

Project Finance Contracts
Strategic analyses for legal institutionalisation

Projectfinanciering contracten
Strategische analyses voor juridische institutionalisatie

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GENERAL TABLE OF CONTENTS

CHAPTER 1 – INTRODUCTION.....	7
Table of Contents.....	9
1.1 A concept and early approach to the elements of PFCs.....	11
1.2 The value of PFCs to society.....	16
1.3 State of the art.....	17
1.4 Problem and need for research.....	25
1.5 The threefold general object of research; the three parts of the thesis.....	26
1.6 Three parts of the study. The individual objects of research and the research questions.....	27
1.7 Value of the research.....	35

PART I

CHAPTER 2 – CONTRACTUAL PRACTICES IN PFCs.....	41
Table of Contents.....	43
2.1 Introduction.....	47
2.2 The rationality of the non-recourse lender PFCs; a preliminary approach.....	50
2.3 The implementation processes.....	52
2.4 Typical and the necessary components of all PFCs. An early approach. The simplest example.....	56
2.5 The parties and their contracts.....	89
2.6 Typical contractual practices enforceable by the FP (the risk allocation mechanism).....	96
2.7 Typical provisions involving only sponsors.....	124
2.8 Final remarks on the contractual practices.....	127
2.9 Conclusions.....	130

**CHAPTER 3 - BEYOND CORPORATE FINANCE. THE
INDISPENSABLE SOLUTIONS OF PFCs.....135**

Table of Contents.....	137
3.1 Introduction.....	139
3.2 Tensions between ownership and control (management).....	143
3.3 Tensions between shareholders and creditors as a class.....	152
3.4 Tensions between concentrated debt holders and the company.....	185
3.5 Tensions between dispersed financing and the company (adverse selection in open markets).....	191
3.6 Conclusions.....	198

PART II

**CHAPTER 4 - IDENTIFYING PFCs: THE NECESSARY ELEMENTS
AND THE STRATEGIES OF PARTIES 203**

Table of contents.....	205
4.1 Introduction.....	209
4.2 Six necessary components of PFCs.....	213
4.3 Six necessary strategic features of PFCs.....	236
4.4 Necessary features of the objective functions of parties in PFCs.....	256
4.5 Necessary feasibility determinants of PFCs.....	263
4.6 Necessary contrasts with other financing techniques.....	265
4.7 Verifying elements, parties, and strategies in four distinct cases.....	267
4.8 Conclusions.....	283

**CHAPTER 5 - THE NECESSARY TENSIONS AND OPPORTUNISM
BETWEEN THE SPONSORS AND THE LENDER IN PFCs..... 291**

Table of Contents.....	293
5.1 Introduction.....	297
5.2 The elements of the framework.....	302

5.3	1st tension: <i>Risking</i>	310
5.4	2nd tension: <i>shirking</i>	322
5.5	3rd tension: <i>Shading</i>	347
5.6	<i>No news</i>	353
5.7	<i>Bad news</i>	355
5.8	<i>Very bad news</i>	358
5.9	<i>Good news</i>	360
5.10	Collective and individual actions.....	361
5.11	Cost overruns, readjustments, and the optimal seniority of debt in PFCs; an early approach	362
5.12	An illustration of risking, shirking, and shading; contractual precautions and need for legal treatment	365
5.13	CONCLUSIONS.....	372

CHAPTER 6 – INDIVIDUAL RESPONSES, SUB-COALITIONS, AND UNANIMOUS COLLUSIONS AGAINST THE NON-RECOURSE LENDER..... 375

	Table of Contents.....	377
6.1	Introduction.....	383
6.2	The elements of the framework.....	389
6.3	The objective functions of sponsors	401
6.4	The first alternative; choosing inputs without renegotiating	404
6.5	The second alternative; choosing inputs after building opportunistic sub-coalitions.....	415
6.6	The third alternative; choosing inputs after renegotiating for colluding unanimously against the FP	452
6.7	The invariable domination of news; from the 1st to the 3rd alternatives.	457
6.8	The opportunism and the problem of costs overruns in PFCs	466
6.9	Conclusions.....	468
	Annexe I - Good news.....	473
	Annexe II.....	478

PART III

CHAPTER 7 - THE NEEDS FOR LEGAL TREATMENT IN PFCs 481

Table of Contents.....	483
7.1 Introduction.....	487
7.2 Social efficiency and the legal needs of diversified corporate business....	493
7.3 Social value and the legal needs of parties in all PFCs.....	520
7.4 The contractual reformation of corporate types; towards institutionalisation of PFCs.....	547
7.5 The inherent strategic needs, the negative value of diversification, and the feasibility of legal treatment in PFCs	562
7.6 Conclusions.....	564

CHAPTER 8 - TOWARDS THE LEGISLATIVE INSTITUTIONALISATION OF PFCs. THE PFC COMPANY FORM575

Table of Contents.....	577
8.1 Introduction.....	581
8.2 1st pillar. Towards a PFC corporate form; default and mandatory rules, registration and publicity	591
8.3 2nd pillar. The fiduciary duties of loyalty to the non-recourse lender (the FP)	597
8.4 3rd pillar. Control responsibility to sponsors in PFCs.....	616
8.5 4th pillar. The publicity of a corporate form. The limitation of the representation organs of the SPV	630
8.6 5th pillar. The fiduciary duties to inform distress in PFCs	639
8.7 Conclusions.....	653

CHAPTER 9 - THREE POSTULATES (PRINCIPLES) FOR THE INTERPRETATION OF CLAUSES IN PFCs..... 661

Table of Contents.....	663
9.1 Introduction.....	665

9.2	The pre-emptive function of clauses	666
9.3	<i>In dubio pro creditore</i>	672
9.4	<i>Intuitu personae</i> interactions.....	682
9.5	Specific commitments to inform (from individual clauses)	687
9.6	Conclusions.....	691

**CHAPTER 10 - FOUR LEGALLY ENFORCEABLE OPTIMALITIES
IN PFCs..... 695**

	Table of contents.....	697
10.1	Introduction.....	701
10.2	Optimal fiduciary duties of diligence in PFCs.....	702
10.3	The optimal responsibility of sponsors and managers in the vicinity of SPV insolvency.....	721
10.4	Optimal seniority for non-recourse claims in PFCs.....	732
10.5	Optimal delegation and managerial competences (mandates)	740
10.6	Conclusions.....	743

CONCLUSIONS 751

11.1	The three parts of the study.....	753
11.2	Chapter 2 - Contractual practices in PFCs	753
11.3	Chapter 3 - PFCs beyond corporate financing (the indispensable PFCs). 758	
11.4	Chapter 4 - Identifying PFCs: The necessary components and strategic positions of parties in PFCs.....	762
11.5	Chapter 5 - Necessary tensions (conflicting interests) and opportunism between the sponsors and the lender in PFCs	767
11.6	Chapter 6 - Individual responses, sub-coalitions and unanimous collusions against the lender in PFCs.....	771
11.7	Chapter 7 - Needs for legal treatment in PFCs.....	775
11.8	Chapter 8 - Towards the legislative institutionalisation of PFCs. The PFC company form	784
11.9	Chapter 9 - Three postulates (principles) for the interpretation of clauses in PFCs	790
11.10	Chapter 10 - Four legally enforceable optimalities in PFCs.....	794

BIBLIOGRAPHY	803
ANNEXE A - DEFINITIONS	827
ANNEXE B - GLOSSARY	833
ANNEXE C - CASE-STUDIES	843

Chapter 1

Introduction

Abstract. The first chapter includes the general introduction to the research. This first part presents a preliminary approach to project finance contracts, its elements and uses, and the rationality of the lender who provides debt without collateral or recourse to third parties. The chapter mentions the reasons and circumstances in which non-recourse financing contracts become indispensable to parties and their value to society. Before introducing the state of the art, the needs, object, and value of the law and strategic economic analysis, the chapter refers to the lack of legal institutionalisation of project financing and its consequences. The Chapter then announces the specific questions of research that correlate with each of the chapters to follow. The last sections remark the contributions in the legal and economic dimensions separately.

Table of Contents

1	CHAPTER 1 – INTRODUCTION	7
	TABLE OF CONTENTS	9
1.1	A CONCEPT AND EARLY APPROACH TO THE ELEMENTS OF PFCs	11
1.1.1	Concept	11
1.1.2	The elements; an early approach	11
1.1.3	Uses.....	12
1.1.4	The rationality of the lender in PFCs	13
1.1.5	When PFCs are indispensable	14
1.2	THE VALUE OF PFCs TO SOCIETY	16
1.3	STATE OF THE ART	17
1.3.1	Economics approach	18
1.3.1.1	Literature on PPPs	18
1.3.1.2	Strategic studies	19
1.3.1.3	The literature on costs overruns (a proxy for renegotiations and under-investment)	21
1.3.2	Legal approach; the need for institutionalisation.....	23
1.4	PROBLEM AND NEED FOR RESEARCH	25
1.4.1	Problem expressed generally.....	25
1.4.2	Legal dimension	25
1.5	THE THREEFOLD GENERAL OBJECT OF RESEARCH; THE THREE PARTS OF THE THESIS	26
1.6	THREE PARTS OF THE STUDY. THE INDIVIDUAL OBJECTS OF RESEARCH AND THE RESEARCH QUESTIONS	27
1.6.1	PART I. Contractual practices and benefits of PFCs as known today	27
1.6.1.1	Question 1; Chapter 2 - Illustrating PFCs. The contractual practices in PFCs	27
1.6.1.2	Question 2; Chapter 3 – PFCs beyond the boundaries of corporate finance (when PFCs become indispensable).....	28
1.6.2	PART II – Strategic analysis of PFCs	29

1.6.2.1	Question 3; Chapter 4 - Identifying PFCs: The necessary components and strategic positions of parties in PFCs	29
1.6.2.2	Question 4; Chapter 5 – The necessary tensions and opportunism between the sponsors and the lender in PFCs	30
1.6.2.3	Question 5; Chapter 6 – The individual responses, sub-coalitions and unanimous collusions against the lender in PFCs	31
1.6.3	PART III. Towards the legal institutionalisation of PFCs	32
1.6.3.1	Question 6: Chapter 7– The needs for legal treatment in PFCs	32
1.6.3.2	Question 7: Chapter 8 - Towards the legislative institutionalisation of PFCs. The PFC company form....	33
1.6.3.3	Question 8: Chapter 9 - Three postulates (principles) for the interpretation of clauses in PFCs	34
1.6.3.4	Question 9: Chapter 10– Four legally enforceable optimalities in PFCs	34
1.7	VALUE OF THE RESEARCH.....	35
1.7.1	Economic dimension	35
1.7.2	Legal dimension	36

1.1 A concept and early approach to the elements of PFCs

1.1.1 Concept

Non-recourse project financing involves the placement of senior debt in a special purpose legal vehicle owned and controlled by its input providers, for the funding of a single, time-limited, materially and financially predefined, highly specific project, without recourse to third parties.^{1 2}

1.1.2 The elements; an early approach

In project finance contracts (hereafter, PFCs), there is always at least one project-dedicated company -a special purpose vehicle (hereafter, the SPV) advancing a single project whose assets it owns and controls. This SPV (or group of them) are wholly owned and also controlled by the so-called sponsors. The sponsors are the individuals who design the project. In addition to owning the SPV, the sponsors are the critical input providers for the single highly specific project.

In PFCs, albeit the sponsors own (and provides the bulk of capital contributions for) the SPV, most of the coverage of financing needs for the project does not come from equity but non-recourse debt from a lender (hereafter, the financing party, or the

¹ Cf. the characterisation of project financing in the BP Internal Memorandum “Project Finance” (1990), page 1, cited in page 139 in B. C. ESTY, *Modern Project Finance: A Casebook*, John Wiley & Sons, Inc., Boston, 2004. See also page 25 in *Ibid.* Pp. 7 and ff. in E. R. YESCOMBE, *Principles of Project Finance*, second, Elsevier, Amsterdam, 2014. Pp. 2 and ff. W. TAN, *Principles of Project and Infrastructure Finance*, Taylor and Francis Ltd, 2007. Page 1 in J. DEWAR, *International Project Finance - Law and Practice*, Oxford University Press, New York, 2011. Pp. 3 and ff. in A. FIGHT, *Introduction to Project Finance*, Elsevier, 2006. Pp. 115 and ff. in E. R. YESCOMBE, *Public-Private Partnerships - Principles of Policy and Finance*, Elsevier, London, 2007. Page 96 in G. DEWULF; A. BLANKEN; M. BULT-SPIERING, *Strategic Issues in Public-Private Partnerships*, second., Wiley-Blackwell, 2012. Page 65 in J. DELMON, *Public-Private Partnership Projects in Infrastructure: An Essential Guide for Policy Makers*, Cambridge University Press, 2011. Page 1 in J. D. FINNERTY, *Project Financing - Asset Based Financial Engineering*, second, 2007.

² In chapters 2 and 4, we will find a distinction with other financial techniques and a reference to the concept of *limited-recourse* project financing.

FP).³ In this context, the non-recourse nature of the debt implies that, in the SPV failing to repay its debts to the lender, the FP would not be capable of seeking repayment or compensation from the sponsors their parties.

Parties recur to PFCs to complete highly valuable (high capital intensive) projects that require long material development periods. These projects are often unique in their kinds; thus, they are regularly highly specific. As in the standard literature, in these environments, the specificities of assets and interactions with parties indicate the low redeployment value of resources when allocated to alternative places. We may think of the value of a satellite infrastructure that fails to perform as expected -or whose technology becomes outdated before the SPV repays the non-recourse debt. Strategically, the high degrees of specificities imply that parties will not avail from project (SPV's) resources as collateral for the non-recourse debt.

From the interplay between the non-recourse nature of debt and the high specificities of project resources it follows that, for the repayment of its debt claims, the FP relies exclusively on the SPV's capacity to produce value as ex-ante expected from the single project as predefined.

Consequently, for rationality, before internalising the non-recourse risks, the FP (and all parties) inspect the completeness and enforceability of a web of contractual interactions securing that, under all eventualities, the SPV will count on all resources necessary for the SPV to implement and operate the project as desirable. I refer to this bundle of contracts as the *risk allocation mechanism*. The functionality of the risk allocation mechanism reflects the non-recourse lender's rationality in PFCs (see below). The analyses of this risk allocation mechanism's functionality and the strategies of all parties are innovative contributions of this study.

1.1.3 Uses

Parties use PFCs for completing projects of peculiar characteristics. Chapter 3 will show how PFCs are most efficient –eventually indispensable- for the financing of projects whose capital needs exceed the financing capacities of the sponsors promoting them (see below). Additionally, for reasons relating to the needs for risk allocation, the project that parties finance without recourse must produce predictable cash flows. As said, such cash flows must be sufficient for repaying the financing debt.

³ B. ESTY, “The Economic Motivations for Using Project Finance”, *Mimeo - Harvard Business School*, 2003.

Aside from the most frequent power stations, we may think of high-speed railways,⁴ satellite communications infrastructures,⁵ or large oil pipes as representative examples.⁶ Projects produce wealth by delivering goods or services to the open market -*e.g.*, building and operating an aircraft,⁷ or the construction and operation of amusement parks.⁸ Alternatively, parties may recur to PFCs for covering the needs of a predefined off-taker -regularly, a government acting as the predefined client of the SPV.⁹ Examples of the latter include building roads and health, administrative, justice, or education infrastructures.¹⁰ In Chapter 4, I will show case-studies with real-life examples of projects and structural variations of PFCs.¹¹

1.1.4 The rationality of the lender in PFCs

In the absence of collateral to third parties, and because the SPV holds access to only specific resources, the sponsors and the FP substitute the collateral protection with the functionality (comprehensiveness and enforceability) of what I call the risk allocation mechanism. In the eyes of the lender internalising the bulk of total risks, the risk allocation mechanism must bring comfort that the sponsors will bring all inputs necessary for the completion of the project under all eventualities. Consequently, as shown in all chapters, in PFCs, the completeness and enforceability of this risk allocation mechanism are crucial not only to the rationality of the non-recourse lender but to the feasibility of PFCs.

⁴ *Vid.* the Texas High-Speed Rail Corporation as described in *pp.* 223 and *ff.* in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

⁵ *Vid.* the Iridium LLC case-study in *pp.* 485 and *ff.* in *Ibid.*

⁶ *Vid.* the *Chad-Cameroon Petroleum Development and Pipeline Project* in *pp.* 71 and *ff.* in *Ibid.*

⁷ *Vid.* the *Airbus A3XX project* in *pp.* 169 and *ff.* in *Ibid.*

⁸ *Vid.* the Hong Kong Disneyland project in *pp.* 383 and *ff.* in *Ibid.*

⁹ *Vid.* the introduction to the Public-Private Partnerships (PPPs) below.

¹⁰ See the literature on PPPs offered below in this and in following chapters.

¹¹ For PFCs case-studies, *Vid.* B. C. ESTY, *Modern Project Finance: A Casebook*, cit. F. PRETORIOUS; P. LEJOT; A. MCINNIS; D. ARNER; B. FONG-CHUNG HSU, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, 2008. J. D. FINNERTY, *Project Finance, Asset-Based Financial Engineering*, third, 2013. J. B. MILLER, *Principles of Public and Private Infrastructure Delivery*, Cambridge, Massachusetts, 2000.

Critically, in PFCs, the positions of the sponsors who are at the same time shareholder of the SPV and contractors for inputs to the project are distinct to those of parties who are either (but not both) shareholders or contractors of companies in regular corporate investing or contracting. As I will show in Chapters 2 to 6, in PFCs, the sponsors are few, they are necessarily highly qualified, and they interact with project assets materially. The control of the SPV and its assets allows them information about their actions and the project's evolution. Based on these two variables, the sponsors will coordinate socially desirable or opportunistic responses as the project evolves. The value of these responses from the sponsors will depend on how parties implement the risk allocation mechanism.

The difficulties of building the risk allocation mechanism grow with material complexity, time terms, and the number of parties involved. Consequently, in conjunction with other factors, these implementation efforts (transaction costs) constitute an ex-ante limitation to the feasibility of PFCs. Finally, accordingly, today, parties recur to PFCs for escaping the feasibility boundaries of conventional collateralised corporate financing. Let us most briefly point out how and when parties must necessarily recur to PFCs. Authors in the literature on corporate finance have already described these reasons.¹² I elaborate on them in Chapter 3.

1.1.5 When PFCs are indispensable

Chapter 3 will show eight reasons for which companies cannot fund the sufficiently high capital intensive, materially complex, and long-term projects. I will also show how PFCs are indispensable for the implementation and financing of such endeavours.

First, PFCs prevent distress costs. These are the agency costs that follow the exhaustion of debt capacities -a problem faced by companies funding large projects. *Second, PFCs avoid risk-shifting.* In PFCs, with a single predefined project in the SPV object, the sponsors cannot expand the value of limited liability protection by choosing other riskier businesses with resources from the large project. *Third, PFCs prevent asset dilution hazards.* *Asset dilution* includes all illegitimate ways under which controlling shareholders extract wealth from the company's assets or resources -a problem of companies managing large projects. The allocation of the single project under the control of a dedicated SPV permits the implementation of information systems monitoring predefined resources and cash flows without other business

¹² *Vid.* B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

units' influences.

Fourth, PFCs prevent debt dilution strategies. Debt dilution occurs whenever earlier (unsecured) contractors find themselves competing with later creditors for the same collateral value of company assets -a limitation of companies seeking debt for funding large projects. In PFCs, parties do not face this problem with the FP holding a monopoly on debt provision to the SPV.

Fifth, PFCs avoid the debt overhang under-investment problems. In traditional corporate settings, high debt-to-equity ratios implies that more of the marginal value of capital investments will be used for servicing debt claims rather than for distributing dividends. Backward induction, debt deprive equity investments of their returns, thus leading to under-investment of capital contributions -a limitation to companies' capacities to fund large projects with debt. Parties do not see this problem in PFCs where they agree on the coverage of all financing needs before incorporating the SPVs.¹³

Sixth, PFCs prevents inefficiencies from managerial misconducts (the free cash flow problem). The use of a project-dedicated SPV permits the implementation of information mechanism preventing managerial indiscipline associated with the administration of costly and materially complex projects involving unallocated resources. In PFCs, sponsors' incentives to control managerial actions are stronger than those of the passive shareholders in traditional corporate financing. *Seventh, PFCs mitigates opportunism by concentrated debt providers.* In PFCs, the claims of the FP depend on project success. This structural feature of PFC allows the lender to internalise more of the effects of her opportunistic actions against her debtor. *Eighth, PFCs favours information flows thus reducing tensions with dispersed investors and debt providers.* This is a problem of companies seeking funds from financing large projects. In PFCs, the financing party's position internalising risks as a function of the quality of ex-ante implementation of the project allows for the revelation of information to dispersed equity investors and bondholders bringing contributions in later stages of the project. This free-riding reduces the well-known adverse selection induced under-investment problems with dispersed investors and creditors.

For the above benefits -critically, for escaping the feasibility limitations of sponsors' debt capacities- parties must necessarily recur to PFCs for the financing highest capital-intensive, long term, highly specific projects at necessary implementation

¹³ See the functionality of the *cash waterfall* clauses in chapters 2, 4, 8, and 11.

(transaction) costs.

1.2 The value of PFCs to society

As a financing method, project financing is not new. Medieval Italian bankers from Florence invested in coal mining in England with non-recourse debt in the 13th century. The technique has also been used more or less extensively to fund sea expeditions starting in the 17th century.¹⁴ More recently, since the decade of the year 1980, non-recourse project financing gained popularity as a means for funding the costlier projects and optimising tax planning.¹⁵

In modern days, PFCs are critical tools for the financing of exceptionally large and costly projects. Additionally, with its many variants, PFCs have become common ways of funding public procurement in the public sector.¹⁶ This is true for both developed and developing countries. PFCs receive funds in the forms of loans, bonds, equity and mezzanine investments.

Two of the best sources of current information are Acuris via its Inframation and SparkSpread products,¹⁷ and Refinitiv¹⁸ by Reuters.¹⁹ In the report of the first half of the year (the 30th of June) 2019,²⁰ Revinitiv discriminates non-recourse financing

¹⁴ For a reference and other illustrations about how *not* innovative are the non-recourse financial techniques re-flourishing in the years of the mid-decade of the 1980, *Vid.* J. W. KENSINGER; J. D. MARTIN, “Project Finance: Raising Money the Old-Fashioned Way”, *Journal of Applied Corporate Finance*, vol. 1, 3, 1988.

¹⁵ *Ibid.*

¹⁶ *Cf.* page 7 in E. R. YESCOMBE, *Public-Private Partnerships - Principles of Policy and Finance*, cit. *Cf.* page 485 in F. J. FABOZZI; C. F. DE NAHLIK, “Project finance”. and E. R. YESCOMBE, *Public-Private Partnerships - Principles of Policy and Finance*, cit. E. R. YESCOMBE; E. FARQUHARSON, *Public-Private Partnerships for Infrastructure - Principles of Policy and Finance*, second, Butterworth-Heinemann, 2018. J. DELMON; V. R. DELMON, *International Project Finance and PPPs - A Legal Guide to Key Growth Markets*, Wolters Kluwer Law and Business, 2013.

¹⁷ *Vid.* www.inframationgroup.com last revised on the 11th of January 2021.

¹⁸ *Vid.* www.refinitiv.com last revised on the 11th of January 2021.

¹⁹ See also, DEALOGIC, *Project Finance Rankings*, 2019, at www.dealogic.com.

²⁰ THOMSON REUTERS, “Global Project Finance Review - First Half 2019”, www.refinitiv.com/dealsintelligence, 2019.

provided via loans, bonds, and support from multilateral agencies. Let us observe these figures.

Global loans. In the first half of 2019, there have been deals closing for a total of \$100,536 bn for 303 projects. Of these, 185 were concentrated in Power facilities, 39 in transportation projects, and 24 in the oil & gas sector. The rest went to projects of other industry sectors. The largest loans involved \$4,104 bn granted for the expansion of the Bapco Refinery Plant in Bahrain (closing the 9th of May 2019). This was followed closely by the project for building the HPCL Rajasthan Refinery in India for \$4,046.4 bn (closing the 28th of January, 2019).

Global bonds. In the first half of 2019, we saw bonds issued for a total of \$ 20,648 bn for 43 projects; of these, 40% were allowed to transportation projects, 25% to power generators, and 25% to oil & gas infrastructure. The largest bond issuances were those of the Midwest Connector Capital Co LLC \$2,496.3 bn (7th of March, 2019), and the Florida Development Fin Corp for \$1,750.0 bn (the 2nd of April 2019) both in the United States. Finally, multilateral agencies provided non-recourse debt for \$11,484 bn in 40 various projects.

Aside from the energy, oil & gas, cases, other conspicuous examples of the use of PFCs range from the Euro Channel, the Orenünd Link between Denmark and Sweden, the US interstate highway system, the Suez Canal, the Panama Canal.²¹ In more recent years we saw the use of PFCs for the Hong Kong Disney²² and the Airbus A3xx projects.²³ With the final completion of Hamburg's beautiful Elbphilharmonie, the industry also learned valuable lessons about moral hazard and costs overruns in these contractually complex environments.²⁴

1.3 State of the art

Today, in virtue of its lack of institutionalisation, PFCs are not considered in their inherent characteristics, elements, or parties. They are not observed in their necessary strategic aspects and the interdependent functionalities of contractual

²¹ Cf. page 3 in F. PRETORIOUS ET AL, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, cit.

²² Cf. page 383 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

²³ Cf. page 169 in *Ibid*.

²⁴ Vid. G. KÄHLER, "Elbphilharmonie; Unglückliche Partnerschaft", 25. September, 2008, <https://www.zeit.de/2008/40/Elbphilharmonie>.

arrangements shaping them. This is true for the literature of Law, Economics, and Law and Economics. Many studies in economic literature focus on PFCs -particularly in the literature of finance and management -including the subfield of private-public partnerships. However, their method has been casuistic or financial. There are no studies restricting their attention to the strategic characteristics or focused on the strategic features relevant for improving their legal treatment. Let us most briefly observe the state of the art in different fields.

1.3.1 Economics approach

During the last years, the extraordinary organisational complexity and the growing popularity of PFCs have generated a proliferation of industry-oriented and interdisciplinary scholarly articles on the matter.²⁵ We now find a body of literature dealing with the financial aspects of non-recourse financing.²⁶ The best of these works identify non-recourse project financing from other funding alternatives.²⁷ However, they do not describe the conflicts amongst the parties choosing inputs for the project. That is, they do not examine the strategies of parties who, in the absence of collateral value, will dictate the feasibility of these arrangements from their non-contractible actions. Illustratively, note how the management literature regularly simply distinguishes *project contracts* from the *financing documentation*.²⁸ Today, the rest of the several conceptual categories introduced in this study do not exist in the literature.

1.3.1.1 Literature on PPPs

There is a group of authors examining agency costs whenever parties use PFCs in

²⁵ D. KAYSER, “Recent Research in Project Finance – A Commented Bibliography”, *Procedia Computer Science*, vol. 17, 2013, Elsevier B.V.

²⁶ E.g., S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, second, Academic Press, 2013.

²⁷ Cf. pages 25 and 26 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

²⁸ Cf. the description of direct agreements and the comment: *Whether Direct Agreements should be classified as Project Contracts or financing documentation is a moot point, but they are usually negotiated at the same time as the Project Contracts, and the form of Direct Agreement is set out as an annex to the relevant Project Contract*. Vid. page 194 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

private-public partnerships.²⁹ Some of these remarkable studies focusing on strategic aspects include articles by Hart (2003),³⁰ Dewatripont & Legros (2005).³¹ However, these works' agency costs dimension refers to the bilateral interactions between the government and the company(s) completing projects. Frequently, this literature will compare the cases of *bundling* versus those of *unbundling*. The earlier including the hypotheses where the government procures from a single company (maybe a SPV). The case of *unbundling* describes scenarios where the project exists under the government's property, who then seeks inputs from independent contractors.

Remarkably, when considering the case of *bundling* (the use of a SPV), authors treat the project company (the SPV of PFCs) as a tensionless vertical integration of all inputs necessary for the endeavour.³² In other words, they do not enter the fundamental problem of sponsors' strategies behind the company holding project assets. They do not inspect how the internal tensions among sponsors or how such tensions correlate with project failures or with the problem of cost overruns signalling agency tensions. As a natural consequence, they also do not analyse whether such (yet unknown) tensions require particular legal treatment.

1.3.1.2 Strategic studies

Some studies focus on the strategic aspects of PFCs. The best examples include Esty's

²⁹ *E.g.*, D. MARTIMORT; J. POUYET, "To Build or not to Build: Normative and Positive Theories of Public-Private Partnerships", *International Journal of Industrial Organization*, vol. 26, 2, 2008.

³⁰ O. D. HART, "Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships", *The Economic Journal*, vol. 113, 1998, 2003.

³¹ M. DEWATRIPONT; P. LEGROS, "Public-private Partnerships: Contract design and Risk Transfer", *EIB Papers*, vol. 10, 1, 2005.

³² Among other remarkable studies of PFCs applied to public-private partnership includes E. IOSSA; D. MARTIMORT, "The Simple Microeconomics of Public-Private Partnerships", *Journal of Public Economic Theory*, vol. 17, 1, 2015. E. IOSSA; D. MARTIMORT, "Risk Allocation and the Costs and Benefits of Public-Private Partnerships", *The RAND Journal of Economics*, vol. 43, 3, 2012. B. R. CHEN; Y. S. CHIU, "Public-private partnerships: Task interdependence and contractibility", *International Journal of Industrial Organization*, vol. 28, 6, 2010, Elsevier B.V. G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit.

(2003) works -most cited in Chapter 3-,³³ and before, Farrel (2003).³⁴ ³⁵ As indicated, these studies do not focus on the tensions amongst sponsors behind the SPV. As the reasons behind this lagoon, we may think of the diversity of theoretical stances studying agency conflicts in corporate law and corporate finance literature.³⁶ We may also blame the complexity and structural varieties adopted by PFCs in the different industries (*Cf.* chapter 2 and 4). This second aspect has led to a proliferation of managerial literature specific to industrial sectors where contractual and organisational practices may take different flavours.³⁷

Most interestingly, however, few authors have begun pointing out the crucial importance of considering agency conflicts within the SPV. Martimort and Pouyet (2008) stated "*The benefits of a coordinated choice of efforts might be somewhat dissipated by the internal agency problem that such a consortium may have to solve.*", and proceeds "*...in our modeling of consortia between builders and operators, we have assumed that efforts of the member firms could be coordinated*

³³ B. ESTY, "The Economic Motivations for Using Project Finance", *cit.*

³⁴ L. FARRELL, "Principal-Agency Risk in Project Finance", *International Journal of Project Management*, vol. 21, 8, 2003.

³⁵ The wisdom from these works is visible in managerial literature too. *Cf.* page 75 in F. PRETORIOUS ET AL, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, *cit.*

³⁶ *E.g.*, M. Z. FRANK; V. K. GOYAL, "Trade-off and Pecking Order Theories of Debt", in Espen Eckbo (ed.) *The Handbook of Empirical Corporate Finance*, Elsevier Science, 2007.

³⁷ C. J. SOZZI, "Project Finance and Facilitating Telecommunications Infrastructure Development in Newly-Industrializing Countries", *Santa Clara Computer & High Tech. LJ*, vol. 12, 1996, HeinOnline. H. A. DAVIS; E. P. PLC, *Project Finance: Practical Case Studies*, Euromoney Publications, 1996. J. B. MILLER, *Principles of Public and Private Infrastructure Delivery*, *cit.* H. A. DAVIS, *Project Finance: Practical Case Studies - Volume II*, Euromoney Books, 2003. H. A. DAVIS, *Project Finance: Practical Case Studies - Volume I*, Euromoney Books, 2003. M. BULT-SPIERING; G. DEWULF, *Strategic Issues in Public-Private Partnerships. An International Perspective*, 2006. M. ROWE, *Trade and Project Finance in Emerging Markets*, Euromoney Publications PLC, London, 1999. I. R. COLES, "Julietta Gold Mining Project: Lessons for Project Finance in the Emerging Markets", *Fordham International Law Journal*, vol. 24, 4, 2000.

efficiently. This assumption should be relaxed. Consortia may be inefficient when they suffer from internal agency problems. These problems may tilt the organisational choice towards unbundling".

Additionally, on their empirical study on Public-Private Partnerships, Hoppe, Kusterer, and Schmitz (2013) have also referred to the impact of internal frictions within the SPV and pointed out the need for research. They remarked, "*Our experiment hence illustrates that frictions within the consortium might make a public-private partnership slightly less attractive than it appears when modelled as a monolithic entity.*"³⁸ Finally, Greco (2015)³⁹ produced a research material that, as a working paper, appeared shortly after I commenced this study. When pointing out the tensions inside the company, he referred to the provision of efforts via a SPV in Public-Private Partnerships as one of *imperfect bundling*.⁴⁰ However, Greco's object of research and assumptions are, different from those of this work. He focuses on the bargaining process behind the SPV in Public-Private Partnerships contracts and leaves aside the ex-post contractual dynamics inspected here in Chapters 4 to 6.

1.3.1.3 The literature on costs overruns (a proxy for renegotiations and under-investment)

Most interestingly, there is a wealth of studies dealing with cost overruns in larger projects. This literature is very dispersed in dates and scopes. Fundamentally, the results reflected in these works, as shown below, do not capture cases where the senior non-recourse debt has been finally unpaid only. They also include scenarios where contingencies (*news*) affected project performance using as initial reference estimations, (likely) also affecting the schedules of debt repayments.

Crucially, the severity of costs overruns serves as a proxy for agency costs of contracting. Note, under-investment (the failure of parties to implement contracts) cannot be easily measured empirically. In this context, costs overruns could indicate the strategic tensions that backwards induction lead parties not to advance in

³⁸ *Vid.* p. 165, E. I. HOPPE; D. J. KUSTERER; P. W. SCHMITZ, "Public-private partnerships versus traditional procurement: An experimental investigation", *Journal of Economic Behavior & Organization*, vol. 89, 2, 2013. The handwritten is mine.

³⁹ L. GRECO, "Imperfect Bundling in Public-Private Partnerships", *Journal of Public Economic Theory*, vol. 17, 1, 2015.

⁴⁰ The handwritten in this paragraph is mine.

implementing PFCs. In other words, costs overrun may signal the contractual imperfections (asymmetries of information and incompleteness) and the strategic tensions that reflect needs for legal treatment.

The literature on cost overruns is rich but dispersed. Let us refer to some examples in chronological order, Merrow et al. (1988)⁴¹ in 47 "megaprojects", the average cost overrun was found to be of 88%, and only four samples delivered timely and on budget. Of these, 72% failed to achieve profit objectives. Authors reveal that performance decrease with greater public ownership and whenever projects are larger, first-of-a-kind, and one-of-a-kind. That is, the problem of cost overruns grows with government ownership and project specificities.⁴² Miller and Lessard (2000)⁴³ also observed 60 large engineering projects implemented between 1980 and 2000, with an average size of \$ 1 bn. Flyvbjerg (2002) found that nine out of ten large projects experienced cost overruns of 28% overestimated costs (in real terms).^{44 45}

More recently, Ganuza (2007) refers to *horror stories* of cost overruns in military procurement.⁴⁶ He cites several authors and different studies showing cost overruns of 220% - on average- for US defence programs. Moreover, when revisiting earlier works, he recalls how we should expect a 10% chance of meeting cost goals and a 15% chance of meeting schedule goals in military defence projects. Citing his analyses of 1997, he reports that the largest 256 public work projects undertaken by the Spanish Administration during two years led to cost overruns in 77% of the cases. He also adds that the average cost overruns were 22% of budgeted costs and 62,7% of cost

⁴¹ E. W. MERROW, *Understanding the Outcomes of Megaprojects. A Quantitative Analysis of Very Large Civilian Projects*, RAND Corporation, Santa Monica, CA, 1988.

⁴² The references are also cited in page 221 in B. ESTY, "Why Study Large Projects? An Introduction to Research on Project Finance", *European Financial Management*, vol. 10, 2, 2004.

⁴³ R. MILLER; D. R. LESSARD, *The Strategic Management of Large Engineering Projects*, MIT Press, Cambridge, Massachusetts, 2000.

⁴⁴ B. FLYVBJERG; M. SKAMRIS HOLM; S. BUHL, "Underestimating Costs in Public Works Projects: Error or Lie?", *Journal of American Planning Association*, vol. 68, 3.

⁴⁵ Some of these references are also cited in page 221 in B. ESTY, "Why Study Large Projects? An Introduction to Research on Project Finance", cit.

⁴⁶ J.-J. GANUZA, "Competition and Costs Overruns in Procurement", *The Journal of Industrial Economics*, vol. 55, 4, 2007.

overrun cases involving project design changes during construction. Cantarelli et Al. (2012) found average cost overruns of 10.6% for rail and 18.6% for roads in Dutch projects.^{47 48}

The dramatism of stories as reported varies greatly with countries and industry sectors. The literature on cost overruns does not discriminate the limited or non-recourse nature of the financing debt. Naturally, it also does not see overruns as a failure of the elements shaping a risk allocation mechanism (*Cf.* Chapters 4 to 6). However, generally, authors do show how performance decrease with public ownership and with projects that are larger, first-of-a-kind, or one-of-a-kind. That is, overrun risks grow not only as a function of government ownership but also of specificities. Such empirical observations are consistent with the predictions of the theory of incentives and the propositions of Chapters 4 to 6.

1.3.2 Legal approach; the need for institutionalisation

From the legal stance, PFCs have not yet been legislative or judicially institutionalised. As a result, judges respond to these organisations' challenges based on legal remedies, legal institutions, and application criteria that have been developed for other (standard) contractual and corporate environments.

Today, legislators, judges, and legal scholars understand PFCs as a group of formally and functionally independent contracts. A similar statement holds partially true for the economic literature, where only certain aspects of their identity, elements, parties, and their inherent strategic aspects have been studied. This results in problems that I will point out with details below when presenting the problem, needs, state of the art, objects, and value of the research.

⁴⁷ C. C. CANTARELLI; B. VAN WEE; E. J. E. MOLIN; B. FLYVBJERG, “Different Cost Performance: Different Determinants?”, *Transport Policy*, vol. 22, 2012. See also B. FLYVBJERG, “Cost Overruns and Demand Shortfalls in Urban Rail and Other Infrastructure”, *Transportation Planning and Technology*, vol. 30, 1, 2007.

⁴⁸ In a historical analysis, Hufschmidt and Gerin (1970) analyses data on 100 dams constructed in the United States between 1933 and 1967. The information here is presented without key references to actual projects. But some of the averages of overruns reported go beyond the 100% thresholds; projects by the U.S. Corps of Engineers presented overruns of 124% for projects built or building prior to 1951. See page 277 in M. M. HUFSCHEMIDT; J. GERIN, *Systematic Errors in Cost Estimates for Public Investment Projects*, vol. I, 1970.

Similarly, how the scholars and industry authors refer to PFCs is not consistent. For instances, in virtue of the well-known dependence of non-recourse claims on project success (as opposed to what we see in regular *corporate* or *personal finance*) non-recourse lending is widely referred to as *project finance*, *project financing*, or *project finance contracts*.⁴⁹ Additionally, because the financing debt is found on the side SPV and not on sponsors' side, industry operators also call it *off-balance-sheet* financing.⁵⁰ Likewise, from the inherent dependence of their feasibility on implementation quality, PFCs are also known as *contract finance*⁵¹ or *contractual finance*.⁵²

Consequently, when I use the expression *PFCs*, *project finance contracts*, *project finance arrangements* or the like, I am taking the conceptual liberty of referring to a bundle of functionally interdependent but formally legally remote agreements. Similarly, I will use the words *party*, or *parties*, when referring to individuals necessary to all PFCs (sponsors, the SPV, and the FP). This clarification will be valid for all chapters. I will do this as a means of signalling the functionally multi-party nature of the organisation. Whether –or, the extent to which- can such functional interdependence affect the interpretation of formally independent instruments, as well as the path that a process for legislatively, judicially, or doctrinally

⁴⁹ Cf. S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. A. BARRETTA; C. BUSCO; P. RUGGIERO, “Trust in Project Financing: An Italian Health Care Example”, *Public Money & Management*, June, 2008. R. J. ORR, “The rise of infra funds”, *Project Finance International—Global Infrastructure Report 2007 - Project Finance International (Thomson Reuters)*, 2007. S. SHAH; A. V. THAKOR, “Optimal Capital Structure and Project Financing”, *Journal of Economic Theory*, vol. 42, 1987. S. THOMADAKIS; N. USMEN, “Foreign Project Financing in Segmented Capital Markets: Equity Versus Debt”, *Financial Management*, vol. 20, 4, 1991. M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, Pearson/Prentice Hall, Singapore, 2003. S. TAYLOR, *Can New Nuclear Power Plants be Project Financed?*, 2011.

⁵⁰ Cf. page 1186 in M. J. T. McMILLEN, “Islamic Shari’ah-Compliant Project Finance: Collateral Security and Financing Structure Case Studies”, *Fordham International Law Journal*, vol. 24, 4, 2000.

⁵¹ Cf. page 8 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

⁵² Cf. page 27 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

institutionalising these arrangements are matters of legal traditions. Legal principles that appear expressly or tacitly throughout the study and those remarked explicitly in Chapters 7 to 10, will be those deemed convergent in company law.

1.4 Problem and need for research

1.4.1 Problem expressed generally

As I already stated, today, project finance arrangements are not legally institutionalised contracts or organisations. This is true concerning legal scholarship, legislations, judicial resolutions, and industry practices as seen in management literature. No laws regulate the essential aspects of PFCs. Judges and scholars regard contracts shaping PFCs as different sets of meetings of minds. Consequently, they disregard their common objectives and the interdependence of their functionalities for nesting a non-recourse loan.

Identifying elements (components and parties), private objective functions, and strategic tensions amongst parties inherent to PFCs is a requirement indispensable for the refinement of both legislative and judicial rules applicable to these scenarios. Ex-ante, better legal treatment should reduce transaction costs. Default rules refined to the strategic environment should also prevent parties from exerting costly efforts correcting inefficient legal treatment as applicable to them (*Cf.* chapters 7 to 10). Lower implementation efforts result in the feasibility of socially desirable contracts in more scenarios. Analysing strategic aspects permitting refinements in legal treatment is the fundamental objective of Law & Economics as a scholarly discipline.⁵³

1.4.2 Legal dimension

As I will show in chapters 4 to 7, PFCs do not serve for delegated managers to advance portfolios of diversified investments with resources from dispersed (passive) investors protected behind limited liability rules. On the contrary, in PFCs, parties implement a single project for which they predefine its unique time-limited

⁵³ *Vid.* generally, I. AYRES; R. GERTNER, “Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules”, *The Yale Law Journal*, vol. 99, 1, 1989. See also R. CRASWELL, “Contract law: General theories”, *Encyclopedia of Law and Economics*, vol. 3, 1999. R. E. SCOTT, “A Relational Theory of Default Rules for Commercial Contracts”, *The Journal of Legal Studies*, vol. 19, 2, 1990. J. S. JOHNSTON, “Strategic Bargaining and the Economic Theory of Contract Default Rules”, *The Yale Law Journal*, vol. 100, 3, 1990.

investment choices (the single project), its financing resources (the non-recourse debt), their capital contributions (the financial contributions from sponsors), and the material inputs (the material contributions from the sponsors) before internalising risks.

As advanced below, when introducing the research questions, the strategic analyses from chapters 4 to 7 will reveal the need for reconsidering many aspects of the current legal treatment of PFCs. These, I will advance in chapters 8 to 10. For instances, in PFCs, the scopes of mandates to managers should be distinct. The (indispensable) control of sponsors of the SPV and project assets should be treated differently. Control responsibility rules should be enforceable against sponsors. The fiduciary duties of loyalty should change, and managers should complete the single project as ex-ante predefined by all parties -and never spend efforts seeking alternative growth options. The fiduciary duties of diligence should be higher to the best-qualified sponsors complying with a predefined project, without needs to protect risk-averse managers. Judges should enforce obligations to inform the status of project insolvency more rigorously upon the sponsors who own, control, and provide the single project's critical resources. Finally, the distinct strategic features of PFC allow for the characterisation of both optimalities and postulates for the ex-post interpretation of clauses of the risk allocation mechanism that today authors have not yet analysed.

1.5 The threefold general object of research; the three parts of the thesis

The general objective of the research is threefold. It includes identifying the elements and parties strictly necessary in PFCs, the characterisation of necessary strategic tensions and the forms of opportunism in PFCs, and the identification of places forms in which legal treatment is efficient towards the institutionalisation of PFCs.

These three dimensions of the general objectives correspond to the three parts of the study.

- The first part will comprise chapters 2 and 3 and identifies the contractual practices, benefits, and necessary elements and parties in PFCs.
- The second part will consist of chapters 4 to 6 and isolates the strategic tensions and forms of opportunism in PFCs.
- The third part will include chapters 7 to 10 and characterise legal treatment needs and ways forward for strictly legal research towards the institutionalisation of PFCs.

1.6 Three parts of the study. The individual objects of research and the research questions

1.6.1 PART I. Contractual practices and benefits of PFCs as known today

The first part (chapters 2 and 3) describes contractual practices and financial benefits of PFCs as they are known today. The first part is, consequently exploratory and illustrative. Chapter 2 find its basis on industry-oriented management literature. Chapter 3 builds on pure finance literature, including papers focussing on the scenarios of non-recourse financing specifically. Chapters 2 and 3 are indispensable for building the realistic assumptions upon which all following chapters will refine abstract postulates. Both chapters 2 and 3 include empirical references that verify the market-mimicking efficiency and legal propositions in chapters 7 to 10.

1.6.1.1 Question 1; Chapter 2 - Illustrating PFCs. The contractual practices in PFCs

Today, the industry-oriented and academic literature describes the contractual practices of parties in PFC in dispersed manners. The authors illustrate distinct aspects of financing and management or focus on risk management matters of industry sectors. A characterisation of contractual practices revealing parties' needs in all PFCs is necessary before advancing strategic and legal examinations.

The first chapter responds to the question:

What are the typical characteristics of contractual practices of PFCs as seen today in the industry-oriented literature?

Chapter 2 introduces project finance contracts as seen in the management and industry-oriented literature today. The chapter elaborates on the implementation sequence, on the project idiosyncratic clauses, and on the mechanisms that cover parties' strategic needs in all PFCs. The chapter also introduces the rationality of the lender internalising risks without adequate collateral from the debtor (the SPV holding specific assets) or recourse to third parties.

Innovatively, the chapter offers an early characterisation of the risk allocation mechanism as a distinct element. The chapter also introduces the three tiers of incentives in response to which the sponsors deliver their material contributions in PFCs. Also innovatively, it classifies the types of defaults and emphasises the compatibility of the non-recourse nature of debt with the sureties of third parties protecting the enforceability of clauses of the risk allocation mechanism.

1.6.1.2 Question 2; Chapter 3 – PFCs beyond the boundaries of corporate finance (when PFCs become indispensable)

In project finance contracts (PFCs) parties spend transaction costs implementing a risk allocation mechanism whose completeness and enforceability substitutes the functionality of the missing collateral and recourse to third parties. Paradoxically, in all representative legal jurisdictions, sponsors and lenders have access to more traditional solutions for more straightforward implementation (corporate finance). Furthermore, these more standardised solutions come associated with efficient default rules of which parties can avail reconstructing every element of their contractual interactions.

Before entering the analysis of strategies of parties in PFCs, the work will consider the comparative advantages of PFCs relative to other more frequently used and allegedly simpler collateralised alternatives. Indirectly, the chapter will characterise the scenarios in which PFCs appear indispensable for the financing of highly capital intensive, materially complex, long-term projects.

Chapter 3 is the second chapter of the first part of the study examining contractual practices in PFCs. Chapter 3 will answer the following question:

What are the strategic benefits from PFCs relative to the limitations that parties find in (collateralised) corporate-financed alternatives when funding exceptionally costly, materially complex, long-term projects?

Alternatively,

What are the strategic benefits of PFCs that make them indispensable for the financing of exceptionally costly, materially complex, long-term projects?

In this chapter, I will extend propositions suggested in the existing literature and add new ones.⁵⁴ I will show how: First, by implementing an accountancy system for a single project-dedicated SPV mitigate the problem of *free cash flow* and subsequent managerial indiscipline associated with the financing of large projects. Second, debt

⁵⁴ To the best of my knowledge, this unpublished paper contains the best resume of some of the elemental aspects advanced in this chapter. B. ESTY, “The Economic Motivations for Using Project Finance”, cit. This paper also contains many of the propositions revisited in Chapter 3. See also B. ESTY, “Why Study Large Projects? An Introduction to Research on Project Finance”, cit. B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

placed in a bankruptcy-remote SPV avoids the volatility-induced distress costs produced to companies acquiring extra debt and losing diversification of growth options. Third, the financing coming from a project dedicated source (the FP) solves the *debt overhang* problem. Forth, the single project allocated under dedicated by SPV excludes the *asset substitution (risk shifting)*⁵⁵ risks. Fifth, the FP holding monopoly of financing sources avoids the *debt dilution* hazards Sixth, the closer monitoring and dedicated management of the SPV prevent the *asset dilution* problem. Seventh, the specific pre-contractual arrangements and the non-recourse nature of debt resulting in the lender internalising more of the effects from its undesirable actions mitigate the opportunism by concentrated creditors requesting restrictive covenants. Finally, eight, the provision of non-recourse debt mainly from a single party capable of gathering and processing information about the single project (not about a portfolio of opportunities) greatly prevents the adverse selection problem with dispersed creditors and investors.

1.6.2 PART II – Strategic analysis of PFCs

After the practice and corporate finance illustrations of the first part, the second part of the research (chapters 4 to 6) includes strategic analyses of PFCs. The second part of the study isolates the components of these arrangements. It then identifies the strategic features (including tensions and forms of opportunism) inherent to the positions of parties in PFCs. The strategic analyses are indispensable for characterising parties' needs before considering legal treatment of PFCs in chapters 7 to 10.

The chapters rely on the economic literature of the economic theory of contracts. In particular, it builds on the intuitions of the most straightforward frameworks of bilateral contracting under uncertainty, asymmetries of information and risk aversion, moral hazard in teams, and the firm's property rights-based theories.

1.6.2.1 Question 3; Chapter 4 - Identifying PFCs: The necessary components and strategic positions of parties in PFCs

Today, the literature does not characterise the elements, parties, and strategic features inherent to PFCs in a defining manner. As shown in Chapter 2, the characterisations of PFCs appear dispersal in the literature of management and

⁵⁵ *Risk shifting* not to be confused with the problem of *risking* as characterised in Chapter 5.

corporate finance. Identifying these elements is indispensable before analysing the strategies of parties and the legal solutions applicable in this environment.

Chapter 4 is the first chapter of the second part of the study focusing on identifying strategic features that are inherent to the positions of parties in PFC. Chapter 4 consequently responds to the third research question:

What are the characteristics of the necessary parties, elements, objective functions and strategic tensions inherent to PFCs?

Chapter 4 isolates the necessary elements and strategic positions of parties in PFCs: First, all PFCs have six indispensable components that define their contractual and strategic nature. Second, in PFCs, we always find six strategic characteristics essential to the sponsors' and the SPV' positions. Based on these identifications, the chapter characterised the objective functions of parties all PFCs, the items that govern the feasibility of all PFCs, and the necessary contrasts with other financing techniques. Finally, the chapter verifies the above with the concrete evidence of four exceptionally diverse real-life scenarios published in the literature of project financing.

1.6.2.2 Question 4; Chapter 5 – The necessary tensions and opportunism between the sponsors and the lender in PFCs

Chapter 5 is the second chapter of the second part of the study examining the strategic aspects necessary of the positions of parties in PFCs. The chapter answers the question:

What incentives common to all sponsors exist in tension with the interests of the non-recourse lender and what forms of opportunism appear in PFCs?

The chapter builds the first framework identifying the strategic tensions (agency costs) between the sponsors as a class and the non-recourse lender (the FP) in PFCs. The chapter also characterises three forms of opportunism that are idiosyncratic of PFCs: *shirking*, *risking*, and *shading*. Under *shirking*, the sponsors withhold valuable contributions. Under *risking*, the sponsors implement technological solutions of riskier than the socially optimal. Under *shading*, the sponsors implement innovations without internalising the negative marginal impact from their actions to project wealth and consequently to the repayment capacities of the SPV (with negative externalities to the FP). The names identify both the tensions and the forms of opportunism. Finally, the chapter characterises how the incentives for *shirking*, *risking*, and *shading* evolve as the conditions deteriorate (from *no news*, through *no news*, to *very no news*). Under *very no news*, the sponsors spend all innovating capacities for implementing cost-saving solutions for complying with their obligations as enforceable under the risk allocation mechanism but without

internalising effects against project capacities. Under *very no news*, the expected welfare capacities of the SPV are lower than the face value of non-recourse debt.

The propositions of the chapter result from the strategic characteristics of the positions of parties in PFCs. Hence, they hold irrespective of project configurations.

1.6.2.3 Question 5; Chapter 6 – The individual responses, sub-coalitions and unanimous collusions against the lender in PFCs

Chapter 6 is the third chapter of the second part of the study focusing on the strategic features necessary to parties' positions in PFCs.

Chapter 6 answers the twofold question:

How are the individual strategies of sponsors under asymmetries of information and bounded rationality when allowed to renegotiate with some or with all other sponsors as the environment changes?

Or, alternatively:

How do individual sponsors respond to changes in the environment when they can readjust with some or with all other sponsors?

The chapter identifies how, as the environment changes and capacities of the SPV to distribute residual benefits deteriorate, the sponsors perceive increasing incentives for behaving opportunistically after renegotiating and coordinating with some or with all other sponsors. The chapter consequently characterises the correlation between the influences from the environment and the likelihood that the sponsor delivers their responses (*shirking*, *risking*, and *shading*) individually, after forming opportunistic sub-coalitions, or after colluding unanimously with the other sponsors against the FP. Moreover, the study demonstrates how the strengths of the incentives for *shirking*, *risking*, and *shading* correlate with the spaces for responding individually, with the optimal size of opportunistic sub-coalitions, and the likelihood of unanimous renegotiations. Finally, the chapter also maps the factors that facilitate each alternative, *e.g.*, the asymmetries of information amongst the sponsors and the FP, the complementarities of quality-enhancing and innovating capacities, and the spaces for interacting relationally *-v.gr.*, the capacities of sponsors to sustain reciprocity-based cooperation.

The chapter isolated the incentives that govern the spaces for opportunistic cooperation in PFCs. The findings of Chapter 6 are critical to the understanding of costs overruns in large projects. The strategic understanding of how the sponsors coordinate socially desirable or opportunistic efforts in PFCs is also fundamental to the design of the legal treatment and understanding the functionality of the risk

allocation mechanism's clauses. *V.gr.*, in PFCs, we see cross-default mechanisms, step-in rights, and the FP advancing over parties' contractual relationships between the sponsors or the SPV and third parties (namely, the off-takers or governments). These clauses reflect the multi-party functionality of PFCs that requires legal treatment via institutionalisation in a PFC corporate form, not by the isolated interpretation of clauses.

1.6.3 PART III. Towards the legal institutionalisation of PFCs

The third part (chapters 7 to 10) will finally identify the needs for legal treatment, offer five pillars for institutionalising PFCs in a PFC company form, characterise three principles for interpreting all contracts, and identify four optimalities legally enforceable in PFCs.

The third part of the study builds on legal institutions that are convergent in Comparative Company and Contract Law.⁵⁶ In Chapter 9, one of the postulates uses as a reference the Art. 9 of the Directive (EU) 2017/1132.⁵⁷ The method of this third part of the study is Law and Economics analytical (Chapter 7) and legal normative (chapters 8 to 10). Chapters 8 to 10 advance twelve postulates for the legal treatment of PFCs whose functional and legal implications exceed the scopes of this project. Accordingly, these propositions adopt the form of proposals for derivative research, some of which currently advances in parallel to this study.

1.6.3.1 Question 6: Chapter 7– The needs for legal treatment in PFCs

Chapters 2 and 3 characterised parties' contractual practises in PFCs as seen today dispersedly in the literature of management. Chapters 4 to 6 identified the elements of PFCs and the strategic tensions inherent to the positions of parties in PFCs.

In the first chapter of the third part of the study oriented to legal aspects, Chapter 7 identifies the contrasts between the legal protection that parties receive today in regular (collateralised) diversified corporate businesses and the sponsors and the FP's needs for legal treatment in PFCs. The chapter remarks how such unattended needs reveal in contractual objectives adapting the solutions offered by current

⁵⁶ Cf. R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, 2nd. Ed., Oxford University Press, 2009.

⁵⁷ *Vid.* Directive (EU) 2017/1132 of The European Parliament and The Council of 14 June 2017 relating to certain aspects of company law (codification). Official Journal of the European Union - L 169/46 - 30.6.2017.

corporate types.

This chapter consequently responds to the 6th research question:

What are the general contrasts between the objectives of the legal solutions allowed today to parties in diversified corporate contracting and the needs for legal treatment in PFCs?

And,

how these needs for legal treatment manifest in the objectives of contractual solutions with which parties readjust the rules of the current corporate types in PFCs?

The chapter has three parts. The first part observes the strategic needs, legislative purposes, and legal solutions efficient in the current legal treatment that legislators and judges allow to parties in regular (diversified and collateralised) corporate businesses. These are the objectives that shape the legal structures (default and mandatory norms) of general business-oriented corporate forms.

The second part of the chapter exposes how the objectives, strategic environment, and needs for legal protection of parties in PFCs are characteristically different from those considered by legislators and for which legislators and judges provide a legal treatment to parties in PFCs. This second part of the chapter shows how, when applied to the environments of PFCs, the functionality of the rules that shape corporate forms oriented at facilitating diversified and collateralised investments and contracting result in costly distortions to both sponsors and the FP in PFCs.

The third part of the chapter remarks the contractual solutions that parties implement in PFCs for circumventing the effects of such distortive rules. This third part of the chapter also shows how many of such contractual solutions are feasible in PFCs but not in diversified environments where they would jeopardise the objectives for which legislators offer corporate forms to parties.

Finally, the chapter also exposed how, in virtue of the invariable aspects of parties' objectives in PFCs (oriented to implementation instead of diversification), many of the critical functionalities of contractual solutions can (and should) be replicated in legal default solutions.

1.6.3.2 Question 7: Chapter 8 - Towards the legislative institutionalisation of PFCs. The PFC company form.

Chapter 9 is the second chapter of the third part of the study advancing postulates towards the legal institutionalisation of PFCs.

Towards the legislative institutionalisation of PFCs, Chapter 8 now answers the question:

What rules are necessary efficient in all PFC scenarios, and how we should consider such norms towards the legislative institutionalisation of PFCs in a dedicated corporate form?

Chapter 8 will identify five pillars for the legislative institutionalisation of PFCs. These are: first, the registration and publicity projects in a PFC corporate form; second, the fiduciary duties of loyalty in the protection of all parties (critically, including the PF) in PFCs; third, the *iuris et de iure* control responsibility enforceable against sponsors in PFCs; fourth, the intervention of the lender in the contracting for debt from third parties (a modification of the capacities of the organs of representation) in PFCs -a solution under the current EU Law; and fifth, the general duties to inform in PFCs. These pillars provide for protection in five critical places, in this order: implementation, responsibility, ex-post completion, the critical cash flows protection, and the revelation of enforcement information.

1.6.3.3 Question 8: Chapter 9 - Three postulates (principles) for the interpretation of clauses in PFCs

Chapter 9 proposes five pillars the legislative institutionalisation of PFCs via a PFC-dedicated corporate form. Chapter 9 is the second chapter of the third part of the study advancing ways forward for the legal treatment of PFCs.

As a way forward for legal research, Chapter 9 will answer the question:

What postulates can we derive for the ex-post interpretation of contracts in PFCs?

Chapter 9, advances four propositions for the interpretation ex-post of all contracts that shape the strategically fundamental risk allocation mechanism. Three of them are postulates with distinct functionalities. The fourth proposal (the interpretation of specific commitments to inform) is a corollary of the other three. The four postulates serve for supplementing the five pillars upon which the legislators should implement the PFC corporate form. Additionally, judges and parties should enforce these postulates in precise conjunction with the characterisations of optimalities offered in Chapter 10 with which they complete the regulation of PFCs.

1.6.3.4 Question 9: Chapter 10– Four legally enforceable optimalities in PFCs

Chapter 10 then advances four principles for the ex-post legal interpretation of all clauses of the critically relevant risk allocation mechanism. As a way forward for later research, the last chapter of the third part of the study answers the following

question:

What legally enforceable optimalities can we characterise in PFCs?

Chapter 10 analyses four optimalities in PFCs: first, the optimal fiduciary duties of diligence in PFCs; second, the optimal responsibility of managers and sponsors in the vicinity of SPV insolvency in PFCs; third, the optimal hierarchy of claims in PFCs; and fourth, the optimal scope of managerial delegation in PFCs.

1.7 Value of the research

The law and economics analyses contribute to advances in both economic and legal fields. These values correspond with the second and third parties of the study. In both directions, the work allows for a better current understanding of PFCs and identifying ways for derivative studies. Legal propositions are robust *-v.gr.*, their effects remain desirable for all evolutions of the project. Some of them are already operative. Let us shortly mention them.

1.7.1 Economic dimension

The identification of elements and the necessary strategies of parties in PFCs results in the following contributions:

First, analyses identify the elements, parties, and strategic aspects that are necessary for all PFCs. We observe these features in all PFC environments, irrespective of project configurations, numbers or SPVs or sponsors and lenders intervening as part of the FP. (*Cf.* Chapter 4)

Second, the study characterises features of a strategic value unknown today, *e.g.*, the value of control, the three tiers of incentives, and the risk allocation mechanism's critical value. (*Cf.* Chapter 4)

Third, the analysis allows for a characterisation of strategic tensions between the sponsors as a class, the sponsors individually, and the FP. The study shows how these strategic tensions evolve with the evolution of project capacities due to the uncontracted influences from the environment. (*Cf.* Chapter 5).

Fourth, the study identifies the idiosyncratic forms of opportunism with which the sponsors respond to the exacerbation in the strategic tensions in PFCs. The first of these is *shirking*. *Shirking* refers to the choice of socially desirable privately costly non-contractible efforts that are necessary lower as a function of the weight of the senior debt relative to total welfare from the SPV (under-investment) (*Cf.* Chapter 5).

Fifth, the work identifies *risking*. *Risking* refers to both the individual preferences and the opportunistic responses of sponsors innovating to implement technologies of

risk higher than the socially desirable (*Cf.* Chapter 5).

Sixth, the analysis characterises *shading*. *Shading* refers to both the responses with which sponsors implement innovations for complying with obligations enforceable under the risk allocation mechanism but -because of the distortions of the senior non-recourse debt- fail to internalise the socially undesirable consequences from such changes (over-investment) (*Cf.* Chapter 5).

Seventh, the work characterises for withholding or revealing information. Under *good news*, as conditions evolve better than expected, the sponsors reveal their choices of inputs to incentivise the responses from other sponsors choosing complementary (synergetic) efforts.

Eighth, the work analyses how the sponsors deliver these four opportunistic responses in individual actions, sub-coalitions, and unanimous collusions against the non-recourse lender. The study also describes how the likelihood of individual responses as well as unanimous collusions and the opportunistically optimal size of sub-coalitions as a function of distinct variables that are strategically necessary in these contexts (complementarities of inputs, innovation capacities, asymmetries of information amongst sponsors and between sponsors and the FP) (*Cf.* Chapter 6).

Ninth, as a way forward for later research, the thesis identifies a postulate for an optimal seniority of claims in PFCs (*Cf.* chapters 5 and 10).

Tenth, the analysis characterises an optimal scope of delegation, shading light on the contractual interaction between the SPV and the appointed managers of the SPV (*Cf.* Chapter 10).

Finally, eleventh, the study identifies the features that dictate a distinctly optimal standard of diligence (fiduciary duties of care) enforceable against managers and sponsors in PFCs (*Cf.* Chapter 10).

1.7.2 Legal dimension

In its third part, in chapters 7 to 10, as ways forward for legal research, the study advances twelve postulates for the legal (legislative and judicial) institutionalisation of PFCs.

First, the study presents the value of institutionalising PFCs legislatively by implementing a PFC corporate form (*Cf.* Chapter 8). The chapter identifies the mandatory and default rules and the information requirements for its registration and publicity.

Second, the work proposes a control responsibility rule enforceable *iuris et de iure* against sponsors in PFCs (*Cf.* Chapter 8).

Third, the study identifies a fiduciary duty of loyalty to the non-recourse lender enforceable against both the appointed manager and the sponsors in PFCs (*Cf.* Chapter 8).

Forth, the analysis identifies the feasibility of, under the current European Directives, domestic legislators could restrict the capacities of the organ of representations of PFC company forms. This would prevent some forms of opportunism and institutionalise the common practice of allowing the non-recourse lender a monopoly in the provision of debt to the SPV (*Cf.* Chapter 8).

Fifth, the study proposes a general fiduciary duty to inform enforceable against the sponsors in PFCs. Under this rule, the sponsors should inform eventualities that fall within a verifiable threshold (*no news*) that the thesis also characterises (*Cf.* Chapter 8).

Sixth, the work identifies and shows the necessary efficiency of a principle under which parties and judges should ex-post interpret all clauses of the risk allocation mechanism as if implemented with pre-emptive objectives (*Cf.* Chapter 8).

Seventh, the analysis shows the efficiency of an *in dubio pro creditore* postulate under which judges should consider the necessarily distinct implementation capacities and risks internalised by the sponsor and the FP in PFCs (*Cf.* Chapter 9).

Eighth, the study shows how the sponsors' positions should be interpreted as *intuitu rei*, and that of the lender should be treated as *intuitu personae* or *intuitu rei* a function of the evolution of the project (*Cf.* Chapter 9).

Ninth, the work describes how the optimal responsibility standards enforceable against sponsors in PFCs should be higher than those (very low) in force today in diversified corporate businesses (*Cf.* Chapter 10).

Tenth, coherent with the above, but for distinct reasons, the analysis characterises higher responsibility standards enforceable against sponsors in the vicinity of SPV insolvency (*Cf.* Chapter 10).

Eleventh, the study identifies a postulate for reconstructing the optimal seniority of claims in PFCs. The proposition is useful for interpreting contracts ex-post and guiding renegotiation processes under insolvency procedures (*Cf.* Chapter 10).

Twelfth, finally, the work characterises the optimal delegation in PFCs. The postulate serves to reconstruct mandates to administrators and to identify decisions adopted in trespass of such boundaries (*Cf.* Chapter 10).

PART I

The first part of the study observes contractual practices and the advantages of PFCs over the classical corporate financing possibilities as seen in the literatures of management and finance.

Chapter 2

Contractual practices in PFCs

Abstract. The second chapter presents a conceptual introduction to project finance contracts as seen in the management and industry-oriented literature. The practice approach sets the factual basis for the strategic analyses in the chapters to follow. The chapter characterises the necessary elements and the typical contractual behaviour of parties PFCs. It also illustrates the implementation sequence. In particular, it introduces the lender's rationality who internalises debt risks without collateral or recourse to third parties.

Innovatively, the chapter introduces the three tiers of incentives that sponsors and the lender implement in all PFCs. Also originally, it classifies the types of defaults to contractual provisions and emphasises the compatibility of the non-recourse nature of debt with the sureties from third parties protecting the enforceability of clauses of the critical risk allocation mechanism -a distinct essential element of PFCs, as such, first introduced here and further characterised in chapters 4 to 6.

Table of Contents

2	CHAPTER 2 – CONTRACTUAL PRACTICES IN PFCS	41
	TABLE OF CONTENTS	43
2.1	INTRODUCTION	47
2.1.1	Object of the chapter	47
2.1.2	Value of the analysis	47
2.1.3	Sequence of the presentation	48
2.2	THE RATIONALITY OF THE NON-RECOURSE LENDER PFCS; A PRELIMINARY APPROACH	50
2.3	THE IMPLEMENTATION PROCESSES	52
2.4	TYPICAL AND THE NECESSARY COMPONENTS OF ALL PFCS. AN EARLY APPROACH. THE SIMPLEST EXAMPLE	56
2.4.1	Sponsors	56
2.4.2	Special Purpose Vehicle (SPV)	57
2.4.3	Non-recourse debt	59
2.4.3.1	Concept	59
2.4.3.2	Non-recourse debt and project risks	60
2.4.3.3	Events of default	61
2.4.3.4	The protection from third parties and the non-recourse nature of the debt	62
2.4.3.5	The dispensable (redundant) non-recourse clause	63
2.4.3.6	Limited recourse debt; a semantic observation	64
2.4.4	Single predefined project	65
2.4.5	Risk allocation mechanism	69
2.4.5.1	Concept and functionality; the strategic value of implementation quality	69
2.4.5.2	Scope of the risk allocation mechanism	70
2.4.5.3	Events of technical default, full default, and non-recourse debt	72
	2.4.5.3.1 <i>Technical default provisions</i>	73
	2.4.5.3.2 <i>Full default provisions</i>	74
2.4.6	Financing party (FP)	76

2.4.7	Other contractors.....	79
2.4.7.1	The contracts from inputs with parties other than the sponsors	79
2.4.7.2	Insurance and credit enhancement providers.....	82
2.4.7.3	The off-taker in PFCs. The case of private-public partnerships (PPPs).....	83
	2.4.7.3.1 <i>The off-taker</i>	85
	2.4.7.3.2 <i>PPPs, the off-taker and reward functions</i>	86
2.4.8	The simplest PFC.....	86
2.5	THE PARTIES AND THEIR CONTRACTS	89
2.5.1	Clauses involving the FP, the SPV, and sponsors	90
2.5.2	Clauses involving the FP, the Off-taker and the SPV.....	93
2.5.3	Clauses involving only sponsors.....	95
2.6	TYPICAL CONTRACTUAL PRACTICES ENFORCEABLE BY THE FP (THE RISK ALLOCATION MECHANISM)	96
2.6.1	Events full default.....	98
2.6.2	Technical definitions; general pledges and commitments	102
2.6.2.1	Provisions defining technical aspects of the project.....	103
2.6.2.2	Pledges and covenants on project management.....	104
2.6.2.3	Pledges and covenants defining the governance of the SPV	105
2.6.2.4	The protection from third parties (insurance and credit enhancement).....	108
2.6.3	Information clauses	111
2.6.3.1	Project-specific commitments to inform	112
2.6.3.2	Progress monitoring (control) ratios	113
2.6.3.3	General obligations to inform	114
2.6.4	Control mechanisms.....	114
2.6.4.1	<i>Cash waterfall</i> (cascade) clause.....	114
2.6.4.2	Monopolies of financing sources	116
2.6.4.3	Control accounts and cash-traps.....	117
2.6.5	Dispute resolution and enforcement precautions	118
2.6.5.1	Arbitration.....	118

2.6.5.2	Direct agreements and Step-in rights	119
2.6.5.3	Assignments of rights	122
2.6.5.4	Sureties (<i>ius in re</i>) over project assets	123
2.6.5.5	The FP and security over the SPV's shares	123
2.7	TYPICAL PROVISIONS INVOLVING ONLY SPONSORS	124
2.7.1	Spaces for contracting (the 2 nd tier of incentives)	124
2.7.2	Back-to-back and pass-through mechanisms	126
2.8	FINAL REMARKS ON THE CONTRACTUAL PRACTICES	127
2.8.1	SPV advances a single project that parties predefine	128
2.8.2	Sponsors exert material and political control of the SPV and its assets	128
2.8.3	Parties implement covenants for also protecting the interests of the FP	129
2.8.4	Default definitions allow early control of project assets and eventually of the SPV by the FP	129
2.8.5	The cash waterfall clause and the optimal hierarchy of claims ...	129
2.9	CONCLUSIONS	130

2.1 Introduction

2.1.1 Object of the chapter

The chapter's object is to present the critical aspects of how sponsors and the financing party implement non-recourse project financing operations today. The chapter adopts a practical approach. It consequently builds on industry-oriented literature.

This first part of the study answers the question: *What are the typical characteristics of contractual practices of PFCs as seen today in the industry-oriented literature?*

2.1.2 Value of the analysis

The chapter's intuitive characterisations show the plausibility of the assumptions in later sections of the study. The descriptions also provide realism to the strategic analyses and legal recommendations that will follow. Much of the four real-life case-studies offered in Chapter 4 will build on the observations of clauses from this chapter.

Innovatively, the Chapter introduces the concept of a risk allocation (or task distribution) mechanism as a component inherent to all project finance contracts (PFCs). The risk allocation mechanism appears as an element indispensable for the rationality of the non-recourse lender (the financing party, or FP) internalising project risks without collateral protection or recourse to third parties. The fundamental strategic characteristics of the risk allocation mechanism and other components, parties, and strategic aspects essential in PFCs appear in Chapter 4.

Also, innovatively, the chapter begins building the intuition about the fundamental strategic value in PFCs of advancing a single project instead of allowing managers to advance a portfolio of business alternatives as in regular corporate contracting. The study shows the critical strategic value of this postulate in chapters 4 to 6; its legal implications appear in chapters 7 to 10.

The chapter is also novel on the approach to the categories of clauses that shape the risk allocation mechanism. The analysis of conceptual boundaries and functionalities of provisions of technical default and full default is also original. Also new is the observation about the events of *full default* and the protections from (recourse to) third parties, and their compatibility with the non-recourse nature of debt in PFCs.

As a distinct innovative contribution, the chapter shows the contractual practices that, in Chapter 4, will serve for identifying two of the three tiers of incentives to which sponsors deliver their responses in PFCs. These are the provisions of the risk allocation mechanism shaped of incentives enforceable by the FP, and the set of

arrangements enforceable only by sponsors.

Additionally, the chapter contains a semantic clarification about the expression *limited recourse financing* found in the management and industry-oriented literature. The observation of the use of the expression contributes to identifying the arrangements in which lenders provide non-recourse debt. Identifying the forms in which such non-recourse nature of debt manifests is of critical importance towards the legal institutionalisation of PFCs.

Finally, from the strictly pedagogic stance, the chapter offers a novel classification of clauses and covenants according to their functionalities: material specifications - including project management and SPV management-, information duties, control mechanisms, dispute resolution and enforcement provisions. This classification is distinct to the traditional division between project contracts and financing contracts.

2.1.3 Sequence of the presentation

Before the conclusion, the following sections of the chapter will be articulated as follows.

In the second section, I will introduce the strictly elemental aspects of the non-recourse lender's rationality in PFCs.⁵⁸ This preliminary presentation of these aspects in this earliest part of the study contributes to improving the perspectives of the functionality of clauses introduced further below. Upon these concepts, I will later analyse the strategic position of the non-recourse lender in chapters 4 to 7.

The third section will describe the basic features of the implementation process. This introduction is necessary for illustrating the role of sponsors in shaping the project, how such development will affect the contractual practices, and the feasibility of implementation (*cf.* the sixth part of this chapter).

In the fourth part of the chapter, I will introduce the essential characteristics of the components -elements and parties- of all PFCs. In this order, I will introduce the sponsors, the special purpose vehicle (SPV), the non-recourse debt, the single predefined project, the single project, the risk allocation mechanism, the financing party (FP), and the other contractors.

Also in the fourth section, I will show the functions of other contractors who are typical but not essential to these arrangements: the contractors for inputs who are

⁵⁸ An elaboration of these strategic features will appear in Chapter 4. Then, an examination of strategic tensions will follow in chapters 5 and 6.

not sponsors, the insurance and credit enhancement providers and the Off-taker in scenarios where parties use PFCs for delivering goods or services to public procurement actions (*v.gr.*, as part of Private-Public Partnerships, or PPPs). These are intuitive illustrations, as seen in industry-oriented literature. A strategic analysis will follow in Chapter 4.

The fourth section will also include a fictitious example of a PFCs with its strictly essential components. Later in Chapter 4, I will present four example-cases. The first of those later examples will be an extension of this hypothetical scenario introduced here; the remaining three cases will show real-life PFCs from the management literature.

The fifth section will analyse the different parties that intervene in the separate contracts that shape non-recourse project financing organisations. Let us recall, today, PFCs are not institutionalised organisations. Their formation results from an accumulation of formally independent (but functionally integrated) agreements. So, in this section, we will see how agreements take place among: first, the FP, the SPV and the sponsors; second, the FP, the off-taker and the SPV; and finally, third, the sponsors only.

In the sixth place, I will offer actual examples of formally independent contractual provisions that habitually shape PFCs. I will also consider covenants as per their objectives and consequences distinguishing cases of full default as opposed to provisions of technical default. In this order, I will bring examples of provisions regulating material aspects of the project (technical definitions, general pledges and commitments), information clauses, control mechanisms, and dispute resolution (and enforcement) arrangements.

In the seventh place, I will refer to the contractual interaction that sponsors sustain without the FP intervention. I will point out at *back-to-back* and *pass-through* mechanisms. These arrangements are parts of the 2nd tier of incentives to which the sponsors respond with material inputs to the project -an aspect analysed thoroughly in chapters 4 to 6.

Section eight will remark five characteristics that define PFCs. First, the SPV advances always a single predefined project. Second, the sponsors control the SPV and its assets. Third, parties implement covenants protecting the position of the non-recourse lender. Fourth, default provisions allow for the FP to take control of project assets and the SPV. Fifth, there is always a contractual provision regulating the flows of resources in and out of the SPV (often called the cash waterfall clause). Section nine concludes this second chapter.

2.2 The rationality of the non-recourse lender PFCs; a preliminary approach

Before entering the practical description of PFCs, let us anticipate a critical strategic aspect of the non-recourse lender's rationality in PFCs. I will further elaborate in these propositions in all chapters. This early mention is indispensable for interpreting strategically the object of contractual practices as introduced below.

Let us recall, non-recourse project financing involves the completion of a project by allocating the contracts for its financing, the arrangements with all inputs providers, and the ownership of its material assets under the control of a project-dedicated legal vehicle (SPV). This SPV is wholly owned and materially controlled by its input providers -the so-called sponsors. In this context, non-recourse nature of project financing means that, in scenarios where a part of the total of the financing debt remains unpaid, the creditor (the financing party, or FP) would not be capable of seeking repayment or compensation from parties other than the SPV -her debtor.^{59 60}

⁵⁹ “Classic nonrecourse project financing provides a structure that does not impose upon the project sponsor any obligation to guarantee the repayment of the project debt if the project revenues are insufficient to cover principal and interest payments. (...) A typical nonrecourse project finance loan provision provides that no recourse is available against the sponsor or any affiliate for liability to the lender in connection with any breach or default, except to reach project collateral.” *Vid. p. 185 in S. L. HOFFMAN, “A Practical Guide to Transnational Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations”, The Business Lawyer*, vol. 45, 181. *Vid. p. 185 in S. L. HOFFMAN, “A Practical Guide to Transnational Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations”, The Business Lawyer*, vol. 45, 181.

⁶⁰ *Cf.* the characterisation of project financing in the BP Internal Memorandum “Project Finance” (1990), page 1, cited in page 139 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit. See also page 25 in *Ibid.* Pp. 7 and *ff.* in E. R. YESCOMBE, *Principles of Project Finance*, cit. Pp. 2 and *ff.* W. TAN, *Principles of Project and Infrastructure Finance*, cit. Page 1 in J. DEWAR, *International Project Finance - Law and Practice*, cit. Pp. 3 and *ff.* in A. FIGHT, *Introduction to Project Finance*, cit. Pp. 115 and *ff.* in E. R. YESCOMBE, *Public-Private Partnerships - Principles of Policy and Finance*, cit. Page 96 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit. Page 65 in J. DELMON, *Public-Private Partnership Projects in*

As shown below and in other chapters, the projects that parties fund via PFCs are usually rare or unique in their types. Moreover, their constructions require long stages of development. Consequently, in PFCs, both the project (entirely) and its assets are highly or fully specific.

In this context, the high degrees of specificities imply that such resources' redeployment value will be low or often negative. Consequently, the effectiveness of such goods as collateral in protecting the financing debt will also be low (strategically ineffective).⁶²

Accordingly, for the servicing of the non-recourse debt and its interests, the FP will depend exclusively on the capacities of the single project owned the SPV to produce value as expected. In other words, the FP will internalise the risk of the single projects that her debtor implements and operates -as predefined.

Thus, before delivering funds to the SPV, ex-ante, the rational FP will spend efforts examining the completeness and enforceability of -what I will call- a *risk allocation mechanism*. This risk allocation mechanism is a web of formally remote but functionally interdependent clauses for comprehensive task distribution. The object of the risk allocation mechanism is to assure that, as feasible, under all foreseeable eventualities, the SPV will count on all inputs necessary for constructing and operating the project as necessary for generating wealth sufficient for repaying the non-recourse debt.

This risk allocation mechanism should include many clauses. The FP should enforce them all directly against the sponsors, or indirectly against the later via the SPV that they own. Accordingly, in PFCs, the value expected from non-recourse debt grows as a function of the quality with which parties implement the risk allocation mechanism.

Infrastructure: An Essential Guide for Policy Makers, cit. Page 1 in J. D. FINNERTY, *Project Financing - Asset Based Financial Engineering*, cit.

⁶¹ For a distinction with other financial techniques see the analysis in Chapter 4.

⁶² Cf. the entry *Specificities* in the glossary. Cf. O. WILLIAMSON, "Transaction-Cost Economics: The Governance of Contractual Relations", *The Journal of Law and Economics*, vol. 22, 2 (Oct.), 1979. O. E. WILLIAMSON, *The Economic Institutions of Capitalism*, The Free Press, New York, 1985. B. KLEIN; R. CRAWFORD; A. ALCHIAN, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process", *Journal of Law and Economics*, vol. 21, 2, 1978.

From a different stance, the value expected from the single project that parties predefine contractually (-*v.gr.*, comprehensiveness⁶³ and enforceability⁶⁴ of the risk allocation mechanism) will be the reference upon which the non-recourse lender will verify compliance with her individual rationality -participation- constraints.

The feasibility of PFCs consequently depends on parties' capacity to spend transaction costs refining the critical risk allocation mechanism. In the absence of collateral or recourse to third parties, the choices of implementation efforts (transaction costs) will be consequently higher in PFCs than in collateralised financing alternatives. Empirically, this last observation is commonplace in the finance literature.⁶⁵

The isolation and subsequent characterisation of these elemental strategic aspects that define the rationalities of all parties and the contractual nature of PFCs are contributions of this study. These elemental postulates will be in the core of all propositions of the chapters to follow.

2.3 The implementation processes

The contractual implementation of PFCs begins with a group of individuals or companies identifying a *project*.⁶⁶ These individuals will later be the sponsors of the arrangement.

⁶³ Against incompleteness.

⁶⁴ Against asymmetries of information.

⁶⁵ *Project finance is sometimes referred to as “contract finance” because a typical transaction can involve as many as 15 parties united in a vertical chain from input suppliers to output buyers through 40 or more contractual agreements. The four major project contracts govern the supply of inputs, purchase of outputs (known as off-take or purchase agreements), construction, and operations. Larger deals can have several hundred and up to several thousand contracts. On footnotes he adds, according to the Australian Contractors Association, the Melbourne City Link Project, a A\$2 billion road infrastructure project, had over 4,000 contracts and suppliers (see the 2002 award finalists at www.constructors.com.au). Vid. B. ESTY, “The Economic Motivations for Using Project Finance”, cit. See also references in Chapter 1 and the analysis of the value of predefining (not diversifying) investments, investors, and contractors in Chapter 7.*

⁶⁶ See below as well as in Chapter 4 the characterisation of a project materially.

Sponsors will initially recognise the material requirements of the project. They will also esteem how they will cover its funding needs with capital contributions and debt allowed by themselves (by contract subordination) or with non-recourse debt from the FP. Sponsors will also agree on how they will control the SPV in charge of the project's contractual relationships. The project's originators will also define how the SPV will distribute dividends after complying with its obligations, including those with the FP providing senior non-recourse debt.

The sponsors will coordinate this pre-financing project implementing exercise via a *development agreement*.⁶⁷ In addition to the above, sponsors will define the most critical aspects of the project from this development process, amongst others: the scope and structure of the project; the roles and responsibilities of each sponsor in the project; the exclusivities in the provision of inputs for the project (that is, in the preservation of their capacities); the feasibility studies that they will advance before requesting financing; the hiring financial, industrial, legal experts as well as other regular contractors for other financial, material, insurance needs. Whenever the company delivers its services within a private-public partnership for public procurement (PPPs), the sponsors will define the interaction of the SPV with an off-taker. Fundamentally, they will anticipate some governance rules valid for both the implementation as well as the construction and operation of the project and the rules for preventing and dealing ex-post with costs overruns. Finally, they will put in place provisions for dispute resolution (third party relief -arbitration) and enforcement. After sponsors complete the pre-financing or pre-contractual process, the variables defined under this *development agreement* will become a shareholder agreement amongst sponsors controlling the SPV.⁶⁸

With such a plan in hand, the sponsors will approach a financial entity (regularly a bank) who will become the financial advisor. This financial advisor may later interact with lead arrangers underwriting the non-recourse debt facility.⁶⁹ The interaction with the lead arranger will begin with drafting a preliminary information memorandum (PIM) by sponsors and the financial advisor. The lead arranger will later underwrite (most or all of) the non-recourse debt, shape a syndicate of lenders, or suggest the intervention of many underwriters.

In addition to the preliminary information memorandum, the financial advisor and

⁶⁷ Cf. p. 39 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

⁶⁸ Cf. p. 39 in *Ibid.*

⁶⁹ *Vid. pp.* 82 and *ff.* in *Ibid.*

sponsors will complete a financial model in cooperation with the arrangers. This financial model will later result in terms-sheets containing the actual conditions of the financing under which the lead arranger will underwrite the non-recourse debt.⁷⁰ In this context, underwriting means that the bank signing (*i.e.*, *underwriting*) the terms-sheet commits to providing funds under the conditions defined therein, that parties should meet during the validity of the document. Consequently, after the underwriting takes place, sponsors must complete the remaining of the documentation process, and the lead arranger (the underwriter) must procure the funds by shaping a syndicate with other lenders -or by other means.⁷¹

Following the underwriting of the terms-sheet, towards forming the syndicate of lenders, in conjunction with the sponsors, the leading arranger, the financing advisor and the underwriter will put in place a final information memorandum (FIM). This document is an update and refinement of the preliminary information memorandum used for hiring the arranger. This memorandum will now include the so-called *Base Case* financial model and sensitivity analyses.

Fundamentally the preliminary and final information documents begin showing the terms of the risk allocation mechanism. These are the documents that reflect the contractual precautions that the advisors, the sponsors and the lead arranger (underwriter) esteem necessary for the project's *bankability*. These requirements will later appear in condition precedents and side agreements as deemed necessary.

Two aspects we must note about the parties that intervene in this process. First, in some cases, the financial advisor can also be the lead arranger. It is a matter of practicalities whether sponsors prefer allowing the financial advisor to be also the financial lead arranger in charge of advancing the underwriting process. Allowing the same bank to take both roles will come with informational benefits. Intuitively, the advisor can share information -thus eliminating much of the uncertainty on the lead arranger's side (as both of them would be the same person).

However, whether this also comes with cost-savings is the object of a distinct

⁷⁰ In terms-sheets, the lender may insert so-called market flex clauses warning about the effect that changes in market or conditions should have against the validity of commitments. Note how, in such stage, commitments are soft -*i.e.*, their enforceability remains conditioned to the compliance with documentation and condition precedent all taking place after underwriting.

⁷¹ The bank in charge of syndication process is also known as the *book runner*.

analysis. Allowing the advisors to be the lead arranger implies that the sponsors will not cover the lead arranger's position (the underwriter) dictating the costs of non-recourse financing from offers brought before them by candidates under market pressure. In other words, if the advisor is the arranger, then there will be no public competition for that role and consequently for the offering of financing conditions. This may affect total costs of debt as well as the range of contributions available from the underwriter.⁷²

Second, before the financial crisis of 2008, the standard practices were that, after underwriting, the lead arranger would open a process leading to the formation of a syndicate of lenders. After the crisis, the bank syndication market almost disappeared in Europe and the Americas. Regulators began requesting that underwriters keep liabilities in their books (rather than transferring the burden to syndicate members).⁷³ Large projects subsequently began to be more often financed by several underwriters, thus forming what it is often referred to as a *club* loan arrangement lead by the initial loan arranger.⁷⁴

In any case, irrespective of the formation of these non-recourse financing capacities, after the lead arranger underwrites the terms sheet, there will be a process of document implementation, the sponsors will incorporate the SPV, all parties will execute contracts as planned, and the SPV will complete all condition precedents as defined in earlier documents.⁷⁵ The moment in which, after complying with condition precedents, the SPV is ready to drawing cash defines the *financing close*. The SPV will then receive funds and commence the project design phase.

As I will illustrate below, during design and construction stages, cash will flow in the form of capital contributions from sponsors and debt financing from the FP to the SPV. Parties will regulate these transfers via the so-called *cash waterfall* (or *cash*

⁷² *Vid. pp. 82 and ff. in E. R. YESCOMBE, Principles of Project Finance, cit.*

⁷³ *Vid. p. 89 in Ibid.*

⁷⁴ *Vid. p. 89 in Ibid.*

⁷⁵ *Cf. pp. 29 in J. DELMON; V. R. DELMON, International Project Finance and PPPs - A Legal Guide to Key Growth Markets, cit. and pp. 71 and ff. in J. D. FINNERTY, Project Finance, 4th, John Wiley & Sons, Inc. New Jersey, 2013. For an example of a list of items contained in condition precedents see Box 7.2 of page 281 in S. GATTI, Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects, cit.*

cascade) agreement. Once the project begins operation and generating resources, cash will flow in the opposite direction. That is, from the SPV to input providers, the FP, and finally to sponsors in the form of dividends.

Before advancing, note how I refer to the financing party as a single entity (a party). Today, because PFCs have not been legally institutionalised, from Contract Law's stance, the lender is a party to the loan agreement and to other contracts that she implements directly with the sponsors and the SPV. See below the description of the FP as a necessary component of PFCs. The pedagogic license of referring to the FP (often a group of lenders) as a *party* facilitates the strategic analysis and reflects the functional unicity of PFCs accurately - a matter to which I will dedicate several paragraphs in later chapters.

2.4 Typical and the necessary components of all PFCs. An early approach. The simplest example

Let us now make a first approach to the elemental components of PFCs. Chapter 4 will revisit these considerations and provide further strategic observations necessary for advancing the analyses of tensions in chapters 5 and 6. For now, let us characterise the basic features of these elements as described today in the literature of management.

I will now introduce the known features of sponsors, the special purpose vehicle (SPV), the non-recourse lender or financing party (PF), the non-recourse debt, the risk allocation mechanism, the off-taker, and other contractors. The final part of this section will include a schematic presentation of the simplest PFC.

2.4.1 Sponsors

As I advanced above and in Chapter 1, the sponsors are the originators of the project.⁷⁶ They are also the parties who design the project structure and its financing contractually. Sponsors may be infrastructure engineering, building, operation, accounting, technological companies of all industry sectors where needs for the funding of exceptionally costly projects may exist.

Typically, these companies shape a contract whose capital needs surpass their individual or collective corporate (debt) financing capacities. As the critical input providers to the project, sponsors see the opportunity of gaining profits from their contracts for inputs. As per their allocations of ownership in the SPV, they also expect

⁷⁶ *Vid.* page 393 in J. DEWAR, *International Project Finance - Law and Practice*, cit.

harvesting dividends after the project company has repaid the financing debt.

In PFCs, the sponsors will own the SPV fully. Additionally, as they are also the input providers to the project, they will control project assets materially. Control of the SPV advancing a single project that all parties predefine before internalising risks is strategically indispensable for the ex-ante contractual implementation of the risk allocation mechanism and non-recourse financing facility.

Ex-ante, as part of the risk distribution mechanism, sponsors not only commit to delivering all pre-identified inputs necessary for the project. Albeit bulk of the financing will come from the FP (see below), via the so-called *cash waterfall* clause, sponsors will coordinate the provision of capital for the SPV (see below). The financial efforts from sponsors will contribute to the funding of the project and bring other strategic benefits, including interest alignment. The SPV capitalisation permits that the project company is capable of internalising commitments independently from sponsors' support.

Finally, as I will describe in full detail in chapters 4 to 7, in the absence of recourse to third parties, in PFCs, the FP's value will depend on project success. Project capacities will then depend on contributions by sponsors that will be highly specific. For this reason, the individual characteristics of sponsors will be of fundamental strategic value to the FP. Thus, in contractual practices, parties will restrict the transferability of shares and positions of the sponsors as contractors of the SPV. In the same vein, the FP will identify the insolvency or subsequent incapacity of sponsors to deliver their contributions as expected as events of a technical default. I will introduce these contractual practices further below and in chapters 4 and 7.

2.4.2 Special Purpose Vehicle (SPV)

The special purpose vehicle (SPV) is a legal entity that, as per its charter, will be dedicated exclusively to implementing the single project as predefined by all parties. Accordingly, sponsors will incorporate the single project-instrumental SPV only after deciding and regulating contractually on most critical aspects of its management and activities. Among others, these will include the allocation of shares amongst sponsors, the governance system that will involve the FP, the elemental features of the single project that it will advance, and the financing sources (both equity and debt).

Only then, the sponsors will implement all agreements associated with the project, including the necessary non-recourse credit via the SPV. This sequence reveals the SPV as part of the risk allocation mechanism and -with legal implications- proves the operative nature of the SPV to the lending contract. In chapters 4 and 7, I will revisit this observation and remark its implications towards the legal institutionalisation of

PFCs.

Typically, the SPV will be wholly owned and fully capitalised by sponsors. These capital contributions from sponsors will suffice to cover only a minor part of the project's cash needs, say, 30%. With a debt of about 70% of total asset value, the debt-to-equity ratios in SPV will be disproportionately higher than what we usually see under collateralised lending.⁷⁷

These figures are representative of industry practices. However, exceptions are frequent. It is often also the case that after certain risks have decreased with the project's progress, outside investors buy shares of the SPV. It is also habitual that the SPV attaches warrants to external investors' debt bonds in later stages of completion.⁷⁸

In Chapter 4, I will identify the necessary features of SPVs and their basic functionality to PFCs. In PFCs, the SPV does not necessarily need to be a commercial organisation. It can adopt other legal entity forms, for instance, *trusts*, or *fideicomisos*.⁷⁹

One of the critical aspects of the chosen legal type is that it grants limited liability protection to sponsors. The use of at least one SPV is indispensable for legally removing the non-recourse debt from the balance sheets of sponsors (*Cf.* Chapter 3). Observe, without limited liability shelter, the non-recourse clause could not function.

In chapters 3 and 4, I will remark how the allocation of the single project under an SPV comes with indispensable risk isolation benefits to the project and thus, the FP. Concretely, it permits the protection of project assets from the creditors of its shareholders. This aspect is elemental to the feasibility of the risk allocation

⁷⁷ *Vid.* pages 7 and 36 and 37 in B. ESTY, "The Economic Motivations for Using Project Finance", *cit.* *Cf.* page 40 in D. CARLIDGE, *Public Private Partnerships in Construction*, Taylor and Francis Ltd, 2006. Authors find debt-to-equity ratios of 90/10.

⁷⁸ *Cf.* the references in Chapter 2, and in particular, the financing of the Iridium LLC case in *pp.* 485 and *ff.* in B. C. ESTY, *Modern Project Finance: A Casebook*, *cit.*

⁷⁹ *Cf.* *pp.* 8 and *ff.* in B. COOPER, "Project-Financing a Vietnam Power Project", *The Journal of Structured Finance*, vol. 10, 1, 2004. page 268 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, *cit.* Page 47. *Cf.* in J. DEWAR, *International Project Finance - Law and Practice*, *cit.*

mechanism.

The allocation of the single project in a dedicated legal structure also allows parties to monitor the endeavour without informational (cash flow) interferences from other business units. Moreover, it facilitates the implementation of incentives -both contractually and via allocation of property rights (expected dividend distributions). Investors and contractors cannot replicate these benefits when using legal entities advancing diversified portfolios.

Chapter 3 will describe how these aspects permit that sponsors and the FP overcome many of the feasibility boundaries that they would otherwise face when funding large projects under their corporate umbrellas. These inefficiencies relate to the material complexity, high capital intensiveness and financing needs, and projects' long-term.

2.4.3 Non-recourse debt

So far, I have introduced components that, in one way or the other, parties may find in other contractual environments. Let us now introduce the essential aspects of the non-recourse debt (the non-recourse nature of debt), a feature that is both essential and distinctive of PFCs.⁸⁰

2.4.3.1 Concept

As advanced, in PFCs, the non-recourse nature of debt requires no third parties other than the SPV liable for repaying the financing debt should the SPV fail to honour *such* debt obligations. In PFCs, the lender will access the collateral value of the assets of the SPV -its debtor. However, she will not seek repayment of amounts unpaid or compensation from other parties, including the sponsors.^{81 82 83}

⁸⁰ See the description of the differences between PFCs and other financing alternatives in Chapter 4. Leveraged equity and generally all private equity investments are also uncollateralised. But in such scenarios, the investors take active participation (managerial involvement) in the project and they extract variable benefits. This makes the strategic positions of ownership investors not comparable with those of lenders in PFCs. See in Chapter 4 the comparison between PFCs and other financing alternatives.

⁸¹ *Vid.* Section 5.2 in G. VINTER; G. PRICE; D. LEE, *Project Finance - A Legal Guide*, 2nd, Sweet & Maxwell, 1998. *Vid. pp.* 29, 45, 181, 191-2, 360, 371 in J. DEWAR, *International Project Finance - Law and Practice*, cit. *Vid.* page 3 in A. FIGHT,

2.4.3.2 Non-recourse debt and project risks

Strategically, three structural features necessary of PFCs reinforce the functionality of non-recourse debt. Two of these relate to the SPV. The third one is distinctive of the single project advanced by the SPV.

First, as I have already described, the SPV is an organisation with legal personality. Hence, neither shareholders (sponsors) nor third parties are debtors of the FP. Second, the legal form of the SPV provides for limited liability protection to shareholders. Thus, beyond the obligations associated with their capital contributions, the FP cannot molest sponsors for the claims against the SPV that remain due and unpaid. Third, as advanced above, and as I will elaborate below, in

Introduction to Project Finance, cit. Pp. 13, 31 and 96 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit.

⁸² A non-recourse provision in a loan agreement, e.g., *“The (Project Sponsor) shall not be personally liable for payment of the amounts evidenced by the Note executed by the Borrower. Nothing contained herein, however, shall (i) preclude the Lender or any holder of the Notes from exercising any right or enforcing any remedy under this Agreements, or the Note, whether upon an Event of Default or otherwise, under this Agreement, the Note, or any other collateral hereunder or furnished as security for any of the indebtedness evidenced by the Note, or (ii) limit the (Project Sponsor’s) liability hereunder in respect of any damages suffered by the Lender as result of any inaccuracy of any representation in this Agreement as result of any fraudulent conduct on the part of the (Project Sponsors).”*

Vid. page 185 in S. L. HOFFMAN, “A Practical Guide to Transnational Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations”, cit.

⁸³ A non-recourse clause found in project financing documents other than loan documents, e.g.,: *“Any claim against the Owner (actual project owner) that may arise under this Agreement shall be made only against, and shall be limited to the assets of, the Owners, and no judgment order or execution entered in any suit, action or proceeding thereon Shall be obtained or enforced against any partner of the Owner or the assets of such partner or any incorporator, shareholder, officer or director of the Owner or such partner or against any direct or indirect parent corporation or affiliate or any incorporator, shareholder, officer or director of any thereof for any purpose of obtaining satisfaction of any payment of any amount arising or owning under this agreement.”*

Vid. page 185 in *Ibid.*

PFCs, the SPV completes a regularly highly or fully specific project. Consequently, the project's redeployment value or the assets that the SPV owns will not provide sufficient collateral protection to the lender.⁸⁴

In conjunction with these three aspects, the non-recourse nature of debt implies that, for servicing her claims, the FP will rely exclusively on the single project's capacity to produce value as expected.

The responsibilities of sponsors and the non-recourse debt. As I will show below, and as I will reiterate in all chapters of the study, in PFCs, the lender will substitute the strategic effect (comfort) of the missing collateral and recourse to third parties with the implementation of a risk allocation mechanism. This risk allocation mechanism will consist of an array of contractual commitments securing that, under all foreseeable eventualities, the sponsors or third parties will bring to the SPV all the inputs necessary for constructing and operating the project as expected.

2.4.3.3 Events of default

As per such commitments of the risk allocation mechanism,⁸⁵ the FP will enforce a series of legal consequences of different nature and severity. Depending on the strategic relevance and the types of penalties that each of these requirements will have attached, provisions may bring either *technical default* or of *full default* consequences. As per the trespasses of the first category, the FP will enforce implications of many types. Some of them will include penalties (fines or increments in interest rates) or assignments of credit titles. Some others will attribute company management powers or project control competences to the FP.⁸⁶ The vast majority of the risk allocation mechanism clauses will be of this first type (events of *technical default*).

Under exceptional circumstances, however, the FP will enforce requirements of the second type, with *full default* consequences. Consider the case in which the FP learns that the sponsors have ex-ante exaggerated their material capacities to provide

⁸⁴ Cf. O. WILLIAMSON, "Transaction-Cost Economics: The Governance of Contractual Relations", cit. O. E. WILLIAMSON, *The Economic Institutions of Capitalism*, cit. B. KLEIN ET AL, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process", cit.

⁸⁵ I will come back to the analysis of the critical risk allocation mechanism below and in many places in the following chapters.

⁸⁶ See below the examples of covenants illustrating the typical contractual practices.

critical inputs to the SPV. Alternatively, think of a scenario where *ex-ante*, sponsors commit to obtaining regulatory permits for the SPV to deliver certain services, and such authorisations cannot be possible because the activity becomes illegal in the municipal jurisdiction.

As I will elaborate further below in these second more dramatic cases, after verifying the violation of such commitments, the FP will *accelerate* the loan terms. The lender will then consider the relationship terminated and call the SPV, -and the sponsors or third parties providing sureties- to return the full of the funds borrowed with interests and penalties. I will come back to this distinction between the technical default and full default provisions in two places below: in the separate sub-section analysing the risk allocation mechanism and again in the section describing actual clauses towards the end of the chapter.

2.4.3.4 The protection from third parties and the non-recourse nature of the debt

Both types of provisions (of technical default and full default) constitute the risk distribution mechanism that allows the non-recourse lender (FP) to relay that the SPV will complete the project. Thus, for the feasibility of non-recourse debt, it is of fundamental value that sponsors (and the SPV) internalise the responsibilities associated with these commitments. Subsequently, sponsors must be capable of complying with these obligations. All obligors (the SPV, sponsors, or third parties) must also be solvent relative to the consequences of defaulting on such commitments.

Therefore, irrespective of whether provisions are of technical default or full default, of fundamental strategic relevance, all such commitments of the risk allocation mechanism (*never* the debt itself) will be collateralised and effectively enforceable against the SPV, the sponsors, or third parties. Precisely the same holds for the sponsors in their individual commitments under the risk allocation mechanism.

Most importantly, the stipulation of circumstances in which the FP will accelerate the loan, and a party other than the SPV will return all funds lent to the SPV (with interests and penalties) as well as the protections (sureties) and *recourse* to third parties available to the FP in the protection of the enforceability of such provisions does not violate the non-recourse nature of the debt that defines PFCs. Remarkably, these will be obligations (penalties) of the SPV and sponsors (or other parties) that will stem from violations to the risk allocation mechanism other than that of failing to repay the debt as per the schedules defined initially by the FP and the SPV. In other words, in these cases, sponsors and the SPV will not be responding (returning borrowed funds) for a failure of the SPV to repay its debt that is non-recourse, but for the consequences of their trespass of different commitments of the risk allocation

mechanism. Crucially, the acceleration of credit terms that triggers the obligation to return all borrowed funds is a cross-default consequence from some trespass to the risk allocation mechanism from either the sponsors or the SPV.

To fix ideas, in PFCs, what it is non-recourse is the debt, not the obligations of the risk allocation mechanism that allow the lender to trust that sponsors (directly and via the SPV) will complete the project as necessary for the SPV to repay said non-recourse debt. Consequently, sureties and recourse to third parties are not only compatible with the non-recourse nature of the debt, but they are also indispensable to the functionality of the risk allocation mechanism that dictates the feasibility of such non-recourse debt.⁸⁷ See the examples of events of full default further below.

2.4.3.5 The dispensable (redundant) non-recourse clause

Let us note how the insertion of a clause of non-recourse supplements (redundantly) the protection that legislators allow to sponsors via the so-called limited liability shelter.⁸⁸ From the contractual stance, the non-recourse clause appears strictly necessary only in the (unseen) cases where parties choose a corporate type that does not allow for limited liability protection -e.g., a general partnership.⁸⁹ Consequently, limited liability rules allow the sponsors to save the transaction costs of implementing non-recourse clauses with all contracting parties. The limited liability shelter also protects sponsors from tort claimants -who do not allow for a contracting stage where the SPV can implement protections other than (inherently incomplete) insurance coverage.

Written clauses (with their titles) remarking the non-recourse nature of debt and the names of contractual arrangements are consequently not strictly indispensable for PFCs to be such. Intuitively, if desired, parties should remark the recourse or the provision of sureties from third parties -not the lack of it. In other words, from the

⁸⁷ As I will insist in chapters 4 to 6, in PFCs, the feasibility of non-recourse debt depends on the completeness and enforceability of the risk allocation mechanism. As shown in Chapter 4, improving the comprehensiveness of these agreements is the purpose for which ex-ante the FP exerts efforts implementing implementation quality as a means for regulating the responses expected from sponsors -via project performance, her only source of benefits.

⁸⁸ *Vid. pp. 9 and ff. in R. R. KRAAKMAN ET AL, The Anatomy of Corporate Law: A Comparative and Functional Approach, cit.*

⁸⁹ This is not a common practice.

contractual legal stance, parties (including sponsors) do not need to clarify contractually that third parties are not liable for the debts of the limited liability SPV, -the sole obligor in the loan agreement.

This observation of how the substance and not the names define contracts and legal treatments holds for all contractual interactions. However, practically, non-recourse clauses do serve to emphasise the business practice of allowing debt financing to an obligor who cannot provide collateral from its assets or third parties.

Accordingly, strategic and legal consequences described in the following chapters stem, not from the non-recourse nature of the debt *per se*, but from the rationality of the lender implementing the risk allocation mechanism indispensable for constructing expectations (*i.e.*, for verifying compliance with her individual rationality -participation- constraints) without sufficient collateral from, or recourse to, third parties. This rationality has elements inherent to all PFCs and distinct from those in the objectives of creditors in regular (diversified and collateralised) corporate contracting. I will elaborate on these in chapters 4 to 7.

2.4.3.6 Limited recourse debt; a semantic observation

Today, the management and industry-oriented literature often speak about *limited recourse debt*, or *limited-recourse project finance*, or *limited-recourse project financing*).^{90 91} With these expressions, authors denote the existence of exceptional

⁹⁰ “The terms “nonrecourse” and “limited recourse” are sometimes used interchangeably.” *Vid. p.* 185 in S. L. HOFFMAN, “A Practical Guide to Transnational Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations”, *cit.*

⁹¹ *Cf. p.* 45, 58, 62, 79, 177, 227-8, 393 in J. DEWAR, *International Project Finance - Law and Practice*, *cit. Vid.* T. CHEMMANUR; K. JOHN, “Optimal Incorporation, Structure of Debt Contracts, and Limited-Recourse Project Financing”, *Journal of Financial Intermediation*, vol. 5, 4, 1996. C. DESTAIS, “Transaction Costs Theory, Asset Specificity and Risk Appraisal: an Analysis Based on the Example of Limited Recourse Project Finance”, in *4th annual conference of the International Society for the New Institutional Economics, Tubingen, September 2000*, vol. 1, 2000. Page 12 in A. MERNA; Y. CHU; FA. AL-THANI, *Project Finance in Construction - A Structured Guide to Assessment*, Wiley-Blackwell, Sussex, 2010. page 203 in F. PRETORIOUS ET AL, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, *cit. P.*

periods or circumstances (events) during which sureties from (*recourse to*) third parties might protect the enforceability of debt claims in the hands of the FP. These periods must be transitory. Effectively, during that time, or under such circumstances, during which the FP finds comfort in collateral protection from third parties, the project will *not* be non-recourse.

Most interestingly, the eventualities that authors describe with these expressions - and the rationality behind them- are precisely those of the events of *full default*. Those are the exceptional circumstances that will allow the FP to seek compensation from parties other than the SPV (from sponsors or other parties). I will describe these events of the risk allocation mechanism in a sub-section below.

In other words, the FP will accelerate the loan agreement, not in violation of the non-recourse nature of the debt, but more simply, as a cross-default consequence of trespass to specific requirements (of the risk allocation mechanism) other than repaying the non-recourse debt by the SPV. Hence, -as already pointed out-, the regulation of events and capacities of the FP to enforce obligations to repay the debt against parties other than the SPV does not violate the non-recourse nature of the debt. The expression *limited-recourse* is consequently imprecise from the legal stance. It is a *façon de parler* in the industry.

The semantic clarification about the expression and the characterisation of the concept of the non-recourse nature of debt -*i.e.*, the cases and forms in which the nature of PFCs manifests- is of crucial relevance to any studies oriented at providing legal treatment to these scenarios after identifying them.

2.4.4 Single predefined project

We can identify six features which are characteristics of the capital-intensive projects often funded under PFCs. In the absence of collateral, the first two of these features (cash flow capacities and contractual feasibility) are strategically indispensable to the FP's rationality.⁹² The other four characteristics are typical.

169 in H. A. DAVIS, *Project Finance: Practical Case Studies*, cit., vol. II. P. 548 in L. FARRELL, "Principal-Agency Risk in Project Finance", cit.

⁹² PFCs loans are *fully self-contained, one-time financing events, where the previous lending relationships between the arranging bank and the project sponsors are far less important than the soundness of the stand-alone project to be financed. Vid.*

First, after completion, projects must reveal as a stable source of cash flow. The project must produce value sufficient for repaying the non-recourse debt. The more than the project's productive life exceeds the terms of financing, the easier than parties can implement readjustment clauses or other protections based on coverage ratios -that is, on the expected capacities of projects to produce cash flows sufficient for repaying the non-recourse debt.

Second, projects must be implementable in response to contractual provisions. The repayment capacities of the SPV (its project) must be estimable as a function of the inputs that sponsors should deliver in response to the implementation quality of the risk allocation mechanism. The perspectives of these responses governing the expected repayment capacities of the SPV define the ex-ante willingness of the FP to internalise non-recourse risks.

Third, projects funded under PFCs are typically high capital-intensive. Projects implemented under PFC require significant financial contributions before completion and operation. With the emphasis on distinct factors,⁹³ authors in the literature of corporate finance and corporate law and economics describe well the boundaries of companies' financing capacities. There is a point beyond which PFCs, are not only more efficient than corporate alternatives, but they become indispensable for dealing with the opportunity costs of funding large projects *on balance sheets*. To analyse how and why PFCs overcome the feasibility limitations of traditional (collateralised and diversified) corporate financing methods, I will dedicate the entire Chapter 3.

Asides, notice how, under conventional corporate-financed methods, companies

page 3 in S. GATTI; S. KLEIMEIER; W. MEGGINSON; A. STEFFANONI, "Arranger Certification in Project Finance", *Financial Management*, vol. 42, 1, 2013. See also S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Vid. page 413 in E. BORGONOVO; S. GATTI, "Risk analysis with contractual default. Does covenant breach matter?", *European Journal of Operational Research*, vol. 230, 2, 2013, Elsevier B.V.

⁹³ *E.g.*, M. L. LEMMON; J. F. ZENDER, "Debt Capacity and Tests of Capital Structure Theories", *Journal of Financial and Quantitative Analysis*, vol. 45, 05, 2010.; E. H. KIM, "A Mean-Variance Theory of Optimal Capital Structure and Corporate Debt Capacity", *The Journal of Finance*, vol. 33, 1, 1978.; A. SHLEIFER; R. W. VISHNY, "Liquidation Values and Debt Capacity: A Market Equilibrium Approach", *The Journal of Finance*, vol. XLVII, 4, 1992. ; M. Z. FRANK; V. K. GOYAL, "Trade-off and Pecking Order Theories of Debt", cit.

could collateralise small tranches of debt and synchronise such cash flows with projects' progress. By doing this, debtors could gradually create collateral value necessary for sequential tranches of financing.⁹⁴

However, two aspects impeded this strategy in larger projects under corporate finance. First, many projects require upfront contributions, so companies cannot always cover funding needs in time. Second, in virtue of the high degrees of specificities of all resources involved, companies cannot remove project risks entirely until the project begins operating after completion. For this, in PFCs, the sponsors and the FP rely on the completeness and enforceability of the risk allocation mechanism and disregard collateral value. This idea will be recurrent throughout the study.

Fourth, projects are highly or fully specific and often unique. The uniqueness of projects results in specificities. Assets developed for unique projects cannot be recycled (redeployed) without internalising high costs. Think of project dedicated machinery, hours spent in training personnel, or publicity actions. Specificities, however, do not come only from the uniqueness of projects. They may also result from the very nature of assets. We may think of the particular shape of the building infrastructure of a power station, a communications satellite infrastructure,⁹⁵ an oil and gas pipe,⁹⁶ or a vehicle traffic bridge affected by geological instability. In extreme cases, these assets' alternative placement values will be not only low but, if abandoned, could also be negative. We may think of ecological damages, or simply the costs of removing or recycling urban infrastructures.

The literature refers to the adaptation (specification) of resources to a single project's peculiarities as the *fundamental transformation*.⁹⁷ Once such alterations take place,

⁹⁴ See this strategy applied to a PFC in the revolving facility of the Calpine Corporation project of case-study 4 (Chapter 4).

⁹⁵ Cf. in pp. 485 and ff. the description of how the *Iridium satellite communications* infrastructure fail to perform as expected in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

⁹⁶ Cf. in pp. 71 and ff. the Chad-Cameroon Development and Pipeline Project in *Ibid.*

⁹⁷ See the corresponding entry in the Glossary. Cf. O. WILLIAMSON, "Transaction-Cost Economics: The Governance of Contractual Relations", cit. O. E. WILLIAMSON, *The Economic Institutions of Capitalism*, cit. B. KLEIN ET AL, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process", cit. O. E. WILLIAMSON, "Credible Commitments: Using Hostages to Support Exchange", *The American Economic Review*, vol. 73, 4, 1983. O. E. WILLIAMSON, *Markets and Hierarchies*:

parties experience strategic inefficiencies, namely bilateral monopolies. Bilateral monopolies affect bargaining outcomes of renegotiations, thus leading to sub-optimal inputs (under-investment). Specificities and bilateral monopolies lie in the core of hold-up problems.⁹⁸

Fifth, projects funded under PFCs take long terms for implementation, operation and financing. This relates to both their construction periods as well as the financing repayment terms of the loan agreement. Intuitively, long terms of construction before operation come in detriment of projects' capacities as current collateral in corporate financing. Hence, the longer the terms of construction, the more efficiently sponsors will rely on the comprehensiveness of the risk allocation mechanism instead of internalising the debt cost in their corporate balance sheets.

In PFCs, the terms of repayment are long simply because large projects require long construction periods before they can generate resources. However, the terms of the loan agreement will regularly not coincide with the life of the project. As Prof. Esty points out, projects have lives ranging from 10 to 50 years, but sponsors use shorter-term bank debt with maturities ranging from five to 15 years.⁹⁹ Once after the project operates with regularity, the sponsors find alternatives for repaying the non-recourse debt by accessing funding from lower-risk appetite sources.

Sixth, large projects funded under PFCs are materially complex. This complexity is not inherent to the technologies at stake. Consider the case of schools, bridges, or road infrastructures. The material hazards associated with them are not technical but correlate with the time terms and the consequential exposure to contractual incompleteness. In other words, the longer the life of the project, the more difficult it will be for parties to foresee and regulate contingencies contractually. This often leads to cost overruns under both corporate and PFCs.¹⁰⁰

Analysis and Antitrust Implications: A Study in the Economics of Internal Organization, Free Press, NY, 1975. P. JOSKOW, "Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence", *Journal of Law, Economics, and Organization*, vol. 4, 1, 1988.

⁹⁸ *E.g.*, P. W. SCHMITZ, "The Hold-Up Problem and Incomplete Contracts: A Survey of Recent Topics in Contract Theory", *Bulletin of Economic Research*, vol. 53, 1, 2001.

⁹⁹ *Vid. p.* 14 in B. ESTY, "The Economic Motivations for Using Project Finance", *cit.*

¹⁰⁰ With literature references, see the observations about the problems of cost overruns in chapters 1 and 5.

Nevertheless, indeed, many projects do require technological developments that are fully specific. Often, they require individual and collective research stages. Consider the case of aircraft developments,¹⁰¹ the design and construction of a high-speed railway line,¹⁰² or communication technologies.¹⁰³ Their technological complexity increases specificities, thus making them more difficult to fund under collateralised corporate-financed arrangements.¹⁰⁴

Strategically, material complexity results in contractual incompleteness and asymmetries of information with the well-known associated strategic tensions. This will affect the enforcement quality of the risk allocation mechanism key to the feasibility of PFCs. I will describe these inefficiencies in chapters 4 to 6.

2.4.5 Risk allocation mechanism

2.4.5.1 Concept and functionality; the strategic value of implementation quality

As already advanced, in PFCs, the lender provides debt without recourse to third parties. Additionally, the SPV who receives the debt advances only a single project whose assets are highly or fully specific. Subsequently, without access to adequate collateral or protection from third parties, the possibilities that the SPV repays its debts to the FP depend exclusively on the SPV's capacity (the single specific project) to produce wealth as expected.

Accordingly, ex-ante, the rational non-recourse lender will substitute the missing protection of collateral or recourse to third parties with the comprehensiveness and enforceability of a task and risk distribution mechanism. This bundle of precautions

¹⁰¹ Cf. the *Airbus A3xx development* in pp. 169 and ff. in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

¹⁰² Cf. the *Texas High-Speed Rail Corporation* project in pp. 223 and ff. *Ibid.*

¹⁰³ Cf. the *Iridium satellite communications* infrastructure in pp. 485 and ff. in *Ibid.*

¹⁰⁴ Cf. generally D. CARLIDGE, *Public Private Partnerships in Construction*, cit. contrast with FLAG (Fiber-optic Link Around the Globe) project in pp. 116 and ff. in H. A. DAVIS, *Project Finance: Practical Case Studies*, cit., vol. II. or the Panda Energy–TECO Power joint venture – project in pp. 193 and ff. in H. A. DAVIS, *Project Finance: Practical Case Studies - Volume I*, cit., vol. I. *Vid.* also B. C. ESTY, “Petrozuata: A case study of the effective use of Project Finance”, *Journal of Applied Corporate Finance*, vol. 12, 3, 1999.

should allow the lender to trust that, under all foreseeable eventualities, the debtor company (the SPV) will count on all inputs necessary to build and operate the single project it owns and repay the non-recourse debt.^{105 106} This risk allocation mechanism will be shaped by provisions that the FP will enforce against the SPV, sponsor, third parties, or all of them. I have advanced these intuitions above and in Chapter 1. I will reiterate them in many places here and in all the following chapters.

2.4.5.2 Scope of the risk allocation mechanism

Some of the risk allocation mechanism provisions are, in their functionality, common to most PFCs. Other clauses depend exclusively on aspects of each project.

Fundamentally, the comprehensiveness of the risk allocation mechanism not only relates to the material or technological aspects that parties will refine with all possible

¹⁰⁵ *Risk evaluation is at the heart of project finance. Project-finance risk analysis is based on: a due-diligence process intended to ensure that all the necessary information about the project is available; identification of project risks, based on this due diligence; allocation of risks (to the extent possible) to appropriate parties to the project through provisions in the Project Contracts; quantifying and considering the acceptability of the residual risks that remain with the Project Company, and hence with its lenders.* P. 198 in E. R. YESCOMBE, *Principles of Project Finance*, cit. Notice also the reference to how the “project should contain an appropriate allocation of risk to the parties best suited to manage those risks” found in the description of requirements of the U.S. Exim Bank as described in p. 477 in *Ibid.* and www.exim.gov. (01/07/2020)

¹⁰⁶ The task distribution strategy of the non-recourse lender is well-known to the industry. However, the identification and characterisation of the risk allocation mechanism as an element necessary in PFCs (in substitution of collateral protection or recourse to third parties) with legal implications are contributions of this study. Cf. pp. 298 and ff, and 302 ff. in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. See also p. 45 in A. FIGHT, *Introduction to Project Finance*, cit. Cf. page 548-9 and ff. in L. FARRELL, “Principal-Agency Risk in Project Finance”, cit. P.1.04 in S. L. HOFFMAN, *The Law and Business of International Project Finance*, 2nd. ed., Kluwer Law International, 2001. Pp. 157 and ff. in W. TAN, *Principles of Project and Infrastructure Finance*, cit. Pp. 81, 122, 133 and ff. in J. DEWAR, *International Project Finance - Law and Practice*, cit.

details. The FP will also verify that she can enforce provisions dealing with the project's management, with the control of the SPV, with duties to inform, and enforcement or insurance matters. In PPP contexts, the risk allocation mechanism will also regulate the interaction between the SPV (and the FP) and the off-taker. I will provide abundant examples of these precautions below.¹⁰⁷

These obligations are distinct from that of repaying the non-recourse debt. Hence, the recourse to sponsors or third parties securing these provisions' enforceability does not violate the non-recourse nature of the debt. I have elaborated on this aspect above. As described, on the contrary, the robustness (comprehensiveness and enforceability) of these precautions regulating the responses from the SPV, the sponsors and other parties under all environments defines the value that the FP can expect from the SPV and consequently from her non-recourse contributions to the project. The quality of the risk allocation mechanism -its enforceability against the SPV or third parties- thus dictates the feasibility of PFCs.¹⁰⁸ I will reiterate these propositions below and in chapters 4 to 7.

As also advanced above, the shaping of the risk allocation mechanism begins with sponsors' earliest identification of the project. The clauses of the risk allocation mechanism continue enforceable and strategically relevant as long as the non-recourse debt remains unpaid. This proposition is true irrespective of the fact that, as the project consolidates its capacity to produce wealth, the FP will often assign (discount) her contractual position in the project to other providers of lower risk appetite.

In the following chapters, I will show how clauses of the risk allocation mechanism constitute the first of the three tiers of incentives in response to which sponsors deliver their contributions to the project. The second tier of incentives will consist of agreements enforceable only by sponsors (see further below in this chapter). The third tier of incentives will result from the individual allocations of property rights (expected dividends) in response to which sponsors choose non-contractible actions.

The strategic analysis of these tiers of incentives is innovative of this study. Hence, it will be the object of a dedicated sub-section in Chapter 4. Chapters 5 to 6 will examine

¹⁰⁷ *Vid. p. 391-7 in, E. R. YESCOMBE, Principles of Project Finance, cit.*

¹⁰⁸ Based on this value that the lender esteems of her claims, she will ex-ante comply with her participation constraints; that is, she will solve the problem of allocating resources in this project or somewhere else.

the strategic tensions that exist under these incentives as the environment deteriorates.

In chapters 7 to 10, the value of advancing the project as predefined by parties will shape the principles of interpretation of clauses in PFCs. Concretely, I will identify the in *dubio pro creditore* postulate, the fiduciary duties of loyalty to the FP, the preemptive objectives of clauses in PFCs, as well as other seven innovative postulates for a legal treatment dedicated to PFCs. In those chapters, I will also remark the compatibility of those -and all the other- postulates with the contractual practices that I advance here in Chapter 2.

I will now explore the fundamental aspects and distinctions between technical default events and the scenarios of full default. In a distinct sub-section, I will come back to these characterisations with concrete examples of clauses.

2.4.5.3 Events of technical default, full default, and non-recourse debt

In the nerve of the risk allocation mechanism, the vast majority of all regulations consists of requirements that the FP will enforce against the SPV or the sponsors - habitually, against both, with sureties and recourse to third parties as deemed necessary. These requisites correspond to all the foreseeable tasks and risks that, as cheapest cost avoiders, each sponsor will manage for the project. As said, the objects of these provisions are not only the material or technological features of the project, but other matters, including the coverage of capital needs, project management, and SPV control and administration.¹⁰⁹

¹⁰⁹ Operatively, these regulations will appear as condition precedents (refined in technical annexes) of the loan agreement or direct agreements with sponsors. Albeit parties can instrument the non-recourse loan agreement in a single document with its annexes, the entire PFC will consist of several instruments involving distinct parties. This practice of implementing the reciprocally (functionally) closely interdependent agreements but formally independent contracts reflects the current state of the art where these sophisticated arrangements have not been legally institutionalised in any form.

Asides all aspects relating to the rationalities of parties and the functionality of the risk allocation mechanisms indispensable for constructing expectations for the lender, formally, the interdependence of contractual provisions appears in cross-default mechanism and the use of such mechanisms for inducing agents to deliver responses that the lender cannot possibly contract upon. I will come back to these

As advanced above, when introducing the debt's non-recourse nature, events of default can be of two types. There are events of technical default¹¹⁰ and events of full default. Parties can implement both categories as cross-default mechanisms.¹¹¹ Frequently, the literature separates events of each class by stating that the earlier includes trespasses other than those of repaying the senior non-recourse debt or other requirements of fundamental value for the creditor to enter the project -the events of full default. Fundamentally, except for the commitment to repay the non-recourse debt¹¹² the distinction of the events that belong to one class of the other does not depend on the objects of provisions but on the legal consequences they provide. That is, on whether the lender can consider the contractual interaction terminated.

Let us note the fundamental aspects of each category. Further below, in separate titles, I will provide examples of provisions of each class.

2.4.5.3.1 Technical default provisions

Provisions associated with technical default penalties reflect needs or requirements that are important to the project but not indispensable in a way that, without them, the FP would not have entered the contract. Violations to technical default provisions do not result *directly* in frustrations of the main benefits that the creditor expects from the contract.

In our case, as already remarked, the trespasses to these provisions *alone* are not incompatible with the non-recourse risk internalised by the FP. In other words, violations to technical default provisions will not result in a significant loss¹¹³ of the repayment capacity of the SPV. Consequently, for violations to these technical default

aspects from a strategic stance in Chapters 4 to 6, and from the legal perspective in chapters 7 to 10.

¹¹⁰ Cf. pp. 65 and 184 in H. DAVIS, "Project Finance: Practical Case Studies, Volume I: Power and Water".

¹¹¹ Cf. p. 361 in J. ARMOUR, "Share Capital and Creditor Protection: Efficient Rules for a Modern Company Law", *The Modern Law Review*, vol. 63, 2000. See also page 165 in H. DAVIS, "Project Finance: Practical Case Studies, Volume I: Power and Water", cit. P. 105 footnote 14 in M. BERLIN; L. J. MESTER, "Debt Covenants and Renegotiation", *Journal of Financial Intermediation*, vol. 2, 2, 1992.

¹¹² This is, naturally, an event of full default -the sole event for which its consequences are not collateralised by third parties.

¹¹³ V.gr., ex-ante unacceptable to the non-recourse lender.

provisions, parties will agree on penalties or other consequences (see below). However, parties will not allow the FP to consider the contract terminated, *accelerate* the loan agreement, and force the SPV (or third parties) to repay the senior non-recourse with interests and penalties.

Subsequently, violations of technical default provisions will less frequently precede renegotiation stages. Similarly, because from the violation of technical default do not follow the breaching of the primary obligations of the debtor *-i.e.*, the obligation to repay the non-recourse debt with interests-, after technical defaults, the creditor will not be allowed to request compensation for losses or enforce other consequences under contract law.

Often, the FP may also enforce provisions against parties other than those failing to deliver (the obligors). For instance, the FP may enforce a penalty against the SPV after observing individual sponsors' trespasses. We may think of a sponsor (or the SPV) circumstantially failing to deliver some quality of outputs, or the SPV temporarily losing its debt-to-equity ratios. I will provide many examples further below. In these scenarios, operators and authors in the management and industry-oriented literature will speak about cross-default events. This is an aspect common to the violations of provisions of full default shown next.

2.4.5.3.2 Full default provisions

In sharp contrast with the cases of technical default described above, the scenarios of full default represent circumstances where the debtor fails to respond as necessary for the creditor to remain in the contract or where FP verifies that the elements or conditions that she *ex-ante* requested as indispensable for entering the project are no longer (or have never been) present. Conspicuously, this also includes the fundamental obligations to serve the non-recourse debt as per the original repayment schedule (*cf.* the *cash waterfall* clause).

Consider the case where the FP learns that, before contracting, a sponsor misrepresented (exaggerated) her capacity to deliver the inputs indispensable for the project, or a scenario where the highly specific¹¹⁴ sponsor becomes insolvent or incapable of providing essential performances. We could also think of a local government withholding a license necessary for the project to operate in the country due to sponsors' faulty behaviour. All such contingencies affect the capacities of the SPV to produce value substantially. Events of default of the risk allocation

¹¹⁴ Functionally, irreplaceable.

mechanism are consequently incompatible with the non-recourse risk internalised by the lender.¹¹⁵

Full default provisions result from regulations enforceable against sponsors or the SPV. Consequently, events of full default will be, by nature, the provisions of cross-default of broadest application -that is, the provisions for which the FP will request the widest protection from parties other than the one failing to perform as expected. After parties verify an event of full default, the FP will consider all other provisions defaulted and will withhold further contributions.¹¹⁶

Accordingly, in contrast to what we saw with the technical default provisions, full default events will usually allow the lender to adopt drastic measures, including the loan's acceleration and the full refunding of the senior debt plus interests and penalties.¹¹⁷ Moreover, in the jurisdictions where creditors can seek damage compensations for the default of debt (cash) obligations, the FP will seek such benefits.

Consequently, as in the events of technical default, here too, ex-ante, when verifying the enforceability of the risk allocation mechanism, the FP will verify that sponsor and the SPV (after receiving capital contributions from sponsors) are both capable of complying with their commitments and internalising the consequences from their breaching. This objective requires solvency sufficient for paying penalties and possibly returning all non-recourse debt funds received. To this end, the FP will request sureties from SPV's and sponsors' assets, as well as collateral protection from third parties.

As already pointed out, such recourse to parties other than the SPV does not

¹¹⁵ Cf. p. 395 and ff. in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹¹⁶ *Exceptio non adimpleti contractus*.

¹¹⁷ Cf. pp. 421 and ff. B. MARKESINIS; H. UNBERATH; A. JOHNSON, *The German Law of Contract - A Comparative Treatise*, 2nd, Hart Publishing, Oxford and Portland, Oregon, 2006. Cf. pp. 70 and ff. and 109 and ff. in S. ROWAN, *Remedies for Breach of Contract - A Comparative Analysis of the Protection of Performance*, Oxford University Press, 2012. Also pp. 209 and 229 in J. M. SMITS, *Contract Law - A Comparative Introduction*, Edward Elgar Publishing, Massachusetts, 2014. Cf. page 334 in M. HOGG, *Promises and Contract Law - Comparative Perspectives*, Cambridge University Press, Cambridge, 2011.

contradict the debt's non-recourse nature. The obligation to refund the FP (with interests and penalties) results from a violation of provisions of the risk allocation mechanism which are distinct to those of the senior debt and come to preserve the strategic environment that allows the lender to rely on the capacities of the project in the absence of collateral or recourse to third parties (*Cf.* chapters 4 to 7). As already pointed out, in PFCs, the *non-recourse* is the debt financing the project -not the clauses and commitments of the risk allocation mechanism whose enforceability permits the completion of the project necessary for the feasibility of the *non-recourse* financing.

Finally, the non-recourse lender will consequently find her expectations frustrated whenever the SPV defaults on the non-recourse debt, and she fails to identify any party defaulting on their obligations under the risk allocation mechanism. In other words, by allowing the non-recourse debt to the SPV, the FP internalises all (residual) risks that she fails to foresee and allocate to individual parties (the FP, sponsors, insurance providers, the off-taker, or other parties). Hence, as shown below and in chapters 4 to 7, *ex-ante* the FP will minimise these risks by expanding the comprehensiveness and enforceability of the risk allocation mechanism that she will also protect with sureties from (recourse to) third parties. For this, we will later see how implementation capacities (expertise and tolerance to transaction costs) will be one of the feasibility determinants of PFCs.

2.4.6 Financing party (FP)

The strategic position and the contracting capacities of lenders. In PFCs, there must always be a provider of non-recourse debt. That is, there must be a lender not capable of seeking payment or compensation from parties other than the SPV -her debtor. This financing contributor must deliver her funds while internalising project risks. Consequently, she must be capable of implementing ad-hoc project specific contractual relationship with the sponsors. This is a simple corollary of the crucial function of the risk allocation mechanism. I will elaborate on these elemental characterisations in Chapter 4.

The diversity of financing sources. The above does not mean that sources of non-recourse financing will come from a single individual. In PFCs, it is habitual that non-recourse funds come from many sources as the project advances. Functionally, the financing party is the group parties that coordinate internalise non-recourse risk from the project. Of these, at least one of them must be capable of *ex-ante* inspecting and *ex-post* enforcing the risk allocation mechanism.

Under the FP's foresight, the SPV receives extra funds from parties whose risks appetites and the satisfactory progress of the project allow them to internalise non-

recourse risks. Functionally, these parties now become part of the FP. However, of fundamental strategic relevance, in PFCs, the entry of distinct providers intervening in the project must be contractually regulated with the consent of the FP.

The power to *accept* that new contributors provide further non-recourse debt to the SPV is critical for preventing debt dilution against the original non-recourse lender.¹¹⁸ The vulnerability of creditors to this problem is particularly acute in non-recourse financing, where cash flow is the sole source of value to debt providers. I will recall this point below and analyse it extensively in Chapter 3.

In PFCs, the use of SPVs and the intervention of contracting FP permits that parties mitigate the problem contractually without restrictive covenants¹¹⁹ affecting side projects. Intuitively, via the so-called *cash waterfall (cascade)* agreement, parties regulate the resources that go in and out of the SPV under the non-recourse lender's vigilance. For this, in PFCs, parties often allow the FP a monopoly on providing debt financing to the SPV (see further below).

The forms and instruments of non-recourse debt. The instruments under which the diverse individuals implement their contributions are various. They will vary significantly with projects, with terms, and even with the current status of money markets. Fundamentally, financial intermediaries coordinate the participation of dispersed bond-holders and equity investors.¹²⁰

We can generally divide the instruments under which the FP provides funds in the form of debt, equity, or titles with components of both (*e.g.*, subordinated debt, or mezzanine financing). Before the financial crisis of the years 2008-9,¹²¹ debt used to come frequently from syndicated lending facilities.^{122 123} After such events, it is more

¹¹⁸ As it will show in Chapter 3, debt dilution describes the dissipation of value that takes place whenever subsequent creditors share cash flows and collateral value with pre-existing creditors. I will come back to this point twice below.

¹¹⁹ *Cf.* page 266 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹²⁰ *E.g.*, <https://www.morganstanley.com/im/en-ch/intermediary-investor/about-us/investment-teams/real-assets/private-infrastructure-team.html>

¹²¹ *Vid.* page 89 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹²² Syndicates include one party, a leading arranger, representing a group of providers pooling financial resources. T. MA, “Basel III and the Future of Project Finance Funding”, *Michigan Business & Entrepreneurial Law Review*, vol. 6, 1, 2016. S.

common to see inter-lender agreements.

In PFCs, debt may also come from dispersed creditors operating under the coordination of a financial intermediary. In all forms (common Collateralised Loan Obligations-CLOs-, Synthetic CLOs, Cash CLOs), bonds may be issued by the SPV or by third parties based on cash flows expected by the SPV. Bonds are popular as a way of discounting titles whenever off-takers participate in the project. By issuing bonds, the SPV can discount the titles received from the government. See case-studies 1 and 2 in Chapter 4.

Equity will usually come from institutional investors with expertise in PFCs. Some of these will channel resources from passive investors -e.g., general private equity funds, pension funds, general infrastructure funds, or insurance companies.¹²⁴ ¹²⁵ Chapter 4 will remark how, even though these investors obtain equity in the SPV, they do not manipulate project assets materially. Hence, as per the functionality of their positions, they should not be treated legally as sponsors. See case-studies 3 and 4 in Chapter 4.

The SPV can receive funds implemented via subordinated or, the so-called,

DENNIS, “Syndicated Loans”, *Journal of Financial Intermediation*, vol. 9, 4, 2000. C. HAINZ; S. KLEIMEIER, “Project Finance as a Risk- Management Tool in International Syndicated Lending”, *University of Mannheim- GESY - Governance and the Efficiency of Economic Systems*, Research Paper 136, 2006. B. C. ESTY; W. L. MEGGINSON, “Legal Risk as a Determinant of Syndicate structure in the Project Finance Loan Market”, *Project Finance International*, 617, 2001. C. HAINZ; S. KLEIMEIER, “Political risk, project finance, and the participation of development banks in syndicated lending”, *Journal of Financial Intermediation*, vol. 21, 2, 2012, Elsevier Inc.

¹²³ For a graphic description of a syndicate structure *vid. pp.* 17 and ff. in A. FIGHT, *Introduction to Project Finance*, cit. For a series of case-studies, *vid.* B. C. ESTY, *Modern Project Finance: A Casebook*, cit. In page 27, we see references to a deal of British Petroleum (PB) involving a syndicate of 66 banks for \$ 945 million in 1972, *Vid. also* J. W. KENSINGER; J. D. MARTIN, “Project Finance: Raising Money the Old-Fashioned Way”, cit.

¹²⁴ *Cf.* p. 314, 316 and 321 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹²⁵ *Vid.* <https://www.morganstanley.com/im/en-ch/intermediary-investor/about-us/investment-teams/real-assets/private-infrastructure-team.html> (20/02/2020)

mezzanine debt.¹²⁶ These are titles whose repayment expectations rank after the claims of unsubordinated debt providers. However, these titles are senior to the expectations of equity holders. As a disadvantage, subordinated debt holders may not access information or exert political rights reserved to shareholders. In many cases, mezzanine titles come as forms of support from the public sectors or other credit enhancement from often supranational entities, *e.g.*, The International Finance Corporation of the World Bank.¹²⁷

Finally, in chapters 4 and 7, I will show other reasons in virtue of which the references to the FP as a single entity is plausible. First, for informational purposes necessary to both implementation and enforcement, as shown, at least a core group of financing providers must act in a coordinated manner. Second, the later intervention of other financing providers, equity investors, or mezzanine and other forms of bondholders does not affect the FP's strategic unicity. Intuitively, the existing creditors (the FP) will regulate the terms under which these investors will contribute to the project, and naturally, such contributors will obey the terms (including expected sequence of sequential contributions) defined *ex-ante* by the sponsors and the FP. Third, as also mentioned, during the life of the project, the coordination of the enforcement of the risk allocation mechanism is indispensable for preventing debt dilution -the tension that arises when subsequent creditors compete for cash flow or collateral protection with earlier providers of financing (*Cf.* Chapter 3). Finally, lenders' treatment as a unique category (the FP) facilitates the provision of an adequate legal treatment according to their common strategic needs (*Cf.* chapters 7 to 10).

2.4.7 Other contractors

PFCs involve the combination of resources from many parties other than the sponsors and the FP. In an arbitrary classification, we could divide these contractors into three groups: first, the contractors for goods and services; second, the insurance providers; and the so-called off-takers buying the SPV proceeds.

2.4.7.1 The contracts from inputs with parties other than the sponsors

In PFCs, the critical material inputs for the project result from the contributions of the sponsors. However, this does not mean that, habitually, the SPV obtains goods

¹²⁶ *Vid. pp.* 74, 403 and *ff.* in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹²⁷ *Cf. pp.* 427 and *ff.* in *Ibid.* *Vid.* also <https://www.ifc.org>. Last visited 19/12/2020.

and services from third-party contractors.

As mentioned, a critical difference between the sponsors and other input providers is that the earlier participate in the project's design and its financing and receive ownership in the SPV. From the strategic stance, in this point, it is worth emphasising the incentive effect that ownership has over the choices of contributions from the sponsors. The strengths of these incentives and the value that all parties could obtain from such responses should serve as guidance for maximising property rights allocation -that is, for deciding who should be a sponsor or a third-party contractor to the SPV. I will come back to these observations in chapters 5 and 6 when analysing the sponsors' positions in detail.

The literature of the economic theory of contracts and, more generally, of company law and economics (including the property rights focussed theories of the firm) have thoroughly analysed the incentive effects of property rights.¹²⁸ We can identify these benefits in two dimensions. First, property rights and expectations to dividends result in incentives for the sponsors to deliver non-contractible efforts. That is, expectations to shares of future dividends induce input providers to offer privately costly contributions that, because of the asymmetries of information, parties cannot otherwise enforce. Property rights consequently mitigate moral hazard.¹²⁹ ¹³⁰ Second,

¹²⁸ Cf. generally, N. J. FOSS; H. LANDO; S. THOMSEN, "The Theory of the Firm", *Encyclopedia of Law and Economics*, vol. 5610, 1999. O. D. HART; B. HOLMSTRÖM, "A Theory of Firm Scope", *The Quarterly Journal of Economics*, vol. CXXV-May, 2, 2010. O. D. HART; J. MOORE, "Property Rights and the Nature of the Firm", *Journal of Political Economy*, vol. 98, 6, 1990. R. GIBBONS, "Four Formal(izable) Theories of the Firm?", *Journal of Economic Behavior & Organization*, vol. 58, 2, 2005. P. W. SCHMITZ, "Information Gathering, Transaction Costs, and the Property Rights Approach", *American Economic Review*, vol. 96, 1, 2006. S. ROSENKRANZ; P. W. SCHMITZ, "Joint Ownership and Incomplete Contracts: the Case of Perfectly Substitutable Investments", *Schmalenbach Business Review*, vol. 56, January, 2004, Centre for Economic Policy Research.

¹²⁹ There is a feasibility boundary to the quality of the incentives that parties can implement via distribution of property rights. This limit results from the canonical moral hazard in team problem. I will refer to this problem in many places in chapters 4 to 9. See the entry "Moral Hazard in Team" in the glossary. The seminal and standard reference is B. HOLMSTRÖM, "Moral Hazard in Teams", *The Bell Journal of Economics*, vol. 13, 2, 1982. For team efforts under risk aversion see E. RASMUSEN,

ownership improves parties' position when bargaining aggressively, thus mitigating the hold-up induced under-investment problem.¹³¹ In our case where the sponsors own a legal entity, property rights (shares in the SPV) also facilitate the flow of information and the constructive exercise of political rights -which are also non-contractible contributions for better implementation and enforcement. The same holds for the naturally non-contractible cross-monitoring efforts that the best-qualified sponsors exert as means of expanding distributable welfare.

Notice though, there is a limited budget of property rights (shares) that parties can allocate to contractors. Intuitively, to every stake of ownership allocated to an extra individual correspond similarly strong incentives that parties will fail to issue to other sponsors. Subsequently, there is an opportunity cost that sponsors face when distributing shares in the SPV. Accordingly, there is an optimal allocation of property rights that maximise both incentives and the value or the responses from the sponsors choosing non-contractible efforts expanding total welfare and individual returns.

The sponsors will consequently allocate property rights to the contributors who can best implement the project contractually, enforce provisions (cross monitor other sponsors and third parties) and whose material contributions that escape their contracting capacities are of highest values. The rest of the material inputs for which the sponsors can implement reliable contracts will come from third parties under

“Moral Hazard in Risk-Averse Teams”, *The RAND Journal of Economics*, vol. 18, 3, 1987. R. STRAUSS, “Moral Hazard in Sequential Teams”, 1996. L. RAYO, “Relational Incentives and Moral Hazard in Teams”, *Review of Economic Studies*, vol. 74, 3, 2007.

¹³⁰ This includes the problem of hidden actions ex-post (whenever the principal fails to observe or verify the actions of the agent), of hidden information ex-post (the case where agents observe but fail to interpret the actions of the agent), both in bilateral and (distinctively) team settings (the scenario in which parties share the output of collective non-contractible effort). I offer abundant literature references to these problems in chapters 5 and 6 where I focus on the responses of sponsors in detail.

¹³¹ Parties delivering specific (non-redeployable) contributions will withhold efforts as a function of their expectations of how much of returns could be lost in an aggressive renegotiation after the environment changes beyond the contracted upon (incompleteness). *Vid.* P. W. SCHMITZ, “The Hold-Up Problem and Incomplete Contracts: A Survey of Recent Topics in Contract Theory”, *cit.*

terms controlled by the market. Consider the case of a commodity (*e.g.*, fuel). Other inputs may relate to goods or services that are not project-specific, *e.g.*, maintenance services (gardening), or an insurance premium (see below).

Remarkably, the fact that some inputs come from parties other than the sponsors does not imply that such contributions escape the risk allocation mechanism enforceable by the FP. In all cases, the non-recourse lender will estimate which inputs are necessary for the SPV to complete the project under all eventualities and request that such contributions be brought before the SPV as the project evolves. The FP will assure the enforceability of such requirements via direct agreements with the sponsors and the SPV. The sponsors will then be liable should such third parties fail to bring the necessary for the project as defined in conditions precedent of the loan agreement (technical or full default provisions). Only then, the lender will internalise non-recourse risks.

2.4.7.2 Insurance and credit enhancement providers

In a second group, we could include insurance providers.¹³² In PFCs, some contingencies may be foreseen (stochastically identified) but whose prevention might be exceptionally costly. Other risks do not depend on the choices of actions or precautions from the sponsors.

In condition precedents to the loan agreement, the FP will typically request that, directly or via the SPV, sponsors implement insurance mechanisms against such risks that often affect long term costly projects.¹³³ These risks may relate to the SPV vulnerabilities, the individual sponsors, the off-taker (see below), or third parties.

Insurable risks vary significantly with the types of projects. There are, however, certain contingencies -and insurance products- that habitually affect non-recourse projects. This is especially true for projects holding assets in different jurisdictions. I will come back to this point with examples below.

¹³² Pp. 157 and *ff.* in W. TAN, *Principles of Project and Infrastructure Finance*, cit.

¹³³ For an example of a list of items contained in condition precedents see Box 7.2 of page 281 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Cf. p. 77, in A. FIGHT, *Introduction to Project Finance*, cit.

2.4.7.3 The off-taker in PFCs. The case of private-public partnerships (PPPs)

Sponsors and governments use PFCs for delivering goods or services to the public. This is frequently the case of the so-called public-private partnerships (PPPs).^{134 135} PPPs serve for expanding the procurement capacities of governments under tight budget constraints.

PPPs are not to be confused with the general concession agreements frequently found in their cores. Alike in PPPs, in simple concession agreements, the contractor receives authorisation for delivering services to the State or to a highly regulated market –at its own risk. Distinctively though, in PPPs, sponsors competing for a project will also bring financing resources for investing in the project -not only for exploiting pre-existing assets -e.g., an old railway.

PFCs for PPPs not only allow for sponsors to fund a project beyond their debt capacities. It also facilitates that governments obtain financing for public works beyond budgetary limitations. This second aspect has been crucial to the growth in popularity of PPPs during the last decades. This is true even though the technique has

¹³⁴ Cf. from an industry stance, C. O. CRUZ; R. C. MARQUES, *Infrastructure Public-Private Partnerships*, Springer, 2013. D. GRIMSEY; M. K. LEWIS, *Public Private Partnerships - The Worldwide Revolution in Infrastructure Provision and Project Finance*, Edward Elgar Publishing, 2004. J. PLUMMER, *Focusing Partnerships - A Sourcebook for Municipal Capacity Building in Public-Private Partnerships*, Earthscan Publications, 2002. G. SCHWARTZ; A. CORBACHO; K. FUNKE, “Public Investment and Public-Private Partnerships”, 2008, editado por Gerd Schwartz, Ana Corbacho y Katja Funke, Palgrave Macmillan, Basingstoke. M. BULT-SPIERING; G. DEWULF, *Strategic Issues in Public-Private Partnerships. An International Perspective*, cit. E. G. CARAYANNIS; J. M. ALEXANDER, *Global and Local Knowledge - Glocal Transatlantic Public-Private Partnerships for Research and Technological Development*, Palgrave Macmillan, New York, 2006. P. URIO, *Public-Private Partnerships: Success and Failure Factors for In-Transition Countries*, University Press of America, 2010. G. HODGE; C. GREVE, “The Challenge of Public-Private Partnerships”, 2005, Edward Elgar Publishing.

¹³⁵ From an academic stance, M. DEWATRIPONT; P. LEGROS, “Public-private Partnerships: Contract design and Risk Transfer”, cit. O. D. HART, “Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships”, cit.

a history of more least 150 years.¹³⁶ The BOT project of the National Stadium for Beijing 2008 Olympic Games used as a reference below and in Chapter 4 is a real-life PFC used for a PPP.¹³⁷

Practices in the industry have somehow typified PPP schemes. These arrangements often contain elements of contracts for leasing, financing, managing, or operating. This is the case of the simplest and most common Build-Operate-Transfer (B.O.T.) or build–own–operate–transfer (B.O.O.T.) agreements.¹³⁸

From these purest forms, industry players have derived further subtypes and combinations for the different industry sectors. Variations of the above include Build-Own-Operate (BOO), Design-Build-Finance-Maintain (DBFM), Design-Build-Finance-Maintenance-Operate (DBFMO), Build-Lease-Transfer (BLT), or Lease-Renovate-Operate-Transfer (LROT). The ways of calling these alternatives appear spontaneously in the industry and management literature.¹³⁹

Interestingly, somehow, PPP regulations result in the institutionalisation of the use of SPVs in public procurement. However, PPP regulations do not enter in the actual design of the SPV nor provide for the sources of financing to be non-recourse.¹⁴⁰

¹³⁶ Cf. p. 79 in J. B. MILLER, *Principles of Public and Private Infrastructure Delivery*, cit. P. 22 D. GRIMSEY; M. K. LEWIS, *Public Private Partnerships - The Worldwide Revolution in Infrastructure Provision and Project Finance*, cit.

¹³⁷ Vid. The National Stadium BOT project for Beijing 2008 Olympic Games, pp. 130 and ff. in H. W. ALFEN ET AL, *Public-Private Partnership in Infrastructure Development Case Studies from Asia and Europe*, Bauhaus-Universität Weimar, 2009.

¹³⁸ For an analysis of these contractual forms from the stance of the public procurement literature, *i.e.*, beyond the boundaries of non-recourse financing, Vid. p. E. AURIOL; P. M. PICARD, “A Theory of BOT Concession Contracts”, *Journal of Economic Behavior & Organization*, vol. 89, 2013, Elsevier B.V.

¹³⁹ Cf. pp. 3 14 and 28 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit. Vid. P. 219 in P. URIO, *Public-Private Partnerships: Success and Failure Factors for In-Transition Countries*, cit. Also p. 12 in D. GRIMSEY; M. K. LEWIS, *Public Private Partnerships - The Worldwide Revolution in Infrastructure Provision and Project Finance*, cit.

¹⁴⁰ As a concrete example, Cf. Articles 7 of Law 27.328 of “Participaciones Publico-Privada” of Argentina. Art. 7º(...) – *Las bases de la contratación respectiva podrán*

Accordingly, when parties implement PFCs within PPP environments, judicially, the contractual elements of PFCs remain interpreted as legally independently agreements.

2.4.7.3.1 The off-taker

Let us now observe the strategic relevance of PPP off-takers in PFCs. The management literature describes the off-taker as the party buying the proceeds from the project. In PPPs, the role of off-taker is played by the government implementing the procurement program.^{141 142}

Off-takers (governments) are not elements essential or necessary to PFCs. They are present only whenever the project includes the SPV selling proceeds to a government. This usually happens within a PPP or similar arrangement.

Strategically, the *off-taker* comes with two significant effects. First, the contract proceeds can now become the object of contractual arrangements that parties predefine before internalising risks. Second, parties can now distribute market risks as desirable between the government and the sponsors embodied by the SPV.¹⁴³

contemplar la constitución de una sociedad de propósito específico, de fideicomisos, otros tipos de vehículos, o esquemas asociativos, que tendrán a su cargo la suscripción y ejecución hasta su total terminación del contrato de participación público-privada.

¹⁴¹ See, generally: D. CARLIDGE, *Public Private Partnerships in Construction*, cit. J. DELMON; V. R. DELMON, *International Project Finance and PPPs - A Legal Guide to Key Growth Markets*, cit. M. DEWATRIPONT; P. LEGROS, “Public-private Partnerships: Contract Design and Risk Transfer”, *EIB Papers - European Investment Bank*, vol. 10, 1, 2005. E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit. D. MARTIMORT; J. POUYET, “To Build or not to Build: Normative and Positive Theories of Public-Private Partnerships”, cit.

¹⁴² For examples of take-off agreements, *vid.* pages 575 and 576 in S. BYOUN; J. KIM; S. S. YOO, “Risk Management with Leverage: Evidence from Project Finance”, *Journal of Financial and Quantitative Analysis*, vol. 48, 02, 2013. *Vid. pp.* 216 to 253 in M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, cit.

¹⁴³ *Vid. pp.* 5 and *ff.* in J. DELMON; V. R. DELMON, *International Project Finance and PPPs - A Legal Guide to Key Growth Markets*, cit. and *pp.* 13 and *ff.* in E. R. YESCOMBE, *Public-Private Partnerships - Principles of Policy and Finance*, cit.

In practical terms, in PPPs, the SPV and sponsors will not only contract with government on critical issues about quality and conditions under which the project will sell its proceeds to a State. Parties can also define readjustment terms that they may follow after observing changes in the environment as the project evolves. Subsequently, the off-taker interaction with other parties becomes the object of the risk allocation mechanism protecting the non-recourse lender.

Moreover, the FP will also implement agreements directly with the off-taker. A remarkable example of the interactions between off-taker and the FP are step-in rights (see further below). Through step-in right mechanisms, the lender substitutes the sponsors or other parties in their interactions with the off-taker. The lender may also interact with the government as part of the administrative process relating to the public competition for projects in which governments expect sponsors to bring financing as part of investment plans (the essence of PPPs).

2.4.7.3.2 PPPs, the off-taker and reward functions

The type of reward schemes used for contracting goods or services from the SPV functions as a risk and incentive allocation device implemented by the government. We will consequently find that certain reward functions are more common than others in particular types of projects.

A substantial volume of academic works focuses on the PPP sector dealing with strategic aspects of this bilateral relationship.¹⁴⁴ Beyond this research's scope, the study of the feasibility and optimality of reward functions is essential for choosing between privatising procurement or implementing contract directly by the government.

2.4.8 The simplest PFC

Let us now present an elemental example of a project funded under a project finance technique. In contrast with what we will later see in the three case-studies in Chapter 4, this scenario is fictitiously simple; it includes only the elements and parties that are strictly necessary for the description to be representative. We will see an extended - but still highly stylised- version of the same case in Chapter 4. In that chapter, I will also present three real-life case-scenarios with accurate information from industry reports.

¹⁴⁴ One of the prominent examples is E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit.

Consider three companies: a designer, a builder, and an operator. As a group, these three entities decide to join efforts and compete in a contest for delivering services to an off-taker -a government in a private-public partnership program. The project is exceptionally costly (high capital intensive). Cash needs exceed the debt capacities of companies involved. Hence, the sponsors choose their financing via non-recourse debt.

Before advancing, note how the mention to the private-public partnership program is not indispensable but merely frequent. In many cases, companies use PFCs for funding projects that offer their proceeds in the open market.¹⁴⁵ The inclusion of the feature serves to simplify the analysis of other chapters.

Therefore, assume that the project involves the financing, designing, building and operating of a Sports venue –say, the BOT project of the National Stadium for Beijing 2008 Olympic Games.^{146 147}

¹⁴⁵ See the Hong Kong Disneyland project, *pp.* 383 and *ff.* in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

¹⁴⁶ *Vid.* The National Stadium BOT project for Beijing 2008 Olympic Games, *pp.* 130 and *ff.* in H. W. ALFEN ET AL, *Public-Private Partnership in Infrastructure Development Case Studies from Asia and Europe*, Bauhaus-Universität Weimar, 2009. References to other projects financing Stadiums can be found in page 23 in S. L. HOFFMAN, *The Law and Business of International Project Finance*, cit.

¹⁴⁷ Other highly stylised representation of PFCs can be found in *pp.* 9 and *ff.* in A. FIGHT, *Introduction to Project Finance*, cit.

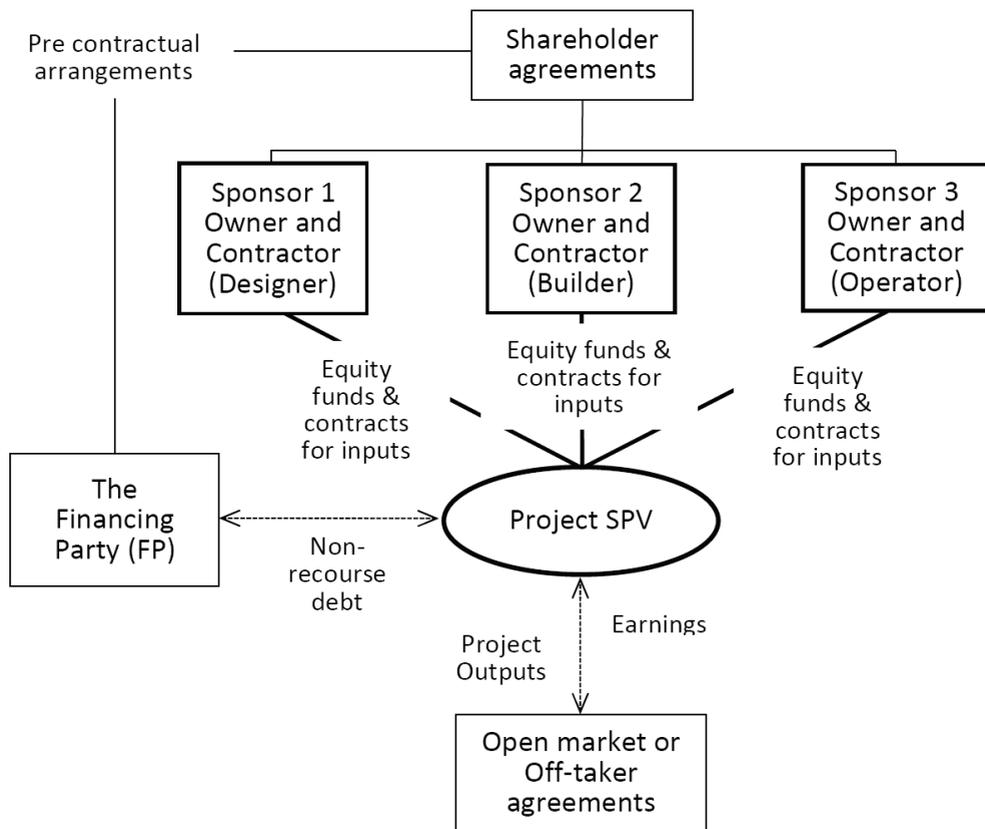


Exhibit 1

The thicker solid lines in the centre indicate both contracts for inputs by sponsors and the ownership (with control) of the SPV. The finer lines show contractual relationships. The dotted arrows demark flows of cash and material contributions in and out of the SPV; that is cash in both directions between the FP and the SPV. The dotted lines then show project outputs and cash flow between the SPV and the off-taker.

Sponsors 1, 2, and 3 are the companies that incorporate the project-instrumental SPV. They set up contractual relationships for such inputs, and they expect dividends from the company they own and control (*de iure* and *de facto*). The off-taker is a Beijing agency of the Chinese government advancing the Beijing National Stadium financing via a Build Operate and Transfer scheme. Finally, as usual, the PF, say, a syndicate of banks and other financial entities, acting a single party lends cash to the highly specific SPV without recourse to third parties.

The SPV will implement the financing, building, operating, maintenance of the project. Parties will implement the project via a concession agreement for 30 years. Note how the SPV will not own the land where it will build the Stadium. After that period, it will transfer its control to the Government.

The pre-contractual arrangements between the non-recourse lender and sponsors will define the requirements that will later appear as condition precedents of the loan agreement between the FP and the SPV. These provisions will later embody the risk allocation mechanism and enforceable against the SPV, sponsors, or third parties (collateral or insurance providers).

Cash will flow from the project as per a reward function offered by the off-taker that is not relevant to this analysis.¹⁴⁸ For simplicity, assume that some of that money will go to the SPV. The SPV will then distribute it covering operating costs to the FP and sponsors as regulated in the *cash flow waterfall clause* (see below) -a critical part of the risk allocation mechanism. Depending on the type of contract with the off-taker, some cash may also flow to the government. After some years (an aspect of the reward function), the SPV will transfer asset control to the State.

2.5 The parties and their contracts

I will begin by characterising the contractual practices according to the subjects that take part in them. Right below, I will refer to the provisions involving the FP against the SPV and sponsors. These are the technical default and full default provisions that shape the risk allocation mechanism. Obligations of these categories include those that the sponsors comply directly and those they fulfil by contracting with third parties, including providers of inputs of material, financial (insurance), and services nature. In Chapter 4, these agreements will appear as the 1st tier of incentives enforceable by the FP.

In the second place, I will refer to the clauses that the FP enforces against SPV that require coordination with the off-taker. These provisions belong to the 1st tier of

¹⁴⁸ Reward functions are of crucial importance in the literature of PPPs. Cf. E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit. E. IOSSA; D. MARTIMORT, “Risk Allocation and the Costs and Benefits of Public-Private”, 2011. E. IOSSA; D. MARTIMORT, “Corruption in PPPs, Incentives and Contract Incompleteness”, *International Journal of Industrial Organization*, vol. 44, 2016. D. MARTIMORT; J. POUYET, “To Build or not to Build: Normative and Positive Theories of Public–Private Partnerships”, cit.

incentives that the FP implements (*Cf.* Chapter 4). In these cases, the off-takers consent is necessary for the FP to interfere in a relationship between the off-taker and the SPV.

Additionally, I will refer to the contracting enforceable amongst sponsors only. These are provisions that sponsors put in place based on information that the FP cannot receive. These are forms of cooperation that sponsors also implement relationally and will later constitute the 2nd tier of incentives. I will come back to this form of interaction below and in Chapter 4.

Finally, without distracting the reader, in Chapter 4, when introducing the objective functions of sponsors and the FP, I will also show how sponsors deliver responses to three tiers of incentives. In addition to the 1st and 2nd tiers of contracts, sponsors will deliver inputs expanding returns from expected dividends (the 3rd tier of incentives). Property rights will serve for incentivising fully non-contractible actions. The strength of these incentives will grow with, amongst other factors, the individual allocation of ownership in the SPV and the performance (dividends) expected from the project after the company repays the non-recourse debt. I will revisit and elaborate on these crucial strategic aspects in many places in the following chapters.

2.5.1 Clauses involving the FP, the SPV, and sponsors

In PFCs, the FP enforces provisions against the SPV (its debtor) as well as against the individual sponsors. These obligations result from the observations of project characteristics that the financial advisor and the lead arranger make during the pre-underwriting stages.

Later, the obligations enforceable by the non-recourse lender will constitute the risk allocation mechanism. As advanced in the second section of this chapter, and as I will further elaborate in chapters 4 and 7, these are the contractual precautions that allow the FP to build confidence that, under all foreseeable eventualities, the SPV will count on all inputs necessary for the completion of the project. To the FP, the functionality (comprehensiveness and enforceability) of the risk allocation mechanisms substitutes the comfort that, under regular corporate contracting, she would otherwise obtain from asset collateral or recourse to their parties. In Chapter 4, these provisions will appear as the 1st tier of incentives enforceable by the FP.

As I will also describe in chapters 4 and 7, in all cases, the FP's objectives will be to exert contractual discipline against sponsors, so that they deliver their contributions as socially desirable under all circumstances. Consequently, the FP can implement agreements with the SPV, with sponsors, or with both (individually or collectively). Moreover, the lender can -and regularly will- enforce provisions against sponsors or

the SPV after verifying the defaults of the obligations of the other (the cross-default mechanisms).¹⁴⁹

Asides, the FP will enforce against sponsors and the SPV commitments to provide specific or general information. In the case of the Beijing Olympic Stadium project, we may consider the obligations to provide certain information about the number of events taking place, the level of occupation of the facility, or the obligations to comply with a schedule of advances. In projects within the frameworks of PPP programs, compliance with many of these requirements will be verified by the lender via reports issued by the off-taker.

As already mentioned, the FP will enforce penalties under the risk allocation mechanism for trespasses of sponsors or the SPV that should not lead directly to the SPV defaulting on the non-recourse debt (the said technical default provisions that parties can implement via cross-default mechanisms).¹⁵⁰ These are provisions that the FP considers valuable for preventing risks or dissuading sponsors from delivering non-contractible responses harming the project (*cf.* the analysis of the pre-emptive objective of clauses in Chapter 9).^{151 152}

¹⁴⁹ A typical and most conspicuous example would be the provision allowing the FP to adopt measures against the SPV after verifying the insolvency or the incapacity to respond as expected of a sponsor. *Cf.* p. 396 in E. R. YESCOMBE, *Principles of Project Finance*, cit. The FP can enforce against the SPV after verifying that the SPV has failed to notify punctual events as requested specifically. *Cf.* p. 392 in *Ibid.* The FP can enforce against sponsors after updating information about investment decisions of the SPV beyond the scope allowed by the loan agreement. *Cf.* p. 393 *Ibid.*

¹⁵⁰ *Cf.* the list of provisions in pp. 392-5 in E. R. YESCOMBE, *Principles of Project Finance*, cit. This includes all types of positive and negative covenants described below. *E.g.*, obligations to comply with standards, to maintain capacities, to maintain control ratios (see below), to refrain from providing third parties, to buy insurance protection, to control the SPV diligently as per predefined standards, *etc.* See the references to the effects of *events of potential default* in p. 397 in *Ibid.*

¹⁵¹ Default provisions usually detect events that the principal (the PF) will consider valuable for risk mitigation purposes -that is, for preventing possible influences from the environment, for preventing that the project approaches scenarios where opportunism becomes the dominant strategy for sponsors, or simply to preserve deterrence against such actions. *Cf.* S. CHAVA; M. R. ROBERTS, "How Does Financing Impact Investment? The Role of Debt Covenants", *The Journal of Finance*, vol.

Examples of the latter include the provision of sureties or guarantees associated with actions by third parties. Generally, any of the sponsors' insolvency or financial distress will constitute an event of technical default with legal consequences to the relationship between the SPV and the FP.^{153 154 155}

We may think of an obligation to obtain administrative authorisations for pursuing a particular activity that the SPV will require as the project evolves (hence, that parties cannot comply with as part of conditions precedent). In these cases, the FP cannot pursue actual damages compensation. Thus, it will enforce penalties against the individual sponsor and the SPV.

The nature of these penalties and the enforcement style will be project-specific. However, the practices observed in PFCs are indeed distinct than those seen in collateralised financing. *E.g.*, the FP may demand that her advisors participate in

LXIII, 5, 2008. M. D. BENEISH; E. PRESS, "The Resolution of Technical Default", *The Accounting Review*, vol. 70, 2, 1995. M. D. BENEISH; E. PRESS, "Costs of Technical Violation of Accounting-based Debt Covenants", *Accounting Review*, vol. 68, 2, 1993. C. DEMIROGLU; C. JAMES, "The Information Content of Bank Loan Covenants", *Review of Financial Studies*, vol. 23, May, 2007.

¹⁵² *Cf. pp. 110 and ff.* (section 5.1), in particular *p. 115*, in G. VINTER ET AL, *Project Finance - A Legal Guide*, cit. *Cf. page 120* in A. FIGHT, *Introduction to Project Finance*, cit.

¹⁵³ *Cf. pp. 319 and 391* in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹⁵⁴ For examples of events of default not associated with the main obligation of the borrower see page 143 section 5.8 in G. VINTER ET AL, *Project Finance - A Legal Guide*, cit.

¹⁵⁵ In the case of the Beijing Olympic Stadium, the lender could enforce penalties, increase interest rates temporarily, or in the extreme case *accelerate* loan repayment terms after the SPV has failed to bring certifications of the quality of the material used for the structure of the stadium as requested by the off-taker; the lender could also enforce penalties against SPV after confirming that sponsors have not respected negative pledges and started other projects whose assets compete with the Beijing Olympic Stadium. We may also think of the obligation to maintain valid certain insurance protections relating to events affecting not only the SPV but also sponsors individually; *e.g.*, against fire, or structural damages, or about the reliability of systems providing communications to the press and media.

adopting certain decisions, trigger increments of interest rates, withhold further contributions, or enforce cash clawbacks regulated by *cash waterfall* schedules. In the extreme, the non-recourse lender may finally accelerate terms and seek the repayment of capital and interests.

Additionally, as I will elaborate under other parts, in PFCs, the FP may also enforce that the SPV assigns certain rights against third parties. These assignments may include entitlement to payments that she can discount in the financial markets. More radically, the FP may enforce step-in rights against the SPV (see further below).

Asides, the FP does not deliver material contributions sequentially to the project. Consequently, her capacity to receive high-quality information and her possibilities to interact informally (*i.e.*, to sustain cooperation relationally on verifiable or observable information) will be low. I will later show how this incapacity of the FP to receive precise information about individual actions will allow space for sponsors to implement the 2nd tier of contractual arrangements with effects that will be desirable or undesirable as a function of the evolution of the project (see below, and chapters 4 to 6).

As I will analyse in chapters 4 to 7, strategically cross-default provisions allow the FP to implement incentives beyond her informational capacities. Intuitively, the fact that she can identify an event of default that she can enforce against the SPV induces the sponsors to exert monitoring (and relational disciplining) efforts as a way of preserving expected dividend value. Effectively, by taking the SPV as a hostage,¹⁵⁶ the FP can free ride on the best-informed sponsors' information capacities.

Finally, the FP will enforce provisions against sponsors for actions or precautions expected from the SPV also for a responsibility reason. In certain jurisdictions, beyond a certain point, a capacity to enforce provisions against a borrower may result in judges interpreting *de facto* control from the creditor. In such scenarios, the FP may prefer exerting incentive pressure against the SPV only indirectly.¹⁵⁷

2.5.2 Clauses involving the FP, the Off-taker and the SPV.

As also mentioned, whenever parties recur to PFCs for delivering projects within the contexts of PPP programs, the FP will be regularly in need for interacting with the

¹⁵⁶ O. E. WILLIAMSON, “Credible Commitments: Using Hostages to Support Exchange”, *cit.*

¹⁵⁷ *Cf. pp.* 220-1 in G. VINTER ET AL, *Project Finance - A Legal Guide*, *cit.*

off-taker directly. The functionality of this interaction is threefold. First, it permits the enforcement of provisions implemented by the FP. Second, it allows sponsors to comply with regulations of the public procurement processes. Third, it serves for risk allocation purposes.

The enforcement function. The off-taker's consent will be necessary for the FP to enforce of entitlements of assignments of contractual positions as provided under the risk allocation mechanism. See further below the elaboration of step-in rights. In PPPs, the FP will need the off-taker's consent before substituting either SPV or some of the sponsors (or both) in their contractual positions in the project.

Additionally, the local government may be requested to confirm that the FP will be allowed to remove and sell assets as regulated contractually after verifying default events.¹⁵⁸ During the project's life, the FP and sponsors may also agree that the off-taker deposit payments in accounts controlled by the lender. See below the description of control accounts. See also the use of cash traps in the A2 Motorway project case (case-study 1) in Chapter 4.

The public procurement requirements. In PPPs, access to sufficient financing is one of the inputs that governments expect from sponsors.¹⁵⁹ Accordingly, the off-taker may require the FP intervention providing financing support for the bidding of sponsors (not yet the SPV) in public competition processes. This aspect is standard in public procurement under PPP schemes.

The risk allocation benefits. Finally, the interaction between the off-taker and the FP may be desirable for risk distribution purposes. The off-taker's presence implies that parties (both sponsors and the FP) can anticipate and regulate critical aspects associated with the reaction of the market to SPV's products. The FP values all assurances that the off-taker will not vary the contracting conditions as the environment deteriorates -a problem of incompleteness of the interaction between the SPV and the government. The FP may also request to be informed by the off-taker about technical default events in the contractual interaction between the off-taker and the SPV and the sponsors.¹⁶⁰

As said, albeit contracting with the government will result in sovereign risks, it is possible to contract insurance coverage against war, political risks, expropriation,

¹⁵⁸ Cf. page 196 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹⁵⁹ Vid. page 39 in D. CARTLIDGE, *Public Private Partnerships in Construction*, cit.

¹⁶⁰ Cf. pp. 194-5 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

state default and other scenarios. On the other hand, parties cannot buy insurance protecting the unexpected reaction of an open market.¹⁶¹ Finally, in many PPP projects (precisely, as the Beijing Olympic Stadium), the SPV does not entirely escape market risks. However, the SPV and the off-taker can now predefine how they will adjust the project or perhaps extend it to preserve the company's repayment capacities.¹⁶²

2.5.3 Clauses involving only sponsors

Finally, let us now describe how sponsors implement agreements amongst them. That is, without the intervention of the FP.

Let us recall, the sponsors manipulate project assets materially. This interaction comes with several strategic benefits to them. Remarkably, the manipulation of project assets allows them to update information about both the project's evolution (mitigating contractual incompleteness) and the individual choices of inputs by peer sponsors and other contractors (refining enforcement against moral hazard).

Moreover, as also advanced, in PFCs, sponsors deliver their contributions sequentially. The order of the contributions and the access to high-quality information permits that sponsors implement incentives beyond the FP's enforceability. Furthermore, this interaction will take place not only on verifiable but also on observable information.

In contrast, in PFCs, the FP cannot interact relationally. She only delivers funds under earlier contracts. Therefore, the spaces within which she can retaliate opportunistically appear as a function of contractual incompleteness only. Accordingly, her capacity to sustain cooperation relationally is minimal compared to that of sponsors. Therefore, to the non-recourse lender, the observable information is strategically nearly irrelevant.

Additionally, the verifiable information that the FP can reach without materially accessing project assets is also of low quality. Her difficulties for accessing verifiable information jeopardise her capacity to enforce provisions externally too. This is true both *ex-ante* and *itineri*, as she will fail to update information on the project's evolution, thus exacerbating the problem of contractual incompleteness. As a result,

¹⁶¹ Exceptions to this are perhaps the cases where market risk can be hedged via financial instruments in the cases where the SPV produces commodities.

¹⁶² *Cf. pp. 194-6 in E. R. YESCOMBE, Principles of Project Finance, cit.*

there will be a space of actions for which sponsors will be capable of contracting *-i.e.*, within which they will sustain cooperation relationally- with impunity. That is, beyond the enforceability capacities of the non-recourse lender.

Moreover, because this interaction occurs on higher-quality information and within the spaces allowed by contractual incompleteness, the object of relational cooperation will also include incentives that sponsors will implement (and enforce externally) via the fully controlled SPV. I will examine the strategic effect of these spaces for contracting in chapters 4 to 6. Chapter 4 will introduce the 2nd tier of incentives -the incentives that the sponsors implement without the intervention of the FP in PFCs.

As I will show in chapters 4 to 6, the capacity of sponsors to sustain cooperation relationally beyond the FP's enforcement capacities will come with both efficient and inefficient strategic effects as a function of the evolution of the environment. In the following chapters, I will show how, whenever parties or the SPV update information about the expected evolution of businesses being equal or better than initially anticipated, this 2nd tier of incentives will permit that the sponsors implement welfare-enhancing innovations with positive externalities to the FP. On the contrary, when the project evolves not as fruitfully desired, the spaces for contracting will allow sponsors to deliver costs saving (but not necessarily welfare increasing) responses to provisions enforceable by the FP but without internalising their undesirable effects to the project.

Irrespective of the above, sponsors will decide on other matters that the FP may not consider strategically relevant to her claims. They will agree on the distribution of property rights (the 3rd tier of incentives to be introduced in Chapter 4), on voting rules and the decision-making system, on managerial delegation and other governance matters of the SPV, or the procedures for subscribing extra shares and for providing additional capital as regulated by the *cash waterfall* clause. Within these spaces for contracting beyond the FP intervention, the sponsors will decide on the individual responsibilities of sponsors in their interactions with the SPV. As in all contractual relationships, sponsors will agree on alternative methods for solving disputes (see further below in this chapter).

2.6 Typical contractual practices enforceable by the FP (the risk allocation mechanism)

Let us now enter the analysis of the individual contractual elements that are most common in PFCs. Following the above sequence, I will now observe some of the typical clauses that the FP enforces against the SPV and the sponsors -the risk allocation mechanism. In a separate section, I will then remark the mechanisms that the sponsors implement beyond the lender's enforcement capacities.

The description that follows will include clauses that will be present in the vast majority of projects in one way or the other. These are the classes of clauses that sponsors apply as per the characteristics of their contractual positions. The consistency of these precautions' styles exposes parties' vulnerabilities and interests that are robust (independent of exogenous factors) and therefore often inherent to PFCs.¹⁶³

There are works in managerial and industry-oriented literature with chapters dedicated to characterising each of these provisions as suitable to the distinct industry sectors. Consequently, the identification or early characterisation of the individual clauses is not a contribution of this study. The systematic classification of clauses coherent with their functionalities of this chapter's risk allocation mechanism and the analysis of the three tiers of incentives presented in Chapter 4 are elements innovative of this research.

I will separate the section into five parts. In the first part, I will refer to the provisions regulating events of full default. In the second place, I will refer to the covenants defining the technical definitions of the project. These will involve: first, the material features of the project and the contributions of sponsors; second, the project's management; and third, the governance of the SPV. In this section, we will also see comments on the protection that the SPV receives from third parties (insurance and credit enhancement) and technical and full default events.

Under the third sub-section, I will elaborate on information clauses. These will include the project-specific commitments to inform, the progress monitoring (control) ratios, and the general obligations to reveal information.

In the fourth place, I will analyse the control mechanisms implemented by the FP. These will be the *cash waterfall* (cascade) clause, the monopolies of financing sources, and the control accounts (and cash traps).

Under the fifth and last sub-section, I will describe the dispute resolution and enforcement mechanisms. Here, I will refer to the efficiency of arbitration in PFCs, the direct agreements and step-in rights, the assignments of rights, the sureties (*ius in re*) over project assets, and the security over SPV's shares.¹⁶⁴

¹⁶³ Cf. chapters 7 to 10.

¹⁶⁴ Vid. pp. 289, 301 and 302 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Pp. 227, 310 to 312, E. R. YESCOMBE, *Principles of Project Finance*, Academic Press, London and

2.6.1 Events full default

Above, I have described the parties that intervene in each type of clause. Let us now restrict our attention to the objects (functionality) of contractual provisions. Above, I have already distinguished between clauses providing for technical default events (the least relevant ones) and those providing for conditions of full default. As also mentioned, events of *full default* are exceptional. Therefore, I will now begin by providing examples of these provisions and their enforcement consequences. In the rest of the chapter, I will illustrate clauses and requirements to which parties attach penalties or legal consequences of events of technical default or full default indistinctively.

Recalling the elemental aspects. As already described, in PFCs, before internalising project risks (before allowing uncollateralised resources to the SPV), the FP will define a series of risks that she will not internalise. These clauses of the risk allocation mechanism will consequently identify risks that the FP will consider incompatible with the non-recourse exposure she will take with her contributions. These are the events of *full default* described above.

Accordingly, as the project evolves, after confirming the absence (or the undesirable presence) of such conditions as described, the FP will no longer permit that the SPV remain funded non-recourse.¹⁶⁵ Consequently, the lender will decide about *accelerating* the loan agreement and requesting the full refunding of all non-recourse contributions with interests and penalties. Moreover, she will enforce these provisions against the SPV, sponsors, or third parties. Alternatively, the FP may choose to continue with the contractual interaction after enforcing some of her entitlements and renegotiating new conditions.

Some examples of events of default. The range of items or risks that the lender will

New York, 2002. P. 411 in E. R. YESCOMBE; E. FARQUHARSON, *Public-Private Partnerships for Infrastructure -Principles of Policy and Finance*, cit. Pp. 62, 203, 266 H. A. DAVIS, *Project Finance: Practical Case Studies*, cit., vol. II. Pp. 291 and 293 in J. CROTHERS, “Project Finance in Central and Eastern Europe from a Lender’s Perspective: Lessons Learned in Poland and Romania”, *McGill Law Journal*, vol. 41, 1995. Pp. 135 and 137 in A. FIGHT, *Introduction to Project Finance*, cit. Pp. 514 to 516 and 519 in M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, cit.

¹⁶⁵ Cf. p. 395 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

define as necessary for the feasibility of the non-recourse financing facility will depend on each project's characteristics. She can identify events affecting the warranties received, or the capacities of sponsors. The FP can regulate provisions based on the project evolution or events associated with the local government of the jurisdiction of the SPV or the off-taker.¹⁶⁶ Let us see some examples.

The sponsors, their warranties, or their capacities. The FP may identify as events of full default, scenarios where: sponsors lose ownership or *de facto* control of the SPV; the FP observes errors in the representations or insufficiencies in the warranties from sponsors; the sponsors or key input providers become insolvent or otherwise incapable of complying with provisions as defined; lender's securities become insufficient, unenforceable, or invalid; the sponsors fail to deliver contributions as defined in annexes or otherwise to comply with standards of inputs as verified by lender's external advisors (*cf.* case-studies in Chapter 4).

The evolution of the project. Similarly, the FP will consider the financing facility under default after verifying that sponsors have failed to inject further capital or other forms of predefined financial support after realising that the average service coverage ratio (or any other control accounts) has fallen below certain thresholds.¹⁶⁷

The local administration or the off-taker. Likewise, the FP may identify scenarios where the SPV loses its authorisations or licences to build or operate; or, whenever the company loses titles or control to the project's site.

Additionally, the FP will often adopt precautions against the risks that the government expropriates the project legally or illegally. Governments can expropriate projects by blocking imports of critical assets, raising taxes to project activities, impeding that the SPV converts currency or transfers funds into or out of countries. Habitually, the FP will not trigger the project debt facility's default in virtue of the above contingencies but rather whenever sponsors fail to organise insurance protection against them. The paradigmatic event of default will describe any failures to repay the debt as per the defined schedules (the waterfall clause).

The needs for renegotiating. Most interestingly, in sharp contrast with what we observe in other contractual environments, in PFCs, the verification of default events does not necessarily come with a termination of the interaction between creditor and

¹⁶⁶ *Cf.* 395-7 in *Ibid.* and *pp.* 290 and *ff.* in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, *cit.*

¹⁶⁷ *Cf.* below the elaboration on control accounts.

debtor. Likewise, these contingencies may not invariably result in SPV ceasing to receive contributions from the creditor. This feature of PFCs is a strategic consequence of the conjunction of the non-recourse nature of the debt, the limited liability protection of the SPV, and the high degrees of project assets' specificities.

Intuitively, because in PFCs, the non-recourse nature of debt is the rule, the extent to which the lender will be capable of reaching sureties or compensation beyond the SPV will depend on the completeness of provisions of the risk allocation mechanism. Compensations associated with full default events may not be sufficient, or insurance provisions (*e.g.*, performance bonds) may allow the lender to recover damages only partially.¹⁶⁸ Additionally, the judicial enforcement of such provisions may take long or be uncertain. Under certain circumstances, the FP may consequently prefer renegotiating in the hope that, after some changes,¹⁶⁹ the SPV may manage to repay the remaining of the debt and interests.

The above is particularly true in the events of full default. In the scenarios of technical default, the FP's willingness to readjust will be minor simply because the consequences from both the trespasses and the enforcement of such provisions will be less aggressive to the project. In contrast, consider the case in which, after verifying full default events, the FP enforces a mortgage over the land in which the SPV builds some critical (and highly specific) infrastructure. The execution of such entitlement would likely fail to cover the claims of the FP. However, such action would indeed result in the interruption of the project.

The enforcement alternatives. Accordingly, after verifying events of (full) default, the FP may choose among several alternatives. These options vary with the evolution of the project and with the exposure that the FP may have internalised at that stage. In one extreme, the FP can waive (forgive) the trespasses or perhaps enforce some or all penalties. In the other extreme, the FP can *accelerate* the loan, send the SPV to its bankruptcy and request full repayment of the non-recourse debt, interests and penalties.

In the vast majority of cases, during construction, the FP will request further commitments and implement extra sureties from individual sponsors or third

¹⁶⁸ The financial capacities of sponsors relative to the risks at stake of the project is the reason why parties resorted to non-recourse project financing in the first place, and the reasons why the FP requests performance bonds that she may now enforce.

¹⁶⁹ *Cf.* below, *e.g.*, the functionality of step-in rights.

parties.¹⁷⁰ She will likely condition further disbursements of debt funds to further contributions of capital from sponsors. That is, the lender will enforce a lessening of debt-to-equity ratios. During operation, after implementing further sureties, the FP may request that the SPV allocates more resources to the repayment of senior non-recourse debt to the detriment of contract claims of the sponsors.¹⁷¹ Critically, after verifying default events, the lender may take over control over the Project Company's decision-making process.

The potential events of default. Most interestingly, it is a common practice in PFCs that parties also include what authors often call *potential events of default*.¹⁷² *These are circumstances in which an event of default can be foreseen but has not yet occurred, thus allowing early action on the lender's part. This should be acceptable to the Project Company provided that it is quite clear that the occurrence of the event is only a matter of time.*¹⁷³ Based on these observations and in the strategic analyses from chapters 4 to 6, in Chapter 8, I will characterise fiduciary duties to inform in PFCs.

The materiality of events of default. Authors also reflect on how events of default should have some *materiality*. For example, *a representation should have been misleading in a material respect to make it an Event of Default*.¹⁷⁴

¹⁷⁰ Pp. 196. in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹⁷¹ Note the strategic impact that altering the seniority of claims will have to the incentives for sponsors to deliver opportunistic responses as conditions further deteriorate. Cf. the incentives described in Chapters 4 to 6 and the analysis of the optimal hierarchy of claims in Chapter 10.

¹⁷² Cf. p. 397 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹⁷³ Cf. p. 397 in *Ibid*.

¹⁷⁴ In the words of E.R. Yescombe: *Similarly, some materiality limitation may be reasonable for some of the Events of Default: for example, a representation should have been misleading in a material respect to make it an Event of Default. This is usually an issue of much debate between Project Company and lenders. For example, the latter may argue that the whole loan should not be placed in default just because it does not fulfil the covenant to deliver the management accounts by a certain date; however, the lenders are likely to consider the failure to produce management accounts in a reasonable period of time a symptom of something seriously wrong with the Project Company's operations, and therefore this should*

Note how authors in management reveal the strategic value that the FP and sponsors give to the provisions of the risk allocation mechanism and how distinct these criteria are to parties' rationalities in regular collateralised lending. In Chapter 9, these observations about the strategic value that sponsors give to default events will characterise the *pre-emptive function* with which parties and judges should complete contractual provisions of the risk allocation mechanism ex-post.

2.6.2 Technical definitions; general pledges and commitments

Let us now observe the range of commitments that parties adopt for the different projects. Here and in all sections to follow, I will focus on these clauses' substance and functionality as seen today in the industry-oriented and management literature. Accordingly, all provisions described below can be the object of practices enforced by the FP against sponsors directly or, as in most cases, via the SPV. Moreover, as also insisted, these provisions' substance can be the object of both clauses of technical default or full default -which, as said, is a matter of the legal consequences that the FP enforces after verifying trespasses.

The management literature often speaks about *pledges*. With this expression, authors identify the sponsors' commitments with eyes on the material characteristics projects or SPV management. These provisions begin to evolve in the earliest stages of the project. That is, after their initial meetings with financial advisors and the lead arranger under the supervision of external engineering and other technology experts.^{175 176}

give them a basis to intervene. Lenders always make the point that they will not automatically use Events of Default to destroy the project (which is seldom in their interests), and that they are just there to get everybody around the table, but obviously once an Event of Default occurs, the Sponsors and Project Company are at a disadvantage in any discussions that take place with the lenders. Cf. p. 397 in Ibid.

¹⁷⁵ Note, what I call the FP is a group of financial or investment entities not qualified on any industry sector. *Cf. pp. 96, 393 and 351 in Ibid.*

¹⁷⁶ In addition to the requirements identified below that parties will elaborate as the they refine the material aspects of the project, during the very earliest stage of contractual implementation of the project, auditors hired by sponsors, the financial advisors and the lead arranger (whose fees will later appear as an expenditure of the project) will inspect critical items as: the suitability of project site; the soundness of

I will now refer to five aspects of these regulations. First, I will remark pledges that relate to technical features of the project (the material contributions of sponsors as input providers). Second, I will mention (positive and negative) pledges and covenants for the management of the project; thirdly, I will refer to the covenants used for regulating the governance of the SPV. Finally, in the fourth place, I will explore some of the protections that the market allows and that parties obtain from third parties (insurance coverage and credit enhancement).

2.6.2.1 Provisions defining technical aspects of the project

As advanced, these are the provisions that define the material contributions with which sponsors will design, build, and operate the project. Operatively, parts of these precise regulations will define standards of contributions and progress reports expected from the off-taker or the FP's external technology consultants.¹⁷⁷ Formally, the FP will request these commitments in the bodies of contractual instruments listing condition precedents and with full details in technical attachments.¹⁷⁸ These technicalities will result from the interaction between sponsors, the financial advisors, and the lead arranger before underwriting the terms-sheet.

In the case of the Beijing Olympic Stadium, annexes could define aspects like the

project technology and design; the experience and suitability of contractors; the qualification (expertise) of the personnel hired for advancing the project at the SPV level; the implementation schedule and the alignment of the financing facility with the progress of implementation expenditures; the needs and access administrative permits when necessary; the quality of the interaction with the off-taker; the contractual provisions regulating adjustment options with the lender as the project evolves; the existence of pollution of ecological damages to their parties or to society; the availability of insurances covering risks of political, economic, or other natures. Cf. p. 96, 391 and 392 in *Ibid.* and pp. 288-90 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹⁷⁷ Cf. case studies in Chapter 4.

¹⁷⁸ For an example of a list of items contained in condition precedents see Box 7.2 of page 281 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Cf. pp. 340, 397, 400 and ff. in M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, cit.

quality of structural materials, the lighting infrastructure, the personnel training, the prices that the operator can charge as a function of usage, the ways of measuring customer satisfaction, or the costs that the company should generate that later should be compensated by the off-taker. Strategically, these provisions reflect the references for complying with the off-taker -an aspect relevant to the FP. These definitions also serve for readjusting with the FP as the interaction with the off-taker evolves with time.

2.6.2.2 Pledges and covenants on project management

A distinct group of provisions will regulate commitments associated with the administration of the project. Authors in the management literature refer to *negative* and *positive* (or *affirmative*) covenants. However, the distinction between negative and positive covenants is not legally or functionally relevant.

Parties simply focus on regulating obligations and contingencies associated with each project casuistically. Moreover, we cannot always distinguish the object of provisions referring to the single project's administration from those of clauses oriented to regulating SPV management. The distinctions appear relevant for pedagogic purposes only.

As examples of pledges regulating the project's management, we may refer to commitments to provide funding in the sequence that parties agreed upon with the FP (*cf.* below the *cash waterfall* clause) or as exceptional needs arise. Parties may also agree that the SPV should enforce obligations against sponsors as input providers -*i.e.*, without the lender's consent, the SPV should abstain from renegotiating with them on critical aspects as the project evolves; sponsors should also provide technical support as necessary for the project.

In many cases, parties will agree that sponsors should refrain from acting in ways that could jeopardise their capacities or those of the SPV. This commitment refers to the canonical actions in conflicts of interests and other decisions putting under risk the sponsors' abilities to deliver material contributions to the SPV. Concretely parties will agree that sponsors should not offer the same inputs necessary for the project to other companies (a typical negative pledge). This provision is frequent in projects where sponsors deliver significant raw materials or where some resources appear scarce or limited to them. In the Beijing Olympic Stadium case, the sponsors in charge of designing the infrastructure should not begin side projects endangering their capacities to provide highly qualified (engineering) human resources to the project.

Additionally, the SPV should not undertake any other business or transaction except

to build and operate the project.¹⁷⁹ Punctually, SPV should not use project resources for side objectives. Except in specific circumstances, such as for obsolete assets, the SPV must not sell, rent, give security or liens over project goods, or otherwise transfer rights associated with them to third parties. In the same vein, the SPV should not integrate its capacities with those of other organisations. Exceptions to these limitations should be agreed upon by the SPV (sponsors) with the FP (her expert advisors).

In PPP cases, it is often the case that the off-taker defines the spaces within which she can alter the original specifications of the project. Based on these possibilities, the sponsors (SPV) will later replicate such needs in the distribution of tasks that they will enforce within the SPV.¹⁸⁰ Finally, the FP will insert provisions making explicit the commitment of sponsors not to abandon the project's construction or operation. This provision functions as a control covenant.¹⁸¹ That is, the FP will enforce compensation of damages directly from sponsors for their political decisions.

2.6.2.3 Pledges and covenants defining the governance of the SPV

When shaping the risk allocation mechanism,¹⁸² parties will be explicit on how they expect that sponsors manage the SPV.¹⁸³ We can distinguish three sets of provisions: first, those relating to the ownership and organisation of the SPV; second, those defining financial precautions; and third those characterising administrative duties. This classification follows a criterion of importance. As indicated above, there is no legally relevant difference amongst these. As much as they are all enforceable against

¹⁷⁹ *Vid.* page 289 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹⁸⁰ *Cf.* below the back-to-back and pass-through clauses.

¹⁸¹ See the references to the strategic value of SPV control by sponsors in Chapters 7 and 8.

¹⁸² The range of requirements enforceable by the FP that result from the evolution of contractual interactions between the issuance of letters of intentions and the underwriting (and formation of syndicates) that manifests in condition precedents.

¹⁸³ For a list of covenants, see page 391 in E. R. YESCOMBE, *Principles of Project Finance*, cit. See also page 288 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. *Cf. pp.* 340, 397, 400 and *ff.* in M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, cit.

sponsors, we can analyse them legally and strategically as control covenants.¹⁸⁴ Let us see some examples of them.

Ownership and organisation. Sponsors will commit not to implement mergers, demergers (spin-offs), or other capital structure significant operations for the SPV, including buying shares in other companies. Moreover, they will pledge to provide capital as per the regulations of the *cash waterfall* clause. Additionally, unless otherwise authorised by the FP, sponsors will not allow external capital investors to gain political or *de facto* control of the SPV. Sponsors will also commit to maintaining the management structure of the SPV as agreed upon with the FP.¹⁸⁵

As shown further below, beyond the collateral protection allowed by project assets, the FP may also take security in the ownership of shares held by sponsors. Habitually, ex-ante, sponsors will commit not to decrease the equity capital and not to issue shares not pledged in favour of the FP.¹⁸⁶ For the same reasons, sponsors will not be permitted to distribute dividends beyond the regulated under the *cash waterfall* clause (see further below). Finally, sponsors will not be allowed to amend the SPV's constitutive charter or other critical instruments. These include authorisations to perform certain activities.

Financial management precautions. On the financial dimension, sponsors will commit not to divert the SPV's investment efforts beyond the project's objectives as defined by all parties.¹⁸⁷ If above I made these remarks concerning the material aspects of the project, now I am referring to the possibilities that the SPV implements investments of financial nature.

During construction, managers will receive cash from the FP and sponsors. However, in these early stages of completion, managers will allocate these funds as per the schedule of construction costs. The need for regulating cash flows will grow when the project begins operating, and cash begins flowing from the market or the off-taker in less foreseeable magnitudes into the management system.

As I will show below, the *cash waterfall* (cascade) agreements will regulate cash flow

¹⁸⁴ Cf. Chapter 9 the criteria for interpreting contractual mechanisms in PFCs.

¹⁸⁵ *Vid. pp.* 96, 203, 392 and 394, in in E. R. YESCOMBE, *Principles of Project Finance*, cit.

¹⁸⁶ Cf. page 289 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹⁸⁷ Cf. page 393 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

in both directions, in and out of the SPV. As I will describe in Chapter 3, for managerial discipline purposes, it is efficient that administrators do not have access to unallocated caches of financial resources. However, as will also elaborate in Chapter 3, the SPV must have access to some liquid funds (contingency provisions) to deal with eventualities efficiently -that is, without experiencing volatility-induced distress costs after minor events affect the company. The SPV managers should allocate cash from these contingency provisions in liquid financial alternatives as agreed upon with the FP. Accordingly, unless expressly allowed, the FP will impede that sponsors use the SPV to incur, create, or permit any other indebtedness to subsist.¹⁸⁸

The above discipline prevents the hazards from the inherently risky nature of financial investments while also protecting the FP from debt dilution. As also characterised in Chapter 3, debt dilution refers to the tension faced by pre-existing creditors finding themselves competing for cash flows and corporate collateral with subsequent creditors of their joint debtor. In PFCs, parties prevent debt dilution by granting the FP a quasi-monopoly on the provision of debt to the FP. As the project evolves, the FP may allow the SPV to receive funds from further creditors under certain conditions relating to the seniority of subsequent debt claims.^{189 190}

Additionally, more generally, parties will agree on a general duty of sponsors to take *any* action -via the controlled SPV- to maintain the lenders' security interests.¹⁹¹ Concretely, these objectives manifest in *cash waterfall* clauses, including the prohibition of issuing dividends unless regulated by schedules or allowed *itineri* by the lender. However, as a general duty, sponsors should adopt decisions keeping the FP's interests under consideration.

This proposition of critical strategic value in PFCs will later serve for evidencing the contractual unicity of PFCs and the instrumentality of the SPV and for identifying principles for the interpretation of clauses in PFCs: the duties of loyalty, *the pre-*

¹⁸⁸ *Vid.* page 289 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹⁸⁹ *Cf.* below the monopoly on the sources of financing allowed to the FP in prevention of debt dilution. *Vid.* page 289 in *Ibid.*

¹⁹⁰ In Chapters 5, 6 and 10, we will see the strategic relevance of the optimal seniority of claims in PFCs.

¹⁹¹ *Cf.* page 393 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

emptive objectives of clauses, and of *in dubio pro creditore* in PFCs.¹⁹²

Administrative duties. Finally, perhaps least relevantly, parties agree on how the sponsors will run the company's organisational dimension.

The FP will request that the risk allocation mechanism includes provisions specifically obliging sponsors to comply with corporate filings, obtain all administrative authorisations necessary for building and operating the project, and comply with all environmental regulations. On the financial side, the FP will oblige sponsors to hire financial auditors approved by the lender. The sponsors will also agree that the SPV internalises the cost of advisors incurred during the implementation process. Parties will regulate how the SPV will maintain bank accounts for cash flow control (see below). Finally, the FP will require that the SPV complies with accounting standards and implement project-dedicated information systems necessary to reveal the type of project-specific information requested.¹⁹³

Functionally, sponsors will internalise these obligations as parties do in control covenants. That is, these will be commitments that sponsors will comply by controlling the SPV as predefined by the FP. As also mentioned, this reveals the functional unicity of all contractual provisions shaping PFCs to which the SPV is a mere instrumental component. I will revisit this observation extensively in chapters 4 and 7.

2.6.2.4 The protection from third parties (insurance and credit enhancement)

Let us observe how, in PFCs, sponsors expand the SPV's capacities to respond to the FP. Recall, in PFCs, the SPV advances only highly specific assets. Consequently, both sponsors and the FP will reorient the strategies of credit enhancement that we would otherwise see in diversified corporate contracting to three objectives: first, to augment the sponsor's capacities to comply with their obligations; second, to secure compensation capacities in the foreseeable events of default; third, to widen the range of events insured by third parties. By doing this, parties effectively increase the

¹⁹² Cf. chapters 8 to 10.

¹⁹³ For a list of covenants, see page 391 in E. R. YESCOMBE, *Principles of Project Finance*, cit. See also page 288 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Cf. pp. 340, 397, 400 and ff. in M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, cit.

likelihood that the SPV will manage to serve its non-recourse debt commitments under more varied environments.¹⁹⁴

The protection from external insurance. In PFCs, the FP will typically request that sponsors implement insurance mechanisms against risks that regularly affect the long term and materially complex projects.¹⁹⁵ These are contingencies that they may foresee (identity stochastically) but whose prevention will be exceedingly costly or do not depend on sponsors' actions or capacities.

The exposure of projects to contingencies varies significantly with their material characteristics. However, the insurance industry counts on products suitable against risks common to many projects. These risks range from simple labour strikes through all forms of legal and illegitimate, direct or indirect expropriations including State's sovereign defaults, social unrests, opportunistic increments in import-export duties targeting project equipment, illegal barriers to international trade, *force majeure*, up to full armed conflicts (war).

Insurance products also provide coverage against other risks of economic nature, especially when the project and the financing sources are in different jurisdictions. These include fluctuations in commodity prices and currency rate changes. Some protections often do not take the form of typical insurance but of financial instruments (typically, variations of swaps). These are efficient against risks associated with variations in interest rates -a matter of relevance in very long-term financing.¹⁹⁶

Insurance protection may come from private and public entities as well as from

¹⁹⁴ In chapters 5 and 6, I will elaborate on the responses expected by sponsors individually and collectively as the environment manifest unexpectedly.

¹⁹⁵ *Vid.* Box 7.2 of page 281 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

¹⁹⁶ *Vid.* generally C. CHENGWING, "What is the Role of Insurance in the Project Finance Matrix?", *CAR - CEPMLP Annual Review*, 2008. Page 110 in B. HOWCROFT; S. FADHLEY, "Project Finance: A Credit Strategy Based on Contractual Linkages", *The Service Industries Journal*, vol. 18, 2, 1998. Page 127 in I. PUSTYLNICK, "Restructuring the Financial Characteristics of Projects in Financial Distress", *Global Journal of Business Research*, vol. 6, 2, 2012. *Cf.* 8.6 in E. R. YESCOMBE, *Principles of Project Finance*, cit. Pp. 107 and ff. in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

supranational organisations. Providers include regional development banks,¹⁹⁷ the multilateral investment guarantee agency of the World Bank¹⁹⁸ and other development entities.¹⁹⁹ The support that projects receive varies with the location of assets and the origin of sponsors. This is especially true regarding the Export Credit Agencies of the countries from which sponsors export goods or services to the project's country-location.²⁰⁰

For instance, the FP of the Beijing Olympic Stadium will request protection against currency rate fluctuations affecting the proceeds' value that the SPV will transfer out of the country. The FP may also require that the SPV buys insurance against illegal (direct or indirect) expropriations by the Chinese government. Finally, specific to the case of large stadiums, parties may agree on insurance protection against obstacles found after the initial soil studies (geological risks).

Credit enhancement (performance bonds). As I will elaborate in Chapter 3, PFCs

¹⁹⁷ *Vid. pp. 28 and ff. 46, and 71 in A. FIGHT, Introduction to Project Finance, cit., pp. 345 and ff. in G. VINTER ET AL, Project Finance - A Legal Guide, cit. page 88 in E. SCANNELLA, "Project Finance in the Energy Industry: New Debt-based Financing Models", International Business Research, vol. 5, 2, 2012. Within PPP programs, vid. Pp. 185 in A. AKINTOYE; M. BECK, Policy, Finance & Management for Public-Private Partnerships, Wiley-Blackwell, Oxford, 2008.*

¹⁹⁸ *Vid. pp. 27 and ff. in A. FIGHT, Introduction to Project Finance, cit.*

¹⁹⁹ *E.g., The European Bank for Reconstruction and Development (EBRD), The International Financial Corporation of the World Bank Group, The Multilateral Investment Guarantee Agency, etc. Cf. pp. 24 and ff. in Ibid.*

²⁰⁰ *Vid. pp. 19 and ff. in Ibid. and R. SHORT, "Export Credit Agencies, Project Finance, and Commercial Risk: Whose Risk is it, Anyway", Fordham International Law Journal, vol. 24, 2000. Page 10 in P. BENOIT, Project finance at the World Bank - An Overview of Policies and Instruments, World Bank Publications, 1996, in <http://www.worldbank.icebox.ingenta.com/content/wb/1051>. Vid. page 1057 in I. R. COLES, "Julietta Gold Mining Project: Lessons for Project Finance in the Emerging Markets", cit. In Germany, cf. Euler Hermes Deutschland AG at <http://www.eulerhermes.de/de/>; in Spain cf. *Compañía Española de Seguros de Crédito a la Exportación* at <http://www.cesce.es/web/sp/>; in Italy, cf. IMEST (*Società italiana per le imprese all'estero*) S.p.A. at <http://www.simest.it>; in Japan, cf. Japan Bank for International Cooperation at <http://www.jbic.go.jp/en/>.*

involve completing projects whose financing needs exceed the funding capacities of sponsors. These projects will be both highly specific and very costly. Moreover, inputs from sponsors -*i.e.*, their material contributions- will be of high value at risk and also come at very high value to the SPV.

Often, sponsors' possibilities to deliver contributions are higher than their capacities to internalise the risks associated with such obligations. Intuitively, sponsors may be capable of financing the costs of their obligations and effectively delivering as expected -under normal circumstances. However, in cases of default (for any reason), the harms they could cause to the SPV and indirectly to the FP could exceed their capacities to provide sufficient compensation. More simply, sponsors may be judgment-proof with respect to the most severe penalties.

Accordingly, in PFCs, it is a common practice that off-takers and lenders request *performance bonds* or support from third parties. Often, this support comes from the parent companies of sponsors. In practice, the same instruments serve to cover the FP and off-takers' risk allocation needs.²⁰¹

2.6.3 Information clauses

In PFCs, the non-recourse lenders will put in place provisions in response to which sponsors and the SPV should actively reveal information to the lender. In practice, these provisions may take three forms. First, the FP can indicate the detailed information that she (*i.e.*, her external advisors, engineering consultants) expects to receive as the project progresses. Second, she can define more or less sophisticated ratios or monitoring accounts. Finally, third, most generally, she can request that the sponsors and the FP reveal all information deemed relevant to the enforcement of provisions of the risk allocation mechanism.²⁰²

From the stance of contractual enforcement (from the view of the general principles of Contract Law) the three types of provisions defer only on their degrees of completion. In Chapter 8, I will characterise a default rule enforcing general obligations to inform events of particular relevance as defined by thresholds of *news* (*the general duties to inform*). Additionally, in Chapter 9, I will characterise a set of principles -*v.gr.*, duties of loyalty, *in dubio pro creditore*, the pre-emptive objectives

²⁰¹ *Cf. p. 137, 395 and 391 in E. R. YESCOMBE, Principles of Project Finance, cit.*

²⁰² Lenders' Engineer will expect to be provided with all significant information on the progress of the construction, and to be able to attend all relevant site or other meetings. *Cf. p. 379 in Ibid.*

of clauses- under which parties and judges should complete obligations to inform (*the specific duties to inform*).

Let us now observe these obligations to inform that parties enforce in PFCs. First, I will refer to the obligations to provide information about predefined events. Secondly, I will describe the progress monitoring ratios. Finally, third, I will mention the functionality of general duties to inform implemented contractually.

2.6.3.1 Project-specific commitments to inform

As part of the risk allocation mechanism, in PFCs, the FP will ex-ante indicate the information that she expects to receive about predefined variables or circumstances. The financial advisor, the external consultants (engineers and experts on the field of the project) and later the lead arranger will identify these items by working with sponsors in the project's design before the underwriting of the credit facility.

The nature of the events to be informed varies with the material and financial aspects of the project. The FP will request to that the banks working for the SPV (the agent bank or security trustee) report, for instance: any interruption in the regular operation of the project, events affecting the solvencies of sponsors or their capacities to deliver contributions as predefined, changes in ownership or control by parent companies with which the FP may have relationships, insurance claims, events of default or litigations by sponsors or by other contractors. The FP will also expect to receive information about satisfactory progress reports issued by the off-taker.

These reports should include details of the outputs delivered by the SPV (the project's output), the individual sponsors and third parties. This includes the achievement of milestone dates, percentage completion of predefined aspects of the project on materially relevant points defined by external advisors of the lender, the expected completion and beginning of operation dates, the operating performance of the project, and forecast of production choices as a function of the responses expected from market competitors. The FP will also expect that sponsors report about the evolution of variables external of the project but critical to the project's evolution: input costs, tax pressure, currency exchange rates, legal-regulatory hazards, and the capacities of sponsors to respond to them as expected.

In the Beijing Olympic Stadium project, certifications of progress will come from the Chinese government. The SPV could also be obliged to report the finding of geological information that differs from the results of original examinations.

As is the rest of the provisions of the risk allocation mechanism (the requirements enforceable by the FP), the information requested by the lender will vary with the progress and types of risks internalised by the project.²⁰³ The *cash waterfall* clause, and technical default provisions (see below) will be enforced based on these and other information sources as accessed by the FP.

2.6.3.2 Progress monitoring (control) ratios

During the project's life, the lender will request that the sponsors produce information in predefined ratios. These ratios reflect relationships between capital and debt, or between cash flows in and out of the SPV, or the SPV's capacities to comply with its commitments with estimated production levels.

Some of these ratios reflect the current states of affairs. Others are *forward-looking* in the sense that they reflect projections. *E.g.*, Cash Available for Debt Service (CADS); Debt Service Reserve Accounts (DCRA); Earnings Before Interests and Taxes (EBIT) and Earnings Before Interests and Taxes plus Depreciation and Amortisation -both measures regularly used in diversified corporate businesses; Free Cash Flows (FCF) defined as EBIT after taxes, plus depreciation and amortisation, minus capital expenditures and increases in net working capital; Annual Debt Service Ratios (ADSCR); minimum Debt Service Coverage Ratio (Minimum DSCR) and Average Debt Service Coverage Ratio (Average DSCR); Loan Life Coverage Ratio (LLCF); Project Life Coverage Ratio (PLCR); and Drawdown Coverage Ratio (DCR).²⁰⁴

In the example of the Beijing Olympic Stadium project, during construction, the FP will look at costs incurred as project advances and how much of equity funds the SPV will use to cover such expenditures. During operation, the lender will monitor the

²⁰³ *Vid. pp. 95-103, 379 and ff. and 392 and ff. in Ibid.* For a description of the flows of information from borrower to lender see section 7.2.3.8 *pp. 284 and ff. in S. GATTI, Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects, cit. Vid. pp. 127, 128 and 130 in A. FIGHT, Introduction to Project Finance, cit.*

²⁰⁴ For a description of these ratios with their formulas, and further literature references, see *pp. 541 and ff. in B. C. ESTY, Modern Project Finance: A Casebook, cit.* See also *pp. 318-36 in E. R. YESCOMBE, Principles of Project Finance, cit.* Also 298 and *ff. (in particular 301) and 322 and ff. in S. GATTI, Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects, cit.*

cash flow produced by the Stadium's operation and how such proceeds suffice for servicing ongoing obligations and expected instalments of the loan agreement.

2.6.3.3 General obligations to inform

Finally, beyond the above, in PFCs, parties will regularly accept clauses implementing *general* duties to inform. Intuitively, the FP will request that the SPV, the sponsors, the off-taker, or other parties (*e.g.*, banks running accounts) notify the lender about other events that might directly or indirectly affect the feasibility of the project.

Remarkably, in PFCs, authors refer to the primary purposes of all covenants as those *to give lenders advance warning of any problems that might affect the Project Company; (...) and to protect the lenders' security.*²⁰⁵ As advanced above, in chapters 8 and 9, I will identify and characterise both general and specific duties to inform in PFCs. I will recall these observations as empirical manifestations of the interests of parties in PFCs.

2.6.4 Control mechanisms

In addition to the task distribution function, the risk allocation mechanism mitigates risks by assuring control of project assets of funds by the lender. The risk allocation mechanism also minimises risks internalised by the FP by preserving the enforceability of agreements.

Under the last section of this level, I will elaborate on the ex-post dispute resolution and enforcement arrangements. Let us now observe how, as the project evolves, the lender minimises exposure by limiting the resources it allows under the control of the SPV.

I will now refer to three mechanisms that are characteristic of PFCs: first, the *cash waterfall* (cascade) clauses; second, the monopolies on the provisions of financing sources (an element often included or implied in the cascade agreement); and the cash control (cash trap) accounts. Whereas the monopolies on the provision of financing resources and the cash control accounts are typical, due to its functionality, the *cash waterfall* (cascade) mechanisms are strategically indispensable (inherent) to all PFCs. Let us describe them shortly.

2.6.4.1 Cash waterfall (cascade) clause

By the so-called *cash waterfall* clauses or *cascade* agreements, the financing party

²⁰⁵ Cf. p. 391 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

controls the resources that flow in both directions, in and out from the SPV. The cascade clauses consequently regulate the sequences as per which the FP will allow non-recourse debt funds to the SPV. The *cash waterfall* clauses also dictate the order in which the SPV will honour its commitments with the distinct types of contractors, including sponsors holding subordinated claims.²⁰⁶

Strategically, in many ways, the *cash waterfall* mechanism defines the FP's incremental exposure to unspecified risks affecting the SPV. For instance, the FP will only deliver extra funds after verifying the SPV and sponsors' compliance with predefined requirements evidencing good progress of the project. Additionally, the *cash waterfall* clause will provide that sponsors will commit to preserving debt-to-equity ratios at certain levels. That is, the FP will allow further debt only as much as sponsors respect a balance of the risks they internalised and the project capacities by maintaining the capital of the SPV as necessary. Parties may also agree that such debt-to-equity ratio varies as a function of costs higher than expected, or the performance of the project drops below certain levels.

Additionally, the *cash waterfall* clause may define spaces for implementing *cash clawback* undertaking. Under these arrangements, whenever parties foresee future difficulties, sponsors will accept lending resources to the SPV or returning the SPV parts of the dividends received during a given period. These clauses are feasible only after the project began operating.

Consequently, the directions of cash flows will vary depending on the stages of project evolution. First, during design and construction, cash will flow from the FP (debt) and sponsors (capital) to the SPV and from the SPV to other contractors and also

²⁰⁶ *Vid. Pp. 375 and ff. Ibid. Page 125, in G. VINTER ET AL., Project Finance - A Legal Guide, cit. Pp. 107, 118, 122, 155, 159 and others in F. J. FABOZZI; M. CHOUDHRY (EDS.), The Handbook of European Structured Financial Products, Wiley Finance, 2004. Cf. pp. 438 and ff. in M. F. K. KHAN; R. J. PARRA, Financing Large Projects - Using Project Finance Techniques and Practices, cit. Vid. sections 7.53, 7.55 and 7.57 in J. DEWAR, International Project Finance - Law and Practice, cit. See also page 375 in E. R. YESCOMBE, Principles of Project Finance, cit. Cf. page 1040 in R. J. SAWANT, "The Economics of Large-scale Infrastructure FDI: The Case of Project Finance", *Journal of International Business Studies*, vol. 41, 6, 2010, Palgrave Macmillan citing. Cf. B. ESTY, "The Economic Motivations for Using Project Finance", cit. S. KLEIMEIER; R. VERSTEEG, "Project Finance as a Driver of Economic Growth in Low-Income Countries", *Review of Financial Economics*, vol. 19, 2, 2010, Elsevier.*

back to sponsors (contracts for inputs). Concretely, in the case of the Beijing Olympic Stadium project, the lender will agree that debt cash is used first for purchasing materials (cement, and electricity materials) and other critical infrastructure assets like luminaria and ticketing infrastructure. Parties may agree that the SPV does not pay for the operation of machinery (*e.g.*, bulldozers) that should be financed -via subordination of claims- by sponsors.

Second, during operation, cash will flow out of the SPV. In our case, once the project begins operation, the Stadium will produce revenues. Cash will move from the SPV to the principal contractors for covering operating costs, fuel, human resources, taxes, *i.e.*, not necessarily related to sponsors. The SPV will then use funds for repaying the FP holding senior claims (the non-recourse debt) and the subordinated contracts from sponsors that remain unpaid. Finally, with what is left, the SPV will distribute dividends to sponsors and other equity investors.²⁰⁷

By regulating the flows of resources in and out of the SPV, the *cash waterfall* clauses reduce the unallocated cash that managers can use for subsidizing managerial laxity. That is, the waterfall clauses mitigate the *free cash flow problem*, well-known in the literature of finance. In Chapter 3, I will present this strategic efficiency as a virtue that shapes sponsors' decision to implement projects via PFCs.

Additionally, by defining the sequence of payments and welfare distributions, the *cash waterfall* governs the seniority of non-recourse debt relative to other claims. In principle, higher seniority of non-recourse debt held by the FP will come as broader protection to the lender. However, beyond a certain point, too strong protection of claims in the lender's hands equates to too powerful incentives for sponsors to deliver other than socially desirable responses (to behave opportunistically) as the environment deteriorates. The opportunistic incentives will be introduced in Chapter 4 and explored in details in chapters 5 and 6. In Chapter 10, I will identify an optimal hierarchy of claims in PFCs.

2.6.4.2 Monopolies of financing sources

In sharp contrast to what we see in diversified corporate environments (*Cf.* Chapter 7), in PFCs, the FP will habitually retain a capacity to veto the SPV access to alternative sources of financing. This provision is a critical element of the risk allocation mechanism and parties implemented in conjunction with (as part of) the *cash waterfall* (cascade) mechanisms. This monopoly of the FP on the provision of

²⁰⁷ *Vid. pp. 275 and ff. in E. R. YESCOMBE, Principles of Project Finance, cit.*

debt comes to avoid debt dilution -a strategy to which I will dedicate a section of Chapter 3.

As mentioned, the debt dilution problem refers to the scenario where the expected value of claims in a creditor's hands drops after the debtor acquires subsequent obligations of similar or superior hierarchy. After the debtor obtains debt from subsequent lenders, the FP will find herself sharing cash flows and the scarce collateral value of the SPV project assets with the new lenders. Effectively, debt dilution results in externalities between non-simultaneous contractors. In PFCs, the FP internalising uncollateralised risks must avoid this problem, and she does it by regulating how the SPV access subsequent financing from third parties.²⁰⁸

The solution brings other desirable strategic benefits to the FP. By preventing the SPV access to extra funding, the FP can preserve the enforceability of other obligations of sponsors. The FP can pressure sponsors to either provide extra capital contributions (with cash or via subordination of claims) or find the SPV financially below the default thresholds described above.²⁰⁹

2.6.4.3 Control accounts and cash-traps

A distinct way to mitigate risks consist in separating cash flows as soon as -or before- they enter the SPV. By doing this, the lender may prevent the *free cash flow problem* (managerial indiscipline) that, as advanced when introducing the cascade clauses, arises when funds remain attributed under the competence of opportunistic administrators. These are the control accounts and the so-called cash traps.

In PFCs, the alternatives for implementing these mechanisms are many. The lender and the sponsors may agree that the SPV separates funds necessary for dealing with cost as they arise, or as managers estimate them. Parties can then keep the rest of the funds in a distinct account under the FP's close monitoring. Parties can preserve some of these resources also for dealing with contingencies (reserve accounts).²¹⁰

Alternatively, the SPV can create a distinct account in which funds will be deposited initially by the off-taker or by the SPV department dealing with revenues from the open market. These accounts could be under the name of the SPV. However, cash

²⁰⁸ See Chapter 3.

²⁰⁹ *Vid.* p. 140 in E. R. YESCOMBE, *Principles of Project Finance*, cit. *Cf.* page 120 (Additional indebtedness) in A. FIGHT, *Introduction to Project Finance*, cit.

²¹⁰ *Vid.* pages 370-4 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

movements should require the authorisation of the lender. This mechanism permits the revelation of information and allows the lender to reach such funds as collateral in case of project default. These are often called cash traps. See the graphic of case-study 1 in Chapter 4.

Finally, parties can use the above accounts in conjunction with back-to-back and pass-through mechanisms. See further below.²¹¹

2.6.5 Dispute resolution and enforcement precautions

Let us now describe the last set of contractual provisions that shape the risk allocation mechanisms. These are the clauses to which the FP is a party. So, I will now make a short reference to arbitration in PFCs. In the second place, I will refer to the step-in rights implemented by direct agreements between the FP (and the SPV) and the off-taker. Thirdly, I will remark the value of assignments of entitlements. Fourth, I will shortly mention the value of transferring shares as security over the SPV. I will mention the strategic value of implementing sureties (*ius in re*) over project assets in the fifth place.

2.6.5.1 Arbitration

In PFCs, the functionality of arbitration is identical to what we observe in other contractually sophisticated environments. As always, arbitration alternatives help avoid lengthy judicial procedures and bring certainty as per the arbitrators' higher qualifications (technical expertise). In the case of large, costly and materially complex projects, the intervention of experts on the fields and the celerity of arbitration processes significantly mitigates the potential grow and spread of delay costs to the several parties providing materially interdependent inputs.

The use of arbitration is consequently a standard in most of the critical agreements shaping non-recourse project financing operations. Moreover, because PFCs have not yet been legislatively institutionalised, parties insert arbitration clauses to the several formally distinct instruments. A positive aspect of this multiplicity of contracts is that sponsors and the FP can often seek third party relief from tribunals experts on the distinct types of inputs that sponsor bring to the SPV.

This possibility allows for efficiency in scenarios where contracting parties are located

²¹¹ *Vid.* section 3.11 in G. VINTER ET AL, *Project Finance - A Legal Guide*, cit.

in different jurisdictions or regulate their interactions by distinct laws.²¹² In the Beijing Olympic Stadium case, the constructor may recur to one tribunal reading her contracts for inputs with the SPV. The consortium (the SPV) can seek the aid of a distinct set of arbitration rules and tribunal for its interaction with the FP.

Finally, all parties will often recur to arbitration court of international reputation (or *de facto* enforcement capacity -*e.g.*, the International Centre for Settlement of Investment Disputes of the World Bank Group (ICSID))- for dealing with the Off-taker (a sovereign party capable of influencing local Courts of Justice in charge of enforcing arbitration awards).²¹³

2.6.5.2 Direct agreements and Step-in rights

In PFCs, direct agreements refer to the implementation of covenants involving parties other than the SPV who formally owns the project. These covenants are necessary for some of these individuals -typically the FP- to implement and enforce precautions that require the intervention of other contributors -habitually, the sponsors or the off-taker. The functionality of some of these direct agreements is idiosyncratic of PFCs; that is, in the ways they function, they are seen very rarely in other contractual environments.

In PFCs, a paradigmatic example of such direct agreements are the so-called *step-in rights*. In PFCs, step-in rights exist in scenarios where the SPV delivers contributions to a predefined contractor. In such cases, parties may agree that, after the verifications of technical default events, the FP will be allowed to substitute some input providers in their relationship with the SPV, or the SPV in its interaction with the off-taker.²¹⁴

²¹² With details of benefits and Arbitration Courts, *vid. pp. 532 and ff.* in S. L. HOFFMAN, *The Law and Business of International Project Finance*, cit. For a critical stance, see, D. D. BANANI, “International Arbitration and Project Finance in Developing Countries: Blurring the Public/Private Distinction”, *Boston College International and Comparative Law Review*, vol. 26, 2, 2003.

²¹³ <https://icsid.worldbank.org/en/1/02/2020>.

²¹⁴ *Vid.* page 292 and specially 304 and *ff.* in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Page 201 in D. GRIMSEY; M. K. LEWIS, *Public Private Partnerships - The Worldwide Revolution in Infrastructure Provision and Project Finance*, cit. P. 118 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit. P. 132 (and footnote 10)

Remarkably, the events of default can be not only of technical nature. The FP may also enforce step-in rights after verifying that the SPV has failed to follow the schedules of repayments of the non-recourse debt. Hence, step-in rights function not only as a method for disciplining sponsors or for reorganising the project. The mechanism also serves as collateral protection (the lender protects the redeployment value of project assets). Additionally, because step-in rights become enforceable after technical or full default events, their exercise will regularly coexist with other enforcement measures protecting the FP.

As already mentioned, the FP will enforce step-in rights by appointing a third party under her direction for assuming the functions of the SPV or some sponsors in the organisation. To the FP, it is paramount that she induces the off-taker to receive such contributions from the party she appoints who is not a party to the PFC. Therefore, the ex-ante implementation of step-in rights amongst the FP, the sponsors, and the SPV requires a prior direct agreement between them and the off-taker.

The ways in which parties will enforce step-in rights vary with projects. Often, parties may define *cure* periods after which (or during which) the step-in becomes enforceable.²¹⁵ During or after this period, input providers appointed by the FP will (transitorily or permanently) deliver the sponsors' contributions or the SPV in default as defined in the requirements of the risk allocation mechanism. The lender will never acquire additional liabilities. However, the substituted parties will remain responsible for losses stemming from her original under-performance, although such losses may manifest at a later stage when they no longer intervene in the project.

Finally, note two more aspects. First, as I will revisit in all chapters to follow, in PFCs, the degrees of specificities are invariably high. The specificities are not only objective

in M. LYONNET, "Financing the Eiffel Tower: Project Finance and Agency Theory", *Journal of Applied Finance*, 1, 2010. Page 59 in E. FARQUHARSON; C. T. DE MASTE; E. R. YESTOMBE; J. ENCINAS, *How to Engage with the Private Sector in Public-Private Partnerships in Emerging Markets*, Public-Private Infrastructure Advisory Facility - The World Bank, 2011. *Vid. p.* 194-5 and 383 E. R. YESCOMBE, *Principles of Project Finance*, cit.

²¹⁵ The cure period may define the terms allowed by the sponsor to remedy her defaults, or the time within which the substituting party will step-in in cases when such substitution is not permanent. *Vid. p.* 195 and 383 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

(resources) but also subjective (parties). Intuitively, in the Beijing Olympic Stadium, the construction company's human resources will be more familiar with the technical aspects of the project. The sponsors will also be best integrated materially and administratively with the SPV and its assets.

Moreover, sponsors will also best coordinate with other input providers. Furthermore, in many cases, the sponsors are the individuals that best understand the project they have designed. As a result, regularly, independently from the project's past unsatisfactory performance, sponsors will be the parties best prepared for running the project.

Accordingly, the perspectives that the FP makes a project successful after the most capable sponsors have failed at that endeavour are often unrealistic. Moreover, because project assets are highly specific, when the FP exerts her step-in rights, the redeployment value of project assets will be not only insufficient for repaying the non-recourse debt but in many cases that value will be negative.²¹⁶ Step-in rights will consequently come too late as a way of preserving collateral value *directly*.

However, in the following chapters, I will refer to how cross-default mechanisms function to induce cross-disciplining efforts amongst the sponsors. In PFCs, the FP may enforce step-in rights against the SPV for defaults of some sponsors. Additionally, when enforcing step-in rights, the FP appoints an expert contractor who will substitute sponsors or the SPV in their functions. When doing this, the lender can define a reward function that she will offer to this new provider (her agent). The FP can consequently benefit from the contractors' capacity to reveal information about the strategic behaviour of other parties during and before the period of intervention. This informational benefit expands the ranges of actions that the FP will be capable of enforcing provisions in detriment of the leeway in which, the sponsors could have otherwise responded opportunistically as the environment deteriorated (*Cf.* chapters 5 and 6). These are ex-post and *itineri* efficiencies.

Backwards induction, superior ex-post enforcement results in incentives for sponsors to reveal information to define eventualities and spaces within which they will not be capable of responding behind asymmetries of information. This is higher implementation quality as a function of a perspective of superior enforcement. Subsequently, in conjunction with the interpretation principles and the regulations

²¹⁶ Consider the costs of removing the infrastructure of a project that no longer functions as expected, -a bridge, or an energy facility.

specific postulated in the following chapters, step-in rights might consequently serve as informational and enforcement mechanisms permitting the contractibility of responses that today escape the implementation capacities of the FP in PFCs.²¹⁷

2.6.5.3 Assignments of rights

The above step-in rights reveal how parties may implement assignment rights in favour of the FP. However, step-in rights are indeed not the only cases in which parties will recur to these safeties.

In PFCs, the FP will frequently implement provisions inducing the SPV to reorient cash flows otherwise designed to the early distribution of dividends to repay the senior debt. To fix ideas, debt claims are enforceable titles. Dividends are not. Consequently, parties should not need a provision for allowing the lender to enforce such claims in detriment of dividend expectations. These provisions consequently relate to aspects of the *cash waterfall* sequences that will vary as a function of project performance. For instance, the SPV will stop issuing dividends after certain financial ratios (*cf.* above the control accounts) fall below certain thresholds.

Distinct from the above, the FP may also request that, in line with the functionality of step-in rights, the SPV transfers to the lender the property or use of licences for delivering certain regulated services. In the same vein, the FP may oblige the SPV to transfer benefits expected from third parties. These include compensations from insurance companies, from litigating debtors, or more simply, from contractors (the off-taker) to which the SPV had already delivered goods or services.²¹⁸ In many cases, the FP can discount these titles in financial markets.

²¹⁷ Concretely, the capacity of the FP to enforce step-in rights and instruct a new agent (the new providers) to reveal information about the (actual and retrospective) behaviour of sponsors will increase the capacity of the lender to enforce responsibility under the insolvency tests specific of PFCs, the generic and specific duties to inform, the duties of loyalty to the uncollateralised lender (the principal in the setting), the pre-emptive objective of clauses, the duties of diligence, and the *in dubio pro creditore* principle (*Cf.* chapters 8 to 10). The improvement in the enforceability of these principles refining the quality of the legal treatment to PFCs should reduce the feasibility of *shirking*, *risking*, and *shading* the idiosyncratic forms of opportunism in PFCs that I will describe in chapters 4 to 6.

²¹⁸ *Cf.* p. 383 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

2.6.5.4 Sureties (*ius in re*) over project assets

In PFCs, parties can preserve the risk allocation mechanism's enforceability by implementing sureties (*ius in re aliena*). These sureties fall over registrable goods as *hypotheken*, mortgages, *prendas*, or liens. Parties may recur to these solutions for protecting the obligations of individual sponsors and collateralising (insufficiently) the primary obligation of the SPV to serve the non-recourse debt. In this last case, in virtue of the debt's non-recourse nature, these sureties will fall over assets of the SPV.

Generally, *ius in re* will come attached to goods of sponsors, third parties, or the SPV. Strategically, these registrable sureties' fundamental value is that they will follow those goods independently of their ownership (*propter rem*). They provide senior protection to the lender. Additionally, under most jurisdictions in Western traditions, these security interests come with attached obligations not to make abuse of such goods protected by criminal laws.²¹⁹

2.6.5.5 The FP and security over the SPV's shares

As we have seen, in PFCs, via direct agreements, the non-recourse lender can extract much of the project wealth even before it reaches the SPV. Moreover, via such provisions, the lender can intervene in the decision-making system of the SPV and appoint board members and managers. Additionally, as shown above, as in all contractual relationships, when protecting her claims, the FP can ex-ante request sureties (*ius in re aliena*) over assets of the SPV or sponsors. As also pointed out, the lender can substitute the SPV or some sponsors in their contractual positions in the project or their interactions with third parties (the off-taker) via step-in rights. Finally, sponsors could be issued a *golden share* to appoint managers or controllers after the verification of events as defined.²²⁰

In PFCs, there is still a more drastic defence for protecting the lender; this consists of taking security over the sponsors' shares in the SPV.²²¹ Taking ownership of the SPV effectively allows the non-recourse lender to control the company and its project with all assets and contractual relationships.

²¹⁹ *Cf.* p. 383 in *Ibid.*

²²⁰ Under certain jurisdictions, financial entities may be reluctant to advance in this direction as judges may interpret these possibilities as de facto control. *Cf.* p. 386 in *Ibid.*

²²¹ *Cf.* p. 385 in *Ibid.*

Moreover, naturally, the SPV ownership permits that the FP exercises full political rights over the legal entity. Therefore, the lender can now decide about the best ways to proceed freely (without the constraints of the risk allocation mechanism that she can now put aside). This includes the possibility of allocating cash flows as desirable. Drastically, ownership also permits that sponsors decide on the SPV liquidation directly or via an insolvency procedure.

However, the implementation of securities over the SPV property is not free of judicial costs and enforcement uncertainty. During the project's life, the sponsors may still lose their capacity to transfer the property of such shares. This may happen, for instance, because the sponsors become insolvent -an event that the FP also identifies as of technical default. Additionally, judges may take long before they may issue resolutions allowing the transfer of shares after sponsors refused to comply with such provisions.

There are many alternatives for mitigating such uncertainties. Parties can allocate the SPV ownership under the property of a company owned by sponsors but registered in a foreign jurisdiction where enforcement can be advanced more swiftly. They can also implement contractual rewards via a call option that could be triggered (*i.e.*, the FP could buy shares at a low price) after verifying events of default. However, because the FP's expectation to access the property of shares is contractual, enforcement uncertainty will always exist.

2.7 Typical provisions involving only sponsors

2.7.1 Spaces for contracting (the 2nd tier of incentives)

As anticipated above, and as I will recall in chapters 4 to 6, in PFCs, the fact that sponsors are both owners of the SPV and contractors for the project allows them to receive information of a quality higher than that available to the FP. This information comes from the possibilities they have to interact with project assets materially and the access they enjoy to the managerial information allowed to shareholders. This information relates not only to the status of the project but also to peer sponsors' actions. Moreover, the manipulation of project assets permits updating information and readjust provisions as the project evolves.

As also said, this information permits that sponsors enforce provisions that escape the enforceability by the lender. Consequently, there is a tier of incentives that sponsors will implement amongst themselves alone. As also mentioned, because sponsors deliver contributions sequentially, they will implement such incentives relationally. That is, they will sustain cooperation by building (or withholding) reciprocity amongst them. Remarkably, this interaction will take place both on

observable and verifiable information.²²²

The spaces for contracting on verifiable information beyond the FP's enforceability come not only from the different capacities to receive information, but more significantly from the incapacity of the FP to complete provisions ex-ante and to update the information about changes in the project as it evolves with time. Intuitively, as the environment changes, new responses become desirable to sponsors only. After updating information on the project's evolution, sponsors will now enforce provisions within the spaces that remained unregulated by the provisions implemented (incompletely) by the FP. Consequently, sponsors will enforce contracts also via the controlled SPV on verifiable information that they enforce externally (judicially).

In chapters 5 and 6, I will describe how sponsors behave in response to this second tier of incentives that they implement beyond the FP's enforcing capacities. Additionally, in Chapter 6, I will remark how the asymmetries of information inter sponsors permit that, as the environment deteriorates to some of them, the sponsors under distress form opportunistic sub-coalitions with the best monitoring peers -the other sponsors who can best observe or verify their opportunistic responses. I will also show how, as conditions further worsen, the optimal scopes of such sub-coalitions will grow to eventually include all sponsors in unanimous collusion against the non-recourse lender.

When implementing agreements amongst them, within sub-coalitions, or when renegotiating unanimously, the sponsors can implement any form of incentives beyond the FP's enforcement capacities. This is particularly true whenever, as the environment deteriorates, sponsors coordinate for *shirking*, *risking*, and *shading*-the three types of opportunism that, in chapters 5 and 6, I identify as idiosyncratic of PFCs. Additionally, in cases in which conditions manifest more favourable than initially expected, sponsors will also implement (renegotiate) agreements for

²²² Generally, beyond the scenario of PFCs, *cf. pp. 297 and ff.* in J. WATSON, *Strategy*, 3rd Ed., W. W. Norton & Company, New York, 2001. *Pp. 461 and ff.* in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, The MIT Press, Cambridge, Massachusetts, 2005. M. HVIID, "Long-term Contracts and Relational Contracts", *Encyclopedia of Law and Economics*, ed. by B. Bouckaert, and G. D. Geest, vol. 3, 1995, 2000. Specifically and more recently, G. BAKER; R. GIBBONS; K. J. MURPHY, "Relational Contracts and the Theory of The Firm", *The Quarterly Journal of Economics*, February, 2002. J. LEVIN, "Relational Incentive Contracts", *American Economic Review*, vol. 93, 3, 2003.

extracting more benefits from circumstances. However, in this second case, unless they prefer the opposite -perhaps to escape enforceability of excessively rigorous regulations by the FP- sponsors will usually disclose their socially desirable innovations and further renegotiate with the FP to implement them with positive externalities to the lender.

In all eventualities, sponsors will implement some contrasts that will escape the control of the FP not because of asymmetries of information or incompleteness but simply because the FP is not interested in the object of such provisions. These agreements could include covenants for management of the SPV, dealing with some contingencies, appointing managers, or interacting with certain classes of providers or other individuals (*e.g.*, contractors for inputs, or liaisons with political authorities).

2.7.2 Back-to-back and pass-through mechanisms

Back-to-back provisions stipulate that certain variables that at the beginning of the project sponsors can identify clearly in nature but not in magnitudes will be later (*ipso iure*) incorporated in the interaction between the SPV and one or more sponsor(s). Hence, as per the back-to-back clauses, -within predefined thresholds-any changes of variables, or extra requests from the government will be automatically replicated (accommodated within) as part of the SPV contracts with at least a sponsor.²²³

In our case, a *back-to-back* clause could provide that the builder of the Beijing Olympic Stadium project should deal with certain aspects of the electricity or the infrastructure of the building. Punctually, should requirements for different sports, or new transmission (say, TV) change beyond the expected, the constructor sponsor would be in charge of building new sitting places or installing extra luminaria. Similarly, updates in the technology of security cameras or the number of counters (and personnel) that should be available as per a request of the off-taker should be a task of the engineering sponsor. Hence, operatively, the off-taker will refine a requirement and will communicate it to the SPV -its contractor. The SPV will then replicate such a requirement in the contractual arrangement with the key sponsor.

Pass-through mechanisms. In their purest form, pass-through clauses allow cash flows to be transferred directly between its sources and its destiny without intervention of any decision-maker or without being commingled with other

²²³ *Vid.* page 97 in J. DELMON, *Public-Private Partnership Projects in Infrastructure: An Essential Guide for Policy Makers*, cit.

resources at the SPV level. Similarly, whenever the SPV delivers contributions to an off-taker, in a pass-through clause, parties may agree that the sponsor dealing with such extra obligations would inform both the SPV and the off-taker about the added costs and the off-taker will cover them as they arise.²²⁴

In practice, parties may agree that some unexpected costs resulting from obligations associated with the back-to-back arrangements have priority of payment. Thus, the sponsor finding itself dealing with rather unexpected costs will be the first to be financially served during the project's life. Alternatively, such sponsor may receive funds in a dedicated account directly from the off-taker. Parties can also implement pass-through mechanism via cash traps or other control accounts.

In the Beijing Olympic Stadium, we may think of a clause indicating that electricity costs will be paid directly to the operator as costs arise. A pass-through clause may provide that, with funds from the stadium's operation, the SPV should cover the extra costs assumed by the operator obliged to internalise the burdens of extra personnel after the government decided that the Beijing Olympic Stadium should operate more ticketing boxes during rush hours. Alternatively, whenever funds to the SPV come from the off-taker (*i.e.*, in cases that the company does not collect or does not retain funds from the public), then the off-taker will take note of the costs of electricity and personnel and reward the SPV or the sponsors directly.

The objectives and practicalities. Pass-through often come associated with back-to-back contract clauses, or with individual outputs that require the intervention of only one party. In terms of implementation and risk distributions, the use of back-to-back and pass-through mechanisms permits the best-prepared sponsors to internalise uncertainty costs. By impeding that the SPV managers manipulate resources, pass-through clauses prevent the *free cash flow problem* (managerial indiscipline) described above and further analysed in Chapter 3.

2.8 Final remarks on the contractual practices

In this last section, I will remark five aspects of PFCs that I have already anticipated. These features relate to the contractual practices that verify the strategic needs of parties in PFCs. These needs of parties depend on structural characteristics inherent to PFCs. Consequently, the contractual practices will appear as verifications of the (market mimicking) efficiency of postulates for legal treatment in chapters 7 to 10.

²²⁴ *Vid.* § 3.1 (page 71) in G. VINTER ET AL, *Project Finance - A Legal Guide*, cit.

2.8.1 SPV advances a single project that parties predefine

In the absence of collateral protection or recourse to third parties, ex-ante, the FP verifies the comprehensiveness and enforceability of a task and risk distribution arrangement. In response to such regulations, sponsors (or third parties contracted by them) will bring all inputs necessary for the project's completion and operation. The risk allocation mechanism consequently defines the project whose risks the FP will internalise via non-recourse debt. With the sole exception of the elaboration of the contracts implemented by sponsors only (the 2nd tier of incentives), all contractual provisions characterised in this chapter describe such efforts for predefining responses by sponsors, for the single predefined project, under all eventualities.

In the following chapters, I will use such references for illustrating on the contractual behaviour that corroborates the (market mimicking) efficiency of several principles: the fiduciary duties of loyalty in PFCs that parties should also observe in consideration of the interests of the lender; the fiduciary duties of diligence; the optimal scope of managerial delegation in SPVs; and the insolvency tests in PFCs.

2.8.2 Sponsors exert material and political control of the SPV and its assets

As also described, in PFCs, sponsors exert control of the SPV. This control is both political and material. Concretely, in PFCs, as part of the risk allocation mechanism, sponsors commit not to lose the capacity to control the SPV with their voting rights. Exceptions to this should be agreed upon with the FP and will often occur in the final parts of the project.

Additionally, in PFCs, sponsors control project assets materially. As I described, as providers of critical inputs to the project, sponsors interact with project assets materially. This manipulation permits the access information of a quality higher than that available to the FP. Control of the SPV and its assets in conjunction with the asymmetries of information permit that the sponsors implement both socially desirable or opportunistic solutions beyond the lender's enforceability. This aspect will be in the core of all propositions in chapters 5 and 6, and in the legal proposals of chapter 8. This twofold control of the SPV and its single project, and the access to information of high quality will later serve for completing the elaboration of a rule of control responsibility (*iuris et de iure*) in PFCs, for general and specific duties to inform, and for insolvency tests in PFCs.

2.8.3 Parties implement covenants for also protecting the interests of the FP

As seen, in PFCs, the lender substitutes the protection of collateral and sureties from third parties with the implementation of a risk allocation mechanism. The feasibility of PFCs consequently depends on parties' capacities to foresee eventualities and regulate the (indeed collateralised) individual responses expected from sponsors under distinct circumstances. This, I will begin exploring in Chapter 4. In chapters 5 to 6, I will analyse the elemental proposition more in-depth.

In chapters 8 to 10, I will recall these practices for identifying three principles that should guide the interpretation of all clauses in PFCs. *E.g.*, the fiduciary duties of loyalty under which the sponsors should adopt decisions completing the risk allocation mechanism; the *intuitu personae* relationships; the pre-emptive (not compensatory) function of all clauses; the general and specific duties to inform; and the in *dubio pro creditore* under which sponsors should complete provisions in attention to the more significant vulnerabilities and lower implementation capacities of the non-recourse lender.

2.8.4 Default definitions allow early control of project assets and eventually of the SPV by the FP

As also shown, in PFCs, sponsors access information of superior quality about the project's evolution. Moreover, sponsors control the SPV that advances a predefined project. Consequently, in PFCs, parties can best esteem the SPV's solvency as a function of the evolution of the single activity.

In chapters 4 to 6, I will remark on the lender's vulnerabilities to particular forms of opportunism whose incentives manifest in PFCs sooner than under regular (diversified) corporate investing. In PFCs, parties' capacity to observe and implement contracts involving the control of the single project permits that the FP implements provisions in the protection of the FP before the thresholds where today's laws identify (and protect) insolvency states. *E.g.*, *step-in rights*, duties to inform, control mechanisms, the involvement of the FP in managerial decisions, taking security on the ownership of shares for debts of the SPV. I will later recall these references for evidencing the practices of parties substituting the strategic needs that remain uncovered by the current forms of insolvency tests and other standards legal solutions as applicable today in PFCs.

2.8.5 The cash waterfall clause and the optimal hierarchy of claims

Finally, a crucial element of the risk allocation mechanism is the *cash waterfall* (*cascade*) clause. As shown, this provision regulates the flows of resources in and out

of the SPV. Moreover, the cascade agreement defines the orders in which the SPV will serve its contractual obligations with sponsors and the PF, and issue dividends as the project evolves.

By regulating the sequence of payments and dividend distributions, the *cash waterfall* clause also implements a hierarchy of claims in FCPs. In chapters 5 and 6, I will analyse the strategic aspects sensitive to the seniority of claims. Then, in Chapter 10, I will identify an optimal seniority of claims in PFCs, and I will recall the functionality of the cascade agreement to illustrate the contractual practices verifying its enforceability.

2.9 Conclusions

Focussing on practices. Based on the management and industry-oriented literature, the second chapter has illustrated the contractual practices with which sponsors and the non-recourse lender implement PFCs today. The first part of the study consequently offered the factual basis upon which I will build the strategic analysis and the proposals for a legal treatment in the chapters to follow.

The nature of PFCs. In PFCs, a financing party (the FP, usually a group of financing and equity investing entities) allocates non-recourse debt in an SPV to complete and operate a predefined project. The SPV will be owned and fully controlled by the sponsors who are also contractors for critical inputs to the project. In this context, the non-recourse nature of debt implies that, should the SPV fail to repay such debts, the FP would access PFCs assets. However, the lender would not find third parties from which she could seek repayment or compensation for amounts remaining due.

Project risks. Parties recur to PFCs for financing assets that are regularly highly specific -i.e., of low or negligible redeployment value. In conjunction with the legal personality and the limited liability protection granted by the SPV, the specificities of assets and the non-recourse nature of debt imply that the value expected from the FP's claims depend exclusively on the capacity of the single project to produce wealth.

The risk allocation mechanism. Accordingly, ex-ante, before internalising project risks, the rational FP verifies the functionality (comprehensiveness and enforceability) of a bundle of requirements assuring that, under all foreseeable eventualities, the SPV will count on all inputs and resources necessary for completing the project as desirable. The FP will then enforce these provisions against the SPV or sponsor -or, via cross-default mechanisms, against both of them.

Strategically, the functionality of the risk allocation mechanism will substitute the comfort that, in other contractual environments, the creditor would find in collateral from debtor's assets, or in sureties from (recourse to) third parties. In other words,

in PFCs, the FP will not rely on collateral protection but on the implementation quality of a web of contracts assuring that the project will perform as necessary due to individual (enforceable) responses from the sponsors. The risk allocation mechanism will consequently involve all types of regulations. The object of these arrangements includes definitions of technical standards of material inputs that the sponsors will bring to the project, project management aspects, SPV control and capitalisation commitments, general and specific information duties, or dispute resolution and enforcement agreements.

The technical default and the full default provisions. Clauses shaping the risk allocation mechanism -the provisions and commitments enforceable by the FP against the SPV and sponsors- can dictate legal consequences of all kinds. However, as per their strategic value and the entitlements they confer to the FP, we can classify them in two categories. These will be provisions of technical default or full default.

Provisions of technical default permit the enforcement of penalties and other entitlements protecting the SPV -e.g., project control rights, increments in interests, expansions of duties to inform, or obligations to increase sponsors' capital contributions. These clauses do not allow the lender to accelerate the loan agreement after verifying trespasses.

Provisions of full default describe eventualities that, ex-ante, the FP considers incompatible with her non-recourse risks. Hence, they will allow the acceleration of the loan, the enforcement of penalties, the transfer of ownership of SPV's shares, and the termination of the contractual arrangements. As said, both types of provisions will be enforceable against either the SPV or sponsors. Via a cross-default mechanism, they may be enforceable against both of them.

The compatibility of enforcement of the risk allocation mechanism and the non-recourse nature of the debt. Of crucial strategic relevance, the risk allocation (task distribution) functionality of these provisions depends on their capacity to induce sponsors to deliver the responses to all eventualities as contracted *ex-ante*. In other words, the effectiveness of the risk allocation mechanism depends on both the completeness (comprehensiveness) and the enforceability of individual provisions (a function of asymmetries of information and financial solvency). These aspects are common to all contractual interactions. Consequently, ex-ante, the FP will verify that sponsors can deliver such responses, and they are solvent to internalise the consequences of their sub-standard decisions.

As projects are costly -*v.gr.*, values at risk are significant-, as much as sponsors or the SPV do not count on resources to provide sureties to the FP, the lender will request protection from -e.g., recourse to- third parties. Accordingly, the SPV, sponsors, and

third parties will respond for the enforcement of penalties and possibly for the obligation to refund the funds borrowed after trespass provisions of the risk allocation mechanism.

Accordingly, third parties' obligation to internalise the penalties from violations of the risk allocation mechanism is compatible with the non-recourse nature of the debt. Intuitively, what is *non-recourse* in PFCs is the obligation of the SPV to repay its debts, not the components of the risk allocation mechanism that provide the strategically indispensable contractual discipline to sponsors. This includes obligations to refund the full debt in cases of full defaults to such obligations of the risk allocation mechanism.

Consequently, the FP will internalise the risks that the project fails to generate value sufficient for the SPV to repay the non-recourse debt and interests without any party (the SPV or sponsors) defaulting on any obligation of the risk allocation mechanism. This analytic (practice-oriented) description obligations shaping the risk allocation mechanism and their scopes of enforcement is innovative of this study. Additionally, based on these considerations, the chapter has offered a semantic clarification of the use of the expression *limited recourse* project financing as seen in the management and industry-oriented literature. Both considerations are crucial for identifying scenarios in which parties use SPVs for implementing non-recourse project financing mechanisms. This characterisation is consequently indispensable before any effort oriented to the legal institutionalisation of PFCs.

The tiers of incentives. In addition to the provisions enforceable by the FP (the clauses that shape the risk allocation mechanism), in PFCs, sponsors respond to agreements that they implement without the lender's involvement. These are arrangements sponsors put in place based on information that they access by enforcing information rights as shareholders of the SPV and by interacting with project assets directly (materially). This capacity of sponsors to sustain cooperation beyond the lender's enforcement capacities will be the object of strategic analyses of chapters 4 to 6. In this chapter, I have anticipated how these provisions constitute the second tier of incentives to which sponsors respond with inputs for the project. The methodological identification of the three tiers of incentives in the objective function of sponsors is an innovative component of this study and the basis of the propositions in chapters 4 to 6.

The functionality of contractual behaviour and the need for legal treatment. The observation of contractual practices offered in this chapter will later serve for corroborating the market mimicking efficiency of propositions for a PFC-dedicated legal treatment advanced in chapters 7 to 10. Five critical aspects will appear more or

less recurrently in the following chapters. These features result from characteristics inherent to the structures of PFCs and will consequently sustain the plausibility of assumptions in chapters 4 to 6.

These aspects include: first, the predefinition of a project by parties (the risk allocation mechanism) before internalising non-recourse risks; second, the *de facto* (material) and *de iure* (ownership) control of the SPV by sponsors; third, the implementation of covenants between owners and the FP protecting the interests of the lender; fourth, the definition of events of technical and full default other than the failure to repay the non-recourse debt, and the orientation of these provisions to allow control of the project (or of the SPV) to the FP before the earlier becomes insolvent; and finally, fifth, the regulation of cash flows *ex-ante* including the sequence of repayments of contracts for inputs and the non-recourse debt, capital contributions from sponsors, and distributions of dividends as the project advances. The above aspects will later illustrate the contractual behaviour of parties substituting the functionality of the legislators and judges enforcing a legal treatment designed for other (regular corporate) environments.

Upon the observations of contractual practices, I will analyse the conflicting interests (strategic tensions) amongst sponsors and the FP in chapters 4 to 6. Then based on both the observations of practices and the strategic analysis of such chapters, I will propose five pillars for the legislative institutionalisation of PFCs (Chapter 8), three postulates for the interpretation of clauses in PFCs (Chapter 9), and finally, four legally relevant optimalities in PFCs (Chapter 10).

Chapter 3

Beyond Corporate Finance. The indispensable solutions of PFCs

Abstract. The chapter shows how the structural features of PFCs avoid some of the feasibility boundaries that costly and technologically sophisticated projects pose to standard corporate-financed arrangements. Building on many aspects of Prof. B. C. Esty's literature, the chapter includes four key sub-sections with sets of strategic tensions in corporate finance settings. Each of these comes with a description of how these conflicts appear moderated or eliminated in PFCs.

First, the chapter describes how exceptionally large projects produce inefficiencies in the relationship between ownership and managerial control in corporate finance. This includes costs from administrative indiscipline (the free cash flow problem) and managerial risk aversion. In PFCs, managerial laxity is mitigated by the absence of free cash flow and the disciplining effects of debt. When projects receive debt funds under non-recourse schemes, cash flows for and from the single project appears finely regulated in advance. Additionally, in PFCs, there are no alternative growth options that can subsidise managerial misbehaviour. Finally, with all fundamental elements of the project provided contractually by all parties (or adopted *itineri* directly by owners), in PFCs fewer eventualities challenge the risk-averse managers.

Second, the chapter considers the tensions between shareholders and creditors in corporate finance settings. In this section, I will refer to: *i.*- the distress costs generated by the volatility (loss of diversification) from investments in a single large project; *ii.*- to the debt overhang induced under-investment problem; *iii.*- to the asset substitution strategies; *iv.*- to the debt dilution hazards; and finally, *v.*- to the asset dilution strategies. PFCs, prevent volatility induced distress costs as insolvency risks appear isolated from parties by both the non-recourse nature of the financing.

Table of Contents

3	CHAPTER 3 - BEYOND CORPORATE FINANCE. THE INDISPENSABLE SOLUTIONS OF PFCS.....	135
	TABLE OF CONTENTS.....	137
3.1	INTRODUCTION.....	139
3.1.1	Question of research.....	140
3.1.2	Findings.....	141
3.1.3	Contributions to the literature.....	142
3.1.4	Sequence of the analysis.....	142
3.2	TENSIONS BETWEEN OWNERSHIP AND CONTROL (MANAGEMENT)	143
3.2.1	Tensions in corporate finance.....	144
3.2.1.1	Large projects, asymmetries and free cash flow.....	144
3.2.1.2	Managerial risk aversion in corporate finance.....	147
3.2.1.3	Time frame-preferences.....	149
3.2.2	Project finance contracts and managerial discipline.....	149
3.2.2.1	Control of cash flows.....	149
3.2.2.2	Low costs of managerial information.....	150
3.2.2.3	Smaller scopes of delegation.....	151
3.3	TENSIONS BETWEEN SHAREHOLDERS AND CREDITORS AS A CLASS.....	152
3.3.1	Large projects and distress costs.....	153
3.3.1.1	Nature and sources of distress costs.....	154
3.3.1.2	Capital structure and volatility induced distress costs.....	159
3.3.1.3	Coinsurance versus risk contamination and distress costs.....	162
3.3.1.4	Project finance contracts and distress costs.....	165
3.3.2	Debt overhang problem (under-investment).....	165
3.3.2.1	Generalities.....	166
3.3.2.2	Precarious solutions in corporate finance.....	168
3.3.2.3	Debt overhang in project finance contracts.....	169
3.3.3	Asset substitution strategies (over-investment).....	170
3.3.3.1	The essence of the problem.....	171

3.3.3.2	Over-investment vs under-investment	174
3.3.3.3	Costs of contractual preventions.....	175
3.3.3.4	Project finance contracts.....	177
3.3.4	Debt dilution (inter-creditor tensions)	178
3.3.4.1	Generalities of the problem.....	178
3.3.4.2	Costs of contractual solutions	180
3.3.4.3	Debt dilution in project finance contracts	182
3.3.5	Asset diluting strategies	183
3.3.5.1	Asset dilution in corporate finance	183
3.3.5.2	Asset dilution and project finance contracts	184
3.4	TENSIONS BETWEEN CONCENTRATED DEBT HOLDERS AND THE COMPANY ...	185
3.4.1	Advantages of concentrating debt	186
3.4.2	Opportunism from lenders and the costly precautions	188
3.4.3	Opportunism of the financing party.....	191
3.5	TENSIONS BETWEEN DISPERSED FINANCING AND THE COMPANY (ADVERSE SELECTION IN OPEN MARKETS)	191
3.5.1	Large projects and the costs of dispersed financing	192
3.5.1.1	Adverse selection in debt	193
3.5.1.2	Adverse selection in equity	194
3.5.2	Adverse selection in project finance contracts.....	196
3.6	CONCLUSIONS	198

3.1 Introduction

PFCs are known for being costly endeavours.²²⁵ Without collateral or recourses to third parties beyond the SPV, for the feasibility of the operation, the FP needs confidence that a project will generate sufficient proceeds to serve her claims.²²⁶ To this end, she will spend transaction costs verifying that all foreseeable risks and necessary tasks are allocated among sponsors by (fully collateralised) contractual safeties –the minimum standards for risk allocation.²²⁷

Additionally, in PFCs, the sponsors control the project directly via the wholly-owned SPV. Minimum standards required by the FP include provisions oriented at foreseeing material contingencies and regulating decision-making aspects. Parties incur transaction costs even before the SPV (the formal debtor of the non-recourse debt) exists.

As the feasibility of non-recourse debt financing depends on the quality of a costly incentive implementation and risk-allocation process, one would think that its

²²⁵ It is beyond speculation that project financed operations are contractually more complex than collateralised alternatives. Project finance contracts *regularly include some 15 parties and up to 40 legally independent contracts* defining their risk allocation structures. Larger contracts frequently involve *up to several hundred (exceptionally thousands) of ancillary covenants* –which in most cases are formally independent instruments. For an introduction to project finance contracts including a series of case studies, *Vid. B. C. ESTY, Modern Project Finance: A Casebook*, cit. B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

²²⁶ Individual rationality (participation constraints, IRC) of the financing party requires that the expected value of the non-recourse operation is not only positive but also higher than the expected value of whatever else she can produce in the market (*i.e.*, its next best alternative placement value).

²²⁷ Importantly, the fact that project financing lending contracts are covered by insurance mechanisms does not mean they lose their non-recourse nature or that the expected losses may be reduced. Insurance simply means that costs are internalised to a third party who is equally poorly informed about the project and also internalising the full impact of default. Notice that in case of project collapse, the insurance company will not enjoy the otherwise standard action against the breaching party (the now insolvent SPV). It is standard in non-recourse lending that insurance providers internalise predefined risks; they do not guarantee the success of the project nor the servicing of the non-recourse debt.

popularity (feasibility) would decrease in the presence of elements that affect, precisely, implementation quality. Furthermore, as to the single lender financing costs grow convexly,²²⁸ we could also be allowed to believe that its frequency should naturally decrease with value at risk. However, not only this is not the case, but observations indicate precisely the opposite. Non-recourse project financing is most popularly used for projects that are capital intensive and last for very long terms.

Furthermore, these projects are often materially complex (asymmetries of information), involving long development stages (incompleteness). In PFCs, the project's exposure to contingencies occurs after the financing risk has been internalised by the lender –*i.e.*, after cash has been transformed into highly specific assets (hold-up).²²⁹ These aspects increase the costs of substituting collateral with safeties from a risk allocation mechanism. Consequently, PFCs must be allowing for benefits that overcome these inefficiencies.

3.1.1 Question of research

This third chapter answers the question:

What are the strategic benefits from PFCs relative to the limitations that parties find in (collateralised) corporate-financed alternatives when funding exceptionally costly, materially complex, long-term projects?

The following sections will show how completing projects under a SPV and non-recourse debt allows contractors to escape feasibility boundaries of corporate contracting. Based on standard literature, I will identify those limitations of corporate

²²⁸ *Cf.* the analysis of distress costs later in this chapter.

²²⁹ In the absence of collateral and after the SPV has transformed financing resources into specific assets, unless the lender identifies a party responsible for some breach (as per the risk allocation mechanism), the FP cannot possibly recover her contributions and interests unless the project produces some sufficient value. Readjustment may be necessary for improving the position of the FP (often the source of cost overrun incentives). Such readjustment will take place aggressively. Ex-ante, the under-investment of the lender will correspond to the expected output from such readjustments that also ex-ante she expects to mitigate by regulating eventualities via transaction costs. This is the holdup induced under-investment problem on lender's side, a problem that remains beyond the scope of the analysis. *Vid.* generally, Y.-K. CHE; J. SAKOVICS, "A Dynamic Theory of Holdup", *Econometrica*, vol. 72, 4, 2004.

finance environments and contrast them with the basic structural features of project finance contracts under which inefficiencies associated with hosting large projects by standard corporate settings are no longer challenging.

Other authors have already advanced considerations about the value of PFCs for escaping the feasibility boundaries of collateralised financing;²³⁰ they have also observed how avoiding such limitations justify the necessarily high transaction costs associated with the implementation of non-recourse structures. Furthermore, justifications of the following propositions can be built based on standard corporate finance frameworks. For this, the chapter will be rich in references to management literature (of large projects) and standard corporate finance.²³¹

3.1.2 Findings

The chapter shows how PFCs mitigate some of the critical tensions among stakeholders that limit companies' capacities to implement exceptionally costly long-term projects.

First, PFCs mitigate tensions between ownership and managerial control. In particular, in PFCs, the use of SPVs reduces the canonical free cash flow problem.²³² When using a dedicated project company, managers find no alternative growth options or sources of funds for cross-subsidise their indiscipline. Furthermore, the tensions resulting from risk aversion and time-horizon preferences are also mitigated with the most important decisions being adopted either ex-ante (before implementation), or as the project evolves by the few shareholders directly.

Second, PFCs also prevent tensions between shareholders and creditors -and the costs that within standard corporate settings, shareholders spend preventing them. Concretely: *i.*- the chapter finds how, by isolating insolvency risks, the limited liability shelter and the non-recourse nature of debt prevent distress costs resulting from the volatility (loss of diversification) associated with exceptionally costly undiversified investments. *ii.*- with the bulk of financing needs covered by an external debt provider, the debt overhang (under-investment) problem is limited to the contributions of capital expected from sponsors. *iii.*- asset substitution strategies are

²³⁰ B. ESTY, "The Economic Motivations for Using Project Finance", cit.

²³¹ Paradigmatic references that will be reiterated below and in all sections of this chapter are the unpublished working paper by *Ibid.* and B. ESTY, "Why Study Large Projects? An Introduction to Research on Project Finance", cit.

²³² See a description of the problem and its solutions in a dedicated section below.

no longer feasible after allocating assets to a project-dedicated SPV and by the flow of information accessible to the FP. *iv.*- the above also prevents asset dilution strategies. *v.*- by contractually requesting a monopoly (*i.e.*, a veto) on financing sources, the FP effectively prevents debt delusion.

Third, the chapter analyses how by allowing them to internalise more of the risks they pose to projects, PFCs (fundamentally, non-recourse debt) also prevents opportunistic enforcement by concentrated creditors.

Finally, fourth, the chapter elaborates on how the presence of a single provider of debt allows for the flow of information of higher quality ultimately mitigating the adverse selection problems associated with the dispersion of financing sources (both of equity or debt). Notice also that the single lender can also readjust (dispersed contractors cannot). The single lender and sponsors will exchange information *ex-ante*, during the complementation phase and *itineri*, as the project progresses. Remaining dispersed contributors of financing will then free ride on this information processed by the qualified FP.

3.1.3 Contributions to the literature

The paper adds to the general literature on project financing. Indirectly, it also adds to the broad stream of works corporate law and economics. In particular, it contributes to the development of studies focused on how parties implement projects under the ownership of special purpose vehicles where the input providers control the legal vehicle and its assets.

The work also builds on and contributes to a body of corporate finance and management literature dealing with non-recourse project financing. There are valuable works already pointing out some of the key benefits of recurring to non-recourse project financing alternatives. Some of these papers specifically focus on the possibilities that PFCs allow for going beyond the limitations of corporate financing methods.²³³

3.1.4 Sequence of the analysis

After this introduction, the second section explores the tensions between ownership and control. The section shows how these tensions grow with large projects, and how PFCs practically avoid them. These problems are the free cash flow problem, the distortions from risk aversion, and time horizon managerial preferences. The third

²³³ B. ESTY, “The Economic Motivations for Using Project Finance”, *cit.*

part considers how structural features of PFCs alleviate the tensions between shareholders and creditors (as a class). Here, I will show how PFCs mitigate: first, the volatility induced distress costs; second, the debt overhang under-investment problem; third the asset substitution over-investment problem; fourth, the debt dilution opportunistic strategies; fifth, the asset dilution actions. The fourth section will elaborate on the strategic tensions between shareholders and debt holders. I will comment on the advantages of concentrating debt in a few hands under corporate finance, the costs of doing so (the opportunism from lenders and the costly precautions in corporate finance), and finally the (mitigated) opportunism of the FP in PFCs. The fifth part elaborates on the benefits of PFCs against conflicts with dispersed financing providers; these are, essentially, the adverse selection problems in equity, and up to a minor extent also in debt. The sixth section concludes the analysis.

3.2 Tensions between ownership and control (management)

In corporate-financed structures, managers are agents of shareholders. In this institutionalised context, authors have already studied the many forms that the strategic tensions between them adopt.²³⁴

Under asymmetries of information, controllers (managers or owners) manipulate data for their own benefit; they appropriate business opportunities; they take defensive measures against takeover bids; they adopt short-sighted decisions (time horizon preference discrepancies), or capture growth opportunities that are less risky than socially desirable (managerial risk aversion).²³⁵

Generally, as in all moral hazard situations- incentives to behave opportunistically (the feasibility of opportunistic actions) increase as a function of elements associated with either the object of delegation or parties' characteristics.²³⁶ The material complexities (asymmetries of information and monitoring costs) and the range of resources (the space of actions) available to the agent, particularly the control of cash

²³⁴ Cf. relevant chapters in J. KRAAKMAN, REINIER ARMOUR ET AL, *The Anatomy of Company Law*, 3rd., Oxford University Press, 2017.

²³⁵ A. MILIDONIS; K. STATHOPOULOS, “Managerial Incentives , Risk Aversion, and Debt”, *Journal of Financial and Quantitative Analysis*, vol. 49, 02, 2014. J. COLES; N. DANIEL; L. NAVEEN, “Managerial Incentives and Risk-Taking”, *Journal of Financial Economics*, vol. 79, 2, 2006.

²³⁶ P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

flows, belong to the first category. Costs of efforts, coefficients of risk aversion, and time-horizons belong to the second group. Under corporate finance settings, the implementation of exceptionally costly, materially complex and capital-intensive projects, result in these variables exacerbating strategic tensions between owners and controllers.

In the next sub-sections, I describe how these elements affect moral hazard between shareholders and managers and how project finance contracts reduce the space for managerial opportunism. Concretely, I will argue that the project-dedicated accounting that becomes possible when owners place assets under the ownership of SPVs facilitates the monitoring of liquid resources. I will also sustain that the conditioning of benefits to the success of the project raises monitoring incentives. Furthermore, I will also consider how the *ex-ante* choice of a single growth option eliminates any risk associated with most relevant managerial decisions and tensions resulting from different time horizons. All this improves the interaction between the owners and the delegated managers in PFCs.

Next, I will sub-divide the analysis into two sub-sections, each of which will contain three parts. I will first describe the tensions in corporate finance associated with three variables. First, I will elaborate on the relationship between the asymmetries of information and the managers' access to cash flows. Second, I will comment on the costs of managerial risk aversion. Third, I will most briefly refer to the time-frame preferences of agents. Under the second sub-section, I will show: first, how PFCs prevent these inefficiencies; second, how PFCs facilitate the access to managerial information (enforcement); and third, how the lower scopes of delegation further reduced the spaces for feasible opportunism.

3.2.1 Tensions in corporate finance

3.2.1.1 Large projects, asymmetries and free cash flow

Large projects are typically capital intensive and materially complex endeavours. Asymmetries of information associated with material complexity allow for spaces of managerial decisions that escape contractible signals. In the corporate finance literature, the well-known strategic tensions resulting from asymmetries of information (moral hazard) and incompleteness have been-well observed

empirically.²³⁷ The problem is visible in different strategies pooled by authors under different names, *e.g.*, *perks consumption*, *empire building*, *managerial laxity*. More often (colloquially), these tensions are generally referred to as the *free cash flow problem*.²³⁸ The name emphasizes the liquidity of the unallocated resources available for the manager to use opportunistically.

The handling of large amounts of cash by administrators is a distinctive characteristic of the long term, large, development projects. In corporate finance settings, accounting systems are complex. Resources are used indistinctively to capitalise diverse projects. Proceeds are often not traced to identifiable resources. Contingency funds are often not pre-allocated to mitigating specific risks. This poor control of resources stems from the different business units holding materially complex assets for which efforts are shared within the same corporate umbrella.

The implementation of large development projects under corporate structures affects these variables differently depending on their implementation stages. During completion (*i.e.*, before operation), rather than to prevent eventualities, managers use cash provisions against contingencies to camouflage managerial laxities in other projects.²³⁹ Managers in traded companies can also use this unmonitored cash to

²³⁷ For a literature review on the matter, *Vid.* S. G. MARKS, “The Separation of Ownership and Control”, *Encyclopedia of Law and Economics*, 2000, Edward Elgar Publishing and The University of Ghent.

²³⁸ M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, *Journal of Financial Economics*, vol. 3, 4, 1976.; M. C. JENSEN, “Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers”, *The American Economic Review*, vol. 76, 2, 1986. For an empirical verification of over-investment policies including a literature review *vid.* S. RICHARDSON, “Over-Investment of Free Cash Flow”, *Review of Accounting Studies*, vol. 11, 2-3, 2006. For a study of the distortions from perquisite consumption incentives over leverage ratios *Vid.* E. MORELLEC, “Can Managerial Discretion Explain Observed Leverage Ratios?”, *Review of Financial Studies*, vol. 17, 1, 2004. *Vid.* also, A. V. S. DOUGLAS, “Capital Structure and the Control of Managerial Incentives”, *Journal of Corporate Finance*, vol. 8, 4, 2002. S. J. GROSSMAN; O. D. HART, “Corporate Financial Structure and Managerial Incentives”, in *In John McCall. The Economics of Information and Uncertainty (University of Chicago Press)*, vol. I, 1982.

²³⁹ *Cf. pp.* 363 and *ff.* in A. DAMODARAN, *Corporate Finance Theory and Practice*, John Wiley & Sons, Inc. New York, 1997.

mask undesired results and escape market pressure in different projects. During operation, large capital-intensive projects generate significant resources for long periods. This creates an investment incentive distortion.²⁴⁰ Managers may use large revenues from operation to over-invest in projects that, albeit being less profitable, they are more cash flow stable. So, they are easier to administer, or they allow for the extraction of perks.

Managers' capacities to avoid disciplining control by cross-subsidising among different business units²⁴¹ ultimately result in companies' lower productivity.²⁴² Furthermore, cross-subsidising may exacerbate conflicts within the different tiers of the managerial system. Additionally, it has already been shown how, by implementing rent-seeking strategies, division managers may extract budgeting allocation benefits from CEOs in detriment of company value.²⁴³

In corporate finance environments, the value of monitoring also changes with certain features frequent in very large projects that also vary with the stages of advances. During implementation –and up to a certain point, also during operation– in long term development projects, companies will go through significant technological changes. The incompleteness of contracts allows managers to implement innovations without necessarily revealing the real extent of positive outputs. Managers will use these undisclosed benefits from technological innovations (unallocated resources – free cash flow) to subsidise opportunism.

Complex projects also jeopardise managerial evaluation processes. Consider the uniqueness of very large projects. Projects funded under non-recourse contracts are often implemented for delivering outputs under legal (or/and natural) monopolistic conditions. We may think of projects involving network infrastructures, a water sanitation facility, or a public hospital. Under other circumstances, we observe monopolistic protection resulting from legal regulations or natural characteristics of

²⁴⁰ M. C. JENSEN, “Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers”, cit.

²⁴¹ The fruits from one business units may serve for covering the administrative inefficiencies (managerial laxity) of other projects.

²⁴² R. INDERST; H. M. MÜLLER, “Internal versus External Financing: An Optimal Contracting Approach”, *The Journal of Finance*, vol. LVIII, 3, 2003.

²⁴³ D. SCHARFSTEIN; J. STEIN, “The Dark Side of Internal Capital Markets: Divisional rent-seeking and Inefficient Investment”, *The Journal of Finance*, vol. LV, 6, 2000.

services and the magnitudes of capital investments or technological capacities necessary for competing in a particular sector. These projects' uniqueness and their monopolies' capacities result in the absence of market pressure and the consequentially increased spaces for managerial laxity.²⁴⁴ Additionally, the idiosyncratic features of these rare (or unique) projects²⁴⁵ also imply that, without market references, relative managerial performance evaluation methods become challenging to implement.²⁴⁶ All these features free managers from market disciplining pressure.²⁴⁷

3.2.1.2 Managerial risk aversion in corporate finance

In corporate finance settings, a distinct source of tensions between ownership and control comes from managerial risk aversion. Generally, managers spend unobservable efforts and companies provide incentives based on verifiable outputs – often, some measure of company performance. Poorly diversified risk-averse managers are inclined to adopt business strategies that, to companies, are less risky than optimal.²⁴⁸ The exceptionally large projects bring further volatility to the organisations, hence inducing managers to behave even more conservatively in other business units. When considering the sources of distress costs, I will describe the sources of volatility.

Let us most briefly anticipate some critical aspects of volatility and the careless actions that managers privately choose to reduce risk. Large projects bring volatility

²⁴⁴ C. GEA-CARRASCO; L. ISLA COUSO, “A First Stochastic General Framework to Model the Project Finance Cash Flows under Monopolistic Situations Gea”, *MPRA Papers*, 27125, 2010.

²⁴⁵ Recall the observations in Chapter 2. Parties use PFCs for advancing projects that are often unique in their kinds and require long periods for design and construction.

²⁴⁶ R. ANTLE; A. SMITH, “An Empirical Investigation of the Relative Performance Evaluation of Corporate Executives”, *Journal of Accounting Research*, vol. 24, 1, 1986.

²⁴⁷ R. INDERST; H. M. MÜLLER, “Internal versus External Financing: An Optimal Contracting Approach”, cit.

²⁴⁸ M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit. J. COLES ET AL, “Managerial Incentives and Risk-Taking”, cit. More recently, cf. A. MILIDONIS; K. STATHOPOULOS, “Managerial Incentives, Risk Aversion, and Debt”, cit.

to companies from both financial and technological sources. From the financial stance, large projects consume debt capacity of companies. Exhaustion of debt capacity equates to a higher likelihood of default (from higher debt-to-equity ratio).²⁴⁹ From the material stance, large projects prevent diversification and jeopardise the dissipation of risk. This effect, in turn, depends on two aspects: first, on the material characteristics of the project (*i.e.*, on specificities, *redeployabilities*²⁵⁰); and second, on how volatilities of projects correlate reciprocally (the higher the correlation of volatilities of individual projects, the greater the aggregated volatility of the portfolio).

The managers' first rational reaction to the exhaustion of debt capacity is to recur to internal financing. However, internal resources come at the cost of affecting dividends' smoothness²⁵¹ –a proxy for managerial performance. Besides, to compensate for the volatility from technological features, the manager will choose other less risky growth options with lower returns to the company.

A rich body of literature deals with managerial compensation schemes and how these can be (partially efficiently) designed to induce administrators to adopt optimal strategies.²⁵² However, recent studies show that, in corporate finance structures, risk aversion may be harder to curve via compensation schemes than what it has been esteemed in classic models. Parrino, Poteshman, & Weisbach (2005) evaluated the magnitude of investment distortions from risk aversion when companies take

²⁴⁹ A. V. S. DOUGLAS, “Capital Structure and the Control of Managerial Incentives”, *cit.*

²⁵⁰ In the literature of corporate finance and project management, the use of the expressions *redeployability* (*non-redeployability*) of assets (the costs of reallocating assets to a different use) appears vaguely similar to that of *specificities* (the difference with the next place alternative placement value) in the literature on contract theory. M. CAMPELLO; E. GIAMBONA, “Capital Structure and the Redeployability of Tangible Assets”, *Journal of Financial and Quantitative Analysis Forthcoming.*, 2013.

²⁵¹ F. EASTERBROOK, “Two Agency-Cost Explanations of Dividends”, *The American Economic Review*, vol. 74, 4, 1984.

²⁵² S. J. GROSSMAN; O. D. HART, “Corporate Financial Structure and Managerial Incentives”, *cit.* M. C. JENSEN; K. J. MURPHY, “CEO Incentives – It ’ s Not How Much You Pay , But How”, in Michael C. Jensen (ed.) *Foundations of Organizational Strategy*, Harvard University Press, 1999.

exceptionally large projects which affect expected bankruptcy losses.²⁵³ The authors considered the impact of several factors, including leverage, debt terms, project size, and managerial risk aversion and compensation packages. They concluded that conservatism from managers persists, even if under limited liability shelter. More recently, other studies have empirically confirmed the prevalence of risk-averse behaviour over compensation-based incentives.²⁵⁴

3.2.1.3 Time frame-preferences

Finally, individual managers will accelerate the production of returns in order to harvest benefits while they keep their jobs. These are the distinct time-frame preferences of companies and managers. Within corporate finance settings, projects assets are subject to managers acting under these distortions.²⁵⁵

3.2.2 Project finance contracts and managerial discipline

Structural features of project finance contracts mitigate these conflicts. First, the SPVs isolates cash flows in a dedicated company with its accounting system bespoke to the project. Second, the conditioning of residual benefits to the completion of the project expands the marginal returns from monitoring efforts that sponsors spend in disciplining managers. Third, the *ex-ante* choice of a single growth option eliminates any risk associated with critical managerial decisions. Fourth, finally, in PFCs, fixed dates of completion off-balance-sheet eliminate the problems stemming from the distinct time horizons. Let us see how this happens.²⁵⁶

3.2.2.1 Control of cash flows

The allocation of isolated projects in SPVs limits the sources of cash flow that may be

²⁵³ R. PARRINO; A. M. POTESHMAN; M. S. WEISBACH, “Measuring Investment Distortions when Risk-Averse Managers Decide Whether to Undertake Risky Projects”, *Financial Management*, vol. 34, 1, 2005.

²⁵⁴ A. MILIDONIS; K. STATHOPOULOS, “Managerial Incentives , Risk Aversion, and Debt”, cit.

²⁵⁵ For an empirical analysis with literature review, *Vid.* P. M. DECHOW; R. G. SLOAN, “Executive Incentives and the Horizon Problem - An Empirical Investigation”, *Journal of Accounting and Economics*, vol. 14, 1991.

²⁵⁶ For an early and very didactic introduction to these problems, *Vid.* B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

used by administrators to camouflage managerial laxity. First, in PFCs, there are no side projects that, as coinsurance devises, may supply cash flow in compensation of poor managerial performance in different business units. Second, during project implementation, cash savings relating to technological improvements and the cash provisions preventing unforeseen expenditures can be adequately separated from regular cash flows. Or even better, parties can keep these resources beyond the reach of managers in the hands of financing providers or sponsors. Cash-traps and account control accounts serve for this (*Cf.* Chapter 2).²⁵⁷ Furthermore, in project finance contracts, there are specific clauses –e.g., the cash waterfall clause– which prearranges the main cash expenditures in synchrony with financing needs both as the project evolves and after completion for the servicing of the financing debt.

3.2.2.2 Low costs of managerial information

By allocating projects assets in a separate legal entity, PFCs allow for implementing a project-dedicated bespoke information system. This system reveals specific data about risks, needs, and unexpected costs and benefits of the single project.²⁵⁸ Parties can now process information without items reflecting values sensitive to performances of different business units.

Besides, unlike in corporate settings, in PFCs, sponsors are -at the same time- equity investors and specific input providers to the project. They are experts on the industrial sector of the project, and they also interact materially with project assets. As a result of this dual capacity, sponsors are qualified observers capable of detecting differences between formal information and the project's real status. That is before technological costs savings as well as cost overruns are reflected in the accountancy. Moreover, due to their close operative and managerial interaction, the sponsors incur lower costs for coordinating their monitoring actions.²⁵⁹

In other words, in contrast with what we observe in regular diversified corporate contracting and investing, in PFCs, the few sponsors (all the shareholders) are highly

²⁵⁷ *Cf. pp.* 225 and ff. in G. VINTER ET AL. , *Project Finance - A Legal Guide*, cit.

²⁵⁸ S. SHAH; A. V. THAKOR, “Optimal Capital Structure and Project Financing”, cit. K. V. SUBRAMANIAN; F. TUNG; X. (SUE) WANG, “Law, Agency Costs and Project Finance”, in *American Law & Economics Association Annual Meetings - Paper 77*, 2008. B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

²⁵⁹ E. CARLETTI; V. CERASI; S. DAL TUNG, “Multiple-Bank Lending: Diversification and Free-Riding in Monitoring”, *Journal of Financial Intermediation*, vol. 16, 3, 2007.

qualified, and they are also the input providers to the single project. This facilitates the access of information by shareholders without managerial interferences. Additionally, in PFCs the allocation of project assets and its contracts under the ownership (administrative control) of a dedicated (project instrumental) SPV implies that the accounting information systems that shareholders use for assessing managerial performance will be free from the potential information contamination from different business units.

Moreover, as I will analyse in chapters 4, 7 and 8, in PFCs, the sponsors exert managerial actions as *de-facto* controllers of the SPV and its assets. The flow of information between the project and the company owners is of a quality that parties cannot easily reproduce in scenarios where shareholders are dispersed or where the company advances materially independent projects under the managerial command of appointed administrators.

3.2.2.3 Smaller scopes of delegation

By limiting and refining the scope of managerial delegation, project finance contracts mitigate conflicts between managers and their principals. Furthermore, by isolating the unique well-predesigned project under a single company, PFCs liberate managers from the needs to take significant decisions. In project finance contracts, the three categories of decisions classically considered in the literature are either taken in advance, or by the direct interventions of other stakeholders during the project's life. These decisions relate to the investment problem, the financing problem, and the dividend distribution problem.

In project finance contracts, it is not within managerial competences to decide on any matter relating to the investment dimension; this is simply so because, under its property, the SPV has a single project as its unique growth option. Furthermore, the sponsors and the FP choose the project during contractual implementation often before incorporating the SPV. The single project advanced by the SPV is a crucial aspect of the risk allocation mechanism necessary for the FP to internalise non-recourse risks. Consequently, in PFCs risk-averse managers running a SPV have no spaces for over-investing in alternative less volatile and stable cash flow generating projects that could subsidise their managerial trespasses.

Additionally, because in PFCs, the sponsors (the shareholders) are also the input providers, the choices of technologies do not fall under the manager's decision-scope.

Hence, without the sponsors' cooperation,²⁶⁰ the manager cannot alter the technologies of the project as per her risk-preferences.

Finally, as I will show in Chapters 4 and 7, in PFCs, most critical decisions come predefined to the manager from the risk allocation mechanism. Consequently, the spaces within which she will adopt risky actions affected by her risk-aversion or time-horizon preferences will be narrow. In other words, because of the less relevant types of decisions she adopts, in PFCs, the managers' risk-preferences will be close to those of the shareholders (the sponsors advancing a single predefined project).

On the financing dimension, in PFCs, all sources of funding both in the form of debt and equity and in relation to internal sources are well sketched in advance –before the formation of the SPV. Moreover, in PFCs, there are specific clauses –*e.g.*, the *cash waterfall* clause- that pre-determines all the main cash expenditures in synchrony with financing needs as the project evolves. These provisions regulate both flows of resources in an out of the project respectively during implementation and completion and after completion during operation for the servicing of the financing debt. Additionally, a dedicated company hosting a single project also removes all conflicts stemming from managerial speculations relating to the distribution of dividends to shareholders and the preservation of liquidity or the availability of internal means of financing.

Primarily, in project finance contracts managers of the SPV are not expected to assume decisions beyond the implementation of the project or executive instructions from sponsors under the financing party's supervision. Moreover, because managers of projects are not expected to take any critical decisions, strong incentive powers are less frequently seen project finance compensation schemes.²⁶¹ Authors associate this hypothesis to the fact that project managers usually perceive compensations that are flatter than those of their peers administrating companies under the responsibility of identifying and advancing alternative growth options.²⁶²

3.3 Tensions between shareholders and creditors as a class

Let us now consider the relationship between the owners of companies and creditors

²⁶⁰ Cf. the problem of *risking* in Chapter 5.

²⁶¹ *Vid.* page 14 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

²⁶² *Ibid.*

as a class.²⁶³ The treatment of the topic is sub-divided in five parts. The first two sub-sections contain *financing* costs. Financing costs do not depend on opportunistic strategies.²⁶⁴ These costs stem from the inherent volatility that the holding of debt and risky assets from very large project bring to corporate structures. These are the volatility-induced distress costs and the debt overhang under-investment problem. The next three sub-sections describe *agency* costs between shareholders and creditors. Unlike the previous ones, these costs result from strategic tensions (opportunistic strategies). The three problems are well-known in the corporate finance literature and appear exacerbated when companies finance exceptionally large, costly and materially complex projects. These are the asset substitution over-investment hazards, the problem of debt dilution, and the asset dilution strategies.²⁶⁵ Conflicts between individual creditors (*i.e.*, both financial and material input providers) will be considered in other dedicated sub-sections further below.

3.3.1 Large projects and distress costs

Let us see how large projects affect the debt capacity of companies. Large projects funded typically under PFCs are very costly and highly specific. To companies in the market, the financing and completion of very large projects affect the diversification of their cash flow sources. The values at risk of individual projects (colloquially, *their sizes*) relative to other income sources raise the likelihood that a collapsing project will drag the company into its insolvency.²⁶⁶ In PFCs, the use of SPVs allows for the removal of both the risky assets and the financing debt away from the balance sheets

²⁶³ For clear descriptions of how the comparative legislator deals with these conflicts, *Vid. pp. 55 and ff. in R. R. KRAAKMAN ET AL., The Anatomy of Corporate Law - A Comparative and Functional Approach, cit.*

²⁶⁴ Strategic tensions however may well result from these factors but only as secondary consequences from the actual problems that I describe here.

²⁶⁵ The collective action problem impedes coordination among dispersed creditors. Without coordination, threats from them as a class against companies or projects are not feasible. Thus, I do not need to focus on these as a problem.

²⁶⁶ As shown below, this statement greatly depends on the correlation of volatilities between projects and other growth options. Generally speaking, the larger the project, the weaker the portfolio benefits, and the higher the volatility induced distress costs.

of sponsors.²⁶⁷ This prevents volatility contamination²⁶⁸ and subsequent distress costs to parties involved.

In this section, I describe the sources of the distress costs that corporate entities face when financing exceptionally large projects. I will then show how PFCs prevent these inefficiencies. First, I will start with a brief reference to the nature of distress costs. Secondly, I will characterise how the exhaustion of debt capacity produces volatility induced distress costs. Thirdly, I will describe the increase in volatility that results from the largest projects' material features. In the fourth place, the sub-section will conclude with a description of how implementing a project with non-recourse debt avoids these costly inefficiencies.

3.3.1.1 Nature and sources of distress costs

During the last decades, the definitions and boundaries of distress costs have varied in academic literature. The general concept of distress costs has expanded from including only the losses from post-default liquidations (direct distress costs) to eventually covering a wide array of items. Eventually, the notion has grown to also include externalities from corporate defaults to society as a whole.²⁶⁹

²⁶⁷ One of the authors to first considered distress costs as a reason why parties should choose project financing was Benjamin Esty. *Vid.* B. ESTY, “Why Study Large Projects? An Introduction to Research on Project Finance”, *cit.* See also B. ESTY, “The Economic Motivations for Using Project Finance”, *cit.* *Cf.* also the description of the off-balance aspect of PFCs in page 19 S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, *cit.*

²⁶⁸ The Allestree entry *Risk contamination* in the glossary. This is the scenario in which the volatility of the cash flow of the company (of its portfolio) begins to resemble the cash flow volatility of the disproportionately large project with the consequential loss of portfolio benefits and increase insolvency risks.

²⁶⁹ Shortly after Modigliani & Miller’s seminal works, early studies on costs of debt and capital structures identified distress costs as the expected losses from default. Only much later the concept of distress costs began to be studied on sub categories and dimensions. Ang, Chua, & McConnell (1982) first analysed empirical evidence of the administrative costs of bankruptcy procedures; Altman (1984) used a proxy methodology to assess *indirect* costs of bankruptcy. *Vid.* F. MODIGLIANI; M. H. MILLER, “The Cost of Capital, Corporation Finance and the Theory of Investment”, *The American Economic Review*, vol. 48, 3, 1958.; J. S. ANG; J. H. CHUA; J. J.

Today, authors focus on the (indirect) costs that contractors experience in the vicinity of insolvency.²⁷⁰ "Indeed, distress is not best considered a binary state but rather a continuum of financial health. Many firms take actions that have wealth implications for employees, customers, suppliers, creditors, and shareholders long before default or bankruptcy".²⁷¹ Typically, *e.g.*, distress costs relate to workers withholding personal further specific investments, to clients seeking alternative sources of supplies, to input providers bargaining for shorter terms, to creditors requesting security interests or collaterals from third parties, to losses of reputation affecting market shares.²⁷² Distress costs also include the costs incurred by all contracting parties building long term relationships and implementing costly precautions to prevent insolvency.²⁷³ The costs of these contractual precautions from third parties reflect in prices that risky companies must internalise.

Noticeably, we can understand distress costs from the stance of opportunity costs. Once the likelihood of default has grown, dispersed creditors may no longer rely on diversification. With limited tolerance to volatility (via interests affecting financing costs of debt), parties adopt increasingly conservative stances on alternative growth options. This holds for both the debtor and creditors.

Distress costs also include the opportunity costs derived from the restrictiveness of debt covenants. To preserve the access to debt at low interests, in the vicinity of

MCCONNELL, "The Administrative Costs of Corporate Bankruptcy: A Note", *The Journal of Finance*, vol. 37, 1, 1982.; E. ALTMAN, "A Further Empirical Investigation of the Bankruptcy Cost Question", *The Journal of Finance*, vol. 39, 4, 1984.

²⁷⁰ See for instances how Branch speaks about Bankruptcy-related costs, and proposes the following classification: "(1) Real costs borne by the distressed firm; (2) Real costs borne directly by the claimants; (3) Losses to the distressed firm that are offset by gains to other entities; (4) Real costs borne by parties other than the distressed firm or its claimants." B. BRANCH, "The Costs of Bankruptcy: A Review", *International Review of Financial Analysis*, vol. 11, 2002.

²⁷¹ *Vid. pp. 58 and ff.* in K. J. CORNAGGIA, "Financial Distress and Bankruptcy", in Baker, H. K., & Martin, G. S. *Capital Structure and Corporate Financing Decisions: Theory, Evidence, and Practice*. John Wiley & Sons, Inc. New York., 2011.

²⁷² T. C. OPLER; S. TITMAN, "Financial Distress and Corporate Performance", *The Journal of Finance*, vol. 49, 3, 1994.

²⁷³ S. TITMAN, "The Effect of Capital Structure on a Firm's Liquidation Decision", *Journal of financial Economics*, vol. 13, 1984.

insolvency debtors will be induced to accept stricter disciplining mechanisms.²⁷⁴ Widely, contractual precautions may take the form of externally enforceable clauses or be just relationally implemented agreements. *E.g.*, banks may restrict lending policies without violating contractual provisions. These contractual arrangements appear necessary as conjectures of reciprocal strategies change near insolvency thresholds.²⁷⁵

The economic theory of contracts and the literature of corporate finance describe well the relation between expected default and the severity of principal-agent tensions.²⁷⁶ Authors have resorted to different proxies and methods for measuring these indirect costs.²⁷⁷ We can identify two factors as the originators of distress costs. These are the two determinants of the claims' expected values: a), the magnitude of the expected losses from the default, and b), the default probability. In the eventuality of default, the magnitude of losses from liquidation or reorganisation will depend on specificities. This is the difference between the expected initially and the next best alternative placement values. The probability of default depends on (the characteristics of) the volatility of corporate cash flows.

To companies, the sources of volatility may be contained within three key factors. The first is the capital structure (debt-to-equity ratio) of the company holding the project.²⁷⁸ The second relates to the material composition of projects.²⁷⁹ That is, the

²⁷⁴ Cf. I. MALITZ, "On Financial Contracting: The Determinants of Bond Covenants", *Financial Management*, vol. 15, 2, 1986. pp. 20 and ff. ...perhaps the only way in which shareholders can receive a price they consider "fair" is to offer restrictive covenants.

²⁷⁵ *Ibid.* E. BORGONOVO; S. GATTI, "Risk analysis with contractual default. Does covenant breach matter?", cit.

²⁷⁶ Notice how variations in distributable welfare being a common challenge to parties under both hidden action and bounded rationality models. Moral hazard is affected from changes in incentive constraints (the private optimal choices of privately costly efforts); holdup is naturally affected by the lower returns from bargaining.

²⁷⁷ Authors often describe how it is *almost impossible to measure agency costs directly, so tests of the costly contracting hypothesis must be indirect ones*. I. MALITZ, "On Financial Contracting: The Determinants of Bond Covenants", cit.

²⁷⁸ This is one of the postulates of Modigliani and Miller' classic works on capital structure. Cf. F. MODIGLIANI; M. H. MILLER, "The Cost of Capital, Corporation Finance

size of projects in relation to other business units under the same company, the liquidity of assets,²⁸⁰ and how much of project's costs are fixed or variable –i.e., how much typically high fixed costs affect the degree of operating leverage of the company.²⁸¹ The third aspect relates to how the volatility of the project correlates to the volatilities of other sources of income for the company. This last aspect can be considered as a type of the second item. So, I will consider the second and third sources under the same sub-section.

Finally, as a fundamental determinant of the cost of debt, the mitigation of distress costs appears as one of the core objectives of modern capital structure doctrines.²⁸²

and the Theory of Investment”, cit. and also F. MODIGLIANI; M. MILLER, “Corporate Income Taxes and the Cost of Capital: A Correction”, *The American Economic Review*, vol. 53, 3, 1963.

²⁷⁹ I am referring to volatility, that is, the likelihood of failure, not to the losses from project failure (specificities, or, as some call it, *redeployabilities*).

²⁸⁰ *V.gr.*, the relationship between time and the loss of value when allocating assets to its next alternative placement option.

²⁸¹ When assessing the present value of financial distress costs authors often consider the values of Betas of companies as a measure of volatility. I am leaving aside this important consideration as I am focusing on the relationship between the project and the company that finances it. Generally, *vid. chapter 16* in ,J. BERK; P. DEMARZO, *Corporate Finance*, 2nd, Pearson/Prentice Hall, 2011. For a deeper discussion on betas as measures of volatilities *vid, pp.* 293 to 295 in A. DAMODARAN, *Corporate Finance Theory and Practice*, cit.

²⁸² Both Static Trade-Off and Dynamic Trade-Off theories identify capital structure targets by comparing incremental bankruptcy derived costs with more linear tax benefits. For a comment on the static version of *trade off* theories *Vid.* M. BRADLEY; G. JARRELL; E. KIM, “On the Existence of an Optimal Capital Structure: Theory and Evidence”, *The Journal of Finance*, vol. 39, 3, 1984.; For an introduction to the *dynamic trade-off theories vid.* A. KANE; A. J. MARCUS; R. L. MCDONALD, “How Big is the Tax Advantage to Debt?”, *The Journal of Finance*, vol. 39, 1984.M. J. BRENNAN; E. S. SCHWARTZ, “Optimal Financial Policy and Firm Valuation”, *The Journal of Finance*, vol. 39, 3, 1984. and E. O. FISCHER; R. HEINKEL; J. ZECHNER, “Dynamic Capital Structure Choice: Theory and Tests”, *The Journal of Finance*, vol. 44, 1, 1989.

²⁸³ ²⁸⁴ Direct and indirect distress costs have also been widely considered in empirical analyses. The fruits of these studies are visible in both legal and economics works on insolvency procedures.²⁸⁵ ²⁸⁶ ²⁸⁷ More broadly, the relationship between distress costs

²⁸³ The *Pecking Order* family of theories also considers financial distress costs as a fundamental element for selecting the sources of funding. Adverse selection-based models of capital structure choose external sources of funding by comparing the impact of financial distress with those from asymmetries of information. *Vid.* generally, S. C. MYERS; N. S. MAJLUF, "Corporate Financing and Investment Decisions when Firms Have Information that Investors Do not Have", *Journal of Financial Economics*, vol. 13, 2, 1984. and S. MYERS, "The Capital Structure Puzzle", *The Journal of Finance*, vol. XXXIX, 3, 1984.

²⁸⁴ Agency cost-based models also elaborate their pecking order by marginally equating the cost of distress with the marginal benefits of debt in terms of managerial discipline. For the seminal papers, *Vid.* M. C. JENSEN; W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", *cit.*, R. M. TOWNSEND, "Optimal Contracts and Competitive Markets with Costly State Verification", *Journal of Economic Theory*, vol. 21, 2, 1979. and D. DIAMOND, "Financial Intermediation and Delegated Monitoring", *The Review of Economic Studies*, vol. 51, 3, 1984. For a literature review including a brief introduction to modern capital structure doctrines *vid.* M. Z. FRANK; V. K. GOYAL, "Trade-off and Pecking Order Theories of Debt", *cit.*

²⁸⁵ The blurriness of the distinctions among the types and components of each of the categories of distress costs has resulted in some discrepancies on the empirical observations, which in any case always show some significant magnitudes: Direct distress costs –like litigation and judicial costs– have been found to be less significant than indirect ones. Studies show that direct distress costs of about 3% to 5% of the value of firms. *Vid.* J. B. WARNER, "Bankruptcy Costs : Some Evidence", *The Journal of Finance*, vol. 32, 2, 1977. and L. A. WEISS, "Bankruptcy Resolution - Direct Costs and Violation of Priority of Claims", *Journal of Financial Economics*, vol. 27, 1990.

²⁸⁶ Indirect costs, including loss of market share are known to be significant but also difficult to measure quantitatively. *Vid.* T. C. OPLER; S. TITMAN, "Financial Distress and Corporate Performance", *cit.* On how distress costs have been observed to affect the values of sales of assets under constraints *Vid.* A. SHLEIFER; R. W. VISHNY, "Liquidation Values and Debt Capacity: A Market Equilibrium Approach", *cit.* (Shleifer & Vishny (1992)), and M. HERTZEL; Z. LI; M. OFFICER; K. RODGERS, "Inter-

and agency conflicts is also of central importance for optimising financing sources.²⁸⁸

Following the same sequence of other sub-sections, before describing how project finance contracts mitigate the distress costs, we must briefly observe the sources of distress costs and how distress costs grow when parties implement large projects under corporate structures.

3.3.1.2 Capital structure and volatility induced distress costs

Very large capital-intensive projects regularly induce companies to seek financing in the form of debt.²⁸⁹ Under this sub-section, I describe how, in corporate finance settings, the sole presence of debt generates volatility and consequential distress

Firm Linkages and the Wealth Effects of Financial Distress Along the Supply Chain”, *Journal of Financial Economics*, vol. 87, 2, 2008.

²⁸⁷ During the decade of 1980 some studies found distress costs to be more substantial: Altman found distress cost to be in the order of 11% to 17% taking as reference firm values three years before bankruptcy. In an extreme case, measured indirect costs on some industrial sector to be of 23.7% of firm value. *Vid. pp.* 1077 and 1078 in E. ALTMAN, “A Further Empirical Investigation of the Bankruptcy Cost Question”, *cit.* See also, J. B. WARNER, “Bankruptcy Costs : Some Evidence”, *cit.*, J. R. FRANKS; W. N. TOROUS, “An Empirical Investigation of U.S. Firms in Reorganization”, *The Journal of Finance*, vol. 44, 3, 1989. T. C. OPLER; S. TITMAN, “Financial Distress and Corporate Performance”, *cit.*, S. C. GILSON, “Transactions Costs and Capital Structure Choice : Evidence from Financially Distressed Firms”, *The Journal of Finance*, vol. LII, 1, 1997. G. ANDRADE; S. N. KAPLAN, “How Costly is Financial (Not Economic) Distress? Evidence from Highly Leveraged Transactions that Became Distressed”, *The Journal of Finance*, vol. LIII, 5, 1998. and H. ALMEIDA; T. PHILIPPON, “The Risk-Adjusted Cost of Financial Distress”, *The Journal of Finance*, vol. LXII, 6, 2007.

²⁸⁸ For a literature review on distress costs, *Vid.* H. ALMEIDA; M. CAMPELLO, “Financial Constraints, Asset Tangibility, and Corporate Investment”, *Review of Financial Studies*, vol. 20, 5, 2007. and more recently K. J. CORNAGGIA, “Financial Distress and Bankruptcy”, *cit.*

²⁸⁹ Rational investors will choose among alternative sources of funding (internal or external equity or debt) by equating their marginal agency costs. For the seminal on the relationship between financing sources *Vid.* M. C. JENSEN, “Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers”, *cit.*

costs.²⁹⁰

There is a simple way to show the relationship between debt and volatility. We must consider how debt affects companies' capacity to absorb the impact of exogenous factors without defaulting on their obligations. First, let us think of a company financed mainly with equity and with a rather insignificant amount of debt. As the enforceable obligations are of very little value (face value of debt is lowest), very little generated welfare would suffice to keep claim holders satisfied.

Notice how shareholders host expectations. But they do not hold enforceable claims to benefits. Hence, owners can survive hopeful of a better future without receiving dividends (or exit the company). Thus, with little debt on its capital structure, this company could very hardly default on its contractual obligations. In practical terms, this company would be reasonably insensitive to exogenous risks and factors affecting particular (or all) projects. Besides, all funds exceeding what it needed to service the little debt would be either reinvested or distributed as dividends (expand internal financing resources).

Let us now observe a company that finances itself mainly from debt and much less from equity. This company needs to consistently produce a certain necessary amount of wealth to stay away from insolvency. Also, as debt consumes more of its proceeds, the company will be capable of keeping smaller margins of free cash flow to absorb income variations. From a different stance, with higher debt, there is less equity which can *safely* remain unprofitable to subsidise more senior bankruptcy threatening claims in bad times. Thus, higher debt-to-equity ratio permits that the same exogenous factors bring the company closer to the vicinity of its insolvency. Alternatively, more simply put, the impact of external events on the company's solvency will depend on its debt-to-equity ratio.

On the other hand, to shareholders, higher (fixed face value) debt over equity means expanded distributable benefits during days of prosperity; during days of hardship, debt comes with volatility. Consequently, limited liability implies that the benefits of volatility are harvested by shareholders, whereas creditors internalise much of

²⁹⁰ In 2003, Benjamin Esty was one of one of the first authors to consider volatility as being one of the economic motivations for using project finance. However, the author did not consider the volatility caused by debt in capital structure but only the volatility resulting from risk contamination from large risky projects. *Vid. pp.* 24 in B. ESTY, "The Economic Motivations for Using Project Finance", cit.

defaults' costs. Effectively, the higher the volatility, the greater value that limited liability shelter transfers from creditors to shareholders.^{291 292}

With their historical contributions, Modigliani and Miller showed how creditors could use the interests they charge to debtors for efficiently internalising expected losses from volatility.²⁹³ However, Modigliani and Miller's contributions are strictly theoretical -i.e., subject to strong assumptions, especially concerning information flows.²⁹⁴ In real life, there are ex-ante asymmetries, contractual frictions, and ex-post moral hazards, as well as tax components that deprive Modigliani and Miller's irrelevance postulates of holding realistically. The frictions described above incentivise creditors to spend efforts on costly precautions which ultimately expand indirect distress costs.

The relationship between debt and volatility is also in the nerve of the concept of debt capacity. Debt capacity –a blurry concept that has been modelled under different styles- appears as a variable key to the choices of financing sources and the optimalities of capital structures. These theories build their postulates around debt capacities and subsequent distress costs.²⁹⁵

²⁹¹ H. E. LELAND, “Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance”, *The Journal of Finance*, vol. LXII, 2, 2007.

²⁹² The reader may correlate these intuitions with the asset substitution opportunistic strategies *infra*.

²⁹³ The costs of volatility from debt in capital structures have been a matter in the core of Modigliani & Miller highly stylised fundamental models of 1958 and 1963. In their seminal papers, these authors showed that –absent other incentives and distortions like tax benefits- the value of projects would not change with capital structure; this is regardless of the fact that debt would necessarily come with higher default risks, and higher interests. F. MODIGLIANI; M. MILLER, “Corporate Income Taxes and the Cost of Capital: A Correction”, cit.; F. MODIGLIANI; M. H. MILLER, “The Cost of Capital, Corporation Finance and the Theory of Investment”, cit.

²⁹⁴ Namely, the absence of bargaining frictions and other distortive incentives, including taxes.

²⁹⁵ Cf. with literature comments, M. L. LEMMON; J. F. ZENDER, “Debt Capacity and Tests of Capital Structure Theories”, cit.

3.3.1.3 Coinsurance versus risk contamination and distress costs

So far, I have described the impact of debt levels on volatility and the resulting distress costs. Let us now consider how the distress costs as a function of the sheer sizes and the material characteristics of projects relative to other business units or projects within companies' portfolios.

In corporate finance investments, the commingling of a multiplicity of organisationally independent projects under one corporate umbrella may serve as an efficient coinsurance device. A multiplicity of independent projects reacting differently to exogenous factors allows companies to dissipate the impacts of unexpected events over particular business units (portfolio benefits).²⁹⁶ Low volatility lessens distress costs and ultimately allows for extra debt capacity (see above the considerations about capital structure, and debt capacity).²⁹⁷

However, when projects are exceptionally large, their integration with other business units may not always be efficient. Under certain circumstances, coinsurance benefits may be dominated by the costs that large projects externalise to other business units.²⁹⁸ The literature identifies three material characteristics or variables defining the signs of synergies among projects.

The first aspect relates to the relative *sizes* of projects.²⁹⁹ The causality between size (magnitude of investments allocated to an individual growth option) and risk-contamination has been analysed in theoretical models and empirical observations. With the loss of diversification, parties lose portfolio benefits.³⁰⁰

²⁹⁶ K. A. FROOT; D. S. SCHARFSTEIN; J. C. STEIN, "Risk Management : Coordinating Corporate Investment and Financing Policies", *The Journal of Finance*, vol. 48, 5, 1993. and C. W. SMITH; M. STULZ, "The Determinants of Firms ' Hedging Policies", *The Journal of Financial and Quantitative Analysis*, vol. 20, 4, 1985.

²⁹⁷ H. E. LELAND, "Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance", cit.

²⁹⁸ Under corporate financing structures, "a risky project may drag an otherwise healthy investing firm into a default as well as a mismanaged company may bring wealth increasing individual business units to their liquidation." B. ESTY, "The Economic Motivations for Using Project Finance", cit.

²⁹⁹ Individual values at risk.

³⁰⁰ W. G. LEWELLEN, "A Pure Financial Rationale for the Conglomerate Merger", *The Journal of Finance (Papers and Proceedings of the Twenty-Ninth Annual Meeting of*

The second characteristic is the correlation of volatilities amongst cash flows from different projects. This includes the sensitivity of distinct projects to the same factors fundamentally.³⁰¹ The higher the correlation of volatilities of individual projects, the greater the aggregated volatility of the portfolio.³⁰² The third material feature relates to the degrees of specificities (redeployabilities) and liquidity of assets of different investment units.³⁰³

The low liquidity, the high specificities, or low redeployability of assets produce distress costs in ways that the literature has considered dispersedly. This is so much so, that –as shown below– the conceptual boundaries and strategic relevance among these categories appear blurred in the literature from the different authors from the different fields. For instance, writers have described how the low liquidity of large projects reduces companies' capacity to obtain cash for hedging risks³⁰⁴ (cross-subsiding) without exhausting internal sources of finance.³⁰⁵ As shown theoretically³⁰⁶ and empirically³⁰⁷, this results from the substitutability between real

the American Finance Association, Detroit, Michigan - December 1970), vol. 26, 2, 1971.; H. E. LELAND, “Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance”, cit.

³⁰¹ That is, how much cash flow producing capacities change as per a variation in the environment, and how such capacities from projects comove.

³⁰² Z. S. ALAM, “An Empirical Analysis of the Determinants of Project Finance: Cash Flow Volatility and Correlation”, 2010, Georgia State University; O. LAMONT, “Cash Flow and Investment: Evidence from Internal Capital Markets”, *The Journal of Finance*, vol. 52, 1, 1997; D. S. SCHARFSTEIN, *The Dark Side of Internal Capital Markets II: Evidence from Diversified Conglomerates*, 1998.

³⁰³ Specificities also referred as *redeployability*, or *reversibility of investments* as in R. S. PINDYCK, “Irreversibility, Uncertainty, and Investment”, *Journal of Economic Literature*, vol. 29, 3, 1991.

³⁰⁴ Often also referred as to hedging. For example, *vid.* K. A. FROOT ET AL, “Risk Management : Coordinating Corporate Investment and Financing Policies”, cit.

³⁰⁵ As shown below, the lack of internal resources (retained dividends) produces under-investment from adverse selection with investors.

³⁰⁶ D. MAUER; A. TRIANTIS, “Interactions of corporate financing and investment decisions: A dynamic framework”, *The Journal of Finance*, vol. 49, 4, 1994.

³⁰⁷ P. MACKAY, “Real Flexibility and Financial Structure: An Empirical Analysis”, *Review of Financial Studies*, vol. 16, 4, 2003.

(material) and financial flexibilities.³⁰⁸ ³⁰⁹ Additionally, specificities, low liquidity, and distress costs from large projects also affect bargaining conditions under which companies interact with contractors.³¹⁰ Distress costs may also induce companies to sell assets under time constraints. This has been associated with a loss in bargaining power when dealing with specific providers.³¹¹ Besides, poorly diversified companies holding highly specific (less redeployable) assets will be more exposed to factors affecting entire industry sectors. As the environments evolve undesirably, companies competing in the same field may be less willing to buy sector-specific assets from companies under distress.³¹²

Finally, large projects' capital intensiveness has been indicated as a different source of volatility and consequential distress costs. Capital intensiveness and operating leverage associated with exceptionally costly projects make it difficult for companies to moderate investment levels ex-post. This lack of flexibility makes them sensitive to exogenous factors affecting optimal production levels.³¹³

³⁰⁸ Consistent with this, liquidity has been shown to be a determinant value for some types of mergers and acquisitions known as “liquidity mergers”. Cf. H. ALMEIDA; M. CAMPELLO; D. HACKBARTH, “Liquidity Mergers”, *Journal of Financial Economics*, vol. 102, 3, 2011.

³⁰⁹ Studies have also found evidence of a negative correlation between debt levels and the “uniqueness” of a firm's line of business. Vid. S. TITMAN; R. WESSELS, “The Determinants of Capital Structure Choices”, *The Journal of Finance*, vol. 43, 1, 1988. Other empirical analysis have offered evidence on the relation between redeployability of tangible assets (which may be null in the case of large projects) and debt capacity (in the form of corporate leverage) Vid. M. CAMPELLO; E. GIAMBONA, “Capital Structure and the Redeployability of Tangible Assets”, cit.

³¹⁰ Cf. D. T. BROWN; C. M. JAMES; R. M. MOORADIAN, “Asset sales by financially distressed firms”, *Journal of Corporate Finance*, vol. 1, 1994. S. C. GILSON, “Transactions Costs and Capital Structure Choice: Evidence from Financially Distressed Firms”, cit.

³¹¹ O. SARIG, “The effect of leverage on bargaining with a corporation”, *The Financial Review*, vol. 33, 1988, 1998.

³¹² A. SHLEIFER; R. W. VISHNY, “Liquidation Values and Debt Capacity: A Market Equilibrium Approach”, cit.

³¹³ Vid. pp. 78 in A. DAMODARAN, *Corporate Finance Theory and Practice*, cit.

3.3.1.4 Project finance contracts and distress costs

PFCs allow for the allocation of both risky assets and the burden of financing debt away from the balance sheet of parties. This permits the preservation of parties' debt capacity and the isolation of volatility induced both financially and materially by the large project. These two features cannot be replicated under corporate finance structures.³¹⁴

In particular, the allocation of debt in a SPV prevents distortions to capital structure (debt-to-equity ratios) of sponsors. This comes with two further benefits. First, the sponsors do not perceive an increase of volatility from debt levels. This preserves low debt prices for further borrowing as usual. Ultimately, this also prevents pre-existing contractors –both financial and material- from renegotiating for further costly protections. Second, indirectly, the preservation of investors' debt capacity also conserves internal (substitute) resources of financing. Furthermore, in PFCs, capital intensiveness and operating leverage do not produce any effect in sponsors' capital structures.

Besides, the financing of projects under the property of SPV also allows investors to evaluate projects and risks on their own merits.³¹⁵ Intuitively, under the property of a project-dedicated company, project assets and resources cannot receive (lose) cash flow or internalise risk interferences from other business units under the same corporate umbrella. This comes with lower transaction costs; lower transaction costs ultimately lower the restrictiveness of contractual precautions – a problem in the core of distress costs.

Finally, in project finance contracts, the only residual distressful effect on the side of sponsors generated by the risky project relates to the possible loss of equity investment and the chances that the SPV defaults on its contractual obligations to them as input providers.

3.3.2 Debt overhang problem (under-investment)

Under this sub-section, first, I will describe the generalities of the debt overhang

³¹⁴ Cf. B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

³¹⁵ Cf. one of the early works on the matter, page 6 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

Z. S. ALAM, “An Empirical Analysis of the Determinants of Project Finance: Cash Flow Volatility and Correlation”, cit.

problem as a source of under-investment; second, I will show how contractual solutions to the debt overhang problem fail under corporate finance structures; third, I will mention how the structural features of project finance contracts avoid the debt overhang problem from its roots.

3.3.2.1 Generalities

The debt overhang problem is the second expression of conflicts between shareholders and debtors as a class. This tension results from the different expectations each class has from the project. By nature, shareholders hold residual (junior and variable) expectations to the company's benefits (dividends). In contrast, creditors hold fixed and senior contractual claims from the SPV.³¹⁶ Fundamentally, shareholders' expansions of capital contributions do not necessarily respond to enforceable obligations, but to a privately or collectively optimal decision.

In his seminal article of 1977,³¹⁷ Myers presented the debt overhang problem as the reluctance of rational owners to provide further contributions to a project after they anticipate that a significant part of the welfare generated from their investments will accrue to debt holders.³¹⁸ The debt overhang problem is known in financial literature as one of the *agency costs of debt* and results in companies skipping positive NPV projects. Indirectly, by reducing total expected wealth from the company, under-investment also comes in detriment of existing creditors. Lower investments levels then increase the costs of further debt, thus resulting in a vicious dynamic.³¹⁹

The costs of debt leading to debt overhang may not only result from the levels of debt in capital structures but also from the circumstances in which debt has been

³¹⁶ These contradicting expectations are also behind the three contract failures between classes of creditors and shareholders in the following sections; the asset substitution, asset dilution, debt dilution strategies.

³¹⁷ S. C. MYERS, "Determinants of Corporate Borrowing", *Journal of Financial Economics*, vol. 5, 1977.

³¹⁸ Under rationality constraints, shareholders will withhold investments with returns lower than their next best alternative allocation.

³¹⁹ For empirical observations on the impact of volatility, the cost of external capital and consequential debt overhang induced under-investment, cf. B. MINTON; C. SCHRAND, "The Impact of Cash Flow Volatility on Discretionary Investment and the Costs of Debt and Equity Financing", *Journal of Financial Economics*, vol. 54, 3, 1999.

acquired. Creditors often implement covenants³²⁰ preventing debt dilution and asset dilution strategies.³²¹ These covenants will typically restrict the freedom of actions of shareholders. For instances, to avoid that wealth is siphoned in the form of dividends, creditors may request minimal capitalisation levels –thus differing the distribution of benefits ultimately harming share value. Creditors may also procure that certain assets be used only for particular projects or that the company does not invest in certain industrial sectors.³²² These contractual precautions deprive the company of financing and investing flexibility. Loss in flexibility reduces distributable benefits to junior equity holders, ultimately weakening their incentives to invest.

The debt overhang problem has been on the focus of specific bodies of the theoretical and empirical literature. One stream of these works describes the impact of debt in general.³²³ A separate series of articles consider this inefficiency in conjunction to the financing needs from large projects.^{324 325}

³²⁰ As in I. MALITZ, “On Financial Contracting: The Determinants of Bond Covenants”, cit.E. BORGONOVO; S. GATTI, “Risk analysis with contractual default. Does covenant breach matter?”, cit.

³²¹ These strategies are escribed later on in this chapter. Debt dilution refers to the problem faced by a creditor sharing collateral and cash flows with later lenders. Asset dilution describes the opportunism by which controlling shareholders or managers extract value directly from company assets and resources for personal benefit.

³²² Generally, *Vid. pp.* 117 and *ff.* in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit. and A. SCHWARTZ, “A Theory of Loan Priorities”, *The Journal of Legal Studies*, vol. 18, 2, 1989.

³²³ See for instances, A. MELLO; J. PARSONS, “Measuring the agency cost of debt”, *The Journal of Finance*, vol. XLVII, 5, 1992. R. PARRINO; M. S. WEISBACH, “Measuring investment distortions arising from stockholder-bondholder conflicts”, *Journal of Financial Economics*, vol. 53, 1999., (Titman & Tsyplakov, 2007), N. MOYEN, “How big is the debt overhang problem?”, *Journal of Economic Dynamics and Control*, vol. 31, 2, 2007.

³²⁴ Relevant to the case of companies funding exceptionally large, long term and potentially volatility contaminating projects, we find D. W. DIAMOND; Z. HE, “A Theory of Debt Maturity: The Long and Short of Debt Overhang”, *NBER Working Paper Series -W18160*, June, 2012, (<http://www.nber.org/papers/w18160>). Further studies shown how debt overhang under-investment may coexist with over-investment (asset substitution) incentives and how the debt overhang problem does

3.3.2 Precarious solutions in corporate finance

One of the earliest specific solutions to the debt overhang problem came from Myers' seminal paper in 1977;³²⁶ he proposed the use of short-term debt against debt overhang scenarios. Since then, scholars have been working on many other solutions to the problem. Initially, papers recommended renegotiating existing debt so that it would not coexist with new projects.³²⁷ Later on, other researchers suggested the use of restrictions to cash distributions; in theory, these would induce companies to increase their investment levels.³²⁸ Empirical evidence seems to verify these propositions.³²⁹ Finally, other recommendations comprised the use of sophisticated financing contracts such as convertible debt.³³⁰

In corporate-financed projects, however, these solutions imply costly compromises.

not necessarily need grow monotonically with leverage. C. X. MAO, "Interaction of Debt Agency Problems and Optimal Capital Structure: Theory and Evidence", *The Journal of Financial and Quantitative Analysis*, vol. 38, 2, 2003.

³²⁵ After Mao, Diamond and He modelled the association among maturity, value of assets in place, volatility, profitability of investments and the debt overhang problem. Recent studies have also found contradictory evidence on the relationship between the degree of leverage and under-investment. D. W. DIAMOND; Z. HE, "A Theory of Debt Maturity: The Long and Short of Debt Overhang", cit. These works were based on prior empirical findings as in S. TITMAN; R. WESSELS, "The Determinants of Capital Structure Choices", cit. and M. BRADLEY ET AL, "On the Existence of an Optimal Capital Structure: Theory and Evidence", cit.

³²⁶ S. C. MYERS, "Determinants of Corporate Borrowing", cit.

³²⁷ E. F. FAMA, "Agency Problems and the Theory of the Firm", *Journal of Political Economy*, vol. 88, 2, 1980.

³²⁸ E.g., C. W. SMITH; J. B. WARNER, "On Financial Contracting: An Analysis of Bond Covenants", *Journal of Finance and Economics*, vol. 7, 1979. and pp. 19 and ff. in I. MALITZ, "On Financial Contracting: The Determinants of Bond Covenants", cit.

³²⁹ Empirical evidence has been found on how obligations to withhold dividends and other cash distributions may incentivise investments thus mitigating the debt overhang problem. *Vid. e.g.*, A. KALAY, "Stockholder-Bondholder Conflict and Dividend Constraints", *Journal of Financial Economics*, vol. 10, 1982.

³³⁰ R. GREEN, "Investment Incentives, Debt, and Warrants", *Journal of financial Economics*, vol. 13, 1984.

As proposed by Myers, short term debt may imply an increase on the volatility of equity, which may lead to more overhang.³³¹ Moreover, as much as companies do not have access to alternative financing sources, short-term debt may also permit liquidation threats from short term creditors.³³² Additionally, restricting cash distributions may also be costly.³³³ Furthermore, depending on several factors, including asymmetries of information, delaying dividends could result in over-investment incentives.³³⁴ Finally, all contractual preventions that instead of inducing companies to increase investment levels come to mitigate loses from potential defaults will also affect the hierarchies of the claims held by other (unprotected) creditors.³³⁵

Bellow, under the treatment of the asset substitution (over-investment) strategies, I will expand on the contractual solution to this under-investment problem. Furthermore, I will provide comments on how solutions to both problems relate, including how, under corporate finance, some solutions may not mitigate one problem without exacerbating the other.

3.3.2.3 Debt overhang in project finance contracts

In project finance contracts, sponsors allocate all debt financing contracts to a dedicated legal entity. By doing so, non-recourse project financing avoids the costs of debt and the consequential overhang problems.³³⁶

Furthermore, in PFCs, under-investment is consequently avoided at both the project and sponsors levels. At the project level, the sponsors and the FP prearrange all financing sources –either in the form of debt or equity- before implementation. In

³³¹ D. W. DIAMOND; Z. HE, “A Theory of Debt Maturity: The Long and Short of Debt Overhang”, cit.

³³² R. GERTNER; D. SCHARFSTEIN, “A Theory of Workouts and the Effects of Reorganization Law”, *The Journal of Finance*, vol. 46, 4, 1991.

³³³ C. W. SMITH; J. B. WARNER, “On Financial Contracting: An Analysis of Bond Covenants”, cit.; A. KALAY, “Stockholder-Bondholder Conflict and Dividend Constraints”, cit.

³³⁴ *Vid. pp.* 33 in E. BERKOVITCH; E. E. KIM, “Financial Contracting and Leverage Induced Over- and Under-Investment Incentives”, *The Journal of Finance*, vol. 45, 3, 1990.

³³⁵ *Vid.* following sub-sections describing conflicts of hierarchies of creditors.

³³⁶ *Vid.* B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

PFCs this is achieved by arrangements that are used typically for this purpose. Some of these include *waterfall* mechanisms,³³⁷ the maintenance of debt-to-equity ratios,³³⁸ and other particular coverage and control accounts.³³⁹

At the sponsor level, the bulk of financing burdens is eliminated from balance sheets. The only financing costs that remain are those associated with their up-front contributions as input providers to the project, or their equity contributions to the SPV. Besides, by allocating debt out of investors' capital structure, PFCs avoid all restrictive covenants and costly securities. This preserves the company's value and expected dividends -at the very core of the under-investment problem.

3.3.3 Asset substitution strategies (over-investment)

Asset substitution strategies involve shareholders deliberately directing the company towards choosing projects that are riskier than socially optimal. By doing so, under limited liability shelter, owners expecting residual benefits extract wealth from senior claimants holding fixed value titles. These contractual claimants may be creditors for material inputs or financial resources (debt) brought to the SPV.³⁴⁰ In the corporate finance literature, these strategies are known as *risk-shifting* (or, in particular contexts, more simply as the *over-investment problem*).

Under this sub-section, I will first describe the nature of the asset substitution problem. Here I present the basic strategic tensions that grow when companies finance and implement exceptionally large projects. In the second place, I will expose the only apparent association between over-investment and debt overhang problems. Thirdly, I will make a short reference to the insufficient contractual solutions against

³³⁷ Cf. page 236, in G. VINTER ET AL., *Project Finance - A Legal Guide*, cit.

³³⁸ Cf. page 284, in E. R. YESCOMBE, *Principles of Project Finance*, cit.

³³⁹ Cf. page 225, in G. VINTER ET AL., *Project Finance - A Legal Guide*, cit.

³⁴⁰ For the seminal papers, *Vid.* M. C. JENSEN; W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", cit. and D. GALAI; R. W. MASULIS, "The Option Pricing model and the Risk Factor of Stock", *Journal of Financial Economics*, vol. 3, 1976. H. E. LELAND, "Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance", cit. R. C. GREEN; E. TALMOR, "Asset Substitution and the Agency Costs of Debt Financing", *Journal of Banking and Finance*, vol. 10, 1986, 1986. B. GAVISH; A. KALAY, "On the Asset Substitution Problem", *The Journal of Financial and Quantitative Analysis*, vol. 18, 1, 1983.

risk-shifting as proposed in the literature. Fourth, I will comment briefly on the costs associated with these contractual mechanisms. And finally, fifth, I will conclude with a description of how structural features of project finance contracts reduce both the incentives and also the material feasibility of risk-shifting strategies.

3.3.3.1 The essence of the problem

The asset substitution problem results from shareholders optimising private values of limited liability shelters. In the private objective functions of shareholders, the projects that maximise residual returns are riskier than the company's optimum. The incentives have been well-described in the literature.³⁴¹

As much as projects receive debt finance, limited liability protection implies that some costs from default risks will be externalised to creditors. The magnitude of this externality to creditors corresponds to the value of limited liability protection to shareholders and grows with volatility.³⁴² The feasibility of the strategy results from limited liability protection and can be presented very intuitively. Limited liability implies that shareholders will harvest extra dividends from riskier endeavours. In contrast, creditors holding senior but fixed claims (interests) internalise the likelier failures' costs without receiving any extra benefits from success.³⁴³ From a different stance, debt financing implies that, in exchange for a fixed price (interest), sponsors can capture positive dividends from risky projects without increasing exposure via further equity investments. Consequently, limited liability rules result in different risk preferences and strategic tensions among shareholders, debt holders, and the

³⁴¹ After the seminal paper, this analogy has been used extensively in corporate finance specific literature and also introductory manuals. *Vid.* Jensen & Meckling M. C. JENSEN; W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", cit. Colloquially put, under limited liability shelter, by choosing projects with *some* higher upside value (to them) but with much greater downside risks (to creditors), shareholders go for *a large slice of a smaller pie* *Vid.* pp. 186-189 in R. R. KRAAKMAN ET AL., *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit. A. DE JONG; R. VAN DIJK, "Determinants of Leverage and Agency Problems: A Regression Approach with Survey Data", *The European Journal of Finance*, vol. 13, 6, 2007.

³⁴² *Vid.* H. E. LELAND, "Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance", cit.

³⁴³ *Vid. supra* the sub-section Capital Structure and Volatility Induced Distress Costs.

company. In the finance literature, authors often describe these intuitions with an analogy to a simple financial instrument. To shareholders, equity functions as a call option on the firm. Call values then increase with the volatility of the underlying asset.³⁴⁴

In addition to allowing shareholders to extract value via riskier projects, limited liability shelter also provides incentives for sponsors to fund such riskier-than-optimal projects with new debt. High debt-to-equity ratio, in turn, implies more volatility –which further expands externalities to creditors under limited liability protection. In the extreme, with sufficient volatility, shareholders will optimise dividend value by choosing growth options that may have negative NPV to creditors and the company.³⁴⁵

Under the strong assumptions that there are no asymmetries of information, creditors would accurately reflect the costs of volatility in the interests. Modigliani and Miller predicted this would neutralise externalities to creditors, thus nullifying the value of limited liability shelters to shareholders.³⁴⁶ However, in real life, asymmetries of information and bounded rationality (concerning future growth options) exist and grow with complex projects. With asymmetries of information and bounded rationality, the internalisation of risks on interest will be imperfect. Externalities to creditors (and the value of the limited liability shelter to shareholders) will exist.³⁴⁷

Shareholders acting rationally will acquire extra debt –and extract value from extra volatility under limited liability shelter- until the marginal costs of that volatility -via interests- leave debt with no extra impact on dividends. Because asymmetries are

³⁴⁴ C. X. MAO, “Interaction of Debt Agency Problems and Optimal Capital Structure: Theory and Evidence”, cit.

³⁴⁵ This will be so whenever we consider the legal entity as having an interest distinct from that of shareholders.

³⁴⁶ F. MODIGLIANI; M. H. MILLER, “The Cost of Capital, Corporation Finance and the Theory of Investment”, cit.

³⁴⁷ Notice that in the cases in which, based on poor conjectures, creditors adjust interests in excess, shareholders will either recur to alternative sources of financing (in which case shifting would not be possible), or risky projects would not be funded. The analysis therefore accepts the standard assumption that asymmetries lead to sub optimal interests with the consequential externalities.

positive, and interests do not sufficiently reflect the impact of volatility, shareholders will choose debt-to-equity ratios to levels beyond those in the company's optimal capital structure.³⁴⁸ Naturally, this will also be beyond the risk preferences of creditors.³⁴⁹ Under asymmetries and bounded rationality –typical in large and complex projects–, risk-shifting and leverage will grow together.³⁵⁰

Beyond leverage and asymmetries, other factors also appear in conjunction with asset substitution strategies and the terms of financing. When financing very large projects, companies often choose long term debt to avoid the agency costs of short-term financing (to some authors, a source of debt overhang-induced under-investment).³⁵¹ Using numerical simulations, Parrino & Weisbach (1999) mapped the incentives to over-invest in risky projects from the duration of financing debt. They also found that over-investment incentives may be more of a problem in companies with stable cash flows.^{352 353}

³⁴⁸ There are several theories on where to find this equilibrium. See for instances, S. TITMAN; R. WESSELS, “The Determinants of Capital Structure Choices”, cit. M. HARRIS; A. RAVIV, “The Theory of Capital Structure”, *The Journal of Finance*, vol. 46, 1, 1991. For a more recent review, *Vid.* M. L. LEMMON; J. F. ZENDER, “Debt Capacity and Tests of Capital Structure Theories”, cit.

³⁴⁹ We notice here the fundamental value of information (returns from monitoring) and transaction costs in allowing creditors to efficiently adjust interests to ongoing risks. As long as creditors cannot adjust interests ex-post, they will internalise risks on their interests based on incomplete estimations. Under-investment grows from the imprecision of these conjectures. From here, the bridge to adverse selection in dispersed markets is evident. *Vid. infra* a description of how, by obtaining funds from a single qualified FP, PFCs also mitigate such adverse selection problem.

³⁵⁰ B. GAVISH; A. KALAY, “On the Asset Substitution Problem”, cit. R. C. GREEN; E. TALMOR, “Asset Substitution and the Agency Costs of Debt Financing”, cit.

³⁵¹ D. W. DIAMOND; Z. HE, “A Theory of Debt Maturity: The Long and Short of Debt Overhang”, cit., R. GERTNER; D. SCHARFSTEIN, “A Theory of Workouts and the Effects of Reorganization Law”, cit. ; and D. W. DIAMOND, “Debt Maturity Structure and Liquidity Risk”, *The Quarterly Journal of Economics*, vol. 106, 3, 1991.

³⁵² R. PARRINO; M. S. WEISBACH, “Measuring investment distortions arising from stockholder-bondholder conflicts”, cit.

³⁵³ Finally, from the material point of view, the feasibility of asset substitution strategies is limited by production flexibility (the costs of redeploying assets to riskier

3.3.3.2 Over-investment vs under-investment

Some scholars have evaluated the relationship between over-investment (risk-shifting) and under-investment (the overhang problem). By applying real option theories, the authors considered the impact of investment uncertainty over risk-shifting incentives under distress.³⁵⁴ In this literature, it is commonly accepted that volatility from leverage deters investment. This results from the increasing value of alternative options under uncertainty. Intuitively, volatility and uncertainty induce parties to wait and find out more about returns from investments before sinking efforts.³⁵⁵

Interestingly, however, Eisdorfer (2008) shows that, when companies are under distress, limited liability makes risk-shifting strategies dominate these under-investment incentives. Furthermore, he also provides empirical evidence on the positive correlation between volatility, distress levels and risk-shifting incentives.³⁵⁶ Finally, also empirically, studies suggest that, if the volatility of project cash flows increases with investment scale, risk-shifting by equity holders will mitigate the under-investment problem. In this case, the agency costs of debt will not grow monotonically with leverage.^{357 358}

projects affect the returns from implementing such decision). Specifically on the matter of how real flexibility affects the feasibility of asset substitution strategies, *Vid.* P. MACKAY, “Real Flexibility and Financial Structure: An Empirical Analysis”, *cit.*

³⁵⁴ A. EISDORFER, “Empirical Evidence of Risk Shifting in Financially Distressed Firms”, *The journal of finance*, vol. LXIII, 2, 2008.

³⁵⁵; R. MACDONALD; D. SIEGEL, “The Value of Waiting to Invest”, *The Quarterly Journal of Economics*, vol. 101, 4, 1986. ; L. T. BULAN, “Real Options , Irreversible Investment and Firm Uncertainty: New Evidence from U. S. Firms”, *Review of Financial Economics*, vol. 14, Special Issue on Real Options, 2005.

³⁵⁶ A. EISDORFER, “Empirical Evidence of Risk Shifting in Financially Distressed Firms”, *cit.*

³⁵⁷ The marginal volatility of investment defined as the change in cash flow volatility corresponding to a change of investment scale. C. X. MAO, “Interaction of Debt Agency Problems and Optimal Capital Structure: Theory and Evidence”, *cit.*

³⁵⁸ We may consider the cases of companies (say, start-ups) that invest efforts in commercially risky technological innovations. These companies benefit from financial assistance which due to market uncertainties will come with volatility –the

3.3.3.3 Costs of contractual preventions

A variety of contractual alternatives have been considered to protect creditors from asset substitution strategies. Some of these contractual preventions have been proposed for alleviating asset substitution problems. Other contractual solutions have been studied in relation to both over- and under-investment problems.

With the general purpose of dealing with both agency costs, Myers (1977) was the first to analyse the use of short-term debt maturing before the investment needs.³⁵⁹ Jensen & Meckling (1976), Barnea, Haugen, & Senbet (1980) and Amir Barnea, Haugen, & Senbet (1981) explored the impacts of callable debt, stock options and convertible securities.³⁶⁰ Stulz & Johnson (1985) proposed the use of secured debt.³⁶¹ Concerning the asset substitution problem, Malitz (1986) suggested avoiding risk-shifting incentives by merely limiting the use of debt.³⁶² Haugen & Senbet (1981) evaluated the benefits of using stock options.³⁶³ Finally, Green (1984) considered the use of warrants to moderate investment incentives from financial leverage.³⁶⁴

More recently, Vanden (2009) considered a financial instrument with a variable face

company uses such equity funds for funding higher risk projects. Here we find marginal volatility from investment that increases the costs of interests for debt. So, we find extra risk with funds from equity avoiding the increasing costs of debt. In particular, equity will come from institutional investors who are best prepared to deal with risks from inside such companies.

³⁵⁹ S. C. MYERS, “Determinants of Corporate Borrowing”, cit.

³⁶⁰ A. BARNEA; R. A. HAUGEN; L. W. SENBET, “Agency Imperfections, Problems, Capital Structure: A Review”, *Financial Management*, vol. 10, 3, 1981; A. BARNEA; R. HAUGEN; L. SENBET, “A Rationale for Debt Maturity Structure and Call Provisions in the Agency Theoretic Framework”, *The Journal of Finance*, vol. 35, 5, 1980; M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit.

³⁶¹ R. M. STULZ; H. JOHNSON, “An Analysis of Secured Debt”, *Journal of Financial Economics*, vol. 14, 1985.

³⁶² I. MALITZ, “On Financial Contracting: The Determinants of Bond Covenants”, cit.

³⁶³ R. A. HAUGEN; L. W. SENBET, “Resolving the Agency Problems of External Capital through Options Resolving the Agency Problems of External Capital through Options”, *The Journal of Finance*, vol. 36, 3, 1981.

³⁶⁴ *Ibid.* R. GREEN, “Investment Incentives, Debt, and Warrants”, cit.

value.³⁶⁵ The face value of this security could be set up to vary negatively correlated to a proxy for the company's default risk. Fundamentally this correlation would have an elasticity higher than 1.³⁶⁶ The link between face-value and risk would increase equity downside exposure. Besides, it would also allow for deterrence effects as soon as risk becomes visible, a moment in which assets still have some value. Such a product could also induce shareholders expanding returns from equity to invest closer to optimally. In the banking industry, acceleration clauses –*e.g.*, penalty clauses that trigger punitive interests or acceleration of terms- contain features that resemble these instruments' fundamental aspects.

Each of these strategies, however, imply distinct trade-offs.³⁶⁷ In most of the cases, covenants include financial flexibility restrictions. Companies need this financial flexibility to access shorter terms of debt and to mitigate under- and over-investment incentives.³⁶⁸ Similarly, it has been shown how some of these instruments –in particular, convertible debt- cannot solve the asset substitution problem in dynamic settings.³⁶⁹ Gertner & Scharfstein (1991) also showed that short-terms used in the prevention of asset substitution might raise the market value of debt, thus leading to

³⁶⁵ J. M. VANDEN, “Asset Substitution and Structured Financing”, *Journal of Financial and Quantitative Analysis*, vol. 44, 04, 2009.

³⁶⁶ *I.e.*, an increase (decrease) of 1% in the value of the company would imply an increase (decrease) of more than 1% the face value of the instrument.

³⁶⁷ Several studies have considered and observed empirically the costs and efficiencies of covenants controlling the shareholder decisions over both financing and investing decisions of the firm. An empirical survey on how covenants may reduce agency costs of debt in high growth firms may be found in M. Billett; T. King; D. Mauer, “Growth Opportunities and the Choice of Leverage, Debt Maturity, and Covenants”, *The Journal of Finance*, vol. LXII, 2, 2007. *For an earlier study on the matter, Vid.* C. W. SMITH; J. B. WARNER, “On Financial Contracting: An Analysis of Bond Covenants”, *cit.*

³⁶⁸ P. D. CHILDS; D. C. MAUER; S. H. OTT, “Interactions of corporate financing and investment decisions: The effects of agency conflicts”, *Journal of Financial Economics*, vol. 76, 3, 2005.

³⁶⁹ C. A. HENNESSY; Y. TSERLUKEVICH, “Taxation, agency conflicts, and the choice between callable and convertible debt”, *Journal of Economic Theory*, vol. 143, 1, 2008, Elsevier Inc.

further debt overhang.³⁷⁰ Additionally, Berkovitch & Kim (1990) analysed the effects of seniority rules over-investment incentives. They showed how most of the financial contracting mechanisms indicated above indirectly specify the relative seniority for existing debt holders' claims vis-a-vis *present and future security holders*.³⁷¹ This eventually leads to further and different over or/and under-investment results.³⁷²

Finally, parties may also request that such limitations be placed as provisions in corporate charters. Charters regularly indicate the business scope activities (the objects) of a legal organisation. Importantly, however, -regardless of the implementation of individual covenants-, in most jurisdictions, charters may be modified without any consent from creditors.³⁷³ Simply, shareholders keep residual (political) rights of control. Finally, the company comes with a history of spending funds from internal sources for building a range of business capacities. The opportunity costs of contractually fixing the enterprise's objectives via covenants are, therefore, evident and significant.

3.3.3.4 Project finance contracts

In PFCs, sponsors and the financing party regulate all critical aspects of a single project. They do this before sinking any efforts. That includes defining the objects of the SPV (*i.e.*, investing choices), the managerial attributions of sponsors, the provision of inputs, and fundamentally, financing sources. If necessary, PFCs also allow an opportunity for the financing party to insert provision on the use of assets.³⁷⁴ Consequently, under project finance contracts, there is no room for sponsors to

³⁷⁰ R. GERTNER; D. SCHARFSTEIN, “A Theory of Workouts and the Effects of Reorganization Law”, cit.

³⁷¹ E. BERKOVITCH; E. E. KIM, “Financial Contracting and Leverage Induced Over- and Under-Investment Incentives”, cit.

³⁷² For a consideration of debt hierarchies systems in general, *Vid.* M. J. BARCLAY; C. W. SMITH JR., “The Priority Structure of Corporate Liabilities”, *The Journal of Finance*, vol. 50, 3, 1995.

³⁷³ *Cf. pp.* 186-189 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit.

³⁷⁴ Banks often setup mortgages to reinforce penalty clauses as a means for deterring sponsors from using facilities for other purposes.

switch to riskier projects without violating specific -effectively enforceable-³⁷⁵ provisions.³⁷⁶

The reader, however, may take this last proposition as precarious. Chapter 5 will show how sponsors can effectively extract benefits by increasing volatility via input technologies. I will call this strategy *risking*. The identification and characterisation of the strategy of risking in PFCs in chapters 5 and 6 are innovative contributions of this research.³⁷⁷

3.3.4 Debt dilution (inter-creditor tensions)

Let us consider now the debt dilution strategies. Under this sub-section, firstly, I will present the general strategic aspects of the problem. In this point, I will describe how inefficiencies grow with new projects and financing needs. Secondly, I will refer to the costly contractual solutions available in corporate finance environments. Finally, I will mention how, by identifying debt financing sources in advance, project finance contracts preclude the feasibility of debt diluting strategies.

3.3.4.1 Generalities of the problem

As business evolves, companies finance new projects with debt obtained from different providers. With new debt, existing lenders find themselves sharing collaterals with the new creditors.³⁷⁸ To the older creditors, sequential borrowing without project value (*i.e.*, higher debt-to-equity value) comes with a lowering of repayment probabilities and a reduction in expected returns from their claims. Besides, the conditions of new loans will not internalise this loss of value of old

³⁷⁵ These include collateralised conditions precedent and penalty clauses of various types in the non-recourse loan from the financing party.

³⁷⁶ For an early and brief reference about the asset substitution problem and the benefits of project finance contracts *Vid.* B. ESTY, “The Economic Motivations for Using Project Finance”, *cit.*

³⁷⁷ Along with *risking*, I will describe two other forms of opportunism in PFCs, *shirking* and *shading*. The earlier is analogous to the under-investment of inputs in bilateral contracting under asymmetries of information. The second relates to the choice of implementing socially desirable innovations for saving costs whenever the stake of total marginal value of efforts internalised by the input provider decreases.

³⁷⁸ A. SCHWARTZ, “Priorities and Priority in Bankruptcy”, *Cornell Law Review*, vol. 82, 1997. A. SCHWARTZ, “A Theory of Loan Priorities”, *cit.*

creditors.³⁷⁹ Consequently, as the company acquires further debt from new sources, it will create an externality from old lenders to new creditors and shareholders. This is the debt dilution problem.^{380 381}

As in all contract failures, debt dilution strategies do not necessarily leave new creditors and shareholders better off.³⁸² Creditors anticipate opportunism (backwards induction) and internalise extra risks in the price of capital.³⁸³

Statically, the debt dilution problem finds its roots not only in the volatility from new debt in capital structures but also on the types of assets that the company finances with new debt. In particular, the magnitude of the devaluation of pre-existing claims appears as an increasing function of (a) the ratio of the amount of new debt to the present expected value added to the firm by new assets funded by such debt; (b) the volatilities (and their correlations) of old and new assets; and (c) the seniority that shareholders agree to new debt.³⁸⁴

Dynamically, debt dilution produces two investment distortions. These depend on the quality of the conjectures made by poorly informed creditors when bargaining for interests. Too high interests will produce under-investment. In contrary, under-priced lending will induce over-investment.³⁸⁵ Due to risk aversion, uncertainty will

³⁷⁹ D. S. BISER; P. M. DEMARZO, “Sequential Banking”, *Journal of Political Economy*, vol. 100, 1, 1992.

³⁸⁰ G. G. TRIANTIS, “Secured Debt under Conditions of Imperfect Information”, *The Journal of Legal Studies*, vol. 21, 1, 1992.

³⁸¹ Without distracting the reader, note the position of creditors lending funds to the company and anticipating their incapacity to readjust for higher interests in the future and the holdup problem.

³⁸² G. G. TRIANTIS, “Secured Debt under Conditions of Imperfect Information”, cit.

³⁸³In sub-game perfect equilibria (backwards induction), we may well find higher interests. D. S. BISER; P. M. DEMARZO, “Sequential Banking”, cit.

³⁸⁴ A. SCHWARTZ, “A Theory of Loan Priorities”, cit.

³⁸⁵ Cf. pp. 117 and ff. R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit. See also G. G. TRIANTIS, “Secured Debt under Conditions of Imperfect Information”, cit. A. SCHWARTZ, “Priorities and Priority in Bankruptcy”, cit. A. SCHWARTZ, “A Theory of Loan Priorities”, cit. For a consideration of the ways in which seniority of claims affect incentives to

consequently pressure interests to rise, causing under-investment to dominate further.

3.3.4.2 Costs of contractual solutions

Shareholders could attempt to contractually commit to only gathering debt from a single source (from a single lender). This alternative does not come free of costs. Under bounded rationality around possible growth options, backward induction, the corporate debtor would find itself in a hold-up scenario (not capable of internalising improving perspectives in old contractual terms devised under risky conditions). The wisdom from authors explaining financing on real choice theories described above applies here. Sponsors will internalise the costs of uncertainty in *the value of waiting*.³⁸⁶

Leaving aside the simplistic solution of no recurring to short term debt altogether,³⁸⁷ short term obligations come with other drawbacks. Shorter terms increase volatility and debt overhang³⁸⁸ and the bargaining power of creditors.³⁸⁹

Several authors have described assumptions under which sophisticated agreements would be compatible with later contracting. Some authors considered the use of callable debt, interest adjusting clauses, or even allowing existing creditors to intervene in the provision of new debt. We can separate these strategies in two groups: a) implementing covenants regulating the access to further debt –as already mentioned; and b) devising seniority hierarchies protecting the value of earlier

shareholders in the vicinity of insolvency, *Vid.* E. BERKOVITCH; E. E. KIM, “Financial Contracting and Leverage Induced Over- and Under-Investment Incentives”, *cit.*

³⁸⁶; R. MACDONALD; D. SIEGEL, “The Value of Waiting to Invest”, *cit.* ; L. T. BULAN, “Real Options , Irreversible Investment and Firm Uncertainty: New Evidence from U. S. Firms”, *cit.*

³⁸⁷ Naturally, short term debt avoids debt diluting strategies because in the short term it is easier to forecast growth options and the more immediate financing needs. However, it cannot avoid the limits of information and transaction costs.

³⁸⁸ D. W. DIAMOND; Z. HE, “A Theory of Debt Maturity: The Long and Short of Debt Overhang”, *cit.*

³⁸⁹ R. GERTNER; D. SCHARFSTEIN, “A Theory of Workouts and the Effects of Reorganization Law”, *cit.*

claims.³⁹⁰

The two types of strategies find their limitations in the bounded rationality and the observability of actions -two aspects at the core of all contractual imperfections. The two dimensions become particularly challenging when projects are materially complex, require long development terms before completion, and they are financially costly. On the one hand, the bounded rationality implies that restrictive covenants will generate opportunity costs to other projects.³⁹¹ ³⁹² On the other hand, observability of side financing relationships (monitoring) becomes more difficult as projects grow in complexity.³⁹³ Creditors may implement strategies that are subtler than simply requesting loans from commercial banks. More simply, consider the case in which the company receives debt from non-institutional lenders, or the more frequent practice of financing projects with the assistance from input providers - without involving cash transfers.

Besides, some covenants may also lead to other forms of opportunism.³⁹⁴ Clauses that condition future borrowing to approval from pre-existing creditors (veto powers) could allow creditors to expropriate benefits from later projects. This is a manifestation of a hold-up problem, which, as such, depletes the incentives for companies to seek new projects.

Finally, authors have also shown the costs (and benefits) of bankruptcy regulations in dealing with seniority conflicts when seniority rules are costly enforceable.³⁹⁵

³⁹⁰ *I.e.*, implementing *prior in tempore, potior in iure* via contracts.

³⁹¹ D. S. BISER; P. M. DEMARZO, "Sequential Banking", cit.

³⁹² Again, contractual incompleteness leads to a holdup under-investment problem from both the debtor and the creditor.

³⁹³ A. BISIN; D. GUAITOLI, "Moral Hazard and Non-Exclusive Contracts", *RAND Journal of Economics*, vol. 35, 2 (Summer), 2004.

³⁹⁴ J. B. WARNER, "Bankruptcy Costs : Some Evidence", cit.

³⁹⁵ A. SCHWARTZ, "Priorities and Priority in Bankruptcy", cit. A. SCHWARTZ, "A Theory of Loan Priorities", cit. A. BISIN; A. A. RAMPINI, "Exclusive Contracts and the Institution of Bankruptcy", *Economic Theory*, vol. 27, 2006. T. H. JACKSON; A. T. KRONMAN, "Secured Financing and Priorities Among Creditors Among Creditors", *Yale Law Journal*, vol. 88, 1143, 1979.

Empirically, financing contracts very seldom incorporate these exclusivity clauses.³⁹⁶

3.3.4.3 Debt dilution in project finance contracts

In PFCs, parties regulate the provision of all financing sources for the project, thus preventing the feasibility of debt dilution strategies.³⁹⁷ Parties achieve this objective via two typical mechanisms: the *cash waterfall* clauses and the monopoly on financing sources.

Cash waterfall clauses regulate the flow of liquid resources in both directions. During completion, funds move from the financing party to the SPV. During operation, the SPV services the non-recourse debt to the financing party, so cash flows in the opposite way.

The monopoly of financing sources does not necessarily provide that funds will come only from the financing party. It precisely indicates the conditions under which the SPV can recur to third parties with the financing party's permission. Fundamentally, this includes sponsors' obligations to provide extra capital under certain circumstances, as regulated by (capital) control accounts.

Notice how PFCs reproduce both of the solutions that, under corporate finance would be theoretically optimal, but would be practically not feasible. First, they allow for the consolidation of all financing sources in a single contracting party. Second, they include a precise regulation of conditions under which the SPV should receive later financing from third parties. The FP can now implement sophisticated agreements to assess the single project on its own merits based on better information.

Additionally, under PFCs, restrictive covenants will affect sponsors only residually. In conditions precedent, the FP requests that individual sponsors show (and preserve) her financial capacity to cover individual needs of the project by providing capital contributions. The FP may also request that sponsors abstain from entering into contracts that could compromise the availability of material resources necessary for complying with their obligations for inputs to the project.

³⁹⁶ C. W. SMITH; J. B. WARNER, "On Financial Contracting: An Analysis of Bond Covenants", cit. A. BISIN; D. GUAITOLI, "Moral Hazard and Non-Exclusive Contracts", cit.

³⁹⁷ *Vid.* B. ESTY, "The Economic Motivations for Using Project Finance", cit.

3.3.5 Asset diluting strategies

The conflicting interests (tensions) of shareholders and creditors also exacerbate because of asset dilution problems. By asset dilution strategies, the literature describes opportunistic actions under which controlling shareholders extract wealth directly from the company to the detriment of creditors.³⁹⁸ A distinctive feature of asset dilution strategies is that often, sponsors implement them in contravention to legal norms expressly protecting the integrity of collateral value to creditors (not only to shareholders).

3.3.5.1 Asset dilution in corporate finance

Asset dilution strategies include all opportunistic ways under which wealth may be transferred from the company to shareholders. The concept is wide-reaching but not imprecise. These actions may be implemented directly both by shareholders controlling the company *de facto* and by managers acting under the duties of loyalty to the company.

In corporate law and economics, asset dilution strategies are associated or studied as an agency problem between owners and creditors. However, the tension can also be understood as stemming from a free cash flow problem –an approach more common in corporate finance literature. Some actions may benefit only sub-groups of shareholders or individuals in control of the company. Asset dilution affects creditors' interests not only by reducing the current value of collaterals but also by increasing the likelihood of default.

Abusive strategies may take many forms. Sponsors may skip reporting self-dealing transactions. They may manipulate accounting information and acquire undervalued goods or services from the company. They may also disguise losses and proceed to the distribution of dividends *as usual* -in violation of charters or mandatory insolvency legal provisions. More rudimentary, shareholders may extract benefits from the

³⁹⁸ Cf. pp. 116 and ff. in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit. Also pp. 84, 103 and 115 in V. FINCH, *Corporate Insolvency Law - Perspectives and Principles*, Cambridge University Press, Cambridge, 2002. Also generally, on contractual preventions pp. 126, in C. W. SMITH; J. B. WARNER, “On Financial Contracting: An Analysis of Bond Covenants”, cit.

company by merely commingling personal and company assets.^{399 400}

Nevertheless, before affecting creditors, the spoliation of corporate organisational value also harms expected profits of minority shareholders. The vulnerabilities and the types of protection enjoyed by shareholders and creditors are, however, different. As owners expecting variable dividends from the business, minority shareholders have access to legal disciplining mechanisms that they can trigger pre-emptively during businesses' lives. Contrast this with creditors' position to which defensive measures are only available before its imminent insolvency, or after default has been verified.⁴⁰¹

3.3.5.2 Asset dilution and project finance contracts

In PFCs, the allocation of a project under the SPV ownership and control prevents

³⁹⁹ The strategy of commingling of assets is known in most western jurisdictions by different names, *cf. pp.* 735 and 736 in A. CAHN; K D. DONALD, *Comparative Company Law - Text and Cases on the Law Governing Corporations in Germany, the UK and the USA*, Cambridge University Press, 2010.

⁴⁰⁰ A particular comment deserves the case of controlling shareholders. Exceptionally large projects typically come with asymmetries of information associated with the complexity of their assets and the abundance of cash flow during operation; these two factors allow for a moral hazard problem which is precisely analogous to that visible in another tension between ownership and control (managerial indiscipline). In this case, internal sources allow controlling shareholders to camouflage asset diluting strategies against creditors. *Cf.* M. C. JENSEN, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers", *cit.*

⁴⁰¹ *Cf.* J. ARMOUR, "Share Capital and Creditor Protection: Efficient Rules for a Modern Company Law", *cit.* Also, J. ARMOUR, "Legal Capital: an Outdated Concept?", *European Business Organization Law Review (EBOR)*, vol. 7, 01, 2006. Legal systems also protect both creditors and minority shareholders by regulating the type and quality of the information externalised by companies. Examples of information-based protections are the regulation of accounting standards and the occasional necessary presence of *gate keepers* and independent directors as qualified and neutral observers. *Cf.* page 285 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, *cit.*, A. W. A. BOOT; T. T. MILBOURN; A. SCHMEITS, "Credit Ratings as Coordination Mechanisms", *Review of Financial Studies*, vol. 19, 1, 2006.

asset dilution strategies. Besides, in PFCs, the SPV has no minority shareholders (outsiders) vulnerable to these strategies.⁴⁰² These benefits are visible in both informational and material dimensions.

On the informational dimension, PFCs allow sponsors and the financing party to design accounting and monitoring systems to a single project –*i.e.*, without noises from other business units. Parties can use this information also for managerial control. Furthermore, the financing party –a creditor- can implement information duties that she can assess with her advisors as the project advances towards completion.

Additionally, the FP is a single debt provider capable of both readjusting and enforcing individually (without rational control apathy problems faced by dispersed shareholders or smaller creditors). The FP will trigger contractually implemented informational mechanisms, including certification processes regulated in conditions precedent. Thus, *in itinere*, the FP will receive information revealed actively by the sponsors, and she will not need to wait until the imminence of the company insolvency to activate informative and contractual defensive mechanisms. On the material dimension, the allocation of assets under the control of a SPV places an obstacle for individual shareholders to materially access assets exclusively or without being noticed by other sponsors.

In PFCs, asset dilution strategies against the financing party are possible, but they require full collusion from all the sponsors. I will dedicate chapters 5 and 6, to describing strategic tensions between sponsors (individually and collectively) and the FP.

3.4 Tensions between concentrated debt holders and the company

The concentration of long-term debt in a few hands brings relevant benefits to companies investing in costly projects. However, long term risks induce the more important lenders to take contractual preventions that also they may use opportunistically. Under this sub-section, first, I will review some of the efficiencies of concentrating debt in a few sources. Secondly, I will describe some of the

⁴⁰² Naturally the largest of project finance contracts might have equity investors beyond sponsors. These equity holders however take participations in stages of the project in which the non-recourse stage has been completed –*i.e.*, after the financing party has recovered her full claims-, or they invest in the project behind institutional (qualified) investors.

opportunistic strategies implementable by concentrated lenders. I will refer to how these abuses are not feasible under project finance contracts in the third place.

3.4.1 Advantages of concentrating debt

The concentration of debt in a few hands brings several benefits. In essence, reducing the number of contracting parties diminishes the general costs of internalising information. These positive aspects have been well-studied in the literature. The economic theory of contracts finds these benefits *ex-ante* (revelation and internalisation of information), *itineri* and *ex-post* (improving both reciprocity-sustained cooperation and external enforcement).⁴⁰³

Furthermore, better information not only improves the contractual interaction between a borrower and each of the lenders but also contributes to the dynamics among individual creditors in their collective action challenges. Let us now consider how these general aspects are visible in the literature on banking contracts.

The scenario ex-ante. Ex-ante, dispersed creditors are not only bondholders (behind expert cash market intermediaries), but they are small input providers often financing with material assets (inputs). These contractors face problems with finding or exchanging information. Moreover, as a result of collective action problems (costs), small dispersed creditors of different projects do not meet in practice. In contrast, ex-ante, larger creditors taking more significant risks have higher incentives for screening.⁴⁰⁴ Larger lenders' contractual behaviour then comes with a certification effect in favour of dispersed free-riding debt holders.⁴⁰⁵

The scenario as the project evolves. During the operation phase, the reduction

⁴⁰³Vid. J. LEVIN, "Relational Incentive Contracts", cit., G. BAKER ET AL, "Relational Contracts and the Theory of The Firm", cit., R. GIL; J. MARION, *The Role of Repeated Interactions , Self-Enforcing Agreements and Relational [Sub] Contracting: Evidence from California Highway Procurement Auctions*, 2009.

⁴⁰⁴ Anecdotally, it has been found that banks produce information to filter bad projects also for reputational purposes. T. J. CHEMMANUR; P. FULGHIERI, "Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt", *The Review of Economic Studies*, vol. 7, 3, 1994.

⁴⁰⁵ S. L. LUMMER; J. J. MCCONNELL, "Further Evidence on the Bank Lending Process and the Capital-Market Response to Bank Loan Agreements", *Journal of Finance and Economics*, vol. 25, 1989. D. PREECE; D. J. MULLINEAUX, "The Role of Lending Syndicates", *Journal of Banking & Finance*, vol. 20, 1996.

in the number of debt sources brings further benefits. The concentration of debt in fewer hands avoids duplication of monitoring efforts among dispersed creditors.⁴⁰⁶ The lower number of creditors, in turn, prevents the costs of renegotiations between individual creditors and the company and among lenders.

All above facilitates relational banking.⁴⁰⁷ ⁴⁰⁸ Relational banking improves the quality of readjustments after unexpected events but also increases managerial discipline.⁴⁰⁹ Authors have also shown how relational pressure over covenant violating firms results in value to shareholders.⁴¹⁰

The scenario ex-post. Scholars have also analysed how parties' capacity to renegotiate agreements inexpensively functions as a complement to monitoring efforts.⁴¹¹ Monitoring then functions in substitution for low collateral value and for weaker creditor protection.⁴¹² This is particularly visible in companies borrowing from lending syndicates.⁴¹³ Finally, the support from large but few banks has been

⁴⁰⁶ E. CARLETTI ET AL, "Multiple-Bank Lending: Diversification and Free-Riding in Monitoring", cit.

⁴⁰⁷ See the entry *Relational banking* in the glossary.

⁴⁰⁸ C. JAMES, "Some Evidence on the Uniqueness of Bank Loans", *Journal of Financial Economics*, vol. 19, 1987. S. L. LUMMER; J. J. MCCONNELL, "Further Evidence on the Bank Lending Process and the Capital-Market Response to Bank Loan Agreements", cit. D. PREECE; D. J. MULLINEAUX, "The Role of Lending Syndicates", cit.

⁴⁰⁹ R. GERTNER; D. SCHARFSTEIN, "A Theory of Workouts and the Effects of Reorganization Law", cit. A. BRUNNER; J. P. KRAHNEN, "Multiple Lenders and Corporate Distress: Evidence on Debt Restructuring", *Review of Economic Studies*, vol. 75, 2, 2008.

⁴¹⁰ G. NINI; D. C. SMITH; A. SUFI, "Creditor Control Rights, Corporate Governance, and Firm Value", *Review of Financial Studies*, vol. 25, 6, 2012.

⁴¹¹ D. PREECE; D. J. MULLINEAUX, "The Role of Lending Syndicates", cit.

⁴¹² M. MANOVE; A. PADILLA; M. PAGANO, "Collateral versus Project Screening: A Model of Lazy Banks", *RAND Journal of Economics*, vol. 32, 4, 2001. A. BERGER; G. UDELL, "Collateral, Loan Quality and Bank Risk", *Journal of Monetary Economics*, vol. 25, 1990.

⁴¹³ D. PREECE; D. J. MULLINEAUX, "The Role of Lending Syndicates", cit.

shown to correlate with restructuring procedures' success.⁴¹⁴ All aspects improve debt capacity.

3.4.2 Opportunism from lenders and the costly precautions

Despite its valuable benefits, debt concentration in a few hands comes with costs to both borrowers and lenders.⁴¹⁵ In essence, long-term, high-risk debt takers regularly demand safeguards via covenants. These arrangements' incompleteness allows for opportunism from lenders (and backwards induction hold-up induced underinvestment from the debtor).⁴¹⁶

We can classify the contractual protections allowing for opportunism in many ways. Some of them produce effects *ab initio*. Some others subordinate their consequences to pre-determined events. These events may be *acts of nature*⁴¹⁷ or defaults from borrowers. Defaults may be *material*, or merely *technical*.⁴¹⁸

⁴¹⁴ P. BOLTON; D. SCHARFSTEIN, "Optimal Debt Structure and the Number of Creditors", *Journal of Political Economy*, vol. 104, 1, 1996. O. COUWENBERG; A. DE JONG, "It Takes Two to Tango: An Empirical Tale of Distressed Firms and Assisting Banks", *International Review of Law and Economics*, vol. 26, 4, 2006.

⁴¹⁵ Let us assume that creditors do not provide any material inputs to companies and that cash transfers are costlessly verifiable. Hence, there cannot be moral hazard associated with hidden actions of lenders. I can therefore confine my attention to the tensions stemming from the necessary incompleteness of these contractual precautions. The assumption is not only realistic, but it is also standard (and tacit) in the literature of corporate finance.

⁴¹⁶ Gorton & Kahn (2000) observed how loan rates and hierarchies of claims are calibrated also with the purpose of minimising bargaining powers of banks in future renegotiations. *Ibid.*

⁴¹⁷ I am using the expression *act of nature*, (similar to the *play of nature*), as in the jargon of contract theory. The act of nature here refers to an event that is exogenous to the strategies of parties and change the setting as originally foreseen. This is not to be confused with the legal *act of God*, or the events of *force majeure* in Comparative Contract Law.

⁴¹⁸ *I.e.*, *technical default* is defined as a violation to any commitment other than one requiring the payment of interest or of principal. *Cf.* S. CHAVA; M. R. ROBERTS, "How Does Financing Impact Investment? The Role of Debt Covenants", cit. M. D. BENEISH; E. PRESS, "The Resolution of Technical Default", cit. M. D. BENEISH; E.

Precautions can take many forms and may include duties to inform, permissions to witness board meetings, impositions of managerial restrictions, limits to the investment policies, or veto powers on alternative financing sources.⁴¹⁹ The purposes of all these mechanisms are to protect lenders from the conflicting interests described under previous sections.

There is a series of academic articles dealing with the costs of bounded rationality in lending contracts. Beyond contractual completeness, lenders will (threaten to) over-enforce protective mechanisms.⁴²⁰ The body of literature exploring these interests in conflict is not large, but it is precise and specific to banking contracts. Let us consider some of these findings.

Perhaps the most common strategic actions are associated with technical default provisions. Some of the most frequent clauses allow for the acceleration of loan terms, the increase in interest rates, or the imposition of pecuniary fines. More drastically, covenants may provide for the withholding of further credit⁴²¹ or the reduction of the borrowing base.⁴²²

In some cases, opportunism becomes possible after access to inside information. For instances, lenders may *strategically release industry-specific information to better its own interests at the expense of the firm*.⁴²³ In other cases, after default events have been verified, debt covenants may also provide for certain transfers of control

PRESS, “Costs of Technical Violation of Accounting-based Debt Covenants”, cit.C. DEMIROGLU; C. JAMES, “The Information Content of Bank Loan Covenants”, cit.

⁴¹⁹ Considering their legal effects, protective covenants often relate to investment policies, or they may impose financing and managerial restrictions to borrowers.

⁴²⁰ This is a manifestation of a holdup problem.

⁴²¹ S. CHAVA; M. R. ROBERTS, “How Does Financing Impact Investment ? The Role of Debt Covenants”, cit. M. ROBERTS; A. SUFI, “Renegotiation of Financial Contracts: Evidence from Private Credit Agreements”, *Journal of Financial Economics*, vol. 93, 2, 2009, Elsevier.

⁴²² Cf. p. 218 in K. C. W. CHEN; J. K. C. WEI, “Creditors’ Violations Debt of Decisions to Waive Accounting-Based Covenants”, *The Accounting Review*, vol. 68, 2, 1993.

⁴²³ Vid. p. 227 in R. AGARWAL; J. A. ELSTON, “Bank–Firm Relationships, Financing and Firm Performance in Germany”, *Economics Letters*, vol. 72, 2, 2001.

rights which may also be used as bargaining threats.⁴²⁴ In more subtle ways, banks may induce managers to capture projects with volatilities that are lower than optimal to the borrower. While trying to maintain cash flow variances and insolvency risks low, banks may also extract benefits by persuading debtors to finance further projects with equity.⁴²⁵

Banks may build their bargaining power also from indirect costs associated with the enforcement of such clauses.⁴²⁶ Among these indirect costs, we may include the financial distress costs caused by the limited access to further debt, the loss in investment flexibility, the increase in agency costs from recurring to other financing sources. Other indirect costs include the losses from selling assets under time constraints⁴²⁷ or the weakening of bargaining power when dealing with their input providers.⁴²⁸ These costs resulting from over-enforcement of debt covenants ultimately lead to investment distortions in other business units.⁴²⁹

The capacity of debtors to absorb such costs without incurring further distress varies with the circumstances under which expropriation occurs. As parties use technical default provisions for deterrence, events of technical default may not occur in situations where debtors are already under distress or in the vicinity of their insolvencies -intuitively, they function as early warnings of risk.⁴³⁰ It seems reasonable to speculate that this state of financial health may allow borrowers to

⁴²⁴ *Vid. p.* 2086 in S. CHAVA; M. R. ROBERTS, “How Does Financing Impact Investment? The Role of Debt Covenants”, cit.

⁴²⁵ *Cf. p.* 420 in R. KROSZNER; P. STRAHAN, “Bankers on Boards: Monitoring, Conflicts of Interest, and Lender Liability”, *Journal of Financial Economics*, vol. 62, 2001.

⁴²⁶ Rajan (1992) was the first to sustain that “while informed banks make flexible financial decisions which prevent a firm’s projects from going awry, the cost of this credit is that banks have bargaining power over the firm’s profits, once projects have begun”. *Ibid.*

⁴²⁷ D. T. BROWN ET AL, “Asset sales by financially distressed firms”, cit.

⁴²⁸ *I.e.*, including workers, as in the analysis by Sarig, *cf.* O. SARIG, “The effect of leverage on bargaining with a corporation”, cit.

⁴²⁹ M. BERLIN; L. J. MESTER, “Debt Covenants and Renegotiation”, cit. P. MACKAY, “Real Flexibility and Financial Structure: An Empirical Analysis”, cit.

⁴³⁰ *Vid. pp.* 431 and *ff.* in E. BORGONOVO; S. GATTI, “Risk analysis with contractual default. Does covenant breach matter?”, cit.

absorb the consequences of renegotiations without significant increments in insolvency risks. This would ultimately result in higher return values from expropriating actions (from more substantial bargaining surpluses).

3.4.3 Opportunism of the financing party

Regardless of efforts spend in mitigating risks, in non-recourse financing, contracts between the financing party and the SPV will be necessarily incomplete. Thus, parties to PFCs still find room for opportunism (and hold-up problems in general).

There are, however, two fundamental differences with corporate finance settings. In project finance contracts, there is no pool of side projects under the corporate debtor's property that can absorb the impact of expropriations (cross-subsidising). The second distinctive aspect is that -debt-to-equity ratios observed in non-recourse financing (*i.e.*, commonly of about 70/30) appear disproportionately higher as compared to the rations habitually observed in regular corporate finance scenarios.⁴³¹

From these two features, we may build a -perhaps simplistic proposition. The SPV is less capable of absorbing unexpected readjustments without increasing the likelihood of default. Then, in virtue of the debt's uncollateralised nature, the FP internalises more of the marginal costs (insolvency risks) externalised to the project from its over-enforcement of debt covenants (interest alignment). With lower returns from opportunistic threats, we should simply find lower enforcement of technical default clauses in PFCs than in somehow comparable corporate-financed settings.

To the best of my knowledge, there is no theoretical or empirical literature dealing with the specific object of opportunism by lenders in non-recourse or limited-recourse project financing. It is interesting to observe both in theory and empirically how bargaining power and consequently, the appropriable wealth varies as the project progresses towards completion. Based on the above, we can imagine opportunism growing as the project approaches the final operation stages.

3.5 Tensions between dispersed financing and the company (adverse selection in open markets)

Above in this chapter, I have considered the contract failures that result *ex-post* from both bounded rationality and hidden actions when projects are very large. References to both the hold-up and moral hazard problems were made. Above, I showed how these problems affect the relationships between the company and individual

⁴³¹ S. SHAH; A. V. THAKOR, "Optimal Capital Structure and Project Financing", *cit.*

contractors (input providers and managers) and between the company and creditors as a class. Let us consider how, backward induction, hidden information affects the relationship between the company and the dispersed (*i.e.*, poorly informed) financing providers *ex-ante*. There are two well-known contract failures, the adverse selection in debt (also known as *credit rationing*) and the adverse-selection in equity.

3.5.1 Large projects and the costs of dispersed financing

In corporate-financed operations, informational asymmetries with external investors lead to a well-known adverse selection problem. In both cases -in debt and in equity-, the adverse selection problem results from the incapacity of dispersed contractors to assess the company's risks (or build conjectures about it) reliably.⁴³² However, the dynamics and costs of adverse selection in debt⁴³³ and in equity⁴³⁴ are different.

⁴³² The adverse selection problem arises when, due to asymmetries of information, parties fail to internalise the real types of their counter parties. Uninformed parties will adjust interests to the average type which will exclude the best samples out of the market. These ultimately brings the quality of the expected type to a lower level opening a race to the bottom from reciprocal conjectures. Parties stop the failure by screening and signalling; collaterals being the most effective mechanisms, only available in debt. G. AKERLOF, "The market for" lemons": Quality uncertainty and the market mechanism", *The quarterly journal of economics*, vol. 84, 3, 1970. M. SPENCE, "Job Market Signaling", *The quarterly journal of Economics*, vol. 87, 3, 1973. M. SPENCE, "Signaling in Retrospect and the Informational Structure of Markets", *The American Economic Review*, vol. 92, 3, 2002. K. E. SPIER, "Incomplete Contracts and Signalling", *The RAND Journal of Economics*, vol. 23, 3, 1992.).

⁴³³ D. M. JAFFEE; F. MODIGLIANI, "A Theory and Test of Credit Rationing", *The American Economic Review*, vol. 59, 5 (Dec.), 1969. D. M. JAFFEE; T. RUSSELL, "Imperfect Information, Uncertainty, and Credit Rationing", *The Quarterly Journal of Economics*, vol. 90, 4 (Nov.), 1976. J. STIGLITZ; A. WEISS, "Credit Rationing in Markets with Imperfect Information", *The American economic review*, vol. 71, 3, 1981. H. BESTER, "Screening vs . Rationing in Credit Markets with Imperfect Information", *The American Economic Review*, vol. 75, 4, 1985. D. DE MEZA; D. C. WEBB, "Too Much Investment: A Problem of Asymmetric Information", *The Quarterly Journal of Economics*, vol. 10, 281-292, 1987.

3.5.1.1 Adverse selection in debt

In debt, dispersed creditors will expand interests after bargaining for contractual safeties. When creditors are concentrated, the failure happens in the bilateral interaction. When debt holders are dispersed, investors will attempt to escape collective action associated limitations by means of free-riding on qualified market intermediaries.

In both cases, by acting directly, or via intermediaries, prospective creditors spend transaction costs and limit the problem via contractual safeties of various sorts. These include collaterals from third parties, security interests, covenants and other credit protective devices. In earlier parts of this chapter, I have elaborated on the opportunity costs of restrictive covenants in general. These precautions come at the strategic costs described above. Their costs grow with the financing needs of exceptionally large projects.

Additionally, by recurring to risky debt, shareholders send information about the company's financial health (see below). Companies seeking financing may also recur to debt for signalling purposes.⁴³⁵

In corporate-financed operations, the asymmetries of information between creditors and the company stem from the complexity of the company's unforeseeable range of growth opportunities. Companies delivering outputs to the open market are also permeable to exogenous factors and conflicting interests affecting different projects and business units as described above. Finally, screening and signalling values and costs invariably decrease with organisations' complexity.

⁴³⁴ For the seminal papers, *Vid.* S. MYERS, "The Capital Structure Puzzle", *cit.* S. C. MYERS; N. S. MAJLUF, "Corporate Financing and Investment Decisions when Firms Have Information that Investors Do not Have", *cit.*

⁴³⁵ *Cf. pp.* 739 and *ff.* in M. MANOVE ET AL, "Collateral versus Project Screening: A Model of Lazy Banks", *cit.* ; H. BESTER, "Screening vs . Rationing in Credit Markets with Imperfect Information", *cit.* D. BESANKO; A. V. THAKOR, "Competitive Equilibrium in the Credit Market under Asymmetric Information", *Journal of Economic Theory*, vol. 42, 1987. Y.-S. CHAN; A. V. THAKOR, "Collateral and Competitive Equilibria with Moral Hazard and Private Information", *The Journal of Finance*, vol. XLII, 2, 1987.

3.5.1.2 Adverse selection in equity

In equity, the dispersed investors cannot adjust interest levels nor request contractual safeties or collateral. The nature of equity (the absence of enforceable expectations) implies that the severity of adverse selection depends exclusively on the quality of information-based strategies (screening and signalling).⁴³⁶ With that information, shareholders can choose entering or leaving the company.

A problem arises when the company cannot access equity markets without signalling incorrectly. In other words, the company cannot easily issue shares without generating costly reactions in the market. Let us shortly see who this happens.

Equity investors will value information from every source. Often, managers and shareholders are the best insiders to the financial wealth of companies. Managers and shareholders act rationally, both privately and institutionally. Therefore, equity investors will look at the company's strategies and the private actions of managers and controlling shareholders (perhaps also of managers complying with disclosure regulations) as sources of information. The managers will consequently convey information leading the market to desirable reactions (signalling). By nature, signalling is costly.⁴³⁷ Some of most basic forms of signalling are simple and consist of playing with dividends, equity and debt in the open market.

First, shareholders signal financial prosperity with dividends. Dividends are a luxury that bad firms cannot afford. However, committing to issuing dividends has the costs of depriving companies from valuable cash flows (internal sources of finding) for other perhaps more valuable purposes. Additionally, once companies have committed to delivering dividends, they become vulnerable to the volatility of cash flows variations from very large business units. Furthermore, in relation to costly projects, commitment to issuing dividends in the short run may affect internal sources as large projects do not generate cash flows until the phase of operation, which may happen

⁴³⁶ M. SPENCE, "Job Market Signaling", cit. K. E. SPIER, "Incomplete Contracts and Signalling", cit. M. SPENCE, "Signaling in Retrospect and the Informational Structure of Markets", cit.

⁴³⁷ Signalling is costly because the information that the market expects is incompatible with the situations of distress that the managers desire to remove from the eyes of investors.

after years of construction.⁴³⁸

Second, companies may signal by playing with the issuance of equity. The dispersed investors perceive that managers and shareholders who are asymmetrically (better) informed will issue equity only if they know that shares are overpriced by the market. Similarly, investors may also understand that managers will buy if shares are underpriced or with good perspectives of growing in their market value. Consequently, under this market dynamics, beyond a certain point, shareholders will lose value the more funds they raise from equity issuances.

Additionally, lowering the price of equity by selling shares as a means of financing exceptionally expensive projects may pose a threat from institutional investors and competitors who may take the opportunity to increase their political powers –or even to take over the company.⁴³⁹ Finally, the funding exceptionally costly projects with internal sources (retained dividends) is not easy without jeopardising distributions of benefits ultimately affecting stock values in the short run.⁴⁴⁰

Third, shareholders may issue debt so as to signal that the company is financially healthy, far from distress costs, and willing to take the risk of allowing senior

⁴³⁸ M. MILLER; K. ROCK, “Dividend Policy under Asymmetric Information”, *The Journal of Finance*, vol. 40, 4, 1985. S. BHATTACHARYA, “Imperfect Information, Dividend Policy, and “The Bird in the Hand ” Fallacy”, *The bell Journal of Economics*, vol. 10, 1, 1979. J. STIGLITZ, “A Re-Examination of the Modigliani-Miller Theorem”, *The American Economic Review*, vol. 59, 5, 1969.

⁴³⁹ Cf. H. E. LELAND; D. E. PYLE, “Informational Asymmetries, Financial structure, and Financial Intermediation”, *The journal of Finance*, vol. 32, 2, 1977 and S. C. MYERS; N. S. MAJLUF, “Corporate Financing and Investment Decisions when Firms Have Information that Investors Do not Have”, cit. Cf. T. CHEMMANUR; K. JOHN, “Optimal Incorporation, Structure of Debt Contracts, and Limited-Recourse Project Financing”, cit.

⁴⁴⁰ For one of the earliest works with a specific treatment of signalling in stock markets, *Vid.* P. ASQUITH; D. W. MULLINS, “Signaling with Dividends, Stock Repurchases, and Equity Issues”, *Financial Management*, vol. 15, 3, 1986. T. H. NOE, “Capital Structure and Signaling Game Equilibria”, *The Review of Financial Studies*, vol. 1, 4, 1988.

claimants to control them. Debt capacity is however limited.⁴⁴¹

Generally, parties know that fixed interests from debt usually means more substantial variable dividends. Equity investors also know that it is difficult for companies to issue collateralised debt to the open market without exhausting debt capacity.

3.5.2 Adverse selection in project finance contracts

Project finance contracts mitigate adverse selection problems both with equity and debt financing. By large, in PFCs, the mitigation of adverse selection problems in both debt and equity results from two aspects. First, the concentration of both equity and debt in a few hands. Second, the use of a SPV for completing a single project.

Fundamentally, because the SPV assets are highly specific, the protective measures designed by the financing party focus on risk prevention (*i.e.*, in assuring project completion) rather than on preserving redeployment (collateral) value. This is the risk allocation mechanism that the FP implements for internalising the bulk of the risk in the form of non-recourse claims. This risk allocation mechanism -in essence, resulting from a signalling mechanism- not only reduces adverse selection at the debt level, but it also produces information externalities to whoever equity investor is not a sponsor.

Adverse selection in debt. In debt, the adverse selection problem is drastically reduced by the concentration of the provision (and supervision) of all financing efforts in a single entity –the financing party who access information (and enforces provisions) both *ex-ante* and *itineri*.⁴⁴² Additionally, in PFCs, the single financing party (often a syndicate of banking entities) can coordinate information revealing efforts. This is true *ex-post* or *itineri* and *ex-ante* during the implementation of the

⁴⁴¹ *Cf.* M. J. FLANNERY, “Asymmetric Information and Risky Debt Maturity Choice”, *The Journal of Finance*, vol. 41, 1, 1986. D. BESANKO; A. V. THAKOR, “Competitive Equilibrium in the Credit Market under Asymmetric Information”, *cit.* S. ROSS, “The Determination of Financial Structure: The Incentive-Signalling Approach”, *The Bell Journal of Economics*, vol. 8, 1, 1977. Y.-S. CHAN; A. V. THAKOR, “Collateral and Competitive Equilibria with Moral Hazard and Private Information”, *cit.*

⁴⁴² *Vid.* in chapters 2 and 4 the elaboration on now, as the project evolves, the FP assign her credits to third parties. In Chapter 4, in the case-studies, see the involvement of banks as intermediaries between the SPV and bond holders as well as equity investors.

lending contract when parties identify the critical tasks and risks under all foreseeable eventualities.⁴⁴³ Furthermore, as shown in previous sections, the financing party holding a monopoly of financing sources is better positioned to enforce protective measures against the conflicting interests that are particularly severe in corporate settings. This includes not only a list of details (proxies for risk) to be revealed during the life of the project, but also a highly simplified governance system allowing the financing party to react under pre-determined circumstances.⁴⁴⁴

Moreover, via direct agreements, the financing party enforces these measures not only against the SPV –the direct debtor- but also against sponsors -the input providers and the *de facto* managers to the project. Likewise, in PFCs, the single project allows the financing party to agree with sponsors on a schedule where cash is delivered precisely as such project advances. As observed, this is implemented via the so-called *cash waterfall* clause.⁴⁴⁵ In PFCs, a single project and the lowered readjustment costs imply that the financing party and sponsors may more efficiently sustain a long-term relational interaction around the single project. Without noises and hazards from other projects, the financing party can -indeed at high transaction costs- implement sophisticated mechanisms allowing for benefits as the single project evolves as planned.⁴⁴⁶ Finally, the better information that the FP externalises also

⁴⁴³ E. CARLETTI, “The structure of bank relationships, endogenous monitoring, and loan rates”, *Journal of Financial Intermediation*, vol. 13, 1, 2004. E. CARLETTI ET AL, “Multiple-Bank Lending: Diversification and Free-Riding in Monitoring”, cit.

⁴⁴⁴ Consider the most representative and most dramatic of these simplified governance measures, the *step-in* rights in favour of the financing party. *Vid.* page 292 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. Page 201 in D. GRIMSEY; M. K. LEWIS, *Public Private Partnerships - The Worldwide Revolution in Infrastructure Provision and Project Finance*, cit. Page 118 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit. Page 132 (and footnote 10) in M. LYONNET, “Financing the Eiffel Tower: Project Finance and Agency Theory”, cit. Page 59 in E. FARQUHARSON ET AL, *How to Engage with the Private Sector in Public-Private Partnerships in Emerging Markets*, cit.

⁴⁴⁵ *Vid.* p. 184 and *ff.* in J. DEWAR, *International Project Finance - Law and Practice*, cit.

⁴⁴⁶ B. KLEIN, “Why Hold-ups Occur: The Self-Enforcing Range of Contractual Relationships”, *Economic Inquiry*, vol. XXXIV, July, 1996; D. WEBB, “Long-Term

reduces the uncertainties of smaller risk-takers –*i.e.*, employees, government, small input providers.⁴⁴⁷

Adverse selection in equity. In equity, in project finance contracts, risk aversion problems are practically eliminated by raising equity almost exclusively from sponsors. As owners and controllers, sponsors are not only the best-informed individuals who generated the project in the first place, but they also interact with project assets materially, both during completion and operation. In project finance contracts, equity is provided not by external dissipated and poorly informed investors but from the providers of critical material inputs to the project –*v.gr.*, by the sponsors themselves.⁴⁴⁸

3.6 Conclusions

The structural elements of PFCs provide certain strategic advantages that may not be obtained under corporate finance settings. These characteristics lack many of the components that lead to the well-known agency conflicts in corporate environments. These benefits counterbalance the exceptionally high transaction costs necessary for the substitution of collateral in non-recourse financing.

On the investment dimension, project finance contracts are used for the completion of single projects under the property of a project-dedicated bankruptcy-remote legal entity (this prevents double way risk contamination between the sponsors or their creditors and project assets). On the financing side, the funding debt comes from a single party (or by a low number of coordinated lenders), and equity is contributed by parties who are also critical input providers to the project. Besides, much of the contractual compensations that the sponsors expected in exchange for their input contributions to the project as well as their variable dividends are subordinated to the

Financial Contracts can Mitigate the Adverse Selection Problem in Project Financing”, *International Economic Review*, vol. 32, 2, 1991.

⁴⁴⁷ R. RAJAN; A. WINTON, “Covenants and Collateral as Incentives to Monitor”, *The Journal of Finance*, vol. 50, 4, 1995.

⁴⁴⁸ While considering an optimal capital structure in project finance contracts, in an early paper Shah & Thakor stressed the minimisation of information costs as one of the main reasons why parties choose to place projects under a separate organisation. *Vid.* S. SHAH; A. V. THAKOR, “Optimal Capital Structure and Project Financing”, *cit. cf.* A. DITTMAR; A. THAKOR, “Why Do Firms Issue Equity?”, *The Journal of Finance*, vol. LXII, 1, 2007.

full servicing of the financing debt.

Concretely, the allocation of debt and risky assets in a separate legal entity avoids distress costs and preserves debt capacity at the sponsors' level. Investing in a single project-dedicated impedes asset substitution strategies - the problem in which controlling shareholders maximise limited liability shelter value adopt riskier than optimal projects in detriment of creditors. The predefinition of all financing (debt and equity) eliminates the debt overhang problem, the scenario in which the company fails to receive capital contributions from shareholders anticipating that company wealth will accrue to creditors. Finally, the contracting for debt from a single source prevents asset dilution problems -the case in which older creditors find themselves competing for cash flows and collateral with newer lenders. Furthermore, the allocation of the property rights of a single project to all sponsors reduces the return value of expropriations, thus discouraging opportunistic strategies from critical input contractors as well as from debt providers. Besides, allocating assets in a dedicated legal entity allows sponsors to coordinate and concentrate monitoring efforts for managerial disciplining purposes. Moreover, in project finance contracts, managerial-related conflicts (from free cash flow, time horizon preferences and managerial risk aversion) are highly avoided by designing a project-specific governance system that also allows the efficient intervention of creditors.

The isolation of a single project under a single legal entity allows a financing party to design and supervise the implementation of a contractual system under which all parties may allocate tasks and risks among individual sponsors. Finally, project finance contracts allow the financing party to access information and to enforce risk pre-emptive mechanisms which next to the fact that equity comes entirely from sponsors –who are key input providers to the project- resolves adverse selection problems in manners that parties cannot replicate under the classic corporate structures.

PART II

The second part of the study identifies the elements and necessary strategic aspects of FPCs, the tensions between the sponsors as a class and the non-recourse lender, and the individual responses from all parties in all circumstances.

Chapter 4

Identifying PFCs: The necessary elements and the strategies of parties

Abstract. Chapter 2 offered illustrations of contractual practices as seen dispersed in the industry and management-oriented literature. Chapter 3 has shown how PFCs overcome the feasibility boundaries of typical collateralised corporate financing. Chapter 4 now isolates six elements and six strategic features that are inherent to SPV.

Based on these identifications, the chapter characterises the objective functions of parties all PFCs, the items that govern the feasibility of all PFCs, and the necessary contrasts with other financing techniques.

Finally, the chapter verifies the above with the concrete evidence of four exceptionally diverse real-life scenarios as published in the literature on project financing.

Table of contents

4	CHAPTER 4 - IDENTIFYING PFCs: THE NECESSARY ELEMENTS AND THE STRATEGIES OF PARTIES	203
	TABLE OF CONTENTS.....	205
4.1	INTRODUCTION.....	209
4.1.1	Research question.....	209
4.1.2	Object of the chapter and the sequence of the analysis	209
4.1.3	Value of contributions	209
4.2	SIX NECESSARY COMPONENTS OF PFCs.....	213
4.2.1	Sponsors	214
4.2.1.1	Sponsors originate the project	214
4.2.1.2	Sponsors dictate project value	215
4.2.1.3	Sponsors contribute with specific resources	215
4.2.1.4	Sponsors deliver non-contractible responses.....	217
4.2.1.5	Sponsors own the SPV.....	218
4.2.1.6	Sponsors control the project materially.....	221
4.2.1.7	Sponsors sustain cooperation relationally.....	222
4.2.1.8	Sponsors hold residual expectations	223
4.2.1.9	Sponsors' number is relevant but not indispensable ...	223
4.2.1.10	Sponsors' necessary features	224
4.2.2	The Special Purpose Vehicle (SPV)	225
4.2.2.1	SPV provides limited liability protects owners.....	225
4.2.2.2	SPV protects project assets from the creditors of owners	226
4.2.2.3	SPV protects project assets from other projects.....	226
4.2.2.4	SPV protects the information that parties receive from the project (the implementation of dedicated information mechanisms)	226
4.2.2.5	SPV facilitates the contractual interaction between all sponsors and the FP.....	227
4.2.2.6	SPV facilitates incentive implementation to sponsors .	228
4.2.2.7	The many SPVs in PFCs	228

4.2.2.8	The SPV control is strictly indispensable for the implementation of the risk allocation mechanism	229
4.2.3	Non-recourse debt	230
4.2.4	Single specific project	230
4.2.5	Risk allocation mechanism.....	231
4.2.5.1	A strategically indispensable component of PFCs and its boundaries.....	231
4.2.5.2	Costs of imperfections.....	232
4.2.6	Financing party (FP).....	233
4.2.6.1	FP's defining characteristics	233
4.2.6.2	FP's and the differences with the position of sponsors in PFCs.....	234
4.3	SIX NECESSARY STRATEGIC FEATURES OF PFCs	236
4.3.1	Dependence of FP's claims on the contributions by sponsors; the agreements amongst parties other than the lender (FP) and the debtor (SPV)	237
4.3.2	Sponsors control the SPV and project assets (a strategic approach).....	238
4.3.3	Three tiers of incentives	241
4.3.3.1	The 1 st Tier: The Risk Allocation Mechanism	241
4.3.3.2	The 2 nd Tier: Contracts involving sponsors only	241
4.3.3.3	The 3 rd Tier: implementing incentives via property rights	243
4.3.4	The nerve of conflicting interests. The senior debt and contractual imperfections.....	246
4.3.4.1	Incentive effects of debt and its seniority	248
	4.3.4.1.1 <i>Debt, news, and direct (total) welfare effects</i>	248
	4.3.4.1.2 <i>Debt, wealth, and incentive effects</i>	249
4.3.4.2	Impact of (an optimal) seniority in PFCs	252
4.3.4.3	The (fourfold) feasibility value of implementation	253
4.3.5	Opportunism beyond company spheres against the broader risk allocation mechanism.....	255
4.3.6	Negative value of diversification	255

4.4	NECESSARY FEATURES OF THE OBJECTIVE FUNCTIONS OF PARTIES IN PFCs..	256
4.4.1	The sponsors	257
4.4.1.1	Itineri	257
4.4.1.2	Ex-ante	257
4.4.2	The FP	258
4.4.2.1	Itineri	258
4.4.2.2	Ex-ante	258
4.4.3	Precarious interest alignment and the tensions	259
4.4.3.1	Precarious alignment	259
4.4.3.2	Choices of inputs (<i>Shirking</i>)	261
4.4.3.3	Choices of risk levels (<i>Risking</i>)	262
4.4.3.4	Choices of innovations (<i>Shading</i>).....	262
4.5	NECESSARY FEASIBILITY DETERMINANTS OF PFCs.....	263
4.6	NECESSARY CONTRASTS WITH OTHER FINANCING TECHNIQUES.....	265
4.6.1	Collateralised lending (diversified corporate finance)	265
4.6.2	The private equity industry	266
4.7	VERIFYING ELEMENTS, PARTIES, AND STRATEGIES IN FOUR DISTINCT CASES.....	267
4.7.1	Case-study 1 – An extension of the simplest case of Chapter 2...268	
4.7.1.1	Critical aspects of the project	268
4.7.1.2	Necessary parties and elements	269
4.7.1.3	Necessary strategies and tensions	271
4.7.2	Case-study 2 - The A2 Highway of Poland.....	272
4.7.2.1	Critical aspects of the project	272
4.7.2.2	Necessary parties.....	273
4.7.2.3	Necessary strategies and tensions	276
4.7.3	Case-study 3 – Non-recourse Leveraged Leasing Finance; the financing of the Colstrip power facility by Pennsylvania Power & Light Company (PPL)	277
4.7.3.1	Critical aspects of the project	277
4.7.3.2	Necessary parties and elements	278
4.7.3.3	The necessary strategies and tensions	280

4.7.4	Case-study 4 – Calpine revolving facility	280
4.7.4.1	Critical aspects of the project	280
4.7.4.2	Necessary parties and elements	282
4.7.4.3	The necessary strategies and tensions	282
4.8	CONCLUSIONS	283

4.1 Introduction

4.1.1 Research question

This chapter responds to the third research question:

What are the characteristics of the necessary parties, elements, objective functions and strategic tensions inherent to PFCs?

4.1.2 Object of the chapter and the sequence of the analysis

In Chapter 2, we have seen a characterised PFCs from a practical stance. In that place, we have also observed how parties, elements and features interact contractually by implementing clauses typical of PFCs.

This chapter will now study the six parties and elements of PFCs from a strategic stance. It will consequently identify the necessary characteristics of sponsors, the SPV, the non-recourse debt, the single specific project, the risk allocation mechanism, and finally, the FP. The chapter will show the features that define them as components and why these elements are essential to PFCs.

The chapter will also focus on six strategic aspects inherent to PFCs. It will also identify the items of the objective functions of parties. Based on individual objectives, the study will then identify the necessary strategic tensions (conflicting interests) amongst them. In later chapters, these identifications of objective functions and strategic tensions will serve for analysing the opportunistic idiosyncratic responses by sponsors in PFCs (*shirking, risking, and shading*).

The chapter will also identify the feasibility boundaries of PFCs and the necessary contrasts with other financing techniques.

The final part of the study will analyse four concrete case-studies PFCs. Of these, three will portray real-life non-recourse financing projects as we find them in the management literature. These distinct projects come to depict how parties use PFCs in the most varied material and financial scenarios. The chapter will remark how, in all circumstances, we find the six necessary components and the same functionalities of parties and features. As expected, we will also see in all cases the same strategic tensions. Finally, we will also observe the FP internalising the same risks inherent to all PFCs.

4.1.3 Value of contributions

In general terms, the chapter is the first study advancing strategic considerations about conflicting interests amongst sponsors contributing to a team output (the SPV) and between sponsors and the FP in non-recourse project financing. The chapter is

also the first work advancing strategic considerations oriented to facilitating a judicial and legislative treatment of PFCs (legal institutionalisation). The chapter builds the elemental strategic environment within which parties will deliver their responses as analysed in chapters 5 and 6.

The particular contributions of this chapter are twelve.

I. The necessary elements and strategic aspects of their positions of parties in PFCs. The chapter isolates six components (two parties and four elements) essential to all PFCs. It also advances the strategic analysis of the positions of both sponsors (collectively and individually) and the FP.

II. The indispensable risk allocation mechanism. In that context, the chapter is the first paper to identify the risk allocation mechanism as a component of PFCs. Therefore, it is also the first work to approach a characterisation of its strategic significance -as we will see it recurrently in chapters 5 and 6. In consequence, it is the first paper advancing observations oriented to later considering the impact of the objectives of the risk allocation mechanism in the solutions for a legal treatment studied in chapters 8 to 10.

III. The distinguishing features of PFCs. Very briefly, the chapter advances a distinction between the objectives of parties in PFCs and those in the two alternative corporate financing mechanisms.⁴⁴⁹ These are the cases of diversified (regular) corporate contracting, and the practices in the private equity industry. In the first case, the creditor relies on collateral value; in the second case, the investor intervenes in the management of the target company actively. In contrast, in PFCs, the FP -the uncollateralised non-recourse lender- builds her expectations on a single project implementation quality.

IV. The necessary control of SPV and its assets by sponsors. The chapter advances the intuition that, for the feasibility of the risk allocation mechanism, the *de iure* and *de facto* control of the SPV and its assets are both feasibility requirements and sources of inefficiencies. Control is necessary for contracting on how sponsors will implement the project. However, control of project assets gives sponsors an information and implementation advantage. In chapters 5 and 6, I will show how this information and implementation benefits will allow spaces for implementing both

⁴⁴⁹ This is the first work adopting a strategic approach. For an analysis of the difference between PFCs and other financing alternatives from the financial stance, see page in 24 to 26 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

efficient and opportunistic responses.

V. *The single project instrumentality of the SPV.* The chapter will show how, distinctively, in PFCs, parties use the SPV not for facilitating delegation and diversification (see below). In PFCs parties benefit from the project-instrumental SPV for risk isolation and incentive implementation.

Concretely, in PFCs, the chapter revisits the idea that the allocation of a single project under the property of the SPV prevents double-way risk contamination between the project and other parties.⁴⁵⁰ Additionally, the use of the SPV reduces the transaction costs incurred when contracting for inputs. Finally, via the allocation of property rights in the SPV (expected dividends), parties implement incentives for delivering fully non-contractible actions. The study will further analyse these aspects in chapter 5 to 7.

VI. *The distinct efficiency of limited liability protection.* The above also reveals how parties benefit from the limited liability protection of the SPV not for permitting the delegation necessary for capturing diversified investors whose efforts the company will use to advance a diversified portfolio of yet unknown business opportunities. In other words, in PFCs, limited liability does not function as the Kaldor Hicks efficiency rule permitting externalities to dissipated creditors as a means for facilitating investments for higher social welfare.

In contrast, in PFCs, sponsors benefit from the SPV for implementing a single project that parties predefine ex-ante. In other words, PFCs appear as Pareto improvements in which parties spend implementation efforts inducing sponsors to internalise the most of marginal impact from their non-contractible responses.

VII. *The undesirable diversification.* In PFCs, the FP position depends on the quality with which parties implement the risk allocation mechanism for a single predefined project. Consequently, diversification of investments, investors, or contractors is not only not a value but a source of conflicting interests in PFCs. Moreover, in PFCs, parties spend implementation efforts reducing the spaces for discretion in the responses expected from sponsors.

In chapter 7 to 10, the undesirability of diversification will reveal the efficiency of legal solutions (default rules) that, in virtue of their effects against diversification

⁴⁵⁰ See the analysis of how PFCs prevent distress costs in B. ESTY, “The Economic Motivations for Using Project Finance”, *Mimeo - Harvard Business School*, 2003 and in Chapter 3.

capacities, today are not feasible in regular corporate contracting nor seen in corporate laws. Contractual practices where parties regulate the objectives and capacities of the SPV confirm these diversification-preventing objectives.

VIII. *The multiparty consensus ad idem beyond the non-recourse loan agreement.* Consequent to the essential strategic function of the risk allocation mechanism, in PFCs, the *consensus ad idem* that shapes the non-recourse loan contract in its core does not occur between the debtor and the creditor but between the creditor and contractors for inputs and controllers of the debtor.

This reveals the instrumentality of the SPV -and its financing contract- to a broader arrangement for completing a single project. Moreover, parties who intervene in the formation of the organisation (the constitutive meeting of minds) will not change -or will change as contracted upon- as the project evolves (*intuitu personae*).

IX. *The three tiers of incentives to sponsors.* The chapter is innovative at identifying the three tiers of incentives to which sponsors choose their costly responses in PFCs. I have advanced them in Chapter 2. First, sponsors comply with the risk allocation mechanism enforceable by the FP. Second, they respond to the agreements that they implement relationally without the intervention of the FP. These are the agreements that sponsors enforce amongst (some or all of) them based on the information of higher quality that they receive from the project with which they interact closely. Finally, third, sponsors choose fully non-contractible inputs expanding returns from their allocations of property rights.

These three tiers of incentives define the objects of the implementation efforts that bring comfort (or distress) to the FP in the absence of collateral or recourse to third parties. The interplay amongst these three tiers of incentives dictates the feasibility of either socially desirable responses or the three forms opportunistic actions idiosyncratic of PFCs (*shirking, risking, and shading*) as the environment improves or deteriorates. The introduction of the three tiers of incentives and characterisation of how they lead to efficient or opportunistic responses -what I will call *shirking, risking, and shading*- is a critical contribution of chapters 4 to 6 of the study.

X. *The components of individual objective functions.* The chapter identifies the items that shape the objective functions of parties.

XI. *The precarious incentive alignment and the sources of tensions.* Of crucial strategic relevance and importance for the legal treatment, the analysis identifies the variables that dictate the degrees of interest alignment (or strategic tensions)

amongst parties. The chapter shows how tensions grow as a function of (senior) non-recourse debt and the risk allocation mechanism contractual imperfections.⁴⁵¹

Intuitively, the sponsors choose efforts as a function of their conjectures about the residual returns that they may receive from the SPV after the company repays the senior non-recourse debt. In this context, the seniority of non-recourse debt dictates the likelihood and strengths with which the SPV will serve the sponsors' expectations after the environment changes unexpectedly.

Consequently, as conditions deteriorate, the sponsors will perceive stronger incentives for responding with opportunistic actions idiosyncratic of PFCs. In all cases, tensions will decrease as project capacities grow and will exacerbate as the value expected from the SPV deteriorates. The types of opportunism and their feasibility will be the object of chapters 5 and 6. Chapters 7 to 10 will identify ways for their legal treatment.

XII. The opportunism beyond the SPV. The chapter also points out at how the SPV advances a highly specific project funded with non-recourse debt and the FP is vulnerable to opportunism that takes place, not at the company level (*i.e.*, not against the collateral value of corporate assets or resources), but outside the company, on the side of contractors for inputs.

In other words, in PFCs, the lender does not fear (mostly) that controlling shareholders or managers harm company assets (which are highly specific). Instead, she will ex-ante concern about how (desirably or opportunistically) contractors will respond when delivering inputs to the SPV as the repayment (and dividend distribution) capacities of the SPV decrease. This aspect will appear of fundamental relevance to the object of all proposals for legal protections in chapters 7 to 10.

Generally, the chapter also adds to a body of literature focussing on the efficiency of PPPs where authors observe input providers' responses.⁴⁵²

4.2 Six necessary components of PFCs

In Chapter 2, I have introduced the six components of all PFCs. In that early chapter,

⁴⁵¹ All clauses are incomplete and parties enforce provisions behind asymmetries of information.

⁴⁵² For all, and with literature review, see E. IOSSA; D. MARTIMORT, "The Simple Microeconomics of Public-Private Partnerships", *cit.* See also the presentation of the problem of research and the state of the art in Chapter 1.

I adopted an industry-based approach focussing on the characterisations found in the management literature. I showed contractual practises and how parties recur to clauses typical of PFCs.

Let us now restrict our attention to the strategic roles of parties and elements of PFCs. As mentioned, this chapter serves to isolate the strategic features that define the incentives (and tensions) of parties in PFCs. In chapters 5 and 6, I will describe how sponsors respond to such incentives with concrete forms of opportunism idiosyncratic of PFCs. Finally, in chapters 8 to 10, I will focus on necessary legal implications.

Let us now begin by identifying the essential features of the positions and functionalities of the six components of all PFCs. In this order, I will refer to the sponsors, the SPV, the non-recourse debt, the single project, the risk allocation mechanism, and the non-recourse lender (the FP).

4.2.1 Sponsors

Let us now characterise the strategic positions of sponsors. Fundamentally, as in all contractual interactions, it is not the name that parties give to themselves, but their objectives, capacities and vulnerabilities what defines their roles in an organisation. This is especially true in legally institutionalised scenarios where mandatory and default rules may apply after registration (as I will propose in Chapter 8).

Accordingly, after the identification and early characterisation of all features, in the last sub-section, I will remark the typical and essential characteristics of sponsors positions. The isolation of these features is critical to identifying sponsors from the FP in unclear cases before enforcing the postulates that I propose in chapters 8 to 10.

4.2.1.1 Sponsors originate the project

As advanced in Chapter 2, in PFCs, sponsors are the originators of the project. As such, they put in place contractual arrangements coordinating the competences that each of them will have once the construction of the project begins. As also described in the first parts of Chapter 2, this early contracting defines the seed of the risk allocation mechanism -the legal implementation of the project and its financing- that sponsors will later bring before FP (the principal in the setting⁴⁵³) for financing.

There are no strategic reasons for parties not to buy shares in the SPV, exert control

⁴⁵³ Note how, as principal, the FP defines the financing conditions.

of the project, bring material inputs, and verify all the above features without participating in the contractual arrangement's initial elaboration. This aspect is consequently typical of FPCs. *V.gr.*, the sponsors are the ones originating the project, but the participation in the origination of the endeavour should not be a requirement *sine qua non* for a party to be considered a sponsor should she enter the organisation at a later stage. Moreover, this is without prejudice of the requirement of public registration as proposed in Chapter 8.

4.2.1.2 Sponsors dictate project value

In PFCs, the value that all parties expect from the SPV, and consequently the likelihood that the FP finds her non-recourse claims served depends on many factors and contingencies. Some of these variables relate to events of the environment -*e.g.*, the fluctuation of costs or prices of project proceeds. However, of these, the sponsors' inputs choices are the most determinant and always indispensable for project success.

As shown below, the sponsors exert non-contractible contributions and provide specific inputs to projects that parties predefine incompletely. Therefore, in this environment, efficiency requires that the sponsors receive ownership in the SPV.

I have advanced this observation in Chapter 2, and will come back to it further below. The idea that we must fix in this point is that the sponsors receive ownership in the SPV -the element that distinguishes them from ordinary contractors for inputs- because their valuable contributions require such incentive mechanism. The rest of the input providers deliver efforts in response to incentives that parties implement contractually under sufficiently effective market control. Thus, the sponsors are the material contributors who receive property rights and the ones who bring the (non-contractible and specific) contributions of the highest value to the project. See next.

4.2.1.3 Sponsors contribute with specific resources

As also advanced, in PFCS, sponsors deliver contributions that are highly or fully specific. This results from the fact that the large and costly projects whose financing needs require the implementation of non-recourse financing are habitually rare and often unique. Specificities may result from the familiarity of human resources with the project technicalities and with stages of development. In other cases, specificities come associated with property rights, including patents, or with costly infrastructures that parties cannot reallocate (*e.g.*, a bridge over a river). The reader may note these aspects in the (real-life) case-study examples further below in this Chapter.

Consequently, contributions and resources allocated in the SPV will have no or little alternative placement value after the project has failed to function as planned. This

includes contributions delivered in cash that, for preventing free cash flow problems (Cf. Chapter 3) the SPV will receive only gradually and immediately transform in specific goods.

Authors have described the strategic relevance of specificities and the *fundamental transformation* of cash into specific resources.⁴⁵⁴ Specificities exacerbate the hold-up problem inherent to contractual incompleteness.

More generally, by dictating the value of alternative placement opportunities, specificities also define bargaining outputs expected by parties when renegotiating aggressively. In the context of this study, we will see the impact of specificities in bargaining processes when analysing the formation of opportunistic sub-coalitions and unanimous collusions of sponsors against the FP in Chapter 6.

As mentioned above and advanced in chapter 2, one of the elements that distinguish the sponsors from regular contractors for inputs is their allocation of property rights in the SPV. In a context of high degrees of specificities and uncertainty (incompleteness), property rights improve bargaining powers and mitigate the hold-up induced under-investment problem. Consequently, the sponsors originating the project will allocate property right to the parties delivering specific contributions of the highest value to the project. This proposition is commonplace in the theories of the firm.⁴⁵⁵ In other words, the sponsors will be the parties receiving ownership in the project because they are also the ones bringing specific resources under

⁴⁵⁴ See the entries “Specificities” and “Fundamental transformation” in the glossary. The classical references to both categories include O. WILLIAMSON, “Transaction-Cost Economics: The Governance of Contractual Relations”, cit. O. E. WILLIAMSON, *The Economic Institutions of Capitalism*, cit. B. KLEIN ET AL, “Vertical Integration, Appropriable Rents, and the Competitive Contracting Process”, cit. O. E. WILLIAMSON, “Credible Commitments: Using Hostages to Support Exchange”, cit. O. E. WILLIAMSON, *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*, cit. P. JOSKOW, “Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence”, cit.

⁴⁵⁵ O. D. HART; J. MOORE, “Property Rights and the Nature of the Firm”, cit. P. W. SCHMITZ, “Joint Ownership and the Hold-up Problem under Asymmetric Information”, *Economics Letters*, vol. 99, 3, 2008, Elsevier. O. D. HART, “Hold-up, Asset Ownership, and Reference Points”, *The Quarterly Journal of Economics*, February, 2009. J. ZHANG; Y. ZHANG, “Sequential Investment, Hold-up, and Ownership Structure”, 2014.

uncertainty -whose associated inefficiencies (hold-up) parties mitigate with property rights. I will return to this concept below and in many places in Chapters 5 and 6.

Finally, the degrees of individual specificities -*i.e.*, substitution costs- result in the FP and parties restricting the transferability of positions of individual sponsors. This does not only refer to their ownership in the company but also to their contractual positions as input providers (the source of specificities). For the same reasons, as mentioned in Chapter 2, the FP identifies the insolvency or subsequent incapacities of sponsors to deliver contributions as events of technical default in the non-recourse loan agreement contract.⁴⁵⁶

4.2.1.4 Sponsors deliver non-contractible responses

As advanced in Chapter 2, the sponsors control the SPV and its assets both politically and materially. Moreover, the sponsors are experts in the industrial fields of the single project that they design. Additionally, because their control of the SPV and their material interaction with project assets, the sponsors obtain and exchange information about the progress of the project and their peers' actions.

The higher technical qualifications (expertise) of the sponsors result in asymmetries of information amongst themselves individually. The access to higher quality information associated with the control of the SPV and its assets equate to asymmetries of information between themselves -both individually and collectively- and the non-recourse lender. Both tiers of asymmetries of information correlate to spaces for non-contractible actions that the sponsors can -individually or collectively- deliver beyond the enforceability of other sponsors or the FP. These spaces define the severity of the moral hazard problem in FPCs

In this context, the allocation of property rights with entitlements to expected dividends increases the sponsors' capacities -both individually and collectively- to internalise more of the marginal impact from their high-value non-contractible efforts.⁴⁵⁷ I will analyse these aspects in chapter 5 and 6.

⁴⁵⁶ I will return to this observation in Chapter 7 when remarking the contrasts between the positive and negative values of diversification, respectively in traditional corporate settings and PFCs.

⁴⁵⁷ O. D. HART; J. MOORE, "Property Rights and the Nature of the Firm", cit. P. W. SCHMITZ, "Joint Ownership and the Hold-up Problem under Asymmetric

Accordingly, the sponsors will be capable of delivering non-contractible contributions simply because, backwards induction, in the prevention of moral hazard, the sponsors will ex-ante allocate property rights to the contributors whose non-contractible efforts are of highest value to the project. In other words, as pointed out above, the sponsors will be the parties providing non-contractible contributions of the highest value because, for incentivising them to deliver such costly actions, they will receive property rights -the element distinguishing them from regular contractors.

4.2.1.5 Sponsors own the SPV

Sponsors provide equity (ownership) funds to the SPV and the project. As advanced, together, the sponsors hold the vast majority⁴⁵⁸ of property rights in the SPV. This comes with several benefits in terms of incentive alignment that the literature has described in other environments very well.

As already mentioned, the allocation of ownership allows the sponsors to hold expectations to residual benefits (a share of future dividends). Such expectations come with strategic effects of two dimensions. First, expected residual benefits induce the sponsors to choose non-contractible efforts at levels closer (never equal) to the socially desirable. This comes in mitigation of the three types of moral hazard.⁴⁵⁹ Second, property rights and expected dividends improve the bargaining power of the sponsors investing in specific resources. This alleviates the hold-up induced under-investment problem.

Information”, cit.O. D. HART, “Hold-up, Asset Ownership, and Reference Points”, cit. J. ZHANG; Y. ZHANG, “Sequential Investment, Hold-up, and Ownership Structure”, cit.

⁴⁵⁸ There may be equity investors who are not sponsors. These must be treated as part of the FP. Cf. further below the description of the FP and the case-studies later in this chapter.

⁴⁵⁹ The problem of hidden actions ex-post in bilateral settings (*Vid.* generally, *pp.* 129 and *ff.* in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.), the problem of hidden actions ex-post in multiparty organizations -moral hazard in teams (*Vid.* B. HOLMSTRÖM, “Moral Hazard in Teams”, cit.), and the problem of hidden information ex-post (when the principal fail to interpret the actions that she observes from the agent). *Vid.* page 9 in O. D. HART; B. HOLMSTRÖM, “The Theory of Contracts”, *Department of Economics - Massachusetts Institute of Of Thechnology -Working Paper 418*, March, 1986.

As also mentioned in Chapter 2, property rights are scarce resources. There is an opportunity cost of allowing ownership to some sponsors. These costs reveal in the loss of expected value -and incentive strengths- that some sponsors will experience when allocating shares to further input providers. Parties will consequently ex-ante optimise property rights allocation by allowing ownership to the contributors whose non-contractible efforts and specificity of resources are of the highest value to the project. Those sponsors receiving equity in the SPV will be the sponsors. The rest of the input providers will respond to contractual incentives exclusively that the SPV will implement under market terms and control.

Concerning the efficiency of ownership as a way of implementing incentives to sponsors, we must note three aspects:

First, as a means for implementing incentives, the distribution of property rights is an imperfect mechanism. As shown in chapter 6, whenever the non-recourse financing operation has more than one sponsor, each sponsor will only internalise a fraction of total marginal benefits (losses) generated to the team output (total dividends). Hence, as long as a team (more than one party harvests the benefits from a common source of benefits) under(over) investment amongst team members will occur, necessarily.⁴⁶⁰ As shown below, whenever a single sponsor owns the SPV, under-investment will exist as a function of the lender's externalities.

Mutatis mutanda, the same intuition applies to describe how whenever no sponsor holds full ownership of the SPV, the bargaining processes following unforeseen changes in the environment will result in inefficient outputs with the consequential hold-up induced under-investment problem. Naturally, the SPV held by a single sponsor will allow this specific contributor to harvest the full benefit of such renegotiations -critically, net of the benefits externalised to the FP (see the third point below).

⁴⁶⁰ See the entry *Moral hazard in team* in the glossary. As a means for implementing incentives, ownership (the distribution of team outputs) is necessarily imperfect. Sponsors cannot possibly escape the canonical moral hazard in team impossibility problem. I will come back to this point in many places in chapters 5 and 6. The seminal and standard reference is B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. For team efforts under risk aversion see E. RASMUSEN, “Moral Hazard in Risk-Averse Teams”, cit. R. STRAUZ, “Moral Hazard in Sequential Teams”, cit. L. RAYO, “Relational Incentives and Moral Hazard in Teams”, cit.

Second, as owners of the SPV, the sponsors hold expectations to dividends. These are residual benefits that the SPV will distribute only after servicing the senior non-recourse debt. As mentioned, these expected benefits serve for interest alignment against the moral hazard and hold-up problems. The strength of these incentives depends on the project's capacity to produce welfare beyond senior-non-recourse debt costs.

Finally, the project and the SPV welfare capacities and, consequently, the strength of incentives associated with ownership in the SPV vary as a function of the environment's uncontracted evolutions. This reveals the strategic value of contractual incompleteness and the costs of transaction implementation efforts (transactions costs) as a limitation to the feasibility of FPCs. The above also anticipates the value of improving the quality of default solutions and ultimately institutionalising FPCs for lower-cost implementation.

See below the strategic effect of the residuality of the sponsors expected benefits. Based on such observations, in chapters 5 and 6, I will refine the strategic tensions and forms of opportunism in FPCs.

Third, recall, as already described, in PFCs, typically the sponsors will provide the total (or the vast majority) of capital contributions. However, such resources will cover only a minor fraction of the total financial needs of the project.⁴⁶¹ The remaining funds that sponsors will turn into specific assets will come from the FP - whose expectations depend on project performance. Thus, as I will show below, analyse in chapters 5 and 6, and reiterate in chapters 7 to 10, as the environment (expected dividends and consequently the strengths of incentives) improves or deteriorates, so will the externalities (positive or negative) that non-contractible actions by sponsors will produce to the non-recourse lender. This proposition lies in the core of the strategic tensions, forms of opportunism, and needs for legal solutions in the following chapters.

Finally, observe how the above three aspects relate to incentive effects from a stance of total welfare. Moreover, the first two points are normative. They define how the sponsors achieve second bests implementation alternatives. The sponsors use property rights for incentivising non-contractible efforts. The efficiency of ownership

⁴⁶¹ Cf. pages 7 and 36 in B. ESTY, "The Economic Motivations for Using Project Finance", cit. See also page 28 and 37 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

for implementing incentives for agents to deliver non-contractible actions (the only available alternative for that purpose) is necessarily imperfect. Nevertheless, the sponsors should achieve the said second-best by attributing ownership to sponsors as a function of the value of their private contributions.

However, with eyes on the sponsors' rationalities, we see how the earlier sponsor initiating the project do not maximise total welfare but personal benefits -v.gr., her benefits, not the benefits of the sponsors as a class. Thus, when allocating property rights, she will allow ownership in the SPV to the best-qualified contributors whose efforts will maximise total project capacities. However, because property rights are limited resources, she will do this at the marginal costs of losing personal returns from the project -her ownership share in the SPV. These are the two marginal variables that define the privately optimal allocation of property rights to the sponsor(s) solving that initial implementation optimisation problem.

4.2.1.6 Sponsors control the project materially

As also advanced above and in Chapter 2. In addition to the political powers that they exert over the SPV, in PFCs, sponsors control project assets materially. Material control is a direct result of their roles as critical input providers to the single project. Three are the most relevant strategic implications from the material control of assets.

First, I have already advanced the informational benefits to the sponsors associated with the material interaction of project goods. The material manipulation of assets permits that the sponsors receive, update and reveal information of a quality higher than that available to the FP. This information relates to the evolution of the project and the responses from other sponsors. In chapters 5 and 6, I will analyse the strategic consequences of socially desirable cooperation and opportunism resulting from these informational advantages.

Second, material control permits that the sponsors implement technological innovations as the project evolves. In conjunction with the asymmetries of information, sponsors' capacities to implement innovations beyond the sight of the non-recourse lender will result in efficiencies or inefficiencies as a function of the environment's evolution (incentives).

Third, material control also allows sponsors to implement contractual provisions as socially desirable ex-ante. With this respect, to the FP, material control of the SPV and its assets by the sponsors is strictly indispensable for the implementation and later enforceability of the risk allocation mechanism. I will articulate the legal implications of asset control in Chapters 7 to 10.

4.2.1.7 Sponsors sustain cooperation relationally

FPCs are most efficient for financing large projects that require long term sequential contributions from sponsors. The sponsors deliver their inputs to the same project under the SPV ownership that they control politically. The sponsors consequently interact with each other politically in the SPV and materially when delivering their inputs for the project. This twofold sequential interaction allows them to obtain (observable and verifiable) information of higher quality about their peers' actions.

The conjunction between information access and the sequentially of contributions also permits that the sponsors sustain cooperation relationally.⁴⁶² That is, they exchange non-enforceable efforts as a means of building, sustaining, or retrieving reciprocity. More simply put, the sponsors find spaces for sustaining cooperation by exchanging (or retrieving) favours. Because this interaction is informal, the sponsors can avail themselves from both observable and verifiable information.

Finally, as advanced in Chapter 2, this interaction will escape the enforcing capacities of the FP. This results from three aspects. First, the non-recourse lender does not access information of quality sufficient for detecting the sponsor's hidden actions. Second, the FP cannot deliver sequential contributions beyond what parties agree in the cash waterfall clause (the loan agreement). Consequently, she cannot interact relationally with the sponsors. Third, because the lender cannot interact relationally, her enforcing capacities find the limit of the verifiable information she uses for recurring to external courts (judicial or arbitration tribunals). However, such information is of low-quality -a quality insufficient for verifying the actions that the sponsors implement with the observable information they receive from their material interaction with the project.

The interplay of the above results in an action space within which the sponsors will interact, implement incentives, and deliver both individual and collective responses (the 2nd tier of incentives) beyond the FP's enforcing capacities (the risk allocation mechanism that she implements). Further below, see the sponsors objective

⁴⁶² In contexts where markets are small, sponsors and the FP can only retaliate relationally by harming reputation outside the contract. Generally, with literature review *cf. pp.* 297 and *ff.* in J. WATSON, *Strategy*, cit. *Pp.* 461 and *ff.* in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. M. HVIID, "Long-term Contracts and Relational Contracts", cit. Specifically and more recently, G. BAKER ET AL, "Relational Contracts and the Theory of The Firm", cit. J. LEVIN, "Relational Incentive Contracts", cit.

functions and analysis of the three tiers of incentives to which the sponsors deliver their responses in all FPCs.

4.2.1.8 Sponsors hold residual expectations

In PFCs, at least some of the claims held by sponsors will be junior to those of the FP. In Chapter 2, we have seen how this is the result of several aspects.

First, as owners of the SPV, sponsors expect dividends from the SPV. These expectations (not enforceable claims) are variable and junior to the non-recourse claims. As per the cash-waterfall (cascade) clause, it is often the case that parties agree that sponsors will receive some dividends even before the senior debt held by the FP. However, this is exceptional and often seen in very long-term projects after the SPV has consolidated its capacity to produce revenues as expected. Allowing these benefits to sponsors permits the implementation of alternative financing involving equity as the project evolves towards the end of its financing process.

Second, despite the above, during the project's life, the sponsors will subordinate substantial parts of their claims from contracts to the FP's expectations. Strategically, this permits that the SPV keeps some capacity to internalise contractual agreements implemented with the FP at a cost internalised by sponsors. Contractual subordination consequently serves as an interest alignment mechanism.

Later, I will show how the residual nature of sponsors expectations lies in the core of the strategic tensions and forms of opportunism in FPCs. Below, I will introduce a reference to how, as conditions deteriorate, the sponsor will lose the socially desirable incentives associated with such expectations to residual benefits. As the capacities of the SPV to distribute residual benefits, opportunistic incentives will consequently grow. Chapters 5 and 6 will analysis these crucial strategic aspects in detail.

Chapter 10, will then offer a characterisation of an optimal hierarchy of claims in PFCs that maximise the value of seniority to the FP (protection against contingencies affecting cashflows) while minimising the incentives for sponsors to behaving opportunistically as the environment (desirable incentives) deteriorates. For simplicity, without loss of generality, until I restrict our attention to the punctual discussion, I will assume that all claims held by sponsors are always junior to those of the FP.

4.2.1.9 Sponsors' number is relevant but not indispensable

Finally, in PFCs, the number of sponsors is indeed strategically relevant. Intuitively, the number of sponsors defines the severity of the moral hazard in team problem, which dictates the effectiveness of ownership as an incentive implementation

mechanism. However, no number is indispensable for PFCs to exist. Note below how case-studies 3 (Pennsylvania Power & Light Company (PPL), and 4 (Calpine Corporation) show PFCs with only one sponsor.

However, it is possible to identify an optimal size for a team of sponsors. As I will show later, this optimality maximises the higher marginal benefits of inputs and the lower marginal costs of efforts from new sponsors while minimising the exacerbation of the under-investment problem associated with the moral hazard in team problem and hold-up induced under-investment that grow with extra team members. Commonly, irrespective of this optimality, the number of sponsors in PFCs will range from 3 to 6⁴⁶³ and will often grow whenever parties use more than a single SPVs.

4.2.1.10 Sponsors' necessary features

Above, I have isolated a series of aspects that characterise the positions of the sponsors in PFCs. While some of these are typical (not essential), some others are indispensable. These necessary features serve to identify the sponsors generally and distinguish them from the FP in lesser clear scenarios.

Of the above, only two requirements are indispensable: first, ownership in the SPV; second, a commitment to delivering material contributions to the project.⁴⁶⁴

The other features identified above exist in distinct degrees as a result of these two. Note, ownership allows for control of the SPV and its assets and access to privileged information. The provision of material inputs to the project permits close interaction with project assets and the relational cooperation with other sponsors. This results in both observable and verifiable information of higher quality and a stage for cooperating with other sponsors relationally beyond the lender's enforcing capacities. Finally, ownership makes the sponsors holders of residual expectations for partial interest alignment against the hold-up problem (incompleteness) and moral hazard (asymmetries of information amongst the sponsors and between the sponsors and the lender).

The two requirements of ownership and material contributions permit the treatment of equity investors bringing strictly financial (not material) contributors not as sponsors but as part of the FP. Finally, the two requirements are compatible with the

⁴⁶³ Vid. B. ESTY, "The Economic Motivations for Using Project Finance", cit.

⁴⁶⁴ This commitment does not need to be enforceable. It requires a capacity to deliver such inputs and the incentives of property rights.

sponsors entering the PFC organisation at a later stage after initial implementation.

4.2.2 The Special Purpose Vehicle (SPV)

The allocation of project assets in a dedicated legal entity is strictly indispensable in PFCs. Hence, as advanced in Chapter 2, in all PFCs, we will always find at least one SPV. The legal type of corporate form of the SPV is least relevant as long as it provides two benefits; first, legal personality, and second, limited liability protection to its owners.

Especially at the end of the implementation phase, when the project begins operating, and the SPV value can be esteemed independently from the sponsors' responses, allowing company shares' transferability could be practical to the financing scheme. *V.gr.*, the sponsors that have complied with their obligations should be capable of discounting values by transferring contractual positions and ownership to third parties.

However, because of the *intuitu personae* characteristics of the interaction between the FP and sponsors providing the critical inputs to the project, this aspect is not always desirable. The non-recourse lender will habitually request a stage for deciding the terms under which such transfers should be acceptable. The transferability of shares is consequently not a feature indispensable in SPVs.

Let us now focus on the strategic benefits that these legal entities bring to parties in PFCs. I will now present them in order of importance. The first four features are strictly necessary for the feasibility of non-recourse project financing.

We can group the following remarks in three objectives: first, risk isolation; second, contract implementation; and third, incentive implementation via property rights distribution. To these three objectives, I will refer in many places of the study.

4.2.2.1 SPV provides limited liability protects owners

In PFCs, the SPV must provide limited liability protection to sponsors. This feature is strictly indispensable for two reasons. First, without limited liability protection, the non-recourse nature of debt would be ineffective as the creditor could eventually advance actions against sponsors. Second, derived from the first aspect, limited liability provides for off-balance-sheet benefits to sponsors. From a different stance, limited liability allows the sponsors to obtain debt financing for a project without the associated impact against their capital structure, *v.gr.*, without exhausting debt capacities. In Chapter 3, see how PFCs avoid the limitations that the volatility induced distress costs impose to companies funding large projects with debt.

4.2.2.2 SPV protects project assets from the creditors of owners

The legal personality of SPV protects project assets from the hazards of risk contamination from the creditors of its owners. In distinct environments, authors in the literature of Corporate Law and Economics refer to these benefits as of *entity shielding*.⁴⁶⁵

Simply, project assets allocated under the property of a SPV will not be exposed to redeployment hazards should any of the sponsors be forced to liquidation, say, as a result of an insolvency regulation procedure. Consequently, the SPV protects the project's value and unicity as an organisation -not as a mere accumulation of specific assets. With *entity shielding* the protection described above shapes the regime of *asset partitioning* of the legal personality.⁴⁶⁶

4.2.2.3 SPV protects project assets from other projects

Additionally, in a different expression of the same benefits, using a SPV advancing a single project prevents internal risk contamination amongst distinct projects or departments. That is, it eliminates the risks that other departments' poor performance brings the company hosting the single project to the vicinity of its insolvency – a distinct source of distress costs (*Cf.* Chapter 3). Indirectly -see further below- ex-ante, the SPV advancing a single project facilitates the contracting of inputs and financing as parties will now spend transaction costs (implementation efforts) preventing risks and exchanging information relating to the single project.

4.2.2.4 SPV protects the information that parties receive from the project (the implementation of dedicated information mechanisms)

The informational benefits described above concerning the possibilities of inspecting the project and implementing precautions without considering risk contamination from other projects also manifest *itineri*. The accounting and comprehensive information system of the SPV can receive data from the single project only.

Similarly, as the project progresses, parties can assess project evolution without cash

⁴⁶⁵ With literature references, see Chapter 1 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁴⁶⁶ *Cf. pp. 6 and ff. in Ibid.*

flow interferences from other business units under the same corporate umbrella.⁴⁶⁷ That is, there will be no side sources of cash flow subsidising managerial indiscipline in this or other projects. This is the known free cash flow problem described in chapter 3.⁴⁶⁸ The use of a project-dedicated SPV eliminates informational noises so the project can be now supervised and assessed on its own merits.

4.2.2.5 SPV facilitates the contractual interaction between all sponsors and the FP

The use of SPVs serves to the bilateral relationship between FP and the sponsors as a class. Intuitively, when the FP enforces provisions against the SPV, she is also affecting the interests of sponsors who own the company. Implementing contracts with the SPV thus permits taking the project's assets as a hostage, thus enhancing the enforceability of provisions against individual providers (*Cf.* the description of cross-default clauses in Chapter 2).

Additionally, the above permits the implementation of incentives for sponsors to deliver actions that, by nature, are non-contractible. Notice the relational interaction amongst sponsors that results from the provisions that the FP enforces against the SPV. Intuitively, as a means for protecting the project, the sponsors will deliver (non-contractible) monitoring efforts -or retaliate relationally (*i.e.*, beyond the enforcement capacities of the FP)- against the sponsor whose substandard actions may allow the FP to enforce against the SPV. These aspects will be in the core of the dynamics of sub-coalitions described in Chapter 6.

Additionally, the use of SPV permits that, as the project advances, sponsors transfer their shares in the business (or other entitlements to cashflows) to other investors. Simply, with a functioning project, the debt will remain non-recourse; however, beyond a certain point, the lender will begin to enjoy collateral protection from actual (no longer future) value from the project. In this stage, both sponsors and the FP may be capable of transferring their rights to benefits expected from the SPV (*i.e.*, from the single project without interferences from other business units) to third parties

⁴⁶⁷ *Cf.* footnote 10 in page 766 in E. BERKOVITCH; E. E. KIM, “Financial Contracting and Leverage Induced Over- and Under-Investment Incentives”, cit. Page 30 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit.

⁴⁶⁸ M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit.; M. C. JENSEN, “Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers”, cit.

with lower risk appetites.

4.2.2.6 SPV facilitates incentive implementation to sponsors

Additionally, the project's allocation under a dedicated SPV allows distributing property rights as an incentive mechanism. Notice, in their objective functions, each sponsor will now perceive returns from their efforts in the form of expected dividends (see below, the 3rd tier of incentives). This expectation induces them to exert actions that will remain unobservable (non-contractible) to other parties. Consider monitoring efforts, management efforts, or actions to implement socially desirable innovations or improve contractual provisions implementation. I will revisit these propositions below.

Similarly, property rights allocation allows sponsors to internalise a fraction of the marginal costs from their opportunistic actions against the SPV. In chapters 5 to 7, I will refer the moral hazard in team-induced feasibility boundary faced by sponsors choosing inputs in response to these incentives.⁴⁶⁹

4.2.2.7 The many SPVs in PFCs

As mentioned in Chapter 2, as project complexity grows, sponsors will often recur to the use of more than one project-company. This practice does not affect the above necessary benefits. In all cases, we will find that parties will contract the non-recourse debt via a SPV. Project assets will remain under SPV's property that may be distinct to the debtor. Finally, parties may implement contracts with input providers via a different project company.

The benefits of using more than one SPV are diverse and project idiosyncratic. Parties can use many SPVs for risk distribution purposes. They may benefit from allocating parts of the project in different jurisdictions. Parties may also maximise tax advantages.

This practice does not affect any of the propositions of this study. In all cases, the sponsors will remain in legal control of the company owning the project and in material control of project assets. Similarly, in all scenarios, the financing debt will remain uncollateralised, and the FP will enjoy no recourse to third parties. Finally, in all events, the project value and the SPV's repayment capacity will depend on the sponsors' inputs. These aspects will be shown clearly in the case-studies below.

⁴⁶⁹*Cf.* B. HOLMSTRÖM, "Moral Hazard in Teams", *cit.*

4.2.2.8 The SPV control is strictly indispensable for the implementation of the risk allocation mechanism

Lastly, let us offer three remarks about aspects that are evident at this point of the study. For completeness, as separate concepts with distinct implications, I must point them out individually. I will recall these observations below when considering the strategic aspects of SPV control. I will also come back to them in chapters 7 to 10 when advancing legal propositions.

Control of the SPV is strictly indispensable to the implementation of the risk allocation mechanism. I have referred to this point below when considering the value of sponsors ownership in the SPV. In PFCs, sponsors must control the SPV so that the legal entity becomes the object of commitments that the FP can enforce against sponsors. Intuitively, the FP must have a capacity to enforce provisions assuring that the SPV will use non-recourse funds only for implementing the project as predefined. Via *control covenants*, the FP defines the control of the SPV before internalising non-recourse risks.

The SPV is controlled by input providers. As also shown in Chapter 2, in PFCs, the sponsors own the majority of SPV's shares. However, as input providers, sponsors control both the SPV and its assets materially. As I have already pointed out, the capacity to interact with project assets results in information reaching sponsors with a quality higher than what equity investors (or the FP) would receive. Control also permit that sponsors interact relationally and implement innovations beyond the enforcing capacities of the lender. These two aspects will lie in the core of the strategic tensions that I will first approach below and analyse fully in chapters 5 and 6.

In PFCs, control is the object of a contractual interaction between the FP and sponsors (both SPV contractors). As shown in Chapter 2, the SPV is the object of a contractual interaction between the FP (a contractor for debt financing) and sponsors (the contractors for the material inputs to the project).

Note the difference between this point and the observation in the above paragraphs of this section. Above I referred to how control is functionally indispensable to the feasibility of the risk allocation mechanism. Here, I am pointing out how the SPV control is the object of contracts amongst parties who are contractors of the SPV - some of which -the sponsors- define the SPV's capacity to produce value and repay its obligations. This reflects how the SPV is instrumental to an interaction that, in substance, takes place between the FP and sponsors as a single principal and a group of agents to which the SPV is strictly instrumental. I will revisit this observation in Chapter 8.

4.2.3 Non-recourse debt

Chapter 2 identified the non-recourse nature of financing debt as a distinctive feature of PFCs. The non-recourse nature of debt requires that there will be no third parties liable for the debt should the SPV fail to honour its obligations.⁴⁷⁰

Strategically, in conjunction with the legal personality of the SPV, the limited liability rule of the corporate type, and the high specificities of assets, the non-recourse nature implies that, for the repayment of capital and interests, the FP will depend on the capacity of the project to produce value as ex-ante expected. Consequently, the non-recourse nature of debt defines the indispensable value of the risk allocation mechanism to the FP in PFCs. This, we have seen in Chapter 2.⁴⁷¹

4.2.4 Single specific project

Chapter 2 elaborated on the basic requirements and characteristics of projects that companies typically fund via PFCs. I mentioned two necessary conditions: first, after completion, projects must reveal a stable source of cash flow sufficient for repaying the non-recourse debt; second, projects must be implementable in response to contractual provisions of the risk allocation mechanism.

I have also described three features that are typical in large projects. First, projects funded under PFCs are typically high capital-intensive. Second, projects funded

⁴⁷⁰ *Vid.* Section 5.2 in G. VINTER ET AL, *Project Finance - A Legal Guide*, cit. *Vid. pp.* 29, 45, 181, 191-2, 360, 371 in J. DEWAR, *International Project Finance - Law and Practice*, cit. *Vid.* page 3 in A. FIGHT, *Introduction to Project Finance*, cit. Page 185 in S. L. HOFFMAN, “A Practical Guide to Transnational Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations”, cit. *Pp.* 13, 31 and 96 in G. DEWULF ET AL, *Strategic Issues in Public-Private Partnerships*, cit.

⁴⁷¹ As also pointed out in the second chapter, the management literature often distinguishes between the cases of *non-recourse* and the *limited* recourse debt in project financing. The expression *limited recourse* denotes the existence of exceptional periods or circumstances under which sureties from third parties might effectively protect the debt. As described in Chapter 2, these protections are elements key to the risk distribution mechanism (see further below). They relate to obligations for input risks -thus, they do not collateralise the PF's debt obligations. As such, these sureties are not only compatible with the non-recourse nature of the financing but, by dissipating exogenous risks and assuring enforceability of contracts for inputs, as foreseeable, they are also necessary to the ex-ante rationality of the lender.

under PFCs take long terms for implementation, operation, and financing. Finally, third, habitually, they are also materially complex. However, this complexity does not result from technological aspects but their long lives and their exposure to contingencies.

4.2.5 Risk allocation mechanism

4.2.5.1 A strategically indispensable component of PFCs and its boundaries

As advanced in Chapter 2 and hereabove, as its identifying feature, in PFCs, the FP allows debt to a SPV without recourse to third parties. In PFCs, parties recur to non-recourse debt to finance projects that are often unique, thus highly specific. In conjunction with such specificities of assets, the SPV's legal personality, and its limited liability protection, the non-recourse nature of debt implies that, for its repayment, the FP can only trust in the capacities of the single project to generate cash flows as initially expected.

Consequently, ex-ante, before internalising risks, the rational FP will substitute the protection missing from corporate collateral with a task and risk distribution contractual arrangement. This risk allocation mechanism should bring confidence that, under all foreseeable eventualities, the SPV will count on all inputs necessary to build and operate the single project.^{472 473}

⁴⁷² This strategy is known to the industry. However, the identification and characterization of strategy of the FP substituting collateral with contract implementation as an element strategically indispensable in PFCs is a contribution of this study. Cf. pp. 298 and ff, and 302 ff. in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit. See also page 45 in A. FIGHT, *Introduction to Project Finance*, cit. Cf. page 548-9 and ff. in L. FARRELL, "Principal-Agency Risk in Project Finance", cit. P.1.04 in S. L. HOFFMAN, *The Law and Business of International Project Finance*, 2nd. ed., Kluwer Law International, 2001. Pp. 157 and ff. in W. TAN, *Principles of Project and Infrastructure Finance*, cit. Pp. 81, 122, 133 and ff. in J. DEWAR, *International Project Finance - Law and Practice*, cit.

⁴⁷³ Notice the reference to how *the "project should contain an appropriate allocation of risk to the parties best suited to manage those risks"* found in the description of

Precisely, ex-ante the non-recourse lender will verify that sponsors internalise all risks, tasks, and material necessities for the successful construction and operation of the project as regulated by provisions that she (the FP) can enforce directly or indirectly against them via the (for that purpose, solvent) SPV. The risk allocation mechanism corresponds with the full set of legal entitlements enforceable by the non-recourse lender and shapes the project legally.

Finally, in PFCs, the risk allocation mechanism is the sole source of certainty that the FP expands by increasing implementation (transaction) efforts. From a different stance, the completeness and enforceability of the risk allocation mechanism is the only reference that the non-recourse lender can observe for assessing the expected value of entering the contract.⁴⁷⁴ The risk allocation mechanism is an element indispensable in the principal's strategy in all PFCs.

4.2.5.2 Costs of imperfections

Two aspects we must note before advancing. First, as all contractual arrangements, the risk allocation mechanism is necessarily imperfect. In other words, all provisions will be inevitably incomplete (rationalities are bounded). Parties will also fail to identify (contract upon) individual actions directly (there are asymmetries of information between parties). Consequently, there will always be conflicting interests between parties responding to the risk allocation mechanism and those interested in their enforcement under changing circumstances.

Second, in PFCs, sponsors do not respond to the risk allocation mechanism only. As input providers, the sponsors respond to three tiers of incentives:

First, sponsors provide inputs in compliance with the said risk allocation mechanism enforceable by the FP. Second, they choose responses to the agreements that the sponsors implement (unanimously or within sub-coalitions) amongst themselves only -that is, based on information (observable or verifiable) of higher quality, thus escaping the enforcing capacities of the lender. Third, as a function of individual allocation of property rights (shares in the SPV), sponsors choose fully non-contractible actions expanding returns from expected dividends.

requirements of the U.S. Exim Bank as described in p. 477 in E. R. YESCOMBE, *Principles of Project Finance*, cit.. and www.exim.gov.

⁴⁷⁴ These are individual rationality (participation) constraints. *Vid.* page 343 in J. WATSON, *Strategy*, cit. See also page 49 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

Later, we will see how the strength and social desirability of incentives from the 2nd and 3rd tiers of incentives depend, amongst many factors, on the unforeseeable evolutions of the environment. This, we will see in detail in chapters 5 to 7.

4.2.6 Financing party (FP)

4.2.6.1 FP's defining characteristics

As advanced in Chapter 2, in all PFCs, we will find four aspects characteristics of the lender in non-recourse financing arrangements. The first two of these aspects are inherent and distinctive of the position of the FP in PFCs.

First, the FP internalises project risks. That is, her claims are not collateralised nor receive protection in the form of recourse from third parties. Consequently, as said in many places, for the realisation of her expectations, the FP will rely on inputs' choices from the sponsors implementing and operating the single project. As I have advanced, the incentives to which sponsors deliver their contributions will change with the environment (a problem of incompleteness). Ex-ante, the FP will consequently spend efforts foreseeing eventualities and regulating such responses expected from sponsors. This is the risk allocation mechanism that, as I have described, is indispensable in PFCs.

Second, as also remarked, the FP does not deliver sequential contributions of material nature in a way that allows her to sustain cooperation relationally with sponsors. This second aspect distinguishes the FP position from that of sponsors who also internalise project risks, but who provide sequential contributions allowing them to interact relationally amongst them. As I will describe in full details in chapters 5 to 7, these spaces for relational interactions beyond the enforcing capacities of the FP result in positive or negative externalities to the lender as a function of the evolution of the environment (*i.e.*, of *news*, as I will call the alternative scenarios). As above, ex-ante, via the risk allocation mechanism, the FP will spend implementation efforts regulating such spaces for contractual interactions.

Third, the FP may group distinct types of financing entities, syndicates of them, bondholders, mezzanine creditors, and even equity investors who are not sponsors (see below case-study 4).⁴⁷⁵ The FP may consequently not represent a single individual but a group of parties that coordinate their contributions and internalise non-recourse risks from the project. As advanced in Chapter 2, this coordination is

⁴⁷⁵ Pp. 157 and ff. in W. TAN, *Principles of Project and Infrastructure Finance*, cit.

functionally necessary for preventing debt dilution.^{476 477} Fundamentally, this coordination in the prevention of debt dilution evidences the strategic unicity of the FP composed of many non-recourse providers. Moreover, as the FP is bound to provide cash contingent on project advances, it is very likely -but not essential to the contractual position- that sponsors, and the existing FP members will oblige late incoming non-recourse financing providers to abide by such commitment schedules.

Forth, at least one non-recourse lender must be capable of contracting for implementing such risk allocation mechanism. That is, at least initially, some members of the FP must inspect the web of contracts in response to which all inputs necessary for the completion of the project will be available to the SPV.

Finally, fifth, at least some of the FP claims will be senior to those of sponsors. This will be true not only because of the standard practice of subordinating contractual claims (*Cf.* the functionality of the cash-waterfall -cascade- agreement) but also because sponsors hold expectations to dividends the SPV. I have mentioned this point above when analysing the position of the sponsors and their residual expectations. In Chapter 10, I will refer to an optimal seniority of non-recourse claims.

4.2.6.2 FP's and the differences with the position of sponsors in PFCs

Before entering Chapter 5 dedicated exclusively to analysing conflicting interests, let us devote a final effort to emphasising the distinctions between the strategic positions of sponsors and the FP -the many non-recourse financing providers.

As described above, two are the inherent and distinctive characteristics of the strategic profiles of sponsors:

- First, because they hold ownership in the SPV and some of their contractual claims subordinated to the titles of the FP, the sponsors deliver contributions internalising project risk. That is, their expectations (from contracts and expected dividends) are not collateralised nor receive protection in the form of recourse from third parties. Effectively, the sponsors deliver their choices of inputs expanding residual benefits.
- Second, because the sponsors contribute with material inputs to the project,

⁴⁷⁶ *Vid.* A. SCHWARTZ, “Priorities and Priority in Bankruptcy”, cit. A. SCHWARTZ, “A Theory of Loan Priorities”, cit. D. S. BIZER; P. M. DEMARZO, “Sequential Banking”, cit.

⁴⁷⁷ *Cf.* Chapter 3, the problem in diversified corporate financing.

they find spaces for delivering hidden actions both individually (in tension with the interests of other sponsors) and collectively (in tension with the non-recourse lender's interests). Moreover, because they all contribute materially to a long-term project, the sponsors enjoy stages for sustaining cooperation relationally amongst them. This interaction results in positive or negative externalities to the non-recourse lender as a function of the ongoing evolution of the incentives to which they respond (project capacities).

Two are the contrasts with the position of the non-recourse lender.

- First, the FP lends cash or other liquid resources to the highly specific SPV without collateral or recourse to third parties. Thus, she also internalises project risks. However, the lender expects fixed face value returns (principal and interests) and her claims are senior to those of the sponsors.
- Second, the FP does not provide sequential material contributions to the project. Thus, she receives low quality information and cannot sustain cooperation relationally -she cannot enforce on merely observable information.

Based on the above, let us observe the positions of three parties whose strategic profiles share features of both sponsors and the FP.

First, an equity investor who does not offer material inputs to the project. As a shareholder, she expects dividends but does not hold a claim that she can enforce against the SPV. Hence, her claims are junior to those of the non-recourse lender (the paradigmatic non-recourse lender). Effectively, as an equity investor, she internalises project risks.

Additionally, as she does not deliver efforts sequentially, she cannot interact materially with the project in a way that allows her to update information or sustain cooperation with sponsors. Consequently, she will not be capable of exerting the forms of opportunism described in chapters 5 and 6. Moreover, because, as an equity investor, her exposure will be, in profile, identical to that of the FP.

Consequently, she will effectively be part of the FP, and as part of the FP is how she should be treated legally. For examples of parties taking this position, see the case-study 3, *Colstrip power facility by Pennsylvania Power & Light Company (PPL)*, and 4 *Calpine Corporation Finance, Co.* further below.

Second, a contractor for inputs who does not hold equity but internalises project risks. This is a contractor for inputs who delivers material contributions sequentially to the project. This contractor delays the enforceability of her claims to a stage after the project begins operating. Thus, by conditioning the repayment of her claims to

the project's success, she is internalising project risks.

Additionally, as she delivers her contributions sequentially to project assets, she enjoys opportunities for updating information about the evolution of the project and the choices of inputs by peers. Moreover, her long-term interaction of sequential contributions to the project allows her stages for sustaining cooperation relationally with the sponsors beyond the party's enforcing capacities of the FP. Consequently, - note- she *can* implement all the types of strategic opportunism described in chapters 5 and 6 under the same tensions and incentives as sponsors. Her strategic profile will be identical to that of sponsors holding ownership. She is effectively a sponsor, and as a sponsor is how judges should treat her.

The observation of this paragraph will reveal its critical relevance in chapters 7 to 10 when exploring the legal responsibility regime applicable to sponsors in PFCs.

The contractor who does not internalise project risk. Finally, let us note the third case of the party whose claims do not depend on project success. The consideration of this alternative is straightforward. These parties are neither sponsors nor part of the FP. They are regular contractors of the SPV.

As examples, we may include insurers' positions (who receive payments upfront) or creditors whose claims are current, *i.e.*, contractors whose repayments unsecured but expected in the very short-term after they update information about SPV's solvency.

One extra remark is worth here. Note that, as part of this third category, we must include all contractors who, albeit not enjoying recourse to third parties (hence, strictly, despite being non-recourse creditors), they still receive sufficient sureties from the SPV (*e.g.*, *iure in re* over registrable goods as *hypotheken*, mortgages, *prendas*, or liens enforceable *propter rem*). Notice how, despite receiving protection from the (project risk exposed) SPV, these contractors do not internalise project success risk but instead asset risk. These are *regular contractors* of the SPV as those described in Chapter 2.

4.3 Six necessary strategic features of PFCs

Above, I have identified the essential strategic aspects associated with the six necessary components of PFCs. I described the critical features of sponsors, the SPV, the non-recourse debt, the single project, the risk allocation mechanism, and the FP.

I will now approach six aspects that result necessarily from the above elements and whose strategic relevance will appear in the following chapters. I will also come back to these propositions when advancing legal propositions in chapters 8 to 10.

In the first place, I will highlight the dependence of FP's claims on the contributions

from sponsors. In the second order, I will observe critical strategic implications from the control that sponsors exert over both the SPV and its assets. Thirdly, I will identify the three tiers of incentives to which sponsors deliver their responses in PFCs.

In the fourth sub-section, I will analyse the nerve of strategic tensions (conflicting interests). I will emphasise the relevance of the senior non-recourse debt and the imperfections of the risk allocation mechanism. In fifth place, I will advance elemental considerations about how, in PFCs, the conflicting interests manifest in opportunistic responses from input providers. That is, in contrast with what we see in regular diversified corporate businesses where managers abuse of company assets, in PFCs, opportunism takes place away from the control sphere of the SPV. This reveals the instrumentality of the SPV.

Finally, in sixth place, I will also advance how, in PFCs, sponsors perceive diversification spaces as socially undesirable and mitigate them contractually. These two points include advances of propositions that I will articulate in detail in the third part of the study, in chapters 8 to 10.

Based on the characterisations of these six features, below, I will identify the necessary aspects of the individual objective function of sponsors and the FP in PFCs. Based on those objective functions, in chapters 5 and 6, I will analyse the three forms of opportunism (*shirking*, *risking*, and *shading*) idiosyncratic of PFCs. Finally, based on this strategic analysis (incentives, vulnerabilities, expectations, and feasibilities), I will bring forward the propositions of strictly legal nature in chapters 7 to 10.

4.3.1 Dependence of FP's claims on the contributions by sponsors; the agreements amongst parties other than the lender (FP) and the debtor (SPV)

In PFCs, the FP's value of claims depends on the choices of inputs from sponsors and on the contractual interactions involving sponsors (not only the creditor -the FP- and the debtor of the non-recourse debt -the SPV). This results from the interplay amongst three elements: The specificities of assets, the non-recourse nature of the debt, and the limited liability protection allowed to sponsor by the corporate type of the SPV.

I have advanced the strategic relevance of the three features. The specificities of assets deprive project goods from redeployment (collateral) value. The non-recourse debt impedes that FP seeks repayment or compensation from parties other than the

SPV. Finally, the limited liability protection prevents the lender from demanding the payment of the debt from the sponsors.⁴⁷⁸

Consequently, in PFCs, the FP's value of claims rest on the capacities of the SPV to complete and operate the single project. The SPV capacities then depend on the responses by sponsors who, as shareholders control the SPV and as contractors bring all necessary inputs for the project. As described above and characterised in Chapter 2, inducing sponsors to deliver outputs as socially desirable is the object of the risk allocation mechanism. I will come back to this point below when describing the value of implementation quality and how transaction costs (implementation capacities) represent feasibility boundaries to FPCs.

Critically, in PFCs, the risk allocation mechanism stems from meetings of minds beyond the formal bilateral interaction between the non-recourse lender (the FP) and its debtor (the strictly instrumental SPV). It is the quality of this risk allocation mechanism -its effectiveness at bringing comfort to the FP- what dictates the willingness of the lender to enter the project. From a different stance (as a matter of implementation choices), in scenarios where parties implement all provisions in a single instrument (*v.gr.*, a framework agreement) we will see obligations amongst parties other than the creditor and the debtor for the non-recourse debt. In the absence of collateral or recourse to third parties, these obligations (*e.g.*, control covenants and cross-default mechanisms) reflect the rationality of the non-recourse lender in the credit contract.⁴⁷⁹

4.3.2 Sponsors control the SPV and project assets (a strategic approach)

As anticipated in Chapter 2, via their full ownership, sponsors control both the SPV and its assets, *de iure* and *de facto*. *De iure*, sponsors own the majority of shares in the SPV. Additionally, as input providers, sponsors control project assets materially. Remarkably, in PFCs, the sponsors and the FP implement functionally indispensable contracts (control covenants) the object of which is the control of the SPV by the sponsors.

The two sources of control come with several benefits that we observe in two

⁴⁷⁸ Strategically, the limited liability protection is indispensable for the functionality of the non-recourse nature of the debt.

⁴⁷⁹ Without institutionalisation, whether judges can use the existence of that necessary environment for shading light on the interpretation of clauses is a matter of legal traditions.

dimensions and four strategically critical points. The first dimension relates to actual control understood as the capacity to adopt decisions influencing its value. The other dimension is informational. We have seen references to these points above and practical illustrations of how these two dimensions materialise in Chapter 2. These propositions will be floating ideas in all chapters of the study.

First, SPV and project control in the object of contracts. In virtue of their ownership allocations, in FPCs, the sponsors exert political control of the SPV. Additionally, because the sponsors deliver material contributions to the project, the sponsors are also *de facto* controllers of all company activities of the SPV.

Moreover, in FPCs, the sponsors implement control covenants with the non-recourse lender predefining all critical aspects of the management of the legal entity until the full repayment of the non-recourse debt. These are the control covenants shown in chapter 2. Political and material control of the SPV and its assets are indispensable for the functionality of the risk allocation mechanism and consequently, essential features of FPCs.

Second, control and the asymmetries of information. By manipulating project goods, the sponsors can update (both observable and verifiable) information about how the project evolves and the choices of inputs of peer sponsors. The material control of project assets (their capacity to interact with such goods materially), then gives the sponsors an informational advantage over the FP.

Remarkably, material proximity with the project assets (*e.g.*, machinery) is not identical for all sponsors. Consequently, next to the asymmetries between the sponsor as a class and the poorly informed FP, there will also be asymmetries among individual sponsors. In other words, there will be some sponsors who will be in a better position to receive information about both the evolution of the project and the individual actions from peers. These advantages of sponsors individually (concerning each other) or collectively against the FP relate to both verifiable and observable information.

Third, the residual rights of control. Ownership permit that sponsors exert residual rights of control over the SPV and its assets. In this context, ownership's residual rights of control relate to the possibilities that, as proprietors, the sponsors have to adopt decisions for all matters that escape the incomplete regulations of the risk allocation mechanisms. This is one of the elemental strategic values of ownership as described in the classical property rights-based theories of the firm -*v.gr.*, residual

rights of control.⁴⁸⁰

Fourth, information, control, and strategic tensions. The interplay among the residual rights of control, the *de facto* and *de iure* control of the SPV and project assets, and the access to information (both verifiable and observable) of a quality superior that available to the FP permit that the sponsors providing sequential contributions to the project deliver both responses beyond the limited enforcement capacities of the FP. These actions will be both individual and collective and, as we will later see, also within sub coalitions of some sponsors. These spaces will exist in virtue of the asymmetries of information and because of the contractual incompleteness of the risk allocation mechanism allowing for unforeseen scenarios and new solutions desirable to sponsors, that they will implement in the exercise of their residual rights of control.

With verifiable information, they will put in place externally (judicially) enforceable contracts amongst each other and also involving the SPV beyond the regulations of the risk allocation mechanism that the FP implements and enforces imperfectly. With merely observable information, sponsors will sustain reciprocity based (relational) cooperation.⁴⁸¹ Finally, because the FP does not deliver sequential contributions, she cannot interact relationally with sponsors. Thus, sponsors will implement incentives based on observable information freely (unrestrictedly). To these spaces of agreements that the sponsors implement beyond the implementing and enforcing capacities of the FP (the risk allocation mechanism), I will later refer to as the 2nd tier of incentives to which the sponsors choose their responses (see next below).

Below, I will show how the efficiency or inefficiency of the actions that the sponsors will deliver in response to the incentives of this 2nd tier will depend on the evolution

⁴⁸⁰ Cf. S. J. GROSSMAN; O. D. HART, “The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration”, *Journal of Political Economy*, vol. 94, 4, 1986. O. D. HART; J. MOORE, “Default and Renegotiation: A Dynamic Model of Debt”, *The Quarterly Journal of Economics*, vol. CXIII, February, 1998. O. D. HART, “Incomplete Contracts and the Theory of the Firm”, *Journal of Law, Economics, & Organization*, vol. 4, 1, 1988.

⁴⁸¹ Generally, with literature review cf. pp. 297 and ff. in J. WATSON, *Strategy*, cit. Pp. 461 and ff. in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. M. HVIID, “Long-term Contracts and Relational Contracts”, cit. Specifically and more recently, G. BAKER ET AL, “Relational Contracts and the Theory of The Firm”, cit. J. LEVIN, “Relational Incentive Contracts”, cit.

of the project governs the capacities of the SPV to distribute residual benefits -the source of returns from sponsors' costly actions.

Finally, as I will elaborate in Chapter 8, in PFCs, the SPV control is the object of clauses between the FP and the sponsors. The object of these provisions verifies the functionally multiparty nature of PFCs and the dependence of the feasibility of the lending contract on the agreements amongst parties other than the formal lender and debtor (*vid. supra*).

4.3.3 Three tiers of incentives

Let us now observe the strategic aspects of the three tiers of incentives to which sponsors respond in PFCs. I have already characterised them in contractual practices in Chapter 2.

The 1st tier of incentives results from the provisions of the risk allocation mechanism (the rules enforceable by the FP); the 2nd tier of incentives stems from agreements implemented by sponsors only; the 3rd tier of incentives comes from the allocation of shares in the SPV (*v.gr.*, property rights with dividend expectations). Let us observe them in more details.

4.3.3.1 The 1st Tier: The Risk Allocation Mechanism

The 1st tier of incentives includes provisions to which the FP is an enforcing party. As I have already described, these are the covenants that shape the risk allocation mechanism -the protections that bring comfort to the lender internalising non-recourse risks. All clauses regulating the control of the SPV, the schedules of project completion, the certification processes, the enforcement precautions described in Chapter 2 -as enforceable by the FP (against sponsors or the SPV)- via technical or full default provisions including cross-default mechanism belong to this category.

As all contractual arrangements, the risk allocation mechanism is inherently imperfect. Its implementation takes place under bounded rationality. The FP enforces clauses behind asymmetries of information. These imperfections will later allow for sponsors (the agents) to deliver solutions in tension with the interests of the lender.

4.3.3.2 The 2nd Tier: Contracts involving sponsors only

Contracting beyond the risk allocation mechanism. The 2nd tier of incentives results from the provisions that the sponsors implement without the FP involvement. Accordingly, this 2nd tier involves all incentives that the sponsors put in place directly amongst them or indirectly via the SPV beyond the risk allocation mechanism. Sponsors put in place these contracts based on the superior information they obtain

from both the SPV they control as well as from the material proximity with the assets.

The scope of the relational cooperation. As also advanced, sponsors access not only verifiable but also merely observable information. Sponsors also deliver contributions sequentially. Therefore, they can sustain cooperation relationally -i.e., by threatening each other with retrieving cooperation in subsequent rounds of inputs.⁴⁸² This reciprocity-based interaction permits the enforcement of agreements on observable information (that the FP cannot use for enforcing internally) and verifiable information about events that -after conditions change- escape the incomplete provisions of the risk allocation mechanism.

Sub-coalitions and unanimous collusions. The proximity of material interactions with project assets is always distinct for each sponsor. Consequently, as a function of the different capacities to observe peers' actions, sponsors will find spaces for forming opportunistic sub-coalitions amongst only some of them. The feasibility (spaces) for these coalitions will depend on the same factors described above -and others analysed later in the study. Sponsors will take advantage of asymmetries of both observable and verifiable information as well as of contractual incompleteness (cf. Chapter 6)

In one of the sections of Chapter 6, I will restrict our attention to the formation of sub-coalitions. I will describe the bargaining processes and the expected and opportunistically optimal briberies. I will characterise the optimal scope of sub-coalitions a function of many factors including the complementarities of the distinct types of (quality-enhancing and innovation) inputs, the qualifications of individuals concerning such actions, and the asymmetries of information among sponsors.⁴⁸³

⁴⁸² Generally, with literature review cf. pp. 297 and ff. in J. WATSON, *Strategy*, cit. Pp. 461 and ff. in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. M. HVIID, "Long-term Contracts and Relational Contracts", cit. Specifically and more recently, G. BAKER ET AL, "Relational Contracts and the Theory of The Firm", cit. J. LEVIN, "Relational Incentive Contracts", cit.

⁴⁸³ In addition to that observation, note how the literature from the decade of the year 1980 often referred to the case of hidden information ex-post as a type of moral hazard. Consider the case of the expert who adopts decisions, and she records them, but her principal fails to judge them due to lack of qualifications (expertise). Analytically, the case of hidden *information* ex-post can be treated similarly to a case of hidden *actions* ex-post -the approach adopted by more recent studies. The

Remarkably, sub-coalitions will exist only for opportunistic purposes -not whenever some sponsors receive *good news* -the scenario where sponsors update information and observe that, in virtue of unforeseen changes in the environment, the project has evolved better than expected. Intuitively, after receiving *good news*, sponsors will choose higher choices of inputs. The sponsors will consequently perceive incentives for revealing rather than for withholding information about their actions. Hence, incentives of the 2nd tier (contracts involving only sponsors but not the FP) will serve for implementing both desirable and undesirable responses. Sub-coalitions - incentives of the 2nd tier implemented by and for only sub-groups of them- as long as such sub-coalitions remain undisclosed, will serve for opportunistic purposes only.

4.3.3.3 The 3rd Tier: implementing incentives via property rights

In compliance with the *informativeness principle*⁴⁸⁴, parties will incorporate all informational references of individual actions in their contractual arrangements (the 1st and 2nd tiers of incentives). In the clauses (in their reward functions) of the risk allocation mechanism (the 1st tier of incentives) parties will internalise all references to the individual actions of sponsors that can be later verified by the FP (who can only enforce judicially). For the 2nd tier of incentives, sponsors will take into consideration (all) the rest of the (superior) information they may access about the individual actions of sponsors.

observation here is not only theoretical, in PFCs sponsors are invariably highly qualified and these qualifications come with practical implications. Cf. page 9 in O. D. HART; B. HOLMSTRÖM, “The Theory of Contracts”, cit. In PFCs, parties value the capacities *to provide any technical or operating support required by the project*. Cf. p. 30 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

⁴⁸⁴ See the entry “*Informativeness principle*” in the glossary. Intuitively, for efficiency, sponsors should incorporate in reward functions (in our case, the 1st and 2nd tiers of incentives) all direct or indirect references of individual actions. From this, ownership (shares with entitlements to expected dividends) should be used only for incentivising fully non-contractible efforts. *Vid.* The seminal is B. HOLMSTRÖM, “Moral Hazard and Observability”, *The Bell Journal of Economics*, vol. 10, 1, 1979. For further illustrations and literature review, cf. pp. 169 and 300 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. See also P. CHAIGNEAU; A. EDMANS; D. GOTTLIEB, “The Generalized Informativeness Principle”, *National Bureau of Economic Research - Working Paper 20729*, vol. December, 2015.

As a last resort, for incentivising actions that are not contractible (fully unverifiable and unobservable) sponsors will then allocate shares of property rights in the SPV.⁴⁸⁵ These stakes of ownership come with expectations to fractions of the dividends expected from the SPV that sponsors expand by delivering private choices of inputs. Consequently, property rights function as an incentive device not sensitive to informational asymmetries.

However, as an incentive mechanism, ownership induces sponsors to choose costly inputs for a common (team) output -the total project value distributed by the SPV. This comes with a feasibility boundary of that team members cannot possibly escape.

Note how sponsors can only distribute entitlements corresponding to the shares of the single SPV which naturally correspond to the total expected dividends that the company can generate. Then, necessarily, if more than one (two or more) sponsor receives shares, it follows that each sponsor will receive less than the total amount of stocks of the company. Consequently, each sponsor will also hold claims to less than the total dividends expected from the project. Subsequently, whereas they will internalise the full costs of private actions, in their objective functions, each team member will see only a fraction of the total marginal value from her efforts corresponding to her allocations of property rights. Hence, the team member will under-invest.

Her under-investment will grow as a function the marginal benefits that, because of the distribution of property rights, she will externalise to other team members. Accordingly, unless the SPV has a single sponsor receiving all dividends, sponsors choosing non-contractible actions will under-invest -necessarily.⁴⁸⁶ This is an application of an impossibility -the canonical moral hazard in team problem- that has

⁴⁸⁵ For references in the management literature to the incentive value of equity in PFCs Cf. p. 30 and 131 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

⁴⁸⁶ Naturally, with the expression under-investment, we indicate not only the delivery of lower choice of socially desirable but privately costly actions but also the opposite and strategically identical failure to withhold privately beneficial actions with socially undesirable externalities. In this case, the individual sponsor produces losses to the project of which she internalises a fraction corresponding to her ownership in the SPV and externalises the rest to another team member.

been described extensively since the last years of the early decade of 1980.⁴⁸⁷

Ex-ante, sponsors will collectively estimate the marginal value of individual actions and distribute shares of the SPV in proportions to the relative values of such contributions.⁴⁸⁸ This is the best they can do for implementing incentives for them to deliver fully unobservable efforts.

Additionally, as they serve for incentivising fully non-contractible actions, incentives

⁴⁸⁷ The seminal and classical reference is B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. See also M. BATTAGLINI, “Joint Production in Teams”, *Journal of Economic Theory*, vol. 130, 1, 2006. L. RAYO, “Relational Incentives and Moral Hazard in Teams”, cit. E. RASMUSEN, “Moral Hazard in Risk-Averse Teams”, cit.

⁴⁸⁸ This optimal distribution of shares maximises total value as a function of the (necessarily under-invested) choices of inputs by team members. Two aspects could be noted here.

First, recall, sponsors exert actions whose costs grow convexly. Recall also, there are synergies in such contributions; consequently, there will be an optimal size for a team that will be higher than one. Simply, more team members mitigate costs of efforts and bring synergies to the team output. That number will be also smaller than infinite. Simply, with infinite team members returns from shares would be fully dissipated, hence under-investment would be total – sponsors would choose zero efforts.

Second, unrelated to the above, as we relax the assumptions that are necessary for the analysis, we observe that in practice, one or two sponsors will first shape a plan for the project and in a second stage they will incorporate other team members to the organization. Simply even though projects result from the evolution of concepts and exchanges of information, concepts may not appear simultaneously in the minds of all team members.

Consequently, ex-ante, the sponsors originating the project will bargain for the terms under which new sponsors will enter the agreements. As result, the sponsors originating the project will not distribute property rights maximising total value (as in the text of this footnote), but rather optimising returns to the sponsor originating the project after giving what the new sponsor requests for entering the project (so she complies with her individual rationality -participation- constraints) and her property rights expand value to the project originator. In this case, the allocation of property rights will consequently not maximise total project value (social welfare) but welfare to the sponsor initiating the project.

from the 3rd tier implemented via allocations of property rights can be readjusted only by exchanging shares amongst each other. Moreover, because sponsors readjust non-contractible actions freely (*v.gr.*, privately, without renegotiating or without increasing enforcement risks), the incentives implemented via property rights will be most sensitive to changes in incentive strengths stemming from unexpected evolutions of the environment.

Finally, albeit sponsors cannot contract on the actions incentivised via property rights, all parties can still preserve the strength of such incentives by protecting the value expected from dividends contractually. Precisely, this is one of the purposes of the risk allocation mechanism -the 1st tier of incentives. Intuitively, the FP will enforce (technical default and cross-default) provisions oriented at preserving the SPV's capacity to produce residual benefits and thus protecting the incentive power of allocations of property rights to sponsors.

4.3.4 The nerve of conflicting interests. The senior debt and contractual imperfections

Let us now restrict our attention to how *news*⁴⁸⁹ (incompleteness) and debt (volume relative to SPV's capacities and seniority) define the incentives and the strategic tensions with the lender. The interplay of these two features will define the value of ex-ante implementation in PFCs dictating the feasibility of non-recourse debt financing.

When introducing the functionality of the risk allocation mechanism, I have advanced the above proposition as a strategic corollary of the absence of collateral or recourse to third parties. Accordingly, the below observations will reveal compatible with the idiosyncrasy of a contractual interaction in which a principal allows non-recourse resources to a group of agents for them to extract variable benefits after returning capital and fixed benefits (interests).

The following propositions will also be consistent with the rationalities of parties to an arrangement in which they implement the non-recourse debt loan formally between the principal and the strictly instrumental SPV but where the indispensable contributions of all parties and the welfare outputs result from agreements amongst such input providers and the lender directly (the risk allocation mechanism). I will

⁴⁸⁹ Let us recall, with the expression *news* (*good news, no news, bad news, and very bad news*) I am referring to the contractually unforeseen evolutions of the environment.

revisit these intuitions below and from distinct stances the other chapters to follow.

Let us begin by presuming all features defined above and characterised in Chapter 2.⁴⁹⁰ Let us also restrict our attention to three critical aspects already described:

First, as said in many places, in the absence of recourse to third parties, in PFCs, the lender will substitute the protection of collateral with the enforceability of a risk distribution mechanism. As said, this set of requirements regulates the expected responses by input providers under all eventualities -but only as ex-ante foreseeable and informationally feasible. Crucially, -and consequently, parties implement the risk allocation mechanism imperfectly -i.e., incompletely and behind asymmetries of information.

Second, stemming from the above, in PFCs, sponsors deliver (some) actions that escape enforceability by the FP -i.e., these actions will be fully non-contractible to the lender. Contractual imperfections of the risk allocation mechanism then come with two further implications. First, there will be uncontracted eventualities (influences from nature -*v.gr.*, *news*) that will affect the value that the SPV will produce from the costly inputs from sponsors. This is a manifestation of both asymmetries of information and contractual incompleteness. Second, as described, within these spaces, parties will deliver responses individually or collectively in response to the 3rd and 2nd tiers of incentives, respectively. The costs of these efforts grow convexly to individual sponsors. For now, ignore the possibilities of implementing innovations; hence, most simply, assume that choices of costly actions always result in higher total project welfare and vice versa.

Third, and as also described, as a creditor, the lender holds a fixed face value senior claim to lent capital and interests. In contrast, the best-informed, materially controlling agents whose efforts dictate total project welfare hold expectations to residual benefits. That is, the sponsors hold expectations that are regularly junior and variable relative to the senior debt titles of the lender.

Below, I will show how the disparity of objectives and the fact that sponsors deliver non-contractible actions in the benefit of (with externalities to) the senior FP will result in desirable or undesirable responses as a function of two factors: first, the

⁴⁹⁰ That is, the SPV allows for a limited liability protection rule; sponsors control the SPV and its assets fully. Sponsors receive allocations of property rights. The SPV advances only one project that is highly specific and whose value depends on the inputs by sponsors.

burden of debt; and second, the quality with which parties implement the risk allocation mechanism that dictates the vulnerability of the project to contingencies (*news*).

4.3.4.1 Incentive effects of debt and its seniority

Let us now note how the FP delivers funds, but not material contributions to the project. Additionally, sponsors provide material inputs (goods or services) and some capital contributions behind limited liability protection. The SPV transforms all resources into specific assets shortly after receiving them. Finally, as described, the risks internalised by the FP depend only on the value that the SPV can harvest from the choices of inputs by sponsors in conjunction with the uncontracted influences from the environment (*news*).

Consequently, we can best describe the vulnerabilities of the FP (the principal in the setting) by restricting our attention to the responses of sponsors as incentives change with the environment (*news*). In conjunction with the influences from nature to the value from inputs, these choices of costly material contributions from sponsors will dictate the welfare that the FP will ultimately receive from her senior claims.

Remarkably, in PFCs, the interplay between the exposures of the project and parties to contingencies (*news*) and high levels of senior debt comes with both welfare and incentive effects to sponsors. The direct welfare effect comes straightforward to our intuition. The incentive effect of debt requires a distinct elaboration. These incentive effects will be in the core of the three types of opportunism idiosyncratic of PFCs - *shirking*, *risking*, and *shading*, that we will see examined in chapters 5 and 6. Let us observe them in separate.

4.3.4.1.1 Debt, news, and direct (total) welfare effects

This effect is financial (wealth allocation) in nature and appears clear to our intuition. The higher the level of debt, the greater the wealth that the SPV will need to produce to serve the non-recourse lender's claims. Accordingly, the higher the debt relative to total project welfare, the more likely that unforeseen undesirable events from the environment (*news*) affecting either sponsors or the project will result in the SPV failing to repay its claims. This equates to both greater and more likely negative externalities to the FP. This is how debt levels create cashflows volatility, ultimately affecting the value of debt (and debt capacity of the borrower).

Finally, higher senior debt level also implies that the value expected from sponsors (from both subordinated contracts and dividends) will more likely and more dramatically fluctuate from a mean of possible outputs (dispersion) as the environment changes. In other words, the higher the levels of senior debt in the

balance sheet of the SPV, the likelier that the sponsors will receive either lower than expected or nil benefits from subordinated contract claims and dividends after either they or the SPV receive the same *bad*, or *very bad news*. Note, these are all only wealth (not yet incentive -*i.e.*, strategic-) effects of senior debt levels.^{491 492}

4.3.4.1.2 Debt, wealth, and incentive effects

The incentive effects of non-recourse debt to sponsors in PFCs require a distinct elaboration. The interplay between the non-recourse debt (and its seniority) relative to total project welfare and *news* (incompleteness) defines not only the wealth that the SPV generates (as shown above) but also the strengths and types of incentives that the sponsors perceive when delivering non-contractible actions expanding such total value and residual benefits.⁴⁹³ That is, senior debt⁴⁹⁴ effectively comes with an impact of marginal (not only total welfare) effect.

From a different stance, the conjunction between the levels of senior debt and contractual incompleteness (exposure to both *news* and opportunism) dictates the responses that the sponsors will choose to the 2nd and 3rd tiers of incentives, beyond the capacities of the lender to enforce the risk allocation mechanism. This tension will ultimately define the total capacities of the SPV and the value of the senior non-recourse debt claims held by the FP. Accordingly, the interaction between senior debt and incompleteness will govern the degree of alignment between sponsors' incentives and the interests of the (least informed, not asset controlling) FP -whose

⁴⁹¹ These costs affect the individual rationality -participation- constraints (IRC), not yet the incentive compatibility constraints (ICC) of any party. Hence, backwards induction, these effects may result in parties withholding their participation in the project.

⁴⁹² Asides, in their position as contractors holding enforceable claims, the loss of utility associated with high levels of senior debt and insolvency risks reveals a loss of utility analogous to the volatility induced distress costs analysed in Chapter 3. Fundamentally distinct, as also described, in the case of PFCs, the levels of distress are significantly lower as a function of the milder contributions to the project -most of which now comes from the FP (whose distress cost she mitigates by increasing implementation quality -see further below).

⁴⁹³ *I.e.*, senior debt affects the incentive compatibility constraints (ICC) of sponsors.

⁴⁹⁴ See below, it is the volatility (likelihood of default) growing with debt levels what causes distortions.

contributions ex-ante define the feasibility of PFCs.

Intuitively, whenever the company does not perform as expected and fails to repay the senior debt, the conjunction between the limited liability protection of the SPV and the non-recourse nature of such debt result in losses that the company (sponsors) externalises to the lender. As I will analyse in chapter 5, this externality that realises in debt default events increases the value of withholding costly contributions whose undesirable consequences will manifest in increasing losses to the FP -the creditor. Accordingly, in chapters 5 and 6, we will see all incentive distortions (with subsequent opportunistic reactions reflecting misalignment of interests) that worsen after parties (indistinctively sponsors or the SPV) receive *bad* or *very bad news*.⁴⁹⁵
⁴⁹⁶ In the opposite scenario, the presence of senior debt implies that, under *good news*, when the company performs better than expected, less of the marginal value of costly actions by sponsors will be used by the SPV to repay such senior claims before complying with subordinated contracts and distributing dividends.⁴⁹⁷ Consequently, in her objective functions, the sponsors choosing inputs will observe that a smaller fraction of the marginal value of their costly inputs will benefit (reducing insolvency risks internalised by) the non-recourse lender. From a different stance, for a greater the value expected from the SPV we find a lower likelihood of default and

⁴⁹⁵ Additionally, recall, *news* does not (necessarily) affect volatility, but it moves up or down the curve that maps expected values (the weighted arithmetic mean of all possible outputs). Thus, by changing expected values (the values of all outputs), *news* makes defaults more or less likely than originally expected. Concretely, with *bad news*, all outputs will produce lower values thus increasing the likelihood of default thus increasing the value of the limited liability shelter -the source of the distortion- ultimately increasing opportunistic incentives (the incentives for parties to behave opportunistically internalising all marginal benefits but externalising a part of the marginal costs to the FP. I will expand this analysis with graphic representations in Chapter 5.

⁴⁹⁶ The marginal (incentive relevant) effect of debt also manifests in the disproportionate ways in which profits evolve (negatively) relative to welfare as choices of inputs change after receiving undesirable *news*. This is the result of the convex shape of the expected project value as a function of choices of inputs whose costs (to sponsors) grow convexly -for a fixed face value burden of debt.

⁴⁹⁷ This observation reflects seniority of claims expectations, not a chronological order of wealth distributions.

consequently a lower value of the limited liability shelter at that input level, and finally also the lower the returns (*i.e.*, the greater the losses internalised) from opportunistic responses. The distortion tends to disappear as insolvency risk dissipates with higher total welfare.

Importantly, note how it is *not* the debt (or its seniority) *per se* what causes the distortion. The externality exists as a function of the insolvency risks whose consequences sponsors can externalise to the FP by behaving opportunistically behind the non-recourse clause and the limited liability protection. Whenever, at the privately optimal input level of the sponsors, the company produces welfare sufficient for repaying the non-recourse debt (*v.gr.*, no default risks regardless of whether it fails to produce as expected), there will be no externality to the FP and no distortion. In this case, the sponsors would internalise the full impact of their extra benefits. Moreover, in algebraic expressions, the burden of senior non-recourse debt would appear as a fixed cost that would drop from the optimal expression of the individual sponsors' objective function -her incentive compatibility constraints. Hence, it would come with no incentive effect as the project evolves (*v.gr.*, once after parties decided to enter the project⁴⁹⁸). Consequently, the higher the wealth that sponsors expect from the SPV relative to total senior debt, the better the interest alignment between them (individually and collectively) and the FP.

In chapters 5 and 6, we will see not only that the three forms of opportunism (*shirking*, *risking*, and *shading*) decrease with *good news*, but we will also observe how sponsors will perceive incentives for revealing rather than withholding information about such changes in the environment and their expected input choices.⁴⁹⁹

Incentive distortions would disappear only in an unrealistic framework in which the

⁴⁹⁸ Ex-ante, backwards induction, by extracting total benefits, high senior debt should result in the sponsor failing to verify individual rationality -participation- constraint. The sponsors would walk away and allocate resources somewhere else. This is more so under risk aversion and volatility of cash flows (exposure to *news*) -a negative function of implementation quality of the risk allocation mechanism.

⁴⁹⁹ As sponsors deliver complementary (synergetic) contributions, they will perceive incentives for revealing information about *good news* (higher marginal benefits or lower marginal cost) as way of signalling an imminent increase in choices of inputs which should further incentivise other sponsors to expand their synergetic actions for further greater expansion of total welfare.

SPV always produced welfare sufficient for repaying the lender. *V.gr.*, in a framework in which, irrespective of debt levels, because wealth would be in all scenarios sufficient for repaying the senior debt, sponsors would always internalise the full impact or losses from their choices of inputs.⁵⁰⁰

Accordingly, the conjectured capacity of the SPV to produce wealth beyond the cost of debt will dictate not only the total (absolute) value that sponsors will receive from the project, but also -of crucial strategic relevance- the strengths and the types (desirable or opportunistic) of incentives that they will perceive when responding⁵⁰¹ to the SPV. This reaction of sponsors will then further expand the impact that *news* would bring to total benefits, a fraction of which (positive or negative) the SPV will externalise to the PF.

Remarkably, recall, albeit the sponsors are contractors for inputs, they still expect benefits that are (mostly) residual -*i.e.*, junior and variable. Thus, in an innocuous stretch of the imagination, if we treat their non-contractible efforts as capital contributions to the SPV, we would note that the incentive distortions described above would share (unsurprising) resemblances with those of the debt overhang (capital under-investment) problem in regular corporate settings.⁵⁰² Naturally, this does not explain the types of opportunistic behaviour in PFCs that we will see in chapters 5 and 6 nor the optimality of the seniority claims, as shown below and in Chapter 10. However, the analogy is pedagogically useful to show the reaction of parties expecting residual benefits from costly non-contractible actions (either input or capital) to the burden of senior debt.

4.3.4.2 Impact of (an optimal) seniority in PFCs

In PFCs, it is the seniority of debt more than its total value what -in conjunction with *news*- results in distortive incentives to sponsors. Notice the twofold (but inherently unique) characterisation of non-recourse debt in total level and seniority. Both variables of debt are reciprocally dependent. That is, strategically, they cannot be

⁵⁰⁰ This would also be the strategic output in a scenario of zero debt (where the SPV funded the project with internal resources) -something also incompatible with the rationality of parties in PFCs where financing cannot be covered without recurring to creditors and, as said, where specificities are high (see Chapter 3).

⁵⁰¹ *I.e.*, when optimising input levels and types of innovations.

⁵⁰² With abundant literature references, see the analysis of the debt overhang problem in Chapter 3.

understood independently from each other.

Intuitively, the seniority of debt will govern how much of the total benefits will accrue to the FP or the sponsors as contractors before the SPV can issue dividends as the project advances through operation phase. Accordingly, for the same amount of total debt, and the same expected project capacities, higher seniority of debt corresponds to a greater likelihood that the SPV will repay its debt. However, higher seniority will also result in greater exposure to incentive distortions as more of the risk will be transferred to sponsors. Stronger opportunistic incentives will then affect total welfare in detriment of the FP.

In the other extreme, a lower hierarchy of claims to the lender corresponds to greater exposure of the FP to contingencies but to stronger interest alignment -*i.e.*, a stronger socially desirable incentives for the sponsors under a broader range of scenarios. As shown in chapters 5 and 10, the interplay between sponsors' individual implementation capacities will define a hierarchy of claims that parties can grant to the FP before such seniority becomes counter beneficial to all parties, including the non-recourse lender. As I will observe in chapter 10, there is an optimal seniority of non-recourse debt that maximises the protection to the FP, the feasibility of PFCs and social welfare.

4.3.4.3 The (fourfold) feasibility value of implementation

In this scenario, it is easy to see how, irrespective of all characterisation of necessary features of PFCs (everything else fixed), the severity of the conflicts between the interests of the principal (the FP) and those of the agents (the sponsors) boils down to two variables: first, the high level of senior non-recourse debt;⁵⁰³ and second, the implementation quality. These are the implementation quality and the principal's exposure to the decisions of the agent(s) common to all principal-agent interactions.

The volume and seniority of the non-recourse debt govern the strength of incentive distortions that parties will perceive as the capacity of the SPV to comply with subordinated obligations and distribute dividends decrease as a result of *news* affecting the project. In this context, the implementation capacities -or the quality with which the FP implements and enforces the risk allocation mechanism- comes with a marginal value that is fourfold.

⁵⁰³ Prof. Benjamin Esty mentions how the average (median) SPV show debt to capital ratios of 70.0%. B. ESTY, "The Economic Motivations for Using Project Finance", cit.

First, as pointed out, directly, by foreseeing eventualities (*news*) and regulating the responses enforceable against sponsors, implementation quality protects total project value in the benefit of all parties.

Second, by regulating the responses by sponsors under such contingencies, implementation quality effectively reduces the spaces of actions within which sponsors can deliver opportunistic responses (*shirking, risking, and shading*) as the capacities of the SPV decrease.

Third, by preventing (penalising) opportunistic actions, the implementation quality preserves project capacities (as said). Then, by preserving SPV capacities to distribute dividends, implementation quality effectively conserves also the power of distributions of property rights (expected dividends) used for incentivising sponsors to exert costly actions that are fully non-contractible (the 3rd tier of incentives). Similarly, it preserves the returns from inputs that sponsors deliver in response to the set of incentives (associated with also junior expectations) that they implement (efficiently) beyond the enforcing capacities of the FP (the 2nd tier of incentives).⁵⁰⁴

Finally, fourth, a higher capacity of the FP to foresee contingencies expands project value, preserves incentives, and allows parties to raise the seniority of claims held by the FP at lower opportunity costs. This ultimately provides the lender for further protection, thus increasing her willingness to enter the project to benefit all parties.

As advanced, the above propositions are coherent with a contractual interaction in which a principal contributes with non-recourse debt resources for a group of agents (the sponsors) to obtain residual benefits after returning the funds borrowed with interests to the principal. The relevance of both variables is also coherent with the rationalities of parties in an arrangement in which they implement the non-recourse debt contributions formally between the principal and the strictly instrumental SPV, but where welfare results from the responses from input providers to agreements enforceable directly by the FP and such contributors. See further below and Chapter 7.

⁵⁰⁴ Based on this proposition that I will advance in chapters 5 to 7, in Chapter 9, I will propose a postulate for interpreting ex-post the provisions of the risk allocation mechanism as if implementing pre-emptive (not compensatory) objectives.

4.3.5 Opportunism beyond company spheres against the broader risk allocation mechanism

In PFCs, the conflicting interests do not materialise (prevalently) within the spheres of control of the SPV but in contractual interactions with input providers. I will show how this happens in chapters 5 and 6. Recall, in PFCs, the SPV advances a single project whose assets are highly or fully specific (their redeployment values are low or nil). Hence, the resources that managers or controlling shareholders can extract from the legal entity are limited.

Additionally, in PFCs, the principal (the FP) does not internalise non-recourse risks with eyes on collateral value but on the perspectives that input providers (who also own and control the SPV) will deliver contributions as socially desirable. Consequently, in PFCs, the creditor will not be (most) sensitive to opportunism managers against corporate assets of the debtor⁵⁰⁵, or the value of a portfolio of investments, or the solvency of parties providing sureties (the current collateral protecting the creditor).

After analysing the forms of opportunism in chapters 5 to 7, I will show how, in PFCs, the inefficiencies affecting the position of the FP will not happen within the spheres of control of the SPV (her debtor). Instead, in PFCs, opportunism will materialise in tensions with the objectives of the risk allocation mechanism. Opportunistic actions will include *shirking*, *risking*, *shading* that will realise outside the SPV, *-i.e.*, as choices of responses by parties to the risk allocation mechanism from sponsors. In other words, in PFCs, opportunism will not arise from within the SPV but from the side of contractors acting individually, within sub-coalitions, or colluding unanimously against the FP.

This aspect is idiosyncratic of PFCs and, critically, defines the object, style, and feasibility of legal solutions necessary for PFCs. I will revisit these intuitions in Chapter 7 when remarking the differences with the conflicting interests observed in diversified corporate businesses. I will also recall these observations when advancing legal proposals in chapters 8 to 10.

4.3.6 Negative value of diversification

As characterised in Chapter 2, in PFCs parties do not recur to the SPV or to its legal (limited liability) type for advancing diversified portfolios of yet unknown business

⁵⁰⁵ As in asset substitution or asset dilutions strategies in regular corporate contracting.

opportunities. Moreover, in PFCs, sponsors do not avail from the SPV for implementing delegation and channelling resources from diversified investors. As said, parties recur to a project-dedicated SPV for risk isolation, contractual implementation, and incentive allocation via distribution of property rights.

Additionally, in PFCs, the object of the SPV as defined by the risk allocation mechanism must be one and parties will pre-define it before the lender internalises non-recourse risks. This aspect is crucial to the feasibility of the risk allocation mechanism.

Accordingly, in Chapter 7, I will show how, in PFCs, parties not only do not value diversification of any form, but they perceive discretion (direct or indirect diversification) as a manifestation of implementation imperfections of the risk allocation mechanism. Hence, in PFCs, parties will spend transaction costs limiting (deliberately restricting) the spaces within which sponsors can use resources for directly or indirectly (by changing parties or technologies) modifying the project as predefined.

These objectives come in sharp contrast with the purposes of investors in regular corporate contracting. Moreover, the value of preserving diversification capacities also appear in the *ratio iuris* of legal protections that legislators and judges apply in typical corporate scenarios. Consequently, as shown in Chapter 2 and as I will recall in chapters 7 to 10, in PFCs, we will observe contractual practices preventing diversification (restrictive covenants) that we will not often see in regular diversified corporate businesses. Similarly, in PFCs, we will find contractual mechanisms oriented at providing the protections that rules oriented to preserving diversification fail to offer to the lender refining all aspects (foreseeable contingencies and expected responses to concrete problems) via the inherently incomplete but strategically fundamental risk allocation mechanism. I will observe these intuitions' functionality in Chapter 7 and in chapters 8 to 10 when advancing legal postulates.

4.4 Necessary features of the objective functions of parties in PFCs

Based on the above and the characterisations of Chapter 2, we are now in conditions to identify the strictly elemental components of the objective function of individual sponsors and the FP in PFCs.

I will now refer to the set of incentives to which parties respond as the project evolves and ex-ante during implementation. In the third sub-section of this section, I will emphasize the strategic tensions between the objectives of both parties.

4.4.1 The sponsors

4.4.1.1 Itineri

As the project evolves, sponsors optimise returns from the three tiers of incentives they perceive in PFCs. These are, the contracts enforceable by the FP, the contracts enforceable by other sponsors, and the dividends expected from the SPV in proportion to individual allocations of company shares. Sponsors will maximise profits by equalising the marginal returns from those three sources with the marginal costs of quality-enhancing and innovation-implementing efforts. These are the incentive compatibility constraints that govern the responses of from sponsors (ICC).⁵⁰⁶

Observe how the three sources of marginal benefits depend on the capacities of the SPV to produce value beyond the costs of debt. Note also how both the marginal costs of efforts and the returns from such costly actions are sensitive to influences from the environment (*news* - a problem of incompleteness that exacerbates moral hazard).

4.4.1.2 Ex-ante

Ex-ante, sponsors will spend implementation efforts exchanging information, anticipating contingencies, and advancing in the regulation of expected responses by all parties. This implementation process will involve contributions of the FP and a signalling stage.⁵⁰⁷

For an individual sponsor to enter the project, the profits that she expects from the

⁵⁰⁶ Cf. pp. 343, 404, 405, 473 and others in J. WATSON, *Strategy*, cit. Also pp. 59, 83, 84, 105 and others in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. Pp. 22, 30, 31, 36 and others in J.-J. LAFFONT; D. MARTIMORT, *The Theory of Incentives - The Principal-Agent Model*, Princeton University Press, New Jersey, 2002.

⁵⁰⁷ This signalling process will involve an opportunistic action by sponsors. The analysis of this aspect of strategies goes beyond the object of this study. However, its features are easy to identify. Under market pressure, sponsors will simply reveal information optimising the benefits they may obtain from the FP in terms of participation (availability of non-recourse debt) and price for monies (interests) at the marginal costs of losing space for later responding opportunistically (individually or collectively) as the environment deteriorates. The spaces within which sponsors will signal opportunistically will grow as a function of individual qualifications (expertise) and imperfections of the risk allocation mechanism as esteemed by them.

project after optimising individual responses as dictated by the above-mentioned incentive compatibility constraints (ICC) will be higher than the value of the next best alternative placement opportunity for such resources. These are the individual rationality -participation- constraints that define sponsors' willingness to enter the arrangement (IRC).⁵⁰⁸

4.4.2 The FP

4.4.2.1 Itineri

During the contractual interaction, the FP will spend efforts enforcing the provisions of the risk allocation mechanism (the 1st tier of incentives -the only incentives she can enforce). The FP will contribute with cash as defined by the waterfall clause.

For the rest of the study, and without loss of generality, I will assume that these efforts are costless.⁵⁰⁹ Accordingly, the enforcement capacities of the lender will be a function of asymmetries of information and her (low) qualifications in the industrial sector of the project.⁵¹⁰ Additionally, as in all contractual interactions, imperfections of the risk allocation mechanism will also stem from the incompleteness inherent to all its clauses. This consideration permits that we restrict our attention to the responses from the agents, thus significantly simplifying the analysis.

4.4.2.2 Ex-ante

As described above, ex-ante, the FP implements a series of contractual provisions - the risk allocation mechanism- regulating the responses expected from sponsors under all circumstances.

By spending implementation efforts, the FP effectively advances against the spaces of actions that sponsors may otherwise benefit by implementing agreements amongst

⁵⁰⁸ Cf. page 343 in J. WATSON, *Strategy*, cit. See also pages 17, 23, 59, 70 and others in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. Page 57 and ff. in J.-J. LAFFONT; D. MARTIMORT, *The Theory of Incentives - The Principal-Agent Model*, cit.

⁵⁰⁹ Accordingly, we do not need to worry about the incentive compatibility constraints of the principal.

⁵¹⁰ We can neglect the fact that lender will recur to external experts. This assumption comes without loss of generality because the expert consultants can mitigate but never revert the informational advantage of the agents interacting with assets materially.

themselves (the 2nd tier of incentives).

As also described, ex-ante, the FP will choose implementation efforts at the marginal benefit of increasing the likelihood that -from the more predictable responses by sponsors under all contractible eventualities- the SPV manages to repay the non-recourse debt. That is, by regulating the responses from the sponsors, the FP will prevent *shirking*, *risking*, and *shading* as opportunistic incentives grow with the changes in the environment (*news*) deteriorating the capacities of the SPV.

Additionally, by regulating the responses from sponsors, the FP will effectively preserve project capacities, thus mitigating the subsequent deterioration of incentives whose strengths and efficiency depend on the SPV's capacities to repay subordinated contracts and issue dividends beyond the costs of senior non-recourse debt. In the last paragraph, I referred to the sponsors' actual responses (*shirking*, *risking*, and *shading*). Now, I am mentioning the value of preserving project capacities and consequently, the sponsors' incentives to respond with non-contractible efforts as socially desirable.

Finally, the lender will enter the contract and internalise non-recourse risks whenever the relationship between interest and likelihood of repayment of uncollateralised non-recourse debt allows her expected returns higher than the next best alternative allocation opportunity in the money markets. These are the individual rationality -participation- constraints (IRC) that the lender verifies before entering the project.

4.4.3 Precarious interest alignment and the tensions

Finally, let us shortly observe the strictly elemental aspects of the interest alignments and strategic tensions between the sponsors and the FP. The following observations consolidate the intuitions advanced before in this chapter as well as in chapter 2. An in-depth analysis of these propositions will appear in chapters 5 and 6, with legal implications in chapters 7 to 10.

4.4.3.1 Precarious alignment

In PFCs, the FP holds claims that are senior and of fixed face value. Consequently, the lender benefits from the higher capacity of the SPV to produce total welfare. Most intuitively, the higher the value produced by the company, the lower the likelihood that it fails to repay its senior debt obligations.

On the other hand, the sponsors hold residual expectations. That is, their claims are variable in value, and they are junior in seniority to those of the FP. As a result, the value that the sponsors harvest depends on SPV's (*v.gr.*, the project's) capacities to

produce wealth beyond the costs of the senior non-recourse debt. Subsequently, both the FP and the sponsors benefit from higher project value.

Additionally, recall, project cash flows are volatile. This means that for a particular choice of inputs, the project can produce higher or lower total wealth to the SPV. Volatility (risk) is a reference of the dispersion of possible outputs from an expected value that dictates the choices of inputs. In other words, this risk is not to be confused with the exposure to *news* that affects the *expected* value (the mean of individual possible outputs) from such actions -and consequently also the choices of inputs under distinct tensions and externalities (a separate analysis in chapter 5).

However, the sponsors internalise risks under a limited liability shelter, and the FP holds claims that are non-recourse. Thus, whenever the company fails to produce value as expected, the bulk of losses will be externalised to the non-recourse lender. Then, the interplay among the volatility of cash flows, the exposure to *news*, the limited liability shelter and the non-recourse debt does, however, result in incentive distortions. I will come back to this point below. For now, notice how the perspectives of not internalising the costs of debt whenever the SPV fails to repay the non-recourse debt impedes that the sponsors internalise some of the marginal value of their costly contributions whose consequences they will externalise to the non-recourse lender. This proposition is in the core of the three strategic tensions to which I will dedicate chapters 5 and 6. The sponsors will withhold costly contributions (*shirking*). They will choose technology solutions riskier than socially desirable (*risking*). Finally, they will implement innovations for saving costs without internalising some of the losses they will produce to the project and the FP (*shading*).

The distortions grow as a function of the likelihood of SPV defaults on the senior non-recourse claims and with the tranche of debt that would remain unpaid in such case. That unpaid value reflects an externality that corresponds with the value of the limited liability shelter.⁵¹¹ This is the magnitude of the distortion from senior debt in conjunction with limited liability, a non-recourse clause, and cash flow volatility.

The tensions disappear when (say, after substantial enough *good news*), with eyes on higher *expected* residual benefits, the sponsors increase choices of inputs, and SPV becomes capable of repaying the senior non-recourse debt irrespective of fluctuations

⁵¹¹ This is the losses that creditors internalise in virtue of the limited liability rule protecting shareholders, and in our case reinforced by the non-recourse clause.

(dispersion) in project outputs.⁵¹² In this scenario, the sponsors internalise the full marginal impact of any variations in their choices of costly contributions.⁵¹³ The response from sponsors will be, in this case, socially optimal. However, as parties can never eliminate risk (the risk allocation mechanism is inherently incomplete), the tension will mitigate but never disappear.

Let us now advance the elemental intuitions of *shirking*, *risking*, and *shading*. The identification of these three forms of opportunism is a contribution of this study. I will analyse them in full detail in chapters 5 and 6.

4.4.3.2 Choices of inputs (*Shirking*)

Shirking is the simplest form of opportunism. It simply involves the withholding of privately costly and socially desirable contributions. The description of the problem is identical to that of the general aspects of the tensions (see above).

As described, the interplay between the non-recourse clause and limited liability protection of the SPV implies that whenever the company fails to produce value sufficient for repaying the senior debt, much of the consequent losses will impact the FP. This results in some of the marginal effects of costly non-contractible actions from sponsors accruing to the FP. Externalities whose value change as a function of private actions result in incentive distortions.

Intuitively, the sponsors will harvest the full value of savings (*shirking*). However, some of the marginal losses associated with the now deeper losses from the also likelier events of default resulting from her *shirking* will impact the non-recourse lender only. Limited liability effectively protects the sponsors from some of the consequences of her savings. Precisely, it expands the returns from *shirking* for as much as such savings are worth to her more than *the fraction* of losses she internalises.

The tension grows as the environment deteriorates, thus increasing the likelihood of default.⁵¹⁴ Finally, irrespective of *news*, the relationship between such marginal costs

⁵¹² Hence, there are no output events in which the FP finds her claims not served by the SPV.

⁵¹³ And the impact of debt becomes not sensitive to the choices of inputs thus dropping from the optimal expression of the objective function (ICC) of sponsors.

⁵¹⁴ As shown in Chapter 5, in a graphic representation, we a flattening of the return function that sponsors optimise.

and marginal benefits of efforts (*v.gr.*, the slope of the individual profit function dictating the optimal choice of inputs) will also change⁵¹⁵ as a function of the volatility of outputs. Simply, volatility governs the likelihood of default under limited liability protection with the consequential externalities to creditors and incentive distortions to the sponsors.

Note, as long as volatility (default risks) exists, *shirking* will also occur under *no news*-the environment of uncertainty in which parties contracted initially. This is because the distortion exists as a function of debt, volatility, and the limited liability protection. In Chapter 5, I will present the form of opportunism in all scenarios. The same caveat applies to the other three forms of opportunism.

4.4.3.3 Choices of risk levels (*Risking*)

As a function of debt levels, behind limited liability shelter, sponsors will also perceive incentives for choosing technological solutions riskier than socially desirable. Intuitively, by increasing the volatility of outputs, the sponsors expand the benefits they obtain in the events of project success but do not internalise the consequences from the SPV now more likely failing to repay more of the total non-recourse debt. Effectively, by increasing risk levels, sponsors expand the value of limited liability protection in detriment of FP's claims.

Precisely as above, the tension grows with the burden (ratio) of debt relative to expected benefits. This is a ratio that changes exacerbating the incentive distortion with any deterioration of the environment (*news*) affecting either sponsors or the SPV.

I refer to this tension as *risking*. *Risking* implies that technological choices will depart from the socially optimal. With *risking*, the sponsors extract higher returns welfare decreasing innovations -an aspect common to the problem of *shading* (see next).

4.4.3.4 Choices of innovations (*Shading*)

As conditions deteriorate, the sponsors will perceive incentives for implementing costs-saving innovations for complying with enforceable obligations but without

⁵¹⁵ The dispersion of outputs increasing the value of limited liability shelter will flatten the marginal return function relative to the total output function thus changing the place where the marginal value meets the marginal costs of efforts for a lower choice of inputs -*shirking*.

internalising the full losses in marginal benefits that their undesirable actions will bring to the SPV and the FP.

Intuitively, the risk allocation mechanism results in obligations that the lender will enforce against sponsors in all eventualities -i.e., irrespective of changes in the environment affecting the capacities of the SPV and consequently returns from costly actions by sponsors. Accordingly, as the conditions worsen and the SPV dedicate more of the total welfare to repaying the senior non-recourse debt, sponsors will perceive stronger incentives for innovating as a means for lowering the costs of complying with obligations with the FP. Because more of the total project value will now accrue to the lender, more of the externalities from sponsors' innovations lowering the costs of complying with their enforceable obligations will harm the lender -not the sponsors. Consequently, as the capacities of the SPV to distribute residual benefits beyond the costs of debt decreases, the sponsors will implement costs saving innovations and internalise less of the welfare decreasing consequences. Eventually, when the SPV manages to produce a value equal to the cost of debt, the sponsors will comply with their enforceable obligations under the risk allocation mechanism. However, they will not internalise any of the loss of welfare consequences of their choices of cost-saving innovations. The distortion diminishes with *good news*.

4.5 Necessary feasibility determinants of PFCs

Finally, we can subsume the variables that dictate the feasibility of PFCs under three items: The capacities of sponsors, the wealth capacities of the project, and the implementation capacities of the FP.

The capacities of sponsors. The capacities to deliver material contributions and to implement innovations (their qualifications) define the value that parties can generate by combining their resources, the funds from debt and the single project. The capacities of sponsors include their solvency to internalise the obligations under the risk allocation mechanism.

These capacities will define the value that the SPV will produce beyond the costs of debt. Consequently, these qualifications will also govern the tolerance of the SPV (and sponsors) to the undesirable influences from the environment before sponsors perceive incentives for responding opportunistically by *shirking*, *risking*, and *shading*. As sub-items of the capacities and qualifications of sponsors, we find the asymmetries of information amongst them that dictate their implementation

capacities (the 2nd tier of incentives) and the complementarities (synergies) of their contributions.⁵¹⁶ I will consider the strategic implications of these items in chapters 5 and 6.

The wealth capacities of the project. As described in Chapter 2, in the core of all PFCs, there must be a project that, if constructed and run from socially desirable responses from sponsors, should allow the instrumental SPV to produce welfare sufficient for, at least, repaying the non-recourse debt. Precisely as described above, the higher the capacity of the project to produce value, the worse the *news* that they or the SPV will internalise at weaker opportunistic incentives.

The implementation capacities of the FP. Critically, in the absence of collateral or recourse to third parties, the capacity of the FP to refine the risk allocation mechanism defines the responses expected from sponsors as the environment deteriorates. The implementation capacities of the FP rule the spaces within which sponsors will deliver responses under the agreements that they will implement (the 2nd tier of incentives) efficiently or opportunistically. Note, unrealistically, with sufficiently high implementation capacities, the FP should be capable of contributing with extra capital and also exert discipline to sponsors under all circumstances. The interplay between these two aspects would make capital contributions of sponsors unnecessary -for this reason, the financial capacities of sponsors do not appear as an element necessary for the feasibility of PFCs.

As already pointed out, the above observations reveal the idiosyncrasy of an organization where a principal provides non-recourse funds for a team of agents to harvest variable benefits after allowing a fixed return to the principal (debt with interests). The above reveals a contractual organization in which parties implement the provision of debt formally between the principal and the strictly instrumental SPV but where the indispensable contributions of all parties result from agreements amongst them directly. Hence, in PFCs, we find clauses whose functionalities depend on the responses from other parties to distinct commitments.

⁵¹⁶ There is a body of articles already considering the influences between the actions from different sponsors in the marginal value of respective actions. Other frameworks also consider the externalities amongst such inputs. Cf. E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit. D. MARTIMORT; J. POUYET, “To Build or not to Build: Normative and Positive Theories of Public-Private Partnerships”, cit.

4.6 Necessary contrasts with other financing techniques

References to the differences between PFCs and several other financing alternatives exist in the literature. Therefore, the elaboration of an exhaustive comparison of the alternative financing technologies is not within the object of this study. However, today, authors in literature adopt a strictly financial approach.⁵¹⁷ Therefore, for completeness, and from a strategic (incentive) approach, I will now show the most remarkable differences between PFCs and other two alternatives for funding project of exceptionally high values at risk: first, the standard collateralised lending contracts between companies and banks; and second, the reception of investment from private equity funds.

4.6.1 Collateralised lending (diversified corporate finance)

As the most relevant difference, in standard corporate lending, parties rely on collateral value as a surety for the repayment of financing loans. In these environments, assets owned by the debtor or third parties do have alternative placement value –*i.e.*, they are not highly specific. As the lender does not rely on project success for measuring the expected value of her claims, *ex-ante*, parties do not spend transaction costs beyond the necessary for implementing collateral and sureties. In these scenarios, *itineri*, the lender spends monitoring and enforcement efforts to preserve such value. Consequently, insolvency regulations, corporate control liability institutions, and penal law protect creditors' interests from opportunistic actions by debtors (controllers) harming collateral integrity.⁵¹⁸

Additionally, in collateralised corporate contracting, companies advance a diversified portfolio of business opportunities. The value of assets of this portfolio serves as collateral to creditors. It is the value of this portfolio what diversified investors observe as the source of dividends. Hence, when contracting with third parties (in particular, with creditors), the company (shareholders) will take into account the opportunity costs that restrictive covenants preserving collateral value could bring to the capacities of the company to advance (or to seek financing for) subsequent yet-unknown alternative projects. These criteria are not only visible in contractual practices but also in the diversification preserving objectives of legislative solutions. I will come back to these observations in chapter 7.

⁵¹⁷ Cf. page 24 to 26 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

⁵¹⁸ With literature references, see the analysis of the problem of asset substitution in Chapter 3.

In contrast, in PFCs, the SPV holds fully specific assets. The lender relies not on current asset value but on the enforcement quality of a risk allocation mechanism assuring the availability of all inputs necessary for the project to generate value sufficient to repay her claims. Accordingly, in PFCs, the lender spends transaction costs not implementing restrictive covenants preserving collateral value but foreseeing eventualities and regulating expected best responses from all input providers. Consequently, as also remarked, in PFCs, opportunism occurs via the responses by such contractors -not predominantly at the company level by managers or controlling shareholders against current company resources serving as collateral.

Additionally, in PFCs, parties (the SPV) advance a single project that they define before incorporating the project company. Consequently, in PFCs, the loss of diversification capacities of the debtor as a result of restrictive covenants does not appear as opportunity costs that parties perceive when failing to advance side projects (that the SPV cannot invest on, in any case). Precisely, on the contrary, the loss of diversification of investments (projects), investors (sources of capital), and contractors, that must be predefined before the FP internalises non-recourse risk appears as a virtue rather than as a cost of contractual implementation. Today, judges and legislators do not consider these aspects when providing legal solutions to the case. I will come back to these observations in Chapter 7 -the first chapter analysing strictly legal aspects.

4.6.2 The private equity industry

We also find bright contrasts between the strategies of the FP and those of investors in the private equity (including leveraged finance) industry. Characterised simplistically, the strategy of private equity investors consists on identifying a private⁵¹⁹ company with growth potential, injecting cash via capital investments (ownership), contributing actively to its management with crucial expertise, and finally divesting after harvesting dividends or other types of profits as per predefined conditions.

As in PFCs, in these scenarios, we also observe insufficient collateral from the project or third parties. However, equity investors do not rely on the liquidation value of the company in which they invest as managed by third parties (the sponsors)⁵²⁰ but on

⁵¹⁹ *V.gr.*, not publicly traded.

⁵²⁰ They are equity investors and the company is not highly profitable at the time of investing.

their expertise at facilitating the efficient exploitation of growth capacities. Moreover, by gaining political control of the invested company, investors can not only contribute with their managerial qualifications, but they can also monitor administrative decisions, further facilitating the enforcement of investment agreements.

Accordingly, in private equity, the investor is an owner, who, as such, holds political control of the company with residual decision-making rights over project assets. Additionally, as owners, investors expect junior variable benefits from their investments. This results in strong incentives for investors to expand company value by improving counselling for the exploitation of the ongoing portfolio of businesses as well as of future opportunities.

The particular objectives of private equity investors reflect in the object of ex-ante implementation efforts. In private equity investments, the object of transaction costs of investors consists of regulating the company's managerial intervention and in predefining the terms under which equity investors will exit their positions as stakeholders after harvesting benefits.

In contrast, in PFCs, we find: First, the FP is a creditor, not an owner exerting control of project assets. Second, assets are highly or fully specific; hence, they do not serve as a source of collateral protection in case of businesses not progressing as desired. Moreover, third, in PFCs, the creditor does not intervene actively in the project evolution but relies on the responses from parties delivering material contributions for a single project as all parties contracted upon before internalising risks.

As insisted, in PFCs, the FP finds comfort exclusively in the implementation quality of a fully enforceable task and risks distribution mechanism assuring that, under all foreseeable eventualities, the SPV will count on the inputs necessary for successfully operating the predefined project. Increasing certainty of project success is the object of implementation efforts by the FP. In other words, in PFCs, ex-ante, the optimal choices of inputs and the decision to enter (or remain outside) the project will be dictated by the expected returns from the project as a function of total implementation efforts -not as a function of the quality of the investors' involvement in the decision-making system of the invested company. For the same reason, implementation capacities (a function of transaction costs) appear as a feasibility boundary of PFCs but not in other scenarios.

4.7 Verifying elements, parties, and strategies in four distinct cases

Let us now observe four cases representing all the necessary and some of the most common features in PFCs. Except for the first case-study, all cases present simplified

versions of real-life projects as described in managerial and finance literature.⁵²¹

These are cases chosen to represent how structural characteristics of PFCs can vary with the distinct projects and needs of parties. However, in all scenarios, I will show the presence of necessary elements and parties and the strategic tensions inherent to all PFCs. These four exceptionally diverse cases serve as evidence of the plausibility of the characterisation of PFCs of chapters 2 and 4. The cases also serve for illustrating the assumptions of chapters 5 and 6.

4.7.1 Case-study 1 – An extension of the simplest case of Chapter 2

4.7.1.1 Critical aspects of the project

Of the four scenarios, this is the only fictitious one. The structure of this first project shows an extension of the minimalistic example offered in Chapter 2. Accordingly, in that vein, we may think of a project requiring financing, designing, building, and operating an Olympic stadium for a local government. A real-life example of a similar endeavour is the National Stadium for the Beijing 2008 Olympic Games BOT project advanced by the Chinese government.^{522 523}

⁵²¹ For compendiums of PFCs case-studies see B. C. ESTY, *Modern Project Finance: A Casebook*, cit. F. PRETORIOUS ET AL, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, cit. For references to the principles of Islamic finance, see page 1186 in M. J. T. MCMILLEN, “Islamic Shari’ah-Compliant Project Finance: Collateral Security and Financing Structure Case Studies”, cit.

⁵²² *Vid.* The National Stadium BOT project for Beijing 2008 Olympic Games, pp. 130 and ff. in H. W. ALFEN ET AL, *Public-Private Partnership in Infrastructure Development Case Studies from Asia and Europe*, Bauhaus-Universität Weimar, 2009.

⁵²³ Other references to the use of PFCs and PPP for the construction of stadiums are visible in pp. 9, 60, 87, 193, 185, 192, M. BULT-SPIERING; G. DEWULF, *Strategic Issues in Public-Private Partnerships. An International Perspective*, cit. *Vid.* P. 21, 236, 267, 296 and 332 in P. URIO, *Public-Private Partnerships: Success and Failure Factors for In-Transition Countries*, cit. Page 23 in S. L. HOFFMAN, *The Law and Business of International Project Finance*, cit.

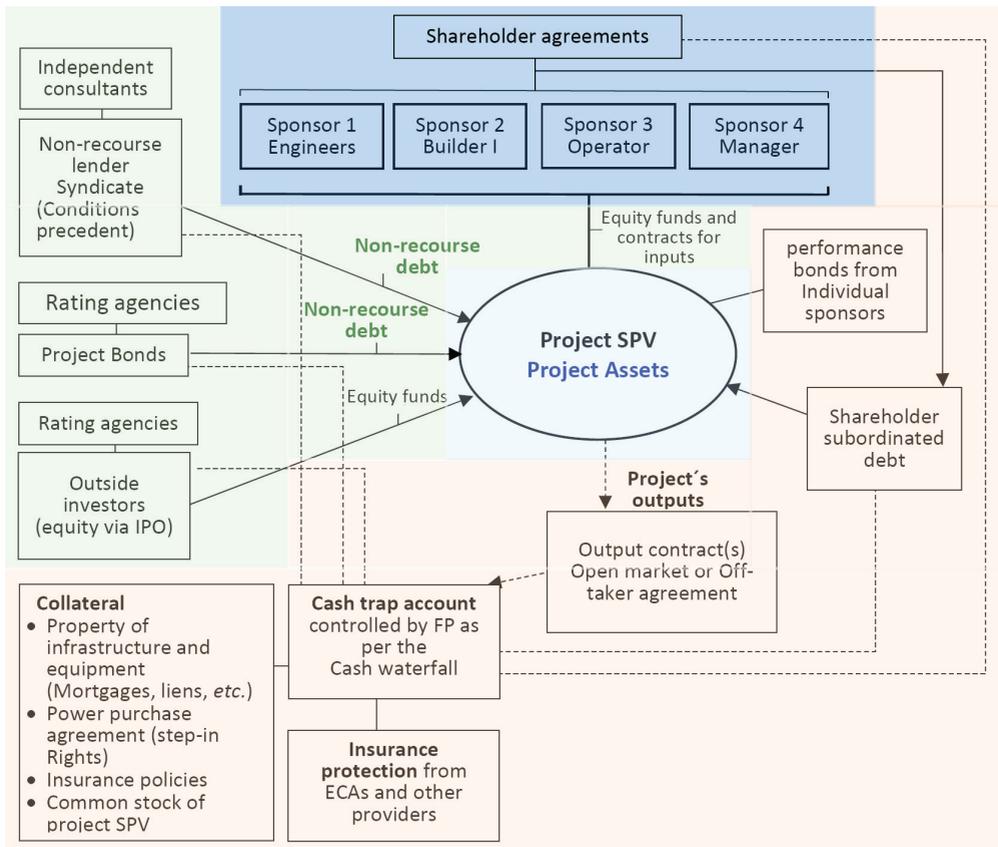


Exhibit 2

4.7.1.2 Necessary parties and elements

The colours identify all the indispensable components and parties in PFCs. The sponsors and their agreements appear in blue. The grey indicates the single SPV hosting project assets. The risk allocation mechanism shows in orange. Finally, the green marks the FP providing non-recourse debt. These four elements plus the single project (owned by the SPV) and the non-recourse debt, indicate the six necessary components in all PFCs. I will use the same colour and line nomenclature in all other cases.

Additionally, the dotted lines designate the transfers of resources or cash flows. The slim lines show contracts of different kinds. The broader lines between sponsors and the SPV remark ownership and control.

In blue, we see sponsors coordinating actions via shareholder agreements. Here we find all contracts implemented on both verifiable of high quality or on observable

information (for relational cooperation) in which the FP does not intervene. These agreements regulate the governance and control of the SPV and critical aspects of how they will deliver inputs to the project as the environment changes. These are also the provisions that ex-ante shapes the earliest stages of the project before they present it to the FP and the off-taker.

In green, we also see bondholders and the syndicate of lenders. This syndicate acts as a single party represented by a leading arranger under the advice of independent consultants. Below we see bondholders.

Finally, also in green, we also find outside equity investors. These are not contractors for inputs; so, they are not sponsors. Outside equity investors are the most junior claimants in the setting. They expect dividends from the SPV, which, in essence, are conditioned to the performance of the project. Naturally, they do not have recourse to third parties. So, they appear as part of the FP.

In orange, we then find the set of contractual arrangements, cash flow management provisions, bond and insurance protections, and other commitments that shape the risk allocation mechanism. In a clockwise direction, we first see performance bonds. The FP requests these in the protection of the SPV. Failure to maintain these in force would result in the enforcement of cross-default provisions against the SPV (who would internalise a fine with equity funds or cash provisions) or against sponsors directly.

Next, we find shareholders subordinated debt-agreements. These are obligations to maintain cash at the SPV level. Functionally, these are not distinct from equity contributions (with fixed face value).

Additionally, parties often implement further financing via so-called mezzanine debt instruments from sponsors. Some of these securities may also include warrants functionally resulting in redistributions of property rights amongst sponsors. All these may have seniority higher than those of regular debt and equity. Habitually, their hierarchy will be lower than the senior non-recourse debt held by the FP. Their use will often respond to tax efficiency reasons or for allowing stronger rights to some sponsors.⁵²⁴

Right below the SPV, we see the off-taker. In our example, this would be the Chinese government verifying the advances of the project and regulating its exploitation by

⁵²⁴ Cf. page 86 and ff. in F. PRETORIOUS ET AL, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, cit.

the SPV. Notice the use of a cash trap account under the control of the FP. Observe how resources (goods and services) flow from the SPV into the off-taker, and cash goes from the off-taker then flows back to the FP and sponsors. In more complex projects, this would permit that resources flow to other SPVs (see the second case-scenario of the A2 Highway of Poland), to input providers or to other provision accounts with minimal intervention of the SPV. Connected to cash traps, we also see collateral, credit enhancement, and insurance protections contracted by the SPV but protecting the FP. Finally, as part of the risk allocation mechanism, the *cash waterfall* clause will regulate the obligations of sponsors to provide extra equity funds (to maintain some debt-to-equity ratios) during the life of the project. This appears in the vertical line above the SPV.

For simplicity, the Exhibit does not show other contractual arrangements typical but highly variable in PFCs as described in Chapter 2. For instances, negative pledges, back-to-back and pass-through clauses will exist as control agreements amongst sponsors with or without the intervention of the FP. Note how the cash trap account controlled by the lenders implements pass-through mechanisms. The same can be said about duties to informed obliging both sponsors and the SPV. Monopolies of financing allowed to the FP will be part of the *cash waterfall* agreement between the FP and sponsors directly or via the SPV (as per control agreements). Step-in rights will relate the FP, the SPV and the off-taker. As much as the FP can enforce them, all these provisions would lie in the Exhibit's orange area.

4.7.1.3 Necessary strategies and tensions

Note how debt from shareholders is junior to the non-recourse debt. Equity investments will produce returns only after the senior debt held by the FP has been served. Additionally, all liens and mortgages relate to projects assets that are highly specific. Finally, performance bonds and perhaps collaterals associated with obligations of sponsors will cover losses to the SPV resulting from the breaching on individual obligations for inputs -the nature of the risk allocation mechanism.

In all scenarios, should the project or the SPV fail to produce wealth as expected, the lender would not be capable of seeking repayment from third parties. In such cases, the FP would indeed trigger the protection of mortgages, liens, step-in rights, and perhaps gain access to the ownership of SPV shares. However, after the project failed, such protections will be necessarily insufficient -this is true, especially during construction, before the operation phase. The incapacity of the project to produce value as expected will consequently result in the SPV failing to repay the senior non-recourse debt, costs overruns requiring further investments and readjustments with the off-taker and the FP, or plain default of the non-recourse debt will then follow.

However, in virtue of their access to superior quality information, the conflicts between the interests of the sponsors and the FP will begin growing well before the insolvency of the SPV becomes verifiable to the FP. That is, as soon as sponsors perceive a deterioration in the capacity of the SPV to repay contractual claims and issue dividends, sponsors will perceive stronger incentives for behaving opportunistically. As already advanced, and as I will analyse in chapters 5 and 6, sponsors will shirk socially desirable non-contractible inputs (*shirking*). They will choose riskier than socially optimal technologies (*risking*). Finally, they will also implement innovations for saving costs when complying with enforceable obligations without internalising the impact of such undesirable solutions to project value (*shading*). They will implement these solutions by acting individually, by forming sub-coalitions, and finally, as the environment further deteriorates, they will collude unanimously against the non-recourse lender.⁵²⁵ This will result in further losses of the capacities of the SPV to repay its non-recourse debt -an externality to the FP.

As said, and as it will be reiterated in many places in this study, preventing these reactions of sponsors under project distress is the object of the risk allocation mechanism dictating the feasibility of PFCs. Facilitating this endeavour to the FP should be the sole object of legal solutions offered to parties in PFCs. These propositions hold robustly in virtue of the strategic aspects that are inherent to the components and parties in PFCs. We will see the reflection of these postulates in the legal proposals advanced in chapters 7 to 10 of this study.

The above first case was a fictitiously typical version of a PFC on its necessary and frequent elements. The next three scenarios will be real-life-based and most diverse in their features as presented in the management literature.

4.7.2 Case-study 2 - The A2 Highway of Poland

4.7.2.1 Critical aspects of the project

This second case involves the financing, construction and operation of the A2 toll highway in Poland by Autostrada Wielkopolska S.A. A reliable description of this project can be found in the compendium *Modern Project Finance – A Casebook*, by Prof. Benjamin C. Esty,^{526 527}

⁵²⁵ Cf. Chapter 6.

⁵²⁶ *Vid. pp. 301 to 320 in B. C. ESTY, Modern Project Finance: A Casebook, cit.*

In the core of the project, Autostrada Wielkopolska committed to financing, building and operating the A2 toll highway in Poland. The project also involved the construction and operation of other facilities for accommodation, entertainment, and fuel supply along the road. Many aspects of the several contractual agreements shaping the project remain today undisclosed to the public. However, the knowledge we have about the structural features of the project allows us to identify the necessary the elements, configuration, and strategic aspects of a PFC used for PPPs for road financing, construction and operation.

4.7.2.2 Necessary parties

The nomenclature of colours and lines here are the same as above. In the column in blue, we now find all sponsors. The two companies in the upper square show operators of other similar projects in the market. The companies in the lowest square are construction companies with the required know-how. Notice the diversity of expertise in the long list of sponsors. These differences in technical backgrounds will result in asymmetries of information amongst them.⁵²⁸

⁵²⁷ There are other works describing other case-studies. See F. PRETORIOUS ET AL, *Project Finance For Construction & Infrastructure; Principles & Case Studies*, cit. J. D. FINNERTY, *Project Finance, Asset-Based Financial Engineering*, cit. J. B. MILLER, *Principles of Public and Private Infrastructure Delivery*, cit.

⁵²⁸ In Chapter 5, I will describe the tensions amongst individual sponsors and how such asymmetries allow for spaces within which sponsors will implement opportunistic sub-coalitions.

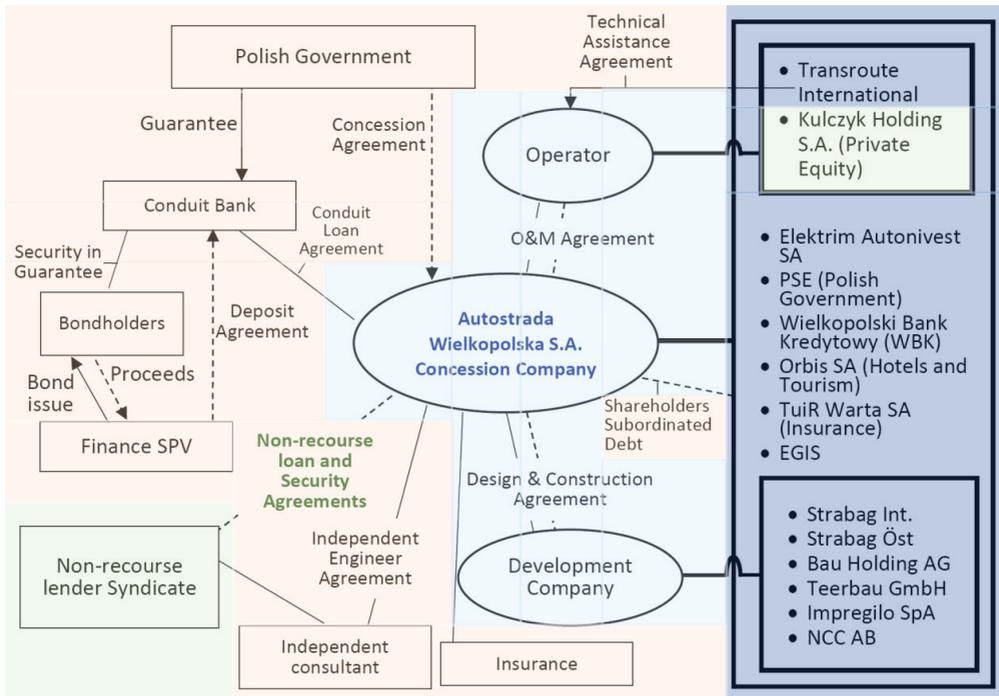


Exhibit 3

In grey areas, we now see three SPVs. The one in the centre contains both project assets and the financing debt (*cf.* the case study below). All sponsors hold shares of this SPV. The other two SPVs respectively hold the operation and management and the design and construction inputs. Accordingly, sponsors will deal with matters associated with one of the two companies. Here too we see the same six elements necessary in all PFCs.

Strategically, by separating the project in more than one SPV, sponsors may implement better incentives via the distribution of property rights to sponsors most capable of choosing non-contractible actions for each of the two. Intuitively, efficiency calls for property rights of the development company to be delivered only to building companies who can better react to such incentives with higher value contributions.⁵²⁹

⁵²⁹ *Cf.* B. HOLMSTRÖM, “Moral Hazard in Teams”, *cit.* Giving stocks to all sponsors diminishes the shares that can be given to each sponsor which exacerbates the moral hazard induced under-investment problem. Along with tax efficiency, this

The second structural aspect that we note is the access to *some* financing from bondholders with recourse to the government. The conduit bank sells bonds of the SPV collateralised by certificates enforceable against the Government. These are entitlements to payments and compensations associated with the operation of the project. This is an aspect in sharp contrast with what we saw before concerning bondholders providing non-recourse debt. The presence of the government offering guarantees makes this financing a part of the risk allocation mechanism. *V.gr.*, such debt is not non-recourse and, as they contribute to funding the SPV, such resources come with positive externalities to the FP.

Notice also, in the blue column of sponsors, in green, we see Kulczyk Holding S.A. (Private Equity). In the original description of the case study, the author placed this company as a sponsor. However, as a private equity investor, Kulczyk Holding S.A. does not contract for material inputs with the project. The company expects dividends whose values are contingent on project performance. Kulczyk Holding S.A. cannot behave opportunistically. By painting it green, I emphasize the equity investor's strategic profile as part of the FP.

Finally, here we do not see the cash trap account. Cash resources now flow directly to the SPV in the organisation's core (Autostrada Wielkopolska S. A.). This company owned by all sponsors then channels the cash from the project to sponsors via the two other SPVs. These are the repayments of contracts for inputs. The same company implements the repayments to the bondholders and the FP. Finally, as all sponsors own the Autostrada Wielkopolska S. A., dividends can be distributed directly from the project company.

The functionality of other elements is similar to what we described before. The syndicate of non-recourse lenders enters security agreements with Autostrada Wielkopolska S. A. holding specific assets. The FP receives advice from independent consultants. These consultants interact directly with the project company for *itineri* enforcement (*e.g.*, project reports). The FP will require that the Autostrada Wielkopolska S. A. buys insurance coverages against critical risks.

Not included in the charter we should probably see performance bonds and other arrangements securing the delivery of inputs by sponsors to each of the two

proposition appears as a clear answer to the rationality of these organization decision. However, to the best of my knowledge, there are no studies focusing on the logic of using more than one SPV.

secondary SPVs. With investors, sponsors, and FP coming from outside Poland, we should also see the intervention of ECAs and international insurance companies protecting the project against currency rate fluctuations, expropriations, and other insurable risks.⁵³⁰

4.7.2.3 Necessary strategies and tensions

The fact that we now find three SPVs does not affect the strategic tensions described above. The FP still holds non-recourse claims. Consequently, the non-recourse lenders still depend on project performance for the repayment of principal and interests. Sponsors still hold claims junior to those of the FP. They are also capable of contracting beyond the enforcing capacities of the FP.

Furthermore, sponsors still control project assets both legally (via the also controlled SPVs) and materially by interacting with each other directly. Just as described, as the environment deteriorates, sponsors will perceive weaker incentives for delivering socially desirable contributions and stronger incentives for choosing riskier than optimal solutions as well as for implementing cost-saving but potentially socially undesirable innovations. The three strategic responses will result in negative externalities to the non-recourse lender.

The sole difference between this and the earlier case is that here, opportunism will manifest in the contractual interaction between each sponsor and the SPV to which she delivers her contributions. The loss of project capacities will then realise in the quality of inputs that the SPV in the centre of the charter, Autostrada Wielkopolska S.A., will receive from the other two SPVs suffering the opportunism from sponsors. Finally, the loss of welfare will appear in the construction and service quality that Autostrada Wielkopolska S.A. will offer the public (or the off-taker). How this will happen will be described in chapters 5 and 6, with several legal implications advanced in chapters 7 to 10.

The following two examples will also show the same necessary components and strategic aspects. Their focus will be on very distinct aspects. Below, I will show an example of a project where sponsors use three SPVs but where the contract with the off-taker, the assets of the project, and its operations are in different companies. Additionally, in this third case-scenario, parties will finance and exploit assets via a non-recourse leveraged leasing mechanism.

⁵³⁰ The project was originally conceived before the Euro era. Thus, cash from drivers would enter the project in Złoty.

The fourth case example will show a project where parties use PFCs for implementing a non-recourse revolving financing facility. In that last case study, we will see several SPVs implementing several sets of assets (power stations) all parts of the same greater PFCs. All SPVs will then advance their projects sequentially and share the same contractual infrastructure facility.

4.7.3 Case-study 3 – Non-recourse Leveraged Leasing Finance; the financing of the Colstrip power facility by Pennsylvania Power & Light Company (PPL)

The example that follows corresponds to a real-life case where via its subsidiary PPL Global, Pennsylvania Power & Light Company purchased the *Colstrip power facility* (later allocated to PPL Montana).⁵³¹ The example serves to illustrate also the so-called *synthetic leasing* mechanisms.⁵³² The concrete case of non-recourse leverage leasing shows best the variations and tensions around the use of leasing for financing, and how, as expected, here too we find the necessary elements and tensions of all PFCs. Below, we will see the same conflicting interests described above.⁵³³

4.7.3.1 Critical aspects of the project

Below, we will see a case where, by implementing PFCs in conjunction with leasing contracts, sponsors can obtain tax benefits and manage expected cash flows more efficiently. These benefits stem from the possibilities that leasing allows for allocating assets, contracts, financing and expected dividends in different legal entities.

Concretely, taxwise, in some jurisdiction, leasing structures permit efficiency on the distribution of deductibles. That is, sponsors can allocate tax costs and benefits from asset depreciation, the interests for the capital, the costs of (income from) leasing fees, the control of assets (capital or operating lease treatment) on different balance sheets of the several SPVs. Parties can then identify the legal entities who can extract greater benefits from deductibles or internalise tax cost at lower rates. Parties can then reflect the value of such costs or tax benefits on the rewards from the project. Additionally, sponsors can distribute cash flows to the FP via leasing fees rather than

⁵³¹ *Vid.* page 441 and *ff.* in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

⁵³² *Vid.* page 455 in *Ibid.*

⁵³³ A comparison among the different types of leasing mechanism, with debt-to-equity ratios and non-recourse tranches can be found in pages 456, 468 and 462 in *Ibid.*

from the repayment of principal and interests at higher taxes burdens.⁵³⁴ Similarly, leasing permits avoiding the impact of depreciation on balance sheets.

The lessee can use assets and shift the tax impact of risk to the lessor. On the financial side, leasing allows for the harvesting of benefits (fees) immediately. In other words, the lender does not need to wait for building phases to be completed before receiving benefits.

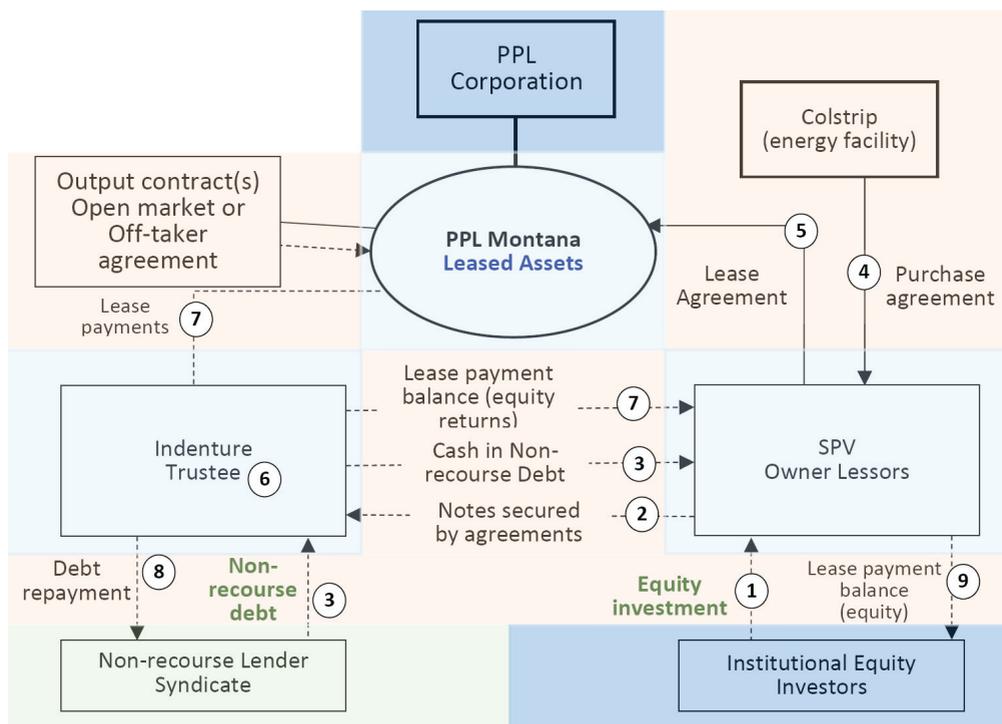


Exhibit 4

4.7.3.2 Necessary parties and elements

As shown in footnotes, for convenience, the least strategically relevant aspects of the real-life case study have been omitted or simplified. Just as above, in blue, we find the sponsors and the shareholders agreements; the risk allocation mechanism shows in orange; the financing party appears in green. As above, here too, we have three SPVs. Likewise, in this third case-scenario, we find the same six components inherent

⁵³⁴ Cf. page 450 in *Ibid.*

to all PFCs.

Of the two SPVs on the sides of the *exhibit 4*, the one on the right, *Owner Lessors*, represents interests of *Institutional Equity Investors*. The one on the left, the *Indenture Trustee* represents the interests of non-recourse lenders.

The implementation sequence is as follows: (1) *Institutional Equity Investors* contribute with \$72 in equity (100% capital) of the *SPV Owners Lessors*. (2) *The Institutional equity investors (SPV Owners Lessors)* then issue non-recourse titles for \$338 to *Indenture Trustee*, in exchange of which, they receive \$338 in cash that *Indenture Trustee* received from the *Non-recourse Lending Syndicate* (3). (4) With funds gathered from the two sources, *SPV Owners Lessors* purchases interests in *Colstrip* for \$410.⁵³⁵ (5) *Owner Lessors* then enters a long-term lease contract (36 years) with PPL Montana, the operating company selling energy, the output of the project. Then, simultaneously, *Owner Lessors* assigns both the interests in *Colstrip* (5) and the lease contract to *Indenture Trustee*.

After implementation, *Indenture Trustee* (controlled by the *Non-recourse Lender Syndicate*) will be now the owner of project assets (via the interests in *Colstrip*) and the lessor receiving fees from PPL Montana -the lessee operating assets (7). After receiving semi-annual lease payments from PPL Montana, the *Indenture Trustee* would then deduce principal and interests due, progressively cancel non-recourse debt titles (8), and pass on the balance to the former *SPV Owner Lessors* for distribution in the form of dividends to *Institutional Equity Investors* (9).⁵³⁶

Whether tax benefits from depreciation appear on the side of the *Indenture Trustee* or *PPL Montana* will depend on the types of assets,⁵³⁷ and on whether legislators require that assets appear on the balance sheet of the lessor or the lessee. This tax costs will reflect in cash flows and prices. Note how fees will start flowing

⁵³⁵ In real-life, project assets (60% interests in the *Colstrip* energy facility) were bought from the PPL Montana, the SPV in the centre of the graphic, which itself received it from PPL Global, both companies being subsidiary of PPL Corporation. The ultimate objective of the project to was finance the purchase and operation of *Colstrip* from Montana Power Company obliged to divest in response to regulatory changes. *Cf.* pages 450 and 451 in *Ibid.*

⁵³⁶ *Vid.* page 452 in *Ibid.*

⁵³⁷ See the analysis of the treatment of capital leases and operating leases in page 457 in *Ibid.*

immediately; so, the lender and investors do not need to wait until the project begins operation. This aspect is important to companies sensitive to dividend volatility. The lessee will see 36 years of tax deductions for the lease fee costs. At the end of the project, ownership goes to *Institutional Equity Investors*.

4.7.3.3 The necessary strategies and tensions

Also, in this project, we observe the same parties and tensions as in all PFCs. One or more sponsors organise the task and risks distribution mechanisms whose enforcement bring comfort to the non-recourse lender. In our case, although Owners buy assets already functioning (the interest in *Colstrip* power facility), and, even though assets remain under a SPV fully controlled by the FP (Indenture Trustee), cash still comes as a result of the operation by the sponsor(s).

Therefore, as in all other cases, the capacity of the project to produce wealth, and the likelihood that the FP finds her non-recourse claims served depends on how sponsors will respond to the risk allocation mechanism. As in other cases, as conditions deteriorate, and the sponsors fail to extract residual benefits from contracts or dividends (after, in the case, paying lease fees), they will withhold all inputs escaping the enforcing capacities of the FP. They will adopt riskier than socially optimal technologies that will still comply with obligations formally. Finally, they will devote innovation-implementing efforts at finding ways to comply with obligations enforceable by the FP at lower costs but without internalising project value. As conditions worsen, these responses by sponsors will progressively reduce the capacity of *Colstrip* to produce value. This will then increase the likelihood that PPL Montana will fail to pay its semester leasing fees -an externality to the FP. *The Indenture Trustee* will then execute its debt claims but will obtain no value from the “Owner Lessor”, a SPV company.

4.7.4 Case-study 4 – Calpine revolving facility

4.7.4.1 Critical aspects of the project

The last case describes the Calpine Corporation non-recourse revolving facility, also in the electric power market in the United States.⁵³⁸ In this last part, we also see the six elements essential to all PFCs. Below, I will show the necessarily conflicting interests too.

⁵³⁸ *Vid.* pages 112 and *ff.* in *Ibid.*

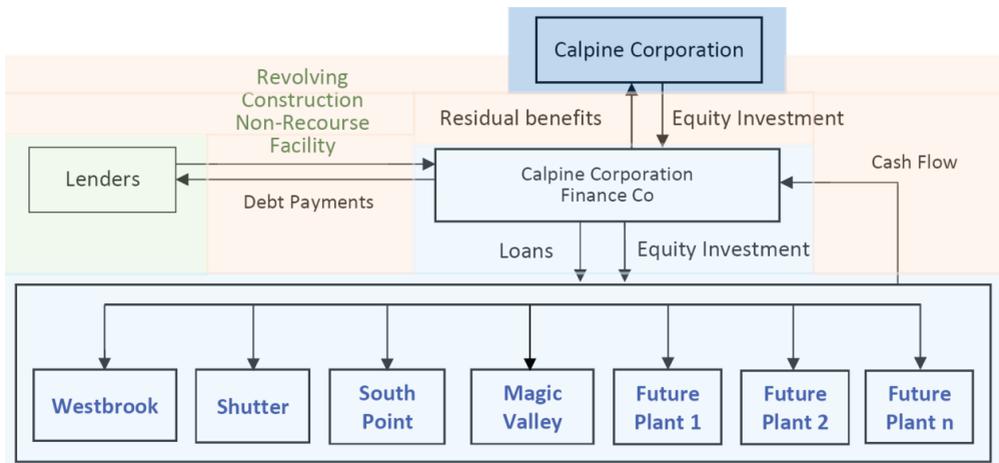


Exhibit 5

Calpine Corporation required \$1 bn of non-recourse funds for financing a series of seven materially independent power facilities.⁵³⁹ The arrangement had a single sponsor, Calpine Corporation. The project finally received material input contributions from affiliated companies.

Funds were lent to a single SPV. This SPV then owned a series of SPVs, each of which was dedicated to a power station. The financing of projects, and consequently, the non-recourse risks internalised by the FP, took place sequentially. The SPV receiving non-recourse debt, Calpine Corporation Finance, Co., capitalised (equity) each of the single project dedicated SPVs and would also lend funds. Lending rather than capitalising via equity came with tax effects and also permitted that, as a creditor, the parent SPV extracted funds more easily from subsidiaries.

As per the term sheet and later *cash waterfall* arrangement, Calpine Corporation Finance Co, (the parent SPV) received funds without recourse to Calpine Corporation. As usual, that parent SPV received equity funds from the sponsor Calpine Corporation -the single sponsor. The SPV then received non-recourse funds and, as collateral, had access to the assets (and ownership stakes) of all subsidiary

⁵³⁹ Interestingly, the term sheet for the proposed revolving structure including key covenants, basic elements of the *cash waterfall* clause (as called, *priority of cash flows*) has been published. *Vid.* page 131 in *Ibid.*

SPVs.

As a fundamental element of the risk allocation mechanism, Calpine Corporation guaranteed all obligations of affiliate companies to the borrower. This guarantees the functionality of performance bonds described in earlier examples and in Chapter 2. The parent company also committed to maintaining debt to capital ratios of the borrower and subsidiaries. On these ratios depended the interests charged by the FP to the parent SPV.

In the first stage, parties will fund four power stations, Westbrook, Shutter, South Point and Magic Valley. Only after these have been completed and entered operations, and only after approval of the syndicate of lenders (the FP), Calpine Corporation Finance Co, the parent SPV, would receive extra non-recourse funds and be allowed to advance in the construction of other units. In the *cash waterfall* clause (visible in the published term sheet), parties regulated how cash from the SPVs of each project would be extracted and used by the parent company.

4.7.4.2 Necessary parties and elements

The presence of all necessary components and parties of PFCs is visible in Exhibit 5. As remarked, inputs will come to each of the power facilities from companies that are formally third parties in the PFCs. However, the single sponsors in the arrangement, Calpine Corporation, controls them all. Hence, we will observe not only full ownership but also the material control of projects that define the nature of sponsors in PFCs.

4.7.4.3 The necessary strategies and tensions

Crucially, as expected, in virtue of the *de iure* and material control of project assets by Calpine (the sponsors) and its affiliates, everything said above about the tensions inherent to PFCs reveals here too. The FP's value of claims depends on the success of projects -a function of the quality of inputs that the sponsors deliver in response to the risk allocation mechanism.

Then, as the environment deteriorates, Calpine could perceive lower incentives for - via its affiliate companies- delivering socially desirable inputs escaping the enforceability of the risk allocation mechanism. Such input providers would adopt riskier technologies for complying with enforceable obligations and will innovate for finding lower costs responses to such commitments without internalising project risk now externalised to the lender.

Two aspects must we notice with regards to the strategic relevance of advancing several projects sequentially. First, later projects were authorised after the earlier

ones have reached a stage of advances that assures its productivity as expected. Second, contractually, as described above, the borrower (Calpine Corporation Finance Co, -the parent SPV) exposed as collateral the full ownership of all SPV funded under the revolver facility. In virtue of these two aspects, parties did not limit the exposure of projects to *material* contingencies. However, sequential transfers of funds conditioned to the completion of the initial set of power plants permitted the generation of extra value collateralising the non-recourse financing of later units. Note how beyond a certain point, the debt was still non-recourse. However, the debtor -Calpine Corporation, the parent company- was eventually capable of responding financially with the property of subsidiary SPVs (each one owning a fully functional power plant) should later projects funded with later tranches of non-recourse debt fail to perform as expected. Additionally, the progressing capacities of the conglomerate to produce constant cash flows make the revolving facility more capable of internalising the impact of *news* at lower incentive distortions to the sponsors (Calpine Corporation).

4.8 Conclusions

The chapter is the first strategic analysis of the positions of parties in PFCs. The chapter is also the first study oriented to the legal institutionalisation of PFCs.

The objective and multiparty nature of PFCs. As shown, PFCs are *ad-hoc* contractual organisations that parties implement for constructing, financing, and operating single time-limited projects. These projects are invariably costly (high capital-intensive) and often unique in their kinds. The assets that shape these projects are also regularly highly (or absolutely) specific. Then, parties recur to PFCs whenever the project's funding needs exceed the internal financing or debt capacities the sponsors (including the access to sureties from third parties).⁵⁴⁰

In PFCs, parties allocate both the project assets and all contractual relationships (including the non-recourse loan agreement and the contracts for inputs) in a single project-dedicated SPV that sponsors own and control. Then, for rationality, the non-recourse lender substitutes the lack of collateral protection of specific assets and the missing recourse to third parties with a risk allocation mechanism. This risk allocation mechanism is a set of (collateralised) contractual requirements procuring that, under all eventualities, the sponsors bring all inputs necessary for completing the project successfully.

⁵⁴⁰ See the propositions of Chapter 3.

This risk allocation mechanism enforceable by the FP against all parties is consequently indispensable to PFCs. Moreover, in the absence of collateral or sureties from third parties, the implementation quality of this risk allocation mechanism defining the responses expected from sponsors dictate the value of non-recourse claims held by the lender, her willingness to internalise non-recourse risks, and consequently the feasibility of PFCs.

The implementation of a single time-limited project. Notably, in PFCs, in sharp contrast with what we observe in regular diversified corporate investing, sponsors do not benefit from the legal corporate type of SPV for facilitating delegation and diversification (of investments, investors, and contractors). In other words, in PFCs, parties do not use the SPV for the business objectives for which judges and legislators devise the functionalities of mandatory and default rules, including the Kaldor-Hicks efficient limited liability protection to dispersed investors.⁵⁴¹

On the contrary, in PFCs, the parties avail from the SPV legal structure for implementing a single project amongst parties that do not change during the life of the endeavour (or change as contracted ex-ante). The allocation of project assets and contracts under a SPV permits eliminating double way risk contamination hazards from and to the single costly project. The SPV also facilitates contracting for inputs for the predefined project.⁵⁴² Finally, by allocating the project under the ownership of a SPV, via distributions of property rights (shares) sponsors implement incentives for them to deliver fully non-contractible efforts enlarging dividends.

The multiparty risk allocation mechanism amongst parties other than the non-recourse creditor and debtor. Remarkably, the feasibility of non-recourse financing depends on the quality with which sponsors and the FP put in place a *functionally* multiparty organisation (*cf.* the analyses in Chapter 8). Without legal institutionalisation, whether this multiparty functionality is also of legal essence is a matter of the distinct legal traditions. However, beyond doubt, ex-ante, all parties intervene in the design of the risk allocation mechanism, and all parties begin complying or enforcing obligations both collectively and individually even before the lender delivers funds for the project.⁵⁴³ In other words, in PFCs, the rationality of

⁵⁴¹ I will elaborate on this proposition in Chapter 8.

⁵⁴² It simplifies the contractual relationships and allows for the use of project assets as collateral of individual obligations of sponsors under the risk allocation mechanism.

⁵⁴³ I will revisit this proposition in Chapter 7.

parties implementing non-recourse debt facility depends on the quality of a risk allocation mechanism implemented by parties other than the formal (functionally instrumental) debtor and the creditor of such financing facility.

The debt repayment capacities of the SPV depend on responses to the risk allocation mechanism. Additionally, as the project evolves, the value of individual contractual responses will depend on the choices of inputs from peer sponsors as well as on the value expected from a team effort. Accordingly, as a result, the personal qualities of sponsors -both financial and material- are relevant to the feasibility of the risk allocation mechanism. Hence, parties will not assign their positions to third parties as the project evolves. These are *intuitu personae* aspects of the positions of parties in PFCs. These *intuitu personae* features come in sharp contrast with the impersonal diversified portfolio investing, and the disperse investor hosting objectives of traditional corporate organisations.

The principal-multi-agent relationship and contractual imperfections. As total welfare depends on the quality with which the main risk-taker enforces a set of incentives to other best-informed material controlling parties to deliver contributions, we can present PFCs as a relationship between a principal and a group of agents. In this interaction, the principal (the FP) holds a fixed face value senior non-recourse credit. The group of agents (the sponsors) harvest residual (junior and variable) benefits beyond the costs of debt.

As in all contractual interactions, the risk allocation mechanism is inexorably imperfect. Technological qualifications will come with asymmetries of information jeopardising enforcement (moral hazard). As projects evolve in very long terms, conditions will change. Contingencies (*news*) will affect both parties and the single project (incompleteness). As a result, tensions between the principal and the agents (both individually and collectively) will invariably arise.

The three tiers of incentives. In PFCs, the SPV will remain under the ownership and control of the agents providing inputs for the project. To sponsors, as input providers, the possibility of interacting with project assets gives them not only material control capacities but also an informational advantage over the FP (the principal in the setting). Control and information then permit that sponsors deliver contributions after coordinating with some or with all other sponsors beyond the enforcing

capacities of the FP.⁵⁴⁴

As a function of asymmetries of information and contractual incompleteness of the risk allocation mechanism, sponsors will consequently choose costly inputs and innovations in response to three tiers of incentives. First, they will comply with the obligations of the risk allocation mechanism enforceable by the FP (the 1st tier of incentives). They will respond to the incentives that sponsors will implement beyond the enforcing capacities of the FP (the 2nd tier of incentives). Third, they will choose fully non-contractible actions enlarging expected dividends as a function of the individual allocation of property rights (shares) in the SPV (the 3rd tier of incentives).

As the project evolves, sponsors will then adjust the 2nd tier of incentives without the lender's consent. These possibilities may result in efficient solutions whenever sponsors benefit from informational benefits, particularly updating information as the project evolves- for implementing welfare-enhancing solutions. Sponsors will perceive incentives for innovating with these objectives after receiving *good news*.

In contrast, irrespective of the evolution of the single project, unless they renegotiate with the lender, the sponsors will always face enforcement of the (imperfect) risk allocation mechanism. Simply, the 1st tier of incentives is the strategic means by which, ex-ante, the non-recourse lender transfers material risks to the sponsors - the cheapest cost avoiders, the best informed, and the parties controlling the assets of the single project materially. The functionality value of the risk allocation mechanism realises as the capacities of the SPV and consequently, the incentives for sponsors to deliver efficient responses deteriorate. As said, the risk allocation mechanism will always be imperfect. Conflicts between the interests of the principal and those of the many agents will inevitably exist.

The severity of tensions and the opportunistic responses. In this context,⁵⁴⁵ in PFCs, the strategic tensions between principal and agents grow (mitigate) as a function of two variables. First, the quality with which parties implement the risk allocation mechanism defining volatility and the expected project capacities as a function of the responses from sponsors as defined. Second, the amount of (senior) non-recourse debt relative to total welfare.

Intuitively, unless we consider unrealistically that the SPV could repay the senior

⁵⁴⁴ In Chapter 6, I will characterise the formation, feasibility and strategic implications of the opportunistic sub-coalitions of some sponsors.

⁵⁴⁵ I will analyse these propositions in full detail in chapters 5 and 6.

debt even after the project fails to produce wealth as expected,⁵⁴⁶ ⁵⁴⁷ the interplay among the non-recourse nature of the debt, the limited liability protection, the level of senior debt and the volatility of outputs will distort the incentives that sponsors will perceive for choosing privately costly actions. Most simply put, the higher the level of debt and consequently the greater the risk internalised by the lender, the higher the externality that sponsors will generate to the FP in scenarios in which the SPV fails to repay its debt. This increases the returns from extracting benefits opportunistically whose consequences only the FP would internalise.

In chapters 5 and 6, I characterise three types of opportunism idiosyncratic of PFCs. Sponsors will save costly and socially desirable efforts (*shirking*). They will increase the risk levels of their choices of technologies (*risking*). Finally, they will innovate for saving costs of efforts and externalise the subsequent losses of value to the FP (*shading*).

The distortion grows as a function of the senior non-recourse debt relative to total welfare, the volatility cash flows (risk) that dictate the value of limited liability shelter to sponsors (the externalities to the FP), and implementation quality of the risk allocation mechanism governing the responses that all parties expect from sponsors as the environment (expected returns and incentives) changes. The three types of opportunistic responses result in externalities to the lender.

The object and value of implementation quality. Backwards induction, as principal, the FP will spend implementation efforts regulating scenarios and expected responses. In this context, implementation quality of the risk allocation mechanism for the single project will come the tree benefits: First, it will define the exposure of both the project and sponsors to the (un)foreseen contingencies. Second, it will regulate the responses expected from sponsors under such eventualities;⁵⁴⁸ this prevents individual and collective responses advancing over the spaces of actions that the sponsors may enjoy for implementing the 2nd tier of incentives opportunistically. Finally, third, by preserving project capacities in virtue of the above, implementation quality will also protect the efficiency and strength of efficient incentives that

⁵⁴⁶ In which case, the sponsors would internalise the full impact of departures from the technologically optimal.

⁵⁴⁷ A strong assumption in light of the degrees of specificities and the debt-to-equity ratios typical of about 70% typical of PFCs. B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

⁵⁴⁸ These are the *incentive compatibility constraints (ICC)* of sponsors.

sponsors perceive for expanding residual benefits (from subordinated contracts and allocations of property rights -the 3rd tier of incentives). Ex-ante, the lender will accept contributing with non-recourse debt only whenever the conjectures she builds about the foreseeable reactions from sponsors under all eventualities allow her expectations (likelihood of repayment of capital and interest) superior to those of her next best alternative placement opportunity in the market.⁵⁴⁹

The negative value of diversification. In PFCs, parties do not recur to PFCs for advancing diversified portfolios of yet unknown business opportunities with the aid of delegated manager. Moreover, as I will show in the following chapters, in PFCs, spaces for diversification appear incompatible with the functionality of the risk allocation mechanism regulating responses to contingencies. Hence, ex-ante, sponsors and the FP will spend efforts precisely limiting the spaces for diversification (seen as references of contractual imperfections) and any form of discretion on the side of agents.

The above will come with two consequences analysed in many of the chapters that follow. In PFCs, we will observe contractual practices (restrictive covenants) that in regular corporate contracting parties would not implement as they would jeopardise business or financing diversification capacities. Similarly, today, legislators and judges enforce corporate rules oriented to facilitating the diversification of businesses. I will explore this aspect in Chapter 7.

Additionally, because the SPV holds highly specific assets, and because the debt is non-recourse to third parties (including sponsors), the FP internalises risks with eyes on the implementation quality of the risk allocation mechanism for the predefined project that allows comfort in substitution of the missing collateral. Consequently, in contrast with what we see in regular corporate investing, the opportunistic actions that will challenge the position of the FP in PFCs will not manifest (prevalently) in abuses from managers or controlling shareholders against corporate resources. Instead, they will reveal (predominantly) in opportunism in the choices of inputs from contractors (*shirking, risking, shading* and *shading*) in tension with the objectives of the risk allocation mechanism for the single project. I will articulate an analysis of this intuition in Chapter 7.

The value of institutionalisation. Today, PFCs are not legally institutionalised. As a

⁵⁴⁹ These are the *individual rationality -participation- constraints (IRC)* of the non-recourse lender.

result, judges do not take into consideration the above strategic tensions, the associated forms of opportunism, and the objectives of implementation efforts. Legislators and judges provide for corporate rules oriented at preventing opportunism within the corporate spheres while preserving the diversification capacities of companies.

We observe this inadequacy in the *ratio iuris* of default rules and solutions within company law that result in distortions when applied to PFCs. As we will see in Chapter 7, in PFCs, parties spend implementation efforts adapting default rules contractually. We consequently see contractual practices typical of PFCs that we do not find in other places.

For instances, legislators and judges shape the rules of managerial delegation oriented at administrators advancing distinct projects and adopting decisions on behalf of dispersed shareholders. Today's duties of loyalty focus on the position of investors and protect creditors only after the insolvency is imminent. *De facto* control responsibility requires a demonstration of a capacity to influence the company's decision-making system. Fiduciary duties of diligence are light protecting risk-averse managers dealing with various materially distinct high value-at-risk opportunities. Today, unless the company is insolvent, managers do not inform creditors (there are no general or specific duties to inform them). In the same vein, obligations to file insolvency processes exist as a function of the (low) capacities of managers to observe or anticipate distress of a portfolio of investments. Finally, today, there are no rules for interpreting or ex-post completing contracts with eyes on the special vulnerabilities of parties or their invariably distinct implementation capacities. The strategic aspects inherent to the positions of parties permit the characterisation of idiosyncratic needs for legal treatment (under all scenarios) that correspond with contractual practices that we see in PFCs -*v.gr.*, legal postulates of chapters 8 to 10 are both robust and market-mimicking.

Accordingly, in chapters 5 to 6 will refine the initially elemental strategic observations of this chapter. Chapter 7 will remark the critical differences between the (business diversifying) objectives of investors in regular corporate contracting and those of sponsors and the FP recurring to PFCs for implementing a single project. In the same chapter, I will observe the multiparty organisational nature of PFCs, and both functional and legal interdependence of contributions of sponsors beyond their direct (*ex-ante* and *itineri*) relationship with the instrumental SPV.

Lastly, Chapter 8 will propose the legal institutionalisation of PFCs based on five pillars and the legislative intervention for the creation of a PFC-dedicated corporate form. Chapter 9 will advance three postulates for the application (*ex-post* completion

and interpretation) of contractual arrangements: the *intuitu personae* position of the sponsors, principle, the pre-emptive function of clauses, and the *in dubio pro creditore* principles. Finally, Chapter 10 will identify four postulates for characterising optimalities of the hierarchies of claims, the scopes of delegation, and the fiduciary duties of diligence (care) in PFCs.

Chapter 5

The necessary tensions and opportunism between the sponsors and the lender in PFCs

Abstract. The chapter offers a first framework for the agency costs of non-recourse debt between the sponsors as a class and the lender in project finance contracts (PFCs). The framework also makes the first approach to the strategic tensions around the risk allocation mechanism indispensable to all PFCs. The analysis shows three strategic inefficiencies growing in the four scenarios of *no news*, *good news*, *bad news* and *very bad news*. As conditions and project capacities deteriorate, the sponsors will gradually: first, choose technological solutions riskier than socially optimal (*risking*); second, withhold (under-invest) socially desirable inputs to the project (*shirking*); third, implement innovations (over-invest) for minimising costs of complying with minimum standard as per the risk allocation mechanism but without internalising the full marginal (negative) impact from such actions to project welfare (*shading*). The three incentives will come in tension with the FP's objectives and the feasibility of non-recourse financing.

Propositions in the chapter are simple and presented as functions of the evolutions in the environment. The chapter shows connections between the incentives for *shading* and the problem of costs overruns. The work also makes a solid approach to an optimal seniority of debt in non-recourse project financing. Finally, descriptions of *risking*, *shirking*, and *shading* result from structural elements essential to PFCs. Strategic characterisations consequently correspond to inefficiencies that are inherent to all PFCs.

This is the second chapter of the second part of the study focusing on strategic aspects in PFCs.

Table of Contents

5	CHAPTER 5 - THE NECESSARY TENSIONS AND OPPORTUNISM BETWEEN THE SPONSORS AND THE LENDER IN PFCS.....	291
	TABLE OF CONTENTS.....	293
5.1	INTRODUCTION.....	297
5.1.1	The object of the research	297
5.1.2	Research findings	298
5.1.3	Contribution to the literature.....	299
5.1.3.1	Generally	299
5.1.3.2	Specifically.....	300
5.1.4	Sequence of the analysis.....	302
5.2	THE ELEMENTS OF THE FRAMEWORK	302
5.2.1	The Parties	302
5.2.1.1	The FP.....	303
5.2.1.2	The sponsors.....	303
5.2.1.2.1	<i>Cooperative contributions</i>	303
5.2.1.2.2	<i>Superior information</i>	304
5.2.1.2.3	<i>Residual claims</i>	304
5.2.1.3	The SPV	304
5.2.2	The non-recourse debt and the risk allocation mechanism	305
5.2.2.1	Enforceability	305
5.2.2.2	Incompleteness	305
5.2.3	Sponsors' two objectives.....	305
5.2.3.1	First objective; complying risk allocation mechanism	306
5.2.3.2	Second objective; increasing total and residual welfare.....	306
5.2.4	Two types of efforts	306
5.2.4.1	Quality-enhancing efforts	306
5.2.4.2	Innovation-implementing efforts	307
5.2.4.3	Externalities between the two objectives from innovations efforts	307

5.2.4.4	Costs of efforts, utility, and budget constraints	308
5.2.4.5	Co-movement of the two types of efforts between both objectives	308
5.2.5	Influences from nature (news)	308
5.2.6	Strategy and value expected by the FP	309
5.2.7	Sequence of contributions	309
5.2.8	Glossary	310
5.3	1ST TENSION: <i>RISKING</i>	310
5.3.1	Introduction	310
5.3.2	Strategic nature of risking	311
5.3.3	How risking happens	313
5.3.4	Source of incentives; the externalities to the FP	317
5.3.5	Sensitivity analysis	318
5.3.6	Feasibility boundaries (news)	320
5.3.7	Idiosyncrasy of the risking in PFC	321
5.4	2ND TENSION: <i>SHIRKING</i>	322
5.4.1	Introduction	322
5.4.2	Shirking; an intuitive approach	322
5.4.2.1	How <i>shirking</i> happens	322
5.4.2.2	The necessary and the sufficient conditions for <i>shirking</i>	326
5.4.2.3	The strength of incentives for <i>shirking</i>	327
5.4.2.4	Strategic nature of <i>shirking</i>	328
5.4.3	Shirking in the objective functions of the sponsors	329
5.4.3.1	SPV receives only capital contributions; the benchmark case-scenario (BCS)	330
5.4.3.1.1	<i>The objective functions of sponsors in the BCS</i>	330
5.4.3.1.2	<i>The scenario of negligible debt</i>	333
5.4.3.2	SPV receives non-recourse debt; the case of PFCs	333
5.4.3.2.1	<i>The objective functions</i>	334
5.4.3.2.2	<i>The incentive distortion</i>	336

5.4.4	Shirking in a graphic representation.....	337
5.4.4.1	SPV receives only capital contributions; the benchmark case-scenario (BCS).....	338
5.4.4.2	SPV receives non-recourse debt; the case of PFCs	339
5.4.5	Shirking in PFCs and other tensions known in the literature	343
5.4.6	Different news, identical consequences	344
5.4.6.1	<i>Bad news</i> against the value of the risk allocation mechanism	344
5.4.6.2	<i>Bad news</i> against the costs of complying with minimum standards	345
5.4.6.3	<i>Bad news</i> against the returns from efforts enlarging residual benefits.....	346
5.5	3RD TENSION: SHADING	347
1.1.1	Introduction.....	347
5.5.1	Strategic nature of shading.....	348
5.5.2	How shading happens	349
5.5.3	Different news, identical consequences	351
5.5.3.1	<i>Bad news</i> against <i>the value</i> of the risk allocation mechanism	351
5.5.3.2	<i>Bad news</i> against <i>the costs</i> of complying with minimum standards	352
5.5.3.3	<i>Bad news</i> against the returns from efforts expanding residual benefits.....	352
5.5.4	The idiosyncrasy of the shading in PFC	353
5.6	NO NEWS.....	353
5.6.1	The scenario.....	353
5.6.2	Efforts in compliance with minimum standards	354
5.6.3	Efforts expanding residual benefits	354
5.6.4	No news. Welfare considerations	355
5.7	BAD NEWS.....	355
5.7.1	The scenario.....	355
5.7.2	Bad news against the value of the risk allocation mechanism.....	355
5.7.3	Bad news against the costs of complying with minimum standards	356

5.7.4	Bad news against the returns from efforts expanding residual benefits.....	357
5.7.5	Bad news. Welfare considerations	358
5.8	VERY BAD NEWS	358
5.8.1	The scenario.....	358
5.8.2	Impact of news in the objectives of sponsors.....	359
5.8.3	1 st . tension; risking	359
5.8.4	2 nd . Tension; shirking	359
5.8.5	3 rd . tension; shading	359
5.8.6	Very bad news. Welfare considerations	360
5.9	GOOD NEWS	360
5.10	COLLECTIVE AND INDIVIDUAL ACTIONS	361
5.11	COST OVERRUNS, READJUSTMENTS, AND THE OPTIMAL SENIORITY OF DEBT IN PFCs; AN EARLY APPROACH.....	362
5.11.1	Shading and cost overruns	362
5.11.2	Optimal seniority of non-recourse debt	363
5.12	AN ILLUSTRATION OF <i>RISKING</i>, <i>SHIRKING</i>, AND <i>SHADING</i>; CONTRACTUAL PRECAUTIONS AND NEED FOR LEGAL TREATMENT	365
5.12.1	Illustrating risking.....	366
5.12.2	Illustrating shirking.....	367
5.12.3	Illustrating shading	369
5.12.4	Contractual mitigations.....	370
5.12.5	Implications to the legal proposals	371
5.13	CONCLUSIONS.....	372

5.1 Introduction

Chapter 5 answers the question:

What incentives common to all sponsors exist in tension with the interests of the non-recourse lender and what forms of opportunism appear in PFCs?

5.1.1 The object of the research

As anticipated in earlier chapters, without collateral from third parties, the feasibility⁵⁵⁰ of non-recourse debt financing rests exclusively on the expectation that a project owned by an insolvent debtor -a special purpose vehicle (SPV)- generates wealth beyond the costs such debt. Thus, *ex-ante*, before internalising risks, the FP providing non-recourse debt will observe the implementation quality of a risk allocation mechanism, in response to which, the sponsors will provide all necessary inputs for the project under all foreseeable circumstances.

However, the likelihood of project success does not depend on the compliance of sponsors with such risk allocation provisions only. Strictly, project success depends on the value of all contributions from sponsors to the project in response to all incentives. Notice, as shown in chapters 2 and 4, the sponsors receive contracting information of a quality higher than that available to the FP. Based on this information, they implement incentives (the 2nd tier of incentives) and deliver inputs beyond the FP's enforceability (the 1st tier of incentives -the risk allocation mechanism). Finally, the sponsors will also deliver costly efforts expanding expected dividends as a function of their allocations of shares (property rights) in the SPV (the 3rd tier of incentives). Thus, the lender will internalise the likelihood that sponsors (the project) produce value in response to the contractual arrangements that she implements as well as to those actions that escape her enforcement capacities (the 2nd and 3rd tiers of incentives).

Accordingly, as we will see below, when the environment evolves as initially conjectured (after *good news*), the sponsors accessing superior quality information will expand residual benefits by delivering socially desirable inputs beyond their obligations enforceable by the FP. That is, beyond the enforceability of risk allocation mechanism by the lender- the 1st tier of incentives. Hence, whenever the environment appears as predicted or better than expected, the FP will free ride on extra welfare produced by sponsors' inputs.

⁵⁵⁰ These are individual rationality (participation) constraints of the principal.

In contrary, when the environment evolves less favourably than foreseen after *bad* and *very bad news*, sponsors will implement innovations producing negative externalities to the FP. Thus, the signs and magnitudes of the externalities to the FP resulting from sponsors' higher capacity to implement incentives will vary with the unforeseen evolutions of the environment. This is a feature distinctive of frameworks of contractual incompleteness where conditions change after contracting (uncertainty).

The chapter characterises three costs that revolve around: first, the risk preferences of technological solutions for input choices (*risking*); second, the lower than socially optimal choices of inputs (*shirking*); and third, the incentives to implement costs-saving but socially undesirable innovations (*shading*). Additionally, the work approaches an optimal seniority of claims held by the FP in PFCs. It also shows a connection between propositions and the problem of costs overruns in materially complex projects.

Finally, the tensions (conflicting interests) described in the chapter result from structural elements essential to PFCs. Thus, the strategic characterisations correspond to inefficiencies that are inherent to all PFCs.

5.1.2 Research findings

The chapter identifies five *general* propositions describing the conflicts between the sponsors' interests as a class and the those of the FP in PFCs.

- First, in virtue of structural features of PFCs, the efforts by the sponsors rising residual benefits come with positive externalities to the FP (a senior creditor) who finds the likelihood of repayment of her claims growing with total value.
- Second, the deterioration of the environment, -in any of the ways under consideration-, directly or indirectly, leads to three inefficiencies: first, the distortions to risk preferences of sponsors implementing solutions for their inputs at a loss in social value (*risking*); second, the withholding of socially desirable efforts expanding residual benefits (*shirking*); and third, to the over-investment of socially undesirable cost-saving innovations –*i.e.*, innovations that save costs of complying with minimum standards for risk allocation enforceable by the lender at negative net social value (*shading*). The three forms of opportunism result in negative externalities to the FP.
- Third, these distortions increase with the losses of project capacities (relative to debt levels) and the volatility of project outputs that increase the likelihood of SPV's insolvency. Both aspects result from the many deteriorations in the environment affecting the project and parties: *bad* and *very bad news* to the

sponsors or the project, before or after choosing inputs.

- Forth, there is a point (*very bad news*) beyond which, the deterioration of the environment leaves sponsors without returns from their actions building residual benefits. In this scenario, we find: *i.*- efforts increasing residual benefits are under-invested fully (absolute *shirking*); *ii.*- the consideration of risk preferences becomes no longer relevant as the sponsors do not choose efforts (technologies) expanding residual benefits; *iii.*- sponsors devote the entirety of their innovation-implementing budgets to implementing solutions for complying with minimum standards enforceable by the lender without internalising any of effects from such innovations to project value (absolute *shading*). The three responses result in negative externalities to the FP. In such scenarios, with the project's expected value being equal or lower than the face value of the senior non-recourse debt, the likelihood that SPV defaults on its commitments is higher than that of repaying her non-recourse debt as desired.
- Fifth, there is an optimal seniority of the non-recourse debt claims. This hierarchy rule allows the lender sufficiently high priority of payment under the broadest scenarios. However, this seniority is also low to protect the sponsors under greater deteriorations of conditions, thus minimising opportunistic incentives in such eventualities. This seniority maximises project expected outputs, non-recourse debt claim value, and total welfare.

5.1.3 Contribution to the literature

5.1.3.1 Generally

The chapter contributes to the literature approaching the topic of agency cost in PFCs.⁵⁵¹ The work has elements of the simplest intuitions of bilateral moral hazard (hidden actions). However, the strongest inefficiencies result from the effects of contractual incompleteness.⁵⁵² Additionally, comments on the idiosyncrasy of the conflicting interests include references to the agency costs of debt in corporate

⁵⁵¹ *Vid.* L. FARRELL, “Principal-Agency Risk in Project Finance”, *cit.*

⁵⁵² *Vid.* generally with literature review, *pp.* 129 and *ff.* in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, *cit.*

finance and company law and economics: ⁵⁵³ the problems of risk shifting (asset substitution⁵⁵⁴), asset dilution,⁵⁵⁵ and debt overhang.⁵⁵⁶

5.1.3.2 Specifically

The contributions of the chapter are the following:

- First, the chapter is the first paper shading light on the internal strategic tensions between a plurality of shareholders as a class and a financing party providing non-recourse debt.
- Second, it is the first framework describing how the non-recourse debt distorts choices of socially desirable inputs rising residual benefits in PFCs (*shirking*).
- Third, it is also the first analysis that considers strategic tensions between the plurality of sponsors and the non-recourse lender about risk preferences associated with the burden of debt relative to total welfare (*risking*).
- Forth, it is the first work that observes sponsors' incentives to innovate for minimising the costs of inputs in detriment of the project value as expectations of residual benefits deteriorate (*shading*).

Indirectly, the work sheds light on other aspects beyond the research.

⁵⁵³ *Vid.* M. C. JENSEN; W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", cit.

vid. and D. GALAI; R. W. MASULIS, "The Option Pricing model and the Risk Factor of Stock", cit. H. E. LELAND, "Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance", cit. R. C. GREEN; E. TALMOR, "Asset Substitution and the Agency Costs of Debt Financing", cit. B. GAVISH; A. KALAY, "On the Asset Substitution Problem", cit.

⁵⁵⁴ See the treatment of the problem in Chapter 3 *Cf.* M. C. JENSEN; W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", cit. and D. GALAI; R. W. MASULIS, "The Option Pricing model and the Risk Factor of Stock", cit. H. E. LELAND, "Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance", cit.

⁵⁵⁵ *Cf.* the analysis of the problem in Chapter 3.

⁵⁵⁶ *Cf.* the treatment of the problem in Chapter 3. The seminal is S. C. MYERS, "Determinants of Corporate Borrowing", cit. See also D. W. DIAMOND; Z. HE, "A Theory of Debt Maturity: The Long and Short of Debt Overhang", cit.

- First, the work allows for a better understanding of the bargaining position of non-recourse project financiers in the vicinity of project failure.
- Second, by describing the progress of incentives as a function of asymmetries and expected influences from nature, the framework not only maps the evolution of these three strategic tensions between sponsors and the provider of non-recourse financing, but also provides the basis for the later refinement of postulates for an optimal seniority of non-recourse debt in PFCs.
- Third, by examining the dynamics of collective readjustments against the SPV and eventually the FP, the chapter adds to the literature dealing with costs overruns in large (high value at risk and highly materially complex) specific projects.⁵⁵⁷
- Forth, finally, SPVs are very frequently used in the contexts of public procurement processes. Subsequently, the chapter adds to the literature on Private-Public Partnerships (PPP) where today SPVs are considered as strategically single individuals with interests in conflict with those of the governments and lenders.⁵⁵⁸

⁵⁵⁷ Cf. B. FLYVBJERG, “Design by Deception”, *Harvard Design Magazine*, Spring/Summer, 2005. and B. FLYVBJERG ET AL, “Underestimating Costs in Public Works Projects: Error or Lie?”, cit. For an example of how changes in the environment, strategic under-investment on pacification followed by collusion by sponsors in large contracts for public procurement, *vid.* J.-J. GANUZA, “Competition and Costs Overruns in Procurement”, cit.

⁵⁵⁸ The literature on private public partnerships belongs to the field of private procurement; it consequently focuses on the relationship between the project company and the governments. It is commonly the case that these remarkable contributions do not pay attention the strategic tensions between parties within the SPV. Cf. E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit. M. BUSO, “Public Private Partnerships: Information Externality in Sequential Investments”, «*Marco Fanno*» *Working Paper N. 176*, 2014. D. MARTIMORT; J. POUYET, “To Build or not to Build: Normative and Positive Theories of Public–Private Partnerships”, cit. M. DEWATRIPONT; P. LEGROS, “Public-private Partnerships: Contract Design and Risk Transfer”, cit. E. IOSSA; D. MARTIMORT, “Risk Allocation and the Costs and Benefits of Public-Private Partnerships”, cit. Most recently, E. IOSSA; D. MARTIMORT, “Corruption in PPPs, Incentives and Contract

5.1.4 Sequence of the analysis

The analysis sequence will be as follows: In the second section, I will introduce the elements of the framework. In the third section, I will present the first tensions, *risking*. Subsequently, in the fourth and fifth sub-sections, I will respectively describe the problems of *shirking* and *shading*. For the three tensions, I will describe: the nature of the problem, how the problem happens, the externalities to the FP, the feasibility boundaries, the impact of variables (sensitivity analysis), and the differences with other trade-offs in the literature. In the subsequent sub-sections, in this order, I will present cases of *no news*, *bad news*, *very bad news*, and *good news*. In the case of *bad news*, I will discriminate whether *news* affects the costs of complying with minimum standards, the value that the SPV can extract from such obligations, and the returns from inputs rising residual benefits.

Section ten will offer key remarks about collective actions and individual choices that we will consider in the following chapter. In the eleventh section, I will make associations between the chapter's propositions and the problem of costs overruns in large projects. Here, I will also anticipate postulates for an optimal seniority of claims in PFCs. Section twelfth will include illustrations of *risking*, *shirking*, and *shading* before concluding in section thirteen.

5.2 The elements of the framework

Let us now shortly present the elements of the analysis. Most of these aspects appear anticipated in Chapter 2.

5.2.1 The Parties

Consider a simple scenario where three parties interact contractually: first, a non-recourse lender or financing party, hereafter, the FP; second, a team of input providers that, as in earlier chapters we call sponsors; and third, a special purpose company, or legal vehicle, hereafter, the SPV.

Incompleteness”, cit. Also interesting, O. D. HART; A. SHLEIFER; R. VISHNY, “The Proper Scope of Government: Theory and an Application to Prisons”, *The Quarterly Journal of Economics*, vol. 112, 4, 1997.

An exception to the above approaching to internal tensions: L. GRECO, “Imperfect Bundling in Public-Private Partnerships”, cit.

5.2.1.1 The FP

The FP lends cash to the SPV with no recourse to third parties. However, her non-recourse claims are of the highest seniority in the setting. This means that the FP will receive her claims served with priority over those of sponsors. The FP enforces the risk allocation mechanism externally (judicially) on verifiable information of *low* quality. The lender provides no material inputs to the project.

Additionally, the framework does not allow for readjustment stages between sponsors and the FP. So, the FP implements and enforces (imperfectly) the risk allocation mechanism in all cases -that is, independently from the evolution of the environment.

5.2.1.2 The sponsors

The sponsors own and control the SPV fully. They are also the critical input providers to the project. The sponsors must respond to the risk allocation mechanism that the FP puts in places before internalising non-recourse-debt. For simplicity, assume that they cannot be insolvent.

Additionally, three aspects must we recall about sponsors: first, in this chapter, they choose inputs cooperatively (expanding team output), -so we can treat them as a single party; second, they deliver quality-enhancing as well as innovation-implementing efforts (two types of actions); third, the sponsors hold information that is superior to that accessible to the FP; thus, they can implement incentives beyond the risk allocation mechanism (the 2nd tier of incentives presented in chapters 2 and 4); fourth, the sponsors subordinate all claims to the senior non-recourse debt and receive dividends from the SPV; so, they harvest residual benefits. Let us see these points shortly.

5.2.1.2.1 Cooperative contributions

In Chapter 6, the study will elaborate on individual actions from individual sponsors. In this chapter, for simplicity, assume that sponsors choose individual inputs cooperatively. That is, individually, they choose inputs at levels maximising not individual but social welfare. In other words, they will choose costly inputs as socially optimal to the team.⁵⁵⁹

⁵⁵⁹ Accordingly, for this chapter it does not matter whether sponsors distribute ownership incentivising non-contractible efforts, or whether they readjust

Strategically, as per the above assumption, we can safely treat the team of sponsors as *a single party*, or study them as a class of stakeholders. Accordingly, the framework will be one of bilateral interaction between a principal offering non-recourse debt and a collective -but unique- agent delivering inputs for the purposes described below. Accordingly, I will restrict my attention to the conflicts between the strategies of sponsors collectively and those of the FP.

5.2.1.2.2 Superior information

The close material interaction with the project allows the sponsors to access information of high quality. That is, information of a quality superior to that available to the FP. Based on it, the sponsors can implement collective decisions and deliver inputs beyond the risk allocation mechanism (the 1st tier of incentives) that the FP enforces upon them. These collective decisions beyond the FP's enforcing capacities correspond to the 2nd tier of incentives advanced in chapters 2 and 4.

5.2.1.2.3 Residual claims

As anticipated, assume that sponsors subordinate all expectations -from whatever source (contractual or from dividends)- to the FP's claims. This comes with two methodological advantages. First, it allows us to treat the choice of inputs rising residual benefits as a single object separated from the other purpose of complying with minimum standards of risk allocation whose returns consist on minimising the costs of enforcement (see below). Second, this further simplifies the analysis allowing us to describe a bilateral interaction without the need to consider the strategic effects of hierarchies of claims as the environment changes.

5.2.1.3 The SPV

The SPV completes a single project whose proceeds will be used for, first, servicing the non-recourse debt, and second, distributing subordinated benefits as well as dividends to sponsors. Additionally, assume plausibly that project assets are fully specific and that next to these goods, the SPV has no other resources under its property. Thus, excepting for its capacity to generate wealth from such a unique and fully specific project, the SPV is insolvent. Consistent with this chapter's assumptions about sponsors acting collectively -as a single party-, we can strategically treat the SPV as representing the team of sponsors interacting with the PF. Finally, the

contractual incentives as well as the moral hazard in team problem affecting them when otherwise maximising individual returns.

corporate form of the SPV grants limited liability protection to sponsors.

5.2.2 The non-recourse debt and the risk allocation mechanism

5.2.2.1 Enforceability

Just as described in early chapters, in the absence of collateral and recourse to third parties, before lending cash to an insolvent SPV who will turn such resources into specific assets, the FP verifies the quality (completeness and enforceability) of a risk (task) distribution mechanism. This set of provisions and requirements typically take the form of condition precedents in the loan agreement and assure that all inputs necessary for completing a project will be available to the SPV in all foreseeable scenarios. This risk allocation mechanism contains provisions about minimum standards with which the sponsors must comply. Fundamentally, ex-ante, the FP verifies that all provisions of the risk allocation mechanism are effectively enforceable against the SPV and the sponsors.

5.2.2.2 Incompleteness

Parties implement the risk allocation mechanism incompletely. Concretely, sponsors and the FP will implement the risk allocation mechanism with an efficient clause of liquidated damages, and when responding to such obligations, the sponsors will act cooperatively as a team of input providers. However, as time passes by, the environment will change, and contractually unforeseen eventualities will arise. Hence, the actual value that the SPV will produce after sponsors comply with such provisions will be affected by the causal interferences of nature.

For this, we say that the value of non-recourse debt is expected from an output by the SPV that results stochastically from sponsors' inputs responding to the risk allocation mechanism, as well as from the desirable or undesirable non-contractible inputs that the sponsors deliver for expanding residual benefits in different scenarios under the influences from the environment.

5.2.3 Sponsors' two objectives

As anticipated, consistent with sponsors' capacities to implement incentives beyond the risk allocation mechanism, we find that sponsors deliver costly efforts for two objectives: first, complying their obligations as per the risk allocation mechanism enforceable by the FP; second, increasing residual benefits. Let us see them separately.

5.2.3.1 First objective; complying risk allocation mechanism

Assume that compliance with obligations enforceable against the SPV and the sponsors under the risk allocation mechanism will allow the SPV to produce wealth similar to the values necessary for repaying the senior non-recourse debt with acceptable likelihood. Consequently, for their first objective, sponsors equalise their (convexly growing) marginal costs of inputs with the marginal benefits of maximising the likelihood of compliance with provisions of the risk allocation mechanism *-i.e.*, minimising enforcement of liquidated damages by the FP.

5.2.3.2 Second objective; increasing total and residual welfare

Next to the objective of complying with minimum standards enforceable by the FP, the second objective for which sponsors deliver costly inputs consist of the expansion of residual benefits. These are the benefits that the SPV allows for sponsors after repaying the most senior non-recourse debt. Sponsors contract on these socially desirable actions beyond the enforcement capacity of the FP. That is, based on their access to information about the project, they innovate and expand total SPV wealth, thus increasing the residual benefits they will harvest after the project company has repaid the senior non-recourse debt. Notice the necessarily positive externalities to the FP from inputs directed to the second objective of expanding residual benefits.

Additionally, let us recall, as an assumption of the chapter, the sponsors choose inputs cooperatively; *v.gr.*, they contribute to expanding a team output in a tensionless manner -as if they were family members only concerned about total value. As a simple extension of such assumption, also assume that, in a similarly frictionless fashion, sponsors can readjust choices of both types of inputs they deliver to the SPV (quality-enhancing and innovation-implementing efforts) as per the ongoing variations in the environment (*news*). See next.

5.2.4 Two types of efforts

Sponsors deliver two types of actions to the project. First, they choose quality-enhancing efforts. Second, they adjust innovation-implementing efforts.

5.2.4.1 Quality-enhancing efforts

Quality-enhancing inputs levels correlate with the expected value of individual contributions (individual output levels) of the technology the parties initially contracted. As in the most straightforward principal-agent frameworks, the levels of quality-enhancing inputs expand total project value and SPV welfare. When delivered in compliance with contractual provisions of the risk allocation mechanism (the first objective), quality-enhancing efforts minimise the costs of (liquidated damages or

penalty) enforcement from the non-recourse lender.

5.2.4.2 Innovation-implementing efforts

Sponsors choose innovation-implementing efforts for widening the range of technological alternatives available for increasing returns from quality-enhancing inputs deliverable for each of the objectives. Except in one case (*shading*), it is not necessary for the analysis to distinguish whether innovations improve returns by increasing marginal benefits or by reducing costs of efforts.

Additionally, in contrast to the efforts increasing quality-enhancing levels, innovation-implementing efforts may be desirable or undesirable. Without loss of generality, assume that innovation-implementing efforts delivered for the second objective of rising residual benefits will always be desirable (social *-i.e.*, project welfare-enhancing). On the contrary, innovation-implementing efforts expanding returns from quality-enhancing inputs for complying with obligations under the risk allocation mechanism may be either socially desirable or undesirable. Punctually, as I will show, in the case of *shading*, sponsors will innovate for finding costs-saving alternatives without internalising impact to project value. Finally, the sponsors innovate within the spaces allowed by contractual incompleteness of the risk allocation mechanism.

5.2.4.3 Externalities between the two objectives from innovations efforts

Innovations for saving costs (or increasing value) from complying with risk allocation obligations enforceable by the FP -the first objective-, bring externalities to the other objective of expanding residual benefits (total welfare). Assume that positive externalities from the first objective of complying with minimum standards to the second objective of enlarging residual benefits are simply part of the choices of innovations of the second objective. So, for simplicity, we can restrict our attention to these negative externalities. The analysis of *negative* externalities from innovations for complying with the risk allocation mechanism is interesting as these inefficiencies lie in the core *shading*, perhaps the strategically most relevant of the three conflicts described in this chapter.

The consideration of externalities in the opposite direction from innovations expanding residual benefits to the costs of complying with obligations as per the minimum standards for risk allocation is also unnecessary. Intuitively, this is because, as will be shown, sponsors internalise the full marginal value of efforts complying with such provisions in all scenarios. This is a logical corollary from the assumption about the efficiency with which parties adjust liquidated damages clauses. Consequently, we can omit the consideration of this second flow of

externalities without losses of generality or any effect on the strategic analyses. I will return to these illustrations when describing the strategic aspects of externalities under each scenario.

5.2.4.4 Costs of efforts, utility, and budget constraints

Consider utility functions that are separable in costs and benefits. Costs of efforts grow convex and benefits grow concave on input levels. References to the impact of risk aversion will be only occasional.

Sponsors allocate quality-enhancing and innovations-implementing from the same budget for the two objectives. Therefore, sponsors can reallocate efforts from either type that they save from one objective (say, increasing residual benefits) to the other objective (say, complying with minimum standards of the risk allocation mechanism) and vice versa.

5.2.4.5 Co-movement of the two types of efforts between both objectives

Choices of inputs of both types (quality levels, and innovations implementing) comove between the two objectives. Alternatively, the reader may assimilate this co-movement to the pattern described by two substitutive goods. Subsequently, the sponsor will dedicate greater innovation-implementing efforts for the objectives for which she internalises the higher *costs of efforts* enhancing quality levels. So, this is not an assumption but an early characterisation of a behaviour that is rational and observed in practice. Parties innovate for the most valuable objectives – v.gr., to minimise enforcement of penalties or liquidated damages (the first objective) or expand positive returns or build contractual rewards (the second objective).

The relevance of using the *cost of effort* instead of input levels will become apparent when considering the third tension of *shading*. Precisely, the reasons leading to the use of costs of efforts that the sponsor optimally chooses for quality inputs as references for the choices of innovation-implementing efforts are the same as those justifying the distinction between the two types of inputs (quality-improving and implementing innovations). Without anticipating propositions, let us say for now that, under *shading*, sponsors facing higher cost (lower returns) from quality-improving efforts complying with obligations as per the risk allocation mechanism will perceive incentives for innovating for lowering the costs of such efforts without necessarily producing (or even if such responses come in detriment of) social value.

5.2.5 Influences from nature (*news*)

The framework considers four scenarios. Each case reflects the influences from nature that parties observe during the project's life as they update information. I am

referring to them as of *no news*, *bad news*, *very bad news*, and *good news*. The scenario of *bad news* will be sub-divided in three cases: *i.*- where *bad news* goes in detriment of the value expected from the risk allocation mechanism (*v.gr.*, the project fails to produce); *ii.*- where *bad news* increases the costs of efforts complying with the risk allocation mechanism; and finally, *iii.*-, where *bad news* diminishes the returns from inputs expanding residual benefits (via cost increments or loses of input value). In the case of *very bad news*, sponsors anticipate that, after delivering inputs as initially expected, the expected value from the project will be similar or lower than the costs of debt. Hence, the sponsors will no longer expect residual benefits. Notice how expected value does not mean necessarily that the SPV will default on its obligations.⁵⁶⁰ There is volatility of outputs relative to the expected value. Thus, the actual project output may be lower or higher than the expected threshold.

5.2.6 Strategy and value expected by the FP

The FP simply internalises the risk that the SPV fails to generate a certain level of wealth necessary for repaying her senior non-recourse claims. The SPV will produce value from quality-enhancing inputs by sponsors. Sponsors will then deliver desirable efforts in response to their obligations as per the risk allocation mechanism (the first objective). Beyond these obligations, sponsors will deliver actions increasing total SPV value for enlarging residual benefits.

Consequently, *ex-ante*, the FP will deliver transaction costs foreseeing eventualities and incorporate such provisions in the risk allocation mechanism. Assume that the FP will only enter the contract after foreseeing that sponsors' compliance with the risk allocation mechanism will result in value sufficient for repaying the non-recourse debt, including interests. In other words, should sponsors decide not to deliver inputs expanding residual benefits, the FP would rely on the expected value from her claims being higher than the next alternative placement value (individual rationality constraints) as a function of the responses that she could expect from the sponsors to the risk allocation mechanism. The framework will analyse the PFCs setting, starting from the moment after initial implementation.

5.2.7 Sequence of contributions

The sequence of contributions includes three stages. First, the SPV (sponsors

⁵⁶⁰ So, depending on bankruptcy laws, *very bad news* may not coincide with an insolvency signal.

collectively) and the FP implement the risk allocation mechanism (we will not study this stage). Second, in successive rounds of simultaneous actions, sponsors will collectively update information from the environment and deliver inputs in a coordinated manner -*i.e.*, they will choose individual efforts of both types expanding team -not individual- outputs. Finally, third, assume that agreements will be enforced at once, welfare from the project will be produced, contractual obligations will be served, and dividends distributed.

5.2.8 Glossary

Under-investment and over-investment; opportunism and efficiency. I will consider efficiencies, inefficiencies, over- and under-investment using as reference the input and wealth levels expected by parties *ex-ante*. That is, as references, I will use the second-best that parties expect after contracting and before updating information about the influences of the environment. This coincides with the value achieved under *no news*.

Risking, shirking and shading. With the expression *risking*, I indicate the action of choosing technologies purposely increasing project output volatility levels, thus enlarging residual benefits (whenever the project evolves as expected) at a loss of total welfare and a negative externality to the FP (whenever the project does not perform as expected). Like the interpretation in the literature on the economic theory of contracts, I will use the expression *shirking* to describe the action of withholding socially desirable quality-improving inputs. Finally, with *shading*, I will indicate the action of implementing costs-saving but socially undesirable (welfare decreasing) innovations. The three actions will come with welfare-decreasing consequences to the project and subsequent externalities to the non-recourse creditor, the FP.

Total welfare, residual benefits, and returns. Finally, for simplicity, I will discriminate three concepts: first, total value, total welfare, total wealth, project value, or total project value: these all indicate the total welfare produced by the SPV – that is, before dealing with debt; second, residual benefits: these are the values that the SPV delivers to sponsors after repaying the senior non-recourse claims to the FP; third, (marginal) returns, or (marginal) sponsors returns: these are the net gains (profits) kept by sponsors after discounting their costs of efforts from the residual benefits they receive from the SPV.

5.3 1st tension: *Risking*

5.3.1 Introduction

Let us start with the first tension of *risking*. For simplicity, as a reference, I will focus

on the case of *bad news*. This is the scenario where, after updating information, sponsors observe that, from the inputs they delivered in compliance with the risk allocation mechanism, the SPV has failed to produce value as expected.

As a result, for servicing the senior debt, the SPV will extract some of the wealth that it will produce from the inputs that sponsors expect to deliver for (otherwise) expanding residual benefits. In this sub-section, we will observe the strategic influence of such senior debt in the risk preferences of sponsors for the technologies implemented for increasing residual benefits from the SPV (their second objective).

In the last section of this chapter, I will offer illustrations based on a real-life case scenario where the sponsors could find spaces for reacting with *risking*.

Before starting, let us recall, sponsors expand residual benefits from inputs that they deliver as per their capacities to implement agreements beyond the enforcing capacities of the FP. Thus, sponsors will innovate at the marginal returns of so doing. That is, without the capacity to enforce, the FP has no strategic relevance in such choices of technologies.

5.3.2 Strategic nature of *risking*

In PFCs, the conjunction among the non-recourse nature of the debt, the limited liability shelter granted by the SPV corporate type, and finally, the burden of some unpaid non-recourse debt results in a distortion of risk preferences of sponsors choosing inputs rising residual benefits.

In PFCs, sponsors always internalise the costs from their actions (inputs). However, they internalise the burden of the non-recourse debt only whenever (as much as) the project produces value sufficient for that purpose. Accordingly, whenever the project produces value equal or higher than expected, the FP will extract wealth corresponding to the face value of the non-recourse debt. Only after her expectations have been fully fulfilled will the SPV repay subordinated obligations and dividends (residual benefits) to sponsors.

In contrary, in scenarios where the SPV fails to repay the debt, sponsors will extract no benefits, and they will internalise costs of efforts; nonetheless, the losses associated with the tranche of unpaid debt will be externalised to the FP. This results from the functionality of the non-recourse debt and the limited liability protection of the SPV.

By increasing volatility, sponsors consequently expand the spaces of benefits in scenarios in which the SPV produces welfare as initially expected, but they do not internalise the deeper and likelier losses from lower SPV value –the costs of debt– that will be externalised to the FP whenever the project does not perform as expected.

Subsequently, in conjunction with a rule of limited liability and the non-recourse debt, the presence of senior debt extracting a fraction of residual benefits effectively distorts the risk preferences of sponsors incentivising them to choose technologies riskier than socially desirable, with risk externalities to the non-recourse lender.

In certain aspects, the private objective functions of *risking* sponsors share commonalities with those of shareholders optimising volatility (maximum limited liability shelter value) in corporate settings.⁵⁶¹ Notice the similarities between the *risking* and the *asset substitution (risk shifting)* problem described Chapter 3. In both cases, contributions (capital or inputs) do not come in response to agreements with the creditor(s) or other contractors. Also, in both scenarios, controllers extract value from creditors by expanding volatility of cash flows beyond socially desirable levels -i.e., in detriment of their company value.

However, the contrasts between that problem of asset substitution and this of *risking* are also notorious. I will characterise them under a sub-section below. Note for now how, for instances, in PFCs, there is a single project, not a range of alternative growth options; additionally, sponsors deliver inputs⁵⁶² as contractors, not cash capital.

Risking is a consequence of contractual incompleteness of the risk allocation mechanism. In a subsequent study, from contractual incompleteness, we can build (anticipate) a proposition about a hold-up problem⁵⁶³ on the side of the FP incapable of readjusting efficiently after becoming aware of riskier innovations.

These discrepancies between risk preferences are the 1st *agency tension between sponsors as a class and the non-recourse lender (the PF) in PFCs*. To the best response by sponsors to these incentives, I refer as *risking*. Let us see how *risking* happens.

⁵⁶¹ Cf. H. E. LELAND, “Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance”, cit.

⁵⁶² It is true that we may also see these as contributions in kind expanding value from ownership distribution.

⁵⁶³ For a short and clear reference to the holdup problem, *vid.* T. J. MICELI; K. SEGERSON, “Holdups and Holdouts: What Do They Have in Common?”, *Economics Letters*, vol. 117, 1, 2012, Elsevier B.V. More recently, Y.-K. CHE; J. SAKOVICS, “A Dynamic Theory of Holdup”, cit.

5.3.3 How *risking* happens

At this point, we do not need considering inputs delivered in compliance with risk allocation provisions enforceable by the FP (the first objective). These will be the object of a distinct failure, *shading*. Accordingly, I will restrict my attention to the strategies around the second objective of enlarging residual benefits. Additionally, I will focus on risk preferences (volatility as per technological solutions). Thus, I will not describe the actual choices of inputs (quality-enhancing effort levels). This, I will do in the case of *shirking*.

Let us now see how volatility affects the capacity of the SPV to produce wealth, the value of claims to *residual benefits* in the hands of sponsors, and the externalities to the FP.

The risky scenarios. The simplest way to present the intuition of *risking* is to shortly compare four most stylised scenarios with alternative technologies for increasing residual benefits. The first and second technologies will have different risk levels. However, both cases will show identical expected values and identical likelihoods of either desirable or undesirable outputs. The third technology will produce that same expected value, but the likelihood of low-value outputs will be higher than those of high-value outputs. We will here see how these high-value outputs will be more highly appreciated by sponsors (only). Finally, in the last scenario, the total expected value from technology will be lower and the distribution of possible outputs will be irrelevant. This will be the realistic scenario consolidating earlier intuitions.

In all scenarios: First, we will focus on the choices of inputs rising residual benefits only -the second objective, the one under consideration. Second, the sponsors will not contract with the FP for these inputs, so they choose technology solutions and volatility levels as desirable to the team. Third, in all cases, the SPV will extract some value necessary for repaying a tranche of senior non-recourse debt that was not serviced with funds produced by the risk allocation mechanism. Forth, in all scenarios, regardless of outputs or who internalises the costs of the unpaid debt, sponsors will internalise their costs of individual efforts fully.

The first (low risk) case. For this technology, the SPV can produce only outputs, h or l . The small h stands for a high value; the letter l stands for a low value. Assume that the outputs of l and h are equally likely. Thus, they are both equally distant from the mean (the expected value). The face value of non-recourse debt is d , and the costs of sponsors' inputs (efforts) are $c(e)$. Finally, the value of l , whenever the SPV produce the lower undesirable output, is lower than the face value of the non-recourse debt, so, $l < d$.

The second (higher risk, same mean) case. The sponsors now implement riskier technology for two possible outcomes, H and L . Analogously, H stands for high-value output, and L stands for low-value output. Here too, H and L are equally distant from the *same mean* as above. Consequently, the *total welfare* expected in this riskier second scenario remains identical to the total value produced by the company in the first low-risk case.

From the greater dispersion of H and L around the same expected value, we know that, necessarily, $H > h$ and $L < l$. Thus, the lower output of the riskier alternative L produces value lower than the analogous of the less risky alternative l . Also, consequently, the value of L is deeper below the face value of the senior non-recourse debt, d . So, $d > l > L$.

Let us compare the two scenarios. The first aspect we note is that, as said, the total welfare expected from the SPV is, in both cases, equal. This is so because, although dispersions (volatility) changes, the means of outputs are, in both cases, identical. This intuition requires no further analysis.

Notice, however, albeit in both cases, the value expected from the SPV is alike, the expected value of residual claims in the hands of sponsors is higher in the second riskier scenario. Additionally (consequently), the expected value of senior non-recourse claims in the hands of the FP will be lower in the riskier case. Finally, from the fact that, in both cases, the SPV produces the same value, we can also know that the loss to the FP will be identical to the gain from volatility to sponsors. These are externalities between the sponsors and the FP, the value of the limited liability protection to the sponsors.

To see this, let us simply compare the outputs that each party expects under both cases' risk levels. When the SPV produces output h or H from each technology, in the first case (the lower risk technology) the sponsors will receive $h - c(e) - d$. In the second case (the riskier technology) they will gain $H - c(e) - d$, which is a higher value to them.⁵⁶⁴

However, when the SPV produces lower welfare l , or L , because both values are lower than the costs of debt d , the sponsors will receive 0 value and will internalise only the costs of debt $-e$. However, because the SPV will not repay the debt after either l or L , the FP will receive $L < l$ (the total value produced by the SPV) always lower than the debt costs.

⁵⁶⁴ $H - c(e) - d > h - c(e) - d$.

So, because L represents lower total wealth from the project than l , whenever the SPV produces the lower outputs L or l , the stake of the claims that the FP will recover will be higher whenever sponsors choose the low-risk technology (h, l) . In contrast, to the FP, it is irrelevant whether the SPV produces H or h ; in both cases, she will harvest d , the face value of her senior non-recourse claims.

So, the expected value of the riskier technology $(H; L)$ allows sponsors to extract either $H - c(e) - d$ or $-c(e)$, which is larger than either $h - c(e) - d$ or $-c(e)$ that they receive from the low-risk technology (h, l) . Then, in the first higher risk case, the FP will expect d or L that will be lower than the equally likely lower risk but more valuable to her d or l when the sponsors choose lower risk technologies.⁵⁶⁵

From the above, we also note how the difference in positive value to sponsors associated with the riskier technology is identical in absolute value to the negative (loss of positive) externality received by the FP. This transfer of wealth from the FP to sponsors governs the function of risk preferences.

Observe also, without an impact on expected value, the transfer does not influence total welfare. Additionally, note how the value of increasing risk appears and grows as a function of the levels of debt d . Intuitively, the level of debt defines the wealth that the SPV will accrue to the FP and also the losses of wealth that (behind the limited liability protection) the sponsors will not internalise after increasing risks for expanding the value of h or H from which they will benefit.

The above differences in value to the sponsors and the FP from both technologies reflect the externalities between the two due to limited liability protection. The sponsors internalise the extra gains but externalise the extra losses whenever the company produces value below the costs of debt. Importantly, notice how, if we keep the assumption that the change in technologies (for a riskier solution) does not affect the capacities of the SPV (that is, it redistributes benefits and risks but not total

⁵⁶⁵ Identically, from a different stance, the likelihood of verifying either l or h is and L or H are identical. Additionally, $L < d$ and $l < d$. Then, the total expected distributable welfare for the SPV from the less risky technology will be $(h - d - c(e))0.5 + (0 - c(e))0.5$. Analogously, for the high-risk scenario, the total expected residual welfare will be $(H - d - c(e))0.5 + (0 - c(e))0.5$. Now, if d is fixed, then it follows that, to sponsors, $(H - d - c(e))0.5 > (h - d - c(e))0.5$ or if we wish, necessarily, $(H - d - c(e))0.5 + (0 - c(e))0.5 > (h - d - c(e))0.5 + (0 - c(e))0.5$. But because $L < l$, to the FP we find that $(d)0.5 + (L)0.5 < (d)0.5 + (l)0.5$.

value) then we may conclude that the optimal -opportunistic- response from the sponsors is to increase risk levels infinitely (a corner solution). This is unrealistic.

Realistically, the implementation of riskier alternatives comes with a departure from the technologically optimal solution. This will necessarily result in losses of expected value to the SPV. Furthermore, volatility may come with a higher frequency of low outputs l . Higher frequency of l will increase the recurrence of $-c(e)$, producing no returns to sponsors. Both aspects result in equilibria that exclude *risking* in a corner solution.

I will exemplify these (simplest) propositions with the next two theoretical contrasting cases next and one illustration in the final part of the chapter.

The third (the less frequent higher value positive outputs – same expected value) case. Let us see the third case where the total expected value from technology choices remains identical as above, but the variations and frequency of positive and negative outputs change. We now find that the high output H^+ for the riskier technology is higher than before. So, $H^+ > H$; in contrast, assume for simplicity that the lower output l remains identical for both technologies. Moreover, for the riskier alternative, l is now more frequent than H^+ . Hence, the probabilities of seeing either H^+ or l are no longer of 0.5. This correction keeps the expected value at the same level as before.

A simple exercise shows that total value to sponsors and total (negative) externalities to the FP may be higher or lower than the second riskier case. However, in all cases, just as above, the two variables -value to sponsors and (loss of positive) externalities to the FP- will be more significant with the higher risk technology. Here, sponsors expand the residual value that they will obtain when output is positive and increase the likelihood that they will receive little returns as the frequency of low outputs will grow. Thus, the (loss of positive) externality to the FP goes via frequency (relative to the low impact from the low output). The higher returns to sponsors come from the greater wealth that they harvest in the less likely events that outputs turn out to be positive net from the (marginally lower) costs of debt.

Finally, let us keep in mind, we are here not yet relaxing the assumption about the no impact of volatility on the production function. So, we keep assuming that volatility does not affect technological efficiency. However, as anticipated, in this scenario, we are now assuming a lower likelihood H^+ relative to the equally harmful but more frequent l . As said, this is necessary for keeping the expected value constant. Yet, to sponsors, the events of l result in $-c(e)$. Subsequently, increasing the frequency of l will have an impact on them. Formally, the marginal value of *risking* decreases with the frequency of low-value events; this ultimately results in an internal equilibrium

for risk preferences.⁵⁶⁶

To the same conclusion will arrive if we allow parties to be risk-averse. The sponsors will obtain lower utility from the rarer but more extreme events of H^+ while internalising more significant losses of utility from the more frequent scenarios of $-c(e)$. This is true also in isolated projects.

The fourth (riskier for lower total expected value) case. In this final case, increments in risk levels will come at a loss of total project capacities. As mentioned, these losses result from the implementation of solutions distinct from the technologically optimal.

Up to a certain point, the sponsor will obtain benefits (externalise risks to the FP) despite project welfare losses. Naturally, eventually, beyond a certain point, losses to project capacities will control the benefits to sponsors thus excluding a corner solution.

5.3.4 Source of incentives; the externalities to the FP

As described above, the distortive incentives appear from the fact that sponsors internalise the burden of debt only in scenarios where the SPV can produce such value. Sponsors will not internalise the costs of debt whenever SPV's outputs are lower than such face value. In both cases, sponsors will still internalise their costs of inputs.

In the presence of non-recourse debt and limited liability shelter, the incentives to expand risk will consequently grow: first, with the (low) severity of the marginal loss associated with technological departure from the materially optimal necessary of increasing volatility; this aspect will determine the volatility that the production function can tolerate via technological alternatives without affecting expected value; and second, with the sensitivity of sponsors to the increments in the frequency of low output events increasing the costs of efforts $-c(e)$ internalised by sponsors. There will be a moment beyond which the sponsors will not find technological alternatives for higher H without increasing the likelihood of L or l that will come at an extra loss via $-c(e)$.

⁵⁶⁶ As already analysed, increasing volatility consistent with a higher frequency of low value outputs l for expanding profits from the less likely H^+ is *not* a corner solution.

5.3.5 Sensitivity analysis

Let us observe *Figure 1* in the Annexe to this chapter. The events of H and h , correspond with the curve $H(e)$ (welfare high). The L , and l outputs appear as $L(e)$ (welfare low). Consequently, precisely in between these two lines, we observe the expected welfare from the project $EW(SPV(e))$. The line $(d; 0)$ marks the costs of debt. The convex curve $(c(e))$ shows the costs of efforts.

Placing costs of efforts on top of the costs of debt brings two practicalities. First, it shows the aggregated efforts necessary for producing SPV outputs. Based on this aggregation, we observe the maximised profits between the two pairs of solid short lines tangent to both curves.⁵⁶⁷ The second practicality of aggregating costs of efforts comes with the possibility of representing seniorities of claims (risk exposure). Concretely, the FP will internalise losses for outputs below the $(d; 0)$ line. Between that basis and curve of costs of efforts $(c(e))$ we will observe losses to sponsors.

Finally, the line Es indicates the wealth expected to sponsors receiving non-recourse financing via the SPV granting limited liability protection - (*under NRD and LL*). Note how such Es lies between the higher output $H(e)$ and the basic debt costs $(d; 0)$. The concave function showing total project welfare $(EW(SPV(e)))$ is lower because it internalises all values down to the curve of $L(e)$ including the costs of debt (areas numbered 2 and 3). The expected value by sponsors (Es) is higher because it adopts 0 value in all scenarios where outputs are lower than $(d; 0)$, as in area 3.

When *risking*, the sponsors change the technology solutions seeking to expand the distances between $h(e)$ and $l(e)$ to make them a higher $H(e)$ and a lower $L(e)$. If the two curves depart the same distances from the centre $EW(SPV(e))$, and the choice of riskier technology allows for the same total expected welfare, the curve showing expected output from the SPV, $-EW(SPV(e))$ – will not change. Additionally, Es showing expected residual benefits to sponsors (before costs of efforts, *i.e.*, not yet profits) will, however, go up and increase its slope relative to the other three curves. This is because the line shows a middle point between $H(e)$ (that moves up with risk) and $(d; 0)$, the debt that is fixed and that the sponsors will not internalise whenever the SPV produces $L(e)$. So, because Es (the value to the sponsors) internalises zero fixed value whenever the SPV produces $L(e)$ below $d; 0$. Es -the value to the sponsors- will rise in both distance and slope (say) half of how the two functions $H(e)$ and $L(e)$ separate from each other with the deeper $L(e) < d$ accruing entirely to the FP. Hence,

⁵⁶⁷ See the asterixis in the costs of efforts at the optimal level in both equilibria (e^*).

the sponsors will perceive incentives for choosing technologies for higher H (value to the sponsors) and lower L (in detriment of the FP).

Finally, by adopting riskier solutions, the sponsors expand the area in which they will obtain benefits after the SPV has repaid the senior debt. Higher risk also implies that, with risking, the spaces below the deeper L -will be broader. Thus, the value that the FP will receive, in these case below the value of her debt claims, will also be smaller. This is a negative externality from risk to the lender -or a positive externality from the FP to the sponsors that the later perceive in the form of greater profits. This is, on its simplest expression, the problem of *risking* in PFCs as introduced in the second scenario above.

Let us now observe in *Figure 1* in the Annexe, the propositions of the third and fourth scenarios above. In the third case, sponsors expand risk by rising $H(e)$ without lowering $L(e)$. The sponsors will find a technology that comes with no harm to total project expected capacities. So, $(EW(SPV(e)))$ remains unchanged. As said, the feasibility boundary of this strategy will now be determined by the costs of efforts $c(e)$, and the increase in the likelihood of $L(e)$. The lower the costs of efforts, the lower the costs of $L(e)$ internalised by sponsors hence, the more frequent that $L(e)$ can be at the marginal benefit of further rising $H(e)$ and consequently Es , the value expected by sponsors.

The fourth case finally showed the realistic scenario in which risking -the departures from the technologically optimal solutions- come with losses of total project capacities $(EW(SPV(e)))$. In this case, now further risking will be desirable to sponsors only as long as the loss of total welfare does not control the gains that the sponsor harvest whenever $L(e) > d$. In other words, the sponsors will choose riskier solutions until the moment in which the fraction of the total loss in $(EW(SPV(e)))$ they internalise (the marginal costs) dominate Es (their marginal benefits). That point reflects the privately optimal opportunistic *risking* beyond which no further risk will benefit the sponsors.^{568 569}

⁵⁶⁸ Additionally, without advancing propositions, notice how rising Es will result not only in higher profits but also in a displacement of the optimal choice of inputs towards the left. These displacements, however, depend on whether the output functions $H(e)$ and $L(e)$ move parallel or, more realistically, change their slopes. In this second case, we will have an impact on the other two tensions *shirking* and *shading*.

5.3.6 Feasibility boundaries (*news*)

By increasing volatility ($H(e) - L(e)$), sponsors extract value by expanding both ranges of events in which they obtain profits ($Es - c(e)$) and those in which the FP internalise risks as per the non-recourse clause and limited liability protection to sponsors ($(d; 0) - L(e)$). The problem of *risking*, therefore, does not depend on debt levels. Rigorously, it depends on the presence of *some* debt that is non-recourse and *some* possible outputs lower than the costs of debt (v.gr., $W(SPV(e)) < d$) allowing for limited liability protection in such eventualities. Note, whenever all possible outputs from the project (i.e., $W(SPV(e))$) are higher than d , volatility will not allow the sponsors to anticipate some insolvency risks; then, the sponsors will internalise the full impact of their risk preferences in cashflows also in both $l(e)$ and $L(e)$.⁵⁷⁰

Having clarified the above, in the following sub-sections, I will make references to how *risking* appears as the environment changes with *news* as per its interaction with the other two conflicts. Finally, under *very bad news*, I will comment about how, without sponsors choosing inputs increasing residual benefits, the consideration of *risking* is no longer necessary.

On a side note, observe how the fact that debt levels alone do not govern the value of *risking* does not hold under risk aversion. Simply, a risk-averse group of sponsors will value profit units more when such profits are low. Similarly, the risk-averse sponsors will perceive greater losses of utility with the greater likelihood of losing the costs of her efforts (v.gr., $-c(e)$), in the scenarios of $L(e)$ grow in likelihood as debt relative to total project capacities grows with *bad news*.

⁵⁶⁹ Note also, parties appreciate value at a decreasing rate (utilities grow concave). So, the appreciation for *risking* will be marginally decreasing as risk grows.

⁵⁷⁰ Without complicating the analysis, notice how it is possible to conceive a scenario in which, initially, there are no possible outputs below the costs of debt, but, in which, the sponsors expand volatility -at a loss in total expected value that they internalise- to allow some lower outputs $H(e)$ to fall below the costs of debt with consequential externalities at the marginal benefit of increasing $H(e) - d$. Then, now with some outputs below the costs of debt, the sponsors will advance in this direction (*risking*) expanding $H(e) - d$ with externalities to the FP whenever $L(e) - d$. The sponsors will take this approach whenever the value expected from the project $W(SPV(e))$ is not far above the costs of debt and increasing risks at a loss in total welfare that they will internalise will be little before the events of $L(e)$ begin falling below d .

5.3.7 Idiosyncrasy of the *risking* in PFC

Following a pedagogic analogy frequent in the literature of corporate finance dealing with *risk-shifting (asset substitution)* problem, we say that, by increasing risk, the sponsors obtain a larger share of a smaller pie.⁵⁷¹ There are evident similarities and also obvious differences between the two problems. A most evident difference between the strategy of sponsors under PFCs and that of controllers implementing *risk-shifting (asset substitution)* against creditors in standard corporate settings is that in, corporate environments, controllers adopt riskier than socially desirable projects -that is, they adjust the composition of their portfolio of growth options. As described in Chapter 3, in PFCs, sponsors cannot advance alternative projects.

However, as shown, in PFCs, sponsors may increase volatility by altering the choices of technologies of the inputs they deliver to that single pre-defined project.⁵⁷² Hence, a second difference between the two problems is that, in corporate finance environments, *risk shifting (asset substitution)* occurs at the company level; whereas in PFCs, *risking* happens on the side of sponsors choosing too risky inputs as contractors to the project.

In other words, in PFCs, *risking* takes place within spaces allowed by contractual imperfections (incompleteness and asymmetries of information) of the agreements involving contractors for inputs. Furthermore, as input providers, sponsors do not deliver inputs in response to the duties of loyalty to other contracting parties. In contrast, in corporate settings, *risk shifting (asset substitution)* may go against the company's interests with relevant legal consequences in jurisdictions in which managers must protect company value -or the creditors beyond the thresholds of insolvency- rather than the profits to shareholders.

⁵⁷¹ *Vid. pp.* 186-189 in R. R. KRAAKMAN ET AL., *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit.

⁵⁷² *Cf. Vid.* M. C. JENSEN; W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", cit. H. LELAND, "Agency Costs, Risk Management, and Capital Structure", *The Journal of Finance*, vol. LIII, 4, 1998. J. ANG; R. COLE; J. LIN, "Agency Costs and Ownership Structure", *The Journal of Finance*, vol. 55, 1, 2000. R. C. GREEN; E. TALMOR, "Asset Substitution and the Agency Costs of Debt Financing", cit. C. R. FLOR, "Asset Substitution and Debt Renegotiation", *Journal of Business Finance & Accounting*, vol. 38, 7-8, 2011. Generally, M. Z. FRANK; V. K. GOYAL, "Trade-off and Pecking Order Theories of Debt", cit.

5.4 2nd tension: *shirking*

5.4.1 Introduction

Let us now describe the problem of *shirking*. In the second sub-section, after the introduction, we will observe the nature of the problem and how *shirking* happens in an intuitive approach. The third sub-section will analyse how *shirking* happens with eyes on the objective functions of sponsors. Here, I will show the contrasts between a benchmark case-scenario in which the SPV receives no debt but funds the project with capital or where the debt is small (strategically negligible). These are scenarios where we do not see *shirking*.

Then, I will contrast these two cases with the environment of PFC, where the sponsors *shirk*. In the fourth place, I will show the same propositions -the benchmark case-scenarios and the case of PFCs- in a graphic plotting, where further details become visible. The last two sub-sections will include a remark of the similarities and differences between *shirking* and other inefficiencies described in the literature of corporate finance, and the impact of *news* on the incentives for *shirking*.

In the last section of this chapter, I will offer illustrations based on a real-life case scenario where the sponsors could find spaces for reacting with *shirking*.

5.4.2 Shirking; an intuitive approach

5.4.2.1 How *shirking* happens

Recalling the two objectives and the choices of efforts expanding residual benefits. Recall, in PFCs, the sponsors choose efforts for two objectives. First, they comply with their obligations under the risk allocation mechanism (the first objective). These are the contributions that the FP enforces for the completion of the project. Second, additionally, and beyond the contracting of the risk allocation mechanism, the sponsors choose inputs expanding residual benefits from the SPV (the second objective). These are variable benefits that they expect after the SPV has repaid the senior non-recourse debt. These benefits stem from subordinated contracts and dividends. The inputs of this second objective escape the FP's enforcement capacities (as said, these are not inputs responding to the risk allocation mechanism). Hence, the sponsors choose them as desirable *-v.gr.*, without concerning for enforcement costs.

The risk allocation mechanism is necessarily imperfect. Additionally, recall, as all contractual interactions, the risk allocation mechanism is necessarily imperfect. The set of clauses that the FP and the sponsors put in place to secure the project's capacities to produce wealth sufficient for the SPV to repay the senior debt

are always incomplete. *E.g.*, the conditions from markets for products or the costs of inputs may change affecting the wealth generated from the company. To the same effect, due to the asymmetries of information, some of such provisions will not be enforceable as finely as initially desired (moral hazard).

As a result of these imperfections, there is always risk that, from the contributions with which the sponsors respond to their obligations enforceable under the risk allocation mechanism (the first objective), the project fails to produce wealth sufficient for the SPV to repay the senior non-recourse as parties (especially the lender) desired ex-ante. In other words, the likelihood that, after enforcing the risk allocation mechanism, with such inputs from the sponsors, the project produces value sufficient for the SPV to repay the senior debt is estimable, but yet uncertain.

The SPV repays the senior debt with resources built by the sponsors for otherwise distributing residual benefits. In PFCs, the FP is the senior claimant in the organisation.⁵⁷³ Consequently, there is always (necessarily) a risk that, as the SPV fails to produce sufficient value from the inputs of the risk allocation mechanism, for repaying the senior debt, the administrators of the SPV recur to the wealth that the sponsors generated with their non-contractible inputs at the SPV level for expanding residual benefits (the second objective recalled above). In this case, as this happens, the sponsors will ex-post notice that some of the fruits from their non-contractible privately costly efforts chosen for augmenting dividends or rewards from subordinated (junior) contracts, after the SPV has repaid the debt will not return to them but will accrue to the FP -the senior lender.

The value of all inputs is always uncertain. Besides the above, the inputs that the sponsors choose for the second objective of expanding residual benefits after the SPV has repaired the senior debt produce outputs that are, by nature, uncertain. That is, the capacities of the project will depend on many factors. Thus, there will be some range of outputs possible from the SPV for every choice of efforts from the sponsors. In other words, just as what we considered when presenting the case of *risking*, for each effort level, the project will produce wealth within a threshold defined by the highest $H(e)$ and the lowest $L(e)$ possible outputs.

Moreover, because the risk allocation mechanism is imperfect, and the value that sponsors generate with their inputs expanding residual benefits is also uncertain, it is

⁵⁷³ In practice, parties define the seniority of claims via the *cash waterfall* clause. With literature references, see the analysis of the clause in Chapter 2.

also always possible that whenever the project produces low-value outputs $L(e)$ from the non-contractible inputs, the SPV fails to repay the senior non-recourse debt. In other words, the SPV may always fail to repay the senior debt with all resources -*i.e.*, with the proceeds from the inputs that the sponsors deliver in response to the imperfect risk allocation mechanism (the first objective) aggregated to the wealth that the company generates from the inputs that the sponsors provide for creating residual benefits (subordinated contracts and dividends, the second objective). In practice, this would be when exogenous events affect project capacities or value of its proceeds. Finally, the failure to repay the senior non-recourse debt with all resources would lead to the insolvency and bankruptcy of the SPV.

Output uncertainty, the incentive effects of the non-recourse clause, and the limited liability protection. In these insolvency scenarios, backwards induction, the possibilities of this happening and the interplay between the limited liability protection and the non-recourse nature of debt come with strategic (incentive) effects.

Note, just as described above when introducing *risking*, in virtue of these two rules, whenever the SPV fails to repay the senior debt, the sponsors will lose all expected residual benefits -they will receive 0 returns from their non-contractible actions expanding returns from subordinated contracts and dividends. Additionally, they will not recover the costs of their efforts $c(e)$.

However, because of the limited liability rule and the non-recourse clause, in these cases of default that arise whenever the outputs $L(e)$ ⁵⁷⁴ are lower than the face value of debt, d , the sponsors will never be liable for repaying the stakes of non-recourse debt that remained unpaid. Precisely, in these cases, the SPV will default on its obligations to the FP and become insolvent. The sponsors will receive 0 benefits from their contributions, and they will only lose the costs of their efforts. However, such value will always be higher than the costs of internalising the weight of repaying the non-recourse debt (and losing the costs of efforts). The difference between the value that the SPV produces and the FP receives and the costs of debt is the value of the limited liability protection (and non-recourse debt) to the sponsors.

Accordingly, also in such cases in which the SPV produces values $L(e)$ lower than the face value of debt, as a senior claimant, the FP will extract the total value that the company produces from all efforts for the two objectives (complying with the risk

⁵⁷⁴ This includes the wealth produced by the risk allocation mechanism.

allocation mechanism and expanding residual benefits). However, such value will be lower than the face value of the non-recourse debt. Then, the difference between such (minor) value that the FP receives in these scenarios from the SPV (the total welfare from the project) and the (higher) face value of her non-recourse claims reflects the negative externality to the non-recourse lender corresponding with the value of the limited liability protection and the non-recourse clause to the sponsors. These are welfare effects of the limited liability rule interplaying with the non-recourse debt.

Besides, the above observations will come with *incentive* effects in the following way. Notice how, in virtue of the limited liability protection and the non-recourse nature of the debt, the fact that for all outputs lower than the weight of debt the sponsors obtain 0 returns⁵⁷⁵ implies that, effectively, whatever value they produce below the threshold of such unpaid debt will accrue to the FP only (the senior creditor in a bankruptcy scenario). Thus, for this subset of possible outputs (*v.gr.*, within the range of possible project outputs from their optimal choices of inputs) below the threshold of debt, the sponsor will be effectively delivering efforts for generating wealth that will benefit the FP only. As a function of this space of outputs falling within the thresholds of debt and at the marginal costs of receiving only 0 gains, the sponsors will under-invest privately costly socially desirable contributions increasing residual benefits. This is the problem of *shirking*.

From a different stance, the sponsors may now save costly socially desirable efforts. When doing so, they will naturally internalise the full value of such savings. However, because of the limited liability protection and the non-recourse clause, of the total losses in marginal value (losses in SPV repayment capacities) resulting from such savings of costly actions they internalise fully, they will only internalise the fraction corresponding to the (uncertain) outputs in which the SPV manages to produce value beyond the costs of debt. The higher or lower value that such extra efforts or savings produce to the outputs below the costs of debt will accrue to the FP -irrespective of the choices of inputs (extra efforts or savings) the sponsor will always receive 0 returns (and lose only the costs of efforts). Hence, they will under-invest (without seeing any impact on their returns, they will save the costly efforts) as a function of the spaces of welfare-outputs likely falling below the thresholds of the costs of debt (insolvency risks).

To fix ideas, the sponsors will always internalise the full impact of variations in the costs of their efforts. However, of the total variation in the values of all possible

⁵⁷⁵ And lose only the costs of their efforts.

(random) SPV outputs within the thresholds of highest $H(e)$ and the lowest $L(e)$ values, the sponsors will receive variations in residual benefits -something that happens only when the company manages to repay the senior debt, v.gr., whenever - and for the difference of- $H(e) > d$. The variations in project value stemming from the higher or lower choices of inputs of values lower than the cost of debt will always result in 0 value to the sponsors after the SPV has defaulted on the senior non-recourse debt. Thus, as a function of the perspectives of this happening (backward induction), the sponsors will esteem a loss in the marginal (incremental) returns and will consequently adjust (reduce) choices of inputs whose effects would otherwise benefit the FP only.

As we see, the sponsors' incapacity to internalise the impact from their costly efforts in the (uncertain) scenarios in which the SPV produces value lower than the costs of debt effectively reduces the marginal value from their costly efforts. This equates to lower places where the marginal costs of efforts (that, as said, the sponsors internalise fully) meet the marginal value of returns (which are lower than the total value from such actions, some of which accrues to the FP). Lower equality of marginal costs meeting marginal returns effectively results in lower choices of costly inputs. This is under-investment of socially desirable contributions -*shirking*.

Below, in a graphic representation, I will show how the above reflects in the flattening of the slope of the curve of returns from efforts that naturally governs the privately optimal choices of input levels. The proposition can be also proved in algebraic expressions by comparing the marginal returns from non-contractible inputs in a realistic case with respect to the returns (incentives) that the sponsors perceive in a benchmark case-scenario where there are no insolvency risks and consequently the limited liability protection interplaying with the non-recourse clause have no incentive effects. See next. I will offer both articulations further below.

5.4.2.2 The necessary and the sufficient conditions for *shirking*

As advanced, the senior non-recourse debt is not, *per se*, the cause of *shirking*. For *shirking* to exist, the sponsors must anticipate some likelihood that the SPV fails to repay the senior debt, the cases in which they would receive 0 benefits with higher likelihood -but never internalise the cost of debt. Without insolvency risks, there is no value in the protection from the limited liability and no-recourse clauses. In their residual benefits, the sponsors now internalise the full changes in value (increments or losses) to total welfare corresponding to their variations in their input choices. From a different stance, without insolvency risks (the case where wealth is, in all ranges of outputs between $H(e)$ and $L(e)$ sufficient for repaying the debt), the debt will always extract the same fixed burden of cash, but the sponsors will benefit from

the full increments of total value (that will go entirely into residual benefits) stemming from their extra efforts. Thus, without insolvency risks -*v.gr.*, without $L(e); l(e) > d$ -, the senior debt has no incentive effects (after the sponsors entered the project).

In such cases, *shirking* will not exist, and the sponsors will respond as socially desirable. In other words, the choices of inputs from the sponsors would be identical to the case in which the sponsors fund the project with capital (without debt).⁵⁷⁶ This description corresponds to the benchmark case-scenario introduced in the following section.

However, this case is unrealistic and incompatible with the project and uncollateralised debt risks. Contracts are incomplete. When choosing inputs, the sponsors can never completely discard the possibility that, due to unforeseen events (*bad* or *very bad news*), the SPV fails to produce value sufficient for repaying the non-recourse debt (SPV insolvency). Consequently, from the conjectures that sponsors build about the likelihood of company default -before and after updating information-, the sponsors will anticipate how, in virtue of the limited liability protection, they may exert costly efforts whose marginal values may only accrue to the FP.

As a function of these possibilities, the sponsors will under-invest. Of this under-investment, the sponsor will internalise the full value (their savings), and the costs of increased insolvency risks will accrue to the FP. The difference between the value of savings and the increased likelihood that the sponsors receive 0 returns is the value of the limited liability protection interacting with the non-recourse debt that the sponsors extract from the FP expecting reactions at socially desirable levels. These are the under-investment and the externalities of *shirking*.

5.4.2.3 The strength of incentives for *shirking*

As seen, the incentives for *shirking* grow as a function of the likelihood that, for the (high or low) welfare outputs that the project may produce for each choice of inputs,

⁵⁷⁶ In this case, because the debt does extract total (not marginal) benefits, backwards induction, minor under-investment would still result from the reluctance of sponsor to enter a less profitable project. More formally, the sponsors would face higher individual rationality -participation- constraints. But, as said, debt will have no incentive effect after the project has begun (incentive compatibility constraints). That is there will be no incentive effects to sponsors choosing input level after updating information about the evolution of the environment (*news*).

the SPV fails to repay the senior debt. The likelihood of these low-value outputs (*v.gr.*, the range of low-value outputs that fall below the costs of debt) defines the limited liability shelter space within which the sponsors do not internalise the marginal impact from their actions.⁵⁷⁷ We have seen this above.

Then, the incentives for *shirking* will consequently grow with *bad* and *very bad news* deteriorating the project's capacities and the likelihood that the SPV manages to repay the senior debt. As shown further below, after receiving *very bad news*, the sponsors update conjectures about the project's capacities and esteem that, after using all its resources, the SPV will fail to distribute residual benefits after repaying the senior debt. Hence, under *very bad news*, the sponsors will withhold *all* costly inputs expanding residual benefits whose value would otherwise accrue only to the FP. Accordingly, *shirking* will be, in this case, absolute.

Remarkably, the case of *good news* is not symmetrical to that of *bad* or *very bad news*. With *good news*, the SPV's capacities will grow, the likelihood of insolvency risks -or the risks that the SPV repays the debt with resources generated by the sponsors expanding residual benefits- will diminish, and associated incentives for *shirking* will decrease. However, in virtue of the incompleteness of the risk allocation mechanism, insolvency risks will never disappear. Hence, as long as such risks exist (as a function of their magnitude), limited liability protection and the non-recourse clause will still induce the sponsors to withhold some costly contribution with externalities to the FP. Finally, a function of the imperfections of the risk allocation mechanism (defining the SPV capacities), incentives for *shirking* will always exist.

5.4.2.4 Strategic nature of *shirking*

As all manifestations of strategic tensions in the necessarily imperfect contracts, the problem of *shirking* has elements of both standard moral hazard (asymmetries of information) and contractual incompleteness (bounded rationality). Contractual incompleteness is visible when, after receiving *bad news* (the incompleteness element), and after sponsors complied with their obligations under the risk allocation mechanism, the SPV fails to produce value as expected -thus allowing the sponsors to anticipate that the senior debt will be repaid with funds that the sponsors may choose for increasing residual benefits.

⁵⁷⁷ *V.gr.*, from their *shirking*, the sponsors only internalise the increase in the likelihood that they receive 0 return and lose the costs of their efforts -which is necessarily higher than internalizing the costs of debt and the costs of such efforts.

The aspect of moral hazard relates to the choice of inputs in levels or qualities that fail to internalise the principal's interests. To be sure, sponsors do not deliver these costly efforts as their best responses to a pre-existing contract with the FP. Accordingly, this is not a framework of asymmetries leading to imperfect enforcement. The reference to moral hazard points out the failure to internalise interests in non-contractible input levels as socially desirable. This is in the pure style of the standard literature on moral hazard in team problems⁵⁷⁸ where sponsors deliver inputs expanding returns from property rights -which in our case constitute one of the sources of residual benefits (dividends), the other one stemming from subordinated claims from contracts.

These discrepancies between choices of inputs that sponsors feasibly deliver below socially desirable levels reflect the 2nd. *tension between sponsors as a class and the non-recourse lender (the PF) in PFCs*. To both the tensions and the opportunistic responses by sponsors, I refer as *shirking*.

The above description of the nerve of the problem is conceptually complete. Moreover, from such an introduction, it is already possible to derive implications in the distinct scenarios (*news*). However, for completeness, I will now fix ideas by presenting the same propositions based on sponsors' objective function. Finally, I will revisit the intuitions by analysing a graphic presentation. After these articulations, as a way of refinement, I will emphasize the impact of *news* on the problem of shirking.

In the final parts of the chapter, I will provide illustrative examples, observe the contractual attempts to mitigate the problem and advance the needs for legal treatment as pointed out in chapters 7 to 10.

5.4.3 Shirking in the objective functions of the sponsors

Let us present the main intuition of the problem by comparing the objective functions of the sponsor in two simple cases. In the first scenario, the company funds the project with internal resources (capital contributions from sponsors). We can use this first case as a benchmark case-scenario. The second scenario will show the case of PFCs and its contrasts with the first case. In both setups, I will offer a formal description of the objective functions and the sponsors' private responses.

⁵⁷⁸ B. HOLMSTRÖM, "Moral Hazard in Teams", cit. E. RASMUSEN, "Moral Hazard in Risk-Averse Teams", cit.

5.4.3.1 SPV receives only capital contributions; the benchmark case-scenario (BCS)

Consider the set of all possible outputs $s(e)$ that the SPV can produce as a function of the aggregated inputs from all the sponsors (e).⁵⁷⁹ Recall, we are not here characterising the responses of sponsors to the incentives from the risk allocation mechanism (contractible efforts) but the choices of non-contractible inputs that the sponsors deliver for increasing residual benefits -*v.gr.*, the wealth from their subordinated claims and expectations to dividends that they may receive after the SPV has repaid the senior non-recourse debt.

Just as in earlier sections, these possible outputs $s(e)$ exist within the ranges of $H(e)$ and $L(e)$ that show the highest and the lowest boundaries of the values that the SPV can produce from the contributions of sponsors.⁵⁸⁰ Additionally, as usual, assume that the costs of efforts $c(e)$ grow convexly on choices of inputs e , and the utility that sponsors perceive from profits increase concavely.⁵⁸¹ Finally, for convenience, I normalise the alternative placement value of non-contractible contributions from the sponsors to be 0.

5.4.3.1.1 The objective functions of sponsors in the BCS

Let us begin with the benchmark-case scenario in which the SPV receives no debt (the source of distortions). Here, the SPV funds the single project with internal resources. That is, the SPV does not need debt, or the sponsors provide extra capital sufficient for covering all needs of the project. Hence, in their profit functions, we will see the total value from the project to which they will subtract the costs of efforts and the weight of capital. In this context, without debt, the limited liability rule is strategically

⁵⁷⁹ Recall, in this chapter, we are considering the strategies of sponsors as a class irrespective of intra-class tensions. In Chapter 6, we will see the responses that the sponsors choose individually, within sub-coalitions, or after colluding unanimously. Thus, for now, we can treat the group of sponsors as a single party.

⁵⁸⁰ Formally, $s[H(e), L(e)] = \{s(e) | H(e) \geq s(e) \geq L(e)\}$.

⁵⁸¹ *V.gr.*, $c(e) > 0, c(e)' > 0$ and $v(\pi) > 0, v'(\pi) > 0, v''(\pi) < 0$. These come to prevent corner solutions (the unrealistic situation in which the variables adopt infinite values).

irrelevant.⁵⁸²

Recall, in this chapter, we are observing the responses that the sponsors implement collectively. Thus, we consider the sponsors as a class as a single party. So, in their objective functions, the sponsors will see:

$$s[H(e), L(e)] - K - c(e)$$

As advanced, the first term captures the value from the range of all possible outputs s within the feasibility threshold $[H(e), L(e)]$ as a function of the production function of the SPV and choices of efforts e . The second and their term describe, respectively, the capital contributions (a constant K), and the costs of efforts $c(e)$ as a function of the choice of inputs e .

From the above, the sponsors find:

$$s[H(e^*), L(e^*)] = c(e^*) \quad \text{583} \quad (ICC) \quad \text{584}$$

The first term identifies the marginal value of inputs as a function of the optimal choices of contributions e^* . The right-hand-side of the expression identifies the marginal costs of efforts. Notice how the capital contributions K (a constant) do not depend on the choices of inputs. Hence, they do not appear in the expression of the incentive compatibility constraints.⁵⁸⁵ This is the choices of inputs that maximise the profit function.

Finally, ex-ante, the sponsor will enter the project whenever the profits they expect from the SPV after choosing the costly non-contractible input levels as privately optimal e^* is higher than the next alternative placement value of such resources which

⁵⁸² This corresponds to the scenario presented above in which the SPV always pays the debt, or where there are no insolvency risks.

⁵⁸³ The star * identifies the choice of inputs that maximise value to the sponsor (the privately optimal response).

⁵⁸⁴ These are the incentive compatibility constraints (ICC), the first order condition of the objective function of the sponsors, that defines the strength of incentive powers and the response levels. Both terms equalised serve for identifying the optimal choice of efforts e^* for which the equally is true. The star * identifies the privately optimal response.

⁵⁸⁵ *V.gr.*, K drops from the first order condition of the objective function.

for simplicity we normalised to 0.⁵⁸⁶

$$s[H(e^*), L(e^*)] - K - c(e^*) > 0 \text{ (IRC)}^{587}$$

An intuitive approach. In the absence of debt, the limited liability rule is irrelevant. The sponsors consequently internalise the full impact of their actions in the capacities of the project. Critically, extra efforts increase both margins of the feasibility boundary $H(e^*)$ and $L(e^*)$. Consequently, the sponsors internalise the full impact from their actions to the likelihood and value of all SPV outputs. Moreover, without debt, because the sponsors internalise the full marginal value from their actions (the full gains and full losses from all input variations to all possible outputs), the choices of efforts will maximise profits that will coincide with the maximum capacities of the SPV, $s[H(e^*), L(e^*)]$.

The distinct scenarios (news). In this scenario, the sponsors internalise the full marginal value (extra losses and extra gains from variations from) their choices of inputs. Without debt or any relevance of a limited liability protection rule, they will adjust their input levels as privately desirable, and that value will coincide with the socially optimal. Remarkably, if *news* affects both thresholds $[H(e^*), L(e^*)]$ without affecting the slopes of such values as a function of inputs nor the slopes of the cost functions, the choices of inputs will not vary. The total profits they will receive from the SPV will grow or decrease, but without changes in the marginal functions or debt, the choices of inputs will remain identical.⁵⁸⁸

⁵⁸⁶ This assumption comes *without loss of generality*. *V.gr*, it will affect the choices of efforts and the willingness of parties to enter the project but will not change the ways in which variables interplay as described in all sections and the conclusions). The assumption is consistent with the highest specificities of resources.

⁵⁸⁷ These are the incentive compatibility constraints (IRC). Before entering the contract, the party choosing efforts must anticipate that, from the project, and after choosing the privately optimal choices of inputs, e^* , she will harvest value higher than the next alternative placement value from such resources -which, under the assumption above, I have normalised to be 0. Hence, the sponsors will enter the project after verifying that, for such choices of inputs, she will receive profits, not losses.

⁵⁸⁸ This also corresponds with the scenario analysed in the *Shirking in a most intuitive approach* section in which the SPV could always repay the senior non-recourse debt.

5.4.3.1.2 The scenario of negligible debt

Notably, observe how the above holds identically in the case in which debt exists but is strategically negligible in magnitude. For “debt strategically negligible” I refer to the scenario in which all outputs from the SPV $s[H(e^*), L(e^*)] > d$ thus always allow for profits to sponsors. In this case, the sponsors will see

$$s[H(e), L(e)] - d - k - c(e).$$

Because debt d will be payable in nearly all scenarios, its weight in the function will not depend on the choices of inputs defining project capacities -that the sponsors will, in any case, optimise for their benefit. Hence, d will appear as a fixed cost -a constant that will drop from the optimised expression of the objective function of sponsors. So, the sponsors will find:

$$s[H(e^*), L(e^*)] = c(e^*) \quad (ICC).$$

Note how the expression is identical to the incentive compatibility constraints of sponsors funding the project without debt. However, the sponsors will now enter the project after anticipating that the same benefits from the project now after internalising the costs of debt will allow for positive returns. The sponsors will consequently enter the project only if

$$s[H(e^*), L(e^*)] - d - k - c(e^*) > 0 \quad (IRC).$$

As observed in the section of the *intuitive approach* when introducing the case in which the SPV always repays the senior debt, this scenario is unrealistic. First, the capacities of the project to produce wealth are always uncertain. Second, for this, insolvency risks and the value of the limited liability protection and the non-recourse debt will always exist. Third, finally, as shown in Chapter 3, parties recur to PFCs precisely because the capital needs of the project exceed the debt capacities (or any other form of financing possibilities) of the sponsors.

Hence, in the same sequence followed when introducing *shirking* in the intuitive approach, let us now observe the responses from the sponsors when debt levels and insolvency risks are substantial.

5.4.3.2 SPV receives non-recourse debt; the case of PFCs

Let us now observe the impact of non-recourse debt in substantial levels on the incentives to sponsors. Before advancing, notice how the scenarios, objective functions, and the elements that shape the responses are comparable, but the welfare effects are not. Simply, the capital contributions k for the project to advance without debt are not within the capacities of the sponsors. This aspect comes with no impact on the generalities of propositions for which the comparison between incentives

(ICC) suffices.

5.4.3.2.1 The objective functions

Let us now observe the objective function of sponsors funding the project with non-recourse debt d . Now ex-ante, the sponsors and the FP agree on the risk allocation mechanism inducing contractible actions (not the object of this chapter) with which they expect that the SPV will produce wealth enough for repaying the senior non-recourse debt.

However, the risk allocation mechanism is necessarily imperfect (incomplete and inaccurately enforceable due to asymmetries of information). Hence, from the responses from the sponsors to the risk allocation mechanism, the SPV may fail to produce value beyond that minimum threshold of d . Consequently, as a function of the limited implementation capacities of parties there is some likelihood that, for repaying the senior-recourse debt, the SPV uses resources that the sponsors produce with non-contractible efforts oriented at rising residual benefits.

Consequently, in their objective functions, when choosing non-contractible inputs expanding residual benefits (their second objective) the sponsors will expect value as a function of their efforts as follows:

$$\begin{aligned} & \{s[H(e), L(e)] - k - d - c(e) | s[H(e), L(e)] > d \} \\ & + \\ & \{-k - c(e) | s[H(e), L(e)] < d \} \end{aligned}$$

Notice how the thresholds from which the sponsors obtain benefits now decrease in virtue of the interplay of the non-recourse debt with the limited liability protection. Above in the first line, the expression shows how the sponsors will receive $s[H(e), L(e)]$ for all output events s of value higher than the weight of d . To that value, the sponsors will subtract the weight of capital k and the costs of d .

The above reflects the fact that $L(e)$ will -with some likelihood- fall below such threshold of d , in which case, as shown in the second line, the sponsors will receive 0 value and internalise $[-k - c(e)]$. This identifies the value of the limited liability protection allowing the sponsors to receive 0 value but never the stronger negative impact of the debt whenever the SPV fails to cover such needs.

In other words, of the outputs of the company that fall below the value of debt, (*v.gr.*, for $s[H(e), L(e)] < d$) the sponsors internalise a higher likelihood of receiving 0

value,⁵⁸⁹ but not a greater likelihood of receiving negative returns (the weight of debt⁵⁹⁰) whose impact the limited liability rule externalises to the FP, the non-recourse creditor. More intuitively, in virtue of the limited liability rule, for any savings of inputs, the sponsors internalise the full loss of value of the reduction in the upper margin of the threshold of possible outputs $H(e)$. However, they also internalise only a fraction of the full loss of value from the lower possible outputs ($L(e)$) which may fall below the threshold of debt whose welfare effects the limited liability rule externalises to the FP.

Consequently, the sponsors find:

$$s[H(e^*), L(e^*)] = c(e^*) \quad \text{s. t.} \quad s[H(e^*), L(e^*)] > d \quad 591$$

or, written in different style,

$$\{s[H(e^*), L(e^*)] | s[H(e^*), L(e^*)] > d\} = c(e^*)$$

As we see, the sponsors do not internalise $s[H(e^*), L(e^*)] < d$. In these events, they receive 0 returns, and such losses accrue to the lender -the value of the limited liability protection.

Then, the sponsors will ex-ante accept entering the project whenever they anticipate that

$$\left. \begin{array}{l} \{s[H(e^*), L(e^*)] - k - d - c(e^*) | s[H(e^*), L(e^*)] > d\} \\ + \\ \{[-k - c(e^*)] | s[H(e^*), L(e^*)] < d\} \end{array} \right\} > 0. \quad (IRC^{592})$$

Finally, the FP will provide non-recourse debt if, what she receives

$$\left. \begin{array}{l} \{d | s[H(e^*), L(e^*)] > d\} \\ + \\ \{s[H(e^*), L(e^*)] | s[H(e^*), L(e^*)] < d\} \end{array} \right\} > I \quad 593. \quad (IRC^{594})$$

⁵⁸⁹ And the costs of efforts.

⁵⁹⁰ And the costs of efforts.

⁵⁹¹ Incentive compatibility constraints of the sponsors in PFCs (ICC PFCs)

⁵⁹² Incentive rationality -participation- constraints of the sponsors in PFCs (IRC of sponsors in PFCs).

⁵⁹³ *Nb.*, “ I ” includes costs of capital and interest to the FP in the open market. Then, recall, d describe debt claims (capital and interests -profits). Hence, the likelihood of finding d unpaid can coexist with profits as estimable ex-ante (the lender can still

In other words, the FP receives d (the repayment of the non-recourse debt) in all scenarios in which the SPV produces wealth beyond such threshold, and she will receive the full production of the SPV whenever such a value is lower than the face-value of her debt claims.

5.4.3.2.2 The incentive distortion

Finally, as we compare the strengths of incentives in the case in which the SPV funds the project with capital contributions and the case of PFCs, we see:

$$\{s[H(e^*), L(e^*)] | [s[H(e^*), L(e^*)] > d]\}^{595}$$

$$<$$

$$s[H(e^*), L(e^*)].^{596}$$

In other words,

*(ICC of sponsors in PFCs) < (ICC of sponsors in the BCS)*⁵⁹⁷

That is, in the case of PFCs, the incentive compatibility constraints that dictate the choices of inputs from sponsors (*ICC of sponsors in PFCs*) are lower than those perceived whenever the SPV funds its project internally with capital resources as in the benchmark case-scenarios (*ICC of sponsors in the BCS*). To these different responses to the distinct incentives in PFCs, I refer to as *shirking*.

Further below, we will see how the problem exacerbates with extra debt or with *bad news* affecting the sponsors or the project.

Welfare considerations. From an inspection of the above, we can advance three observations. Below, I will confirm these welfare considerations based on the analyses of areas in the graphic of *Figure 1* in the Annexe to this chapter. Moreover, these observations correspond to the remarks in the above sub-section articulating

expect profits under repayment uncertainty because such risk is covered by profits beyond the cost of debt, *i.e.*, with $d > I$).

⁵⁹⁴ Incentive rationality -participation- constraints of the FP in PFCs (IRC of the FP in PFCs).

⁵⁹⁵ Incentive compatibility constraints of the sponsors in PFCs (ICC in PFCs)

⁵⁹⁶ Incentive compatibility constraints of the sponsors when the SPV receives no debt (ICC in the BCS)

⁵⁹⁷ *Q.E.D. (Shirking).*

the *intuitive approach*.

First, all incentive distortions grow with the levels of debt d relative to project capacities *-v.gr.*, the insolvency risks defining the limited liability protection and the non-recourse debt. As we see, in all formulations, the weight of debt dictates the constraints (the inequalities “>”) that define the values expected by the sponsors. The higher d , the more scenarios in which the sponsors will internalise 0 and enjoy the incentive distortive protection of the limited liability rule and the non-recourse debt when *shirking* at the marginal value of cost savings.

Second, *shirking* grows with *bad news* and diminishes with *good news*. Intuitively, *good* or *bad news* moves up or down $s[H(e^*), L(e^*)]$, but does not alter d . Consequently, *news* will also define the range of output events that will fall below the threshold of d that rule the slope of the curve of marginal values to which the sponsors equalise the marginal costs of efforts $c(e^*)$.⁵⁹⁸ *News* will also affect debt relative to such capacities of the SPV, $s[H(e^*), L(e^*)]$ with the implications remarked in the first point.

Third, the incentives for *shirking* grow with the dispersion of outputs $[H(e), L(e)]$ from their expected values. In particular, as said, the problem grows with the range of events that fall below the threshold of d , *-v.gr.*, with $s[H(e), L(e)] < d$. Remarkably, when this happens because of *news* (unforeseen events), we speak about *shirking*. To the contrary, when such dispersion results from technological innovations that the sponsors implement exclusively for enlarging both margins (below and above of the weight of debt), we find *shirking* preceded by *risking*.

5.4.4 Shirking in a graphic representation

Just as above, I will now compare two cases graphically. First, I will shortly present the benchmark case-scenario, where the SPV receives no debt or low debt funds. Second, I will show the contrasts with the case of PFCs. After these observations, I will remark the sources of incentives and the impact of *news* (the exacerbation of the problem as conditions deteriorate).

⁵⁹⁸ *V.gr.*, as in $\{s[H(e^*), L(e^*)] | s[H(e^*), L(e^*)] > d\} = c(e^*)$.

5.4.4.1 SPV receives only capital contributions; the benchmark case-scenario (BCS)

Definitions. In *Figure 1* (*vid.* the Annexe to this chapter), I have introduced the curves of $H(e)$ that define the upper margin of values that the production function allows the SPV from the choices of the sponsors' non-contractible efforts. We also saw in the lower extreme of the graphic a concave curve $L(e)$ that marks the lowest margin of outputs possible from the SPV. As analysed, these curves indicate the margins of the thresholds of all possible outputs as functions of the choices of efforts $s[H(e), L(e)]$. The curve $EW(SPV(e))$ runs in between the ranges of the two highest and lowest possible outputs from the project $H(e)$ and $L(e)$ identifying the capacities expected from the project.

The only convex curve shows the costs of efforts, as above, $c(e)$. This curve finds its origin not in the bottom of the graph but in the curve $(d; 0; K)$. As already said, this serves for remarking both the total (aggregated) costs of efforts (including debt when sponsors internalise it). See below. As also pointed out, it also serves for demarking the seniorities of claims.⁵⁹⁹

In the centre of the graphic, we find a concave solid curve $EW(SPV(e))$. This curve shows the production function of the project, transforming inputs into total welfare. Accordingly, this line runs precisely in between $L(e)$ and $H(e)$. The distances between $L(e)$ and $H(e)$ shows the dispersions of outputs (volatility and risks) from all input levels e .

As also introduced, the solid concave curve $EW(SPV(e))$ we find a distinct concave curve Es . This curve indicates the values expected by the sponsors from the SPV under the limited liability rule. Note now how this curve is higher and has a slope distinct to that of the $EW(SPV(e))$ because it internalises 0 value for all outputs lower than d . Intuitively, the function Es does not internalise the costs of debt in scenarios in which the SPV produces value below such threshold. Consequently, the curve Es does not run between $H(e)$ and $L(e)$ but somewhere between $H(e)$ and $(d; 0; K)$. Accordingly, generally -i.e., independent from the particular choices of inputs- the differences between the heights and slopes of $EW(SPV(e))$ show the value of the non-recourse debt and the limited liability protection to the sponsors and the risk

⁵⁹⁹ Intuitively, the efforts on top of the senior debt show how, as wealth decreases from the changing conditions, the sponsors will be first ones affected by the loss in repayment capacities of the SPV.

externalities that, from such rules, result to the FP.

Finally, in this benchmark case-scenario, in the absence of debt, the SPV receives capital from the sponsors (internal resources). Hence, the horizontal line $(d; 0; K)$ will reflect such capital contributions. Accordingly, without debt, the limited liability rule and the non-recourse debt are irrelevant. Hence, we can ignore the horizontal line and assume that all curves (including the costs of efforts $c(e)$) find their origins in the bottom of the charter. In other words, in the benchmark case-scenario there is no function Es distinct from that of $EW(SPV(e))$ remarking the value of limited liability protection and non-recourse clause.

The analysis of the case is straight forward. Without debt extracting the benefits from the choices of inputs, the sponsors internalise the full value from their costly efforts. They consequently optimise the difference between $EW(SPV(e))^{600}$ and the costs of efforts $c(e)$. Then, the sponsors will find this maximal distance between the two where the slopes of both curves (the marginal benefits and the marginal costs from efforts) equalise. In *Figure 1*, we see these points marked by the two parallel short lines indicating the equal slopes in both curves. The optimal choices of efforts appear marked as $W(SPV(e^*))$ of the BCS. The maximum profit shows as $E\pi SPV(e^*)$ of the BCS.

As we see, the sponsors equalise the total marginal costs of efforts with the total marginal benefits from their actions. Consequently, without debt, their responses are socially optimal.

5.4.4.2 SPV receives non-recourse debt; the case of PFCs

How shirking happens. In the earlier BCS, we saw the sponsors choosing inputs using the reference of $EW(SPV(e))$ because, with capital contributions (without debt), they internalised the full impact from their costly efforts.

Now, as advanced in the first intuitive approach and further articulated in the expressions of the objective functions of sponsors, when receiving non-recourse debt, in virtue of the limited liability shelter and the non-recourse nature of the debt, there will be a fraction of the risks that the sponsors will not internalise. These will be the scenarios in which, from the privately optimal choices of inputs from sponsors $c(e)$, of the range of possible outputs (between $H(e)$ and $L(e)$), the SPV produces some of the lowest $L(e)$ below the thresholds of the senior d .

⁶⁰⁰ In the algebraic formulations, this curve shows the expected value of $s[H(e), L(e)]$.

Now, whenever the SPV produces these outputs lower than the costs of debt, the company will use all resources for servicing (as much as possible) such senior commitments. However, in these cases, behind limited liability protection, and in virtue of the non-recourse nature of the debt, the sponsors will receive 0 returns (they will not receive any of the outputs from their non-contractible efforts increasing residual benefits). Furthermore, crucially, they will not internalise the costs of debt.

As advanced when introduced the definitions, this is the reason why the curve Es identifying returns to sponsors runs above that of project outputs $EW (SPV(e))$. This protection appears marked in the dotted line in the lowest extreme of the \mathbf{B} column, between $L(e)$ and $(d; 0; k)$. Moreover, because the externalities to the FP (and the marginal value of the non-recourse clause and the limited liability protection) grow with the higher insolvency risks from the lower the choices of inputs (as efforts move to the left in the graph), is that the slope of Es will be lower than that of $EW (SPV(e))$. This reflects how, because with the lower choices of inputs the likelihood of lower outputs is higher, for these lower choices of inputs, the sponsors will obtain greater value from savings (that they internalise fully) relative to the marginal costs (loss of welfare) that, in virtue of the limited liability rule, they partially externalise to the non-recourse lender. This results in a lower (flatter) slope of Es , the curve indicating what the sponsors receive after the SPV repays the debt d (their marginal returns from efforts). The different slopes (the marginal returns) then imply lower places where such marginal values will equalise with the marginal costs of efforts (growing convexly). Finally, to lower equality between marginal costs and marginal benefits from efforts correspond necessarily lower choices of inputs departing from the socially desirable level as a function of the non-recourse clauses and the limited liability protections and insolvency risks. This is *shirking*.

Fixing ideas, because the dotted curve Es finds its origin in the horizontal debt line d ,⁶⁰¹ the area between the cost of efforts $c(e)$ and such line that the sponsors utilise for identifying marginal profits extends to the East of the charter ($E\pi S$) including (encapsulating) and exceeding the smaller $E\pi SPV$ that runs between costs of efforts $c(e)$ and the lower $EW (SPV(e))$. Then, the differences in slopes and areas covered come with several implications. Let us see how we observe them in *Figure 1*.

First, the choices of costly inputs in PFCs will always be lower than under the MCS.

⁶⁰¹ Recall, for outputs below that threshold the sponsors receive no benefits higher than 0.

Intuitively, we see this in the sponsors facing convexly growing marginal costs of efforts will equalise such reference with the now lower marginal benefits. In *Figure 1*, there are the two short parallel lines marking the places where Es and $EW (SPV(e))$ have identical slopes. Note how both slopes are lower than the corresponding references for the BCS as pointed by the expression $W(SPV(e^*))$ of the BCS.

Second, the differences in the areas between Es and $EW (SPV(e))$ -v.gr., between $E\pi S > E\pi SPV$, - implice not only that, under limited liability protection and non-recourse debt the sponsors will extract higher benefits than under the BCS, but they will harvest positive returns for a broader range of scenarios defining privately optimal choices of inputs as conditions change. Note how the $E\pi S$ exceeds $E\pi SPV$ also on East and West directions. That is, the sponsors extract positive benefits in scenarios where they choose both lower and higher choices of efforts than what their rationality constraints would allow for under the BCS.

Third, the higher benefits that the sponsors harvest in PFCs are the result of the $(L(c) < d)$ risks that they externalise to the FP in virtue of the limited liability protection and the non-recourse nature of the senior debt. In the concrete case of the optimal choice of inputs of *Figure 1* (for that particular project), the externalities are visible in the two triangles η . One triangle appears above $L(e)$ and below d , in the bottom-centre of *Figure 1*. This triangle indicates the extra scenarios in which, in virtue of the limited liability protection and the non-recourse nature of the debt, the FP internalises the costs of debt that remains unpaid by the (now lower) efforts that the sponsors chose rising residual benefits. These are also the extra scenarios in which the sponsors will internalise 0 returns from efforts but will not repay the remaining costs of debt. The other triangle η in the middle of *Figure 1* shows the scenarios in which the sponsors extract positive returns in virtue of the $L(c) < d$ risks that they externalise to the PF.

Welfare considerations. Let us now make the following observations that confirm the predictions of the analyses of the objective functions above.

First, all distortions grow with insolvency risks. Recall, we are here analysing the *shirking* that affects non-contractible actions from the sponsors increasing residual benefits. The debt that causes the distortion corresponds to the claims that the SPV fails to repay from resources generated from the inputs that the sponsors deliver in response to the risk allocation mechanism. Hence, all distortions analysed here grow as a function of the imperfections of the risk allocation mechanism. From here, we see how -as remarked in chapter 7 to 10, legislators and judges should orient the legal treatment to facilitating single-project implementation (never portfolio diversification).

Second, shirking grows with *bad news* and diminishes with *good news*. Intuitively, *good* or *bad news* moves up or down the curves of $H(e)$ and $L(e)$ without altering the costs of debt. Consequently, *news* will affect the range of output events that will fall below the threshold of d that define the strength of externalities, and the slope of E_s with subsequent incentive distortions. The distortions will diminish with *good news* and will vanish entirely only after the least valuable event of $L(d)$ serves for repaying the remaining debt. This scenario is incompatible with output uncertainty (incompleteness of the risk allocation mechanism).

Third, the incentives for *shirking* grow with the dispersion of outputs away from their expected value ($EW(SPV(e))$). In particular, as said, the problem grows with the range of events that fall below the threshold of d . Remarkably, when this happens because of *news* (uncontracted events), we speak about *shirking*. In contrast, when such dispersion results from technological innovations that the sponsors purposely implement for enlarging both margins (below and above of the weight of debt) we find *shirking* preceded by *risking*.

Identifying areas. After the above welfare considerations, let us now see how we interpret the spaces that we see in *Figure 1*.

Number 1 shows output events that, irrespective of the choices of inputs from the sponsors, are not feasible to the production function of the SPV. This is also true for outputs in the lower part of the charter. Notice how, in this case, the slope of $(L(e))$ drops as we move to the left. This shows the extra risks that the FP internalises as the choices of inputs decrease. This also remarks how such risks decrease but will never disappear as the inputs from sponsors expand.

Number 2 shows the areas above and below the two references of expected values.

Number 3 identifies the area below the thresholds of d for which the SPV will produce $L(e)$ and the sponsors will receive 0 return and will internalise only the cost of efforts. In these scenarios, the FP receives the total production from the SPV that will be lower than the face value of non-recourse debt claims. This difference between what the FP receives and the face value of d claims reflects the value of the limited liability protection and non-recourse debt in PFCs.

Number 4 identifies the differences in the choices of efforts between the BCS and the case of shirking.

Number 5 identifies an area within which the FP will always internalise the full d (as said, the fraction of it that remain unpaid by the SPV based on the wealth produced by the responses from sponsors to the risk allocation mechanism). Note how these are under the vertical of the scenario of *very bad news*. This is the point where E_s

meets the $c(e)$. On the East of this point, the sponsors do not choose non-contractible efforts rising residual benefits.

Similarly, number 6 shows areas that are below the costs of efforts. In one of the cases (the small triangle), such outputs are possible *-v.gr.*, within the boundaries of $H(e)$. The other two areas of number 6 cannot reflect outputs from the production function of the SPV (the are part of the area of number 1).

Finally, columns A and B show what the sponsors internalise in the benchmark case-scenario (BCS) and PFCs.

5.4.5 Shirking in PFCs and other tensions known in the literature

The literature of corporate finance identifies the debt overhang problem in regular diversified and collateralised environments (Cf. Chapter 3). The problem describes how shareholders withhold capital contributions necessary for funding desirable projects whenever debt-to-equity ratios results in wealth not returning to owners but being diverted to creditors.⁶⁰² From such literature, we may also think of how the incentives to behave opportunistically against the company grow to owners as the company approaches the thresholds of insolvency (high debt-to-equity ratios).^{603 604}
⁶⁰⁵ In common with the strategies of shareholders in regular diversified corporate

⁶⁰² *Vid.* S. C. MYERS, “Determinants of Corporate Borrowing”, cit. N. MOYEN, “How big is the debt overhang problem?”, cit. D. W. DIAMOND; Z. HE, “A Theory of Debt Maturity: The Long and Short of Debt Overhang”, cit. See literature in Chapter 3.

⁶⁰³ For debt dilution problem associated with claim seniorities *cf.* A. SCHWARTZ, “Priorities and Priority in Bankruptcy”, cit. D. S. BIZER; P. M. DEMARZO, “Sequential Banking”, cit. See literature in Chapter 3.

⁶⁰⁴ For asset dilution strategies, *Cf. pp.* 116 and *ff.* in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit. Also *pp.* 84, 103 and 45 in V. FINCH, *Corporate Insolvency Law - Perspectives and Principles*, cit. G. G. TRIANTIS, “Secured Debt under Conditions of Imperfect Information”, cit. Also generally, on contractual preventions *pp.* 126, in C. W. SMITH; J. B. WARNER, “On Financial Contracting: An Analysis of Bond Covenants”, cit.; A. DE JONG; R. VAN DIJK, “Determinants of Leverage and Agency Problems: A Regression Approach with Survey Data”, cit. See literature in Chapter 3.

⁶⁰⁵ For free cash flow problems *cf.* M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit.; M. C. JENSEN, “Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers”, cit.

investing, the sponsors choose inputs increasing residual benefits that are not responses to contractual provisions -very much as capital contributions in kind. The differences between these well-known conflicting interests and the problem of *shirking* in PFCs are, however noticeable in how *shirking* interacts with *risking* and *shading*.

5.4.6 Different news, identical consequences

For completeness and conceptual flow, it comes handy now to advance key aspects about the impacts from the subtypes of *bad news* to the incentives for *shirking*. Below, I will also explore how these responses by sponsors to *news* relating to *shirking* interact with the problem of *shading*, and up to a minor extent also with *risking*. I will return to these cases later under sub-sub-sections dedicated to each of the *news*.

I will now analyse three cases: first, the case in which bad news affect the value of the risk allocation mechanism; second, the case in which *bad news* affect the costs of complying with the risk allocation mechanism; third, *bad news* against the costs or value of efforts increasing residual benefits.

5.4.6.1 Bad news against the value of the risk allocation mechanism

Let us observe the impact of *bad news* against the value of the risk allocation mechanism. This is precisely the case studied above. Sponsors deliver their contributions under the obligations of the risk allocation mechanism as enforceable by the lender. They also observe that, based on such responses to the obligations, the SPV has not produced, or will not produce, wealth beyond the face value of senior non-recourse debt. The sponsors also anticipate that some of the outstanding debt will be repaid with funds that they will produce with costly inputs enlarging residual benefits (the second objective). As a result, the sponsors will under-invest in socially desirable but privately costly efforts. The interplay between the limited

For an empirical verification of over-investment policies including a literature review *vid.* S. RICHARDSON, “Over-Investment of Free Cash Flow”, *cit.* For a study of the distortions from perquisite consumption incentives over leverage ratios *vid.* E. MORELLEC, “Can Managerial Discretion Explain Observed Leverage Ratios?”, *cit.* *Vid.* also, A. V. S. DOUGLAS, “Capital Structure and the Control of Managerial Incentives”, *cit.* S. J. GROSSMAN; O. D. HART, “Corporate Financial Structure and Managerial Incentives”, *cit.* See literature in Chapter 3.

liability rule and the non-recourse clause will externalise the subsequently generated risks to the FP.

5.4.6.2 *Bad news* against the costs of complying with minimum standards

As anticipated in the introduction, sponsors have two budgets; one for all quality-enhancing inputs; and a distinct one for innovation-implementing efforts. In this case of *bad news*, the sponsors observe that the *costs of complying* with their obligations as per the risk allocation mechanism have now grown.

These obligations as per the risk allocation mechanism cannot be readjusted. The FP enforces them as her primary source of comfort in the absence of collateral or alternative placement value of the highly specific project assets. Sponsors experiencing higher costs of efforts will solve a dilemma whose inputs will be necessarily costlier than initially foreseen. Either they will comply with their obligations at higher costs, or they will face higher enforcement costs. Rational sponsors will do a bit of both.⁶⁰⁶

Crucially though, under a well-implemented clause of liquidated damages, the sponsors will comply or compensate. However, when they compensate, such compensation will be -assumedly- efficient.⁶⁰⁷ Thus, in both cases, the SPV will produce value from the enforcement of such minimum standards as expected initially.

However, the increments in costs and the said dilemma come with indirect implications to the other (the second) objective for which the sponsor choose costly inputs.⁶⁰⁸ To the input provider accessing a single budget, higher resources allocated at the first objective of complying with minimum standards will deprive her of a capacity to allocate non-contractible inputs rising residual benefits from the SPV. There is an opportunity cost that grows with the increment in the costs of one type of

⁶⁰⁶ The rational sponsor will optimise the marginal value of saving costlier inputs against the marginal costs of increasing undesirable enforcement by the FP.

⁶⁰⁷ We have assumed that parties adjust the clause of liquidated damages efficiently.

⁶⁰⁸ Recall, there are two types of efforts *v.gr.*, quality-enhancing and innovations-implementing that the sponsors use for two objectives -complying with the risk allocation mechanism. Both types of efforts for the two objectives come from the same budget.

efforts of one objective.⁶⁰⁹

Consequently, the loss of inputs expanding residual benefits results from the lower resources available for this second objective. However, this drop in the choices of inputs is, *per se*, not inefficient because after *news*, efficiency calls for it, and this is socially optimal. However, because of the limited liability protection, lower inputs expanding residual benefits will result in higher volatility with externalities to the lender. The perspective of responding away from the socially desirable with externalities to the non-recourse lender will then exacerbate *risking* and *shading*. Risking and shading will then worsen the incentives for *shirking*. So, in this type of *bad news*, we will observe *shirking*, but the incentives will come as a result from the impact of *shading*, -not directly from *news*. I will elaborate on this proposition further below when consolidating propositions based on each type of *news*.

5.4.6.3 Bad news against the returns from efforts enlarging residual benefits

Bad news affects the costs or benefits of expanding residual benefits. This is the case used for introducing the concept above. The analysis of this third subtype of *bad news* is simplest. In *Figure 1*, we would observe a decrease of total returns (*bad news* against marginal benefits) from efforts with changes in slopes of $H(e)$, $L(e)$, and naturally $EW(SPV(e))$ or rise of costs (*bad news* against costs) with changes in the slope of $c(e)$, or both.

Bad news does not affect the costs to sponsors or the value expected by the SPV in relation to the risk allocation mechanism. Moreover, just as in the second subcase of *bad news*, whenever sponsors choose inputs expanding residual benefits, debt will have been already payable from wealth produced by the risk allocation mechanism. Hence, sponsors will internalise the full value from their actions efficiently.

So, the sponsors will choose inputs expanding residual benefits without distortions from senior debt affecting their returns. However, because of the lower returns (higher costs or lower benefits), the choices of inputs and expected residual benefits will be lower. Precisely as above, this is not -per se- inefficient. Efficiency calls for a lower choice of inputs after an increment in the marginal cost of efforts.

⁶⁰⁹ In *Figure 1*, this would be represented by an increase in the slope (and altitude) of $c(e)$. This change in the slope of costs of efforts will result in a displacement of the optimal equilibrium from the East to a lower point in the West of the graph.

However, here too, indirectly, lower returns from residual benefits exacerbate the *shading* problem (see next) which in turn does allow debt to survive resulting residual benefits being diverted away from sponsors (for consequent *risking* and *shirking*). Effectively, as I will also show in details below, any form of distortion (*news* against the costs of efforts or the value of inputs, or the capacities of the project) resulting in any of the three tensions and forms of opportunism (*risking*, *shirking*, or *shading*) will inevitably exacerbate the other two.

5.5 3rd tension: *Shading*

1.1.1 Introduction

Let us now introduce *shading*, the third tension of the chapter. The analysis will follow a sequence identical to that in the cases of *risking* and *shirking*. I will describe the nature of *shading*, how the problem happens, including the private objective function of sponsors, and I will observe the sources of incentives. Here too, I will anticipate how *bad news* affects the other tensions and conclude with a remark about the nature of the problem.

In contrast to the two other cases, for simplicity of the articulation, I will now use the subcase *bad news* where sponsors observe increases in the costs of complying with their obligations as per the risk allocation mechanism. Also, differently from the previous analysis, here I will make references not only to the choices of inputs increasing quality levels but also to the choices of efforts implementing innovations.

Before proceeding, let us recall four aspects advanced in the introduction. First, incentives and consequently, the choices of inputs rising quality levels and innovations comove. As said, this is so simply because the value of innovating is higher for the objective (complying with minimum standards of risk allocation or rising residual benefits) for which exponentially costly quality-enhancing efforts are most valuable. Second, the value of innovation-implementing efforts consists of discovering technological alternatives. Third, these alternatives may result in positive or negative externalities from quality-enhancing inputs delivered for one objective against the value of the other. Finally, fourth, for reasons described,⁶¹⁰ we can restrict

⁶¹⁰ Positive externalities from innovations complying with the risk allocation to the objective of increasing residual benefits can be synthetised as being quality-enhancing efforts (the other type of effort) enlarging residual benefits. Externalities from innovations expanding residual benefits to the returns from quality-enhancing

our attention to the negative externalities arising from innovations implemented for the first objective of complying with obligations under the risk allocation mechanism to the second objective of increasing residual benefits.

In the last section of this chapter, I will offer illustrations based on a real-life case scenario where the sponsors could find spaces for reacting with *shading*.

5.5.1 Strategic nature of *shading*

Rational sponsors implement innovations for reducing the costs for complying with obligations as per the risk allocation mechanism -the first of the two objectives. Some of these innovations will be desirable for such a purpose. Some others may be welfare decreasing.

Under *shading*, losses of total welfare result from the implementation of cost-saving innovations that allow compliance with (for lowering enforcement of) the risk allocation mechanism but without necessarily producing value to the company. Under normal circumstances (under *no news*), as residual claimants, the sponsors (collectively⁶¹¹) will efficiently internalise the total value of these costs-saving innovations to the SPV via expectations to residual benefits.

The problem of *shading* appears when the relationship between the returns from inputs delivered for each of the two objectives deteriorate. Under the circumstances described below, sponsors will prefer implementing costs-saving innovations for complying with obligations of the risk allocation mechanism even when such

efforts complying with the risk allocation mechanism will be always fully internalised in the value of minimising enforcement. This is true for both negative and positive externalities. The object of the analysis can be therefore restricted to the externalities from innovation-implementing efforts of the first objective (complying with minimum standards) to the residual benefits.

⁶¹¹ As it will be shown in Chapter 6, the sponsors individually cannot possibly internalise the full marginal impact from their non-contractible efforts. The irremediable moral hazard in team problem leads to this consequence. Intuitively, the sponsors distribute property rights as the only means for incentivising non-contractible actions. Via ownership (shares in the SPV), the sponsor can only internalise the fraction of the total marginal effects of their actions that corresponds to the individual stakes of the total benefits each of them expects from the company via dividends. B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. E. RASMUSEN, “Moral Hazard in Risk-Averse Teams”, cit.

innovations are socially undesirable after computing loss of total welfare. This is rational because some of these losses will be externalised via risk to the FP.

Just as above, the problem of *shading* -the implementation of socially undesirable innovations- is one of risk allocation mechanism incompleteness. Also, here, from the problem of incompleteness, we can build a short bridge to the hold-up problem faced by the FP investing in (future) specific assets anticipating her incapacity to readjust after sponsors implement *shading*. Here too, the reader may also observe a moral hazard flavour in the tension between sponsors and the principal (the FP).

Incentives to implement costs-saving socially undesirable innovations show the 3rd strategic tension in PFCs. To these best responses from the sponsors to such incentives, I refer to as *shading*.

5.5.2 How *shading* happens

Just when presenting the first and second conflicts, the simplest way to introduce *shading* is perhaps by contrasting two simplified scenarios. In the first case, sponsors will choose inputs after updating information and realising the project appears as initially foreseen. In the second case, the sponsors observe that the costs quality-enhancing efforts (not of implementing innovations) has unexpectedly increased.

The no news benchmark case-scenario. Without changes in the environment, both costs and returns from inputs deliverable to both objectives appear as expected. Consequently, from the contributions of the risk allocation mechanism, the SPV will produce wealth similar to or higher than the face value of non-recourse debt. Next, the sponsors will choose costly actions to the second objective expanding residual benefits, and they will receive returns also as expected.

Observe how, when implementing innovations for complying with the risk allocation mechanism, sponsors (collectively) internalise the full marginal value from such innovations to total welfare. That is, they will internalise the impact that such innovations will produce to the welfare generated by the risk allocation mechanism, and the externalities they may cause to the other objective of augmenting residual benefits. Simply, when innovating for complying with their contractual obligations enforceable by the FP (the risk allocation mechanism, the first objective) they will internalise the effects of their technological changes to total project value via their expectations to residual benefits (the second objectives). In other words, in their private objective functions, the sponsors will equalise the marginal value of innovating for lowering costs of efforts with the marginal costs associated with the departure from the optimal technologies as initially (incompletely) regulated by the risk allocation mechanism to total welfare (residual benefits). Hence, innovations at

lowering costs of complying with minimum standards for risk allocation will be adopted at socially desirable levels.

The case of bad news against the costs of complying with obligations of the risk allocation mechanism (the first objective). Recall, the FP (SPV) will not renegotiate provisions of the risk allocation mechanism. So, after updating information finding increments in the costs of complying with such obligations, the rational sponsors will face the economic problem of minimising the cost of efforts (lowering inputs) as well as the expected enforcement. The output of the dilemma will bring extra costs for lower input levels and higher enforcement.

Strategically, this comes with three consequences. First, as per the plausible assumption about the co-movement of both types of inputs, higher costs in the optimal choice of quality levels will bring higher choices of innovations from the second objective of expanding residual benefits to this first objective of complying with now costlier obligations. Higher innovations efforts will then come with wider technological alternatives for saving such higher costs of quality-enhancing efforts. Second, after updating information about the increments in the costs of complying with enforceable obligations, in their private objective functions, sponsors will now observe that it becomes rational to accept cost-saving technological alternatives that come at increasing losses to residual benefits (total welfare). In other words, sponsors will now accept innovating against their expected residual benefits (total project value) at the value of saving higher costs of compliance and enforcement of the risk allocation mechanism. Third, under a non-recourse clause and limited liability protection, lower total welfare from the SPV invariably results in higher insolvency risks⁶¹² and subsequent loss of value to the FP. In other words, there will be a fraction of the marginal impact of their cost-saving innovations that they deliver for complying with the risk allocation mechanism that they will not internalise. So, by innovating, the sponsors externalise the impact of *news* affecting their obligations to the FP the principal. This is the nerve of the *shading* problem.

The transfer of unforeseen costs affecting agents via externalities to the principal is

⁶¹² The risk will materialise as a result of the negative effect of such innovations to the capacities of the SPV to produce value from the inputs associated with the risk allocation mechanism -which is a loss to total welfare. As shown further below, the loss in total residual expectations (associated with the SPV using resources that the sponsors build with costly contributions for expanding residual benefits) will then lead to *shirking* and *shading*.

commonplace (a defining aspect) in bilateral contracting under incompleteness. Below I will show how the problem appears with all three types of *bad news*. I will also describe how it exacerbates as it interacts with the *shirking* resulting from the same undesirable influences from nature.

5.5.3 Different news, identical consequences

As shown below, the problem will appear as a function of increments in the costs of efforts for complying with minimum standards (the case described). The tension will also appear whenever the value of compliance with the risk allocation mechanism decreases. Finally, now indirectly, it will also exist after sponsors lose returns from costly actions rising residual benefits. In all cases, externalities to the FP exist as a function of welfare losses resulting from such innovations. Let us see how this happens. I will come back to these propositions in a consolidated analysis further below.

5.5.3.1 Bad news against the value of the risk allocation mechanism

In this first case, after *news* affects the value of complying with minimum contractual standards of the risk allocation mechanism enforceable by the FP, we now observe that the senior non-recourse debt will not be payable fully from wealth produced by such inputs. This is the scenario used for presenting the cases of *shirking* and *risking*. In *Figure 1*, we would observe the presence of d that remained unpaid before the sponsors choose inputs increasing residual benefits.

Sponsors now anticipate that the SPV will use some of the otherwise generated residual benefits for servicing the senior debt. As per this loss in returns, they will consequently under-invest (*shirking*) and choose riskier than socially desirable solutions (*risking*). Under-investment for the second objective of expanding residual benefits will then free resources for innovating for the other objective of complying with risk allocation obligations.⁶¹³ Additionally, the sponsors aware of the SPV extracting otherwise residual benefits for paying the non-recourse debt to the FP will anticipate that some of the impact from their cost-saving innovations will now accrue to the lender. The sponsors will consequently use such freed resources for implementing cost-saving solutions for complying with the risk allocation mechanisms without fully internalising the consequent losses to project capacities.

⁶¹³ Recall, the sponsors allocate resources to the objective that is most valuable -this is how rational parties maximise returns from a budget they use for two purposes.

(*shading*).

5.5.3.2 Bad news against the costs of complying with minimum standards

This is the scenario described above when presenting the conflict. The conclusions are identical to the last sub-section *supra*. Higher costs of complying with the risk allocation mechanism equate to higher enforcement. In the objective functions of the sponsors, higher enforcement equates to a higher value of preventing it. Thus, the sponsors will perceive a higher value for innovating for lowering the costs of (choosing higher efforts for) complying with the risk allocation mechanism.

The sponsors will then exert higher choices of innovation-implementing efforts implementing cost-saving innovations in detriment of the total project value for three reasons. First, the marginal value of such actions will be higher; this is in virtue of the higher costs of complying with obligations that remain enforceable by the FP (the risk allocation mechanism). Second, of the externalities that such innovations could bring to total welfare, the sponsors will only internalise a fraction of the total. This results from the functionality of the limited liability protection and the non-recourse clause and the subsequent risk externalities to the non-recourse lender. Third, the losses of residual benefits effectively liberate innovation-implementing resources from that objective that the sponsor can now allocate to the first objective of finding technological solutions for lowering the costs of complying with the obligations of the risk allocation mechanism (*shading*).

5.5.3.3 Bad news against the returns from efforts expanding residual benefits

Finally, the sponsors now observe that returns (the marginal costs or the marginal benefits) from both efforts -quality-enhancing and innovating- for enlarging residual benefits will decrease. The analysis here is identical to the second part of *supra*.

In this scenario, two aspects we must note that lead to *shading*: First, after noting that the returns from expanding residual benefits dropped, the sponsors will find that they will appreciate their innovation-implementing resources when allocated to the objective that remains valuable -*i.e.*, complying with the obligations enforceable under the risk allocation mechanism. Second, lower returns from efforts increasing residual benefits equate to lower choices efforts expanding total welfare. Lower total welfare then results in higher risks that, in virtue of the limited liability protection and non-recourse clause, the SPV will externalise to the FP. Both aspects, -the availability of innovation-implementing resources and the perspectives of externalising the consequences of losses to total project capacities- induce the lender to implement cost-saving socially undesirable innovations for lowering the costs of

complying with the obligations enforceable under the risk allocation mechanism (*shading*). As shown further below, *shading* then exacerbates *shirking* and *risking*.

5.5.4 The idiosyncrasy of the *shading* in PFC

In *shading*, we observe two strategic aspects. In the first place, we see the SPV contributing with a subgroup of contractors to the detriment of the interest of a single creditor, the FP. Strategically, this aspect may be seen as analogous to the conflicts between the interests of a class of creditors (in PFCs, the FP) and those of a group of contractors exerting *de facto* control over the company. The second aspect, in sharp contrast to what we see in regular corporate environments, the collusion between the *de facto* controlled SPV and sponsor (a class of contractors) goes directly against the interests of contractual provisions implemented by such contractor providing non-recourse financing. I will come back to this proposition in Chapter 7 when empathising how, with implications to the legal propositions, in contrast with what we see in regular diversified environments, in PFCs, the strategic tensions happen habitually (and prevalently) against contractual provisions by parties delivering inputs (from outside the administrative spheres of the project-specific SPV).

Let us now consolidate the above propositions and see how the three tensions interact with each other as the environment changes in different ways. I will now show how it is irrelevant where and how *news* affects the sponsors or the project (SPV). All deteriorations of the environment will, directly or indirectly, result in all *shirking*, *risking*, and *shading*.

5.6 No news

5.6.1 The scenario

The (no) effects from no news. Under this first case of *no news*, sponsors update information confirming initial estimations about the environment. Without influences from nature, bounded rationality -the vulnerability of contractual provisions to *news*- comes with no impact. Expected values, responses, and the strategic relevance of contractual imperfections remain as initially foreseen. So, let us now observe how sponsors collectively allocate quality-enhancing and innovation-implementing resources between the two objectives of complying with minimum standards and augmenting residual benefits under *no news*.

Critically, in the following paragraphs, I will analyse the case of *no news* as if *shirking*, *risking*, and *shading* did not exist in this scenario. This consideration relates to the inexistence of exacerbations resulting from influences in the environment.

However, to be sure, also under *no news* some level of *shirking*, *risking*, and *shading* will exist as a function of the initial contractual imperfections with which the project begins. In all contractual arrangements, there are initial asymmetries of information that affect the expectations to outputs. Similarly, as a result (say) of the imperfections in the initial implementation, certain aspects of parties⁶¹⁴ or the project will remain unknown to other parties. Consequently, the capacities of the project may not result to all parties as initially considered and *shirking*, *risking*, and *shading* will, in some extent, always exist -also *no news*.

5.6.2 Efforts in compliance with minimum standards

Under *no news*, the marginal costs and benefits of efforts complying with minimum standards for risk allocation remain unchanged with regards to the anticipated. Choices of inputs complying with the first objective will be as high as expected and produce the value foreseen initially.

Senior debt will then be served from these funds generated by compliance with minimum standards -*not* by the value generated by sponsors rising residual benefits. Hence, when choosing *innovation-implementing* efforts, sponsors will internalise the full value of externalities to (total) residual value from the project. Subsequently, under *no news*, we find no *shading* against the risk allocation mechanism.

5.6.3 Efforts expanding residual benefits

With the SPV having produced value sufficient for repaying the senior non-recourse debt from the risk allocation mechanism, sponsors are certain that no wealth generated by their costly actions expanding residual benefits will be diverted for servicing SPV obligations. Thus, risk preferences will be socially desirable, *shirking* will not be observed, and as indicated above, *shading* will not exist. Additionally, without *news* affecting returns from such efforts, the choices of both innovations and quality-improving efforts for increasing residual benefits will be as high as socially desirable.

⁶¹⁴ Their “types” as in the jargon of Game Theory, where the true character of parties reveals after they internalise risks -a problem of incompleteness as parties fail to provide consequences for such findings. *Vid.* page 379 and *ff.* in J. WATSON, *Strategy*, cit.

5.6.4 *No news*. Welfare considerations

Under *no news*, the environment reveals as initially foreseen. Total welfare appears around the value expected ex-ante. Finally, the FP internalises the levels of risk estimated when evaluating individual rationality (participation) constraints.

However, note how this statement about the conflicting interests and welfare outputs of *no news* hold only under the assumptions of the chapter. That is, we are here accepting that individual sponsors deliver contributions cooperatively and interact with the FP as a single entity. I will dedicate Chapter 6 to evaluating tensions amongst individuals after relaxing these suppositions.

5.7 Bad news

5.7.1 The scenario

Let us now consider the scenario of *bad news*. Here, I will discriminate the three subcases already anticipated. These are *bad news* against the value that the SPV can produce from the inputs delivered by sponsors in compliance with the risk allocation mechanism (the first objective). In the second place, I will explore *bad news* against the private costs of efforts faced by sponsors complying with their obligations as per the risk allocation mechanism. Finally, in the third place, I will describe the scenario where *news* depletes returns from efforts expanding residual benefits.

In all cases, I will observe the direct effects of *news*, and the strategic implications that result from the first reaction by sponsors to such influences from nature. The order in which I will describe each of the three conflicts will vary.

5.7.2 *Bad news* against the value of the risk allocation mechanism

Let us start with the first scenario where sponsors update information and realise that, after delivering inputs as contracted upon, the SPV will not produce value sufficient for repaying the non-recourse debt with wealth from the risk allocation mechanism.⁶¹⁵ As a result, sponsors will also anticipate that some of the returns from their costly actions governing residual benefits will be directed to servicing the senior debt. The presence of debt d will consequently come with one indirect from two direct implications.

Directly. Directly, the presence of debt will increase risk preferences for the

⁶¹⁵ This is the scenario used as a reference for making the earliest introduction to the tensions of *risking* and *shirking*.

technological solutions rising residual benefits (*risking*). As shown, by increasing volatility, sponsors expand the returns of desirable outputs (above $d:0$ for saving costs, and above $c(e)$ for profits) in detriment of extra losses (insolvency risks) externalised to the FP whenever the SPV produces outputs lower than $d;0$. Also, directly, and for reasons similar to those distorting risk preferences, the presence of debt and the resulting capacity of the FP to internalise losses sponsors will harvest greater returns from lower choices of inputs (*shirking*). In other words, because some of the resources that would otherwise increase residual benefits will be used for paying the senior debt, there is a fraction of the losses associated to their withholding of costly contributions that the sponsors will not internalise. For this fraction of marginal benefits accruing to the FP, the sponsors will under-invest (*shirking*).

Indirectly. Indirectly, savings from *shirking* also distort the relative distribution of resources between the two objectives. Let us remember, the optimal choices of both types of efforts comove between the two objectives. Hence, sponsors transfer innovation-implementing resources from the objective of expanding residual benefits to finding cost-saving alternatives for complying with their obligations under the risk allocation mechanism. Broader alternatives resulting from such innovations permit that they find solutions lowering the marginal costs of efforts. Some of such solutions will be socially desirable (with positive externalities to residual benefits). Some other will be socially undesirable. These would be cost-reduction alternatives whose benefits (cost-savings) would be greater than the fraction of the total losses that they would not internalise (as under limited liability and non-recourse clause protection some risks will be externalised to the lender) (*shading*).

Interestingly, observe how, whenever *shading* reduces the value expected from the risk allocation mechanism, it will also expand the debt subtracting returns from the other objective of enlarging residual benefits. This then further exacerbates *shirking*, which in turn allows for further savings of innovation-implementing resources that sponsors can allocate to further *shading*. The vicious circle will progressively moderate with the decreasing marginal value of undesirable innovations.

5.7.3 Bad news against the costs of complying with minimum standards

Let us now observe the second case where sponsors update information and realise that the costs of complying with enforceable obligations under the risk allocation mechanism have risen. Let us recall, these provisions of the risk allocation mechanism build the confidence that the FP requires in the absence of collateral. Hence, the lender will not renegotiate them regardless of costs of efforts internalised by sponsors (the best informed and cheapest costs avoiders whose responses define the value of FP's claims). Note, under an assumption that liquidated damages clauses

have been efficiently adjusted, to the SPV (or the FP), it would be indifferent whether sponsors deliver or compensate as per such obligations. In contrast to the earlier case, from these influences from nature, we now find two direct and one direct implication.

Directly. Higher costs of complying with obligations will directly increase the value of innovating for reducing costs associated with such objective. These innovations come at a loss in terms of, either or both, reducing the value expected from the risk allocation mechanism (the first objective), or producing externalities against the value from efforts expanding residual benefits (the other objective); this is *shading*.

Indirectly. Precisely as described above for the first subcase of *bad news*, lower value from the risk allocation mechanism will result in the SPV failing to repay the non-recourse debt from such proceeds. A tranche of senior debt will be cancelled using funds that would otherwise be residual benefits. The presence of debt extracting residual benefits will lead to *risking* and *shirking*, which would then expand incentives for further *shading*.

5.7.4 **Bad news against the returns from efforts expanding residual benefits**

Let us approach the last subcase of *bad news* where sponsors update information and realise that *news* has affected the returns from inputs expanding residual benefits. In *Figure 1*, we will see this is a drop in both levels and slopes of $H(e)$, $L(e)$, and consequently also $EW(SPV(e))$. From this subtype of *bad news*, we find two direct and two indirect implications.

Directly. Directly, losses in returns from efforts increasing residual benefits result in lower choices of inputs for that purpose. This, yet, is not *shirking* but an efficient readjustment to new lowered marginal values. Also, directly, a lower marginal value from efforts expanding residual benefits will reduce the use of innovation-implementing efforts to that end. This will, in turn, make such resources available to the other objective of complying with enforceable obligations as per the risk allocation mechanism.

Indirectly. As described, higher resources for innovating available for the first objective results in a broader range of cost-saving solutions, some of which will be socially undesirable (*shading*). These socially undesirable solutions will such that will allow marginal cost-saving benefits that will dominate the share of total marginal losses that the sponsors will internalise.

Such low costs compliance solutions will, in turn, reduce the value expected from the risk allocation mechanism. As shown, this will induce the SPV to repay the senior

lender with funds produced by efforts delivered at rising residual benefits. Backward induction, the burden of this unpaid tranche of senior debt will induce both *risking* and *shirking*, which more remotely will further exacerbate *shading*.

5.7.5 *Bad news*. Welfare considerations

Directly or indirectly, in all cases, *bad news* invariably exacerbates the three tensions and forms of opportunism, *risking*, *shirking* and *shading*. The three tensions result in losses of total welfare with a consequential increase in the likelihood that the SPV will fail to honour its commitments with the non-recourse lender. Innovations result from the higher expertise of sponsors; strategically, however, they also reflect a problem of contractual incompleteness of the risk allocation mechanism.

As the environment deteriorates, directly or indirectly, stronger influences from nature will further expand the feasibility spaces for complying with the risk allocation mechanism by implementing solutions that will be of lower cost but will produce lower value to the SPV (*shading*). Of the three conflicts, we may argue that *shading* appears as the most harmful one. *Shirking* will only affect the stake of debt that the SPV failed to repay with funds produced by the risk allocation mechanism. The same holds for the inefficiencies from *risking*.

For their feasibilities, both *risking* and *shirking* require (and negatively affect the value of) this fraction of unpaid debt. In contrast, *shading* results in a loss of SPV capacity to produce value from the risk allocation mechanism, the main source of value, the object of ex-ante transaction costs, and reference of expected claim value by the non-recourse lender -the main risk-taker in the setting.

Finally, as the influences from nature approach the thresholds of *very bad news*, the sponsors anticipate that they will receive little or no residual benefits from their costly efforts. As I show below, under *very bad news*, incentives for *shirking* will prevent them from delivering any efforts expanding welfare (*shirking* will be absolute). Without choices of efforts expanding residual benefits, we cannot discuss the choice of risky technologies (*risking*). The sponsors will then devote their entire resources at minimising costs of compliance with enforceable obligations without internalising *any* of the undesirable implications from the inefficiency of such solutions to project value (*shading*). This scenario of *very bad news* follows next.

5.8 Very bad news

5.8.1 The scenario

The scenario of *very bad news* presents a further deterioration of influences from nature relative to what we described under *bad news*. As a result, the conflicts of

interests described above appear now exacerbated to the extreme.

Under *very bad news*, after updating information about the environment, sponsors observe two aspects that distinguish this threshold from the case of *bad news*. First, the sponsors perceive negative expected returns from their efforts (note the arrow indicating this point in *Figure 1*). Second, despite the above, sponsors will remain bound by the costly obligations to comply with minimum standards for risk allocation externally enforceable by the FP. The strategic responses by sponsors to the extreme changes in the environment will all result from the interplay between these two aspects.

Additionally, note how, it is not strictly necessary that we discriminate the sub-types of *very bad news*. As long as the two elements described above are present (expect no residual benefits and remain obliged as per the risk allocation mechanism), all the outputs described below will hold independent of the place (variable) where the sponsors perceive the influences from nature.

5.8.2 Impact of news in the objectives of sponsors

Most simply, without the SPV producing wealth beyond the burden of senior debt, sponsors perceive no incentives for expanding residual benefits. In their private objective functions, they will choose costly inputs (particularly innovation-implementing actions) minimising both the costs of complying with obligations as per the risk allocation mechanisms that will remain enforceable by the FP. Sponsors will internalise none of the externalities that such innovations would bring to total welfare.

5.8.3 1st. tension; *risking*

Without sponsors exerting efforts rising residual benefits, we cannot consider the risk (output volatility) preferences for the technologies they (do not) implement maximising residual benefits. See next.

5.8.4 2nd. Tension; *shirking*

Without hopes of harvesting residual benefits, the sponsors do not deliver inputs expanding total welfare. Under *very bad news*, *shirking* is absolute.

5.8.5 3rd. tension; *shading*

Just as anticipated, under *very bad news*, in their private objective functions, sponsors only internalise returns from complying with obligatory provisions enforceable by the FP as per the risk allocation mechanism. Under *very bad news*, sponsors do not internalise any of the effects of their actions to total welfare. Thus,

sponsors will now devote their entire budgets at devising and implementing alternative solutions for minimising the costs of inputs for complying with enforceable obligations with absolute disregard to project welfare.

5.8.6 *Very bad news*. Welfare considerations

Very bad news is defined by the threshold within which sponsors lose expectations of harvesting residual benefits. Strategically this comes with two effects. First, it anticipates the fact that the FP will likely (not certainly) not recover the capital and interests associated with the non-recourse debt fully.⁶¹⁶ Second, it provides the strongest incentives for sponsors to withhold all socially desirable uncontracted actions; third, it maximises the incentives for innovating for complying with remaining obligations with complete disregard of project welfare. This last aspect further reduces total welfare and the value of claims in the hands of the FP.

Finally, in the following chapter, I will describe individual strategies of sponsors and their conflicts with the rest of sponsors as a class and the FP. Then, I will show how, under *very bad news*, the lack of expected value from residual dividends will also deplete the power of ownership as an incentive implementation mechanism, fully.

5.9 Good news

Finally, let us make a short remark about the scenario of *good news*. In this case, the sponsors update information and realise that the environment has evolved better than originally foreseen. Invariably, this comes with positive externalities to the FP.

Simply, directly or indirectly, lower marginal costs, or higher marginal value from efforts, results in higher choices of inputs to both objectives. When complying with the risk allocation mechanism, sponsors will increase the likelihood of compliance and reduce the likelihood of enforcement of liquidated damages. This excludes *shading*. Additionally, *good news* will result in the likelihood that the SPV fails to produce value sufficient for repaying the non-recourse debt with resources generated by the risk allocation mechanism to be minimal. So, minimal will also be the incentives for *shirking* and *risking*.

Good news improving the capacities of sponsors to expand residual benefits will result in higher choices of both innovation-implementing and quality-enhancing socially desirable responses for higher welfare and invariably positive externalities to

⁶¹⁶ With the SPV producing wealth below the cost of debt, the lender would extract the full proceeds of the project.

the non-recourse lender. *Good news* effectively further minimises -without ever fully eliminating- the space for *risking*, *shirking*, and shading parts could have accepted ex-ante under no-news as a function of contractual imperfections of the risk allocation mechanism.

5.10 Collective and individual actions

Before proceeding, let us notice how the three conflicts described in this chapter not only affect sponsors collectively but they also govern the best responses from individual sponsors. Beyond the object of this chapter, should we observe individual strategies, we would see how, in their private objective functions, the burden of debt and the changes in the environment would affect incentives analogously to what we saw above as affecting collective interests of sponsors as a class.

In the next chapter, I will observe individual strategies in a framework where sponsors can readjust with some, or with all other sponsors. In Chapter 6 we will also see how individual sponsors will choose privately costly efforts now in conflict not only with the objectives of the FP, but also with those of the sub-group (the sub-coalition) of readjusting individuals, and with the team of sponsors embodied by the SPV.

So, in the next chapter, we will see two tiers of *risking*, *shirking* and *shading*. The first tier will affect collective actions by sub-coalitions, or by the team of sponsors acting unanimously (precisely as described here). In a second tier, we will find *risking*, *shirking* and *shading* in the individual responses by each of the sponsors to such incentives implemented collectively (also under the three tensions) by sub-coalitions or by sponsors as a team. Concretely, *risking* and *shading* will be observed in choices of inputs expanding residual benefits associated with subordinated contracts and to the personal allocation of property rights (entitlements to dividends). That is, to the distribution of ownership as a means for incentivising non-contractible actions.

In the individual choices of inputs expanding dividends, we will also note the inefficiencies associated with the moral hazard in team problem⁶¹⁷ from which sponsors cannot escape -a form of *shirking*. *Shading* actions will be then implemented against the costs of complying with obligations enforceable by members of opportunistic sub-coalitions, by all sponsors collectively, or by the FP via the SPV. In all cases, the severity of the conflicts will be proportional to the burden of senior

⁶¹⁷ Cf. B. HOLMSTRÖM, “Moral Hazard in Teams”, cit.

debt relative to distributable welfare as the environment deteriorates with *news*.

5.11 Cost overruns, readjustments, and the optimal seniority of debt in PFCs; an early approach

Let us shortly refer to two key points that deserve attention beyond the scope of this analysis. These are: first, the close relationship between the spaces for *shading* and the problem of cost overruns in large projects; and second, the characteristics of seniority of non-recourse debt that maximises value to the lender. That is, a hierarchy of claims that is optimal to the lender. I will come back to this topic in Chapter 6.

5.11.1 *Shading* and cost overruns

Let us characterise a *cost overrun* as the action of implementing inefficient (socially undesirable) technologies. Costs overruns typically lead to projects consuming more resources than ex-ante expected before their completion or full operation. This generic characterisation allows us to not restrict our attention to scenarios where contractors deliver their inputs under *cost-plus* reward functions.^{618 619}

The appearance of costs overruns is in the core of *shading* strategies. As shown above, as the environment changes with *bad* or *very bad news*, sponsors lose returns from inputs (and innovative solutions) increasing residual benefits. So, they perceive incentives for implementing cost-saving but socially undesirable innovations.

As all strategic tensions, the problems of *shading* exacerbating the problem of costs overruns reflect frictions associated contractual imperfections. Ex-ante sponsors implement the risk allocation mechanism between themselves and the FP after a process that includes a stage for imperfect signalling. Therefore, sponsors fail to reveal their capacities to innovate (*shade*) under the full array of expected evolutions from the environment. Ex-post, *shading* and costs overruns are feasible as per the contractual incompleteness resulting (partially) from such imperfect signalling by sponsors.

The perspectives of *shading* and the possibilities it permits for complying with costly

⁶¹⁸ From an example of a cost-plus reward in a seminal paper, see page 309 in B. KLEIN ET AL, “Vertical Integration, Appropriable Rents, and the Competitive Contracting Process”, cit. For more recent examples of the use of cost-plus contracts cf. E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit.

⁶¹⁹ This generalisation comes at no effect to the propositions of the analysis.

obligations in a wide range of scenarios, effectively increase the expected value from the project to sponsors and leads to ex-ante over-investment. That is, sponsors will accept projects leading to social welfare decreasing projects; much of the social costs generated by such a project will be externalised to the non-recourse lender.

Fundamentally, *shading* and cost overruns do not need a readjustment stage to exist. However, as it comes associated with the implementation of a socially undesirable solution with externalities, the feasibility of *shading* also reflects a space for efficiency gains after renegotiating. The anticipation of an aggressive renegotiation stage then further expands the value of *shading* increasing bargaining threats. We now find cost overruns in conjunction with aggressive bargaining against the FP.

Finally, observe, beyond the scope of this study, the problems of cost overruns also exist as a function of the willingness (and capacities) of off-takers to accept aggressive renegotiations.⁶²⁰ The problem is consequently is acute in cases of public procurement projects (*cf.* the literature references to the use of PFCs in Private-Public Partnerships in Chapter 1). A conspicuous example is the case of the construction of the Elbphilharmonie (The Elbe Philharmonic Hall of Hamburg). Initially, the initial budget was estimated to remain under the threshold of € 200 million. The final cost reached € 870 million.⁶²¹

5.11.2 Optimal seniority of non-recourse debt

Finally, from the above, we may attempt an approach to the elements of a criterion for identifying the optimal seniority of non-recourse claims. I will revisit these considerations in a dedicated proposal for later research in Chapter 10.

The sources of value. The optimality will be governed by the interplay among: first, the comprehensiveness and enforceability of the risk allocation mechanism; that is, by how minimum standards for risk allocation produce value enough for repaying the non-recourse debt under the more various influences from nature; second, by the capacity of sponsors to produce value from inputs delivered beyond contracting with the FP; this is the marginal value from their quality-enhancing efforts chosen for the second objective of rising residual benefits naturally increasing project welfare; third,

⁶²⁰ Note the remarkable alignment of these propositions with the findings in the literature of Prof. Flyvbjerg. *Vid.* B. FLYVBJERG ET AL, “Underestimating Costs in Public Works Projects: Error or Lie?”, *cit.* B. FLYVBJERG, “Design by Deception”, *cit.*

⁶²¹ <https://www.faz.net/aktuell/feuilleton/millionengrab-elbphilharmonie-der-grosse-eisberg-ueber-der-stadt-13427408.html>. Last visited, 30/7/2020

by the capacity of sponsors to innovate. This capacity of sponsors to implement innovations comes with twofold effects. On the one hand, it increases the capacity to expand residual and total benefits; this ultimately modifies (desirably) the threshold beyond which *bad news* become *very bad news* and *shading* becomes the dominant strategy. On the other hand, under *bad* and *very bad news*, innovation-implementing capacities will increase the value of acting under three tensions. This includes the capacity to implement cost-saving but socially undesirable solutions (*shading*).⁶²²

The trade-offs of seniority. Let us observe the marginal costs and values to the FP from increasing the seniority of non-recourse debt.

The marginal value. Higher hierarchy of claims -a privilege allowing the FP to receive payment before other creditors- increases her expectations to receive payment of non-recourse claims under broader evolutions of the environments. In other words, seniority allows the FP to extract wealth produced by inputs delivered to both objectives of complying with minimum standards of risk allocation as well as of expanding residual (and consequently total) welfare from the project under stronger influences from nature. Generally, the benefits from the higher hierarchy of claims are common places in the literature of corporate finance.⁶²³ Higher seniorities of claims -*v.gr.*, subordinating the contractual claims of the sponsors and other creditors- comes at the marginal benefit of improving the position of the lender thus increasing the feasibility of FPCs (up to a point).

The marginal costs. After updating information from the environment, higher seniority of non-recourse claims implies that, under more various eventualities, the sponsors will fail to receive residual benefits because the SPV will use such resources for servicing its commitments with the senior lender. Higher exposures and lower expected residual benefits then expand the incentives for *risking*, *shirking* and *shading* under *bad* and *very bad news*.

This is particularly true for *shading*. Simply put, to sponsors, the lower seniority of their claims results in higher exposure to minor contingencies affecting SPV value. This then increases the value of implementing cost-saving solutions. Also, from the

⁶²² Notice however, *very bad news* results in *shading* being the dominant response by sponsors; but the capacity of *shading* does not govern the threshold of *very bad news*.

⁶²³ With literature review, *Cf.* the references to the value of seniority in the elaboration on the asset dilution problem in Chapter 3.

stance of sponsors, lower seniority displaces the thresholds beyond which *bad news* becomes *very bad news* and *shading* becomes the sole response feasible to sponsors. Finally, as per the influences of nature, and the capacities of sponsors to innovate (*i.e.*, to *shade*), a too high seniority of non-recourse claims increases the likelihood that -in virtue of the exacerbated opportunistic responses from the sponsors- the SPV will fail to produce value sufficient for repaying the non-recourse debt.

The relevance of timing. Finally, the interplay of the above items depends greatly on the sequence of contributions and the exposure of the project, or the sponsors cost functions, to influences of nature. Contingencies taking place after sponsors comply with their obligations under the risk allocation mechanism will affect *risking* and *shirking* but not *shading* -the opportunistic innovations complying with the risk allocation mechanism. In contrast, influences from nature that take place before sponsors choose technologies for complying with the risk allocation will exacerbate the three conflicts, including *shading*.

Optimality. The optimal seniority of non-recourse debt claims should be high enough to maximise the likelihood that the FP finds her expectations serves in most varied scenarios -and she can anticipate these outputs before contracting. However, such optimal hierarchy should be also low enough to preserve the expectations of the sponsors whose frustration exasperate strategic tensions ultimately harming project capacities and the expectations of the all parties -in particular the FP whose willingness to internalise non-recourse risk defines the feasibility of FPCs.

Finally, the optimal seniority should grow with the better implementation quality of the risk allocation mechanism and with the expected range of influences from nature taking place *after* sponsors deliver efficient inputs. To the contrary, the optimal seniority should be lower with the higher capacities of sponsors to innovate as per the unexpected evolutions of the environment (*news*) *before* sponsors deliver such inputs, and with the lower efficiency of readjustments.

5.12 An illustration of *risking*, *shirking*, and *shading*; contractual precautions and need for legal treatment

For illustrative purposes, let us now provide an intuitive example of *risking*, *shirking* and *shading*. The responses of *risking*, *shirking* and *shading* cannot yet be identified in documents as the category does not exist in the empirical (or theoretical) literature, yet. As remarked in Chapter 1, today, we only observe opportunism as reflected in the levels of cost overruns and in the under-investment of likely desirable projects that fail to advance before the contractual implementation stages.

For convenience, we can elaborate on possible responses that the sponsors could

deliver in a scenario in which the SPV (the many SPVs) advance the construction and operation of a telecommunications satellite infrastructure. Concretely, we may think of the Iridium LLC project that resulted in bankruptcy after receiving over U\$D 5.5 billion in non-recourse debt and equity investments with the intervention of Motorola as one of its sponsors. The case has been studied in the literature and includes material inputs that are convenient for illustrating *shirking*, *risking* and *shading*.⁶²⁴

5.12.1 Illustrating risking

In the Iridium project, we could think of a *risking* response of as follows. As conditions of the project deteriorate, the sponsors (say, Motorola) anticipate that the capacities of the SPV to distribute residual benefits will decrease. Motorola will also anticipate that the SPV will use a substantial part of the wealth produced by their non-contractible efforts increasing residual benefits for repaying the senior non-recourse debt. Additionally, the sponsors will also note that should the SPV default on its commitments with the FP, the sponsors would fail to harvest benefits from her efforts expanding residual benefits. However, because of the non-recourse nature of the debt, and the limited liability protection of the SPV corpora form, in such scenarios the sponsors would not internalise the costs of the defaulted debt.

Consider now the obligations of Motorola to provide for software solutions for the project. To expand the value of the limited liability shelter and the non-recourse clause of debt, Motorola will now implement software of a technology not known until that moment. Note, the definition of the project does not regulate the technical aspects of these solutions (incompleteness). Moreover, Motorola may not be at all obliged to provide this solution that, albeit costly, allows for exceptional benefits to the SPV.

However, the technology that Motorola plans to implement is not reliable. In this case, this implies that, if the technology works as expected, the maintenance costs will drop substantially to the SPV, thus increasing residual benefits to all sponsors extraordinarily. On the other hand, if the technology does not perform as expected, Motorola would lose its investments, and the SPV will experience significant inefficiencies that will be costly to mitigate. This would increase the likelihood of default in detriment of the SPV.

Because Motorola chooses innovations behind the protection of a limited liability

⁶²⁴ *Vid. pp. 485 and ff. in B. C. ESTY, Modern Project Finance: A Casebook, cit.*

rule, the input provider knows that, if the solution does work, she will harvest extra residual benefits from the risky technology. Moreover, if the technology is not functional, she will internalise only minor costs (the cost of the innovation) and the bulk of the consequences (liker insolvency) will be externalised to the FP. Thus, Motorola will be eager to adopt this, and other solutions riskier than the socially desirable.

As we see, the protection of limited liability and the non-recourse nature of debt provides incentives for Motorola to adopt decisions of risk levels that she would not advance without such protection -say, with her responding for the debt (*risking*).

Critically, note how Motorola is not withholding costly contributions (shirking). Instead, the company spends efforts devising solutions that are riskier than socially desirable (shading) whose benefits she can internalise, and hose costs (risks) can she partially externalise to the lender.

Because *risking* involves the implementation of solutions distinct to the technologically optimal, to the SPV, such innovations will necessarily come at a loss of total project capacities that the value of limited liability shelter (allowing for extra benefits when the technology functions as desired) over-weights to Motorola.

Importantly, notice how the example applies irrespective of *news* because the risk allocation mechanism will always be imperfect. There will always be some likelihood that, from the resources of the risk allocation mechanism, the SPV fails to produce value as expected for repaying the non-recourse debt. In that case, the sponsor will anticipate that some of their efforts will accrue to the FP and, behind limited liability protection, will respond opportunistically thus increasing the value of the limited liability shelter.

5.12.2 Illustrating shirking

Let us now provide an example of *shirking* with which Motorola may respond in the Iridium LLC project. The sponsor will update conjectures about the likelihood that the SPV will use some of the benefits from the non-contractible actions expanding residual benefits. Motorola will plan *shirking* by implementing a distinct (socially efficient) software solution. However, now she will not adopt riskier alternative; instead, she will withhold costly efforts whose costly consequences she will externalise to the FP.

Concretely, Motorola anticipates that the project will not function as desirable. It also esteems that, with the resources that the project can produce after all parties complied with the risk allocation mechanism, the SPV will not repay the senior debt without first using wealth that the sponsors will generate with non-contractible

efforts expanding residual benefits. Consequently, the company anticipates that some of the returns from her non-contractible efforts expanding residual benefits will accrue to the FP. Motorola will consequently shirk non-contractible inputs expanding residual benefits (shirking). Behind limited liability protection and the non-recourse clause, she will then externalise some of the risks from such *shirking* to the FP.

Motorola will simply spend fewer hours (human resources expenses) in refining the connectivity between her software solutions and the satellite's hardware (say). The non-recourse lender cannot verify or enforce the efforts from the human resources. This is because of the asymmetries of information and because shirking affects the choices of inputs expanding residual benefits -not those of the risk allocation mechanism that enforces the FP. In other words, the lender has no title to enforce claims to these performances. Other sponsors can indeed observe and verify these choices of inputs but, sharing the same incentives, will collude relationally (*Cf.* Chapter 6). The *shirking* of human resources will result in later incidents that the SPV will fix with non-recourse debt that will more likely fail to repay -an externality to the FP.

Observe how, in contrast with *risking*, the sponsor is now not altering the technology solutions but simply withholding contributions. There are no innovations; there is plain under-investment of quality-enhancing inputs.⁶²⁵

Notice also the contrasts with the standard moral hazard (enforcement) frameworks. Here the sponsors withhold socially desirable contributions increasing residual benefits beyond their obligations with the FP under the risk allocation mechanisms. Hence, Motorola withholds fully non-contractible actions or actions or actions that do not respond to contractual obligations.

This is moral hazard in the style of the moral hazard in team problems. Motorola was not obliged to implement innovations. The *shirking* points out at the under-investment relative to socially desirable levels -not to the contracted ex-ante with a principal. This is true irrespective of the fact that all shirking, risking, and shading takes place within the spaces allowed by the imperfections of the risk allocation mechanism.

As remarked above, when introducing the propositions, when *shirking*, sponsors' position is strategically analogous to that of shareholders providing capital

⁶²⁵ This observation shows the value of separating the two choices of inputs in the framework.

(voluntary) contributions in kind to the insolvent company they own. If conditions change, they will harvest dividends. If conditions do not change or worsen, the limited liability rule will protect them. However, this is where similarities end.

5.12.3 Illustrating shading

Finally, if the case of *shading* was complex to analyse, its examples are perhaps the simplest of the three conflicts. In sharp contrast with the cases of *shirking* and *risking*, *shading* does not happen as a reaction involving efforts expanding residual benefits (the second objective of the two) but to the responses of sponsors to the risk allocation mechanism (the first objective for which sponsors choose costly actions).

Recall, the sponsors choose not only efforts enhancing quality (total outputs directly), but they also implement innovations. Additionally, the sponsors choose the technologies with which they will comply with the obligations of the risk allocation mechanism with eyes on the externalities that such innovations can bring to the other objective of increasing residual benefits. In other words, within the spaces allowed by contractual incompleteness, the sponsors respond to the obligations enforceable by the lender without losing sight of total project value -from which they will extract residual benefits (dividends) after the SPV repays the senior non-recourse debt. Then, as conditions of the project deteriorate, as analysed in *shirking* and *risking*, the sponsor anticipates that more of the externalities from the choices of technologies that she implements for complying with the risk allocation mechanism will accrue not to them via residual benefits, but to the FP who will extract such values as the senior claimant.

Thus, after realising that the project will not produce wealth as expected, Motorola will implement technological solutions at complying with the risk allocation mechanism as enforceable by the lender (she will innovate for minimising enforcement). However, as conditions (capacities of the SPV to distribute residual benefits) worsen, she will worry gradually less about the undesirable effects that such innovations could bring to total project value, most of which will accrue (in the form of negative externalities) to the FP. Finally, note, the incentives for *shading* grow as a function of the feasibility of *shirking* and *risking* that also affect total value, thus exasperating all opportunistic incentives.

Concretely, Motorola will note that the risk allocation mechanism is incomplete. That is, the technical descriptions do not go into details about the antiquity of protocols and their compatibility with modern electronic standards that television broadcasters (the clients of the SPV) begin to implement. Motorola has access to old solutions that require hardware adaptations without costs -say, she can recycle them from other older projects. She will comply with her (incomplete) commitments to the SPV (and

the FP) by implementing the old connectivity system. For this, she will implement low-cost innovations improving the connectivity of such solutions with the rest of the infrastructure. Moreover, at also a low cost, she will certify the new (recycled) solution and with such certification will comply with the requirements of the lender that the later will enforce with the help of an external consultant.

The outdated standards of such software and hardware solutions will later result in adaptation cost that the SPV will finance with non-recourse debt. This will increase the likelihood of SPV default -an externality to the FP.

Critically, as said, notice that here, in *shading*, Motorola is responding to the risk allocation mechanism and finding solutions allowed by the incompleteness of such regulations. Thus, *shading* reveals a problem of bounded rationality. A problem that parties mitigate by increasing implementation efforts refining the risk allocation mechanism. Before, with *shirking* and *risking*, the sponsors behaved opportunistically when choosing inputs for expanding residual benefits -a problem that parties solve not only by implementing better contractual solutions but by also distributing property rights -the only means for incentivising non-contractible inputs -I will come back to this observation in Chapter 6.

5.12.4 Contractual mitigations

As we see, *shirking*, *risking*, *shading* result from the imperfections of the implementation of the risk allocation mechanism defining the responses expected from the sponsors in all evolutions of the environment. That is, the risk allocation mechanism fails to restrict undesirable solutions that the sponsors deliver when *shirking*, *risking*, and *shading*. *Ex-ante*, the FP will implement contractual solutions in three directions. As analysed in chapters 2 and 4, because the FP enforces these provisions, these clauses will be part of the risk allocation mechanism whose implementation quality substitutes the protection of collateral and recourse to third parties missing in PFCs.

First, the FP can implement technical default mechanisms preventing the deterioration of the capacities that allow the SPV to repay the senior debt without extracting residual benefits to sponsors. See the functionality of technical default provisions and cross-default mechanisms in Chapter 2. By preserving repayment capacities of the SPV, the FP avoids the scenarios in which the sponsors anticipate that some of the value they generate with their inputs enlarging residual benefits will accrue to the lender.

Second, the FP can directly regulate responses impeding the implementation of solutions other than the socially desirable. That is, aside of preventing the rising of

opportunistic incentives, the FP can also restrict the spaces for delivering opportunistic responses. Both solutions appear limited by the ex-ante implementation capacities of the FP and sponsors. The implementation capacities of the sponsors consequently govern the feasibility of non-recourse financing in PFCs. Hence, preserving and increasing implementation and enforcement capacities of parties in this environment with its strategic peculiarities should guide the objectives and functionalities of the legal treatment to parties in PFCs.

Third, as analysed in Chapter 4, the sponsors choose non-contractible efforts increasing expected dividends as a function of the distributions of property rights. Thus, parties must allocate shares in the SPV as a function of the marginal value of their capacities -the social value of their non-contractible inputs. This third approach is contractual only during implementation stage in which the parties bargain on such distribution. This third point will be treated in Chapter 6.

5.12.5 Implications to the legal proposals

In Chapter 7, I will show the legal relevance of the needs for improving the implementation quality of the risk allocation mechanism. In sharp contrast with what we see in regular diversified contracting, in PFCs, the sponsors will not value diversification. Moreover, the sponsors will implement contractual solutions (*cf.* Chapter 2) for regulating particular aspects of the project and preventing the capacities of sponsors to adopt undesirable solutions as the project evolves. I will dedicate Chapter 7 to identifying the rationales of the current legal treatment, to showing how such legal objectives are distortive in PFCs, the functionality of mechanisms that parties have and implement contractually in PFCs for correcting the dysfunctional legal treatment, and what objectives legislators and judges should pursue when offering legal solutions to parties in PFC scenarios.

Based on Chapter 7, chapters 8 to 10 will advance twelve propositions for improving both the completeness and the enforceability of the risk allocation mechanism in the prevention of *shirking, risking, shading*.

Chapter 9 will commence by sustaining the need for providing legal solutions by institutionalising PFCs legislatively. This institutionalisation should serve for enforcing mandatory rules and offering default solutions to sponsors. Institutionalisation should also facilitate the evolution of jurisprudential criteria based on strategic aspects that are inherent to the position of parties in all PFCs.

For enhancing the completeness of the risk allocation mechanism, Chapter 8 will propose fiduciary duties of loyalty as per which the sponsors should adopt administrative (and collective) decisions implementing the objectives defined by all

parties -critically- including the lender in the risk allocation mechanism. Also, for completeness of the risk allocation mechanism, Chapter 9 will identify three principles for interpreting contracts *ex-post*. Two of which are, the *in dubio pro creditore* and the pre-emptive purposes principles. Lastly, for minimising the incentives for the sponsors to respond opportunistically, Chapter 10 will identify an optimal hierarchy of claims in PFCs.

For facilitating the enforceability of the risk allocation mechanism, also in Chapter 8, I will advance fiduciary duties to inform *bad news* as defined by verifiable (judicially operative) thresholds. Also, for enforceability, Chapter 8 will refine *iuris et de iure* control responsibility enforceable against all sponsors, and a limitation to the capacities of the organ of representation in SPVs based on Art. 9 of the Directive (EU) 2017/1132 (*Company Law*).⁶²⁶ Chapter 10 will characterise (stronger) optimal fiduciary duties of diligence in PFCs. As a corollary of these duties of care, we will also see higher standards for responding in the protection of creditors in the vicinity of SPV insolvency.

5.13 Conclusions

This is the first of three chapters describing the agency costs of non-recourse debt in PFCs. I have focused on the strategic tensions between sponsors as a class expecting residual benefits and a financing party (FP), providing non-recourse senior debt. Finally, I have characterised the ways in which these tensions grow as the environment deteriorates, finally leading to project failure.

In PFCs, in the absence of collateral from third parties, the feasibility of non-recourse rests exclusively on the expectation that a project produces value sufficient to serve the senior debt. To this end, ex-ante, as the principal taking the bulk of risks in the setting, the FP will verify the soundness and enforceability of a task distribution mechanism under which all necessary inputs will be delivered by the input providers under all foreseeable circumstances.

The likelihood of project success, however, does not depend exclusively on the compliance of sponsors with such risk allocation provisions. Strictly, the success of the project depends on the value generated by sponsors' contributions to the project. Note how sponsors are, nevertheless, only responsible for compliance with such minimum standards that parties implement imperfectly. Sponsors do not respond for the value of debt -i.e., for the success of the project.

⁶²⁶ *Vid.* Official Journal of the European Union - L 169/46 - 30.6.2017.

The chapter focusses on two key aspects. First, the access to superior information allows for sponsors to implement incentives expanding total value. This consequently results in a higher likelihood of debt repayment (a positive externality) to the FP. Second, the contractual imperfections allow sponsors to both innovate and to deliver inputs in compliance with risk allocation provisions devised by the FP producing value distinct -higher or lower- than they initially expected.

The findings of the chapter can be expressed in four groups of propositions. First, as the environment deteriorates, sponsors will perceive incentives for implementing three types of actions in conflict with the interests of the FP. *I.-* Under limited liability shelter and a non-recourse clause, the risk preferences of sponsors at the time of choosing technologies for increasing residual benefits will grow relative to the socially optimal (in detriment of total project value) (*risking*). *II.-* As per the presence of senior debt, sponsors will withhold socially desirable inputs enlarging residual benefits (*shirking*). *III.-* With nature depriving sponsors of returns as initially expected, as input providers, the sponsors will over-investment on socially *undesirable* cost-saving innovations (*shading*).

Second, the tensions will grow regardless of whether *news* affects individual cost functions of sponsors or the values that the SPV can produce from such inputs. In all cases, directly or indirectly, *bad news* will exacerbate the three tensions. Moreover, in all cases, the two problems will result in negative externalities to the FP.

Third, under *very bad news*, the consideration of *risking* and *shirking* becomes irrelevant as the sponsors do not choose inputs rising residual benefits.

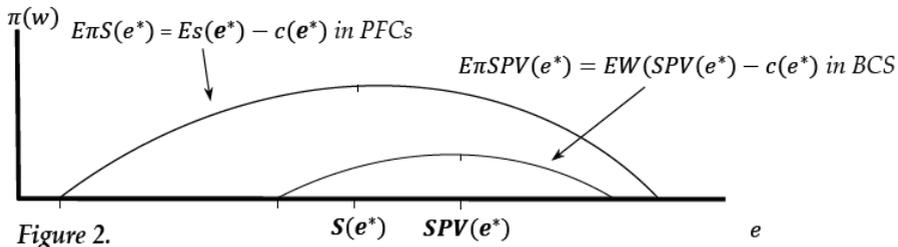
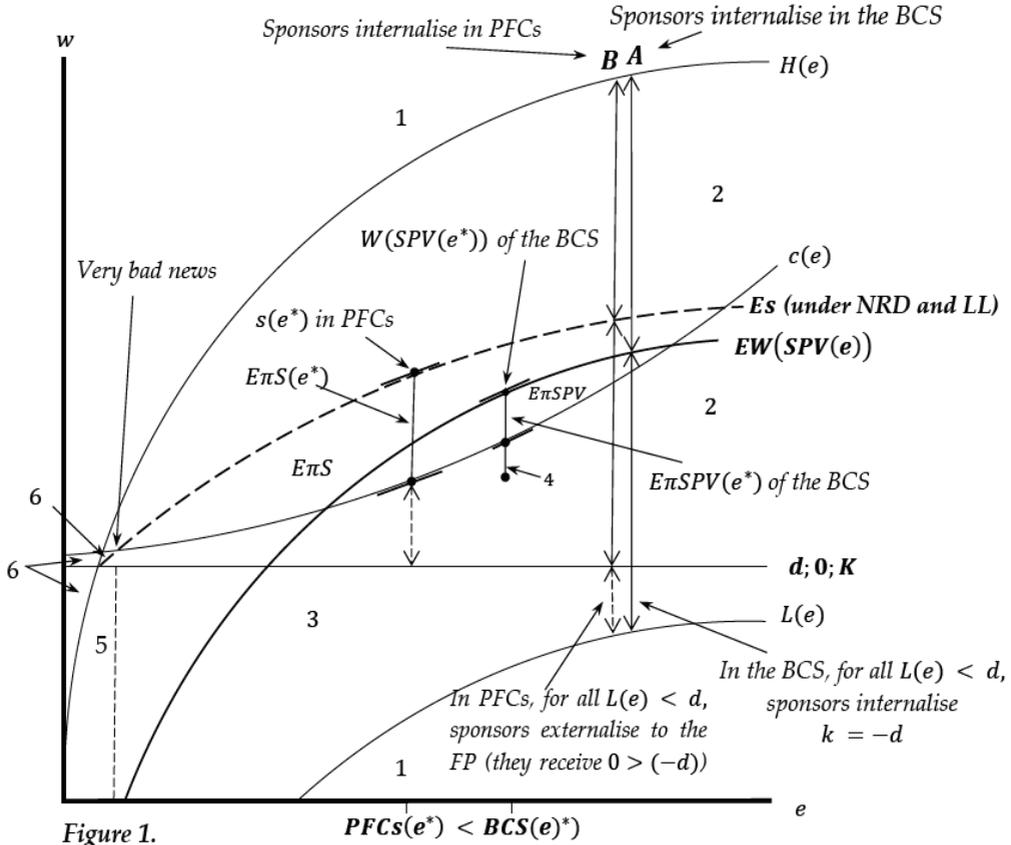
Forth, finally, under *very bad news*, the sponsors will devote their resources to innovating for minimising the costs of complying with enforceable provisions but without internalising any of the effects from their actions to project value. That is, they will innovate only for *shading*. In this scenario, the face value of non-recourse debt will be higher than the wealth *expected* from the SPV. So, the FP will may not recover the full capital lent to the SPV.

Besides, based on the above, the chapter pointed out key aspects of the interplay among the deterioration of the environment, the incentives for *shading* and the problem of costs overruns. Finally, based on this analysis, the chapter offered an early approach to the characteristics of an optimal seniority of non-recourse claims in PFCs.

Remarkably, all propositions do hold under all other scenarios with limited liability and with recourse to third parties other than the sponsors.

Annexe I

Inputs, residual benefits to the sponsors and risk externalities to the FP



Where

$$Es = \{s[H(e), L(e)] - d | s[H(e), L(e)] > d\} + \{0 | s[H(e), L(e)] < d\}$$

$$E\pi S = \{s[H(e), L(e)] - k - d - c(e) | s[H(e), L(e)] > d\} + \{-k - c(e) | s[H(e), L(e)] < d\}$$

Chapter 6

Individual responses, sub-coalitions, and unanimous collusions of sponsors against the non-recourse lender in PFCs

Abstract. In earlier chapters, we saw the tensions between the sponsors collectively and the non-recourse lender. We also observed three forms of opportunism, *shirking*, *risking*, and *shading*. The study now presents a framework for individual actions under both asymmetries of information and contractual incompleteness.

As in Chapter 5, we find four scenarios of *good news*, *no news*, *bad news*, and *very bad news*. The sponsors choose private responses without renegotiating, after renegotiating with some sponsors (in opportunistic sub-coalitions), or after readjusting with all other sponsors (in unanimous collusion) against the non-recourse lender. The preferability of each alternative depends on many variables. *E.g.*, the asymmetries of information, the allocations of property rights, the complementarities of innovation-implementing efforts, or the spread of information about *news* affecting other sponsors. Of these, the most determinant factor are the changes in the environment (*news*). *News* dictates each alternative's opportunistic value, the spaces for opportunism, and the externalities to other sponsors and the PF.

The analysis of the conflicting interests and parties' objectives is critical to understanding the functionality of default rules in this context (*Cf.* Chapters 7) and guiding the institutionalisation in PFCs (*Cf.* Chapter 7 to 10). By describing the evolution of the strategic tensions and the parties' responses under distress, the analysis also contributes to the literature of cost-overruns in large projects.

Chapter 6 is the third chapter of the second part of the study focusing on strategic aspects of PFCs. The chapter offers a framework of corruption and collusion under incompleteness (deteriorating conditions) in PFCs.

Table of Contents

6	CHAPTER 6 – INDIVIDUAL RESPONSES, SUB-COALITIONS, AND UNANIMOUS COLLISIONS AGAINST THE NON-RECOURSE LENDER.....	375
	TABLE OF CONTENTS	377
6.1	INTRODUCTION	383
6.1.1	The object.....	383
6.1.2	The findings	383
6.1.3	The contribution to the literature	384
6.1.3.1	Generally	384
6.1.3.2	Specifically.....	385
6.1.3.2.1	<i>The elements</i>	385
6.1.3.2.2	<i>The strategic aspects</i>	386
6.1.4	The sequence of the analysis	388
6.2	THE ELEMENTS OF THE FRAMEWORK.....	389
6.2.1	The parties; the sponsors, the FP, the SPV.	389
6.2.2	The actions and efforts	390
6.2.2.1	The monitoring efforts	390
6.2.2.2	Quality-enhancing.....	390
6.2.2.3	Innovations.....	391
6.2.2.4	Complementarities	391
6.2.3	The contracting, the information, and the enforcement	391
6.2.3.1	Information and enforcement.....	391
6.2.3.2	The access to information and the relational interactions	392
6.2.4	The incentives of property rights and residual benefits	393
6.2.5	The three alternatives for delivering inputs.....	396
6.2.6	Shirking, risking and shading; collectively and individually	399
6.2.7	The influences from nature (news)	399
6.2.8	The timing.....	401
6.3	THE OBJECTIVE FUNCTIONS OF SPONSORS	401
6.3.1	The sources of returns and costs of efforts	401

6.3.2	Preliminary considerations	402
6.4	THE FIRST ALTERNATIVE; CHOOSING INPUTS WITHOUT RENEGOTIATING	404
6.4.1	Concept and feasibility	404
6.4.2	The principal-agent relationships	405
6.4.3	The responses to contracts	405
6.4.4	The responses to ownership	407
6.4.5	The externalities between the incentives of contracts and property rights	407
6.4.6	The responses by other sponsors	409
6.4.7	The strengths of the opportunistic incentives and the magnitudes of the externalities to other sponsors	409
6.4.8	The externalities to the FP	410
6.4.9	Project idiosyncratic aspects	411
6.4.9.1	The asymmetries of information	411
6.4.9.2	The complementarities of efforts and the externalities	411
	6.4.9.2.1 <i>Complementarities of quality-enhancing efforts</i>	412
	6.4.9.2.2 <i>Complementarities of innovation- implementing efforts</i>	413
6.4.9.3	Readjustments scopes and enforcement capacities	413
6.4.9.4	The value of relational cooperation	413
6.4.9.5	SPV control and the feasibility of readjustments	414
6.4.9.6	Information, the proliferation of sub-coalition and informational synergies	414
6.4.9.7	News and costs of efforts	415
6.4.9.8	The preferability of the 1 st alternative	415
6.5	THE SECOND ALTERNATIVE; CHOOSING INPUTS AFTER BUILDING OPPORTUNISTIC SUB-COALITIONS	415
6.5.1	Concept and feasibility	416
6.5.2	The principal-agent relationships	419
6.5.3	The bargaining elements and sequence	419

6.5.3.1	The individual rationality -participation- constraints of sub-coalition members; the default outcome (disagreement points); the Pareto improvement.....	420
6.5.3.2	The marginal value to sub-coalition members	421
6.5.3.2.1	<i>The benefits to the sponsor under distress...</i>	421
6.5.3.2.2	<i>The collective benefits from the opportunistic responses collectively and individually</i>	422
6.5.3.2.3	<i>The informational rents.....</i>	423
6.5.3.3	The marginal costs to sub-coalition members.....	423
6.5.3.3.1	<i>The distortions to contractual incentives.....</i>	424
6.5.3.3.2	<i>The distortions to the incentives of property rights</i>	425
6.5.3.4	The bargaining surplus, bargaining outputs, compensations, and briberies.....	426
6.5.4	The optimal sub-coalition I. The elemental aspects	428
6.5.5	The optimal sub-coalition II: the size of sub-coalitions and the structural features inherent to FPCs	430
6.5.5.1	The convexly growing spaces for hidden actions on sub-coalition size	431
6.5.5.2	The marginally decreasing dissipation of surpluses on sub-coalition size	432
6.5.5.3	SPV control and the feasibility of readjustments	433
6.5.5.3.1	<i>The value of SPV control.....</i>	433
6.5.5.3.2	<i>Control and the value of contracting information</i>	433
6.5.5.3.3	<i>Control and the opportunity cost of sub-coalitions</i>	433
6.5.5.3.4	<i>Control and bargaining power</i>	433
6.5.5.4	Readjustments scopes and enforcement capacities	434
6.5.5.4.1	<i>Concept and strategic effects.....</i>	434
6.5.5.4.2	<i>Enforcement within and outside the sub-coalitions</i>	434
6.5.5.4.2.1	<i>On the information dimension</i>	434
6.5.5.4.2.2	<i>On the enforcement dimension..</i>	435

6.5.5.5	The strengths of the opportunistic incentives and the magnitudes of the externalities to other sponsors	437
6.5.5.5.1	<i>The spaces for opportunism, residual claims, and the capacities of the sponsors to internalise losses to project capacities</i>	<i>437</i>
6.5.5.5.2	<i>The increasing externalities against fewer sponsors outside the sub-coalition</i>	<i>438</i>
6.5.5.5.3	<i>The over-investment by outsiders and the free-riding by sub-coalition members</i>	<i>438</i>
6.5.5.6	Information and the proliferation of sub-coalitions	439
6.5.6	The optimal sub-coalition III; project idiosyncratic aspects	440
6.5.6.1	The asymmetries of information.....	440
6.5.6.1.1	<i>Asymmetries and sub-coalitions</i>	<i>441</i>
6.5.6.1.2	<i>Asymmetries and news.....</i>	<i>443</i>
6.5.6.2	The complementarities and the externalities	444
6.5.6.2.1	<i>Concept and strategic effects.....</i>	<i>444</i>
6.5.6.2.2	<i>Complementarities of quality-enhancing inputs</i>	<i>444</i>
6.5.6.2.2.1	<i>Complementarities of quality-enhancing efforts and sub-coalitions</i>	<i>445</i>
6.5.6.2.2.2	<i>Complementarities of quality-enhancing efforts and the preferability of each alternative</i>	<i>446</i>
6.5.6.2.2.3	<i>Complementarities of quality-enhancing efforts and the characteristics of sub-coalition members.....</i>	<i>447</i>
6.5.6.2.2.4	<i>The access to information and the complementarities of quality-expanding inputs</i>	<i>447</i>
6.5.6.2.3	<i>Complementarities of innovation-implementing efforts.....</i>	<i>447</i>
6.5.6.2.3.1	<i>Complementarities of innovation-implementing efforts and sub-coalitions</i>	<i>447</i>

	6.5.6.2.3.2	<i>Complementarities of innovation-implementing efforts and the preferability of each alternative</i>	448
	6.5.6.2.3.3	<i>Complementarities of innovation-implementing efforts and the characteristics of sub-coalition members</i>	448
	6.5.6.3	The value of relational cooperation	448
	6.5.6.3.1	<i>Concept and strategic effects</i>	449
	6.5.6.3.2	<i>Information and relational cooperation</i>	449
	6.5.6.3.3	<i>Bad and very bad news, and pessimism</i>	450
	6.5.6.3.4	<i>Good news and optimism</i>	451
6.6	THE THIRD ALTERNATIVE; CHOOSING INPUTS AFTER RENEGOTIATING FOR COLLUDING UNANIMOUSLY AGAINST THE FP		452
	6.6.1	Concept and feasibility	452
	6.6.2	The principal-agent relationships	453
	6.6.3	The optimality of unanimous readjustments.....	453
	6.6.3.1	The internalisation capacities of the team.....	453
	6.6.3.2	The internalisation capacities of individual sponsors ..	455
	6.6.4	Externalities to sponsors	456
	6.6.5	The externalities to the FP.....	456
6.7	THE INVARIABLE DOMINATION OF NEWS; FROM THE 1ST TO THE 3RD ALTERNATIVES		457
	6.7.1	The strategically defining importance of news	457
	6.7.2	No news.....	459
	6.7.2.1	The 1st alternative: delivering inputs without renegotiating.....	460
	6.7.2.2	The 2nd alternative: renegotiating within a sub-coalition.....	460
	6.7.2.3	The 3rd alternative; the unanimous collusion.....	461
	6.7.3	Bad news	461
	6.7.3.1	The environment	461
	6.7.3.2	1 st alternative: delivering inputs without renegotiating.....	461

6.7.3.3	2 nd alternative: Renegotiating within a sub-coalition ..	462
6.7.3.4	3 rd alternative: the unanimous collusion	463
6.7.4	Very bad news	464
6.7.4.1	The rationality of all the sponsors	465
6.7.4.2	Externalities to the FP	465
6.8	THE OPPORTUNISM AND THE PROBLEM OF COSTS OVERRUNS IN PFCs	466
6.9	CONCLUSIONS	468
ANNEXE I - GOOD NEWS.....		473
Property rights; the incentives to reveal information		473
Old contracts and new contracts		474
Original contractual provisions		474
New contractual arrangements		475
The remaining tensions		475
Other factors		476
The strategic tensions in PFCs		477
Externalities to the FP		477
Welfare considerations		477
ANNEXE II.....		478

6.1 Introduction

Chapter 6 answers the question:

How are the individual strategies of sponsors under asymmetries of information and bounded rationality when allowed to renegotiate with some or with all other sponsors as the environment changes?

Or, alternatively:

How do individual sponsors respond to changes in the environment when they can readjust with some or with all other sponsors?

6.1.1 The object

Chapter 5, analysed the conflicts between the FP and the sponsors collectively. The object of chapter 6 is to complete the analysis by describing the individual responses of sponsors to all incentives, under all eventualities.

Chapter 6 now considers how, as conditions change beyond the foreseen, behind asymmetries of information, and within the spaces allowed by the incompleteness of the risk allocation mechanism, the sponsors perceive incentives for renegotiating with some (within sub-coalitions) or with all peers, in unanimous collusion against the non-recourse lender.

Chapter 6 will focus on the impact of several factors: the asymmetries of information, the complementarities of quality-enhancing and innovation-implementing inputs, the allocations of property rights, and -critically- the changes in the environment.

Finally, Chapter 6 will consider the evolution of the externalities to other sponsors and the FP in all scenarios.

6.1.2 The findings

The chapter shows how, whenever the environment evolves as initially expected (*no news*), the sponsors predominantly deliver high inputs without renegotiating. Under *no news*, the sponsors form the smallest sub-coalitions as a function of initial asymmetries of information. In this first case, negative externalities to other sponsors and the project -*v.gr.*, to the SPV, and indirectly to the FP- are smallest.

As the environment deteriorates (*bad news*), the sponsors under distress form larger opportunistic (clandestine) sub-coalitions and less likely deliver inputs without readjusting. In this second scenario, the sponsors possibly but unlikely renegotiate

unanimously (in collusion against the FP). Under *bad news*, the environment's impact against residual benefits⁶²⁷ (*news*) defines sponsors' willingness to respond after choosing one of the three alternatives. In all cases, *news* dictates the renegotiation scopes, the severity of opportunism -*shirking*, *risking*, and *shading* collectively and privately. Consequently, *news* also determines the magnitudes of the negative externalities non-readjusting sponsors and the FP.

Despite the degrees of opportunism and the scopes of renegotiations within sub-coalitions or unanimous collusions, under *bad news*, to expand residual benefits, the sponsors still choose efforts non-contractible to the FP. This comes with positive externalities to the FP -the senior claimant. Beyond a certain threshold where the environment deteriorates dramatically (*very bad news*), after updating information, the sponsors find that, after renegotiating, the wealth they expect from the project will be similar (or lower) than the face value of senior non-recourse debt. In this scenario, the sponsors always renegotiate unanimously. Additionally, they withhold all socially desirable contributions and dedicate all their efforts to complying with their obligations to the FP but without necessarily producing value to the project (*shading*).

For completeness, in *Annexe I*, the chapter explores the *good news* scenario in which the environment appears more favourable than initially foreseen. Under *good news*, the sponsor reveals (instead of withholding) information about the project's evolution. She also sells to other sponsors the contributions she can commit not to deliver. By informing the effects of *good news*, the sponsor provides a reliable reference to her choices of synergetic actions. This information incentivises other sponsors to deliver higher choices of socially desirable complementary inputs in the benefit of all parties.

6.1.3 The contribution to the literature

6.1.3.1 Generally

Chapter 6 fills a space in the literature on non-recourse project financing, where strategic tensions involving *individual* sponsors have not yet been considered.⁶²⁸

⁶²⁷ *V.gr.*, her subordinated contracts and future dividends from the SPV.

⁶²⁸ The literature on public procurement compares the desirability of two alternatives, *bundling* and *unbundling* of tasks. The case of *bundling* describes the contract between a government and a SPV -often financed with non-recourse debt-

Innovatively, the chapter describes how, as the expectations to residual benefits decrease, the sponsors deliver their responses without renegotiations, after forming opportunistic sub-coalitions, or after readjusting with all the sponsors against the FP. The chapter refines the body of propositions about forms of opportunism typical of PFCs described in Chapter 5 (*shirking, risking, and shading*).

The study consequently contributes to understanding how, as conditions worsen, the sponsors perceive growing incentives for coordinating relationally against the non-recourse lender. The analysis of the evolution of the conflicting interests and the forms of opportunism is indispensable to the development of default rules, and most generally, to the quality of the legal institutionalisation of FPCs.

By showing the evolution of tensions among individuals, the sponsors, and the lender, the framework contributes to the literature on moral hazard and cost overruns in large projects. Indirectly, it also adds to the discussion around the optimal organisation choices in public-private partnerships (PPP) in public procurement.

6.1.3.2 Specifically

6.1.3.2.1 The elements

The chapter is the first study introducing the analysis of three factors in the context of PFCs. These are the asymmetries of information, the role of complementarities (synergies), and property rights distribution in the SPV.

Asymmetries of information. The study observes the strategic impact of asymmetries of information in the choice of delivering inputs without readjusting, or after readjusting with some, or with all sponsors. The work offers an approach to the impact of asymmetries of information among sponsors both inside and outside sub-coalitions.

Complementarities. The chapter analyses the strategic value of complementarities to the preferability of each of the three alternatives for responding to incentives.

but does not focus on the tensions among the controllers and contractors of such company. E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit. P. W. SCHMITZ, “Public Procurement in Times of Crisis: The Bundling Decision Reconsidered”, *Economics Letters*, vol. 3,121, 2013. D. MARTIMORT; J. POUYET, “To Build or not to Build: Normative and Positive Theories of Public–Private Partnerships”, cit.

Generally, complementarities of quality-enhancing efforts increment the value of delivering inputs without readjusting. The opposite is true for complementarities of innovation-implementing efforts. The synergies of innovation-implementing efforts increase the value of delivering contributions after renegotiating with some sponsors in sub-coalitions or after readjusting with all other sponsors in unanimous collusion against the lender.

Ownership. The chapter describes the property rights distribution's strategic value and its efficiency to induce sponsors to deliver non-contractible actions. The work observes the feasibility boundaries placed by the moral hazard in team problem affecting all types of contributions of the sponsors' non-contractible efforts. The chapter shows how, as conditions deteriorate, the distribution of ownership (shares in the SPV) loses its effectiveness as an incentive power mechanism. Under *very bad news*, distributions of property rights become strategically irrelevant.

6.1.3.2.2 The strategic aspects

Let us remark key strategic aspects first explored in this chapter.

1. ***Shirking, risking and shading.*** The chapter characterises the same three opportunistic actions introduced in Chapter 5 -*shirking, risking, and shading* under *no news, bad news, and very bad news* now implemented within sub-coalitions, after renegotiating with all the sponsors, and in individual best responses to all incentives.
2. ***News, information, and the value of reciprocity.*** We work studies how, in PFCs, the spread of information about *bad* or *very bad news* leads to *pessimism* (*v.gr., pessimism* defined here as a strictly rational reaction to an update of conjectures about the likely evolution of the environment). *Pessimism* then increases the value of building reciprocity-based (relational) cooperation affecting bargaining surpluses and, ultimately, bribery prices. This eventually favours the expansion of sub-coalitions and the frequency of unanimous readjustments.
3. ***The growing externalities affecting fewer sponsors.*** The work observes how, as conditions deteriorate, the scopes of sub-coalition grow. With this, the total externalities increase disproportionately against the fewer non-renegotiating sponsors and the FP.
4. ***Unanimous readjustments and control.*** As shown in all earlier chapters, in FPCs, the sponsors always control the SPV. Chapter 6 now shows the value of renegotiating unanimously for controlling the SPV for opportunistic purposes without objections *i.e., enforcement risks-* from

sponsors outside the sub-coalition.⁶²⁹ This includes contracts that the sponsors implement using the SPV in aspects that the risk allocation mechanism did not regulate. This value becomes an opportunity cost of not renegotiating with the sponsors outside the sub-coalition.

5. ***The enforcement capacities.*** We will also see how sponsors' capacities to enforce provisions both within and outside sub-coalitions vary as a function of sub-coalition size and how these variations affect the value of enlarging sub-coalitions.
6. ***Informational rents.*** The chapter identifies how, within sub-coalitions, the sponsors extract informational rents from outsiders. This results from the incapacities of the later to update information about the opportunistic *shirking* of complementary inputs by the earlier. Sponsors outside sub-coalitions deliver complementary actions at levels higher than they would otherwise do based on better information about peers' opportunistic actions. This results in positive externalities to the readjusting sponsors.
7. ***Information and the proliferation of sub-coalitions.*** The chapter also describes how the spread of information associated with renegotiation processes results in a proliferation of independent sub-coalitions by sponsors after they update information about nature affecting them too. The chapter further shows how sponsors participating in more than one sub-coalition update conjectures about other sponsors' complementary inputs choices. Based on these updated beliefs, the sponsors further readjust their inputs' choices and their willingness to renegotiate with more sponsors in distinct sub-coalitions.
8. ***The marginally decreasing costs of bribing extra sponsors into sub-coalitions. The opportunistic spaces growing exponentially with each extra sponsor.*** The chapter characterises how bargaining surpluses dissipate in a marginally decreasing fashion as per each extra sponsor entering the sub-coalition. This increases the value of enlarging sub-coalitions in terms of extra spaces for hidden actions relative to the weight of such extra fractioning of bargaining surpluses.
9. ***The depletion of incentive powers as a function of renegotiations***

⁶²⁹ The full control of the SPV allows for the relational renegotiation of all the provisions escaping the enforceability by the FP.

and news. In the path lead by Chapter 5, Chapter 6 describes how, as the environment deteriorates, incentive powers from both contractual arrangements and distributions of property rights deplete as a function of increasing readjustments. This results from: first, the residual benefits decreasing with the losses of project wealth associated with undesirable renegotiations; and second, the loss in the marginal value of complementary inputs associated with the withholding of efforts following environmental deteriorations.

10. **The case of good news.** Finally, in a dedicated *Annexe*, the chapter describes the two main strategic effects associated with *good news*. First, sponsors perceive incentives for revealing (rather than withholding) information about *good news* and the expected choices of complementary efforts that they *cannot* commit not to deliver. Second, sponsors sell contractible inputs (efforts that they *can* commit *not* to deliver). Under *good news*, agency costs remain in place, but they are minimised. Under *good news*, the higher choices of inputs result in positive externalities to all parties.

6.1.4 The sequence of the analysis

The analysis will proceed as follows: In the second section, I will introduce the framework's elements. Here we will find the same parties and much of the features observed in Chapter 5. Distinctively, the sponsors will now deliver their inputs without renegotiating, after renegotiating with some, or after readjusting with all other sponsors.

In section 3, I will describe the items that compose the objective function of sponsors. I will present the types of inputs they deliver in compliance with contractual provisions and increase benefits from individual allocations of property rights.

In Sections 4, 5, and 6, will respectively explore the choices of delivering inputs without prior renegotiations (the 1st alternative), after renegotiating within sub-coalitions (the 2nd alternative), and finally, after readjusting with all sponsors (the 3rd alternative).

In sections 7, the study will consider the critical value of *news* governing the incentives for renegotiating, the spaces for opportunism, and the externalities to some sponsors and the FP. Here, I will analyse how the value of delivering inputs without renegotiating, after renegotiating within sub-coalitions, and finally, after readjusting with all sponsors change with *no news*, *bad news*, and *very bad news*.

Section 8 observes the relationship between opportunism and the problem of costs overruns in PFCs.

Section 9 concludes the analysis. The chapter ends with two Annexes. First, we will see a description of the case of good news. Annexe II includes a didactical charter of how responses evolve privately and collectively as the environment deteriorates.

6.2 The elements of the framework

6.2.1 The parties; the sponsors, the FP, the SPV.

As in other chapters, the sponsors deliver critical material contributions to the project. The sponsors provide all capital resources to the SPV. So, they own the project company and control its assets fully. In virtue of their distribution of shares, each sponsor expects a fraction of total dividends that the SPV distributes after repaying the non-recourse debt.

These capital contributions from the sponsors do not cover the majority of the financing needs of the project. Consequently, there is a lender, the financing party (FP) who is a group of financial entities acting in coordination. The FP provides non-recourse debt covering the most significant part of the project's financing needs.

In the absence of recourse, before internalising risks, the FP verifies the comprehensiveness and enforceability of the risk allocation mechanism. This risk allocation mechanism brings her comfort that, under all eventualities, the SPV will count on all inputs necessary for the project to produce wealth sufficient for repaying the non-recourse debt. These are technical or full default provisions regulating minimum quality standards with liquidated damages, penalties, or other consequences (*cf.* Chapter 2). The FP enforces against the SPV and the sponsors directly.

The FP does not interact with project assets materially. I will come back to this point below. Lack of material proximity does not allow the lender to update information about the project's evolution or sponsors' contributions to the project. This will affect her enforcement capacities. Assume also that the claims from the FP are always senior to those of the sponsors.

There is also a limited liability granting special purpose vehicle (SPV) dedicated exclusively to completing a single project that is entirely specific. The SPV does not deliver material contributions to the project. Its efficiency on permitting risk isolation, contract coordination, and property rights (non-contractible incentive) allocation to the sponsors (*cf.* propositions in Chapter 2, 4 and 7).

Finally, for simplicity of the analysis, assume that the sponsors are always solvent. In other words, assume that they are always capable of compensating the SPV or the FP in case of default to their commitments under the risk allocation mechanism (not

including the non-recourse debt) or other contracts that they implement with other sponsors.⁶³⁰

6.2.2 The actions and efforts

Identically to what we saw in earlier chapters, leaving aside the consideration of monitoring (enforcement) efforts, the sponsors choose two other types of inputs: quality-enhancing and innovations-implementing inputs. Let us shortly characterise these inputs.

6.2.2.1 The monitoring efforts

Parties exert monitoring efforts in response to their incentives to expanding residual benefits. Intuitively, monitoring facilitates enforcement of contractual provisions indirectly expanding value to all parties. For simplicity, and without any effect on the study's conclusions,⁶³¹ I will not dedicate efforts at analysing the individual choices of monitoring inputs but will refer to the spaces for hidden actions in the many circumstances as a function of the asymmetries of information.

See below the reference to the asymmetries of information and enforcement capacities. The sponsors will be always better informed than the lender. Additionally, there will be asymmetries of information amongst the many sponsors. Consequently, the capacities of monitoring will be lowest in the FP case, higher for all the sponsors, and highest in the case of some sponsors delivering material contributions in closer proximity to the sponsor choosing inputs. These asymmetries (monitoring capacities) will dictate sub-coalitions' feasibility and the efficiency of unanimous renegotiations (collusions).

6.2.2.2 Quality-enhancing

Quality-enhancing efforts increase output value to the sponsors and the SPV. Hence, quality-enhancing efforts are always socially desirable. These inputs resemble the types of efforts habitually seen in the most straightforward bilateral contracting frameworks under asymmetries of information, where the total welfare results from a single choice of agent's efforts.⁶³²

⁶³⁰ Strategically, the sponsors cannot be judgment proof.

⁶³¹ *v.gr.*, without loss of generality.

⁶³² *Cf.* page 20 and ff. in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

6.2.2.3 Innovations

To rational parties, innovations are always *privately* beneficial and non-contractible. However, *socially*, they can be desirable or undesirable (welfare-enhancing or decreasing) as per the environment's evolution. In the cases of *good news*, innovations will permit the implementation of quality-enhancing efforts with positive externalities to the project and the FP. As conditions deteriorate, innovations will allow for the opportunistic *risking* and *shading*. Innovations will happen both collectively (unanimously or within sub-coalitions) and individually.

6.2.2.4 Complementarities

Assume that there are complementarities (synergies) among individual actions by sponsors. The degrees of complementarities dictate the interdependence between the marginal values of inputs from the many sponsors.⁶³³

The sponsors will consequently adjust their individual choices of efforts based on conjectures about the best responses by other sponsors to the incentives in places (before or after readjusting) as per the changing environment. Finally, for simplicity, complementarities will exist among all input choices from all sponsors. This is irrespective of the types of incentives to which they respond.

6.2.3 The contracting, the information, and the enforcement

6.2.3.1 Information and enforcement

As advanced, there are asymmetries of information between the FP and the sponsors, and among the sponsors individually. The assumption is plausible and derives from how parties manipulate project assets. Thus, some actions will be observed or verified by all sponsors but not by the FP. Some other actions can be observed or verified only by some sponsors. Asymmetries of information also relate to the parties' capacities to update information about the project's evolution.

Consequently, there will be sponsors' actions in compliance (or contravention) to the risk allocation mechanism that the peer sponsors will observe or verify, and the FP will fail to detect. These asymmetries of information and the associated space of actions contractible only by the sponsors will be a source of efficiencies and inefficiencies (opportunism against the lender) as a function of how the project and

⁶³³ Sponsors will consequently interact as in a standard game of strategic complementarities. *Cf. pp. 81 to 87 in J. WATSON, Strategy, cit.*

the incentives evolve with time.

6.2.3.2 The access to information and the relational interactions

As analysed in earlier chapters, the sponsors deliver contributions sequentially for a single, long term, predefined project. This close material interaction with the project and the inputs from other sponsors comes with the informational benefits mentioned above. The sponsors obtain superior information about the progress of the project and peers' actions.

Consequently, based on this information, the sponsors enjoy a space for interacting relationally. That is, the sponsors will offer, exchange or retrieve favours as a means for building and sustaining reciprocity-based cooperation (internal enforcement).⁶³⁴ Because the FP does not interact with the project materially, she cannot obtain high-quality information or build reciprocity with the sponsors.⁶³⁵ In other words, the

⁶³⁴ The sponsors interacting materially with the project for which they deliver their inputs find opportunities for building reciprocity with each other and sustaining cooperation conditioned to the value of future informal interactions. In addition to enjoying opportunities for exchanging favours, the sponsors can enforce these agreements via merely observable information *-v.gr.*, for retrieving the commitments to exchange favours, the sponsors do not need verifiable information as for advancing claims before Courts of Justice. The FP finds fewer opportunities for exchanging favours. Generally, with literature references, Cf. M. HVIID, "Long-term Contracts and Relational Contracts", cit. J. LEVIN, "Relational Incentive Contracts", cit. K. DOORNIK, "Relational Contracting in Partnerships", *Journal of Economics & Management Strategy*, vol. 15, 2, 2006. O. KVALØY; T. E. OLSEN, "Endogenous Verifiability and Relational Contracting", *The American Economic Review*, vol. 99, 5, 2009. R. E. SCOTT, "A Relational Theory of Default Rules for Commercial Contracts", cit.

⁶³⁵ For methodologic rigor, accept the standard assumptions indispensable for the sustainability of relational cooperation. *V.gr.*, sponsors either never know how many rounds of efforts remain before the operating phase of the project ends, or alternatively, individuals can retaliate (reputation) in the open market outside the contract. Generally, with literature review cf. pp. 297 and ff. in J. WATSON, *Strategy*, cit. P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. M. HVIID, "Long-term Contracts and Relational Contracts", cit. Specifically and more recently, G. BAKER ET AL, "Relational Contracts and the Theory of The Firm", cit. J. LEVIN, "Relational Incentive Contracts", cit.

lender cannot implement and enforce agreements internally (relationally) but only externally -*v.gr.*, judicially, only on verifiable information of low quality.

Consequently, there will be a space of actions within which the sponsors will implement contracts (contractual incentives) only amongst themselves, *i.e.*, beyond the lender's enforcing capacities. Critically, these relational provisions will also include contracts that the sponsors may implement via the fully controlled SPV and enforce judicially (on verifiable information). Finally, because the sponsors can update information as the project evolves, the incompleteness of the risk allocation mechanism allows them for leeway within which they can implementing contractual solutions as conditions evolve and without the participation of the (least informed) FP. In other words, there are certain incentives that the sponsors implement as the project evolves and escape the enforcement capacities of the FP not in virtue of the asymmetries of information, but because of the incompleteness of the risk allocation mechanism that the lender enforces. These agreements and incentives that the sponsors implement without the lender's intervention constitute the 2nd tier of incentives seen in chapters 2 and 4.

Below, I will show how, as part of this 2nd tier of incentives, the sponsors will implement incentives for the sponsors to respond with inputs expanding total project (equity share) value.⁶³⁶ In contrary, as conditions deteriorate, some sponsors will implement opportunistic sub-coalitions involving only some, or all other sponsors but never the FP. Below, we will also see how relational expectations will impact bargaining outputs of renegotiations prior to the formation of sub-coalitions or unanimous readjustments. Thus, reciprocity will also affect the optimality of briberies and cash transfers.

6.2.4 The incentives of property rights and residual benefits

As owners of the SPV, each sponsor holds claims to a fraction of its total dividends. *I.e.*, a share of the residual benefits that the SPV distributes after paying its non-recourse debt. Strategically, property rights allocations serve to implement incentives

⁶³⁶ See next below, equity value is the 3rd tier of incentives. Effectively, there are synergies between the incentives. The sponsors implement better contracts beyond the risk allocation mechanism (the 2nd tier of incentives) that result in higher total project value. This value reduces the burden of senior debt relative to distributable welfare thus increasing the strength of the 3rd tier of incentives -the allocations of property rights with which the sponsors incentivise non-contractible efforts.

for the sponsors to deliver fully non-contractible efforts.⁶³⁷ ⁶³⁸ These are expectations (not enforceable claims) to residual benefits.

Additionally, the sponsors will expect residual benefits associated with their subordinated contracts -the contracts that they expect repayment only after the senior-debt servicing. For simplicity of the analysis, without loss of generality, assume that the sponsors subordinate all their expectations to the non-recourse debt. In other words, unless otherwise indicated, assume that the sponsors receive payment only after the SPV has managed to repay the non-recourse debt to the FP.⁶³⁹

I will recall further below that sponsors cannot possibly achieve socially efficient outputs by distributing property rights. Regardless of the actual allocation of property rights, sponsors will always be limited by the feasibility boundaries of moral hazard in teams. Consequently, they will under-invest.

The intuition behind this is simple and robust.⁶⁴⁰ When contributing to non-

⁶³⁷ Note, the incentives of ownership (expected residual benefits) are sensitive to the evolution of the environment (in our case, project's capacities) but not to the asymmetries of information or contractual incompleteness. Consequently, property rights are the only means for implementing incentives for parties to deliver fully non-contractible efforts.

⁶³⁸ Cf. O. D. HART; J. MOORE, "Property Rights and the Nature of the Firm", cit. R. GIBBONS, "Four Formal(izable) Theories of the Firm?", cit.P. AGHION; R. HOLDEN, "Incomplete Contracts and the Theory of the Firm: What Have We Learned over the Past 25 Years?", *Journal of Economic Perspectives*, vol. 25, 2, 2011.

⁶³⁹ As analysed in chapters 2 and 4, the cascade or the cash waterfall clause regulates the seniority of entitlements and expectations. See chapter 5 for an approach to the strategic effects of the hierarchies of claims, and chapters 7 and 9 for a consideration of the optimal seniority of claims in PFCs.

⁶⁴⁰ The problem has been well-studied in the literature on the economic theory of contracts. This is the moral hazard in team problem inherent to all contributions of non-contractible actions to commonly distributable outputs. Team members delivering privately costly non-contractible actions to a common output cannot avoid this problem. The best they can do is to ex-ante distribute ownership to team members in proportions to the marginal values of individual inputs. This allocation will allow for a second best. The seminal and classical (standard) reference is B. HOLMSTRÖM, "Moral Hazard in Teams", cit. For early speculations evidencing the impossibility of efficiency, cf. E. RASMUSEN, "Moral Hazard in Risk-Averse Teams",

contractible actions expanding team outputs, the individual sponsor internalises the full marginal costs from her private efforts but will harvest only a fraction of the marginal benefits she produces. This fraction will correspond to her share entitlements to the residual benefits produced by the team. In our case, this corresponds to their stakes of ownership in the SPV *-v.gr.*, to their claims to expected dividends. Sponsors cannot avoid the distortion associated with the team problem.

Sensitivity. Additionally, observe how the effectiveness (efficiency) of ownership as a means for incentivising non-contractible inputs will decrease the smaller the stake of property rights (claims to junior benefits) in the hands of the sponsor choosing non-contractible actions. Intuitively, the sponsor holding claims that are most significant (relative to the total team output) will harvest more of the total marginal value from her costly efforts thus under-invest less severely -and produce milder externalities to other sponsors. Conversely, the sponsor holding smaller shares of property rights in the SPV will recover smaller fractions of total marginal benefits from the actions whose marginal costs she internalises fully. Her under-investment and externalities to other sponsors will be, in this second case, more pronounced. These intuitions are elemental corollaries from the standard moral hazard in team frameworks.⁶⁴¹ I will come back to these propositions when describing sponsors' capacities to internalise returns from their actions.

Note one more aspect. The above trade-offs will govern not only the choices of non-contractible inputs delivered directly at rising residual benefits. They will also determine the stakes of externalities they will produce to the SPV from the inefficient responses to contracts (behind asymmetries of information). Intuitively, the greater the stakes of total ownership in the hands of a sponsor, the more that, via expected dividends, she will internalise of the externalities to the SPV.⁶⁴² Below, I will refer to

cit. Under a set of assumptions closer to the object of our study R. STRAUZ, "Moral Hazard in Sequential Teams", cit. M. BATTAGLINI, "Joint Production in Teams", cit. In relational contracting L. RAYO, "Relational Incentives and Moral Hazard in Teams", cit.

⁶⁴¹ Cf. literature *supra*.

⁶⁴² To a reader inclined to the reading of frameworks with formal expressions, this clarification may appear redundant. To the narrative, the observation will appear critical to show how the sponsors internalise the welfare-decreasing externalities from renegotiations and the resulting opportunistic innovations, the objects of sub-coalitions.

this effect as an externality from inputs delivered to complying with contracts of the risk allocation mechanism (one of the objectives) to the returns from subordinated contracts and dividends (a distinct objective).

Subsidiarity. Rational parties will incorporate in their contracts all informational references of private actions. Consequently, as an incentive mechanism, sponsors will recur to allocating property rights only after incorporating all information in their contracts for inputs. This corollary results from the interplay between the value of property rights for incentivising non-contractible efforts and the informativeness principle.⁶⁴³ The sponsors will consequently reserve ownership for incentivising fully non-contractible actions.

Externalities to and from contractual rewards. Below, we will see externalities between inputs' choices rising residual benefits to the returns from contractual rewards and vice versa. Inputs producing residual benefits also increase the SPV's capacity to repay contractual obligations that are always junior to the FP's non-recourse claims. Inputs building contractual rewards also increase total value. Accordingly, withholding inputs in response to contractual incentives (the standard moral hazard) will also reduce the value of expected dividends.

No readjustments. Lastly, assume that sponsors do not readjust on the initial allocations of property rights.

6.2.5 The three alternatives for delivering inputs

As anticipated, before choosing some of their individual responses, the sponsors enjoy an opportunity for (optionally) renegotiating with other sponsors. Just as in Chapter 5, assume that, after *news*, the risk allocation mechanism will be outdated. However, these clauses will remain enforceable as the primary source of value to the FP in all cases. Thus, the FP does not readjust these provisions.

Accordingly, the possibility of implementing readjustments within sponsors before choosing inputs allows for three alternatives.

- First, sponsors can deliver individual inputs without readjusting.
- Second, sponsors can deliver individual contributions after readjusting with a sub-group of the other sponsors -the opportunistic sub-coalition.

⁶⁴³ The seminal is B. HOLMSTRÖM, “Moral Hazard and Observability”, cit. For further illustrations and literature review, cf. pp. 169 and 300 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

- Third, sponsors can best respond to incentives after renegotiating with all other sponsors -the unanimous collusion against the lender.

Below, I will show how this order is also a hierarchy of preferences as the environment gradually deteriorates.

The first alternative. When delivering inputs without renegotiating (the first alternative), the individual sponsor will exert actions in the best response to the three tiers of incentives that we saw in Chapter 5:

- First, the contracts of the risk allocation mechanism that the FP enforces (the 1st tier of incentives that parties do not renegotiate);
- Second, the agreements enforceable by all the sponsors directly or via the SPV without the intervention, and beyond the enforcement of, the FP (the 2nd tier of incentives);
- Third, the incentives implemented via distribution of property rights in the SPV (shares with expectations to fractions of total dividends - the 3rd tier of incentives that parties never reallocate);

Hence, whenever a sponsor chooses to deliver inputs without readjusting (this first alternative), we will see a principal-agent problem where she is agent, and all other sponsors and the FP are principal.

The second alternative. In this second alternative, sponsors choose their individual inputs after readjusting with some other sponsors. As said, this renegotiation will be opportunistic, *-i.e.*, socially undesirable to the sponsors as a class, to the SPV, and consequently to the FP. Thus, when delivering inputs after readjusting with some sponsors, the individual input provider will respond to incentives implemented by:

- First, the contracts of the risk allocation mechanism that the FP enforces (the 1st tier of incentives that parties do not renegotiate);
- Second, the agreements enforceable by all the sponsors directly or via the SPV without the intervention, and beyond the enforcement of, the FP (part of the 2nd tier of incentives);
- Third, the agreements implemented by the sub-coalition members (also part of the 2nd tier of incentives that now some sponsors implement beyond the FP enforcing capacities);
- Fourth, the incentives implemented via distribution of property rights in the SPV (shares with expectations to fractions of total dividends - the 3rd tier of

incentives that parties never reallocate);

Note how, when shaping decisions within the sub-coalition, sponsors will be acting collectively as agents of all other sponsors (SPV) and the FP. Then, when choosing their best responses individually, sub-coalition members will be agents of other sub-coalition members, of all other sponsors, and the FP.

The third alternative. The third alternative includes delivering inputs individually but after readjusting unanimously with all other sponsors -but not with the FP. Strategically, based on information not accessible to the FP, this third alternative constitutes an update by sponsors of the set of incentives that parties implement ex-ante to the new environment (*news*).

As shown below, in contrast to what we will see whenever the sponsors chose the second alternative, the sponsors renegotiating unanimously can now enjoy full control of the SPV. Hence, under this third alternative, within the spaces allowed by the risk allocation mechanism's incompleteness, the sponsors may include contracts implemented via the SPV on verifiable information (judicially enforceable). Observe, with unanimous sponsors' participation, their renegotiation spaces will be bound only by such incompleteness of the risk allocation mechanism -not by asymmetries of information between the sponsors and the FP.⁶⁴⁴

Finally, just as in the first alternative, after renegotiating unanimously, each sponsor will choose efforts in response to:

- First, the contracts of the risk allocation mechanism that the FP enforces (the 1st tier of incentives that parties do not renegotiate);
- Second, the agreements enforceable by all the sponsors directly or via the SPV without the intervention, and beyond the enforcement of, the FP (part of the 2nd tier of incentives);
- Third, the agreements that, directly or via the SPV all sponsors enforce after renegotiating them unanimously (the unanimous collusion against the lender also part of the 2nd tier of incentives);
- Fourth, the incentives implemented via distribution of property rights in the

⁶⁴⁴ When the sponsors renegotiate unanimously, between themselves as a class and the FP we find holdup but not moral hazard. As shown below, in the collective readjustment process and the responses from individual sponsors we will find a moral hazard in team problem. I will come back to these points in detail further below.

SPV (shares with expectations to fractions of total dividends - the 3rd tier of incentives that parties never reallocate);

Finally, when readjusting unanimously, all the sponsors will be the collective agent of the FP. When delivering their private responses behind asymmetries of information, each sponsor will be the agent of two principals: the team, and the FP. These are the same tensions we saw under the first alternative, where the sponsors did not renegotiate. As mentioned in the introduction, I will dedicate sub-sections to each of these alternatives.

6.2.6 *Shirking, risking and shading; collectively and individually*

As assumed above, claims of the FP are the most senior in the setting. Consequently, all returns expected by sponsors –from dividends and contracts- will be necessarily residual. In other words, the sponsors will receive benefits only as much as the SPV (the project) produces wealth beyond the costs of the senior non-recourse debt. This subordination of claims comes with strategic implications characterised in Chapter 5.

As elaborated in the last chapter, as a result of the interplay between the limited liability protection of the SPV, the non-recourse clause, and volatility (*i.e.*, debt default risk), the sponsors fail to internalise the full impact of their choices of costly quality-enhancing and innovation-implementing efforts. Consequently, they will withhold private efforts (*shirking*). They will also choose riskier than socially desirable technologies (*risking*). Finally, they will implement cost-saving innovations without internalising the welfare-decreasing effects to project welfare. The three forms of opportunism will come with negative externalities to the FP.

In contrast with the strong assumptions of Chapter 5, in this chapter, the sponsors can now realistically renegotiate among themselves (in sub-coalitions or unanimously) before delivering their private responses. Consequently, we will find two stages in which *shirking*, *risking*, and *shading* will occur. In the first stage, whenever the sponsors choose to renegotiate (under the second and third alternatives), they will implement *shirking*, *risking*, and *shading* collectively unanimously or within sub-coalitions. When choosing their responses to such solutions in a second stage, they will again perceive incentives for further *shirking*, *risking*, and *shading* individually.

6.2.7 The influences from nature (news)

Just as in Chapter 5, consider three scenarios (*news*) where nature interferes with the project. Under *no news*, sponsors update information and observe that nature has not changed with respect to the environment they foresaw at the time of contracting. Next to these, as in Chapter 5, *bad news* indicates a decline in the returns from efforts –say due to costs increments or losses in the project's capacities to produce

value from such inputs.

The case of *very bad news* represents a further deterioration of the environment beyond what we observed under *bad news*. Under *very bad news*, the sponsors obtain no positive returns from any inputs increasing residual benefits. Precisely, two aspects define the threshold beyond which *bad news* becomes *very bad news*: First, after updating information from the environment, the sponsors receiving *very bad news* always prefer readjusting with all sponsors (the third alternative); subsequently, under *very bad news*, there will be no first or second alternatives. Second, after renegotiating unanimously, all individual sponsors will lose their hopes of harvesting residual benefits from the project. Parties lose their hopes after implementing the innovations preferable to them. These unanimous innovations host the opportunistic responses (*risking*, *shirking*, and *shading*). Note the expression *hopes* indicating the *expected* capacities of the project. This does not necessarily mean that the SPV will be necessarily insolvent.^{645 646}

Additionally, for completeness, in *Annexe I*, I will describe the case of *good news*; this is the scenario where conditions improve to a sponsor; for simplicity, just as in other scenarios, assume *good news* affects (desirably) the marginal cost of her efforts.

Finally, influences from nature affect only one or more sponsors. We must interpret changes in the environment affecting all sponsors (the SPV) as a scenario where nature affects all sponsors individually. The absence of *news* affecting the SPV is a relevant difference with respect to the last chapter's setting. However, to the propositions of this chapter, this assumption comes at no loss of generality.

⁶⁴⁵ Notice how the impact of *very bad news* to a single sponsor must be such that she prefers compensating all other parties for their full residual benefits rather than delivering such costlier inputs or facing enforcement. Strictly realistically, we will see this scenario not only whenever such *bad news* is particularly severe, but more likely when, in a certain moment, residual benefits expected by other sponsors are already low.

⁶⁴⁶ Without anticipating propositions, observe the direct strategic implication from *very bad news* that we saw in Chapter 5. Sponsors will lose all incentives for rising residual benefits. Thus, they will withhold all socially desirable inputs beyond the contracting by the FP (full *shirking*); they will also devote the entire budget of innovation-implementing efforts to implementing technological alternatives that may save costs of complying with enforceable provisions but without producing (*v.gr.*, without internalising) project value (full *shading*).

6.2.8 The timing

The timing is similar to that in Chapter 5. The sole difference being that, while delivering contributions, sponsors now enjoy a period for choosing among the three alternatives and for interacting relationally. Consequently:

First, sponsors and the FP implement an imperfect risk allocation mechanism under which all inputs necessary for the project will be delivered as per a range of foreseeable eventualities. In the same stage, sponsors also implement their contractual provisions on higher-quality information beyond the FP's enforcement reach.

The analysis will start after this moment.

Second, one or more (or all) sponsors update information about the environment affecting them in their cost functions.

Third, based on such information, individual sponsors build conjectures about the expected value (marginal benefits) of choosing inputs under each of the three alternatives: *i.*- delivering inputs without readjusting; *ii.*- exerting actions after renegotiating with some sponsors within an opportunistic sub-coalition; or, *iii.*, choosing efforts after renegotiating with all other sponsors. When necessary, some or all sponsors will renegotiate.

Forth, all sponsors deliver their inputs in a long-term relational interaction where parties deliver many rounds of inputs, some sequentially, and some simultaneously.

Fifth place, the FP enforces the risk allocation mechanism externally, and, as possible, the SPV distributes residual benefits (contracts and dividends to the sponsors).

6.3 The objective functions of sponsors

6.3.1 The sources of returns and costs of efforts

Before entering the analysis of sponsors' responses under different circumstances, let us start by characterising the sources of incentives in the setting. These are the six items that shape the objective functions of the sponsors individually. Four of these correspond to incentives implemented via contractual interactions:

- first, the risk allocation mechanism that the FP enforces;
- second, the incentives that the sponsors implement beyond the risk allocation mechanism when the project begins (*ex-ante*);
- third, the incentives stemming from the opportunistic sub-coalitions;
- fourth, those resulting from unanimous renegotiations. Because they are

contractual, these incentives are sensitive to asymmetries of information, and the sponsors can readjust them.

- The fifth incentive corresponds to allocations of property rights. Incentives implemented via ownership are not sensitive to asymmetries, and the sponsors do not renegotiate them.
- The sixth one includes the costs of efforts which are also vulnerable to changes in the environment.

Additionally, the sponsors deliver a series of sequential and simultaneous contributions as the project evolves. Consequently, for each round of efforts, each sponsor will choose from the three alternatives already advanced. Accordingly, the total value that each sponsor anticipates from her participation in the project will include the returns from all rounds of efforts delivered after choosing one of the alternatives. Some of these rounds of efforts may follow a renegotiation with some or with all other sponsors. Some may not. The value aggregated from all rounds of inputs will define whether the sponsor enters the project or allocates her resources to her best alternative opportunity (individual rationality -participation- constraints).

6.3.2 Preliminary considerations

Before entering the consideration of each of the three alternatives, let us make three intuitive remarks.

The enforcement of the risk allocation mechanism. As mentioned above, the FP enforces the risk allocation mechanism against the SPV and -often- also the individual sponsors. Whenever the FP identifies the SPV's or a sponsor's failure to deliver contributions as expected, she will enforce penalties or liquidated damages (under technical default or full default provisions⁶⁴⁷) against the SPV or the trespassing sponsor. Whenever the FP enforces against the SPV, the SPV will then seek compensation from the individual sponsors. Thus, ideally, each sponsor should be capable of internalising each of the SPV commitments other than those of repaying the senior non-recourse debt.

Relational interaction. As also mentioned above, based on the information of higher quality that they obtain from the material manipulation of project assets, the sponsors will implement agreements beyond the enforcing capacities of the lender - v.gr., beyond the scope of risk allocation mechanism. For this, they will avail from

⁶⁴⁷ Cf. the analyses of these provisions in chapters 2 and 4.

both observable and verifiable data and sustain cooperation relationally. With this information, the sponsors will implement the 2nd tier of incentives ex-ante.

However, with this high-quality information, the sponsors will also build opportunistic sub-coalitions and renegotiate unanimously in collusion against the lender. In the object of these two later contractual interactions, we will find arrangements for: first, innovating for hosting materially the renegotiation needs of the sponsors under distress -*v.gr.*, the sponsor who receives *bad* or *very bad news* and needs a readjustment with her peer sponsors; second, innovating for hiding information about such renegotiation from the sponsors outside the sub-coalition and the lender (or only the lender, when such renegotiation is unanimous). Finally, these renegotiations will come at a loss of total project welfare. As we well see, the renegotiating sponsors will internalise a fraction this. The rest will go as an externality to the FP.

The incentive value of ownership and the cross-externalities. As already advanced, in PFCs, the distribution of property rights (equity shares) in the SPV serves for implementing incentives for the sponsors to deliver non-contractible inputs. However, as an incentive mechanism devise, the allocation of ownership is inherently imperfect. Shares in the SPV come with expectations to future dividends. However, when choosing private input levels maximising such returns, the sponsors internalise the full cost of private efforts but receive only a fraction of the total marginal benefits (a minor fraction of total dividends) corresponding to their property shares. The sponsors will consequently under-invest, necessarily.

Independent but related to the above, note two types of externalities between the choices of inputs complying with contracts and those expanding returns from equity. First, we see externalities of a technological origin. Second, we find externalities of a strategic nature.

As advanced in the introduction, parties offer complementary (synergetic) contributions. This implies that some sponsors' marginal values depend on other sponsors' technologically integrated efforts. Therefore, the values that some sponsors produce with inputs chosen for expanding residual benefits (in response to property rights incentives) depend on how other sponsors comply with their contractual commitments. This is true for both the quality-enhancing efforts and innovation-implementing actions.

In addition to the above, we will see externalities between the choices of inputs complying with contracts and those expanding dividends, and vice-versa. These are strategic, not material. Recall, the sponsors harvest residual (junior and variable) benefits. This is true not only for the expected dividends but also for their contractual

rewards. Consequently, by expanding the total project and SPV's capacities, the higher choices of inputs increasing equity (dividends) value, the sponsors also augment the likelihood that the company manages to repay subordinated contractual obligations after servicing the senior non-recourse debt. The other way around is also true. When choosing responses to contractual obligations, the sponsors know that extra efforts will also expand her expected dividends.

With utmost rigour, this second *externality* is not such. Indeed, the sponsor find an optimal response to the SPV's reward function. Beyond that point, extra efforts come to expand returns from dividends. This is true irrespective of the fact that she achieves this purpose by increasing the input choices of an action expanding contractual rewards. However, the way of speaking is suitable for identifying the (now correctly expressed) externalities between inputs' choices expanding contractual rewards or equity from the different sponsors. The reference to these side effects as cross-externalities illustrates how inputs affect the different sources of returns. Finally, this is not the first work observing externalities between the contributions of different sponsors.⁶⁴⁸

6.4 The first alternative; choosing inputs without renegotiating

Let us observe the first alternative's strategic aspects, where the sponsor chooses inputs without renegotiating with any other sponsor.

I will start by introducing the concept and the most general aspects of its feasibility. In the second place, I will present the principal-agent relationships. Then, I will elaborate on the responses to contracts, property rights allocations, the externalities between the two sources of incentives, and other sponsors' responses. Finally, I will observe the externalities to other sponsors and the FP, and conclude with welfare considerations.

6.4.1 Concept and feasibility

Under this first alternative, the sponsor will choose inputs without first renegotiating with any other party. This is the strategically simplest of the three alternatives. Without renegotiating, the individual sponsor will respond to the same incentives as implemented imperfectly *ex-ante*. She will increase benefits from contractual incentives as per the asymmetries of information between her and the best monitor

⁶⁴⁸ E. IOSSA; D. MARTIMORT, "The Simple Microeconomics of Public-Private Partnerships", *cit.*

among the other sponsors and the FP. The sponsor will then choose fully non-contractible actions augmenting returns from property rights (expected dividends) as per the shares of total ownership in her hands only (the moral hazard in team problem).

There will be externalities between the two sources of incentives and their responses, amongst the different sponsors' actions, and between such actions and the value that the FP expects. Such externalities will vary with the incentive distortions of *news*. However, without renegotiating, the spaces for opportunism will remain as considered ex-ante. That is, spaces for opportunism will be narrower than whenever the sponsors renegotiate within sub-coalitions or unanimously with all the sponsors against the FP. Let us see how this happens.

6.4.2 The principal-agent relationships

Under this first alternative, where the sponsors do not renegotiate, the strategic setting elements appear as estimated when parties contracted initially.

As per the initial asymmetries of information, we observe a principal-agent relationship between the single sponsor choosing efforts (the agent) and all other sponsors and the FP (the principals). We find these tensions in the two responses by sponsors to contractual arrangements and the incentives implemented via property rights allocation. Both tensions will exacerbate under *bad* and *very bad news* (incompleteness). Without sponsors renegotiating, the following propositions describe the strategies of all sponsors identically.

6.4.3 The responses to contracts

As anticipated in the previous sections, sponsors will choose costly efforts responding to contractual provisions behind asymmetries of information.⁶⁴⁹ Precisely, without

⁶⁴⁹ The principal (the SPV controlled by the team of sponsors under the surveillance of the FP) will offer the agent (the individual sponsor) a reward function based on information about the actions of the agent that she can verify. Optimally, such reward should offer a compensation higher than the costs of efforts only in the point in which the response from the agent is socially optimal. The rational sponsor will consequently choose such input level because, otherwise, her costs will be higher than the benefits from contracting. However, because the contractible proxy for individual actions is imperfect (verifiable outputs do not result from individual actions exclusively), the principal will increase the incentive power (the reward function -

readjusting, the space for hidden actions will be determined by the capacities to observe the project and the individual actions by the best-informed of all other sponsors. This applies identically to the responses to provisions enforceable by the SPV corresponding to the FP's risk allocation mechanism and the incentives from other agreements that the sponsors implement on higher-quality information for enlarging junior benefits (*i.e.*, both contracts and dividends) beyond such minimum standards.

As in the habitual moral hazard frameworks, the sponsors withhold (under-investment) all socially desirable but privately costly inputs whose effects fail to be detected by their rewards' contractible signals. Similarly, behind the asymmetries of information, the sponsors will exert (over-investment) privately beneficial but socially undesirable actions that make no impact on their contractual rewards. Of the effects to the project from both under-investment and over-investment behind asymmetries of information, the individual sponsors will internalise only the fraction corresponding to their stakes of property rights in the SPV (see next).⁶⁵⁰

incentive compatibility constraints) so that the agent prefers choosing inputs rather than withholding them behind asymmetries of information (or using them for other project and leaving the agreement before entering the project).

However, because the agent is risk-averse, the stronger incentive powers and choices of inputs will come at a loss of total utility (uncertainty) to the agent. Backwards induction, this uncertainty may, result in the agent not entering the project (individual rationality -participation- constraints). To compensate this loss, the principal will offer a fixed term in the compensation to the agent that will not be contingent on any reference of outputs (a premium). Under these terms, the agent will enter the project and choose a second-best level of inputs.

As we see, asymmetries of information and risk aversion expands the value of contractual rewards (incentive powers and premiums) thus limiting the feasibility of contracting. To mitigate this, only after incorporating all contractible signals in the reward functions, the principal will allocate property rights with expectations to residual benefits not sensitive to asymmetries of information for the agent to choose inputs that remain non-contractible by the agent. *Cf.* generally, *pp.* 129-169 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, *cit.* and J.-J. LAFFONT; D. MARTIMORT, *The Theory of Incentives - The Principal-Agent Model*, *cit.*

⁶⁵⁰ Later, we will see how under-investment will grow as the environment deteriorates. Simply, *news* will increase the marginal cost of efforts. The higher

6.4.4 The responses to ownership

As advanced above, the sponsors will choose efforts enlarging returns from ownership. In compliance with the informativeness principle, the sponsors will distribute property rights only for incentivising fully non-contractible actions.⁶⁵¹ As in a team effort, sponsors will harvest returns from a collective output (dividends). As also described above, when adjusting input levels, the individual sponsors will equalise the full marginal costs of her private actions with only the minor fraction of the total marginal benefits from such efforts that she will internalise as per her shares of property rights in the SPV (her expected dividends). Thus, sponsors will necessarily under-invest (over-invest) socially desirable (undesirable) but fully non-contractible actions. This is the canonical moral hazard in team problem.⁶⁵² The sponsors can mitigate the problem by allocating property rights (shares with expectations to dividends) to the sponsors as a function of the value of their non-contractible contributions. However, they will never solve the problem entirely.

6.4.5 The externalities between the incentives of contracts and property rights

Additionally, as already anticipated, via their shares of ownership, the sponsors

marginal cost of inputs will intensify the willingness to lose some contractual returns internalise more likely enforcement against them at the marginal value of saving costlier resources. This is true for the contracts enforceable via the SPV for the risk allocation mechanism as requested by the PF, and for those that the sponsors implement relationally on superior information directly or via the SPV.

⁶⁵¹ Rational parties will incorporate in the contractual reward functions all information that can serve as reference of agent's actions. Thus, as long as such information exist, the sponsor should use it for implementing contractual incentives. Only for the actions that the sponsors cannot observe or verify, they should recur to property rights with expectations to shares of total residual benefits (which is insensitive to asymmetries of information). The seminal is B. HOLMSTRÖM, "Moral Hazard and Observability", cit. For further illustrations and literature review, cf. pp. 169 and 300 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

⁶⁵² I have introduced this concept above. The seminal and classical reference is B. HOLMSTRÖM, "Moral Hazard in Teams", cit. For early speculations evidencing the impossibility of efficiency, cf. E. RASMUSEN, "Moral Hazard in Risk-Averse Teams", cit.

internalise a fraction of the marginal value of the efforts that, behind asymmetries of information, they over-invest or under-invest in response to contractual incentives. This is an externality from contractual incentives to dividends. Remarkably, this externality also exists for the choices of inputs of other sponsors when responding to their contractual incentives (see further below). Their extra efforts expand total project value with positive externalities that other sponsors will harvest in their dividends.

The same externality exists in a reverse way. Recall, the sponsors hold contract claims that are junior to those of the FP. A higher project value associated with the responses to the incentives implemented via property rights (ownership and expected dividends) increases the likelihood that the SPV manages to repay the sponsors' contractual obligations. This is a positive externality from the incentives implemented via property rights distribution to sponsors' contractual claims.

Finally, as we will see in the sections below, as the environment deteriorates,⁶⁵³ it also affects the SPV's capacity to distribute residual benefits. The burden of senior debt will be heavier relative to subordinated from contracts and expectations to dividends). As shown in Chapter 5, within the spaces allowed by asymmetries of information and contractual incompleteness, the individual sponsors will consequently perceive more substantial incentives for *shirking*, *risking*, and *shading*.⁶⁵⁴

⁶⁵³ Beyond this framework, incompleteness and specificities lead to the canonical holdup problem. P. W. SCHMITZ, "The Hold-Up Problem and Incomplete Contracts: A Survey of Recent Topics in Contract Theory", cit. F. GUL, "Unobservable Investment and the Hold-Up Problem", *Econometrica*, vol. 69, 2, 2001. T. J. MICELI; K. SEGERSON, "Holdups and Holdouts: What Do They Have in Common?", cit. More generally, and T. PFEIFFER, "The Value of Information in the Hold-Up Problem", *German Economic Review*, vol. 5, 2, 2004.

⁶⁵⁴ Observe how this loss of inputs from higher costs of efforts will naturally come at a loss to total welfare but will not affect the dynamics of the moral hazard in team problem. Recall, the incentives from ownership are sensitive to the marginal value of inputs (as per team output), not to the asymmetries of information. The moral hazard in team problem refers to the dissipation of marginal returns in virtue of the distribution of claims extracting the marginal value from other sponsors' costly actions. Indeed, *news* will affect marginal returns and the choices of efforts.

6.4.6 The responses by other sponsors

Without renegotiating, the strategies of all sponsors choosing the 1st alternative are all symmetrical. Recall, complementarities define the marginal value from individually costly actions as a function of other sponsors' choices of inputs. Under complementarities, sponsors consequently adjust effort levels based on peers' conjectures of actions as a function of ex-ante implementation quality and property rights distribution. Furthermore, this optimal response includes elements of *shirking*, *risking* and *shading* as per the foreseeable burden of senior debt relative to the value of all junior claims (*cf.* Chapter 5).

Then, without readjusting, *-v.gr.*, when choosing this 1st alternative under consideration-, the sponsors will not have a chance to update news about other sponsors' *news*. After receiving *news*, each of them will readjust down as convenient, privately. Externalities will appear as described next.

Finally, note the informational rents from the sponsors withholding complementary (or not complementary) contributions. The sponsor withholding socially desirable inputs and not informing other sponsors about *news* affecting her, will also not allow other team members to readjust (lower) their contributions as privately optimal under complementarities. Such third parties will deliver efforts higher than what they would choose should they have received better information. These higher inputs will produce benefits that will accrue to the sponsor withholding both socially desirable inputs and information (informational rents).

6.4.7 The strengths of the opportunistic incentives and the magnitudes of the externalities to other sponsors

The sponsors implementing *shirking*, *risking* and *shading* individually bring total losses to project capacities and, consequently, to contract value and expected dividends to other sponsors. This, I have analysed above. However, in virtue of their shares in the SPV, other sponsors still benefit from peers' socially desirable actions. This is a free-riding problem stemming from the team effort -an aspect of the moral hazard in team problem.⁶⁵⁵

However, it will not increase the under-investment relative to the socially desirable in marginal terms.

⁶⁵⁵ Note how the problem does not diminish because of the under-investment in absolute terms relative to the socially optimal. The free riding and the under-

Incentives to build team outputs and the free-riding problem vary with the proportion of total claims held by the team member relative to total project welfare. In our context, with the smaller property rights in the hands of the sponsor choosing inputs will also grow the incentives for under-investing⁶⁵⁶ and will decrease the impact from her opportunism to total welfare. Additionally, it will also decrease the value of such contributions relative to total welfare stemming from the entire team's efforts.

Hence, recall, property rights' distributions do not change with total project capacities. Thus, for a single sponsor holding minimal ownership in the SPV, we find: First, strongest incentives for responding opportunistically (*shirking, risking, and shading*). Second, the highest value that she receives from other team members relative to her contributions. Once again, this is the free-riding problem in the core of all moral hazard in team problems described above.⁶⁵⁷

6.4.8 The externalities to the FP

Intuitively, the same individual outputs lower than the socially optimal described above as sources of externalities to other sponsors affect the FP. When choosing inputs, all sponsors under-invest in their contributions to the team output.⁶⁵⁸ This results in project value being necessary lower than the socially optimal.⁶⁵⁹ Lower project value decreases the capacity of the SPV to comply with its enforceable obligations. The difference between the socially optimal wealth and what sponsors can achieve by delivering non-contractible inputs to a team output (the losses of project value and SPV repayment capacities) constitute externalities to the FP.

Under the 1st alternative, opportunism takes place only behind asymmetries of

investment- will always exist in virtue of the allocations of property rights and expectations to residual benefits (dividends) of other parties.

⁶⁵⁶ With smaller shares of ownership, she will internalise less of the marginal value of her costly actions. The moral hazard in team problem exacerbates with the dissipation of property rights governing the strengths of individual incentives relative to the social optimal (the case in which the agent receives the full marginal value of her non-contractible actions).

⁶⁵⁷ *Vid.* for all, B. HOLMSTRÖM, "Moral Hazard in Teams", cit.

⁶⁵⁸ *Vid.* for all, *Ibid.*

⁶⁵⁹ The value that, in virtue of their capacities, the team of sponsors would produce in a scenario where the sponsors selected responses cooperatively

information that survive the initial contracting process. Everything else fixed, whenever sponsors choose inputs without renegotiating, the losses to project welfare and the FP's externalities will be mildest if compared to those from the responses to the 2nd and 3rd alternatives where spaces for hidden actions are larger as per collusion with corrupted sponsors. This proposition holds for all evolutions from the environment (*news*).

6.4.9 Project idiosyncratic aspects

6.4.9.1 The asymmetries of information

As in standard frameworks, asymmetries impede that the SPV and the FP enforce provisions. The higher the asymmetries of information are, the wider the spaces for hidden actions ex-post (moral hazard) and the lower the project welfare. Under this 1st alternative where the sponsor does not readjust, the relevant asymmetries are those between the sponsor choosing inputs and the best informed all other peers -all of which will be willing to reveal information necessary for the enforcement of all kinds.

Additionally, indirectly, higher asymmetries imply that more efforts remain non-contractible, thus incentivised only via property rights. Hence, whereas the number of sponsors affects total welfare,⁶⁶⁰ the asymmetries of information determine both total wealth and the point beyond which the sponsors will no longer implement incentives contractually and recur to the distribution of shares as their last resource for incentivising non-contractible actions.

As I describe in other sections, the asymmetries of information allow for wider opportunism without renegotiating. Consequently, the asymmetries of information favour the 1st alternative of delivering contributions without renegotiating over the 2nd and 3rd alternatives of choosing private efforts after renegotiating with some or with all other sponsors.

6.4.9.2 The complementarities of efforts and the externalities

Recall, complementarities (synergies) govern the correlations between inputs' choices by all sponsors and the marginal values of such individual actions. In other words, the higher the complementarity of inputs, the stronger that the dependence of marginal values of individual inputs to the choices by other sponsors will be. Hence,

⁶⁶⁰ *V.gr.*, the severity of the moral hazard in team problem.

with higher degrees of complementarities, the more significant the impact from one sponsor's opportunism against total team output will be. Strategically, this comes with implications that are opposed depending for the quality-enhancing and the innovation-implementation efforts.

6.4.9.2.1 Complementarities of quality-enhancing efforts

Higher complementarities of quality-enhancing efforts imply that the under-investment or over-investment of a sponsor will affect the other sponsors' contributions' marginal value. Thus, the impact of her opportunism on total project value will be higher with the higher complementarities (synergies). This is true for both the quality-enhancing inputs that the sponsor delivers for complying with contracts and for those expanding residual benefits from her shares in the SPV. Consequently, higher complementarities function as a deterrent to opportunism.⁶⁶¹

As we will see below, the above observation holds (with different strategic outputs) for the other two alternatives of delivering inputs after renegotiating with a sub-coalition or after readjusting with all the sponsors in unanimous collusion against the lender. Note, because when renegotiating with peers, the sponsor must compensate for the share of total welfare losses that the renegotiating sponsors internalise, the complementarities of inputs augmenting the losses to total welfare will increase the

⁶⁶¹ Additionally, complementarities of efforts rising dividends affects the expected returns from actions expanding returns from subordinated contracts (the contractual incentives). Intuitively, the greater the total value (from efforts expanding residual benefits), the higher the likelihood that the sponsors will find their claims from subordinated contracts served. The likelihood of finding subordinated contract claims served defines the marginal value of inputs to such purpose. This is the marginal value of inputs complying with contractual obligations. Complementarities of quality-enhancing efforts oriented at one objective of expanding residual benefits effectively affects the value of inputs that the sponsors use for complying with contracts.

Additionally, the marginal value of efforts rising dividends affects the expected returns from actions expanding returns from subordinated contracts (the contractual incentives). Intuitively, the greater the total value (from efforts expanding residual benefits), the higher the likelihood that the sponsors will find their claims from subordinated contracts served. The likelihood of finding subordinated contract claims served defines the marginal value of inputs to such purpose. This is the marginal value of inputs complying with contractual obligations.

costs of bribes. I will revisit this proposition further below. Effectively, the higher the complementarities (synergies) of quality-enhancing efforts, the more that a sponsor under distress will favour responding opportunistically under this 1st alternative (without renegotiating) in detriment of readjusting with some or with other sponsors (the 2nd and 3rd alternatives). Remarkably, this is true only for quality-enhancing efforts.

6.4.9.2.2 Complementarities of innovation-implementing efforts

The analysis of innovation-implementing efforts is distinct from the above. Under the 1st alternative without renegotiations, the sponsor does not cooperate with their parties. So, the complementarities of the innovations that nobody will note (or technologically integrate) will come with no strategic effect. Thus, the complementarities of innovation-implementing efforts do not incentivise (or deter) the opportunism that a sponsor may implement without renegotiating with peers.

The value of complementarities when innovating for choosing the 2nd and 3rd alternatives is, however different. When readjusting with other sponsors, the complementarities (synergies) of innovation-implementing efforts increase the value of cooperation for hosting the material needs of the sponsor in distress. As I will show in the following sections, this increases the optimal size of the opportunistic sub-coalitions and the feasibility of unanimous renegotiations. The complementarities (synergies) of innovation-implementing efforts effectively favour renegotiating for *shirking*, *risking*, and *shading* with some or with all other sponsors (the 2nd and 3rd alternatives).

6.4.9.3 Readjustments scopes and enforcement capacities

Below, I will analyse how the scopes of renegotiations within sub-coalitions affect the sponsors' enforcement capacities within and outside such sub-coalition. Under this 1st alternative, without the sponsors renegotiating with any other parties before choosing inputs, there is no need to consider such trade-off. The individual sponsor faces enforcement risks due to the information asymmetries between her and the best informed of all other sponsors (and the FP). In this environment, the enforcement capacities of the team are consequently highest. I will put this observation in context when returning to the point in later sub-sections.

6.4.9.4 The value of relational cooperation

In the following sub-sections, I will analyse the value of relational cooperation. I will also elaborate on how the conjectures about the perspectives of finding future deteriorations (*pessimism*) or improvements (*optimism*) in the environment (*news*)

affect the dynamics of the opportunistic renegotiations.

Under this 1st alternative, the sponsor chooses inputs without first readjusting. However, she does update information about the progress of the project. This information permits that she updates her beliefs about the project's likely evolution (*optimism* or *pessimism*). This attitude will later impact how she will interact relationally with other sponsors when choosing the 2nd or 3rd alternatives, or when receiving a request for renegotiating opportunistically from other sponsors in distress.

6.4.9.5 SPV control and the feasibility of readjustments

In later sections, when analysing the impact of sub-coalition size and bargaining powers, I will refer to the value of controlling the SPV. For now, let us say that, the wider the sub-coalition, the greater the return value of bribing the fewer sponsors remaining outside of the sub-coalition as they allow for the use of the SPV also for implementing opportunistic renegotiations.⁶⁶² The consideration of these benefits is unnecessary in this scenario where the sponsor deliver inputs without renegotiating.

6.4.9.6 Information, the proliferation of sub-coalition and informational synergies

I later sub-sections, I will also show how the formation of sub-coalitions and unanimous collusions against the lender requires the revelation of information to the readjusting sponsors. The flow of information about *bad news* and the withholding of synergetic contributions from some sponsors induce other sponsors to implement subsequent sub-coalitions or unanimous renegotiations.

Under this 1st alternative, the sponsor delivers inputs without renegotiating. She does not disclose information about the environment affecting her or other sponsors, to any other parties. Consequently, under this 1st alternative, there is no proliferation of derivative sub-coalitions or informational synergies amongst the sponsors.

⁶⁶² As analysed in chapters 2 to 4, 7 and 8, the sponsors always control the SPV. In FPCs, control is indispensable for the feasibility of the essential risk allocation mechanism. I am here referring to the capacity of the sponsors to have the SPV as the object of opportunistic renegotiations. *V.gr.*, beyond the enforcement of the FP and without other sponsors outside the sub-coalition objective decisions in protection of company value.

6.4.9.7 News and costs of efforts

Finally, the stronger the unforeseen and undesirable impact of nature against costs or value functions, the lower it will be the choice of quality-enhancing efforts in equilibrium. Intuitively, when adjusting responses to contractual incentives, the worse the *news* against marginal costs or benefits of efforts, the higher the sponsor's willingness to accept the FP or the SPV enforcement.

Similarly, whenever contractual mechanisms that the sponsors implement beyond minimum standards come with rewards variable on individual outputs, we find that stronger impacts of *news* lead to lower the choice of efforts expanding contractual benefits. An identical proposition describes the choices of now costlier inputs expanding dividends. The higher the costs of efforts, the lower the choices of inputs for which such marginal cost will meet the marginal benefits (dividends) corresponding to individual allocations of property rights.

6.4.9.8 The preferability of the 1st alternative

I will describe the preferability of each of the alternatives under dedicated subsections below. Later, I will show how the rational sponsor forms sub-coalitions or readjust unanimously (the 2nd and 3rd alternatives) only whenever the returns from her opportunistic (coordinated) savings are higher than the costs of compensating the renegotiating sponsors for the losses they internalise from the renegotiation. When the sponsor delivers her contributions to the project without renegotiating (this first alternative), she saves some of her costly efforts. However, she does not compensate other sponsors or the FP for what they internalise in virtue of the losses in project capacities.

As I will show below, the costs of compensating other sponsors grow with many factors. These include the complementarities of inputs affecting project capacities, the value of subordinated claims, and the ownership stakes in the renegotiating sponsors' hands. Additionally, the spaces for delivering private responses opportunistically grow with the asymmetries of information. When these features are present, the sponsors prefer delivering contributions without renegotiating (this 1st alternative) instead of choosing private efforts after readjusting with some or with all other sponsors (the 2nd and 3rd alternatives). I will come back to this proposition in many places below.

6.5 The second alternative; choosing inputs after building opportunistic sub-coalitions

Let us now observe the 2nd alternative where, behind asymmetries of information, the sponsor delivers her private inputs only after readjusting and forming an

opportunistic sub-coalition with some other sponsors.

I will articulate this section in a path similar to that followed when analysing the 1st alternative. I will start by introducing the concept and the most general aspects of its feasibility. In the second place, I will present the principal-agent relationships. Then, in third and fourth places (two sections), the readjusting strategies' critical aspects and the bargaining sequence will be introduced. These sub-sections will present the default outcomes of the readjustments (the disagreement points), the costs and values to sub-coalition members, the bargaining surplus, the bargaining outputs, the feasible bribes, and value transfers implementing the renegotiation. I will also consider the marginal value and costs of renegotiations and the externalities to the FP. Here, I will also characterise too-small and too-large sub-coalitions. In the last two sections, I will describe first, the trade-offs that depend on sub-coalition sizes, and second, those relating to project idiosyncratic aspects.

6.5.1 Concept and feasibility

As described in the introduction, there are asymmetries of information (spaces for hidden actions) among the individual sponsors and between all sponsors (individually and collectively) and the FP. However, in PFCs, the sponsors can not only act undesirably by choosing substandard material inputs to the project. In the functionally multiparty setting where total distributable welfare depends on contractual enforcement, asymmetries of information amongst the many parties also permit that some sponsors behave opportunistically in their roles of monitors.

Concretely, asymmetries of information between the best monitor and the rest of all other parties in the setting allow for the sustainability of cooperation between monitors and other sponsors choosing opportunistic responses that only such sole monitors can detect. The sponsor choosing inputs (the readjusting sponsor) and the corrupted monitor will now form an opportunistic sub-coalition and distribute renegotiating surplus among them.

In exchange for withholding verifiable information, other sponsors may later enter the sub-coalition at the marginal benefit of enlarging the spaces for hidden actions - the marginal value of opportunistic sub-coalitions. The marginal costs and benefits associated with the enlarging sub-coalition depend on many factors: *e.g.*, the fraction of total losses that such members will internalise in their objective functions that renegotiating sponsors will compensate; the fraction of surplus they will extract in the bargaining process including the value of opportunistic savings, the costs of innovating for adapting the material needs of the renegotiating sponsors, and for withholding enforceable information from other sponsors and the FP; and the transfers they will receive from the renegotiating sponsor (the sponsor under distress

after receiving *news*). I will come back to these points below.

The object of the sub-coalition. The sub-coalition has no entity other than that of a coordinating mechanism. Its sole function is to organise opportunistic responses -*v. gr.*, to relationally enforce- clandestine agreements amongst sub-coalition members. The sub-coalition's net value will then be simply the aggregated benefits in the renegotiating sponsors' objective functions.

Additionally, the sponsors orient the said coordination towards two objectives. First, the sponsors prevent enforcing information from reaching other sponsors outside the sub-coalition and the FP. By doing this, they expand the spaces for hidden actions without triggering enforcement of ex-ante agreements. Second, they provide incentives for sub-coalition members to implement innovations and other responses as opportunistically desirable to the sub-group. This is, for *shirking*, *risking*, and *shading*, in addition to hosting the material needs of the sponsor who initiates the sub-coalition in distress after receiving *bad news*.⁶⁶³

Note, the sponsors respond with non-contractible actions to their property rights allocations (expectations to shares of dividends).⁶⁶⁴ Then, because the actions incentivised via property rights are non-contractible, they will remain out of the object of renegotiations. Finally, the losses of welfare resulting from the sub-coalitions' arrangements will result in losses to SPV capacities to distribute dividends. With lower expected dividends, property rights will lose power as a means for incentivising fully private decisions.

Recall three more aspects; First, there are externalities between the two sources of benefits (contracts and property rights). Second, both expectations, including all claims from contracts, are junior to the FP titles. Third, because of the many opportunistic responses that they will enforce internally, some sponsors taking part in the sub-coalitions will internalise benefits from savings. In contrast, others will internalise losses in their expected contractual returns and dividends.

For all sponsor to comply with their individual rationality -participation- constraints, the sub-coalition must be a Pareto improvement to all its members. Hence, below, we will see a flow of compensations up to all sub-group members' disagreement values

⁶⁶³ *I.e.*, the sponsor willing to compensate other sub-coalition members in exchange for withholding enforcement after she withholds her now costlier contributions.

⁶⁶⁴ See below, without consequences to the analysis, I will assume that they will not reallocate property rights.

before distributing renegotiation surpluses in an aggressive bargaining process. This bargaining stage will dictate the bribery values and total transfers to each sub-coalition member.

Finally, the sub-coalition's feasibility boundaries will result from the interplay between the marginally increasing burden of compensating further sub-coalition members internalising losses from wider readjustments and the marginal value of saving costly efforts in the objective functions of all sub-coalition members. The optimal sub-coalition maximises the difference between the two sets of items in sub-coalition members' objective functions.⁶⁶⁵ Sub-coalitions will always result in negative externalities to outside sponsors and the FP.

The opportunistically optimal scope of sub-coalitions, the incentives governing the individual responses, and the externalities to all parties outside the sub-coalitions grow with many aspects. However, of these factors, the severity of *bad news* will invariably dominate.

Therefore, as the environment deteriorates and approaches that of *very bad news*, the sub-coalition scope is broadest. The number of sponsors renegotiating tends to the number of all the sponsors in the project. The sponsors within the sub-coalition implement incentives for individuals to almost exclusively *shade*. *Shading* is the prevailing action also in their individual private responses behind asymmetries of information. The opportunistic innovations of *shading* become utmost harmful to the project and strategically (incentive) most relevant to the sponsors. The externalities to (the few) outsiders will be most significant. Finally, the wealth expected from the project will approach that of the face value of non-recourse debt. When this happens, we are finally in the scenario of *very bad news* where the project's expected capacities are similar to the face value of the non-recourse debt.

Let us see how this happens.

⁶⁶⁵ When presenting the bargaining process, I will elaborate on these items individually. Let us say for now that the total expected value from the sub-coalition will be simply the *positive net* aggregated *impact* from the best responses by sponsors to both types of incentives to all sub-coalition members. That net-value (the bargaining surplus minus the costs of all compensations) will be distributed as per the output of an aggressive bargaining process involving all sub-coalition members.

6.5.2 The principal-agent relationships

As anticipated, the sub-coalition collectively decides on the obligations that the sub-group imposes (relationally) to its members.⁶⁶⁶ The expected responses to these obligations (hiding information and innovating opportunistically for *shirking*, *risking*, and *shading*) maximises the value that such sub-group members later perceive in their individual objective functions. Observe how responses to such obligations depart from the socially optimal solutions that parties chose ex-ante. This results in losses of project value in tension with the rest of the team's interests and the FP.

Independent from the above, there are asymmetries of information amongst all the sponsors forming the sub-coalition. Thus, to the decisions (incentives) that sub-coalition members adopt (enforce) collectively, the individual sponsors respond as privately desirable. In other words, sub-coalition members maximise returns from the sub-coalitions by responding as privately optimal (with further *shirking*, *risking*, and *shading*) behind asymmetries of information between themselves individually and the best monitor of the sub-coalition member.

From the above, when the sponsors choose efforts after forming sub-coalitions, we find two overlapping principal-agent relationships.

- First, as per the choices of innovations (opportunistic incentives) enforceable within the sub-coalition, the sub-group acts *collectively* (as agent) in conflict with the interests of the sponsors outside the sub-coalition and the FP (the principals).
- Second, when optimising their *private* best responses to the sub-coalition incentives, the sponsors act in conflict with the other sponsors who participate in the sub-coalition, the other sponsors that do not take part in the renegotiation, and the FP (the three classes of principals).

6.5.3 The bargaining elements and sequence

The formation of sub-coalitions requires a clandestine renegotiation in the core of

⁶⁶⁶ From here we will see a collective action implementing *shirking*, *risking* and *shading* maximising sub-coalition value.

which we find a bargaining stage.⁶⁶⁷ Let us now observe the renegotiating parties' elemental rationality. Further below, I will analyse the items that define the optimal sub-coalition, i.e., the marginal values and costs of renegotiating to sub-coalition members. In the last sub-section of this level, I will refer to the bargaining process, the compensations, the bargaining surplus, and the briberies.

6.5.3.1 The individual rationality -participation- constraints of sub-coalition members; the default outcome (disagreement points); the Pareto improvement

Recall, the opportunistic renegotiation is a voluntary readjustment of rational individuals. In other words, to sub-coalition members, readjusting opportunistically must appear as a Pareto improvement. Accordingly, before entering the sub-coalition,⁶⁶⁸ a sponsor must first build a reliable conjecture about the value that she can expect from peers within the sub-coalition. With eyes on such value, individually, each sponsor requests that the wealth that she obtains in response to their cooperation be higher than her next best alternative opportunity (defecting). Consequently, any offer below this threshold will be rejected. Any offer above this value will be accepted, and such monitors will corruptly cooperate forming an opportunistic sub-coalition.

The need for verifying a Pareto improvement in the sub-coalition constitutes the individual rationality -participation- constraints of all sub-group members. This minimum value that the sponsors expect from the sub-coalition is known as the default outcome, the disagreement point, or the default outcome of the renegotiation.^{669 670}

⁶⁶⁷ In the following sub-sections, I will present the analysis recalling the simple concepts of the elements of bargaining processes in Game Theory. *Vid. pp. 230 and ff.*, in particular *pp. 232 and 234* in J. WATSON, *Strategy*, cit.

⁶⁶⁸ *V.gr.*, for accepting (not defecting) cooperating as part of the sub-coalition.

⁶⁶⁹ *Cf.* page 232 in J. WATSON, *Strategy*, cit.

⁶⁷⁰ This is also known as the outside option, or outside value, or alternative placement value. Note how this value corresponds to the expectation that the sponsor had in returns from her privately optimal inputs when entering the renegotiation. Strictly, should the readjustment take place with this sponsor not taking part of it, the value that she would get would include externalities to outsiders. Thus, again, without distracting the reader, note how once she becomes aware of the renegotiation, her

Before advancing, note how the private objective functions of sponsors are always alike. This is true even though sponsors enjoy different spaces for opportunism, some of them internalise losses, others extract benefits from delivering opportunistic solutions or withholding costly inputs (especially those experiencing *bad news*).⁶⁷¹ See next.

Let us now observe these marginal values and costs that the corrupted sponsors internalise from the sub-coalition.⁶⁷² In a section further below, I will refer to the marginal values from cooperating opportunistically. From these variables, I will identify optimalities in the sub-sections as a function of many factors.

6.5.3.2 The marginal value to sub-coalition members

Let us now observe the benefits that the sub-coalition bring to its members. We can group these values into three categories: First, the benefits that the sponsor under distress receives. Second, the benefits from the opportunistic responses. Third, the benefits they derive from informational rents.

6.5.3.2.1 The benefits to the sponsor under distress

Recall, the desirability of sub-coalitions grows with the influences of *news*. Strategically, without *news* altering the sponsors' cost-benefit functions, any readjustments would function as corrections of the initial set of agreements they

outside option will include the value she (and sub-coalition members) would expect should she enforce based on the information about the opportunistic renegotiations that she could receive. We do not need to consider this eventuality because the sponsors launching the bargaining threat (the sponsor under distress making the corrupting offer) will build her offer on reliable conjectures. Thus, she will reveal information about her offer only after assessing her chances of being accepted positively.

⁶⁷¹ This is true because, assuming the symmetrical multiparty Nash bargaining solution, the sponsors will distribute the aggregated opportunistic gains from the sub-coalition in equal parts only after compensating sub-coalition members for all the losses they internalise from the sub-coalition's opportunistic solutions. I will elaborate on bargaining outputs and surpluses below.

⁶⁷² I am labelling them as marginal because these values will grow functions of the sub-coalition's scopes (the sponsors involved) and the array of opportunistic actions that the opportunistic sponsors will implement.

implemented ex-ante.

Consequently, all readjustments begin with a sponsor updating information about some deterioration in the environment that affects her negatively (*bad news*). With eyes on the possibility of withholding these costlier (or less valuable) contributions without internalising enforcement costs, the sponsor will be willing to compensate other sponsors for the losses resulting from her opportunism and share some of the total benefits from such actions with them.

In other words, these sponsors will transfer benefits to other parties at the marginal value of withholding inputs that, after receiving *news*, are either more costly or less beneficial to prevent enforcement from other sponsors or the FP. Within the sub-coalition, the sponsors will include the value (the savings) of this sponsor under distress as part of the total bargaining surplus.

Under other sections, I will show how *news* governing these benefits to the sponsor under distress is the factor dominating the optimal scope of sub-coalitions.

6.5.3.2.2 The collective benefits from the opportunistic responses collectively and individually

Within the sub-coalition, we observe *shirking*, *risking*, and *shading* in two tiers, both of which allow for benefits to sub-coalition members.

First, the sponsors coordinate actions for withholding costly efforts (*shirking*), for putting in place solutions riskier than socially desirable (*risking*), and finally for implementing innovations for saving costs of complying with the obligations of the risk allocation mechanism (*shading*). They implement these actions collectively. They agree on the responses they expect from sub-coalition members, and they enforce such agreements relationally. These are the *risking*, *shirking*, and *shading* that maximises benefits to the opportunistic team.

The private responses to the collective incentives within the sub-coalition. As recalled above and in the introduction, there are information asymmetries among all sponsors, including those of the sub-coalition. Additionally, in collective actions within the sub-coalition (see above), the sponsors implement incentives incompletely. The two imperfections of the implementation and enforcement allow the sponsors to respond to the sub-coalition incentives with *shirking*, *risking*, and *shading* as privately desirable. This results in further benefits to the individual members of the sub-coalition.

As analysed in Chapter 5, the incentives for the sponsors to respond with *shirking*, *risking*, and *shading* both collectively and individually derive from the deteriorating capacities of the SPV to distribute residual benefits. The SPV loses some of its

capacity to distribute value after repaying the senior debt after either the project or the sponsors receive *bad news*. After receiving *bad news*, one or more of the later values implementing opportunistic renegotiations further harming the project capacities.

6.5.3.2.3 The informational rents

Finally, sub-coalition members extract informational rents from the sponsors outside the sub-coalition.

Recall the analysis of the costs of sub-coalitions. Above, I highlighted how, based on information about the sub-coalition agreements, the sponsors have an opportunity to update conjectures about the impact of opportunism in the marginal returns from their actions. As analysed, the sponsors become aware of the lower choices of efforts by sub-coalition members. They also assess how much lower input levels from sub-coalition peers affect the returns from their synergetic efforts. With their eyes on these losses of marginal returns, sub-coalition members under-invest. *V.gr.*, they implement *shirking*, *risking*, and *shading* as privately desirable.

In contrast, the sponsors outside the sub-coalition do not receive information about the opportunism of sub-coalition members. Consequently, they fail to readjust their private responses to the now lowered marginal value of their complementary efforts. This comes with two effects. First, they effectively over-invest relative to the input levels they would find privately optimal should they have received better information. Second, of this lack of information and over-investment, the sponsors within the sub-coalition extract positive value. This value materialises in the higher marginal value of their private actions and higher returns from equity -a team output. These are informational rents.

6.5.3.3 The marginal costs to sub-coalition members

As the sub-coalition scope grows, the sponsors implement solutions for *risking*, *shirking*, and *shading* (both collectively and in private responses) resulting in losses to project capacities. These inefficiencies result from the departures from the technologically optimal -the project's solutions on their original configurations.

Losses of project capacities come with several both welfare and incentive implications that the sponsors within the sub-coalition internalise only partially. The rest of the total losses from their opportunism accrue to the sponsors outside the sub-coalition and the FP. Let us now see how these effects occur at the contractual level. Further below, I will analyse the distortions to the incentives of property rights.

6.5.3.3.1 The distortions to contractual incentives

Recall, the contractual claims of the sponsors are junior to those of the FP. This implies that the SPV will comply with its obligations to sponsors only after servicing the senior non-recourse debt. As analysed in Chapter 5, strategically, lower seniority of claims comes with incentive effects that result in *risking*, *shirking*, and *shading*. Let us observe three aspects.

First, this opportunistic *risking*, *shirking*, and *shading* affects the project capacities, consequently harming the likelihood that the SPV produces value beyond debt costs. As a result, the sub-coalition actions lower the chances that the SPV repays subordinated contractual claims (higher risks) to all sponsors -including those cooperating with the sub-coalition. Higher default risks reduce the returns from the inputs that the sponsors choose in compliance with such arrangements. As shown in chapter 5, lower returns from inputs expanding residual benefits (from both contracts and property rights) aggravate the incentives for *risking*, *shirking*, and *shading* further harming project capacities.

Second, the above incentive distortions appear exacerbated by the loss of total welfare resulting from the distinct (but related) distortions to property rights incentives (see the following sub-section). Lower choices of inputs expanding dividends result in lower total project capacities and consequential reduction in the SPV's possibilities of repaying its contractual claims. This leads to the same welfare losses and incentive distortions remarked above. These distortions affect all sponsors, including those taking part in the sub-coalition.

Third, recall, all sponsors deliver complementary (synergetic) inputs. The sub-coalition sponsors receive information and update conjectures about the lower choices of inputs from peers. Lower choices of complementary inputs from some sponsors imply that the marginal values from all other sponsors' contributions will also be lower.

Then, lower the marginal values of synergetic efforts correspond with lower private choices of inputs (further *shirking*, *risking*, and *shading*) for lower (SPV) capacities. This is an incentive distortion resulting in lower total welfare to all sponsors - including the sponsors taking part in the sub-coalition. The sponsors within the sub-coalition will receive information about these costs before bargaining.

Of the three inefficiencies, the first two are financially (risk) induced incentive

effects.⁶⁷³ The last aspect reflects a technology (complementarity) induced incentive effect. The three aspects result in losses to total welfare to the sponsors within the sub-coalition. Remarkably, albeit the sponsors' objective functions are identical, these effects will harm the sub-coalition members differently. This is so because of the technological differences in their contributions.

6.5.3.3.2 The distortions to the incentives of property rights

The sub-coalition effects on the incentives of property rights are different but closely related to those above. Notice, to the incentives of ownership (expected dividends), the sponsors respond with non-contractible efforts. Moreover, the sponsors do not reallocate their property rights (shares in the SPV).⁶⁷⁴ Consequently, these incentives and their responses cannot be the object of renegotiations. Let us focus on three aspects.

First, from *news* affecting the project, the sponsors anticipate a loss in project capacities to produce value beyond the SPV's debt costs. Losses of SPV's capacities to distribute residual benefits reduce property rights' incentive powers. As analysed in Chapter 5, the failure of ownership as a mechanism incentivising non-contractible efforts leads to *shirking*, *risking*, and *shading* in further detriment of project capacities. This results inexorably in externalities to the sponsors outside the sub-coalition and the FP.

Second, just as remarked above, the problem exacerbates with the degrees of complementarities (synergies) of inputs. With reliable information, the sub-coalition sponsors adjust conjectures about the lower input choices from peers. They also anticipate losses in the marginal value of their non-contractible inputs -the sponsors

⁶⁷³ Loss of welfare affects repayment capacities of the SPV which indirectly results in incentive losses to the best-informed sub-coalition members.

⁶⁷⁴ This is an assumption that simplifies the analysis without effecting its conclusions. There are no obstacles for the sponsors within or beyond the sub-coalition to transfer shares to each other without informing parties outside the sub-coalition. Such transfers could indeed affect the incentives that each sponsor perceived. Moreover, they could also alter the total loss of welfare that sub-coalition members would internalise. This is so because the reactions to the re-allocation of share would also affect their individual responses that dictate project capacities and the sources of distortions. However, the dynamics with which this occur would not alter the analyses that follows or the conclusions of the chapter.

outside the sub-coalition do not enjoy this opportunity.⁶⁷⁵ Consequently, the sub-coalition sponsors further withhold costly contributions (*shirking*, *risking*, and *shading*). This affects the expectations of all the sponsors, including those cooperating with the sub-coalition.

Three, the sponsors hold contractual claims that are junior to those of the FP. Then, as analysed in chapter 5 and mentioned above and in the introduction, the losses in project capacities associated with the withholding of contributions expanding residual benefits diminish the SPV's capacity to repay contractual obligations. These are costs that the sub-coalition members internalise as a function of the contractual claims they hold only (see above).

Also, as above, the first aspect is financially-induced incentive effect. The origin of the second incentive problem is technological (complementarities). Both aspects come with welfare effects that, as total costs of intervening in the sub-coalition.

Finally, these effects result in losses of welfare and incentive distortions to all the project sponsors. The sub-coalition is inherently clandestine. Thus, from the effects of their opportunism, the sponsors only internalise the total welfare losses and incentives distortions as per their claims and expectations.

6.5.3.4 The bargaining surplus, bargaining outputs, compensations, and bribes

Let us begin by recalling, within the sub-coalition, even though the items in their objective functions are identical, the sponsors internalise costs and values that are, in all cases, distinct. This results from the different input technologies and contractual commitments to the project. These sponsors also hold distinct stakes of equity shares in the SPV. Thus, the opportunism of the sub-coalition affects them differently. Let us now observe the different steps with which the sponsors will shape the sub-coalition.

The sponsor launching offers to other sponsors for the sub-coalition begins by estimating whether the total benefits from all the opportunistic actions surpass the costs they internalise. With these net benefits, the sub-coalition sponsors later compensate each other up to their respective disagreement points. Thus, this test verifies the feasibility of the sub-coalition.

Differently put, recall, the sub-coalition is a clandestine but voluntary agreement. For sponsors to participate in the sub-coalition, each individual must expect returns at

⁶⁷⁵ Cf. below the analysis of the informational rents.

least equal to the value that she would otherwise receive should the sub-coalition not take place.⁶⁷⁶ These are the individual rationality -participation- constraints of the sub-coalition members. Thus, with the resources resulting from the difference between the total benefits and the stake of the losses they internalise from the sub-coalition actions (see above), the sponsors compensate the sub-coalition members who internalise losses from implementing the sub-coalition.

After compensating all the sponsors who internalised losses from the sub-coalition, parties bargain aggressively to distribute the remaining welfare -the aggregated net benefits- from the sub-coalition (the bargaining surplus). Under the standard symmetrical multiparty Nash bargaining solution (NBS), the sponsors distribute the remaining value in equal parts. Each of these identical shares is their bargaining output -their net gains from the sub-coalition.⁶⁷⁷

Note how the total transfers include a tranche of compensation and a different part of bribery -the bribery being the bargaining output that each sponsor receives from the total bargaining surplus net of compensation costs.

Before beginning the analyses of optimalities, let us remark three more points. First, because parties obtain different opportunistic benefits and internalise distinct costs from the sub-coalition, we see cash transfers in different directions amongst sub-coalition members when implementing compensations and briberies. The sponsors who obtain the most significant benefits transfer resources to those internalising greater losses.⁶⁷⁸

One of the sponsors making transfers should be the one starting the sub-coalition.

⁶⁷⁶ *V.gr.*, their alternative placement opportunity, their outside option, their disagreement values.

⁶⁷⁷ Under the simplest Nash Bargaining Solution, parties split the surpluses (after discounting individual losses or costs) in equal parts. Generally, *cf. pp.* 95 and *ff.* and *pp.* 234, 236-8 in J. WATSON, *Strategy*, cit. See also, K. BINMORE; A. RUBINSTEIN; A. WOLINSKY, "The Nash Bargaining Solution in Economic Modelling", *The RAND Journal of Economics*, vol. 17, 2, 1986. For the seminal and standard reference, the canonical J. F. NASH, "Equilibrium Points in n-Person Games", *Proceedings of the National Academy of Sciences of the United States of America*, vol. 36, 1, 1950.

⁶⁷⁸ Moreover, it is possible that sponsors receiving exceptional benefits from the sub-coalition make transfers to other sponsors even after considering the value of briberies.

This is the party who, after receiving *bad news*, should benefit from the renegotiation the most. With the cooperation of corrupted monitors, in addition to the *shirking*, *risking*, and *shading* coordinated by the sub-coalition, she can now withhold costlier contributions to the SPV.

Second, as part of the value that parties internalise in the bargaining, the sponsors include the expectations to reciprocity. Depending on circumstances, as parties interact relationally, they may also refrain from receiving contributions from parties receiving *bad news* today in exchange for a similar treatment in the future. I will come back to this point below when considering the strategic effect of *pessimism* and *optimism* -the conjectures that the sponsors build about the likelihood that events evolve with *good* or *bad news*.

Finally, third, as seen, before functioning as an opportunistic welfare distribution coordination, the sub-coalition results in incentive distortions with necessary losses of total welfare and externalities to sponsors outside the sub-coalition and the FP. Then, because the sub-coalition is necessarily welfare-decreasing, and because the sponsors are rational, the losses to outsiders and the FP will be necessarily more substantial than the aggregated gains to opportunistic sub-coalition members. This is true also after unanimous renegotiations (the 3rd alternative, see the sections below) in which cases externalities flow only to the FP. I will analyse the matter of externalities in sub-sections below.

6.5.4 The optimal sub-coalition I. The elemental aspects

Based on the above, let us observe the individuals that should take part in the sub-coalition. This is the optimal composition of the opportunistic sub-coalition.

The optimal sub-coalition will include the group of opportunistic sponsors that maximise renegotiating surpluses -*i.e.*, total opportunistic gains (see above) net of total costs from the sub-coalition as internalised by sub-coalition members. This sub-coalition maximises total opportunistic welfare and the bargaining outputs to each readjusting sponsor beyond disagreement points.

As in standard maximisation problems, let us observe the marginal costs and the added marginal values from corrupting an extra monitoring sponsor into the sub-coalition. Note the following items' consistency and the above description of sub-coalitions' marginal benefits and marginal costs. I will now follow a similar articulation based on the value and costs of incorporating further sub-coalition members (expanding the sub-coalition scope).

The marginal value of an extra sub-coalition member. By bribing the next best monitor into the sub-coalition, the opportunistic sub-group expands the spaces for

hidden actions ex-post (moral hazard). More concretely, the sub-coalition members increase the total savings and the range of incentives they can implement⁶⁷⁹ (and the best responses that individual sponsors can deliver⁶⁸⁰ to such incentives and the incentives implemented by outsiders and the FP) without triggering enforcement by the lender or outside sponsors. Fundamentally, an extra sponsor into the sub-coalition allows for wider opportunism (*shirking*, *risking*, and *shading*) which correlates to extra savings value net of the (minor than total) losses they internalise - see below.

The marginal costs of an extra sub-coalition member. We observe three aspects shaping the marginal cost of expanding the sub-coalition:

First, by enlarging the sub-coalition, new members withholding enforcing information expand the spaces for opportunism. However, they also increase the losses that sub-coalition members will internalise in their rewards from contracts and expected dividends (their aggregated allocations of property rights).

Second, the extra sponsor entering the sub-coalition not only cooperates by withholding information and implementing innovations, but she also requests compensation for the losses she will now internalise. Hence, enlarging the sub-coalition results in more of the total losses being internalised by sponsors who before negotiating were outside the sub-coalition receiving externalities with other sponsors and the FP. This increases the burden of compensations, thus reducing bargaining surplus relative to the value of savings (as above).

Third, the extra sponsor also participates in the aggressive bargaining process around the distribution of renegotiation surplus. Thus, an extra sponsor further dissipates the value from readjusting. This reduces the net gains expected from the sub-coalition to each member (bribery value beyond compensations).

The optimal sub-coalition. The optimal sub-coalition will: first, maximise the value of savings (the value of hidden actions ex-post -the standard moral hazard); second, minimise the impact from such savings (opportunism) against the project as internalised by sub-coalition members (in contracts and dividends); and third,

⁶⁷⁹ This is *shirking*, *risking*, and *shading* as enforced relationally within the sub-coalition.

⁶⁸⁰ This is *shirking*, *risking*, and *shading* in the individual responses behind asymmetries of information with other sub-coalition members as well as with all other sponsors and the FP.

minimise the dissipation of readjusting surpluses among sub-coalition members.

The optimal sub-coalition is revealed by the last corrupted sponsor whose marginal value at increasing opportunistic savings equals the marginal costs of project losses internalised by them and the resulting surplus's fractioning. This sponsor maximises the total bargaining surplus beyond disagreement points to all sub-coalition members. This sponsors also maximise the negative externalities to outside sponsors and the non-recourse lender.

When the sub-coalition is larger than its optimal size, we find broader spaces for extracting benefits opportunistically with *shirking, risking, and shading* collectively and individually. However, such sponsors perceive too strong incentives for responding opportunistically privately, thus further harming SPV's capacities. Additionally, too many sponsors internalise more of the total losses of welfare to the SPV (the share of externalities decreases, marginally). Excessively wide sub-coalitions result in too burdensome obligations to compensate its members depriving sub-coalition of net benefits (bargaining surpluses).

When the sub-coalition is smaller than the opportunistically optimal, we find the opposite as above. The spaces for behaving opportunistically are now narrower. Consequently, the sub-coalition causes too little harm to the SPV. Additionally, the fewer sponsors will now internalise less of such loses. This results in lower costs of compensating losses to sub-coalition members. However, the gains from the sub-coalition (the bargaining outputs) will also be lower in virtue of the milder opportunism.

6.5.5 The optimal sub-coalition II: the size of sub-coalitions and the structural features inherent to FPCs

Let us now consider six aspects inherent to all interactions within the sub-coalition. These features are unique (distinctive) of PFCs and vary with the scope of the sub-coalition. Thus, they also serve for further characterising the optimal sub-coalition beyond the above elemental aspects.

Next, I will show how the spaces for behaving opportunistically do not grow linearly but instead increase convexly with each extra sponsor in the sub-coalition. In the second place, I will observe the marginally decreasing effect of further sub-coalition members over bargaining processes. Thirdly, I will elaborate on the value of expanding sub-coalitions to include all sponsors (as in the 3rd alternative) for controlling the SPV opportunistically. In the fourth sub-section, I will consider how the sponsors' enforcement capacities inside and outside the sub-coalition evolve as the sub-coalition grows in size. In the fifth place, I will elaborate on how sub-coalition

size dictates the spaces of actions and strengths of the incentives for behaving opportunistically. I will show how the fewer sponsors outside the sub-coalition receive growing externalities. Finally, I will analyse how the lack of information about the sub-coalition allows for the extraction of informational rents. Finally, in the sixth sub-section, I show how the flow of information about opportunistic renegotiations facilitates the proliferation of independent sub-coalitions and unanimous renegotiations.

6.5.5.1 The convexly growing spaces for hidden actions on sub-coalition size

Let us now observe how the total space for opportunism grows convexly on the number of sub-coalition members. In other words, the capacity of each extra member of the sub-coalition to find information internally and withhold such information from the sponsors outside the sub-coalition grows marginally on the size of the sub-coalition. The same is true for the capacities to deliver quality-enhancing and innovation-implementing complementary efforts.

Intuitively, the sponsor entering the sub-coalition commits to cooperating materially and withholding information about her peers' actions within the sub-coalition. Then, further sub-coalition members have the opportunity to receive information, to spend monitoring efforts, and to cooperate materially with complementary inputs in conjunction with more sponsors. Consequently, the greater the sub-coalition, the more information about more actions by more numerous peers that each extra sub-coalition member obtains and withholds opportunistically, and the more individuals with whom she can coordinate synergetic efforts. Because of their capacities to interact with gradually more individuals, the marginal value of contributions from sponsors entering the sub-coalition grows with sub-coalition size.⁶⁸¹ For this reason,

⁶⁸¹ More concretely, the sponsors of a small sub-coalition of three sponsors can interact materially with complementary efforts and withhold information about the other two sponsors that no other sponsors. In contrast, in a sub-coalition of, say, seven sponsors, the same extra sub-coalition member interacts materially with synergetic efforts and receives (and withholds) information about the other six sponsors' opportunistic actions within the sub-coalition. The same single extra sponsor entering the large sub-coalition receives, withhold information and interact materially with complementary efforts as a function of the other sponsors she can interact.

everything else fixed, the marginal value of bribing an extra sponsor will rise as the sub-coalition.

Finally, the capacity to receive information -resulting not only from information revelation but, critically, from the opportunistic cooperation at the material level,⁶⁸² grows convexly with three factors: First, the number of sponsors -*v.gr.*, with the opportunistic actions the more numerous sponsors can implement for the sub-coalition. Second, the asymmetries of information between that sponsor and the rest of the sponsors outside the sub-coalition.⁶⁸³ Third, -critically- the assumptions (or technical circumstances) about the evolution of the *marginal* value of contributions of more individuals entering the sub-coalition. This third aspect puts a limit to the value of the material contributions from sponsors for opportunistic purposes. This third observation also remarks how, as the sub-coalition grows, the burden of compensating more sponsors for more of the total marginal losses that the sub-coalition generates places a boundary to the sub-coalition expansion.

6.5.5.2 The marginally decreasing dissipation of surpluses on sub-coalition size

The marginal dissipation of surpluses in the bargaining process decreases with the sub-coalition size (*v.gr.*, with extra sponsors). This comes in the light of the simplest symmetrical Nash bargaining solution.

Recall, in an aggressive bargaining process, the sponsors distribute the value of the renegotiation net of compensating all those internalising losses from the sub-coalition. Under the standard symmetrical Nash bargaining solution, each sponsor receives an equal share of such total net benefits -their individual bargaining outputs. Accordingly, the earlier sponsor entering a small sub-coalition will extract large stakes of total benefits.⁶⁸⁴ The sponsors entering larger sub-coalitions will extract smaller fractions of the total collective surpluses.⁶⁸⁵

⁶⁸² The relational interaction for implementing innovations.

⁶⁸³ I will come back to analyse the asymmetries of information inside and outside the sub-coalition below.

⁶⁸⁴ The sponsor forming a sub-coalition of two will harvest half of the total distributable benefits.

⁶⁸⁵ The sponsors intervening in a sub-coalition with nine parties will receive a ninth of bargaining surpluses.

6.5.5.3 SPV control and the feasibility of readjustments

6.5.5.3.1 The value of SPV control

Control of the SPV allows for extra readjustment space. Concretely, it permits that sponsors withhold enforcement or readjust provisions that they implement relationally on verifiable information. More specifically, control permits that the sponsors readjust such provisions without other sponsors outside the sub-coalition triggering external enforcement protecting the company. Particularly, unanimous renegotiations also allow sponsors to renegotiate provisions whose compliance is visible to all other sponsors, or to readjust decisions requiring special quorums.

With all shareholders intervening in the renegotiation, the sponsors can decide in detriment of SPV at the marginal costs determined only by the FP's capacity to enforce creditor protections from insolvency laws or the incomplete clauses of the risk allocation mechanism. In other words, with unanimous control of the SPV, the spaces for implementing renegotiations are now only bound by the enforcement capacities of the FP.

6.5.5.3.2 Control and the value of contracting information

Additionally, observe how, albeit the project company is controlled as per a relational interaction among sponsors, provisions between the SPV and individual input providers can be enforced only externally (judicially) on verifiable information. Simply, the SPV cannot enforce on observable information. Consequently, the value of unanimous control grows with the wider the range of incentives implemented initially via the SPV on verifiable information relative to those implemented directly by sponsors on merely observable information. That is, within the framework of a relationally sustained cooperation.

6.5.5.3.3 Control and the opportunity cost of sub-coalitions

Control is only available after readjusting unanimously. Consequently, the value of control provides incentives for expanding the sub-coalition to include all sponsors. Then, the value of control associated exclusively to collective readjustments correlates with an opportunity costs of readjusting individually or within sub-coalitions. More explicitly, as sub-coalition grows, we find growing opportunity costs of not bribing further sponsors necessary for completing the full readjustment.

6.5.5.3.4 Control and bargaining power

The above is coherent with attributing higher value to the consent from the fewer remaining sponsors necessary for reaching unanimity of decisions. This is also

consistent with increased bargaining powers.⁶⁸⁶ Finally, as we relax the Nash bargaining solution's symmetricity assumption and the renegotiating sponsors approach unanimity, the last sponsors outside the sub-coalition extracts greater stakes of bargaining surpluses. This is consistent with a *holdout problem* growing with the scope of the sub-coalition. That is, with the fewer sponsors left before reaching unanimity thresholds.⁶⁸⁷

6.5.5.4 Readjustments scopes and enforcement capacities

In the first sub-section of this level, I referred to how the spaces for exerting hidden actions grow convexly on the number of sub-coalition members. As the sub-coalition grows, each of these sponsors withholds information about the actions of more numerous peers. I now analyse how the sponsors' capacities inside and outside the sub-coalition evolve relative to each other, as the sub-coalition size grows. In both cases, the findings call for larger sub-coalitions.

6.5.5.4.1 Concept and strategic effects

The number of sponsors inside and outside sub-coalitions determines their capacities to enforce provisions collectively. This is due to two dimensions: first, their abilities to find and reveal information; second, the weights of relational threats with which they sustain cooperation. The same holds for the sponsors within the sub-coalition. Increasing enforcement capacities call for broader sub-coalitions.

6.5.5.4.2 Enforcement within and outside the sub-coalitions

Let us start by observing how sponsors' enforcement capacity within the sub-coalition and outside the sub-coalition changes with sub-coalition size.

6.5.5.4.2.1 On the information dimension

Information about actions by sponsors outside the sub-coalition. All sponsors can monitor actions by sponsors not taking part in the sub-coalition. The sponsors outside the sub-coalition reveal information about peers as usual. The sponsors within the sub-coalition also enforce against outsiders for the provisions in place ex-ante. Therefore, the size of the sub-coalition does not interfere with the

⁶⁸⁶ *V.gr.*, see the expected losses to other sponsors from not accepting take it-or leave it threats by such last sponsors.

⁶⁸⁷ T. J. MICELI; K. SEGERSON, "Holdups and Holdouts: What Do They Have in Common?", cit.

information available about actions by outsiders.

Information about actions by sponsors within the sub-coalition. In contrary, as sub-coalition grows, the information about actions by sponsors within the sub-coalition becomes scarcer. This results from two aspects. First, sponsors within the sub-coalition naturally refrain from revealing observations about their opportunistic actions. Second, sponsors outside the sub-coalition are now fewer. The probability of detection of actions by sponsors within the sub-coalition becomes consequently smaller, the bigger the sub-coalition.

6.5.5.4.2.2 On the enforcement dimension

Let us now observe the capacity of sponsors to enforce provisions. I will now describe: first, the enforcement against actions by sponsors outside the sub-coalition. These are responses to contracts implemented ex-ante. Second, I will explore the enforceability against sponsors within the sub-coalition, also based on provisions ex-ante. This includes the possibilities that the sponsors outside the sub-coalition react with substandard inputs (*shading*). Finally, in third place, I will describe the enforceability of collective decisions implementing opportunistic innovations within the sub-coalition.

Enforcement against actions of sponsors outside the sub-coalition. Let us recall, the sub-coalition size does not interfere with the availability of information about the actions from sponsors outside the sub-coalition. Based on this, let us observe the feasibility of judicial and relational enforcement.

Judicial enforcement comes with enforcement threats that result from legal provisions. Hence, with information not being sensitive to the sub-coalition size and enforcement threats depending on legal remedies, external enforcement against non-readjusting sponsors' actions remains unaffected by sub-coalition size.

Let us observe the feasibility of relational enforcement now against non-renegotiating sponsors. As in the case of external enforcement, the availability of information necessary for enforcing relationally does not depend on sub-coalition size. Additionally, with all sponsors enforcing against outsiders, the bargaining threats also remains insensitive to sub-coalition scopes. Hence, with unchanged access to information and with all sponsors threatening with retrieving reciprocity-based cooperation, relational enforcement against outsiders remains efficient independently of the number of renegotiating input providers.

Enforcement against actions by the sponsors within the sub-coalition for non-renegotiated obligations. The analysis of enforcement against sub-coalition members comes in stark contrast with the above propositions.

Let us observe the enforceability of provisions externally. As said, the enforcement threats associated to judicial procedures depend on legislative remedies. Thus, these enforcement threats are not sensitive to sub-coalition size. However, the size of the sub-coalition does indeed affect the availability of enforcing information. Note, as the sub-coalition grows, the monitors outside the sub-coalition become fewer. Sponsors taking part in the sub-coalition do not reveal information. Consequently, as the sub-coalition grows, external enforcement against sub-coalition members decreases.

On the relational stance, enforcement is also affected by sub-coalition size. Sponsors within the sub-coalition withhold both information and relational retaliation. The space for relational enforcement against sub-coalition members diminishes with the lesser information and the weaker enforcement threats from such fewer non-renegotiating sponsors. Consequently, as the scope of the sub-coalition increases, relational enforcement against sub-coalition members decreases.

Enforcement against the opportunistic actions of the sub-coalition. Finally, the analysis of the enforceability of incentives implemented within the sub-coalition is straight forward.

First, the access of outside the sub-coalition sponsors to information about the sub-coalition actions decreases with the sub-coalition size. With the decreasing quality of their information also diminishes their capacity to enforce provisions against sub-coalition members. This is true for both relational and judicial enforcement.

Second, with the broader sub-coalition also grow the sub-coalition capacities to reveal gain information about sub-coalition members' actions. This results in a higher quality of judicial enforcement. With the larger number of sub-coalition members also grow their capacities to retaliate relationally. These capabilities and the access to superior information improve their capacities to sustain cooperation relationally as the sub-coalition grows.

Additionally, inputs are complementary (synergetic). Hence, greater discipline increases disproportionately the value of readjusting as the scope of renegotiations grows. By expanding losses to the SPV, better enforcement within the sub-coalition also results in disproportionately more substantial externalities to (the fewer) sponsors outside the sub-coalition and the FP as the sub-coalition grows.

Finally, to synthesise concepts, as the environment deteriorates with *bad news*, and the sub-coalition grows, we find: First, all sponsors' capacity to enforce provisions against outside sponsors remains unchanged. Second, the capacity of sponsors outside the sub-coalition to enforce provisions against sub-coalition members progressively decreases. Third, as the sub-coalition scope broadens, the sponsors' capacities to enforce opportunistic innovations within the sub-group increases. The

three aspects increase the value of sub-coalitions, as the size of such coalitions increases.

6.5.5.5 The strengths of the opportunistic incentives and the magnitudes of the externalities to other sponsors

I will now focus on two aspects relating to sponsors' internalisation capacities inside and outside the sub-coalition. First, I will show how the stakes of property rights and the subordinated claims in sub-coalition members' hands place a limit to the desirability of increasing sub-coalition scopes. I have advanced this proposition when introducing the renegotiation process. Second, I will point out how, as the sub-coalition grows, the increasing externalities affect fewer sponsors outside the sub-coalition at an increasing rate. Third, I will show how the incapacities of the sponsors outside the sub-coalition to update beliefs about sub-coalition members' inputs result in informational rents to the latter.

6.5.5.5.1 The spaces for opportunism, residual claims, and the capacities of the sponsors to internalise losses to project capacities

Above, we have seen how larger sub-coalitions correlate with wider spaces for hidden actions and more significant losses to total project welfare. However, via their expectations to dividends (a function of their property rights in the SPV) and their subordinated contract claims, the sub-coalition sponsors internalise a fraction of the total losses resulting from this opportunism.

Because the formation of the sub-coalition requires Pareto improvement, during the bargaining process, the sponsor entering the sub-coalition require compensation for such losses before discussing *-v.gr.*, bargaining aggressively for- the distribution of the bargaining surplus. Consequently, bringing an extra sponsor in the sub-coalition implies that the sub-coalition will collectively internalise more of the total marginal costs that the sub-group opportunism brings to the SPV and all parties to FPCs.

From the above, it is easy to see how, when the sub-coalition is small, the sponsors enjoy smaller spaces for exerting hidden actions. However, their returns from such opportunistic actions within such spaces are strong. Intuitively, most of the total losses to project capacities accrue to the many sponsors outside the sub-coalition and the FP.

In contrast, when the sub-coalition is large, fewer sponsors exert enforcement actions outside the sub coalition. Additionally, the more renegotiating sponsors now internalise most of the total losses that the sponsors as a class (not including the FP) internalise from their opportunism. Thus, while the spaces for behaving

opportunistically are now large, the net gains from such efforts are now slim.

6.5.5.5.2 The increasing externalities against fewer sponsors outside the sub-coalition

Following the path of the above observations, note how, in equilibrium, the larger sub-coalition results in more widespread opportunism with greater losses to project capacities. As also said, the sub-coalition does not internalise losses. Such losses accrue to the sponsors outside the sub-coalition and the FP. Then, it follows that, as the sub-coalition grows, the increasingly heavier externalities concentrate in the fewer sponsors outside the sub-coalition, and the FP.

The inefficiencies grow with the complementarities of inputs and the deterioration of the environment governing sub-coalitions' size. The most significant expropriations and externalities affect the last sponsor remaining outside the sub-coalition. Note the consistency of this proposition with the concepts in the sub-section that follows. We do not see the problem when sponsors choose the 3rd alternative and deliver their contributions without renegotiating.

6.5.5.5.3 The over-investment by outsiders and the free-riding by sub-coalition members

As described in the introduction, all the sponsors' subordinated contractual claims are expectations to dividends are residual to the FP titles. Moreover, these values - and the incentives they generate- are also reciprocally dependent. As also advanced, this comes in virtue of financial and material aspects.

Financially, the capacity of the SPV to distribute dividends implies a capability to repay subordinated contracts. Conversely, in terms of incentives, the value that choices of inputs produce from contracts also increases SPV's capacities to distribute dividends. Materially, because the sponsors deliver complementary contributions, the levels of inputs that some sponsors choose for complying with contracts define the marginal value of contributions with which other sponsors build dividends. The values that all the sponsor harvest from all sources -and consequently their incentive powers- are all reciprocally dependent. This is equally true for the sponsors choosing inputs inside or outside the sub-coalition, irrespective of sub-coalition size, or whether they renegotiate before contributing to the project.

The dependence of individual claim value on the *non-contractible* actions by all input providers leaves all sponsors interacting in a moral hazard in a team setting. This comes with the under-investment problem that is inherent to these scenarios. I have insisted on this classical proposition above. However, in our case of PFCs, we see other implications from this problem.

The easiest way to present the following proposition is to adopt the stance of outsiders. Simply, sponsors outside the sub-coalition fail to update information about the incentives and best responses they should expect from sub-coalition members. As a result, as they choose efforts based on outdated beliefs, they adjust their input levels as if the sub-coalition sponsors responded with complementary inputs as contracted upon *ex-ante* (as if the sub-coalition did not exist). In other words, they will deliver responses at levels higher than what they would choose should they be better informed. Higher input choices come in the benefit of the sponsors inside the sub-coalition (an informational rent).

Under a team effort, the lower the input levels by the sub-group of sponsors, the greater the fraction of the total team value that other sponsors outside that group will generate. Thus, the more profound the under-investment, the more that the value harvested *by all sponsors* will stem from the costly actions of the least informed outsiders. This is the canonical free-riding inefficiency in the core of moral hazard in team problems.⁶⁸⁸ However, in this concrete scenario of FPCs, the problem grows with the incompleteness of the risk allocation mechanism allowing for *bad news* and subsequent sub-coalitions. The interplay between the coordination of sub-coalition members and the lack of information of sponsors outside the sub-coalition results in informational rents beyond the underlying moral hazard in team problem.

6.5.5.6 Information and the proliferation of sub-coalitions

Let us now elaborate on how information flow induces the proliferation of derivative sub-coalitions and unanimous readjustments.

Based on the information about *news* that sub-coalition members receive during the renegotiation process, the corrupted monitors update information about *news* affecting them directly and other parties. Critically, the sponsors also update conjectures about the now lower choices of complementary inputs that she can expect from these parties. Based on this information, the sponsor receiving information evaluates the convenience of initiating distinct-sub-coalitions with these or other sponsors.

Then, the sponsors taking part in both (or more) sub-coalitions receives information about expected choices by members of both (or more) sub-coalitions. These best-

⁶⁸⁸ Cf. B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. R. STRAUZ, “Moral Hazard in Sequential Teams”, cit. L. RAYO, “Relational Incentives and Moral Hazard in Teams”, cit.

informed individuals internalise the losses of returns from the lower choices of complementary inputs from members of both opportunistic sub-groups. Then, the inputs levels (the private choices) from these sponsors taking part in both sub-coalitions will be lower than those of sponsors taking part in only one rearrangement, -or in a smaller sub-coalition. Effectively, taking part in more than one sub-coalition or in larger sub-coalitions produces informational synergies that (via awareness of lower returns) expand the feasibility spaces for opportunistic actions and the externalities to non-readjusting sponsors and the FP.

The problem results not only from the flow of information alone, but from the interplay between such information and the complementarities of inputs. In a reaction function, these complementarities define how each sponsor respond privately to the under-investment they expect from other sponsors.

Complementarities and information dictate the proliferation of readjustments with harmful effects to project capacities. Both aspects consequently increase the likelihood that *news* result in the project falling within the thresholds of *very bad news*. This observation points out the value of fiduciary duties to inform as postulated in Chapter 8.

6.5.6 The optimal sub-coalition III; project idiosyncratic aspects

Let us now observe the impact of three elements necessary of all FPCs. In contrast with the aspects mentioned above, these features do not depend on structural elements of FPCs, but on the projects' material characteristics: first, the asymmetries of information; second, the complementarities of quality-enhancing and innovation-implementing efforts; and third, the value, spaces and quality of the relational cooperation (a function of the asymmetries of information).

The distinction between the two categories is pedagogical more than ontological. The asymmetries of information govern the spaces for opportunism and consequently, the sub-coalition scopes. The same is true for the complementarities of efforts and the quality of the relational interaction. The three aspects interact (define) the structural features of the opportunistically optimal sub-coalitions in FPCs -the structural features we observed above.

6.5.6.1 The asymmetries of information

Above, we saw how the asymmetries of information defined the spaces that the sponsors enjoy for choosing hidden actions within the sub-coalition. This was the initial and general approach.

Asymmetries of information between the sponsors inside the sub-coalition and those

outside the sub-coalition also define the sub-coalition capacities to enforce opportunistic incentives for *shirking*, *risking* and *shading* (and hosting the needs of the sponsor under distress indicating the sub-coalition). In addition to the known effects of asymmetries of information to the spaces of hidden actions, asymmetries of information dictate the postulates for selecting individuals entering the sub-coalition and the sequence in which they should enter the opportunistic-group. Finally, the distinct information asymmetries rule the relative preferability of each of the three alternatives as a function of environment changes (*news*). Let us see this in more detail.

6.5.6.1.1 Asymmetries and sub-coalitions

For best describing the strategic effects of asymmetries under the 2nd alternative, we must discriminate the implications from the asymmetries of information outside and inside the opportunistic group. These are the information asymmetries between each sub-coalition member and the best informed of the monitors outside the sub-group and the FP, and the asymmetries of information among sponsors within the sub-coalition.

Asymmetries of information between sponsors inside and outside the sub-coalition

Let us observe the first tier of information asymmetries among sponsors inside and the best monitor(s) outside the sub-coalition. These asymmetries determine the range of the opportunistic actions (*shirking*, *risking*, and *shading*) that sub-coalition members can implement collectively without triggering enforcement from the sponsors outside the sub-coalition. These are the spaces for opportunism that, within the sub-coalition, the sponsors can implement collectively and enforce internally to the individual members without bribing (and compensating) an extra monitor into the sub-coalition. From a different stance, these are the asymmetries that define the space for delivering private responses to *all* incentives without internalising enforcement risks from the sponsors outside the sub-coalition. These asymmetries increase the opportunistic value of the sub-coalition and the externalities to other sponsors and the FP.

Asymmetries of information among sub-coalition members

Let us now consider the second type of asymmetries among the sub-coalition members. Recall, within the sub-coalition, the sponsors adopt collective actions enforcing incentives associated with innovations desirable to the said sub-coalition. These are the technological modifications necessary for materially hosting the needs of the renegotiating sponsor(s) under distress and for *shirking*, *risking*, and *shading*

as convenient to the clandestine group. The asymmetries information intra-sub-coalition present enforcement challenges to these collective decisions. Consequently, by jeopardising the relational enforceability of these incentives, these asymmetries allow that sub-coalition members find spaces for further *shirking*, *risking*, and *shading* as privately desirable. This is a moral hazard between the sub-coalition collectively and its individual members. Accordingly, the asymmetries of information within the sub-coalition reduce the total value that sponsors can obtain collectively from their opportunistic renegotiations.

Lowering sub-coalition value then reduces bargaining surplus relative to the costs of compensating sub-coalition members for the losses they internalise from the renegotiation. This leads to lower optimal scopes of sub-coalitions (and lower externalities to outsiders and the FP). Notice how this is true independently from the fact that weaker enforcement within the sub-coalition does permit that sub-coalition members withhold costly inputs (to their private benefit).⁶⁸⁹

Asymmetries of information and the sequence for bribing sponsors into the sub-coalition

The interplay amongst the above propositions results in a hierarchy of preferences for sponsors that sub-coalition members will follow when choosing monitors they will bribe.

When expanding the sub-coalition, the rational sub-coalition members will act according to the following postulates: First, they will prefer bribing the (least informationally asymmetric) individuals who can best observe socially undesirable actions within the sub-coalition. These are the best monitors who can allow for highest bribery value for expanding spaces for hidden actions. Second, within the sub-coalition, sponsors will prefer incorporating monitors who are most asymmetric with other sponsors outside the sub-coalition with respect to their own actions. These are the sponsors who can exert widest opportunistic actions without triggering enforcement by outsiders. Her actions will then enlarge the space for coordinating opportunistic innovations within the sub-coalition. Third, sponsors will choose the

⁶⁸⁹ The sub-coalition implements solutions that are desirable to the team. Tensions within the sub-coalition -*v.gr.*, *shirking*, *risking*, and *shading* in private responses- results in losses of opportunistic welfare, but also in lower project capacities, a part of which the sponsors of the sub-coalition will internalise but for which will not receive compensations.

(least informationally asymmetric) sponsors whose actions can be best-observed by sub-coalition members. These are the sponsors who can be best disciplined. Discipline expands expected value and consequently, also the feasibility of the sub-coalition.⁶⁹⁰

The conjunction of these three aspects expands the value of the 2nd alternative of building sub-coalitions relative to the value of delivering inputs without renegotiating, or after readjusting unanimously.

6.5.6.1.2 Asymmetries and news

From the above, it is easy to see that the higher the asymmetries of information between sponsors choosing inputs and the best monitors (other sponsors or the FP), the more frequently the sponsors deliver inputs without readjusting. Similarly, the wider the asymmetries of information among all parties, the smaller the sub-coalitions, and the less likely the unanimous renegotiations.

Additionally, the smaller asymmetries among some sponsors favour sub-coalitions including only them, in detriment of greater sub-coalitions, unanimous renegotiations, and the first alternative of choosing inputs without readjusting. Then, the smaller the asymmetries among all the sponsors, the less likely that sponsors deliver their inputs without renegotiating, and the likelier that they readjust unanimously.

In all cases, these postulates will hold generality (robustness) for all types of influences from the environment (*i.e.*, *no news*, *bad news*, *very bad news*⁶⁹¹).

In all cases, as the intensity of *news* grows, the sponsors less likely choose inputs without readjusting. *News* expands the scopes of sub-coalitions, and the sponsors will more likely renegotiate unanimously. The asymmetries of information only interfere with the speed with which the sponsors evolve irremediably from not

⁶⁹⁰ Additionally, beyond the analysis of asymmetries, with regards to the hierarchy of preferences for candidates for entering the sub-coalition, the sponsors within the sub-group will prefer individuals whose opportunistic actions (both under-investment and over-investment) produce lesser impact to the SPV of which the sub-coalition will internalise a fraction correlated to the summa of their property rights and contractual claims. These are also the sponsors who will be deterred from behaving opportunistically for the lowest allocation of property rights.

⁶⁹¹ Under *good news* sponsors reveal rather than withhold information. *Cf. Annexe I.*

renegotiating towards unanimous renegotiations under *bad* or *very bad news* (renegotiations whose feasibility depend on the asymmetries with the FP only).

6.5.6.2 The complementarities and the externalities

Let us now observe the impact of complementarities (synergies) of quality-enhancing and innovation-implementing efforts. These complementarities govern the feasibility of opportunism and renegotiations. The synergies of contributions also interfere in the rationale for choosing sponsors into the sub-coalition.

In this order, I will now introduce the concept and elemental strategic effects of complementarities. In the second place, I will consider the effects of quality-enhancing complementarities. Thirdly, I will observe the strategic relevance of innovation-implementing synergies. In the last two sections, I will also elaborate on how complementarities result in a hierarchy of preferences for sponsors entering the sub-coalition, and how complementarities (do not) contribute to the deterioration of the environment. Finally, I will also consider how complementarities affect the extraction of informational rents from the sponsors outside the sub-coalition.

6.5.6.2.1 Concept and strategic effects

As described in the introduction, complementarities imply that the marginal value and returns from costly actions by some sponsors depend on the choices of efforts from the other input providers. As also anticipated, we distinguish two types of actions by sponsors: first, quality-enhancing inputs; and second, the innovation-implementing efforts.

Sponsors spend quality-enhancing inputs in response to incentives after choosing any of the three alternatives. In contrary, sponsors put in place technological innovations only whenever they readjust within sub-coalitions or unanimously. They do this to host the material needs of the sponsor requesting the renegotiation and implement solutions as desirable to the opportunistic sub-group. Additionally, innovations depart from the technologies optimally identified ex-ante. Thus, they are always project welfare-decreasing.

Before proceeding, recall, of these losses associated to substandard quality-enhancing inputs as well as to the undesirable innovations, the sponsors internalise only a stake corresponding to their individual (or aggregated, when renegotiating) ownership in the SPV and their contract claims that are always junior to FP's claims.

6.5.6.2.2 Complementarities of quality-enhancing inputs

As indicated above, the higher they are the degrees (synergies) of quality-expanding

complementarities, the greater they are the influences of non-contractible efforts in the marginal value of inputs from other sponsors, and consequently, on the welfare expected from both contractual returns and dividends. Strategically, by expanding the losses from *shirking*, *risking*, and *shading*, complementarities effectively function as deterrence against opportunism.

Let us now observe the strategic impact of complementarities of quality-enhancing efforts on the sub-coalitions, the preferability of each alternative as conditions deteriorate, and how complementarities increase the extraction of informational rents.

6.5.6.2.2.1 Complementarities of quality-enhancing efforts and sub-coalitions

When readjusting with some sponsors (the 2nd alternative), we find five contrasts with the first case where the sponsor chooses complementary quality-expanding inputs without readjusting.

First, when shaping the renegotiating process, the sponsors now reveal information to other sub-coalition members about the existence and strategic value of implementing the opportunistic readjustment.

Second, after receiving information about the *shirking*, *risking*, and *shading* within the sub-coalition, sub-coalition members further reduce their input choices as per the lower values they now produce precisely in virtue of the complementarities of efforts withheld by other sub-group members. In other words, after updating information about the under-investment of synergetic efforts from peers, sub-coalition members anticipate lower returns from costly efforts also under-invest. Backwards induction, the sponsors initiating the sub-coalition further withholds costly complementary private efforts.

Third, the conjunction of expanded under-investment by readjusting sponsors and complementarities extend the harm from the sub-coalition to total welfare.

Forth, only sponsors participating in the renegotiation process become aware of the renegotiation and consequently further under-invest. Sponsors outside sub-coalitions perceive negative externalities from peers' *shirking*, *risking*, and *shading* and deliver higher complementary contributions at levels higher than what they would otherwise choose should they have received updated information. This is a positive externality - an informational rent- from the sponsors outside the sub-coalition to sub-coalition members. I will come back to this point below.

Finally, fifth, of the losses resulting from the sub-coalition's opportunism to total project capacities, the sub-coalition members internalise what they perceive in their

contractual rewards and the aggregated claims to dividends -both of which grow with complementarities.⁶⁹² Within the sub-coalition, the sponsors perceive these losses in the calculus of compensations, bargaining surpluses and bribes. Thus, by expanding the total losses to project capacities resulting from *shirking*, *risking*, and *shading*, the complementarities of quality-enhancing inputs function as deterrence to opportunism. Accordingly, to higher degrees of complementarities of quality-enhancing efforts correspond milder renegotiations and smaller scopes of sub-coalitions.

6.5.6.2.2 Complementarities of quality-enhancing efforts and the preferability of each alternative

From the above, we see how complementarities favour delivering responses without renegotiating. By so doing, the sponsors do not compensate sub-coalition members internalising more significant losses in virtue of higher complementarities.

Additionally, we can also see how such losses grow convexly on each extra sponsor entering the sub-coalition. This is because each extra sponsor does not only expand her *shirking*, *risking*, and *shading* from the socially desirable, but she also further reduces the marginal value of quality-expanding efforts from the other sponsors. This effect is exponential because each extra sponsor withholding information allows all the earlier sub-coalition members to behave opportunistically.⁶⁹³ Second, this further induces sub-coalition (or unanimous) readjusting sponsors to reduce their input levels further.

To the single sponsor initiating the sub-coalition and compensating for such losses, complementarities of quality-expanding efforts expand the desirability of delivering inputs without readjusting rather than after readjusting with some or with all other sponsors. Complementarities consequently decrease the optimal scope of sub-coalitions and ultimately reduce the frequency (likelihood of optimal) unanimous readjustments.

⁶⁹² Ultimately, by expanding losses to sub-coalition members, complementarities increase the costs of building Pareto spaces for sponsors to accept taking part in the sub-coalition.

⁶⁹³ The function describing these spaces will have both first and second order conditions positive.

6.5.6.2.2.3 Complementarities of quality-enhancing efforts and the characteristics of sub-coalition members

When choosing sponsors for entering the sub-coalition, the sponsor under distress will first choose the sponsor whose contributions show higher complementarities in conjunction with other sub-coalition members' inputs. This feature also provides for higher marginal value from her contributions to the sub-coalition and lower opportunism in her responses to the sub-group. The same sponsor looks for other sponsors offering lower complementarities with the rest of the project's sponsors (outsiders). This characteristic lowers the impact to project capacities from the *risking*, *shirking*, and *shading* of such individual.

6.5.6.2.2.4 The access to information and the complementarities of quality-expanding inputs

Finally, under the 2nd alternative, the sponsors outside the sub-coalition do not update conjectures about expected choices of inputs by opportunistic sponsors. Consequently, these input providers also fail to readjust as per the marginal value from their inputs now lowered by the loss of complementarity efforts by sponsors within the sub-coalition. Complementarities consequently increase the value that sponsors within the sub-coalition extract from outsiders. These informational rents grow as a function of the shares of ownership in the hands of such sponsors outside the sub-coalition.

Note how the sponsors choosing inputs without renegotiating also perceive returns from inputs by all other team sponsors. Hence, the above holds valid for cases where the sponsor opts for 1st alternative. Naturally, this is not true for the 3rd alternative where sponsors renegotiate unanimously, and all parties have an opportunity to update conjectures about reciprocal choices of complementary inputs.

6.5.6.2.3 Complementarities of innovation-implementing efforts

The strategic impact of innovation-implementing efforts is precisely the opposite to that from quality-expanding actions. Complementarities (synergies) of innovation-implementing efforts determine the marginal value of cooperation. Other propositions are also opposed to those describing the strategic value of complementarities of quality-expanding efforts. Let us shortly see how this happens.

6.5.6.2.3.1 Complementarities of innovation-implementing efforts and sub-coalitions

The reduction in the costs of implementing renegotiations results in increments in bargaining surpluses. This implies higher prices of bribes in equilibrium (a

function of payoffs, itself a function of surplus value). More significant distributable surpluses then equate to wider scopes for opportunistic actions, a larger number of individuals within sub-coalitions, and finally higher likelihoods of unanimous readjustments for the same initial deteriorations in the environment (*news*). The total welfare effect of complementarities of innovation-implementing efforts increases with the higher number of sponsors intervening in the readjustment.

6.5.6.2.3.2 Complementarities of innovation-implementing efforts and the preferability of each alternative

The greater value of cooperating expands the scope of sub-coalitions and the likelihood of unanimous readjustments. Both aspects increase the value of renegotiating unanimously (the 3rd alternative) over the possibilities of readjusting within sub-coalitions (the 2nd alternative). This also favours sub-coalitions over the 1st alternative of delivering inputs without renegotiating. This is contrary to what we saw above when considering the complementarities of quality-enhancing efforts.

Finally, by expanding the spaces for cooperating for innovating opportunistically (*shirking*, *risking*, and *shading*) in detriment of SPV value, complementarities of innovation-implementing efforts accelerate the decadence of project capacities from *bad news* to *very bad news*. This is also opposed to what we saw above when considering the complementarities of quality-enhancing inputs.

6.5.6.2.3.3 Complementarities of innovation-implementing efforts and the characteristics of sub-coalition members

Additionally, the above puts lights on a hierarchy of preferences that the sponsors follow when selecting new individuals entering the sub-coalition as the environment deteriorates. Simply, the sponsor issuing bribes give preferences to those whose innovation capacities are most valuable to the opportunistic team. That is, they prefer those individuals whose innovation-implementing efforts are more synergetic with inputs from other sub-coalition members. As said, this expands renegotiation surpluses and opportunistically distributable welfare.

The complementarities of innovation-implementing effort between the actions of sponsors inside and outside the sub-coalition are strategically irrelevant.

6.5.6.3 The value of relational cooperation

Finally, let us now observe the strategic value of reciprocity induced cooperation in FPCs.

6.5.6.3.1 Concept and strategic effects

Relational cooperation involves the building of expectations with consideration of the value of reciprocity. Intuitively, parties behave in a way that they consider desirable to peers hoping that, in the future, parties will respond with reciprocity (or with retrieving cooperation). The enforcement of relational interactions -or the sustainability of relational cooperation (internal enforcement)- depends on the value that parties can attribute to future cooperation. Strategically, one of the critical differences between relational (internal) and judicial (external) enforcement lies in the possibility of using observable information in the earlier case.⁶⁹⁴ Relational interaction expands the scopes of contract enforcement.

In the scenario of FPCs, to this, we can add other strategic aspects inherent to the positions of parties in this context. Concretely, as sponsors intervene in renegotiations, they receive information about changes in the environment affecting sponsors initiating the readjustment process. This flow of information about the influences of nature (news) allows the sponsors to update estimations about the likely eventualities affecting them in the future. Uncertainty about the future then increases the value of reciprocity and ultimately of readjusting. Most interestingly, this is true not only to cases of *bad*, and *very bad news* but also in scenarios of *good news*. Let us see how this happens.

6.5.6.3.2 Information and relational cooperation

During the renegotiation process, a sponsor reveals information about the environment to other sub-coalition members. This information allows renegotiating sponsors to refine conjectures about the chances that in the future, they also experience *good*, *bad*, or *very bad news* before subsequent rounds of inputs. The sponsors will build beliefs about these likely evolutions of the environment imperfectly. For simplicity, to the two possible errors in her expectations, I refer to as

⁶⁹⁴ There are other crucial differences whose functionalities go beyond the scope of this analysis. Relational cooperation requires sequential contributions and uncertainty about future rounds of cooperation. *cf. pp. 297 and ff. in J. WATSON, Strategy, cit. P. BOLTON; M. DEWATRIPONT, Contract Theory, cit. M. HVIID, "Long-term Contracts and Relational Contracts", cit. G. BAKER ET AL, "Relational Contracts and the Theory of The Firm", cit. J. LEVIN, "Relational Incentive Contracts", cit.*

optimism and pessimism.⁶⁹⁵

6.5.6.3.3 Bad and very bad news, and pessimism

The case of *pessimism* is intuitive. After becoming aware of *bad news* affecting other sponsors, the *pessimistic* sponsor internalises an expectation to a greater likelihood that, in the foreseeable future, she finds herself choosing responses to enforceable obligations under distress. Today, this sponsor does not request a renegotiation. However, she renegotiates with third parties today in distress. This party today in distress might be tomorrow a monitor enforcing provisions against her. The perception that in the future she may find herself in need for renegotiating (her pessimism) induces her to build reciprocity with this sponsor whom today requests a readjustment after receiving *bad* (or *very bad*) *news*. Intuitively, with the hope of receiving similar favours, the *pessimistic* sponsor will *relax*⁶⁹⁶ her bargaining position and accept lower bribery from her peer under distress.

More rigorously, to the corrupted monitor -and consequently to all parties entering the bargaining stage- reciprocity brings positive value that increases the bargaining surplus and raises bargaining payoffs under the simplest Nash bargaining solution. We must not lose sight of the fact that, as in standard literature,⁶⁹⁷ higher payoffs regularly come associated with higher bribes.⁶⁹⁸ In our case, the wider surplus is compatible with lower bribes (cash transfers as elements of payoffs) simply because a fraction of that wider surplus is now extracted in the form of an expectation to reciprocity (a form of utility transfer to the *pessimistic* corrupted monitor). Hence, the amount of cash transferred (the monetary bribery that completes the payoff value) to the *pessimistic* monitor is smaller.

⁶⁹⁵ Note, these reactions are strictly rational -the framework does not consider behavioural aspects.

⁶⁹⁶ In the following paragraphs, I will show how reciprocity expectations enter the bargaining surplus thus in bribery values.

⁶⁹⁷ With literature comments on bargaining solutions, *cf.* p.95 and *ff.* in J. WATSON, *Strategy*, cit. J. F. NASH, "Equilibrium Points in n-Person Games", cit. K. BINMORE ET AL, "The Nash Bargaining Solution in Economic Modelling", cit. A. OKADA, "The Nash Bargaining Solution in General N-Person Cooperative Games", *Journal of Economic Theory*, vol. 145, 6, 2010, Elsevier Inc.

⁶⁹⁸ After compensating, bribes represent the shares of value that sponsors extract from the total readjustment surplus.

Smaller transfers of cash corresponding to bribes and wider surpluses invariably correlate with a higher value from readjusting. This expands the scope of sub-coalitions and increases the likelihood of unanimous readjustments due to the information flows revealing deteriorations in the environment. Finally, the extent of everything said grows with the convexities in costs of efforts and, naturally, with the degrees of risk aversion.

6.5.6.3.4 Good news and optimism

The case of *good news* leads to the opposite distortion from the environment. However, the strategic output is similar.

See *Annexe I*. Under *good news*, we observe three strategic differences with the cases of *bad* or *very bad news* to some of the parties. First, under *good news*, the sponsor updating information about the environment does not withhold but instead reveals information about the environment. Moreover, she reveals information to all sponsors. By doing this, she induces other sponsors to increase their complementary inputs in responses to the higher choices they can now expect from herself. Second, under *good news*, the sponsor updating information about the environment affecting her does not request a readjustment -involving compensations and bribes from her to other sub sponsors- but instead offers (sells) higher contributions⁶⁹⁹ in exchange for a price. Third, in contrast to the case of *bad* and *very bad news*, in the costs function of the sponsor receiving *good news*, the contributions that she offers to the project will be not costlier, but less costly. Hence, she will be now capable of extracting reciprocity value from the interaction by offering (or selling) contributions that she will deliver at a lower sacrifice.

The description of the causality between *optimism* and high value from readjusting follows a path analogous to that of *pessimism*. Reciprocity expands the bargaining surplus. This equates to higher bribes, but more of that bribery will be distributed in the form of reciprocity value -hence, cash transfers will be smaller. Larger bargaining surpluses correlate with a higher value of readjusting. This leads to wider sub-coalitions (the 2nd alternative) and more frequent unanimous readjustments (the 3rd alternative) in detriment of delivering efforts without renegotiating (the 1st alternative).

Strategically, there is no contradiction on postulating similar results from opposite distortions from nature. In both cases, the sponsors value the space for building

⁶⁹⁹ The contributions that she can commit not to deliver.

reciprocity. In both cases the value of reciprocity internalised in bargaining surpluses then results in greater returns from readjusting. It is the convexity in cost functions interplaying with risk aversion what induces the *pessimistic* sponsor (the corrupted monitor) to perceive value in reciprocity. The same interplay between the shape of the costs function and uncertainty allows the sponsor who receives *good news* (not the corrupted monitor) to accept giving away resources and build reciprocity at a lower cost.

6.6 The third alternative; choosing inputs after renegotiating for colluding unanimously against the FP

Let us observe the strategic aspects of the 3rd alternative, where the sponsor chooses inputs after renegotiating with all other sponsors. Next, I will omit aspects already described (the renegotiation process), add new elements unique of the case (control of the SPV), and exclude items no longer applicable. Save these aspects, the path of analysis will be analogous to that seen when observing the two other alternatives.

I will start by introducing the concept and the most general aspects of its feasibility. In the second place, I will present the principal-agent relationships. Then, I will proceed with the optimality of unanimous readjustments. In the last two sections, I will refer to the externalities to sponsors and the FP.

6.6.1 Concept and feasibility

Under this 3rd alternative, the sponsor updates information and finds that nature has increased costs of efforts beyond the thresholds described above. The sponsor under distress now no longer finds optimal renegotiating with some peers in an opportunistic sub-coalition. Instead, she prefers saving such costlier efforts after compensating and splitting benefits with all the other sponsors in the team, in unanimous collusion against the lender.

Structurally two aspects separate this alternative from the cases where the sponsor delivers actions without readjusting (the 1st alternative), or after forming a sub-coalition (the 2nd alternative). First, now all sponsors intervene in the readjustment process. This brings two further strategic effects: *i.* it broadens the spaces of actions that sponsors will readjust; and *ii.* it improves the internalisation capacity of sponsors both collectively and individually. Second, the entire group may now control the SPV and include provisions that they implement via the project company, beyond the risk allocation mechanism.

Unanimous readjustments and incompleteness. Notice how unanimous renegotiations cannot take place without some influences from nature. Below, we will see how there will be no choice of 3rd alternatives under a *no news* scenario. Without

changes in the environment (*news*), the sponsors would be confirming their beliefs about the initial conditions. Thus, under *no news*, sponsors' unanimous renegotiations not involving the FP cannot be treated as readjustments with strategic effect distinct to those of the initial contracting process.

Unanimous renegotiations and very bad news. Rationally, unanimous renegotiations require an environmental deterioration (*news*) sufficiently substantial for a sponsor prefer compensating and bribing all peers. However, the fact that she chooses to renegotiate with all other parties does not indicate that sponsors or the SPV will be receiving *very bad news*. As described in Chapter 5 and below, *very bad news* requires that after readjusting (in a Pareto improvement), all parties lose expectations of harvesting residual benefits from the SPV.⁷⁰⁰ Under *very bad news*, parties will renegotiate unanimously. However, unanimous renegotiations are not incompatible with residual benefits -*e.g.*, as in some the scenario of severe *bad news*.

6.6.2 The principal-agent relationships

Structurally, whenever a sponsor readjusts unanimously, we observe the same two tiers of tensions seen when contracting collectively with the non-recourse lender.

- First, sponsors unanimously implement incentives for them to deliver their best responses maximising team value. In this renegotiation, collectively, the sponsors are the agents of the FP as principal.
- Second, behind asymmetries of information, the sponsor responds individually to those incentives readjusted unanimously, to the distributions of property rights, and to the incentives enforceable by the FP on low-quality verifiable information. Hence, each sponsor is an agent of the entire team of sponsors and the FP as principals.

6.6.3 The optimality of unanimous readjustments

6.6.3.1 The internalisation capacities of the team

The unanimous renegotiation; SPV control. As advanced, the fact that all sponsors intervene in the renegotiation implies that the space for readjustments is now broadest. Concretely, now, the sponsors are no longer bound by any sponsors

⁷⁰⁰ As also shown in Chapter 5, *very bad news* comes with the strategic consequence that sponsors will spend efforts exclusively for *shading*; hence, *shirking* will be absolute, and the consideration of *risking* becomes no longer possible.

outside the sub-coalition who can enforce original agreements on verifiable and observable information of high quality. Now, all sponsors renegotiate only limited by the FP's capacities to enforce the original risk allocation mechanism, on the verifiable information of low quality that she receives.

Besides, the unanimity of renegotiations allows them to have the SPV control as the object of new agreements. *V.gr.*, the sponsors can exert control of the company and renegotiate agreements involving the SPV without the objections from sponsors outside sub-coalitions. Thus, as long as they do not trespass commitments as per the risk allocation mechanism and such trespasses are verifiable to the poorly informed FP, all agreements implemented by the SPV will now be open to readjustments.⁷⁰¹

The heaviest losses to total welfare. The widest renegotiations permit broader innovations for more significant departures from the technologically optimal as provided ex-ante, in the original implementation. This is the broadest *shirking*, *risking* and *shading* as identified in Chapter 5. This comes with the most significant impact to project capacities and subsequent externalities to the non-recourse lender.

The full internalisation of losses to residual benefits, and the highest dissipation of surpluses. With all sponsors taking part in the readjustment, compensations must now cover the losses internalised by all sponsors in their objective functions. The burden of compensating for the total losses before all sponsors join the renegotiation are consequently highest.

From this, the severity of *news* allowing the rational sponsor to find optimal bribing all peers must be necessarily higher than whenever sponsors renegotiate within sub-coalitions, or naturally than whenever the sponsors choose to deliver actions without readjusting.

Additionally, because of the largest number of sponsors intervening in the renegotiation, the dissipation of renegotiating surpluses is now highest. However, because the number of sponsors is now greatest, the last sponsor's impact in terms of dissipation of bargaining surpluses is mildest.

The depletion of incentives will be highest. With all sponsors intervening in the collective renegotiation for implementing the widest *shirking*, *risking*, and *shading*, the heaviest losses to project capacities also exacerbate all incentives distortions. The

⁷⁰¹ Notice how, despite of its implementation on externally enforceable provisions, the control of the SPV can be now decided (agreed upon and implemented) based on a relational interaction involving all sponsors.

SPV loses much of its capacities to distribute residual benefits. As shown in Chapter 5, SPV's capacities to issue residual benefits constitute the incentive powers of subordinated contractual rewards and property rights allocations.

With the losses of these capacities and the returns from non-contractible efforts, the sponsors perceive the strongest incentives for *shirking*, *risking*, and *shading* in their private responses. Backwards induction, the sponsors collectively internalise the losses of welfare expected from this non-contractible but estimable reactions in the calculus of compensations and bargaining surpluses.

As also analysed, all losses from collective and individual responses and all incentive distortions grow with complementarities' degrees. This is possible because the information flow allows parties to update reliable conjectures about the sponsors' responses and further under-invest. The deterioration of conditions and the flow of information then accelerate the project's deterioration, more likely revealing scenarios of *very bad news*.

6.6.3.2 The internalisation capacities of individual sponsors

Enforcement and the responses to contractual incentives. In contrast to what we saw under the 2nd alternative, now there are no sponsors withholding information within a sub-coalition or enforcing separate agreements amongst them only. Unanimous renegotiations now permit the revelation of higher quality information and the enforcement by all sponsors. Enforcement of renegotiations is consequently of the highest quality.

This is similar to what we observed when the sponsors delivered private responses without renegotiating (the 1st alternative). Therefore, individual best responses will be closest to what sponsors renegotiated unanimously in collusion against the lender.

The value of reciprocity; relational cooperation (pessimism). With all the sponsors intervening in the sub-coalition, the flow of information about the (necessarily severe) deteriorations in the environment will reach all individuals. All sponsors update beliefs about the project's evolution and the likelihood that *news* affects them individually in a later stage. Many of them will react *pessimistically*.

In this environment, the value that the sponsors attribute to reciprocity is highest. This increases the likelihood of unanimous renegotiations. By facilitating opportunism with consequential losses to project capacities, it also increases the scenarios in which the SPV will fall within *very bad news* thresholds.

Information and the proliferation of renegotiations. As remarked, the unanimous participation of sponsors in the renegotiation facilitates the flow of information about the environment's deteriorating conditions. This also maximises the likelihood that

other sponsors update information about *news* affecting them too. The flow of information maximises the chances that some sponsors initiate further renegotiations after realising that *news* affects them. With all the sponsors participating in the initial renegotiation, the likelihood that some of them participate in two or more rounds of readjustments is also highest. This also exacerbates the under-investment by such sponsors updating information about reductions in sponsors' complementary inputs in other sub-coalitions (informational synergies).

6.6.4 Externalities to sponsors

In principle, with all sponsors receiving compensations, the renegotiation appears as a Pareto improvement. Consequently, there are no sponsors outside a sub-coalition who could perceive negative externalities from the collective readjustment. Additionally, as also said, besides compensations up to disagreement points, all sponsors extract a stake of readjusting surplus.

Losses of welfare only affect the sponsor requesting the renegotiation after receiving *bad news*. This sponsor now allocates a fraction the negotiating surplus in the aggressive bargaining process after compensating all peers. This aspect is common to the case of sub-coalitions.

However, with all the sponsors involved in the bargaining process, we observe two distinct implications. First, now there are no sponsors outside the sub-coalition receiving externalities necessary for the sub-coalition to produce positive welfare beyond the benefits to the sponsors under distress. The possibilities that the renegotiation produces a positive value (not counting on the benefits to the sponsors under distress) depend exclusively on the externalities to the non-recourse lender. Second, with all the sponsors intervening in the renegotiation, the dissipation of readjustment surpluses is now most significant.

Naturally, with all sponsors involved in the renegotiation, all team members can update information and conjectures about their reciprocal responses. This eliminates the free-riding problem (informational rents) described under the 1st and 2nd alternatives.

6.6.5 The externalities to the FP

Ceteris paribus, under the third alternative, externalities to the FP are heavier than under the 1st or 2nd alternatives, where the sponsors deliver inputs without readjusting, or after forming a sub-coalition. This results from the broadest spaces for innovating opportunistically (*shirking*, *risking*, and *shading*) collectively. Critically, under this 3rd alternative, the incentives for *shirking*, *risking* and *shading* in individual responses are also the strongest.

The most powerful incentives for *shirking*, *risking*, and *shading* collectively result from the greater value that such renegotiations bring to the sponsor under distress. These benefits should surpass the losses that all the sponsors internalise in virtue of the renegotiation process. The feasibility of *shirking*, *risking*, and *shading* is also highest because all the sponsors refrain from enforcing and withholding enforcement information from the FP.

The incentives for the sponsors to *shirking*, *risking*, and *shading* in their private individual responses are also the strongest because of the most dramatic losses of the project's capacities to produce welfare beyond non-recourse debt costs.⁷⁰² As a result, the negative externalities to the FP are most substantial under this 3rd alternative.

6.7 The invariable domination of news; from the 1st to the 3rd alternatives

Above, I analysed the value of delivering contributions without renegotiating, after readjusting opportunistically within sub-coalitions, or after renegotiating with all the sponsors unanimously against the FP. This section shows how the incentives for responding opportunistically under the three alternatives evolve as the environment deteriorates from *no news*, through *bad news*, to *very bad news*. I will begin by emphasising the defining relevance of *news* in general.

6.7.1 The strategically defining importance of news

I will now show how, with the deteriorations of the environment (*news*), the value of responding opportunistically after renegotiating grows faster than that of responding to incentives without renegotiating. Thus, after anticipating increments in the input costs or losses in the expectations,⁷⁰³ beyond a certain point, the sponsor necessarily renegotiates. Whether the sponsor renegotiates with one, many, or all sponsors depends on many variables. However, of these factors, the deteriorations in the project's expectations (*news*) always dominate.

For simplicity, I will now articulate the analysis with eyes on the incentive- and

⁷⁰² However, with all the sponsors involved in the enforcement of renegotiations, the spaces for private opportunism (a function of the asymmetries of information and contractual incompleteness of these renegotiations) will be smallest.

⁷⁰³ It is irrelevant whether *news* affect the marginal value or the marginal cost of her actions responding to enforceable agreements -*i.e.*, the 1st or the 2nd tiers of incentives analysed in Chapter 5.

welfare-value of opportunism, not on the returns from socially desirable efforts.

When choosing the 1st alternative, as in the most straightforward bilateral moral hazard frameworks, the sponsor withholds valuable (costly) contributions (the marginal value of her hidden *shirking*, *risking* and *shading*) as a function of two variables. First, the enforcement risks -a function of the asymmetries of information; second, the fraction of the total impact to the project from her opportunistic savings that she internalises via her expectations to dividends and subordinated contract claims (the marginal⁷⁰⁴ costs of her opportunism).

In contrast, when the sponsor chooses the 2nd or 3rd alternatives, she bribes one or more other sponsors for withholding enforcing information and cooperating for implementing opportunistic innovations. The withholding of information expands the spaces within which she (and the other sponsors) can now save more of those costly efforts without triggering enforcement (the marginal value of renegotiating with extra sponsors). The sponsor does this at the marginal costs they all perceive in the expected value of the subordinated contracts' claims and expectations to dividends in their hands (only).

Then, if the deteriorations of the environment (*news*) govern the value (savings) of opportunism, the coordination with corrupted monitoring sponsors dictates the spaces for such abuses. The sponsor renegotiates whenever the expected value of the savings in virtue of the opportunistic cooperation net of the costs of compensating and bribing all cooperating parties⁷⁰⁵ is higher than the expected savings she could otherwise keep behind asymmetries of information should she deliver her responses without renegotiating.⁷⁰⁶

From a different stance, the 1st alternative feasibility depends on the value of the savings that a sponsor extracts with hidden actions -within the limited spaces of the asymmetries of information-, net of the subsequent welfare losses that she internalises via her shares of equity and contracts. By renegotiating with corrupted monitors (the 2nd alternative), she can remove the boundaries of the asymmetries of information (the spaces for hidden actions) thus expanding the savings at the identical marginal costs of (compensating) loses in subordinated contracts and dividends (of the now many opportunistic parties). Thus, renegotiating with other

⁷⁰⁴ They are *marginal* with respect to the choice of the sub-coalition size.

⁷⁰⁵ Her value from the 2nd or 3rd alternatives.

⁷⁰⁶ Her value from the 1st alternative

sponsors permits the extraction of the difference in the marginal value of further savings and the costs of compensating the opportunistic parties -for whatever value that is higher than the savings she obtains behind asymmetries of information without renegotiating.

This differences in values depend on the magnitude of savings. The value of savings grows as a function of *news*. Then, with sufficiently significant deteriorations in the environment (*news*) the sponsors will renegotiate. Finally, *news* defines the willingness to renegotiate with one, with many, or with all the sponsors.

Many other factors interfere with the speed with which the sponsors react by choosing alternatives after receiving *news*. I have analysed them above, and I will revisit them in the following chapters when I remark their implications to the legal treatment of FPCs. These include the distributions of property rights, the seniority of claims, the asymmetries among the many sponsors individually, the complementarity quality-enhancing efforts and innovation-implementing efforts, the value of unanimity for controlling the SPV now opportunistically, or how *news* influence the *pessimistic* or *optimistic* attitudes of the renegotiating sponsors. Finally, the sub-coalitions' size also governs the externalities to the sponsors and the FP and the proliferation of other renegotiation processes.

Below, we will see how in the scenario of *no news*, without changes in the environment, the sponsors deliver responses without renegotiating. Small sub-coalitions are possible only behind the asymmetries of information that survived the imperfect initial contracting process. Parties cannot renegotiate unanimously under *no news*. Under *bad news*, the value of savings grows, the sponsors implement larger sub-coalitions in detriment of the first alternative of responding without renegotiating. Unanimous collusions now become possible. Finally, under *very bad news*, the scenario in which the sponsor loses their perspective of harvesting residual benefits, they renegotiate unanimously and only respond with *shading*. Let us see how this happens.

6.7.2 No news

As described in the introduction, in the scenario of *no news*, the sponsors update information and confirm that nature has evolved as initially expected. The return functions of all individuals consequently remain unaffected. As also anticipated, the evolution of the environment does not affect the asymmetries of information.

Consequently, without changes in the environment, some space for opportunism will still exist due to the original contractual imperfections. Subsequently, under *no news*, we will find *shirking*, *risking* and *shading* only as a function of pre-existing

asymmetries of information but not as a result of extra incentives produced by costs unexpectedly influenced by nature.

6.7.2.1 The 1st alternative: delivering inputs without renegotiating

Under *no news*, without changes in the environment, there are no unexpected costs or losses in the value of contributions that justify bribing other sponsors in exchange for cooperation in saving them. The sponsor consequently chooses her contributions behind asymmetries of information without renegotiating with any other party. In most of the scenarios, the sponsor will consequently choose her responses without renegotiating. Of the impact to the total project capacities from her *shirking*, *risking* and *shading*, she only internalises some losses in the expected values of her subordinated contractual claims and future dividends.

Without any sponsor renegotiating, the asymmetries of information between her and the best monitor will be small. Hence, her spaces for behaving opportunistically will be narrow. However, because her capacity to internalise her actions' total marginal costs ⁷⁰⁷ is small, her incentives to withhold contributions will be strong. Also strongly she will free-ride on the efforts of the rest of the team members who will choose complementary inputs at high levels, ignoring her opportunism (the informational rents she extracts). However, because she does not collude, the total externalities will be small and dissipate amongst all the other sponsors. Additionally, without renegotiating, the sponsor does not consider the opportunity costs of not bribing extra sponsors for exerting SPV's control opportunistically.

With mild opportunism, the effects of complementarities quality-enhancing will be weak. The complementarities of innovation-implementing efforts will be strategically irrelevant to a sponsor not coordinating with third parties and with little space for innovating privately. Without *news*, there cannot be *optimism* or *pessimism* affecting future relational interactions. Without *news*, there cannot be any derivative renegotiations. Finally, under *no news*, when the sponsor does not renegotiate, the feasibility of opportunism and the externalities to other sponsors and the FP are smallest.

6.7.2.2 The 2nd alternative: renegotiating within a sub-coalition

Without *news* affecting the costs or the benefits from contributions, the sponsor can only implement sub-coalition within the spaces allowed by the asymmetries of

⁷⁰⁷ *I.e.*, the fraction corresponding to her contract claims and expectations.

information that survived the initial contracting. This includes the provisions of the risk allocation mechanism that the FP enforces against the SPV and the sponsors. More relevantly, this also applies to the provisions that the sponsors implement and enforce relationally on verifiable and observable information of high quality, beyond the risk allocation mechanism.

With little incentives of saving costlier or less valuable contributions, the scope of sub-coalitions will be minuscule, allowing for similarly small spaces for readjusting. However, because their share of total equity and contracts are small relative to the total (a situation similar to the one described above), the free-riding problem is strong. The impact of informational rents will dissipate to the rest of the sponsors. With a small sub-coalition, the sponsors do not consider the value of bribing further sponsors for controlling the SPV opportunistically.

Just as above, without *news* and mild opportunism, the effects of complementarities of quality-enhancing actions are weak. However, the innovation-implementing efforts now began to acquire strategic relevance for implementing *shirking*, *risking* and *shading* within the sub-coalition. With few sponsors cooperating opportunistically, the enforcement capacities within the sub-coalition will be weak, and those outside the sub-coalition will remain strong.

Additionally, without *news*, there cannot be *pessimism* or *optimism* affecting relational interactions or any proliferation of derivative renegotiations. Finally, the total externalities to both the FP and the sponsor will be small, and when reaching other sponsors will dissipate.

6.7.2.3 The 3rd alternative; the unanimous collusion

Under *no news*, sponsors cannot renegotiate unanimously. Simply, from the strategic stance, without changes in the environment, a unanimous renegotiation would be an extension of the initial contracting.

6.7.3 Bad news

6.7.3.1 The environment

Let us observe the scenario where one or more sponsors update information and observe that nature has negatively affected the returns from their efforts. In the same path as above, let us observe the evolution of each alternative's preferability as a function of *news*.

6.7.3.2 1st alternative: delivering inputs without renegotiating

Now, after receiving *bad news*, the sponsor perceives stronger incentives for

shirking, risking and *shading*. However, without renegotiating, the sponsor still finds the boundaries of the asymmetries of information between her and the best monitor enforcing provisions. Thus, opportunism choices grow. However, because of the enforcement risks (a function of the unchanged asymmetries of information), they will not increase in proportion to the environment's deteriorations (the losses of returns from efforts). As shown below, as the environment deteriorates, the sponsor will channel the incentives for withholding costly efforts via sub-coalitions in detriment of the frequency of scenarios in which they deliver responses without renegotiating.

Let us restrict our attention to the aspects that differ from those analysed above. After receiving *bad news*, the sponsor becomes moderately *pessimistic* about her perspectives of finding herself in distress in the future. This induces her to accept renegotiations from third parties in more relaxed terms. This also favours the proliferation of sub-coalitions when initiated by third parties.

Just as above, externalities to other sponsors dissipate among the many of them. The same is true for the informational rents. Finally, the total externalities to other sponsors and the FP are now higher than under *no news*. However, they are still milder relative to what we will see below when parties renegotiate in sub-coalitions or unanimously.

6.7.3.3 2nd alternative: Renegotiating within a sub-coalition

The *bad news* scenario in which the sponsor chooses the 2nd alternative resembles the characterisation seen in earlier sections. The deteriorations in the environment increase the value of saving contributions whose value is now higher when used by the sponsor for something else than when allocated to the project in compliance with enforceable provisions. With the now higher value of the saved contributions, the sponsor splits benefits after compensating all the corrupted sponsors for the losses they internalise in their subordinated contracts and expected dividends.

As conditions further deteriorate, the value of renegotiating with few or with many sponsors (this 2nd alternative) grows faster than the value of choosing efforts privately without renegotiating (the 1st alternative). This is simply because the 2nd alternative allows the sponsor under distress to escape the boundaries of the asymmetries of information and buy valuable spaces for withholding costlier contributions at the marginal costs of compensating sponsors. Hence, as conditions further deteriorate, the sponsors will eventually never recur to the 1st alternative and always renegotiate.

As analysed in earlier sections, the sponsors collude for *shirking, risking*, and *shading*. Of the consequences of their actions, they internalise only the effects that

the total losses of project capacities bring to their aggregated expectations from subordinated contracts and future dividends. As the sub-coalition grows and the spaces of opportunistic actions broaden, the sponsors within the sub-coalition begin appreciating the strategic value of complementarities of quality-enhancing and innovation-implementing efforts valuable for implementing *shirking*, *risking*, and *shading* both collectively and privately.

With the larger sub-coalition, the capacities of the sponsors to enforce agreements relationally increase. In the same proportion, the enforcing powers of those outside the group decrease. Better internal enforcement increases the sub-coalition value and scope for more widespread *shirking*, *risking*, and *shading*. This result from the changes in their access to information and their varying bargaining threats.

However, more individuals holding more subordinated contracts and stakes of property rights in the SPV now internalise more of the total marginal losses they cause to the project. With broader sub-coalitions, the sponsors note the opportunity costs of not bribing the remaining sponsors outside the sub-coalition as a means for gaining the unanimity necessary for controlling the SPV opportunistically.

In contrast with the case of *no news*, the information about the environment's deterioration spreads to the many sub-coalition members. This results in *pessimism*. *Pessimism* increases the value that the sponsors attach to relational cooperation smoothing the bargaining processes and lowering the costs of expanding the sub-coalition. The spread of information and *pessimism* also results in the proliferation of larger sub-coalitions. The larger sub-coalition produces more externalities that now concentrate in fewer individuals outside the sub-coalition and the FP. The same applies to the severity and flows of informational rents.

Finally, as conditions further deteriorate, the sponsors will invariably renegotiate. Thus, parties will find wider sub-coalitions growing also in frequency in detriment of scenarios in which the sponsor choose the 1st alternative of delivering responses without renegotiating.

6.7.3.4 3rd alternative: the unanimous collusion

Finally, under *bad news*, as conditions worsen, eventually, the sponsor finds optimal renegotiating with all the sponsors. Additionally, as conditions worsen, unanimous renegotiations will more frequently displace sub-coalitions as the preferable alternative. Strategically, as analysed above, the 3rd alternative is not an extension of sub-coalitions.

Concretely, now with all the sponsors intervening in the renegotiation, the asymmetries of information remain strategically relevant only to enforce collective

renegotiations for *shirking*, *risking*, and *shading*. In other words, the sponsors no longer renegotiate within the spaces for choosing hidden actions that some sponsors outside the sub-coalition will define as a function of their enforcement capacities. Without such informational and enforcement risk boundaries, spaces for readjusting collectively are now broadest. They are only limited by the poorly-informed FP enforcing the likely outdated risk allocation mechanism. Moreover, the sponsors can now avail from their control of the SPV for opportunistic purposes. Additionally, with all the sponsors involved in the opportunistic decisions, the enforcement of *risking*, *shirking*, and *shading* over individual sponsors is now of the highest quality.

Remarkably, when acting unanimously, the team now internalises the full impact from the renegotiations except for the FP's externalities. There are no externalities to sponsors (the readjustment is a Pareto improvement). There are also no informational rents from some sponsors to others.

The complementarities of quality-enhancing efforts come with a twofold effect. On the one hand, they expand the losses associated with the opportunism against project welfare (deterrence). On the other hand, they increase the value of opportunistic solutions (positive incentive). In sharp contrast, the synergies of innovation-implementing efforts are now highest and most valuable for adapting technologies to the *shirking*, *risking*, and *shading* as decided collectively.

Finally, the spread of information about *bad news* results in *pessimism* with its effects in bargaining outputs. The flow of information and *pessimism* then favours the proliferation of derivative renegotiations more than in any other scenario.

Under very *bad news*, the spaces for renegotiating are broadest. However, the sponsors still expect residual benefits. Thus, they do choose some socially desirable contributions. Thus, the externalities to the non-recourse lender are stronger than in any other scenario excepting for that of *very bad news*.

6.7.4 Very bad news

As described in the introduction and mentioned above, the scenario of *very bad news* is defined by two aspects. First, to a single sponsor, the severity of the deterioration in the environment is such that she finds optimal delivering inputs only after readjusting with all the sponsors (the 3rd alternative). Second, after renegotiating - *i.e.*, within the Pareto improvement spaces- and implementing (team) value-maximising innovations, the sponsors expect that the project will produce value similar to that of the non-recourse debt.

6.7.4.1 The rationality of all the sponsors

The scenario of *very bad news* shares most of the strategic features with the case in which the sponsors choose the 3rd alternative under *bad news*. However, the fact that the sponsors expect no residual benefits comes with critical implications.

First, with the project producing wealth similar to that of the non-recourse debt, after responding as collectively and privately desirable to the team, the sponsors will not harvest residual benefits. In other words, they do not expect returns from their subordinated contracts and future dividends.

Second, without expectations from residual benefits, the rational sponsors withhold all non-contractible contributions expanding total project welfare. As I have analysed in Chapter 5, this is *shirking* fully. With full *shirking*, we cannot consider the technologies that the sponsors choose to expand residual benefits (*risking*). Finally, more critically, the lack of returns from residual benefits implies that the sponsors will no longer internalise the effects from the innovations they implement for complying with the obligations of the risk allocation mechanism -the obligations that the FP enforces despite the circumstances. Consequently, the sponsors will devote their innovation-implementing efforts exclusively to devise alternative solutions minimising compliance costs, but without concern for the effects of such actions on total welfare (*shading*).

Third, the sponsors implement *shading* both collectively and privately. In other words, they collectively enforce solutions for *shading* as desirable to the team; however, behind the asymmetries of information, each sponsor will implement further *shading* in her private responses. In other words, without internalising the consequences of her actions to project's and SPV's capacities, the sponsor now implements innovations for further lowering the costs of compliance with both her obligations under the risk allocation mechanism and those now enforceable by the team of sponsors (for *shading* as collectively desirable). These actions lead to externalities to other team members (*cf.* the tensions analysed when presenting the 3rd alternative above).

6.7.4.2 Externalities to the FP

Under *very bad news*, the negative externalities to the non-recourse lender are greatest. In this scenario, the likelihood that the SPV fails to repay the senior debt to the FP is highest.

However, this does not result from the deteriorations of the environment alone. Notice how the threshold of *very bad news* does not imply insolvency. The greatest losses to the project capacities and consequently to the repayment possibilities of the

SPV results from the coordinated *shading* with which the sponsors respond to the *very bad news* that deprives them of the fruits of their efforts non-contractible to the FP.

This holds for both the collective actions and private responses. As a result, under *very bad news*, the likelihood that the FP finds her non-recourse claims served is the lowest of all the scenarios and circumstances.

Of relevance to the legal treatment, *shading* requires an innovation that becomes feasible only after parties update *news* about changes in the environment (*very bad news*). Thus, in its roots, *shading* does not reflect a moral hazard problem, but one of incompleteness of the risk allocation mechanism.

Contractual incompleteness is a problem that can be mitigated by improving the quality of default rules. That is, with legal institutionalisation reducing the transaction costs of contractually defining expected outputs. This aspect is critical to the FP who relies on the completeness of a risk allocation mechanism before internalising uncollateralised debt risks, ultimately defining the feasibility of FPCs.

6.8 The opportunism and the problem of costs overruns in PFCs

Chapter 5 has advanced to how *shirking*, *risking*, and *shading* could lead to cost overruns in large projects. Chapter 6 showed how the opportunistic incentives that guide the sponsors' responses evolve as conditions deteriorate. As a contribution of this study, Chapters 5 and 6 have shown how in response to such losses of expected returns from the SPV, the sponsor not only withhold socially desirable and privately costly inputs. Instead, they also implement innovations for saving the costs of complying with enforceable arrangements without internalising project losses. The incentives for behaving opportunistically appear soon, as soon as the sponsors perceive mild losses in SPV's capacities to distribute residual benefits.

As analysed here in Chapter 6, the sponsors advance in this direction not only collectively but also in their private responses after renegotiating with some or with all other sponsors. Moreover, we also saw how such incentives to collude opportunistically grow as conditions deteriorate, and the information about both *news* and peers' responses delivering complementary contributions begins flowing to the renegotiating sponsors.⁷⁰⁸ These responses of *shirking*, *risking*, and *shading* harm the project more than the *news*. These forms of opportunism idiosyncratic of

⁷⁰⁸ Cf. the proliferation of sub-coalitions.

FPCs -not *news* alone- bring the SPV to its insolvency boundaries.

Strategically, the abovementioned implications to the problems of cost overruns are manifold, ex-post and ex-ante. These relate not to the sponsors but the positions of the FP and governments.

First, recall, parties use FPCs for advancing highly specific projects. Additionally, the sponsors are not responsible for the repayment of the senior non-recourse debt. Consequently, as the SPV loses its capacity to complete the project and repay its debts, two stakeholders lose bargaining power. These are the governments (or the off-takers) in PPPs and the FP.

The exposure of the FP to non-recourse risk has been analysed in many places before. However, if third parties provide collateral for additional financing (no longer non-recourse), the rational lender will provide further debt financing. Intuitively, the returns from collateralised capital now consist of the interests for the capital as in the money markets and the extra benefits associated with increasing the chances of reviving the (critically highly specific) project under distress. Consequently, the lender provides further financing as a function of collateral and project perspectives.

Second, also ex-post, the government faces several costs (including political pressure) from assuming the failure of a large, very costly, and highly specific project. The possibilities of saving these costs increase the value of accepting aggressive renegotiation threats from sponsors. The lender's willingness to provide financing then increases the government's value of renegotiating with the sponsors.

Third, ex-ante, the sponsors accessing information of superior quality about project risks anticipate the above. Backwards induction, during the negotiation process with the FP and the government, the sponsors will internalise the value of withholding information about scenarios that they foresee but will not reveal. The sponsors will do this as at the marginal costs of losing competitiveness in the terms of contracting. This results in loss of implementation quality and subsequent deliberate incrementations of cost overrun risks.

The above propositions are consistent with findings in the literature of cost overruns, where empirical analyses focus on both sponsors and governments' willingness to tolerate contractual defects and relaxed renegotiating terms.⁷⁰⁹

⁷⁰⁹ Cf. B. FLYVBJERG, "Design by Deception", cit. and B. FLYVBJERG ET AL, "Underestimating Costs in Public Works Projects: Error or Lie?", cit.

6.9 Conclusions

The chapter has described how, as the environment deteriorates, the sponsors perceive increasing incentives for behaving opportunistically in their private responses.

No news. Under *no news*, without changes in the environment, the sponsors do not perceive renegotiating incentives for adapting to unforeseen circumstances. In this scenario, the 1st alternative of delivering contributions without renegotiating dominates. Each sponsor implements *shirking*, *risking*, and *shading* within the spaces allowed by the information asymmetries between them and the best monitoring peers. The externalities to other sponsors and the FP are, in this scenario, minimal.

Bad news. As the environment deteriorates, some sponsors now prefer delivering private responses after readjusting after forming opportunistic sub-coalitions of sponsors. Collective (unanimous) readjustments are now possible and growing in likelihood as the project's capacities deteriorate. The degrees of complementarities of quality-enhancing inputs produce significant losses that the sponsors in sub-coalitions internalise only partially.

As sub-coalitions widen, the value of complementarities, innovation-implementing efforts, and the enforcement capacities for readjusting grow inside the sub-coalition and decrease for the rest of the team. The value of sustaining cooperation relationally (in *pessimism*) favours the readjusting parties' positions, thus increasing the scopes of sub-coalitions and the likelihood of collective readjustments -the case in which enforcement capacities are highest. The enlargement of sub-coalitions comes with further losses to total welfare and negative externalities to the fewer sponsors outside the sub-coalition.

As the SPV misses its capacities to produce residual value, ownership gradually loses its incentive powers. With this, the strengths of conflicts in PFCs progressively grow. The sponsors devote more of their budgets to *shading*. This is true both collectively within the sub-coalition as well as in individual best responses. The negative externalities to the FP increase with strategic inefficiencies as the environment deteriorates.

Very bad news. Finally, under *very bad news*, the sponsors lose their hopes of

harvesting positive (marginal and total) benefits from the SPV.⁷¹⁰ The allocations of property rights consequently lose their powers as a mechanism for incentivising non-contractible efforts. The sponsors readjust unanimously and collectively to implement only *shading*. In other words, they devote their innovation budgets to finding cost-saving solutions without internalising losses of welfare externalised to the SPV and the FP. This is true for both collective actions (as in Chapter 5) and private responses to all incentives.

Collectively, when renegotiating unanimously, the sponsors now control the SPV and use it opportunistically without the objections of any sponsors otherwise outside the sub-coalition. The boundary of readjustment is now drawn by the enforcement capacities of the FP on verifiable information of low quality.

Asymmetries of information are now relevant only regarding the individual responses by sponsors to the readjusted incentives. With all sponsors taking part in the renegotiation, the grand coalition's enforcement capacities are highest. Highest are also the effects of *pessimism* in bargaining processes.

Lastly, as described in earlier chapters, under *very bad news*, with sponsor implementing *shading* solutions, the wealth expected from the SPV is necessarily lower than the face value of the non-recourse debt. When sponsors face *very bad news*, the FP will likely fail to find her claims adequately served.

The chapter has also made a first approach to analysing the strategic impact of three key variables to all contractual interactions.

1. ***Asymmetries of information.*** The chapter identified the distinct strategic impact of the asymmetries of information, not only between the sponsor choosing inputs and all other individuals but among the sponsors outside the sub-coalition. This second type of asymmetries determines the capacity of sponsors entering the sub-coalition to open additional spaces for hidden actions.
2. ***Complementarities.*** The chapter observed the strategic value of quality-enhancing and innovation-implementing effort's complementarities. The quality-enhancing complementarities increase the costs of compensating

⁷¹⁰ Under *very bad news*, after the sponsors implement innovations as desirable to the class (*shirking*, *risking*, and *shading* in unanimous collusion) - the *expected* capacities of the SPV to produce wealth are similar or lower than the face value of the non-recourse debt.

renegotiating sponsors when forming sub-coalitions or readjusting unanimously. Complementarities of quality-enhancing efforts, therefore induce sponsors to deliver contributions without renegotiating. The opposite is true for complementarities of innovation-implementing efforts. Complementarities of innovation-implementing efforts increase the value of coordinating opportunistic efforts with renegotiating sponsors. They consequently favour larger sub-coalitions and unanimous renegotiations.

3. **Ownership.** The chapter has characterised property rights' strategic value to induce sponsors to choose non-contractible efforts in FPCs. As in the property rights-focussed theories of the firm, the sponsors should allocate ownership to the sponsors whose non-contractible efforts are of highest value to the project. The study also showed the inefficiencies of the moral hazard in team problem. This chapter also saw how ownership loses its effectiveness as an incentive mechanism as the project's expected value decreases to deplete fully under *very bad news*.

In addition to the above variables that are relevant to all contractual interactions, the chapter has explored other strategic aspects fundamental to the case of PFCs:

1. **Shirking, risking and shading.** *Shirking, risking, and shading* have been identified in Chapter 5 from the stance of the sponsors as a class. Such approach corresponds to the analysis of unanimous readjustments (the 3rd alternative for choosing inputs after renegotiating with the now colluding unanimity of sponsors). Chapter 6 has now characterised the three alternatives -choosing inputs without renegotiating, after renegotiating with a sub-coalition, or after readjusting with all sponsors- under *no news, bad news, and very bad news*.
2. **News, information, and the value of reciprocity.** The chapter observed the evolution of reciprocity's value as a function of information flow and the severity of *news*. The chapter also explored the value of *pessimism* and *optimism* resulting from the updating of *news* and their impact on the value of building relational cooperation. As in standard literature, the value of reciprocity has been presented as an expectation of obtaining future benefits from a party requesting a readjustment under favourable terms and distress today. Consequently, the chapter showed the value of building reciprocity as increasing bargaining surpluses without increasing monetary transfers. Reciprocity consequently facilitates renegotiations both within sub-coalitions and unanimously.
3. **The enforcement capacities.** With sub-coalition size, it also grows the

opportunistic group's capacity to enforce provisions within the sub-coalition. In the same proportion to how that happens, the capacities of the sponsors outside the sub-coalition to act against opportunistic arrangements within the sub-coalition decrease. Both aspects result from the capacity to gather information and place enforcement threats as functions of the changing number of enforcing sponsors inside and outside the sub-coalition.

4. ***Information and the proliferation of sub-coalitions.*** The spread of information taking place during renegotiations results in the proliferation of derivative sub-coalitions. Intuitively, when renegotiating, some sponsors receive information about both the environment's changes and the expected reactions by best-informed peers within sub-coalitions. This information allows sub-coalition members to update information about *news* affecting them too. The sponsors taking part in more than one sub-coalition perceive informational synergies -they reduce their contributions more strongly as per the opportunism by more sponsors within both sub-coalitions. The sponsors not taking part in both readjustments will fail to readjust accordingly (see next).
5. ***Informational rents.*** As sub-coalitions grow, the outsiders fail to update information about opportunistic withholding of complementary inputs. As a result, these inputs providers outside the sub-coalition choose input levels based on outdated conjectures about the response of complementary inputs from sub-coalition members. The benefits that sub-coalition members extract from these inputs constitute informational rents. This also happens under the 1st alternative, when the sponsor behaves opportunistically without renegotiating. The same problem does not occur under the 3rd alternative when all sponsors update information about their actions.
6. ***The marginally decreasing costs of bribing extra sponsors into sub-coalitions. The opportunistic spaces growing exponentially with each extra sponsor.*** Each extra sponsor entering the sub-coalition implies that the readjusting surplus will dissipate within a group now including an extra member. The impact of each extra member to the bargaining surplus consequently decreases with the number of sponsors inside the sub-coalition. It is easy to show how the *initial* sub-coalition members produce the most substantial impact in terms of dissipation of net benefits (and individual bargaining outputs).

Additionally, as the sub-coalition grows, that extra sponsor now withholds information about all pre-existing sub-coalition members. Consequently, the

larger the sub-coalition (and the greater the number of sponsors within the sub-coalition), the wider the spaces for hidden actions that will grow with each extra corrupted monitor.

7. ***The increasing externalities to the fewer sponsors outside sub-coalitions.*** Sub-coalitions are Pareto improvement arrangements. The sponsors cooperating opportunistically receive information about the losses in welfare and incentives. They enjoy a moment for receiving compensation before cooperating. The sub-coalitions scopes define the magnitudes of the externalities to the sponsors outside the sub-coalition and the FP. Finally, as the sub-coalition grows, the heavier externalities fall against fewer non-cooperating sponsors.
8. ***The depletion of incentive powers as a function of renegotiations and news.*** In the path lead by Chapter 5, Chapter 6 has identified how, as the environment deteriorates, incentive powers from both contractual arrangements and distributions of property rights deplete as a function of increasing readjustments.

The total residual value produced by the SPV decrease with readjustments that follow deteriorations in the environment. The consequently higher senior non-recourse debt-to-residual benefit ratio results in sponsors exerting actions whose marginal benefits accrue to the FP. This induces *shirking*, *risking*, and *shading* as characterised in Chapter 5. Eventually, under *very bad news*, depletion of incentive powers (sponsors will harvest no residual benefits) is absolute. Sponsors exclusively *shirk* and *shade*. The tensions grow with the complementarities of inputs.

9. ***The opportunism and the problem of costs overruns in PFCs.*** As the conditions deteriorate, the sponsors renegotiate aggressively against the FP and governments (the off-takers). Their capacities to extract benefits stems from the high degrees of project specificities. The non-recourse lender receiving collateral or sureties provides further debt at the extra value of saving the project's project -and repayment expectations of her non-recourse titles. The government extends projects terms for the same reasons (saving a highly costly specific project), perhaps facilitated by the FP's financial assistance. Backwards induction, the above affects the quality of the initial negotiation. These considerations come in line with empirical studies.
10. ***The case of good news.*** For completeness, in *Annexe I*, the chapter also identifies the main strategic effects of *good news*.

Annexe I - Good news

Let us describe the strategic aspects of the case of *good news*. This is the scenario where the sponsors discover that nature has improved the conditions under which all parties contracted initially. Below, we will see how the sponsors now perceive incentives for revealing rather than for withholding information. Additionally, when readjusting, instead of bribing other sponsors with the object of withholding costly contributions, sponsors now sell inputs that they can commit not to deliver.

Below, I also show how, under *good news*, new strategic tensions reveal as a function of the new relationships among sponsors. With a greater capacity to deliver inputs at lower costs, the pre-existing conflicts appear always moderated. Furthermore, in terms of expected values, all parties, including the FP, receive positive externalities. The lender perceives these benefits as an increase in the likelihood of repayment of her non-recourse claims. Let us see how this happens.

Property rights; the incentives to reveal information

Good news and inputs expanding dividends. Under *good news*, the efficient function of ownership as a means for incentivising non-contractible efforts is highest. As clarified under other scenarios, this does not mean that the moral hazard in team induced under-investment problem retreats. This free-riding problem results from the fractioning of ownership. Thus, sponsors cannot avoid the problem that stems from the dissipation of the marginal values of (individual returns from) their contributions to the team's efforts.⁷¹¹ However, *good news* lowering the costs of efforts (or increasing their value) permits higher total value from the same stakes of ownership that a sponsor holds in the SPV.

Complementarities and the value of revealing information. As described in other scenarios, under complementarities, the choices of inputs from one sponsor dictate the marginal value of other individuals' efforts. Consequently, the sponsors receiving *good news* will perceive incentives for revealing *good news* to all other sponsors.

By revealing *good news* information, the sponsor brings two consequences to the other sponsors. First, other sponsors update conjectures about the increase in the expected choices of complementary inputs by such individual receiving *good news*. Second, by updating beliefs about the higher choices of synergetic inputs from the

⁷¹¹ B. HOLMSTRÖM, "Moral Hazard in Teams", cit.

sponsor receiving *good news*, the sponsor also informs other sponsors about the increment in their contributions' marginal values. This should lead to higher input choices in their responses. Then, the higher complementarity of inputs from the sponsors receiving information also increases the marginal value and, consequently, the sponsors' returns and choices of efforts of the sponsor revealing information about *good news* in the first place.⁷¹²

Recall, the sponsors distribute property rights as a means for incentivising fully non-contractible efforts. So, sponsors cannot contract on her choices of inputs building residual benefits. In the same way, the sponsors *cannot commit not to deliver* such non-contractible actions. Hence, parties cannot trade on these actions. For these non-contractible efforts, revealing information is all the sponsor receiving *good news* can do.

Old contracts and new contracts

When considering the effects of *good news* on the sponsors' best responses to contractual incentives, we must follow a twofold analysis. First, we must observe the choices of inputs delivered in compliance with provisions that the sponsors do not readjust -this includes provisions associated with minimum standards for risk allocation that the FP enforces and other agreements that the sponsors decide not to modify. Second, we must observe the strategic aspects of new contracts and provisions that the sponsors do renegotiate.

Original contractual provisions

In their private objective functions, for actions complying with these contracts that parties do not modify, the sponsors now observe lower marginal costs of efforts. Lower costs allow them to raise private choices of inputs in compliance with all contractual provisions. Higher choices of inputs come with two benefits. They reduce the likelihood of defaulting to fixed standard provisions enforceable by the FP or by sponsors via the SPV. They also raise the returns from reward functions variable on outputs contracted upon with the SPV beyond enforcement by the FP (the 2nd tier of incentives).

Furthermore, similarly to the description above, higher input levels result in higher marginal value from other sponsors' efforts under complementarities. This increases

⁷¹² This is a game of strategic complementarities. *Cf. pp. 81 and ff.* in J. WATSON, *Strategy*, cit.

the value of inputs delivered in compliance with other agreements. In other words, higher choices of complementary inputs increase the capacities of other parties to comply with contractual provisions and to extract greater value from them. Here too, sponsors perceive incentives for revealing information about having received *good news* from the environment.

New contractual arrangements

Let us observe how *good news* induces the sponsors to implement new contracts. Intuitively, the sponsor receiving *good news* will now find space for selling inputs to other sponsors. The same consideration applies to provisions that the sponsors decide to renegotiate.

Notice how above, I referred to the action of revealing information leading other sponsors to trust that, after receiving *good news*, an input provider will deliver higher inputs for her own benefits. Above, I observed how *good news* induced the sponsor to exert actions *she cannot commit not to deliver*. Because she cannot sell these non-contractible inputs, the sponsor informs about *good news* so third parties become aware of her higher choice of complementary inputs.

However, after receiving *good news*, the sponsor can also choose (now less costly) efforts that she *can commit not to deliver*. These are contractible efforts that are not necessarily beneficial to her. So, she would not choose them for her benefit. However, she could deliver them if somebody else paid for them.

Consequently, these contractible actions become the object of distinct, socially desirable agreements. In other words, after receiving good news, the sponsor reveals information allowing the contractibility of actions that now appear within her capabilities and for which she will negotiate with third parties. These are actions desirable to sponsors that now become reasonable after *good news*. Because they are socially desirable, these efforts come with positive externalities to the FP.⁷¹³

The remaining tensions

Here too, we must distinguish tensions from the agreements that sponsors do not

⁷¹³ These actions are socially desirable -*v.gr.*, welfare enhancing- necessarily. Any news that allows for new actions to become feasible (privately desirable to one or more sponsors) but that is not socially desirable should be analysed as a manifestation of incompleteness of the risk allocation mechanism -*i.e.*, non-recourse risks that the FP internalizes.

readjust, from those arising from new contracts or agreements that they do renegotiate.

In the first case, with sponsors delivering inputs at levels higher than initially expected, strategic tensions will remain behind asymmetries of information, *-i.e.,* regardless of lowered costs of efforts-, the sponsors not deliver inputs that make no effect to contractible signals. However, the magnitudes of such conflicts and the externalities arising from them appear now minimised. *Good news* does not eliminate the conflicts but reduces their costs with respect to the estimated initially.⁷¹⁴

In the second case, with efforts delivered in response to new agreements -the contracts as per which the sponsor receiving *good news* sells extra inputs to other sponsors- strategic tensions remain as per the contractual imperfections of such agreements. Two aspects we must remark here. First, sponsors implement these new agreements imperfectly, but they do so based on updated information about the environment and the improved individual costs of efforts. So, the conflicts exist as in a new set of contractual arrangements. Second, despite contractual imperfections, all the best responses from all the sponsors -not only from the one experiencing *good news*- *could* include higher choices of socially desirable efforts. This last aspect *could* result from the complementarity of inputs from the sponsors selling extra efforts providing incentives for other sponsors to increase their own choices of desirable efforts.

These aspects result in higher project capacities and positive externalities to the sponsors not intervening in renegotiations and the FP.

Other factors

The value to sponsors and externalities to the FP will grow with: first, the magnitude of the impact of *good news*; second, the higher degrees of complementarities of all socially desirable inputs; third, the lower asymmetries of information permitting readjustment and facilitating the revelation of information; and forth, the higher capacities of implementing innovations.

⁷¹⁴ Furthermore, *ex-ante*, when evaluating compliance with individual rationality - participation- constraints, all parties internalise the *expected* costs under uncertainty that includes possibilities of receiving *good news*.

The strategic tensions in PFCs

Under *good news*, behind asymmetries of information and contractual incompleteness, the strategic tensions described in Chapter 5 will remain in place but mitigated. This is true both with regards to solutions implemented collectively among sponsors and the technological innovations implemented by individual sponsors. Note, of fundamental strategic relevance, under *good news*, likelihood that the SPV will produce expected residual benefits after repaying the senior non-recourse debt is highest. Consequently, the incentives for *shirking*, *risking*, and *shading* will be minimal relative to the distortions expected in all other scenarios.

Externalities to the FP

As described above, *good news* results invariably in positive externalities to both the sponsors and the FP.

Welfare considerations

When a sponsor perceives *good news*, she delivers higher choices of inputs that she cannot commit not to deliver. These are the efforts that she chooses for increasing the returns from property rights and contracts. Additionally, sponsors receiving *good news* perceive incentives for revealing information about the environment to their parties. By doing so, they allow other sponsors to update reliable conjectures about expected levels of complementary efforts. This induces other parties to deliver higher choices of complementary inputs which finally benefit the sponsor revealing information. Additionally, the sponsor receiving *good news* will sell efforts that she can commit not to deliver. The implementation of these provisions will be imperfect.

Under *good news*, the conflicts identified in Chapter 5, will still affect both collective actions and the individual responses to incentives implemented imperfectly. However, with the SPV allowing for highest residual benefits, the incentives for *shirking*, *risking* and finally *shading* are minimised. Finally, under *good news*, all sponsors and the FP receive benefits higher than the expected value considered ex-ante when evaluating compliance with participation constraints.

Annexe II

Figure 2 shows the correlation between the evolution of the environment, the opportunistic responses, and the choices for delivering inputs individually (without renegotiating), after forming sub-coalitions, or after readjusting unanimously (in collusion) with all the other sponsors against the lender (the FP).

	<i>Shirking</i>	<i>Risking</i>	<i>Shading</i>	Prevalent delivery choice	Risk & Externalities to the FP
Good news	Minimised	Minimised	Minimised	Individual	Lowest
No news	As expected from imperfections of RAM* ¹	As expected from imperfections of RAM* ¹	As expected from imperfections of RAM* ¹	Individual and sub-coalitions from imperfections of RAM* ¹	As expected
Bad news	Exacerbated	Exacerbated	Exacerbated	<ul style="list-style-type: none"> • Individual choices minimised • Larger sub-coalitions • Possible unanimous renegotiations 	Increasing
Very bad news	<ul style="list-style-type: none"> • Not possible (the sponsors do not expand residual benefits) 	<ul style="list-style-type: none"> • Not possible (the sponsors do not expand residual benefits) 	<ul style="list-style-type: none"> • Absolute • The sponsors devote all innovation efforts to <i>shading</i> 	<ul style="list-style-type: none"> • Broadest sub-coalitions • Most likely unanimous renegotiations 	<ul style="list-style-type: none"> • Risk highest • Likely Cost Overruns • Likely SPV defaults on NRD*²

Figure 2

1* Risk Allocation Mechanism

2* Non-Recourse Debt

PART III

Based on the strategic analyses of Parts I and II, the third part of the study identifies ways for legal research. It emphasises the value institutionalising PFCs. It identifies five pillars under which this institutionalisation can be achieved legislatively, three postulates for the interpretation of all clauses shaping PFCs, and four legally relevant postulates for finding optimalities in PFCs.

Chapter 7

The needs for legal treatment in PFCs

Abstract. This is the first chapter of the third part of the study that advances exclusively (efficiency-oriented) legal considerations. The chapter has three parts. In the first part, it observes the strategic needs, legislative purposes, and legal solutions efficient in the current legal treatment that legislators and judges allow to parties in regular (diversified and collateralised) corporate businesses. These are the objectives that shape the legal structures (default and mandatory norms) of general business-oriented corporate forms.

The second part of the chapter exposes how the objectives, strategic environment, and needs for legal protection of parties in PFCs are characteristically different to those considered by legislators and for which legislators and judges provide a legal treatment to parties in PFCs. This second part of the chapter shows how, when applied to the environments of PFCs, the functionality of the rules that shape corporate forms oriented at facilitating diversified and collateralised investments and contracting result in costly distortions to both sponsors and the FP in PFCs.

The third part of the chapter remarks the contractual solutions that parties implement in PFCs for circumventing the effects of such distortive rules. This third part of the chapter also shows how many of such contractual solutions are feasible in PFCs but not in diversified environments where they would jeopardise the objectives for which legislators offer corporate forms to parties.

Finally, the chapter also exposes how, in virtue of the distinct objectives of parties in PFCs (oriented to implementation instead of diversification), many of the critical objectives of contractual solutions can (and should) be replicated in legal solutions.

Based on this identification of solutions to the strategic tensions of chapters 4 to 6, the following three chapters 8 to 10 will define critical aspects that permit the legislative institutionalisation of PFCs via a dedicated corporate form (towards the legislative institutionalisation of PFCs). Chapters 8 to 10 also provide for postulates

for the interpretation of contracts and legally enforceable optimalities. All legal propositions are functional in protecting parties in their strategic needs that are inherent to their positions in PFCs. Hence, all legal postulates are robust to evolutions in the environment irrespective of project configurations.

Table of Contents

7	CHAPTER 7 - THE NEEDS FOR LEGAL TREATMENT IN PFCS..	481
	TABLE OF CONTENTS	483
7.1	INTRODUCTION	487
7.1.1	Research question.....	487
7.1.2	Objectives of the Chapter	487
7.1.3	Value of the analysis	487
7.1.4	Sequence of the presentation	491
7.2	SOCIAL EFFICIENCY AND THE LEGAL NEEDS OF DIVERSIFIED CORPORATE BUSINESS	493
7.2.1	Legal personality, limited liability, delegation, and diversification	494
7.2.1.1	Legal personality	495
7.2.1.2	Limited liability protection	495
7.2.1.3	Managerial delegation.....	496
7.2.2	The (positive) value of diversification	498
7.2.2.1	Diversification of investments	498
7.2.2.2	Diversification of investors	499
7.2.2.3	Diversification of contractors (for material inputs and debt financing).....	501
7.2.3	Value expected by creditors in diversified corporate businesses	504
7.2.3.1	Effectiveness but limitedly efficiency of sureties (<i>ius in re</i> and recourse to third parties)	504
7.2.3.2	Portfolio collateral value	505
7.2.4	Tensions in diversified corporate contracting: within corporate spheres and against the collateral value	505
7.2.4.1	Opportunism affects collateral value	507
7.2.4.2	Opportunism manifests within corporate control spheres	507
7.2.5	Legal and contractual solutions; the balance between preventing tensions and preserving diversification capacities....	509
7.2.6	The tensions, diversification, and legal solutions	509
7.2.6.1	Duties of loyalty in diversified corporate business.....	510

7.2.6.2	Control responsibility in diversified corporations.....	511
7.2.6.3	Causality and informational aspects of corporate insolvency.....	512
7.2.6.4	General duties to inform in diversified corporate businesses	515
7.2.6.5	Optimal delegation in diversified corporate businesses	515
7.2.6.6	Optimal seniority of claims in diversified corporate businesses	516
7.2.6.7	Optimal standards of managerial diligence in corporate businesses.....	517
7.2.7	The tensions, diversification, and contractual practices	518
7.2.7.1	Capacities of shareholders to modify projects.....	518
7.2.7.2	Deterrence or compensatory functions of clauses.....	519
7.2.7.3	Equal treatment of parties	520
7.3	SOCIAL VALUE AND THE LEGAL NEEDS OF PARTIES IN ALL PFCs	520
7.3.1	Implementation quality of the risk allocation mechanism and the feasibility of PFCs	522
7.3.2	The consensus amongst parties other than the formal debtor (the SPV).....	524
7.3.3	Multi principal-multi agent relationship for a single project	525
7.3.4	Instrumentality of the fully controlled SPV for three purposes only	528
7.3.4.1	Need for a limited liability protection.....	528
7.3.4.2	Three objectives for using SPV in PFCs	529
7.3.4.3	Indispensable control of the SPV.....	531
7.3.4.4	Closely held project-instrumental SPV and managerial delegation	531
7.3.4.5	Control of the SPV and the access to information.....	532
7.3.4.6	The SPV instrumental to the multiparty agreement	532
7.3.5	Tensions in PFCs realise beyond SPV spheres, at contractor´s level and against implementation quality (not against actual collateral value)	533
7.3.6	The (negative) value of diversification; the predefinition of parties and components in PFCs.....	536

7.3.6.1	No diversification of contractors for inputs in PFCs	536
7.3.6.1.1	<i>Need for not diversifying contractors for inputs</i>	536
7.3.6.1.2	<i>Predefinition of contractors; derivative aspects</i>	537
7.3.6.1.3	<i>Undiversified sponsors in the legal proposals (Chapters 8 to 10)</i>	539
7.3.6.2	No diversification of contractors for financing in PFCs	540
7.3.6.2.1	<i>Need for not diversifying sources of debt</i>	540
7.3.6.2.2	<i>No diversification of financing sources; derivative aspects</i>	540
7.3.6.2.3	<i>Undiversified contracting for non-recourse debt financing in the legal proposals (Chapters 8 to 10)</i>	541
7.3.6.3	No diversification of investors in PFCs.....	542
7.3.6.3.1	<i>Need for not diversifying capital investors</i> .	542
7.3.6.3.2	<i>Costs of diversifying capital contributions in PFCs</i>	544
7.3.6.3.3	<i>Undiversified investors in the legal proposals (Chapters 8 to 10)</i>	545
7.3.6.4	No diversification of investments (projects) in PFCs ...	545
7.3.6.4.1	<i>Need for not diversifying investments</i>	545
7.3.6.4.2	<i>Undiversified investments in the legal proposals</i>	546
7.4	THE CONTRACTUAL REFORMATION OF CORPORATE TYPES; TOWARDS INSTITUTIONALISATION OF PFCs	547
7.4.1	Availing from the efficient, reforming the rest of the legal treatment	547
7.4.2	The three objectives of implementation efforts readjusting the legal context	550
7.4.2.1	Regulating the material requirements of individual projects.....	550
7.4.2.2	Adjusting optimalities	550
7.4.2.3	Covering the needs of unattended by the current legal treatment and correcting the existing legal mechanisms with distortive objectives in all PFCs	551

7.4.3	Preserving the indispensable limited liability protection	552
7.4.4	Restricting features of the legal personality I – Excluding the contracting for alternative sources of inputs	553
7.4.5	Restricting features of the legal personality II – Excluding the contracting for alternative financing (the monopolies of financing sources).....	554
7.4.6	Adapting corporate forms, I – Excluding all alternative investment spaces (the single predefined project)	555
7.4.7	Adapting corporate forms II – Excluding the transferability of property rights (shares in the SPV).....	556
7.4.8	Adapting corporate forms III – Excluding the transferability of contractual positions	557
7.4.9	Adapting corporate forms IV – Imposing enforceable capital contributions from shareholders.....	557
7.4.10	Adapting corporate forms V – Imposing control responsibility to all shareholders (sponsors)	558
7.4.11	Adapting corporate forms VI – Imposing both general and individual obligations to inform.....	559
7.4.12	Adapting corporate forms VII – Incorporating the lender to the decision-making system of the SPV	560
7.4.13	Adjusting corporate forms VIII – Pledge security on company shares	560
7.4.14	Adjusting optimalities I - Imposing a hierarchy of claims	561
7.4.15	Adjusting optimalities II - Predefining a distinct scope of administrative delegation.....	562
7.5	THE INHERENT STRATEGIC NEEDS, THE NEGATIVE VALUE OF DIVERSIFICATION, AND THE FEASIBILITY OF LEGAL TREATMENT IN PFCs.....	562
7.6	CONCLUSIONS	564
7.6.1	General aspects.....	564
7.6.2	Findings	565
7.6.3	Towards the institutionalisation of PFCs.....	572

7.1 Introduction

Let us now observe the contrasts between the legal protection that parties receive today in regular (collateralised) diversified corporate businesses and the needs of sponsors and the FP in PFCs. Let us also see how such unattended needs for legal treatment reveal in contractual objectives adapting the solutions offered by current corporate types.

7.1.1 Research question

This chapter consequently responds to the research question:

What are the general contrasts between the objectives of the legal solutions allowed today to parties in diversified corporate contracting and the needs for legal treatment in PFCs?

And,

How these needs for legal treatment manifest in the objectives of contractual solutions with which parties readjust the rules of the current corporate types in PFCs?

7.1.2 Objectives of the Chapter

The chapter shows the contrasts between the distinct needs for legal solutions in both diversified corporate businesses and PFCs.

The chapter characterises how the specific default and mandatory rules of corporate types that appear efficient in diversified corporate contracting are either insufficient or wholly undesirable -i.e., with distortive objectives- in PFCs environments.

The chapter further categorises the objectives of contractual mechanisms that parties implement for adjusting the legal treatment currently applicable to them. More specifically, it characterises the mechanisms with which, in all circumstances -as per the strategic needs of parties inherent to all PFCs in all jurisdictions- parties modify the corporate types of choice for the SPV.

Later, these objectives will verify the market-mimicking efficiency of the legal proposals brought forward in the following chapters.

7.1.3 Value of the analysis

In general aspects, the academic value of the chapter and contributions to the literature are threefold:

1. The chapter is the first work focusing directly on the legal implications associated with the strategic needs of parties in PFCs.

2. This part of the study is also the first analysis identifying the strategic features of PFCs that make the current legal treatment *-i.e.*, the mechanisms of the existing corporate types- inefficient in PFC environments.
3. Finally, the chapter is also the first work identifying and characterising the necessary contractual objectives (not the actual clauses⁷¹⁵ that parties implement dispersedly) through which the sponsors and the FP modify the regulations of corporate types in all PFCs.

Chapter 7 offers nine concrete contributions.

First, it differentiates the benefits for which parties recur to regular diversified (collateralised) corporate business from those that benefit sponsors and the FP in PFCs.

Second, the chapter first observes the legal implications from the facts that, in regular corporate investments scenarios, under a rule of limited liability protection, the value that investors expect depends on the capacities of a manager to extract value from a diversified portfolio of risky and materially unrelated opportunities. In contrast, in PFCs, the value that all parties expect from their claims depends on the quality with which they implement the single project contractually (the risk allocation mechanism). For this, we find choices of transaction costs being invariably higher in PFCs than in regular corporate contracting or investing environments. The analysis of the dependence of PFCs on implementation quality -and the implementation capacities of parties as feasibility boundaries of PFCs- serves to reorient the objectives of the legal treatment that today focus exclusively on collateral protection.

Third, the chapter analyses how the feasibility of PFCs depends on a meeting of minds that pre-exists the non-recourse loan agreement. Moreover, such *consensus ad idem* involves parties other than the primary debtor (the strictly single-project-instrumental SPV). This agreement is multiparty, and its features include aspects derived from strategic elements inherent to all PFCs.

Fourth, in the absence of collateral value and recourse to third parties, this risk allocation mechanism has the FP as the residual risk-taker internalising losses derived from implementation imperfections. In PFCs, the FP is also the least-informed party who also does not control resources. The chapter consequently shows how PFCs can be best-interpreted as a single-purpose time-limited principal-multi-agent interaction between the non-recourse lender (the FP) and the many sponsors.

⁷¹⁵ *Cf.* chapter 2.

In this context, the risk allocation mechanism defines both the project and the set of rules governing the relationship between principal and agents.

Fifth, based on the above, the chapter revisits the early observations about the instrumentality of the SPV (*cf.* chapters 2 and 4). In PFCs, the sponsors control SPV necessary and avail from its legal structure exclusively for three purposes. First, for risk isolation between the project and sponsors and for implementing the non-recourse debt. Second, for contract implementation between the SPV and sponsors and the FP. Third, for incentive implementation via allocation of property rights (expected dividends incentivising fully non-contractible actions).

Sixth, in PFCs, the control of the SPV is a feasibility requirement of the risk allocation mechanism. The control of the SPV in the object of contractual provisions between the FP and the sponsors confirms the multiparty interaction between the principal and the many agents for a single project. Characterising the SPV as a fully-controlled and merely instrumental element allows for the legal treatment of the strategic needs of parties to the broader agreement.

Seventh, the chapter revisits observations about how, in diversified corporate contracting, opportunism (externalities to dispersed creditors) take place by company administrators or its controllers. Moreover, in regular (diversified and collateralised) corporate settings, such abuses happen against current corporate resources (*e.g.*, company's assets, opportunities) and within spheres of company control.

In stark contrast, in PFCs, abuses (externalities to the FP) realise in the responses by contractors for inputs to the risk allocation mechanism. Additionally, in PFCs, such opportunism happens beyond spheres of SPV control (as an opportunistic decision from input providers). These are the *shirking*, *risking*, and *shading*, described in chapters 5 and 6 with which sponsors respond to the conflicting interests inherent in all PFCs. These observations help to explain the efficiency of contractual solutions that parties implement in the absence of adequate legal treatment. The analysis also serves for reorienting the legal treatment towards facilitating the implementation of the risk allocation mechanism (the contractual interaction amongst parties other than the SPV).

Eighth, the chapter elaborates on how, in regular diversified investing and contracting, parties (shareholders and contractors for inputs and financing) value all forms of diversification. This value of diversification capacities results in boundaries to the efficiencies of contractual mechanisms that parties can implement. The value of diversification also affects the feasibility of legal solutions of corporate types that legislators and judges implement against strategic tensions. Intuitively, today, contracting parties, legislators and judges implement solutions preventing strategic

tensions but also minimising the impact of such solutions against the diversification capacities of companies.

In sharp contrast, in PFCs, the non-recourse lender does not value any form of diversification. Moreover, the FP (the vulnerable principal) perceives all forms of diversification negatively -as a manifestation of implementation imperfections -*i.e.*, as sources of conflicts of interests and feasible opportunism. This observation will later serve for characterising the fundamental efficiency of solutions in PFCs that we do not see in regular diversified environments. This holds for contractual practices that parties put in place in substitution of the missing legal protection (see below) as well as for the considerations of possible legal treatment in chapters 8 to 10.

Finally, ninth, the chapter remarks how inefficient is the current configuration of some specific legal solutions to strategic tensions in PFCs and how, in PFCs, the sponsors and the FP spend efforts modifying the mechanisms of current corporate types. The chapter shows how, in PFCs, parties benefit from (only) some features of the legal personality and limited liability protection for risk isolation, contractual implementation, and incentive distribution via property rights. The chapter analyses how, in PFCs, the sponsors and the FP place limitations to the exercise of the rights inherent to the SPV's legal personality. In PFCs, parties place boundaries to the contracting with third parties for alternative projects, for alternative inputs, or alternative sources of financing. Instead, the rule of providing limited liability protection to sponsors -which is strategically indispensable to the functionality of the non-recourse clause- holds unchanged in all circumstances and project variations.

Sponsors then build a comprehensive set of legal solutions (the risk allocation mechanism) that substitutes (contradicts the objectives of) all canonical solutions of corporate types that today legislators and judges enforce for facilitating diversified corporate contracting and investing. *E.g.*, sponsors restrict the transferability of ownership and contractual positions of sponsors. They limit the investment of the SPV to a single predefined project. The FP enforces general and specific duties to inform. Parties devise especial hierarchies of claims. They put in place contractual mechanisms replicating the strategic effects of a regime or control responsibility to sponsors. Finally, sponsors restrict the scopes of the managerial delegation of the SPV. All these objects protect the strategic needs inherent to the positions of parties PFCs. These protections come in substitution of the solutions missing from default rules or regulations of corporate types today oriented exclusively to the protection of diversified investing and contracting.

The description of the objectives of modifying the legal treatment -the features of the corporate type of the SPV- will later serve as a (market-mimicking efficiency

confirmation) bridge connecting the contractual practices shown casuistically from the management literature in chapter 2, with the strategic analyses of chapters 4 to 6, and finally the consideration proposals for a PFC-dedicated legal treatment in chapters 8 to 10.

7.1.4 Sequence of the presentation

The rest of the chapter consists of four larger parts.

The first part (the third section) reviews critical strategic aspects of diversified corporate environments and the legal treatment that legislators and judges provide via corporate types today. Punctually, it remarks the value of the legal personality and limited liability rules for delegation and subsequent investment diversification. Additionally, it revisits the objectives of investors and the risks that creditors internalise when contracting with a limited liability company.

The chapter then revisits the strategic tensions and the forms of opportunism in diversified corporate contracting. Specifically, it elaborates on how, in diversified contracting, contractors are materially independent. Hence, they do not collude. Accordingly, in diversified corporate businesses, opportunism takes place by managers or controlling shareholders and come in detriment of actual corporate portfolio resources. The chapter then points at the efficiency of the current legislative and judicial solutions against such conflicting interests and forms of opportunism. Finally, the section observes the contractual practices typically efficient in this environment.

The second major part of the chapter follows a pattern similar but focusing on the different features and needs of parties in PFCs. This fourth section remarks the objects for which sponsors recur to PFCs and how the feasibility of non-recourse debt depends on the quality with which sponsors and the FP implement the risk allocation mechanism -*i.e.*, not on the actual collateral capacities of the debtor or third parties, or on the ways in which a manager administers a portfolio of yet-unknown opportunities.

This part of the chapter also shows how PFCs result from a broader agreement amongst parties other than the debtor (the sponsors and the FP). It also remarks how such agreement pre-exists and supersedes the loan agreement. This is the strategically indispensable web of provisions of the risk allocation mechanism amongst the sponsors and the FP that nests the non-recourse debt facility strategically.

The study also elaborates on how, in contrast with what we see in regular diversified contracting, in PFCs, the tensions exist against the objectives of the risk allocation

mechanism. That is, in PFCs opportunism manifests in the responses by sponsors - the contractors for inputs- not in abuses of actual corporate assets by company controllers.

The chapter then observes how, because the success of PFCs depends on the implementation quality of the risk allocation mechanism for a single project, parties do not value any form of diversification. Accordingly, the legal solutions efficient to PFCs should direct its effects not at mitigating conflicting interests while preserving diversification capacities (as in regular corporate settings) but at preventing opportunism by sponsors in their responses to the risk allocation mechanism while also eliminating (never preserving) the spaces for diversification of investments, investors, and contractors. This is precisely contrary to the objectives of the solutions that the legislators offer to parties in regular diversified corporate businesses.

The third larger section of the chapter (the fifth section) identifies a list of contractual objectives (not actual contractual practices -*cf.* Chapter 2) through which sponsors and the FP adjust the legal treatment. That is, sponsors and the FP adjust default rules, refine optimalities, provide the strategic protection for needs unattended by legislators and judges, and functionally circumvent the effects of mandatory norms whose effects are inherently distortive in the context of PFCs.

In this part of the chapter, I also show how, in PFCs, parties benefit from the legal personality and limited liability rules for risk isolation, for facilitating contractual implementation and for allocating incentives via distributions of property rights. However, beyond these benefits, parties will contractually limit the exercise of the rights associated with the legal personality that the SPV. Concretely, the FP will always limit the spaces within which the SPV will manage the assets it owns or the persons with which the company will interact contractually (acquiring, complying, and enforcing rights and obligations). *E.g.*, parties will agree that the SPV will invest only in a single project, it will not contract for financial inputs from alternative sources other than the FP.

Asides of these crucial benefits (indispensable for the functionality of the non-recourse clause), the sponsors and the FP will dismount most of the rest of the legal mechanisms that legislators offer with the corporate type of choice for the SPV.

This last part also shows how parties restrict the transferability of ownership in the SPV or the contractual positions of sponsors (two remarkable *intuitu personae* considerations). In sharp contrast with what we see in regular diversified investing, in PFCs, parties also predefine the capital contributions they expect from shareholders (sponsors) as the project evolves. They impose responsibility for managing the SPV as well as duties to inform the lender as the project advances. Parties also adjust the

scope of delegation, and the seniority of claims held by the sponsors and the FP. Finally, parties agree on the scenarios in which the FP can intervene in the decision-making system of the SPV (its debtor).

The fifth and final part of the chapter will remark the negative value of diversification in PFCs, the inherent strategic needs of parties in PFCs, and the feasibility of legal treatment (possible ways forward) that I will advance in chapters 8 to 10.

7.2 Social efficiency and the legal needs of diversified corporate business

The literature has described the social value and the purposes for which individuals invest in *regular* corporate businesses extensively. The efficiency of diversified corporate investing results from the interplay among three canonical legal features. The legal personality, the limited liability protection to investors, and managerial delegation.

In regular corporate businesses, the enforceability of a rule of limited liability results in sporadic externalities from the unsatisfied creditors to investors. However, by limiting the risks internalised by investors, limited liability shelter permits managerial delegation and the transferability of property rights to passive investors. This strategic interplay between the institution of legal personality and the protection of limited liability consequently results in socially desirable effects (a *Kaldor-Hicks* efficiency).

Several scholarly disciplines have already considered these features as motors of investments and economic progress.⁷¹⁶ These efficiencies come inherently associated with the diversification of investments portfolios, financing sources, and contractors for inputs. Accordingly, the protection of these forms of diversification will lie in the core objectives and spheres of application of corporate regulations as we know them today.

In sharp contrasts, as shown in all earlier chapters and remarked further below, diversification is not a value that parties appreciate in PFCs. Precisely, on the contrary, in PFCs parties advance a project that is unique and materially predefined in all aspects. Moreover, in PFCs, parties identify and regulate critical aspects of the project, the parties, the central contracts, and the sources of financing (both via debt

⁷¹⁶ *Vid.* for all, R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

and equity) before incorporating the SPV. Furthermore, as first mentioned in Chapter 4, and further explored in chapters 5 to 7, in PFCs, the inhibition of all forms of diversification is essential to the implementation quality of the single-project risk allocation mechanism -the sole source of comfort to the single provider of non-recourse debt thus defining the feasibility of PFCs.

Subsequently, three aspects appear visible concerning the above, that we will see analysed in many places below. First, the objects (functional teleology) and shapes (scopes of applications) of rules preserving diversification as valuable in regular corporate business will function with distortive effects in PFCs. Second, in PFCs, whenever possible, parties will spend transaction costs correcting the application of default rules as we know them today. Third, because in PFCs diversification is not desirable, there will be regulations (default rules) and contractual solutions that parties will now implement without concerning for the (otherwise) opportunity costs of losing diversification benefits. These and other critical strategic aspects will be the object of another section.

Accordingly, before entering the analysis of the needs (and feasibility) of legal treatments in PFCs, let us revisit some elemental strategic aspects defining the functionality of default rules and their efficiency in diversified long-term corporate investments. Based on these elemental observations, I will later remark both the insufficient and distortive effects of current regulations as applied to PFCs. All propositions that follow are all commonplace in the literature of Company Law and Economics.⁷¹⁷

7.2.1 Legal personality, limited liability, delegation, and diversification

Before analysing the functionality of individual rules, let us most shortly observe the strictly essential strategic aspects of these three features indispensable for diversification in regular corporate businesses.

I will now refer to the fundamental value of: first, limited liability protection; second, the feasibility of managerial delegation; third, the diversification of investments (projects); fourth, the diversification of investors (owners providing capital); fifth, the diversification of contractors (for inputs and financing); finally, I will remark the value of diversified corporate businesses to society.

⁷¹⁷ Cf. pp. 1-182 and 275-340 in *Ibid.*

7.2.1.1 Legal personality

When applicable to commercial activities, the canonical institution of legal personality permits that entitlements and obligations associated with a business activity remain attached to a patrimony distinct from that of its investors, managers, financing providers, or other contractors. Strategically, legal personality comes with two critical benefits in terms of risk isolation. First, it induces business creditors to pursue the servicing of their claims from assets of the legal entity before (habitually without) molesting its owners. Second, in the majority of cases, the legal personality permits that creditors of investors attack the ownership of the legal entity (company shares) but not the property of its assets (the organised projects). This feature effectively preserves the value of the ongoing organisation. Authors in the Company Law and Economic Literature refer to these elemental protections as the benefits of *entity shielding*.⁷¹⁸

7.2.1.2 Limited liability protection

A rule of limited liability allows investors to respond for the debts of the legal entity only up to the burden of their initial capital contributions. In terms of returns from incentives, limited liability, implies that investors will internalise only a minor fraction of total potential losses -a fixed value- but will extract unlimited benefits. In financial literature, authors refer to the value corresponding to the unlimited potential gains and the limited extent of likely losses as *limited liability shelter*.⁷¹⁹ As advanced, the conjunction between the legal personality and the limited liability protection (together often referred to as *asset partitioning*⁷²⁰) permits dispersed investors to invest in companies without a need for internalising monitoring costs as a means for preventing risk contamination from their investments.

Asides, in scenarios where diversified portfolios do not perform as expected, the limited liability protection results in externalities to circumstantial (frustrated) creditors. Moreover, as information about the deterioration of investment portfolio reaches corporate decision-makers, limited liability protection provides incentives for shareholders extracting residual benefits to behave opportunistically in the ways

⁷¹⁸ See Chapter 1 in *Ibid.*

⁷¹⁹ *Cf. pp.* 766 and others in H. E. LELAND, “Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance”, cit.

⁷²⁰ *Vid.* Chapter 1 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

described in Chapter 3. Below, I will recall how, first, despite this, the externality to creditors is a harmful effect of a Kaldor-Hicks efficient rule, and second, legislators do legislate for mitigating opportunistic incentives mentioned in the second place.

7.2.1.3 Managerial delegation

Next to legal personality and limited liability, the third pillar of diversified corporate businesses is the feasibility of managerial delegation. To dispersed investors, delegation is reasonable only under a rule providing for limited liability shelter. In the context of corporate businesses, delegation comes with benefits in three dimensions.

First, delegation allows the company to advance several projects and deal with contingencies without recurring to collective actions by decision-makers (shareholders). That is the *itineri* gap-filling function of delegation completing mandates from shareholders. Such value of delegation is fundamental when dispersed shareholders own the company, and when the company advances several projects. That is, when investors and investments are diversified.⁷²¹

Second, delegation allows for the company to benefit from the specific qualifications of experts. The value of delegation as a means for expanding the quality (marginal value) of costly managerial decisions grows with the spaces (ranges) of growth options that the company may capture. That is, with the diversification of investments.⁷²²

Finally, third, the interplay of the above points allows dispersed investors to extract benefits from their investment at a minimum cost of intervening in the decision-making and monitoring efforts. Lower needs for intervening or monitoring the company then simplifies the transferability of property rights. The transferability of property rights facilitates both investments and divestment of positions (*v.gr.*, the *exit* as a defensive strategy to minority shareholders⁷²³). All aspects favour the

⁷²¹ As shown below, this is not the case of PFCs where sponsors are few (*cf.* the analysis of the optimal delegation in PFCs in the following chapters).

⁷²² Without distracting the reader, let us notice the little value in terms of qualifications that a delegated manager can bring to PFCs where sponsors are themselves the input providers, the experts on the field, and the parties who conceive the unique project - I will come back to this point below and in a later chapter.

⁷²³ *Vid. pp. 94 and 41- to 42 in R. R. KRAAKMAN ET AL, The Anatomy of Corporate Law: A Comparative and Functional Approach, cit.*

liquidity of markets, ultimately increasing the value of capital participation in diversified corporate businesses. Fundamentally, note how, in regular corporate businesses, the expected value of the diversified portfolio becomes independent from the personal aspects or even the identities of its owners (*intuitu rei*).

The functionality of delegation in diversified companies requires the enforceability of managerial fiduciary duties of loyalty and diligence. These are abstract criteria guiding managers on the use of the discretion they enjoy for adopting decisions in the benefit of the company (the principal). Crucially, in regular corporate businesses, such duties of loyalty bind the managers (and, only exceptionally, the shareholders) to the company. In this context, *the company* means the profit-maximising interests of the legal entity -which under certain circumstances may be reflected in collective decisions by owners. That is, today, in regular corporate businesses, duties of loyalty direct managerial actions to the benefits of shareholders -not of creditors. The shape of this postulate is strictly coherent with the objectives of limited liability rules promoting investments even if in detriment of circumstantial creditors -a *Kaldor-Hicks* efficiency, as anticipated above.

Consequently, today, we will see postulates for duties of loyalty that protect creditors only after the company approaches its insolvency -as visible in the eyes of diligent managers. This late protection of creditors is efficient as a means of preserving collateral value when the imminence of insolvency exacerbates incentives for shareholders to behave opportunistically. I will come back to these points below.

Notice for now, the three aspects mentioned above relate to features that are precisely opposite to what we observe -or what the parties value- in PFCs. In PFCs, the main principle dictating the feasibility (crucially, the social value) of non-recourse financing is *not* the measure of the diversification of investments, investors, and contracting parties, but -in the opposite- the capacity of parties to predefine a risk distribution mechanism for a single project. Also, as shown below, in PFCs parties do not benefit from managerial qualifications (the qualifications of the sponsors are of highest quality). Finally, in PFCs financing does not come from dispersed (passive) investors but from a predefined party some of which intervene in the project actively (the sponsors).

Let us note some significant but straightforward strategic aspects of the diversification of investments, investors, and contractors of regular corporate businesses. Later, I will remark the crucial differences with the case of PFCs.

7.2.2 The (positive) value of diversification

7.2.2.1 Diversification of investments

In regular corporate investments, the scope of investments diversification (the portfolio of independent projects, or growth alternatives) comes with several benefits and implications. Let us restrict our attention to five critical ones. The first three of them are strictly strategic (incentive oriented). The fourth and fifth points are financial (risk allocation) in nature. The sixth aspect relates to the scope of managerial delegation.

First, in regular corporate settings, contractors for distinct inputs to the materially independent projects cannot sustain cooperation (collude opportunistically) against the company. Second, these unrelated parties will not receive information about the company's distinct projects further impeding cooperation. Third, diversification of both contractors and projects dissipates the impact of individual opportunistic strategies of controlling shareholders of the debtor company. Forth, the diversification of portfolios reduces the volatility of cash flows (insolvency risks) resulting from the failure of projects or the default of company debtors. Fifth, the distinct degrees of specificities (redeployment values) of materially independent assets of the diversified portfolios (ranging from equipment to commodities and liquid titles) improve the collateral protection of corporate assets. This further increases the benefits from diversification described right above. Sixth, in the same vein, in regular corporate financing, we will observe managerial scopes of delegation growing with the higher dispersion of ownership (diversification of investors). Duties of loyalty will be functional to the maximisation of company value by expanding the freedom of (the too risk-averse) managers to seek diverse sources of benefits that remain unknown at the moment of investing.

As a final remark, note how, the contractual side, in regular corporate businesses, the value of project diversification is also visible in the opportunity costs that parties will acknowledge as associated with all obstacles to business-hunting capacities. For instance, restrictions to the access to financing (in the prevention of debt dilution, *cf.* Chapter 3) jeopardise the capacities of companies to fund later projects. Therefore, albeit legally feasible, these provisions -as well as restrictive covenants in general- are rare in diversified corporate environments. Similarly, company managers regard the use of collateral (sureties) implemented on project assets as coming at an opportunity costs visible when funding future projects. Hence, if they do implement such sureties (restrictive covenants), companies will reflect in prices or conditions the costs internalised from losing diversification.

Remarkably, as shown below, legislators will follow similar rationality. Company law

rules will mitigate conflicting interests but, as possible, without jeopardising diversification capacities. In contrast, threatening diversification will not be a problem but rather a virtue of rules and contractual regulations in PFCs. I will revisit these intuitions below.

7.2.2.2 Diversification of investors

As advanced, facilitating the channelling of financing resources from dispersed investors is one of the core efficiencies of the legal personality and limited liability institutions. The hosting of diversified investments becomes possible also in virtue of managerial delegation. Both aspects then allow dispersed investors to harvest benefits from their contributions without incurring significant managerial efforts intervening actively in the company.

At the investor level, diversification of investment positions reduces the volatility of cash flows. Portfolio benefits then preserve the utility of risk-averse investors. Additionally, from the strategic stance, the diversification (dispersion) of investors implies that, for them, contracting (colluding) and in general, adopting collective decisions will be transaction costs consuming. This observation applies identically to the limitations to the feasibility of relational contracting by diversified contractors associated with materially independent projects (see further below).

However, whereas -beyond a certain point- the diversification of contractors is not valuable⁷²⁴, in regular corporate settings, -crucially as a function of the quality of managerial delegation⁷²⁵- the diversification of investors is invariably desirable in

⁷²⁴ Note, the diversification of contractors does mitigate the incentives for implementing opportunistic collusions amongst them -a problem that is severe in PFCs (*Cf.* Chapter 6). Therefore, in diversified corporate settings, the diversification of contractors is effectively valuable. However, beyond certain point where coordination costs are sufficiently high, more diversification by contractors comes at not avail to parties.

⁷²⁵ From the strategic stance, diversification exacerbates the conflicts between controlling shareholders and minority investors (or the tensions between such controllers and the company as a whole). Intuitively, the greater the dispersion of ownership, the less of the total impact from opportunistic actions against company value that controllers will internalise. This increases the returns from behaving socially undesirably. For an introductory approach to such conflicting interests *cf. p.*

habitual corporate environments.⁷²⁶ Subsequently, in diversified corporate settings, legislators will enforce duties of loyalty inducing managers (and controlling managers) to behave in the protection of these passive contributors.

For identical reasons, in diversified corporate businesses, judges cannot presume *de facto* control of companies by the dispersed shareholders. The critical separation of ownership and control in corporations prevent this.⁷²⁷ Functionally, this approach is indispensable for companies to receive funds from passive investors.

For *de facto* responsibility to exist, claimants will internalise the burden of bringing convincing evidence of a shareholder capacity of effectively influencing the managerial decision-making system of the company. In regular corporate settings, relaxing any of these two aspects of the legal treatment would result in investors adopting costly precautions and subsequent under-investing of capital contributions.

I will later contrast these aspects with the case of PFCs, where the diversification of investors is not only undesirable but also prevented contractually. Moreover, below, we will see how, in PFCs, sponsors are few and control the SPV fully. Investors (sponsors) will also regulate how they will control the SPV before they incorporate the legal entity.

Finally, note how, by regulating the presence and expected reactions of shareholders (sponsors) via condition precedents, the FP internalises project risks with eyes on the individual characteristics of investors. This makes PFCs *intuitu personae* organisations -a feature against the very nature of corporate organisations (and the

36 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁷²⁶ Diversification dissipates insolvency risks thus increments total utility. Diversification also often corresponds to the easiness (liquidity) with which investors transfer company shares, a distinct source of company value.

⁷²⁷ This stems from the separation of ownership and control necessary for shareholders to invest in legal entities as business vehicles. With literature references, from a functional and comparative approach, *cf. pp.* 11-16, 29-32, 36, 39, 56-58, for a control liability stance, *pp.* 95, 138-40, 175-6 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit. Exceptionally, this may not be true for certain corporate types, *e.g.*, General Partnerships where the owners do not enjoy limited liability protection. However, these corporate forms are not suitable for PFCs.

legislative default rules) designed for hosting investments from dispersed contributors.

7.2.2.3 Diversification of contractors (for material inputs and debt financing)

Finally, in regular corporate environments, we can observe the diversification of contractors from two perspectives in five points. One is strategic (the first four points); the second one is of risk distribution effects (the fourth point).

First, contractors for distinct inputs cannot sustain cooperation against the company. I have advanced this intuition above when observing the effects of diversifying investments. The fact that the company advances many projects implies that it will contract with many input providers that will not interact with each other. That is, input providers will deliver contributions for projects that will be materially independent. The interaction amongst them will be costlier as a function of portfolio diversification. The many materially independent projects will allow contractors little space for *exchanging favours* amongst each other. In other words, contractors for distinct projects will find little spaces for sustaining cooperation relationally.⁷²⁸ That is, for building reciprocity in sequential contributions. As a result, in diversified corporate contracting, we do not find legislative norms preventing these interactions.

Second, contractors will not receive information about the company's distinct projects. In diversified corporate contracting, as contractors work with materially independent assets, contractors will also fail to update information (verifiable or observable) about their actions at low costs. This informational challenge limits their capacities to enforce agreements internally, further preventing collusion.

Third, diversification impedes the traceability of information about corporate solvency to contractors. The fact that contractors cooperate for many distinct projects impedes that, by updating information about the progress of the single

⁷²⁸ These strategic observations of diversified environments are precisely in contrast to what we find in PFCs. As Chapter 6 showed, in PFCs, not only contractors interact with each other (often clandestinely), but their incentives for forming coalitions and unanimous collusions for *shirking*, *risking*, and *shading* against the FP grow as the capacities of the SPV deteriorate. Less hazardously, whenever the environment evolves better than originally foreseen (the case of *good news*) these spaces for interacting amongst sponsors permits that they implement socially desirable innovations with positive externalities to the lender.

project they work for, contractors also build reliable conjectures about the solvency of the company. Later we will see how this is not true in the case of PFCs where sponsors know that the status of the project is a precise indicator of the actual or expected financial capacities of the SPV.

Fourth, the diversification of contractors and projects dissipates the impact of individual strategies. Diversification dilutes the impact of the possible opportunism from contractors against the solvency of the company. From a different stance, the variety of (cash flow unrelated⁷²⁹) business units under the same corporate umbrella dissipates the impact from a failing project to the volatility of corporate cash flows. These are the same benefits that I described above when observing the diversification of investments. Now I am pointing out the impact of the opportunism from parties associated with each of the many projects. As described in Chapter 3, these cross-subsidising benefits mitigating the costs of the opportunism from contractors decrease with the higher values at risks of individual projects in the portfolio.⁷³⁰

Fifth, diversification of contractors permits the dissipation of the impact of company defaults also against each of them. To these contractors, our company appears as a source of benefits in their diversified portfolios. In other words, there is diversification of contractors for the many projects that the company advances and for the many projects that each contractor pursues (her side business opportunities). By dissipating risks, diversification of contractors results in lower prices for contracting. Consequently, the capacity of creditors to dissipate the impact from a defaulting debtor favours investments (investors) on both contracting sides. This shows the *Kaldor-Hicks* efficiency of limited liability protection, facilitating diversification.⁷³¹

⁷²⁹ Cf. the analysis of cash flow correlations in Chapter 3 when elaborating on the problem of distress costs.

⁷³⁰ In Chapter 3, see, the description of the solutions of PFCs to the volatility induced distress costs.

⁷³¹As Chapter 3 described, in PFCs, the risks associated with the exceptionally capital-intensive projects are too high for individual contractors to dissipate them within their portfolios. Therefore, as shown in chapters 5 and 6, in PFCs, with the project and the financing debt allocated under the property of a SPV, sponsors will internalise and dissipate only the risks associated with the likely project default at the costs of their (capital and contractual) contributions. Strikingly, in PFCs, the bulk of total risks will be internalised by the FP who will not rely on the collateral of the

Finally, before advancing, let us point out at two more aspects that I will elaborate in the second part of the chapter.

First, consistent with the dispersion of contractors (both for inputs and for financing), before enforcing *de facto* control liability, judges request evidence of their capacities to issue directives or otherwise exert critical influence over the decision-making system of the company. Intuitively, judges cannot presume control by contractors who are not capable of interacting with each other or with the company they work for in distinct projects. In the following chapters, this judicial practice will appear distortive (insufficient) in PFCs where contractors do control the SPV -as such control is not only desirable but functionally indispensable for the implementation of the risk allocation mechanism.

Second, today, in diversified environments, parties do not often implement clauses restricting the capacities of companies to contract with parties other than those predefined. Most intuitively, these restrictions come at the unsurmountable opportunity costs of losing investment capacities. For identical reasons, today, there are no functional or legal justifications for judges to consider that parties implement contracts with eyes on interfering on the capacities of parties to contract with third parties.

Below, the chapter will remark the sources of value observed by creditors when entering a contractual arrangement with diversified companies. I will refer to the effectiveness but limited efficiency of sureties and the value of the investment portfolio as a reference for the risk internalised by all contractors. Then, I will comment on the strategic vulnerabilities of creditors to opportunism in diversified corporate businesses. The last sub-sections will list critical aspects of the legal treatment protecting these creditors and how this treatment accommodates the efficiency value of diversified investments, investors, and contractors in regular diversified corporate contracting.

As anticipated in the introduction, in the second part of the Chapter, I will replicate the analysis remarking the contrasts with the distinct strategic aspects, vulnerabilities, and needs for legal treatment in single predefined (not diversified) PFCs.

(project-specific) SPV but on the comprehensiveness and enforceability of the risk allocation mechanism -a matter ignored by legislators today. I will come back to this point below.

7.2.3 Value expected by creditors in diversified corporate businesses

In regular (diversified) corporate contracting, when estimating the value expected from their claims, the individual creditors observe two terms in their objective functions.⁷³² The first term identifies the value expected from their titles whenever the company complies with their obligations as desired. The value of this term results from the fixed face value of their claims factored by the likelihood that the company manages to deliver such payments.

The second term will include the value expected in scenarios where the debtor becomes insolvent. The value of this second term will result from the likelihood of insolvency and the minor value that the debtor may obtain from the company, from either: a) sureties from the company or from third parties (that is, recourse to third parties); or, b) the redeployment value of corporate assets.

Let us most briefly observe the effectiveness of these sources of collateral value to creditors and their legal protection in diversified corporate financing. The description of these aspects is necessary for later remarking the differences in strategies and needs for legal treatment in PFCs.

7.2.3.1 Effectiveness but limitedly efficiency of sureties (*ius in re* and recourse to third parties)

In corporate financing, sureties (*ius in re*) may come from the debtor or from third parties. These sureties fall over registrable goods. *E.g.*, *hypotheken*, mortgages, *prendas*, or liens all enforceable *propter rem*.

As protections to the expectations of creditors, *ius in re* and collateral or resources from third parties are indeed adequate. However, companies have a limited budget of registrable assets that they can attach to financing contracts. Additionally, the capacities of these legal persons to benefit from collateral or protection from third parties are also bounded.

Beyond a certain point,⁷³³ the limited availability of assets upon which parties can

⁷³² I am restricting my attention to the sources of benefits. I leave aside the choices of inputs and the standard assumption about the convexly growing costs of efforts -in the case of financial creditors, the incremental distress costs of losing diversification benefits and the opportunity costs of failing to allocate such resources somewhere else.

⁷³³ See the observations with respect to debt capacities and distress cost in Chapter 3

implement *iure in re*, or the sacrifices necessary for accessing protections from third parties (restrictive covenants) will result in under-investment from other projects advanced by the same company. Finally, in their limited availability, sureties are not sufficient for collateralising the financing of high capital-intensive projects as those funded via PFCs.⁷³⁴ In other words, parties will access, and offer sureties to creditors under a budget constraint.

7.2.3.2 Portfolio collateral value

Leaving aside the protection of sureties from (recourse to) third parties, in regular corporate contracting, the expected values of claims held by creditors depend on two variables. Each variable (a term in their objective functions) describes returns expected in the events of two simple scenarios: whenever the company produces wealth beyond the costs of debt, and whenever the company fails to produce value as high as the face value of debt claims.

In the first case, the creditors will receive wealth equal to the face value of debt claims. In the second case, creditors will obtain the redeployment value of the goods that form the investment portfolio of the debtor; this second value is a function of the degrees of specificities of portfolio assets.

Below, we will see how insolvency regulations protect these values. We will also see how such protections are efficient in the contexts of diversified businesses only -*v.gr.*, they are not effective in the cases of PFCs.

7.2.4 Tensions in diversified corporate contracting: within corporate spheres and against the collateral value

Let us now observe the forms of opportunism to which creditors are vulnerable and the legal protection that they receive in diversified corporate businesses. As shown in Chapter 3, we find that, in *regular* corporate settings, the types of abuses implemented by managers and controllers of corporations against creditors will be of three types: the asset substitution (*risk shifting*⁷³⁵), the asset dilution,⁷³⁶ and the debt

⁷³⁴ See the observations about the sources of distress costs in Chapter 3.

⁷³⁵ Let us remember, as conditions deteriorate, the capacities of the company to produce welfare beyond the burden of senior debt decreases. Shareholders then expect lower residual benefits from the company. In this context, the functionality of the limited liability shelter rises the risk appetite of controlling shareholders. In other words, shareholders will perceive incentives for leading the company (*i.e.*, for

dilution⁷³⁷ problems. Besides, shareholders (managers) behave opportunistically against creditors when they fail to file bankruptcy procedures as required by insolvency laws (in rigour, a form of the asset dilution problem).⁷³⁸

These actions are clandestine violations of the canonical fiduciary duties of loyalty. These duties bind not only managers but also controlling shareholders (or third parties, including contractors) exerting *de facto* control over the decision-making system of the company.

Two aspects we must note here. First, in diversified corporate contracting, opportunism comes directly in detriment of company *actual* collateral capacities. Second, in regular corporate investing, opportunism realises within corporate control

instructing the manager) to capture projects that will be progressively riskier than socially optimal. Higher volatility of cash flows expands the residual benefits they can obtain from successful projects but also increases the likelihood of insolvency in the detriment of creditors.

⁷³⁶ Behind asymmetries of information, controlling shareholders will extract value directly from the company. This expropriation may take the form of appropriation of *business opportunities*, the implementation of contracts with related parties under other than market conditions, the deviation of unallocated cash from the company, or the use of company assets for personal benefits. Notice how, as the capacity of the company to issue residual dividends decreases, so does the marginal value of resources under the legal entity. In other words, the smaller the capacity of the debtor to issue dividends, the more that, to shareholders, those goods will be worth more outside than inside the company. As said above, all forms of expropriations implemented by managers as per the instructions of controlling shareholders (generally, the free cash flow problem) will fall in this category.

⁷³⁷ Additionally, as described in Chapter 3, as conditions worsen, controlling shareholders will perceive stronger incentives for acquiring additional debt for the company. By doing so, shareholders would subsidise inefficient opportunities with externalities to old creditors.

⁷³⁸ Controllers (shareholders or managers) will externalise risks to creditors when they fail to file for insolvency procedures after signals of distress appear to them. As shown below, there is a bundle of obligations associated with the awareness of corporate insolvency. Failure to file insolvency procedures will regularly result in control liability for the losses to creditors since the moment in which the obligation exists.

spheres (on the side of companies -not its providers).

7.2.4.1 Opportunism affects collateral value

In diversified corporate businesses, companies hold assets that are specific in different degrees. Accordingly, in their current state, company assets do have a current redeployment value -*i.e.*, they are already functional to other purposes. Thus, on the one hand, these assets and resources have collateral value to creditors. On the other hand, such redeployment values induce managers and controlling shareholders to benefit from them opportunistically.

Additionally, the company advances many projects which are materially independent in the benefit of investors who are also diversified. As a result, in diversified contracting, the company can use cash flows from side projects for masking the opportunism that sponsors implement against corporate resources. This interdepartmental subsidising is a manifestation of the free cash flow problem.⁷³⁹

Accordingly, in diversified corporate contracting, we observe how opportunism affects corporate assets and actual resources of lower degrees of specificities. This we observe in *risk shifting*, *asset dilution*, and *debt dilution* problems. All abuses result in detriment of company actual (not expected) goods and resources in detriment of collateral to creditors of the company.

7.2.4.2 Opportunism manifests within corporate control spheres

Closely related, but independent from the above, in regular corporate contracting, abuses result from managerial decisions of the company and manifest in forms of opportunism that materialise at the company level -*i.e.*, within the spheres of administrative control of company managers. *E.g.*, managers and controllers choose riskier than optimal projects; they expropriate business opportunities; they use and abuse of corporate assets for their benefits.

Remarkably, this observation is not a claim in the sense that managers cannot behave opportunistically in cooperation with contractors. Notice, diversified contractors and managers can mask opportunism behind asymmetries of information of the complex organisation advancing many projects. They can also hide expropriations via by cross-subsidising cash flows within the company (a problem of free cash flow). However, in contexts in which companies advance several materially independent projects, collusion amongst input providers is costly. Hence, there is a space for

⁷³⁹ See Chapter 3 for references to the problem with literature review.

cooperating amongst contractors that, in these diversified contexts, does not exist.

In other words, in regular corporate contracting, company managers may collude with one or maybe with more contractors. However, in diversified contracting, contractors cannot form opportunistic sub-coalitions or unanimous collusions with managers based on cooperation sustained via reciprocity.⁷⁴⁰ Hence, in regular corporate investment scenarios, opportunism will be decided and implemented - prevalently- at the company level.

These two observations reflect in the objects and spirits of legal institutions with which legislators and judges assist parties against the conflicts of interests in regular corporate contracting. Moreover, the same rationality guides the contractual precautions implemented by companies and their contractors. In both cases, legislators, judges and contracting parties focus on asset protection against management and control opportunism, and the object of such precautions result in strategic effects that we observe, *mainly*, on the corporate side.

Concretely, legislators enforce managerial (and *de facto* control) responsibility against administrators and owners expropriating company benefits from corporate assets. Legislators and judges also deter administrators from abusing of corporate goods and resources or appropriating business opportunities. Finally, corporate insolvency laws oblige managers to file insolvency procedures as soon as they find the company beyond a certain threshold of distress (and incentives to extract value grow).

In the same vein, in contractual practices, parties protect corporate assets that creditors take as collateral. Notice the functionality of mortgages and liens and the regulation obliging owners to preserve *things* in their functionalities and values. Additionally, both contracting parties and legislators protect company value while keeping corporate capacities to diversify investments, investors, sources of inputs and financing. Hence, restrictive covenants will appear only exceptionally in the context of corporate contracting. I will revisit these propositions below.

Later, I will also show how, the case of PFCs, opportunism will result from responses by contractors in conflict with contractual relationships as regulated in the risk allocation mechanisms (not from actions whose effects result prevalently, in loses of the *actual* value of business units within a portfolio of investments). Also, in contrast

⁷⁴⁰ That is, as we saw in the idiosyncratic forms of opportunism of FPCs examined in chapters 5 and 6

with what we just saw, in PFCs, opportunism will not stem from a decision within the company but from the interests of sponsors in their capacities of contractors optimising responses often in coordinated ways (*Cf.* the analysis of *shirking*, *risking*, and *shading*, in chapters 5 and 6). These aspects associated with the distinct needs that are inherent to the positions of sponsors and the FP will guide the shape or the legal treatment proposed in the following chapters for PFCs.

7.2.5 Legal and contractual solutions; the balance between preventing tensions and preserving diversification capacities

In diversified corporate businesses, when preserving the value of corporate collateral from the opportunism of managers and controlling shareholders, legislators and judges will procure not to jeopardise the capacities of corporations to diversify investments, investors, and contractors. In regular diversified corporate contracting, this is the strategy that maximises social welfare. This is also the legislative approach that maximises the Kaldor-Hicks efficiency of the interplay between the legal personality and the limited liability rules in corporate investing and contracting.

This equilibrium between protecting creditors *-i.e.*, moderating the externalities from limited liability shelter- while preserving the functionality of diversification not only orients the shape of current legal treatment under company laws but -crucially- it also manifests in contractual practices between the company and financial creditors or input providers.

Below we will see how, in the case of PFCs, losses of diversification capacities are not detrimental to SPV capacities. On the contrary, in PFCs, parties will perceive the loss of (direct or indirect) diversification capacities as efficient for the implementation and enforceability of the risk allocation mechanism for the single project. Furthermore, in PFCs, parties (notably, the FP) will spend implementation efforts limiting direct or indirect (see below) diversification possibilities.

Finally, because parties do not perceive losses of diversification as a loss of value, in PFCs, we will find contractual solutions that will be habitual in these arrangements, but that will be rare in diversified corporate environments. We will see these in section 5.

7.2.6 The tensions, diversification, and legal solutions

Let us now focus on the actual solutions that legislators and judges offer as default rules against the conflicts between creditors and controlling shareholders (and managers) in diversified corporate contracting.

7.2.6.1 Duties of loyalty in diversified corporate business

Most generally speaking -aside considerations of corporate types- there are two ways in which companies adopt decisions. One source of decisions consists involve the collective actions by shareholders (the undelegated decision-matters); the second aspect of the decision-making system relates to the resolutions adopted by executive managers (or groups of them, e.g., directors) within their scopes of delegation. Fiduciary duties of loyalty always guide the solutions adopted by managers in compliance with their legal and contractual mandates. Only exceptionally, under particular jurisdictions, judges and legislators impose such duties to shareholders exercising their collective political rights as owners of the company.

In the earlier case, during the life of the company, managers (and *de facto* controllers) respond to a duty to maximise profits by advancing diversified opportunities on behalf of the company. In the latter case, owners are, in principle, free to adopt decisions as desirable to the class.⁷⁴¹ Only after obligations to file insolvency procedures arise, both shareholders and managers must adopt decisions now preserving corporate collateral value in the benefit of creditors.

The above corresponds to the duties of loyalty to the company and creditors that change with the solvency of companies. Both configurations of the duties of loyalty, first to the company and in later stages to creditors, are subsequently efficient as per the diversification objectives of regular corporate businesses. During times of *business as usual*, when the organisation is solvent, managers (and controlling shareholders) maximise profits by hunting various risky growth alternatives. Whenever managers find the company under distress, the objective of their actions will orient decisions at preserving collateral value.

Along with the limited liability protection, the profit-maximising objectives inducing

⁷⁴¹ However, certain legal requirements often exist in the protection of minority shareholders. Additionally, some decisions affecting collateral value (or corporate risk levels in general -e.g., corporate reorganisations including mergers or split-offs, changes in the places of registration, entering or exiting the market for corporate shares, etc.-) will be also subject to requirements in protection of creditors. Cf. pp. 72-5, 93, 166-9 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit. From an economic stance, vid. M. BURKART; D. GROMB; F. PANUNZI, "Large Shareholders, Monitoring, and the Value of the Firm", *The Quarterly Journal of Economics*, vol. 112, 3, 1997.

managers to advance diversified portfolios facilitates delegation, which ultimately makes passive investment possible. That is, duties of loyalty to shareholders (to the company) permit that the company receives capital contributions from dispersed investors for higher economic activity.

In the same vein, in the vicinity of corporate insolvency, the later duty of loyalty oriented at protecting creditors (collateral value) allows lenders and contractors to anticipate (vaguely) the type of risks they internalise. Both configurations of duties of loyalty maximise social welfare by protecting investors and creditors interacting in an environment where investors, contractors, and investments are diversified and changing with time. Once again, let us notice how, in diversified corporate investing, the loyalty of managers (and controllers) switches from shareholders to creditors only in the imminence of corporate insolvency.

As I will show below and in the following chapters, these practices will not be efficient in scenarios of non-recourse financing. Recall, PFCs are not organisations in which parties obtain benefits from advancing diversified businesses. In contrary, in non-recourse contracting, the wealth expected by all parties -in particular, by the single principal internalising the bulk of total risks - depends on the quality with which parties implement the single risk allocation mechanism for the unique project. Consequently, the rules as applied today result in distortions that parties correct contractually. In the following chapters, I will show how, in PFCs, duties of loyalty should be oriented *not* at seeking diversified business opportunities but at completing contractual provisions as defined in the -inherently imperfect- risk allocation mechanism as desirable by all parties. Crucially, this is including the creditor whose rationality dictates the feasibility of PFCs. Moreover, in PFCs, these fiduciary duties of loyalty should also guide the collective actions adopted by sponsors in the exercise of their political rights as owners of the SPV. This results from the instrumental nature of the SPV to the risk allocation mechanism.

7.2.6.2 Control responsibility in diversified corporations

The comparative legislator provides for rules enforcing managerial responsibility against shareholders or whoever exerts influences over the decision-making system of the legal entity. *De facto* responsibility permits that these individuals directing the company in the shadows of the decision-making system internalise the costs of managerial (control) misbehaviour. This includes actions of asset dilution (*e.g.*, appropriation of business opportunities, related party transactions, the use and abuse of corporate material goods and rights). In the vicinity of corporate insolvency, the rule preserves the collateral value of creditors. Additionally, during the life of companies, this institution protects the interests of minority shareholders.

Fundamentally, today, for claims for the recovery of damages to advance before courts, legislators and judges request that plaintiffs actively demonstrate *de facto* control.⁷⁴² In diversified corporate financing environments, this norm is efficient. A rule in contrary would induce the otherwise diversified shareholders (passive investors) to spend efforts intervening actively in the management of the company. The configuration the responsibility rule presuming that shareholders do not interfere personally with the delegated decision-making system of the company, and hence that they are not responsible for managerial decisions is consequently indispensable for the transferability of shares to passive investors.

Most interestingly, note how the above proposition holds identically to justify the shape of a *de facto* control responsibility for managerial decisions as well as for the types of decisions that shareholders may adopt collectively in violation of the law (or in violation of protections to the company or minority shareholders under each jurisdiction). Today, shareholders respond for such acts only as much as they intervene in such a decision-making process, and only whenever such collective actions violate the law. As said, in regular diversified corporate investments, any departures of legal solutions from this principle would result in incentives for shareholders to participate actively in the decision-making process, ultimately increasing the costs of investing, resulting in under-investment.

Later, and in the following chapters, I will show how, in PFCs, as owners and input providers, sponsors *do* control the SPV *de facto* and *de iure*-always. Moreover, in PFCs, such control is not only desirable but a necessary condition for implementation feasibility of the risk allocation mechanism (that pre-exists the constitution of the strictly instrumental SPV). Moreover, I will later show how, in PFCs, the current rule forcing claimants to produce evidence of such control allows sponsors for procedural defences that lead to inefficiencies visible only in PFCs scenarios. In later chapters, I will demonstrate the rationality of treating sponsors as controllers of the SPV under a presumption *iuris et de iure*. Sponsors implement contractual solutions (*v.gr.*, control covenants) adjusting the current form of default rules.

7.2.6.3 Causality and informational aspects of corporate insolvency

Today, comparative legislators judge the (in)solvency of a company based on the current evolution of its businesses. Regularly, bankruptcy laws or jurisprudential

⁷⁴² *Vid. pp.* 138-141 (with footnotes 128 and 129) and 175-6, in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

standards use as a proxy for corporate solvency the incapacity of the organisation to comply with its *current* obligations without resorting to exceptional financing means. That is, insolvency will reveal to controllers and managers whenever the enterprise fails to serve its enforceable commitments with cash flows from *business as usual*. Other references used for insolvency tests often include capital to current liability ratios. This is solvency understood as a capacity to provide collateral to creditors.⁷⁴³

Remarkably, not how the above tests do not induce the manager to observe the status of individual projects within investment portfolios. Naturally, the manager is not prompted to pay particular attention to events affecting the contractors of some of those several projects. Importantly, this does not imply that a manager observing events external to its company that reveal imminent insolvency should not file for an insolvency procedure. To be clear, in the application of abstract rules of reason, certain events external to companies that should regularly lead to insolvency situations should (and -as observable- will, today) result in an obligation for a manager to file for insolvency protection. The point I am making is that insolvency laws require that the manager pays attention to the solvency of the company measured by the quality of its assets or balance of cashflows. These are two variables of the company, not of third parties.

Consider the cases in which the manager finds that the core activity of the company has been *de facto* illegalised (*e.g.*, an increase on duties payable for importing key inputs), or whenever regulations affect the core activity of the company directly. In these scenarios in which the loss of payment capacity is imminent, managers will be induced by law or jurisprudence to protect creditors and file for insolvency procedures with all its consequences in terms of managerial duties and control responsibility.

However, in a diversified environment, the likelihood that events external to the sphere of material control of the company result in corporate insolvency is low. That

⁷⁴³ In comparative law, we find two types of insolvency tests. Those focussing on the cash flows relative to current liabilities, and those based on the capacities of the company to repay its obligations with the recovery value of its assts. *Vid. pp.* 133-4 and 122 (footnotes 30) in *Ibid.* See also P. 173 in F. TOLMIE, *Corporate & Personal Insolvency Law*, 2nd, Cavendish Publishing, London, 2003. *Pp.* 123-5 in V. FINCH, *Corporate Insolvency Law - Perspectives and Principles*, cit. See also, in many places and with reference to European jurisdictions A. MADS; F. WOOLDRIDGE, *European Comparative Company Law*, Cambridge University Press, Cambridge, 2009.

is a virtue of the fact that the company will not harvest resources from one or a few projects but many growth options. Such events affecting one or more but not all individual projects will indeed result in increases in the volatility of cash flows. However, the impact of such events to corporate insolvency will be minor the broader the diversification of company activities. Then, only exceptional judges and legislators will be ready to identify sources of insolvency in such events.

Additionally, the diversification of projects in regular corporate contracting comes with informational implications to the enforceability of duties to reveal the status of insolvency enforceable against managers. Intuitively, in diversified corporate businesses, managers advance a broad portfolio of opportunities. The capacities of an administrator internalising convexly growing costs of efforts to monitor external events affecting one or more projects will be lower the broader the diversification of the portfolio she administers. Intuitively, such manager will better (privately and socially optimally) focus on improving the performance of the portfolio, not of individual projects. Hence, she will advance (and identify insolvency from) the entire portfolio of risky projects; *i.e.*, she will not spend high efforts lowering the likelihood of failure (identifying the insolvency) of each investment opportunity that will come with gradually less impact to the aggregated cash flows. This is how the rational manager optimises her managerial choices when administering many materially independent growth options simultaneously.

In the following chapters, I will show how, very often, in PFCs, the imminence of SPV will result from events affecting assets or resources other than those of the SPV. Consider the case of a specific input provider losing its capacity to deliver as expected. In any case, the likelihood that events affecting a single project result in SPV insolvency will be necessarily higher than what we should expect in diversified environments.⁷⁴⁴

⁷⁴⁴ Below, and in the following chapters, I will show how, in PFCs, managers (both delegated administrators and sponsors) should be capable of identifying these events with accuracy higher than that feasible to managers in diversified corporate environments. These propositions will result in a recommendation for judges to allow judicial bankruptcy protection to the SPV after claimants identify events affecting *the single project* from beyond the sphere of material control of the company. The informational observation should expand the rigour with which judges should enforce obligations to file for insolvency procedures to managers in PFCs. The proposition coincides with contractual practices in which the FP adopts informational

7.2.6.4 General duties to inform in diversified corporate businesses

Today, in regular corporate contracting, neither administrators nor shareholders have obligations to inform contracting parties about the solvency status or other events affecting the company. Exceptions to these are the obligations to reveal information whenever the company approaches the vicinity of its insolvency, or cases where parties contract upon commitments to provide information explicitly.

The above rule is efficient for three reasons. First, in diversified corporate businesses, parties have access to a pre-contractual stage in which, if desired, they can define such obligations for particular cases or circumstances. Second, in diversified environments, managers protect the redeployment value of assets as collateral in the protection of creditors in response to their obligations under bankruptcy laws. Third, most determinant, as I described above, diversified companies are less sensitive to eventualities affecting individual projects within portfolios. This reduces the rationality of enforcing duties to inform (of costly compliance) about events that come with no effect to the company or benefits to creditors. For these reasons, legislators and judges do not provide or enforce against managers or shareholders general or specific duties to inform creditors.

Below, we will see how the dependence of non-recourse debt on the enforceability of the risk allocation mechanism for a single project makes fiduciary duties to inform feasible and efficient PFCs. In the following chapters, I will also elaborate on the desirability of two distinct duties to inform: a general obligation to reveal *very bad news*; and a specific obligation to reveal information as necessary for the enforcement of individual clauses of the risk allocation mechanism with a *pre-emptive* (not compensatory) function and scope of application.

7.2.6.5 Optimal delegation in diversified corporate businesses

In regular corporations, the optimal delegation depends highly on many factors including corporate types (liability of owners), the dispersion of investors (dictating the costs of collective decisions), or qualifications of shareholders relative to that of managers (governing the marginal value of delegating at the marginal costs of agency tensions). *Perhaps*, for these reasons, works identifying optimal postulates for an

and project protecting precautions contractually. In Chapter 2, see respectively, duties to inform and *step-in rights*.

optimal scope of the delegation⁷⁴⁵ do not abound in the literature.⁷⁴⁶ The identification of this postulate is the objective of an ongoing research effort.

For now, let us note how, in regular corporate organisations capable of advancing long term and capital-intensive projects, the optimal delegation will be broad. This observation results from the following: First, the degree of dispersion of shareholders will be high. Hence, by delegating, shareholders will save collective action costs. Second, the scope of investment portfolios of these companies will also be high. As a result, the flow of contingencies and decisions required from the decision-making system of companies will also be significant. Third, the qualifications of dispersed (passive) investors will be low -and such investors will preferably not participate in managerial decisions. Then, by implementing mandates with broad scopes of delegation, companies will benefit from the higher managerial qualifications.

Below, and in the following chapters, I will show how, concerning these variables, the scenario in PFCs will be precisely opposite to what we see in diversified corporate contracting. There is anecdotal evidence in line with these observations reflected in the shape of reward functions offered habitually in the industry.⁷⁴⁷

7.2.6.6 Optimal seniority of claims in diversified corporate businesses

In diversified contracting, when contracting with creditors, managers regularly do not optimise both the value of protections (likelier repayment) and the associated input incentives effects. This results from many aspects: First, in diversified businesses, the individual choices of inputs deliverable for individual projects will have little impact to the solvency of entire portfolio; such minimal impact may not justify the transaction costs associated with the implementation of such protections taking into account incentive effects. Second, the actual calculus of an optimal

⁷⁴⁵ These are not to be confused with the matter of the optimal rewards (executive compensations) to managers -the object of many studies and industry practices.

⁷⁴⁶ *V.gr.*, delegation is often taken in the simplest sense of Holmström and most recently of Alonso and Matouschek, where a principal identifies a set of possible actions allowed to the agent -a closed interval within the array of activities of a company. *Cf.* B. Holmström, “*On the Theory of Delegation*”, in M. Boyer, Kihlstrom R. (eds.) *Bayesian Models in Economic theory*. North-Holland, NY., 1984. and R. ALONSO; N. MATOUSCHEK, “*Optimal Delegation*”, *The review of Economic Studies*, vol. 75, 2008.

⁷⁴⁷ See B. ESTY, “*The Economic Motivations for Using Project Finance*”, *cit.*

hierarchy of claims for contractors delivering contributions to distinct projects may be costly when companies advance diversified portfolios with many parties interacting sequentially with the company. Third, in regular corporate contracting, we find creditors of distinct types; many of these parties are highly diversified hence internalise low value-at-risk claims; these creditors dissipate the likely impact of default within their portfolios of investments; thus, they do not spend efforts implementing contractual protections. Finally, forth, during the life of companies, contracting takes place under uncertainty about the evolution of the company and consequently about future needs and the costs of allowing protections to parties.

In contrasts, PFCs, sponsors and the FP do implement hierarchies of claims to cash flows and sureties over real assets (*cf.* the *cash waterfall* clause in Chapter 2). Moreover, in PFCs, the regulation of seniority of claims is of fundamental value for interest alignment. In the following chapters, I will identify an optimal seniority of claims in non-recourse financing.

7.2.6.7 Optimal standards of managerial diligence in corporate businesses

In diversified corporate business, managers adopt decisions on behalf of their companies. These decisions regularly involve matters associated with inherently risky projects. Hence, albeit their soundness, some of these decisions will still lead to undesirable outcomes. Additionally, in regular corporate investments, managers adopt such decisions behind asymmetries of information. Administrators deal with many unrelated contractors and sources of financing simultaneously. Furthermore, the risk-averse managers will often be experts in market sectors but not on individual projects.

As mentioned above, legislators oblige managers to adopt decisions on behalf of the companies they administer under general fiduciary duties of diligence. Compliance with such duties of care allows risk-averse managers *not* to internalise the undesirable consequences of the actions they adopt following their mandates diligently. In the context of diversified investments, the protection to the manager is strategically indispensable for her to adopt projects that are risky as socially desirable.

In the following chapters, I will show how the capacities of managers to receive information about the projects they advance is higher in the cases of PFCs than in diversified environments. Moreover, in PFCs, managers will not require protection in their degrees of risk aversion as they will not adopt relevant or risky decisions. This will come with effects to the optimality of standards of care enforceable in PFCs.

7.2.7 The tensions, diversification, and contractual practices

Let us now observe three key places where criteria for interpreting contracts appear efficient in diversified corporate contracting but not necessarily in PFCs.

7.2.7.1 Capacities of shareholders to modify projects

In diversified corporate contracting, judges and legislators do not complete contracts ex-post to restrict the capacities of either party to pursue diverse business activities. This results from three reasons. One is on the side of the creditor, and the other one is on the side of the debtor. I have advanced these three aspects above and in earlier chapters.

First, let us begin by observing the impact of such interpretation criteria on the side of the debtor. As shown above, diversification is a core value of corporate investing. In corporate businesses, diversification becomes possible from the interplay amongst the legal personality of companies, the limited liability protection, and the feasibility of delegation. Interpreting clauses as restricting the capacities of debtors to advance side businesses opportunities would come at an opportunity cost to business enterprises in terms of the access to investment opportunities and resources from diversified investors.

Second, on the side of the creditor, preventing diversification may not result in a desirable solution. Diversification allows for portfolio benefits reducing volatilities of cash flows.⁷⁴⁸ Intuitively, to a creditor, the diversification of portfolios reduces the likelihood that contingencies affecting individual projects result in corporate insolvency.⁷⁴⁹ Additionally, in diversified business, companies do not advance only highly specific projects. Assets have redeployment value that serves as (partial) collateral protecting creditors.

Third, in diversified corporate businesses, the reliance of parties in portfolio benefits grows with the smaller value at risk contracts where it is not efficient for parties to spend efforts implementing provisions defining the range of activities allowed to the debtor.

⁷⁴⁸ With abundant literature references, see the description of volatility induced distress costs in Chapter 3.

⁷⁴⁹ By reducing volatility, diversification comes a marginal value to the creditor higher than the marginal costs of implementing restrictive covenants the debtor that the latter will externalise to the earlier in the price of contracting.

Consequently, in diversified corporate businesses, judges do not complete provisions ex-post with a spirit of restricting investment scopes to debtors. For the same reasons, we do not see contractors implementing restrictive covenants in regular corporate contracting. This is especially true amongst parties contracting for smaller values at risk. I have explored these propositions above.

Recall, the feasibility of non-recourse finding (the rationality of the FP) depends on the accuracy with which all parties regulate all aspects of the single project. Consequently, the above rationalities do not hold in case of PFCs.

7.2.7.2 Deterrence or compensatory functions of clauses

In diversified corporate businesses, the ex-post treatment that judges allow to penalty clauses varies greatly with jurisdictions and legal traditions. Habitually, operators will enforce penalties whenever such provisions come with explicit references to the damages expected by parties (-i.e., liquidated damages).⁷⁵⁰

In environments where contractors are diversified and solvent, unless clearly expressed by them, judges will find difficulties for distinguishing whenever parties implemented penalties with pre-emptive (deterrence) or compensatory purposes. Subsequently, unless they observe a neat rationale for implementing dissuasive precautions, in diversified corporate contexts, judges will fall back on the compensatory spirit with which legislators treat scenarios of contractual default.⁷⁵¹

In the following chapters, I will show how, in PFCs, the discussion about the damage compensation function of clauses loses its relevance. Intuitively, in PFCs, the lender enforces clauses for regulating the responses by sponsors under all foreseeable

⁷⁵⁰ E. MASKIN, “On the Rationale for Penalty Default Rules”, *Florida State University Law Review*, vol. 87, 1989, 2005. G. DE GEEST; F. WUYTS, “Penalty Clauses and Liquidated Damages”, *Encyclopedia of Law and Economics*, 1999. U. MATTEI, “The Comparative Law and Economics of Penalty Clauses in Contract”, *American Journal of Comparative Law*, vol. 43, 1995. M. I. GARCÍA, “The Enforcement of Penalty Clauses in Civil and Common Law: A Puzzle to be Solved by the Contracting Parties”, *European Journal of Legal Studies*, vol. 5, 1 Spring/Summer, 2012.

⁷⁵¹ E. MASKIN, “On the Rationale for Penalty Default Rules”, cit. G. DE GEEST; F. WUYTS, “Penalty Clauses and Liquidated Damages”, cit. U. MATTEI, “The Comparative Law and Economics of Penalty Clauses in Contract”, cit. M. I. GARCÍA, “The Enforcement of Penalty Clauses in Civil and Common Law: A Puzzle to be Solved by the Contracting Parties”, cit.

circumstances. More precisely, the FP enforces provisions for preserving the capacity of the SPV to produce the residual benefits that dictate the strengths of incentives to sponsors.⁷⁵² Consequently, in PFCs, violations of default provisions will not come at a current (actual) loss to the lender stemming from a failure to repay the senior non-recourse debt but with an impact on total project welfare (to sponsors) and subsequent exacerbation of opportunism -then leading to an increase in the likelihood of default. Showing how this happens has been in the object of chapters 5 and 6. Accordingly, in PFCs, the FP will devise clauses shaping the risk allocation mechanism with predominantly pre-emptive (not compensatory) purposes.

7.2.7.3 Equal treatment of parties

In diversified corporate businesses, judges do not assume that parties have distinct capacities to implement contractual protections or to internalise risk distinctly -a conspicuous exception to this may be the case of labour law. Subsequently, when completing provisions ex-post, judges are equally sensitive to the vulnerabilities of all parties involved. Accordingly, in diversified corporate contracting, judges interpret clauses implemented by all contractors (sponsors and the SPV) rigorously under a *pari passu* spirit -i.e., with parties in equal footing.

Below, and in further chapters, I will show how, in PFCs, the capacities of sponsors and the FP to implement and enforce provisions as well as to internalise costs are not similar. This contrast will provide for the rationale behind an *in dubio pro creditore* principle orienting the ex-post interpretation of clauses in PFCs.

7.3 Social value and the legal needs of parties in all PFCs

In Chapter 4, I have described five aspects that, along with the necessary components of PFCs (parties and objects) define the strategies of both sponsors and the FP in non-recourse financing. In that chapter, I characterised: first, how the expected value of non-recourse claims of the FP depends on the (contractible and non-contractible) inputs from sponsors; second, how, as shareholders and input providers, sponsors control the SPV and its assets fully; third, the three tiers of incentives to which sponsors deliver their contributions governing the value of FP's claims in PFCs; fourth, how, in the nerve of conflicting interests, we find the amount and seniority of non-recourse debt and implementation quality; fifth, how in PFCs, opportunism does

⁷⁵² Cf. the description of technical default events in Chapter 2 and the evolution of incentives in chapters 5 to 7.

not take place within corporate spheres but in the responses from input providers to the project (a decision beyond corporate decision-making system); and finally, sixth, how, in sharp contrast with what we see in regular corporate contracting, in PFCs, parties do not appreciate diversification (and spend efforts eliminating it).

As said, these points advanced in Chapter 4 identified the strategic aspects that result from the elements and structural features inherent to all PFCs. Additionally, in chapters 5 and 6, I have identified the reactions of sponsors to the conflicts of interest inherent to PFCs (*shirking*, *risking*, and *shading*, individually, within sub-coalitions, and unanimously) as the environment changes unexpectedly (*news*).

Furthermore, above in this chapter, I have remarked elemental aspects of strategic tensions, the legal treatment and the contractual reactions to opportunism in diversified corporate contracting and investing.

Based on those characterisations, I will now restrict our attention to six critical strategic differences between the positions, the contractual practices, and the needs for legal treatment of parties in diversified corporate investing and PFCs. Concretely, in this second part of the chapter, will:

First, show how the implementation quality of the risk isolation mechanism governs the feasibility of PFCs. This comes in contradiction with the objectives of legislators as manifested in the regulations corporate types oriented at preserving diversification capacities of companies.

In the second place, I will elaborate on how the feasibility of PFCs depends on a meeting of minds from parties other than the creditor and the formal debtor of the non-recourse debt. Such *consensus ad idem* is multiparty involving all input providers who control the project company (the sponsors) and pre-exists both the SPV (the formal debtor) and the loan agreement -both instrumental components of PFCs. This observation is crucial for the ex-post interpretation of contractual provisions in the benefit of all parties, including the lender (*cf.* chapters 8 to 10).

Thirdly, I will analyse how the best way to understand PFCs strategically is to see them as single principal-multi agent single-project contractual interactions.

Forth, I will observe how, in PFCs, the SPV is single-project instrumental to the objectives of a broader organisation serving for specific purposes of risk isolation and incentive implementation only.

Fifth, I will show how, in contrast with what we see in regular diversified corporate businesses, in PFCs abuses take place not from managers or controllers against corporate resources, within corporate spheres. In PFCs, the abuses materialise prevalently in the responses from input providers against the provisions of the risk

allocation mechanism, beyond SPV spheres. This observation is of paramount value to the legal treatment of conflicts in PFCs.

Finally, sixth, I will elaborate on how, in PFCs, the FP observes all spaces for diversification as imperfections of the risk allocation mechanism allowing room for opportunism. We will observe the value of minimising (never preserving) diversification in contractual practices modifying current default rules. This disvalue or diversification will permit that legislators and judges enforce a legal treatment otherwise incompatible with the current objectives of shareholders and contractors in regular (diversified) corporate businesses. This characterisation is critical for the articulation of legal solutions whose objectives come in contrast with the (business diversification) inertia with which commentators analyse legal solutions.

Based on these observations, later, in the third section of the chapter, I will show how sponsors rescue only some aspects of the legal personality and the limited liability protection and spend implementation efforts putting in place a distinct set of solutions (the risk allocation mechanism) oriented at preserving the value expected from the single project. These provisions substitute the remaining regulations of corporate types with which, today, legislators and judges preserve diversification capacities in regular corporate contracting and investing scenarios.

7.3.1 Implementation quality of the risk allocation mechanism and the feasibility of PFCs

As I have described extensively in earlier chapters, in the absence of sufficient collateral and recourse to third parties, the feasibility of PFCs depends on the quality with which parties implement a risk allocation mechanism for the single project they identify and contractually characterise. This risk allocation mechanism assures that, under all foreseeable eventualities, the SPV will count on all inputs necessary for the completion and operation of the predefined project. This expected performance of the single project as a function of the quality of the risk allocation mechanism dictates the repayment capacity of the SPV and consequently, the willingness of the FP to enter the project. That is, ex-ante, the perspectives (the expectations) of the efficiency of the risk allocation mechanism dictate the capacities of the lender to verify her rationality-participation-constraints and consequently, the feasibility of PFCs.

Accordingly, the risk allocation mechanism enforceable by the FP includes three types of obligations. The three commitments are strange to regular corporate contracting and investing practices. The three of them are necessary all PFCs. First, in PFCs, sponsors (shareholders) commit to providing capital as predefined by the *cash waterfall* clause. Second, sponsors commit to bringing the inputs necessary for the completion of the project as predefined before incorporating the SPV (their

contracting party). Finally, third, crucially, the input providers (sponsors) will commit to preserving the control of the SPV and directing the fully-controlled and strictly project-instrumental entity towards the completion of the single project for the generation of minimum welfare and ultimately repaying the senior non-recourse debt. Through technical default provisions enforceable via cross-default mechanisms, the FP enforces these obligations of the risk allocation mechanism against sponsors (both individually and collectively) and the SPV -hence incentivising cross-monitoring non-contractible efforts from the earlier.

In PFCs, the difference between the set of eventualities and tasks allocated to individual sponsors by the risk allocation mechanism (its implementation quality defining the risks internalised by sponsors) and the actual needs (contingencies) that the SPV will face during the term of the financing (the implementation imperfections) will govern the SPV default risks that the non-recourse lender will internalise in PFCs. Then, the quality (comprehensiveness and enforceability) of this risk allocation mechanism in the eyes of the PF⁷⁵³ will dictate the willingness of the lender to internalise non-recourse risks and consequently, the feasibility of PFCs. We have seen this observation elaborated in many places in all chapters.

Observe how the refinement and enforceability of the risk allocation mechanism not only precedes (both strategically and chronologically) any contributions from sponsors and the internalisation of non-recourse debt risks by the FP but also supersedes it regulating the responses from sponsors until the full repayment of the non-recourse debt. This rationality of parties in PFCs comes in sharp contrast with the objectives of lenders in traditional banking where all contractors rely on the collateral (solvency) of a portfolio of ongoing businesses of the debtor or third parties.

In chapters 10 to 11, I will analyse the several legal implications from the critical strategic value of the risk allocation mechanism. Let us note, as described in Chapter 4, the quality of the risk allocation mechanism is a function of the capacities of parties to foresee contingencies. This capacity then depends on the array of activities that the SPV can advance. This is the underlying reason why, in PFCs, parties will restrict the activities of the SPV to the single project whose eventualities they may anticipate. I will elaborate on these objectives in a dedicated point below.

Accordingly, as also elaborated and as I will revisit below, in PFCs, the non-recourse

⁷⁵³ There is an adverse selection problem that is evident in this point. This is the object for a later research.

lender interprets spaces for discretion as a manifestation of implementation imperfections of the risk allocation mechanism allowing for opportunism. Consequently, ex-ante, the FP will spend implementation efforts eliminating (never preserving) all spaces for diversification.

See the following section of this chapter as well as Chapter 9. The value of the risk allocation mechanism in substitution of collateral will affect the objectives of all contractual mechanisms. The lack of collateral value or any capacities of sponsors to repay the non-recourse debt will reveal an always pre-emptive, never compensatory objective in all clauses. The single project and the identification of parties ex-ante will also expose the *intuitu personae* nature of the interaction between individual sponsors and the FP. Following these objectives, in PFCs, parties will limit the transferability of shares in the SPV, they will restrict the scenarios in which the SPV will be allowed to seek inputs from parties other than the sponsors, or financing from other lenders without the consent of the FP.

7.3.2 The consensus amongst parties other than the formal debtor (the SPV)

From the above description of the functionality of the risk allocation mechanism, it follows that, albeit parties may document the non-recourse agreement as a formal bilateral contract between the project-instrumental SPV and the FP, in PFCs, the strategic aspects that govern the feasibility of the non-recourse financing result from the interaction amongst the FP and sponsors (both collectively and individually). It is the quality of this interaction -the capacity of the risk allocation mechanism to prevent contingencies and responses- what dictates the performance expected from the project and consequently, the willingness of the FP to internalise non-recourse risks after they incorporate the SPV (the formal debtor).

The sponsors not only will bring capital and inputs as contracted directly with the FP before even incorporating the SPV (the formal debtor). Crucially, sponsors will also commit personally to controlling the SPV and orient all resources towards the completion of a project and the generation of wealth necessary for the repayment of the non-recourse debt. I have mentioned this above and in all other chapters. The pre-existence of the risk allocation mechanism that sponsors (individual and collectively) implement with the FP before internalising non-risks reveals an -at least functional- multiparty nature of PFCs.

Moreover, because during most of its existence, the SPV will not be capable of

repaying the senior non-recourse debt,⁷⁵⁴ the quality (comprehensiveness and enforceability) of the risk allocation mechanism depends on the capacities of sponsors to internalise all individual commitments and collateralise the penalties that the lender will enforce.⁷⁵⁵ Hence, because the implementation quality of the risk allocation mechanism depends on the capacities of sponsors, these provisions will be *intuitu personae* in nature (I will come back to this proposition with a dedicated section in Chapter 9). The *intuitu personae* nature of the interaction that parties implement for securing the feasibility of a project defining the repayment capacities of the non-recourse debtor (the SPV) remarks the said multiparty strategic nature of the interaction between the sponsors collectively and individually (the SPV a merely formal legal instrument for only specific interactions -see below), and the FP.

This interdependence of all contributions from sponsors is known to all parties ex-ante just as much as they know all strategic features inherent to PFCs (*cf.* chapters 4 to 6). Accordingly, the awareness of parties about the material and strategic interdependence of contributions will manifest in the features and objectives of contractual provisions that we see consistently in PFCs and that the FP enforces against sponsors -not only against the SPV. See the elaboration on the functionality of cross-default provisions in PFCs in Chapter 2.

Below, in the next section in this chapter and chapters 8 to 10, I will build a consideration of the possible legal implications from the *consensus ad idem* amongst all parties,⁷⁵⁶ including the lender and shareholders. The vulnerabilities of the least informed FP internalising the bulk of total risk will serve for articulating an *in dubio pro creditore* principle, the general and specific duties to inform, and fiduciary duties of loyalty also protecting the lender.

7.3.3 Multi principal-multi agent relationship for a single project

In earlier chapters, we have seen how, in PFCs, parties use SPVs not for advancing diversified portfolios with resources from dispersed investors but for the financing an implementing a single highly specific project with non-recourse debt. As reiterated, in

⁷⁵⁴ The SPV will transform cash into highly specific assets as soon as it receives them as regulated by the *cash waterfall* clause.

⁷⁵⁵ See the description of the events of technical default and full default in chapters 2 and 4.

⁷⁵⁶ *V.gr.*, the sponsors and the FP often implementing interactions via formally independent instruments.

PFCs, the interplay between the specificities of asset and the non-recourse nature of debt implies that, for the servicing of its claims, the FP will rely on the quality of a web of contracts -the risk allocation mechanism- that she enforces against sponsors.

The above description reveals PFCs as principal-agent interaction between the non-recourse lender as principal, and the sponsors as agents implementing and operating the project with resources of the FP. Accordingly, in PFCs, the FP and sponsors devise a bundle of contracts and legal institutions shaping the set of incentives that govern the interaction between a principal and a team of agents exerting material efforts. Amongst these provisions, we find the mandatory and default norms applicable to the project instrumental SPV -of which parties benefit from certain features, and other ones they will change contractually as feasible.

In Chapter 6, I have referred to the principal-agent interactions when analysing the formation of opportunistic sub-coalitions in PFCs. Based on the considerations of earlier chapters, it is easy to see how, in all PFCs, we find a four-fold principal-multiagent relationship. In all dimensions of the interaction, the FP appears as the least-informed party. The FP does not control resources materially and who internalises the bulk of total risks. As analysed in all chapters, as principal, the FP spends implementation efforts inducing agents to behave as socially desirable -the only source of value that she expects when entering the project (the stage in which she verifies individual rationality -participation- constraints).

These interactions exist via the interposed single project-instrumental SPV (see further below).⁷⁵⁷

The sponsors acting as agents collectively. The first of the two principal-agent interactions involve the FP as a single principal who implements incentives for a multiplicity of sponsors who, as agents, exert both contractible and non-contractible actions.

In this setting, the principal brings cash and receives senior but fixed non-recourse claims. As agents, the sponsors respond by delivering cash (capital to the SPV) and material inputs for the predefined project. The sponsors then extract junior but variable benefits from contracts and distributions of property rights (shares with

⁷⁵⁷ During the life of the project, these principal and agents may change -and often do (the FP discounts titles to other financing providers of lower risk appetite); however, such changes will take place as contractually regulated ex-ante amongst all parties, including the non-recourse lender.

entitlements to dividends). As said, principal and agents (sponsors collectively) implement much (but not all) of these collective contractual interactions via the SPV that they all own.

Second, sponsors acting as individual agents. Second, there is a distinct but not independent principal-agent relationship that takes place whenever sponsors choose inputs individually. In this case, the individual sponsors are the agents, and the rest of the sponsors and the FP are principals with different entitlements. Sponsors deliver responses individually to incentives that parties implement contractually (the risk allocation mechanism) as well as to expand benefits (expected dividends) from their allocations of property rights in the SPV. *Cf.* chapters 5 and 6.

The case of sub-coalitions. There are third and fourth principal-agent relationships that also correspond with collective and individual responses. We now find one extra conflict between the sub-coalition members acting collectively (the fewer agents colluding clandestinely) and the rest of the sponsors and the FP as principals. Finally, the fourth relationship involves individual sub-coalition members as agents of all other parties (sponsors within and outside the sub-coalition) and the FP as principals.

The FP is always the principal and the residual risk-taker. As we see, in all relationships, the FP appears as principal and never as an agent. Moreover, it is the FP who internalises the residual risks of the project. This results from the interplay between the non-recourse nature of the debt, the lack of collateral protection from SPV assets, and the necessary imperfect nature⁷⁵⁸ of the strategically critical risk allocation mechanism. Accordingly, it is the FP who spends implementation efforts preventing risks as she can foresee eventualities. Crucially, the sponsors spend implementation efforts expanding value as optimal to the team and as sufficient for involving the FP (at the marginal value of decreasing interests' rates) in the business - that is, for the lender to verify her participation constraints and participate in the project at market-controlled prices (interests) for the non-recourse funds.

The merely formal interposition of the SPV. It is through the SPV that both the SPV and the FP deliver and harvest contributions and benefits. However, as described extensively, the contractual interaction between sponsors and the FP does not take place through the SPV, but via direct agreements -most of which they implement

⁷⁵⁸ Provisions are incomplete. Due to asymmetries of information, the principal cannot verify all actions from the agents.

before the incorporation of the legal entity -the critically relevant risk allocation mechanism. These direct agreements induce all parties to internalise the risks they anticipate when contracting.

Functionally, independently of the use of the SPV for the purposes that I describe below, the distribution of risks results always from a contractual interaction between the FP and sponsors -not between the creditor and the formal debtor of the loan agreement (the SPV). As in all relationships, this interaction is subject to agency costs limiting the implementation quality -resulting in default risks that the FP (the principal and the residual risk taker) internalises.

These aspects are inherent to the interactions of sponsors and the FP in all PFCs, in all environments (*Vid.* chapters 5 to 6) and structural variations (*Vid.* Chapter 4).

7.3.4 Instrumentality of the fully controlled SPV for three purposes only

7.3.4.1 Need for a limited liability protection

As I described above, the efficiency of diversified corporate investing results from the interplay among three legal features: the rules of legal personality, the limited liability protection, and the possibilities for managerial delegation. The interaction of the three institutions permits the diversification of investments as well as of investors.

As also recalled, in the context of diversified corporate contracting, the rules of legal personality and limited liability result in punctual externalities to dispersed creditors in the anticipated events of corporate default. However, the capacities of frustrated creditors to dissipate the impact of defaults within their also diversified portfolios and the benefits that the rules bring to society by incentivising investments reveal the conjunction of these legal institutions as *Kaldor-Hicks* efficient. These propositions are commonplace in the literature of corporate finance and corporate law and economics.⁷⁵⁹ I have revisited them above.

However, in all earlier chapters, we have seen how these aspects do not reflect the utility for which parties use SPVs in PFCs. In PFCs, in PFCs parties do not recur to the project company for implementing the delegated administration of a diversified portfolio of projects with resources from dispersed investors whose risks shareholders will externalise partially to also dispersed creditors. In PFCs, sponsors

⁷⁵⁹ For all, see Chapter 1 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

benefit from the SPV for implementing and financing a single project. Hence, in PFCs, legal personality and limited liability rules do not function as *Kaldor-Hicks* efficient rules inducing diversified creditors to internalise insolvency risks that they may dissipate within their diversified portfolios. Moreover, in contraposition with the objective of investors in regular corporate businesses, in PFCs, parties spend efforts precisely preventing diversification (see further below).

7.3.4.2 Three objectives for using SPV in PFCs

As characterised in Chapter 4, in PFCs, parties recur to the use of a project-dedicated SPV for three purposes: for risk isolation, for contract implementation, and incentive allocation via distributions of property rights. All these aspects relate to a single (undiversified) project.

Risk isolation. The SPV permits the separation of assets and entitlements (contractual relationships) of the project in a distinct legal entity. This prevents double way risk contamination between the project and sponsors.⁷⁶⁰ ⁷⁶¹ The limited liability protection of the SPV is consequently indispensable for the functionality of the non-recourse rule without which the FP could seek post-default compensation from sponsors. This benefit is not strategically possible in diversified environments where the debtor advances a portfolio of independent projects with distinct contractors sharing corporate collateral (see the analysis of the benefits of PFCs against the volatility induced distress costs in Chapter 3).

Contract implementation. The legal personality of the SPV serves for simplifying the contractual implementation of the single project. The use of a SPV allows the FP to interact formally with the project company for implementing incentives for all sponsors (as a team) to behave as socially desirable. For instance, as shown in Chapter 4, the FP can implement control agreements that she can enforce against individuals and vice-versa. That is, the FP can enforce against sponsors penalties associated with the misbehaviour of the SPV and vice-versa (cross-defaults).⁷⁶²

This possibility is not available to contractors and shareholders in regular corporate

⁷⁶⁰ See the references to the benefits of *entity shielding* and the regime of *asset partitioning* of the legal personality in Chapter 4. *Cf. pp. 6 and ff. in Ibid.*

⁷⁶¹ See also the analyses of the ways in which PFCs prevent distress costs in Chapter 3.

⁷⁶² The use of a SPV consequently allows the FP to take all project assets as hostages for enforcing the obligations of sponsors. *Cf. generally, O. E. WILLIAMSON, "Credible Commitments: Using Hostages to Support Exchange", cit.*

financing where providers deliver their inputs for functionally independent projects that they cannot monitor or with which they cannot interfere materially. Moreover, in diversified corporate investing, the fact that all contractors (for inputs and financing) share the same collateral value from the same debtor results *debt dilution* -a distinct source of externalities amongst contractors not possible in PFCs with parties regulating the sources of financing ex-ante.⁷⁶³

Incentive implementation via the distribution of property rights. Lastly, as also described in Chapter 4, in PFCs the allocation of the project under the legal frame of a SPV permits that sponsors distribute property rights (shares of expected dividends) as a means of allocating incentives for them to deliver fully non-contractible actions. In Chapter 6, I have referred to the feasibility boundaries of the incentive implementation via property rights (the moral hazard in team problem⁷⁶⁴) and how, in compliance with the informativeness principle,⁷⁶⁵ the rational sponsors will recur to this method only as their last resource. However, in PFCs, where sponsors are few, the impact of the moral hazard in team problem is not pronounced.

In contrasts, even if assuming that parties agree to pay contractors with shares in the debtor company, these benefits are not feasible in scenarios where numerous contractors deliver inputs for several materially-independent projects. In such cases of diversified corporate contracting and investing, the moral hazard in team problem dilutes the strengths of incentives as a function of ownership dispersion. For this reason, -with the conspicuous exception of managers and workers who do interact with companies in many projects- in diversified businesses, we do not see distributions of shares as a means for incentivising third-party input providers to deliver non-contractible actions.

⁷⁶³ Cf. the analysis of the problem in Chapter 3.

⁷⁶⁴ The seminal and classical reference is B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. See also M. BATTAGLINI, “Joint Production in Teams”, cit. L. RAYO, “Relational Incentives and Moral Hazard in Teams”, cit. E. RASMUSEN, “Moral Hazard in Risk-Averse Teams”, cit.

⁷⁶⁵ Before allocating property rights as a means for implementing incentives, contracting parties should internalise in the reward functions all information about their individual responses. The seminal is B. HOLMSTRÖM, “Moral Hazard and Observability”, cit. For further illustrations and literature review, cf. pp. 169 and 300 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. See also P. CHAIGNEAU ET AL, “The Generalized Informativeness Principle”, cit.

7.3.4.3 Indispensable control of the SPV

In Chapter 4, I have also referred to how, in PFCs, control is both a reality and a feasibility requirement for the risk allocation mechanism. *De iure*, sponsors own the SPV. *De facto*, sponsors deliver the bulk of the highly specific inputs for the project. Ex-ante, sponsors' control of the SPV is critical for the implementation of the strategically indispensable risk allocation mechanism. Intuitively, as characterised in practices in chapters 2 and 4, and as examined strategically in chapters 5 to 6, ex-ante the FP must be capable of enforcing control covenants with controllers of the SPV so that she can trust that the project will advance as foreseen, thus producing wealth sufficient for repaying her credits.

In sharp contrast, in diversified corporate contracting, critical decisions come from delegated managers and dispersed shareholders rarely exert undesirable influences in the decision-making system of the legal entity. In diversified corporate investing, collective action problems and the so-called rational control apathy⁷⁶⁶ prevent the dispersed investors who hold only smaller shares of ownership in the SPV from participating directly in the decision-making process of the company. Also rare is the *de facto* control that contractors for inputs can exert over the company. For this, for creditors to advance claims based on *de facto* control responsibility, legislators and judges require plaintiffs to bring evidence of both actual control and wrongfulness of its exercise.

In Chapter 9, I will show how the standard control responsibility rule common in comparative company laws is not efficient in scenarios of PFCs, where sponsors not only control the SPV (always) but they exert control of project assets beyond the sights of the less qualified and least informed non-recourse lender.

7.3.4.4 Closely held project-instrumental SPV and managerial delegation

Additionally, independent from the above, in PFCs, sponsors do not avail of the single project-instrumental SPV for implementing managerial delegation. In PFCs, sponsors are highly qualified, and they are few. Consequently, they can adopt collective decisions of high quality at low collective action costs and at low under-investment associated with the moral hazard in team problem from which they cannot possibly escape.⁷⁶⁷ Moreover, -in any case- in PFCs, sponsors adopt most of the critical decisions ex-ante, with the participation of the FP, before incorporating the SPV.

⁷⁶⁶ *Vid. p.* 5630 in S. G. MARKS, "The Separation of Ownership and Control", cit.

⁷⁶⁷ *Cf.* B. HOLMSTRÖM, "Moral Hazard in Teams", cit.

Hence, in PFCs, managers adopt only the least relevant decisions habitually concerning daily administrative matters. Accordingly, in PFCs, parties do not need delegation for the fully controlled project-dedicated SPV for running the single investment option without the active involvement of dispersed investors. These aspects will define a distinct scope of optimal delegation in PFCs. *Cf.* Chapter 10.

7.3.4.5 Control of the SPV and the access to information

Finally, as also characterised in chapters 4 to 6, in PFCs sponsors' control of the SPV comes with two consequences for the access to information and implementation capacities. Sponsors can now access information of high quality about the project. These informational capacities appear enhanced by the possibilities of sponsors as input providers to interact with project assets materially. Material control and information about both the project and the responses from peers result in spaces within which sponsors can implement incentives relationally beyond the enforcing capacities of the FP (the second tier of incentives). Control and information then allow sponsors to react opportunistically (*shirking, risking, and shading*, individually, within sub-coalitions, and unanimously) to the strategic tensions generated by the senior debt under the second and third tiers of incentives.

7.3.4.6 The SPV instrumental to the multiparty agreement

The instrumentality of the fully controlled SPV confirms the functionally multiparty principal-multi agent interaction for the single project. As seen, in PFCs, many parties utilise the SPV as a legal mechanism for only some purposes. That utilisation requires control of the SPV, which is the object of contractual interaction between the controllers and the FP.

The FP instruments the non-recourse loan agreements formally with the SPV. However, the FP -the principal in the setting- builds her expectation about the value of her non-recourse debt with eyes on the responses from sponsors -the input providers of the single project with whom she contracts directly. Moreover, the FP interacts contractually with sponsors -and sponsors interact with each other- with contractual arrangements that focus on strategic aspects inherent to the positions of parties in PFCs (see the objectives of the casuistic introduction of Chapter 2 and the objectives of clauses shown further below). Thus, the substance of the interaction between the SPV and the FP is not only instrumental to objectives that the sponsors and the FP define in side agreements, but such interaction results from strategic needs of parties interacting directly. For this, control of the SPV (*i.e.*, its preservation by *e.g.*, enforcing restrictions to the capacities of sponsors to sale shares in the SPV to third parties) is the object of a multiparty interaction between the FP and sponsors.

These aspects confirm the functionally multiparty principal-multi agent interaction between the FP and the sponsors (collectively and individually) in all PFCs.

Many concepts derived from the functionally multiparty principal-multi agent interaction between the FP and sponsors, the instrumentality of the SPV to the single project as contracted upon by all parties, and the non-recourse nature of debt will be in the core of the articulation of all legal proposals for the legal treatment of PFCs in chapters 8 to 10. Concretely, those chapters we will explore the possible efficiency postulate for an optimal scope of delegation, a postulate for a *iuris et de iure* control responsibility applicable to sponsors, general and specific duties to inform, more rigorous duties of diligence enforceable against sponsors, and an expanded regime of individual responsibility of sponsors in the vicinity of SPV insolvency.

Below in this chapter, I will also remark the many ways in which, today, sponsors contractually correct the inefficiencies in the current legal treatment focusing on facilitating diversified investments and contracting. These corrections will later serve as market-mimicking efficiency verification of the legal propositions in chapters 9 to 11.

7.3.5 Tensions in PFCs realise beyond SPV spheres, at contractor's level and against implementation quality (not against actual collateral value)

Above, in this chapter, I showed how, in regular diversified corporate contracting, controlling shareholders and managers expropriate welfare that exists *predominantly* under the control of the company. That is, in diversified corporate environments, opportunism affects value principally on the side of the company. For instance, in regular corporate investments, *asset dilution* strategies involve the appropriation of business opportunities or the use and abuse of company material goods by controlling shareholders. This includes all forms of direct or indirect value appropriation that authors describe as the canonical free cash flow problem.⁷⁶⁸

Similarly, the *asset substitution* strategies allow shareholders to expropriate value by increasing the levels of risk in the projects that administrators choose for building the company's investment portfolios. Intuitively, managers will capture riskier-than-optimal opportunities as a way of benefiting from the more wealth-significant events of company success while externalising the costs of likelier insolvency risks to

⁷⁶⁸ With literature references, see free cash flow and the asset dilution problems in Chapter 3.

creditors. *Asset substitution* strategies result in increments in cash flow volatilities and losses in total expected value (in detriment of creditors) from investment portfolios.

As pointed out in Chapter 4, in diversified contracting, all forms of opportunism result prevalently from visible or clandestine actions of managers or *de facto* controllers of the company. Remarkably, these actions do not habitually involve contractors working for independent projects who can hardly collude (with each other and collectively against the company).

Accordingly, in diversified corporate contracting, both legislators (judges) and contracting parties implement protections whose strategic effects (the objects of the norm) we observe, *mainly*, on the corporate side. Legislators enforce managerial (and *de facto* control) responsibility against administrators and owners expropriating company benefits from corporate assets or opportunities. Judges apply fiduciaries of loyalty and diligence consistent with these obligations to advance and protect company value. Managers will also be obliged to file insolvency procedures after the company has failed some solvency tests.

The value of diversification in legal protections. Remarkably, as shown above, in this chapter and chapters 8 to 10, in regular corporate investing, legislators and judges provide default rules preventing opportunism at the management and control levels but without jeopardising diversification capacities of the company.

Simply, as remarked above, in regular corporate investing, there is an optimal social regulation that protects creditors from managerial opportunism but without inducing risk-averse managers to adopt excessive precautions ultimately dissuading diversified investors. In regular corporate contracting and investing, this equilibrium is part of the Kaldor-Hicks efficiency of corporate businesses (legal personality, limited liability, and managerial delegation resulting in moderate externalities to creditors) as a legal institution.

We also saw how the value of preserving (the costs of losing) diversification manifests also in the contractual solutions that we observe in regular corporate investing and contracting where restrictive (investing or financing) covenants are rare and regarded as too costly –especially to larger more diversified companies. We see this in the functionality that parties give to the use of mortgages and liens and in the legal protection that legislators and judges confer to these collateral protecting institutions.

The sources of tensions in PFCs. The strategic positions of parties capable of behaving opportunistically in PFCs are distinct to what we see in regular corporate environments.

As analysed extensively, the feasibility of PFCs does not depend on the redeployment (collateral) value of a portfolio of investments but on the quality with which parties foresee and regulate the expected responses from input providers (sponsors) under all eventualities. The implementation -i.e., comprehensiveness and enforceability- of the risk allocation mechanism dictates the value expected from the project and the risks that the FP internalises as non-recourse debt provider.

Let us recall the propositions of chapter 5 and 6. In PFCs, behind asymmetries of information, in their roles of input providers, sponsors choose low-quality contributions (*shirking*). They also implement technological innovations that may not be socially desirable. This includes choosing input alternatives that are riskier than socially optimal (*risking*), or complying with obligations under the risk allocation mechanism with cost-savings technologies at a loss of welfare some of which they fail to internalise (*shading*).

As we see, in PFCs, the loss of actual or expected welfare does not result (predominantly) from abuses against corporate goods (within the spheres of company control) but from opportunism that manifests in the responses from contractors for inputs. In other words, in PFCs, opportunism does not stem from decisions adopted or implemented at the SPV level, but from the responses by contractors in their interaction with the SPV and (via the risk allocation mechanism) the FP, beyond company spheres. These are the opportunistic reactions that legislators and judges should prevent via default and mandatory rules (see below and chapters 8 to 10).

Fundamentally, all the above does not mean that in PFCs, sponsors cannot abuse of project assets. Indeed, in PFCs, sponsors -who always control the SPV and who also hold qualified information⁷⁶⁹- can take advantage of project machinery. They can steal commodity goods. They can send personnel from the project to work at their facilities. However, these forms of opportunism do not prevail as the primary source of inefficiencies.

Moreover, there are certain forms of abuses typical of diversified contracting and investing that sponsors cannot implement in PFCs. I have explored these in Chapter 3. For instance, in PFCs, sponsors cannot extract further benefits by choosing riskier projects (asset substitution) or by appropriating side business opportunities of the company -because there are none (asset delusion). Additionally, in PFCs

⁷⁶⁹ Cf. the analysis in Chapter 4.

administrators cannot use much of project resources for their benefit because these are highly specific. In the same vein, in PFCs managers cannot subsidise any of the well-studied administrative laxity forms (all manifestations of the free cash flow problem) with liquid resources from side projects because there is only one project and because the cascade clause regulates cash flows entering and exiting the SPV.⁷⁷⁰

In PFCs, the conflicts beyond the spheres of SPV and the needs for preventing them manifest in the objects of contracts (see the next section). The dependence of non-recourse debt on the responses by input providers to requirements of the FP also guide the objectives of the legal solutions as proposed in chapters 8 to 10 focusing on facilitating the implementation of the risk allocation mechanism. In addition to the above propositions, the understanding of the fact that strategic conflicts manifest in abuses by input providers will serve for characterising an optimal seniority of claims maximizing incentives in PFCs (*Vid.* Chapter 10).

7.3.6 The (negative) value of diversification; the predefinition of parties and components in PFCs

Let us now analyse how, in exact opposition to what parties appreciate (and legislators protect) in regular corporate investing, in PFCs sponsors and the FP do not value spaces for diversification in any form. Moreover, as said above, in PFCs, the FP perceives discretion as a reference for the spaces within which sponsors can later behave opportunistically (*cf.* chapters 5 and 6). Precisely, the FP will perceive the room for discretion as a manifestation of contractual incompleteness of the strategically indispensable risk allocation mechanism. Accordingly, as already said, in PFCs, parties will spend implementation efforts eliminating (not preserving) spaces for diversification, in all its forms.

Let us now observe the reasons why, in PFCs, sponsors *do not* value diversification of contractors for inputs, for financing resources, of investors, and most importantly, of investments (the single project). I will later focus on legal implications.

7.3.6.1 No diversification of contractors for inputs in PFCs

7.3.6.1.1 Need for not diversifying contractors for inputs

In sharp contrast to what we observe in regular corporate settings, in PFCs, the

⁷⁷⁰ *Cf.* Chapter 3 dedicated to mapping the strategic benefits of PFCs against these and other forms of opportunism.

identification of input providers is indispensable for contracting for the single project. That is, the identification of contractors with their characteristics (crucially, technological capacities and solvencies) is indispensable for implementing the risk allocation mechanism that strategically substitutes the protection of collateral.

Critically, the identification of providers for the single project permits that parties implement contracts -as possible- allowing them to internalise the full impact from their actions to both the single project and to the solvency of the legal entity. Fundamentally to the feasibility of the risk allocation mechanism, this includes the collateralisation of individual obligations by sponsors or by third parties.⁷⁷¹

Similarly, in PFCs, the high degrees of specificities require that parties refrain from assigning their contractual positions in the project. Punctually, sponsors regularly do not delegate their obligations to third parties without consent from other sponsors or the FP. This intuition is conceptually similar to an aspect of the indirect no diversification of projects that I will describe below. The specificities of parties (material capacities and solvency) and the consent of the FP required before leaving their contractual positions denote an *intuitu personae* nature of relationships between sponsors and the FP in PFCs. Remarkably, this *intuitu personae* aspect manifests in the many provisions of the risk allocation mechanism that host strategically the non-recourse loan agreement.

7.3.6.1.2 Predefinition of contractors; derivative aspects

The predefinition of contractors (sponsors) comes with several strategic benefits. These aspects relate: first, to the access and revelation of information induced by cross-default provisions; second, to *de facto control* and its contractibility; and third, to the spaces for input providers to sustain (opportunistic or socially desirable) cooperation beyond the enforcing capacities of the FP. Let us see these aspects.

The informational benefits. As I will describe in later chapters, the fact that sponsors are few and all contribute by manipulating assets of the same project results in the revelation and exchanging of information about their individual actions. Remarkably, albeit the FP cannot access this information, the non-recourse lender can still implement incentives for individual sponsors to use such information for her benefit.

⁷⁷¹ As illustrated in Chapter 2, the provision of sureties by third parties protecting the enforceability of obligations for inputs to the project is not only compatible with the non-recourse nature of the debt but it is strategically necessary for the feasibility of the risk allocation mechanism.

The FP achieves this by enforcing cross-default mechanisms inducing peer pressure (cross monitoring and cross enforcing) amongst the best-informed sponsors. In regular corporate business, none of these informational benefits is available to dispersed contractors working for materially independent projects.

The facto control and its contractibility. Under some jurisdictions, judges may interpret a scenario where a small group of parties deliver inputs indispensable for the completion of a relevant project of a company as revealing *de facto* control over such entity.⁷⁷² In PFCs, not only parties do not concern for such risks, but they deliberately implement control covenants amongst contractors (the sponsors and FP).

This observation is not to be confused with a similar one referring to the capacity of sponsors to control the company as its owners. Both aspects involve control - and come with the same strategic effects -thus, I mention them here. However, political (ownership) control receives a distinct legal treatment under the current legal treatment where PFCs have not been institutionalised. *Cf.* below the sub-section focusing on the no diversification of investors. Both aspects will be the object of distinct legal proposals in the following chapters.

The relational interaction. In PFCs, habitually, the small group of sponsors delivering inputs sequentially for the same project will not change during the life of the company. The permanence of parties manipulating the same material assets will permit that sponsors sustain cooperation relationally. The spaces for relational cooperation allow the FP to induce sponsors to discipline each other in response to cross-default provisions. Similarly, such relational interaction (cooperation in sequential contributions⁷⁷³) facilitates the implementation of socially desirable innovations when the environment evolves better than expected (see the description of *good news* in chapters 5 and 6).

The spaces for colluding opportunistically. Finally, whenever the environment deteriorates, and the strengths of incentives implemented via the allocation of expectations to residual benefits decrease, within such spaces for relational cooperation, the few undiversified sponsors will collude opportunistically for

⁷⁷² Whether contractors exert such control desirably is the matter of a distinct analysis (*cf.* the chapters that follow).

⁷⁷³ J. LEVIN, “Relational Incentive Contracts”, cit. M. HVID, “Long-term Contracts and Relational Contracts”, cit. K. DOORNIK, “Relational Contracting in Partnerships”, cit.

shirking, risking, and shading. This collusion is not feasible for dispersed contractors working for independent projects and comes with legal implications. See next.

7.3.6.1.3 Undiversified sponsors in the legal proposals (Chapters 8 to 10)

I will now remark some of the legal proposals that will explore in the following chapters whose features relate more closely to the small number of predefined contracting sponsors in PFCs.

De iure control. In PFCs, the interaction between the contracting (necessarily undiversified) sponsors and the single project is direct and exclusive. As input providers, sponsors control the single project materially.⁷⁷⁴ In PFCs, these sponsors agree with the FP on all critical aspects of the SPV as part of a general financing and project implementing arrangement. Moreover, strategically, in PFCs, the control of the SPV and its single project by the defined (undiversified) group of sponsors is strictly indispensable for ex-ante implementation. Based on these necessary aspects, in the following chapters, I will demonstrate the efficiency of a postulate for treating sponsors as *iuris et de iure* controllers of the SPV -hence, the regime of control responsibility will orbit around the consideration of rightfulness of managerial decisions -not around control capacities. The requirement of SPV control and its value in the eyes of the FP is incompatible with the capacities of the sponsors to assign their positions without the consent of the non-recourse lender.

Duties to inform. As advanced, in PFCs, the small group of sponsors interacting materially with the same project permits the revelation and exchange of information of a quality higher than that accessible to the FP. Additionally, the relational interaction amongst sponsors also facilitates the enforcement of similar duties implemented contractually by the FP via cross-default mechanisms. Both aspects will contribute to the efficiency of two (general and specific) duties to inform the lender (a creditor, independently from SPV's solvency status) in PFCs advanced in Chapter 8. Fiduciary duties to inform enforceable against all sponsors induce cross-monitoring amongst the sponsors.

The duties of diligence in PFCs. In the following chapters, I will propose treating sponsors as managers (*de iure* controllers) of the SPV. Then, the access and

⁷⁷⁴ The fact that in some projects we find equity investors that own participation does not affect the validity of this statement. In PFCs, such investors are passive, and do not manipulate project assets materially.

revelation of information by the small group of highly qualified sponsors interacting materially with the same project increase the rigour with which judges should enforce (optimal) managerial fiduciary duties of diligence in PFCs. This optimality changes as the number of controlling parties grow and the availability of information decreases.

7.3.6.2 No diversification of contractors for financing in PFCs

7.3.6.2.1 Need for not diversifying sources of debt

The reasons why, in PFCs, the SPV obtains non-recourse financing from a single party are most intuitive. I have described them in chapters 2 and 4. In PFCs, the FP substitutes the protection of asset collateral with the perspectives of repayment shaped by the quality (comprehensiveness and enforceability) of a risk allocation mechanism. As a risk-taker, the FP chooses implementation efforts improving the implementation quality of that task distribution plan.⁷⁷⁵

Consequently, in PFCs, the debt must come from a party capable of contracting for such a risk allocation mechanism. As characterised in chapters 2 and 4, and as shown in the case-studies of Chapter 4, it is often the case that SPV receives financing from bondholders and other dispersed investors entering the project at later stages. These individuals interact with the SPV via financial intermediaries or other financial institutions that are parts of the FP.

7.3.6.2.2 No diversification of financing sources; derivative aspects

Additionally, in all environments, the provision of debt funding sequentially from uncoordinated creditors results in *debt dilution* problems. As described in Chapter 3, *debt dilution* refers to the scenario where earlier creditors compete with later debt providers for the cash flow or collateral value of their joint debtor. In PFCs, allowing the SPV to seek financing without control of the FP results in later creditors completing on cash flows -the only source of value to uncollateralised creditors- with

⁷⁷⁵ Additionally, projects funded under PFCs are highly capital intensive. The values at risks involved in the financing of these projects subsequently escape the debt capacities of sponsors implementing them. Non-recourse lenders cannot rely on the diversification of their portfolios for dissipating the risks associated with the likely failure of the SPV to repay its uncollateralised obligations.

the FP. This increases the risks internalised by the original non-recourse lender.⁷⁷⁶

A distinct problem appears in the implementation and enforcement sides. The contractual complexity of PFCs does require an active ongoing interaction amongst the SPV, sponsors, the lender, and other parties. A multiplicity of creditors would result in collective action inefficiencies and free-riding problems. Consequently, the interaction between such creditors and the SPV must take place in a coordinated manner, that is, via syndicates or other contractual arrangements amongst non-recourse debt providers.⁷⁷⁷

Finally, as also shown in Chapter 2, in PFCs, the FP does frequently assign debt claims to other creditors of different risk appetites. These new debt financing providers, however, do not intervene in the implementation of the risk allocation mechanism. The transfer of these credits allows the FP to anticipate benefits after most of the risk has been eliminated. That is, after the project has proved its operating capacities and the SPV becomes attractive to more conservative debt providers.

7.3.6.2.3 Undiversified contracting for non-recourse debt financing in the legal proposals (Chapters 8 to 10)

In PFCs, the fact that the SPV obtains non-recourse from a single creditor (the PF) comes with impacts over all the legal postulates of the following chapters. However, three of these propositions show closest connections with this aspect.

The duties of loyalty. In PFCs, the feasibility of the participation of the principal (the primary risk taker) depends on the quality with which she -the single creditor (or the coordinated group of them)- defines all aspects of a single project. Consequently, below, I will articulate a proposal for a fiduciary duty in the protection of all parties - including the FP. These duties should induce managers to complete agreements and adopt discretionary solutions replicating (an estimation of) what all parties should have decided upon via the risk allocation mechanism should they have known.

This proposition is strictly consistent with a contractual arrangement where parties

⁷⁷⁶ From a different stance, the later creditor would be extracting some of the marginal value of implementation efforts spent by the FP for devising the risk allocation mechanism ex-ante.

⁷⁷⁷ *Vid.* with literature references the description of the financing party in Chapters 2 and 4.

implement a single project and in which the risks internalised by the principle depend on the quality with which parties define the expected solutions to contingencies associated with the earlier. These duties should also guide the decisions that the sponsors adopt collectively in the exercise of their political rights as owners of the SPV.

In dubio pro creditore. Three aspects we must note here. First, as described, the risks internalised by the single non-recourse lender and the feasibility of PFCs depend on implementation quality. Second, the risks internalised by the FP are higher than those internalised by sponsors. Finally, third, the implementation capacities of the least-informed FP are invariably weaker than those of sponsors. From this, it follows that in case of uncertainty (ex-post incompleteness) judges should weight the vulnerabilities of the (undiversified) FP with importance higher than those of sponsors who are best prepared to both mitigate (regulate) risks ex-ante and internalise the costs of incompleteness ex-post.

The pre-emptive objective of clauses. In PFCs, as the environment and incentives deteriorate, the feasibility of *shading* results in increments in the likelihood of SPV failing to repay the non-recourse debt without sponsors appearing as defaulting parties. Subsequently, the capacity of the undiversified FP to enforce contractual precautions with compensatory effects is limited.

The lender will consequently shape the risk allocation mechanism based on provisions that she implements pre-emptively. From this, it follows that unless otherwise expressly or unequivocally specified, judges should complete the objectives of contractual provisions and the scopes of application of penalties as oriented to the prevention of the deterioration of the project towards scenarios of *bad* or *very bad news* where opportunism becomes the dominant responses.

The optimal seniority. Finally, recall the observations of chapters 5 and 6, the optimal seniority of claims minimises the incentives for sponsors to respond opportunistically with *shirking*, *risking*, and *shading*, as the environment deteriorates. The feasibility of such opportunism is also defined by the individual capacities of the few sponsors to cooperate relationally. The spaces within which the small group of undiversified sponsors cooperate opportunistically will consequently affect the optimal allocation of seniorities of claims in PFCs. This optimality is distinct to those in scenarios in which creditors appear diversified.

7.3.6.3 No diversification of investors in PFCs

7.3.6.3.1 Need for not diversifying capital investors

In PFCs, there are two main reasons for not diversifying the sources of capital

contributions. One is financial, and a second one relates to control and project implementation. Let us begin with the first reason.

Distinctively, as described in chapters 2 to 4, and in contrary to what we find in diversified corporate businesses, in PFCs, all parties agree ex-ante on the capital contributions for the single project. Furthermore, in PFCs, sponsors and the FP also regulate the capital contributions that sponsors -as shareholders- will bring to the SPV as the single project advances. This agreement is part of the financing and the dividend distribution decisions that parties adopt before the FP internalises non-recourse risks. In practice, as shown in Chapter 2, parties regulate the expected *capital* contributions via the so-called *cash waterfall (cascade)* clauses defining the resources that will flow in and out of the SPV until the full repayment of the senior debt.

In PFCs, the predefinition of capital contributions comes with two functions. First, it allows the SPV to comply with some of its obligations as they become due.⁷⁷⁸ Second, more importantly, capital provisions allow the SPV some degree of solvency permitting that the FP enforces some of the provisions of the risk allocation mechanism against the SPV.⁷⁷⁹

Subsequently, the provision of capital contributions depends on the capacities of sponsors (in their roles of equity investors) that the FP inspects while implementing contracts before internalising risks. Two further aspects result from this: first, the responsibility of sponsors as obligors to providing capital contributions is not delegable; and second, the insolvency or incapacity of sponsors to expand capital as defined by control ratios and as reflected by control accounts will be regularly an event of technical default (see examples in Chapter 2).

Note the difference with the rationale followed in diversified corporate businesses. In regular corporate investments, capital requirements dictate the solvency of companies with a perspective on collateral value. In contrast, in PFCs, excepting for the stages in which the SPV approaches the moment where it will repay its debt,

⁷⁷⁸ PFCs, the SPV will cover most of these obligations with funds coming from the FP in the form of non-recourse debt.

⁷⁷⁹ Note, whenever the FP fails to enforce against the SPV, she will indeed request for collateral or other forms of credit enhancement from third parties, including sponsors -this aspect is elemental to the quality of the risk allocation mechanism (*cf.* cross-default provisions).

during design, construction, and most of the operation phases, debt-to-equity ratios will be much higher than what diversified creditors would otherwise esteem as reliable as collateral for their claims.⁷⁸⁰ This is true even though claims will become due (enforceable) against the SPV only at later stages. Fundamentally, in PFCs, parties predefine capital contributions (as well as the contribution capacities of sponsors) and value them for contract implementation -the source of welfare-, not for collateral protection.

Finally, the predefinition of investors (owners) is indispensable for project control reasons. Parties -in particular, the FP- need to identify investors for them to implement SPV control covenants. In other words, in PFCs, the FP must interact contractually with shareholders capable of exerting political control of the SPV that will receive the non-recourse debt funds, be capable of injecting capital as needs arise and materially complete and operate a single contract as predefined.

7.3.6.3.2 Costs of diversifying capital contributions in PFCs

As described in chapters 2 and 4, the SPV can -and often do- receive investments from dispersed contributors. For the reasons described above, contributions from dispersed investors come to PFCs coordinated contractually (represented) through institutional investors. I have illustrated this observation in the case studies in Chapter 4.

Five key aspects define the position of dispersed investors in PFCs. First, as owners, they may obtain information about the evolution of the project and exert enforcement actions as allowed by company law. Second, they do not choose inputs for the project; hence, they are not the sponsors. Subsequently, they cannot behave opportunistically as they do not manipulate project assets directly, nor they respond to contractual obligations. Third, as owners, they will be subject to control covenants. Forth, as part of the risk allocation mechanism, they may be obliged to provide extra contributions as the project evolves. Fifth, their claims will be now the most junior in the setting; precisely, they will hold expectations to a share of total dividends, but not enforceable claims as those of the FP (a creditor).

As seen, the value and strategic positions of equity investors who are not sponsors are weakest in the setting. For this, in chapters 2 and 4, I categorised dispersed equity contributors -as well as dispersed bondholders- as part of the FP.

⁷⁸⁰ See B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

7.3.6.3.3 Undiversified investors in the legal proposals (Chapters 8 to 10)

The reduced number of sponsors who, as investors, are capable of contracting ex-ante with the FP is relevant to all proposals. However, two of them are especially sensitive to this aspect. These are the *fiduciary duties of loyalty* and the *optimal scope of delegation*. The efficiency of these postulates comes as a result of the access to information and the low costs of collective actions adopting undelegated decisions.

Fiduciary duties of loyalty. As already mentioned, as the project evolves, the sponsors must adopt decisions completing the provisions of the risk allocation mechanism. During the implementation period, the risk allocation mechanism's design requires the active intervention of parties committing personally to delivering both capital and material contributions to the project until the SPV repays the non-recourse debt.

The scope of delegation. In PFCs, there will always be a single project and a low number of investors (sponsors) adopting collective decisions on behalf of the SPV. Moreover, these investors will be highly qualified in the industry sector as well as in the technology of the project. These aspects appear precisely opposite to what we see in diversified corporate investments.

In the following chapters, we will see how in PFCs the optimal delegation will be broader than under diversified corporate investment scenarios. Moreover, these delegation features in PFCs will be consistent with anecdotal evidence about the reward functions offered to project managers in PFCs.

7.3.6.4 No diversification of investments (projects) in PFCs

7.3.6.4.1 Need for not diversifying investments

Finally, as shown in all chapters, in the absence of collateral or effective sureties, the value expected by the non-recourse lender depends on the implementation quality of a risk allocation mechanism. In this context, implementation quality correlates with completion (the problem of bounded rationality) and enforcement (the problem of asymmetries of information). That is, it relates to the precision with which such contractual arrangements can foresee the evolution of the environment and regulate the responses of sponsors as expected residual benefits -the strength of incentives-deteriorate. To this end, the identification of a single project is crucial for the capacities of parties to anticipate contingencies.

As shown in later chapters, direct sponsors may modify the project by using SPV resources to pursue an activity other than the one contracted initially. However, less

evidently, and to the same strategic effect, indirectly, sponsors may modify the project by altering the technologies of their inputs. As said, direct or indirect, diversification is always undesirable in non-recourse PFCs.

Subsequently, because diversification of the activity of the SPV is undesirable, and because parties contractually restrict the scope of such activities to the single project, is that sponsors implement contractual provisions with disregard to effects that, in regular company businesses, would come with opportunity costs to other projects (that should not exist). I have made references to this proposition above when presenting the equilibrium found by parties in diversified corporate contracting where they optimise the protection of collateral value without jeopardising the diversification capacities of companies. The absolute irrelevance of these concerns about opportunity costs of precautions against other projects or to diversification benefits will be in the core of all proposals for an efficient legal treatment of PFCs.

7.3.6.4.2 Undiversified investments in the legal proposals

The fact that parties in PFCs advance a single predefined project -an aspect critical to the feasibility of the risk allocation mechanism- lie in the core of all legal propositions. However, the value of restricting diversification appears more clearly in two proposals: the *fiduciary duties of loyalty and diligence*, the *fiduciary duties to inform*, and the *responsibility of managers under bankruptcy laws*.

The responsibility of managers under bankruptcy laws. In the following chapters, I will propose a reconsideration of the responsibilities of managers (sponsors) in events of corporate insolvency. The fact that in PFCs the SPV advances a single project permits that managers anticipate the insolvency of the company from events that, albeit remote to the control of the company, they still affect the single project and consequently its repayment capacities.

Fiduciary duties to inform. In Chapter 8, I will propose a fiduciary duty to inform *bad news*. The efficiency of such postulate results from the close relationship between events affecting the pre-defined project and the incentives that the sponsors perceive for responding opportunistically after anticipating a loss in the capacities of the SPV to distribute residual benefits.

The fiduciary duties of loyalty and diligence. I have referred to these points above. The existence of a single project controlled by the SPV is critical for the sponsors to complete the provisions of the risk allocation mechanism following the interests of all parties (including the FP). The single project is also indispensable for the sponsors to be capable of delivering managerial responses according to their higher qualifications and substantial knowledge of its technical aspects.

7.4 The contractual reformation of corporate types; towards institutionalisation of PFCs

In Chapter 2, we observed the contractual practices as seen today in the industry-oriented management literature. Then, from an innovative strategic stance, in Chapter 4, I identified the necessary components and characterised the strategic features inherent to PFCs. Based on that identification of elemental features, in chapters 5 to 6, I also identified the strategic tensions and the forms of opportunism essential to the positions of parties in PFCs as projects evolve.

Above in this chapter, we have also seen how legislators and judges provide for legal treatment as efficient to diversified collateralised corporate investing and contracting scenarios. Additionally, we also saw how such default and mandatory rules are not optimal in PFCs environments where parties advance predefined projects that they fund with non-recourse debt.

After having analysed the necessary aspects of the strategic positions of parties in PFCs, and before advancing legal proposals for a legal treatment in PFCs (chapters 8 to 10), let us now elaborate on how sponsors and the FP adjust the legal mechanisms (features of corporate types) with which today legislators and judges treat PFCs. The analyses of these objectives will later serve as a bridge between the contractual practices as seen in the industry (Chapter 2) and the proposals for a legal treatment thus verifying the market-mimicking efficiency of later (chapters 8 to 10).

7.4.1 Availing from the efficient, reforming the rest of the legal treatment

Let us remark, once again, in the absence of collateral value or recourse to their parties, the feasibility of PFCs is a function of the quality with which parties can regulate the reactions they expect from sponsors as the environment and incentives deteriorate. This is the functionality of the risk allocation mechanism that all parties implement ex-ante for the unique time-limited project they implement and finance.

Crucially, today there is no legislation or jurisprudence considering strategic aspects of parties in PFCs. Similarly, there is no jurisprudence capturing customs (legally binding commercial practices) or a body of literature describing them strategically.

As remarked, today, legislators and judges enforce rules oriented at maximising the social value of delegation for advancing diversified investments with resources from (habitually) dispersed investors. Moreover, today, legislations protect risk-averse managers. Judges also implement remedies to the conflicts that materialise in abuses within the company (not with contractors) while also protecting the capacities of companies to advance simultaneous opportunities with independent (uncoordinated) providers.

As analysed in earlier chapters, these objectives and incentive effects of the current legal treatment do not serve the strategic needs of parties in PFCs. Accordingly, when implementing the risk allocation mechanism for the unique time-limited highly specific project, parties will spend efforts correcting default rules, predefining (optimal scopes of) enforcements, and also circumventing functionalities when distortions result from mandatory norms.

Indeed, these practices of parties are not remarkable *per se*. In the vast majority of contractual interactions, all parties spend efforts adapting the legal environments to their individual preferences and circumstances. However, in PFCs, the purposes of adaptations that sponsor and the FP implement are consistent in environments as per the strategic needs that are inherent in PFCs.⁷⁸¹ The scopes with which parties in PFCs modify the legal solutions applicable to them is noteworthy in three ways.

First, the extent of such modifications is such, that parties will also manipulate aspects that relate the functionality of the legal personality allowed by corporate types. Indeed, as shown, sponsors will benefit from the legal personality of the SPV for contract implementation, for owning project assets, and for implementing incentives via allocation of property rights (expected dividends).⁷⁸² Moreover, sponsors will preserve the functionality of the limited liability rule protecting shareholders -an aspect also necessary for the functionality of the non-recourse clause. However, beyond those elemental points, sponsors and the FP (the risk allocation mechanism) will also limit the spaces within which the SPV will acquire rights and obligations by interacting with third parties -the features defining the essence of the legal personality. *E.g.*, the FP will enforce control covenants restricting the capacities of the SPV to implement contracts with parties other than the sponsors. Similarly, the lender will impede that the SPV interacts with third-party lenders. Finally, the SPV will not be allowed to advance contracts other than the single project as initially predefined.

Second, aside from the above, in PFCs parties spend implementation efforts dismantling the functionality of most of the remaining corporate mechanisms that legislators and judges use for facilitating diversified businesses. Parties will then

⁷⁸¹ Observe how the validity of the following propositions holds in all examples of the diverse structures with which parties implement PFCs in the real-life case-studies of Chapter 4.

⁷⁸² *Cf.* Chapter 4 for the elemental aspects and chapters 5 and 6 for the relationship between ownership distribution and opportunism.

replace the remaining critical aspects of corporate types with a new set of rules oriented at facilitating the implementation of the single project (see below). Parties will fix the object of the company to a single project (they will restrict the investing capacities). They will ex-ante commit shareholders (sponsors) to maintain capital levels under uncertainty as the project evolves (*i.e.*, the FP will make capital contributions enforceable). Parties will exclude the transferability of company ownership. The FP (a creditor) will limit the transferability of contractual positions of sponsors. Parties will also implement provisions making sponsors responsible for the management of the SPV. The sponsors and the FP will also regulate the dividend policies and the cash flows both in and out of the SPV (including all schedules of contract payments); or, they will implement obligations to inform creditors.

Notably, in PFCs, parties will predefine the three variables in the nerve of delegated decisions: the financing decisions (the *cash waterfall* clause); the investing decision (the single project); and the dividend distribution decision (also in the *cash waterfall* clause). Some of these provisions are contrary to the default rules of corporate types; some others are strange to the regulations of company law (*e.g.*, the restrictions enforceable against contractors). All of them have as their common objective the facilitation of the implementation of a single project -never the preservation of diversification capacities.

Third, the objectives of these modifications (the purposes of contractual practices) are functionally similar in all jurisdictions. This third aspect comes with two implications. *I.-* it remarks the strategic essence of PFCs revealing independent of legal circumstances. In other words, in all scenarios, sponsors avail from the few features of corporate types that serve for risk isolation and implementation and replace the remaining regulations devised for diversified environments with the very distinct set of rules efficient for them for implementing a single project.⁷⁸³ *II.-* it paves the way for analysing such strategic aspects (chapters 4 to 6) and elaborating normative postulates for the legal treatment of these contractual practices (chapters 8 to 10). I will revisit this observation before concluding this chapter.

⁷⁸³ This environment should allow parties to foresee that sponsors will respond as expected under all eventualities -and the robustness of such equilibrium must be such that should allow the lender to provide debt without collaterals or protection from third parties.

7.4.2 The three objectives of implementation efforts readjusting the legal context

Before entering the analysis of the concrete ways in which parties dismount the critical features of corporate types, let us note how, when doing so, the sponsors and the FP focus on three generic objectives.

First, they expand the coverage of the strategic needs of individual projects. Second, they prevent the application of norms (legal mechanisms) devised by legislators with distortive effects in PFCs or provide strategic solutions to needs that legislators fail to attend. Finally, third, they adjust optimalities (the scopes of enforcement).

Accordingly, below, we will see sections with titles indicating: first, how parties regulate the material requirements of individual projects (right next below); how parties preserve the indispensable aspects of the limited liability protection; how parties restrict the features of the legal personality (I and II); how parties adapt corporate forms (I to VIII); and finally, how parties adapt optimalities (I and II). This analytic classification reflects the three objectives identified in the above paragraph.

Lastly, in the list of contractual objectives that follow, we will also see reflected the strategically indispensable strategic objectives of excluding the diversification of investors (and the regulation of capital contributions), of investments (the SPV advances only one project), of contractors (parties regulate sources of inputs), and sources of debt financing (the FP controls debt sources).

7.4.2.1 Regulating the material requirements of individual projects

First, the sponsors spend efforts implementing provisions applicable to individual aspects of each project. These clauses define material technicalities, schedules, and other punctual commitments of parties.

Habitually, parties do not explicitly orient these clauses to modifying the legal environment. However, in light of the analyses of strategic aspects inherent to all PFCs (chapters 4 to 6), from these provisions, we can derive postulates for the *ex-post* interpretation of contractual provisions in all PFCs.

These will be the principles for the interpretation of clauses advanced in Chapter 8. *E.g.*, the specific duties to inform. Notice, because these are criteria of interpretation, for their enforcement, judges may not require a reform of legislative origin. Accordingly, the description of strategic aspects inherent to all PFCs makes these postulates for the *ex-post* interpretation of clauses judicially operative.

7.4.2.2 Adjusting optimalities

Additionally, second, parties spend efforts adjusting optimalities. That is, they refine

the criteria for identifying the optimal scopes of enforcement of default rules. These are postulates for the application of current mechanisms that are efficient both in diversified (collateralised) investing as well as in PFCs.

Consider the optimal scopes of managerial delegation in PFCs, the optimal duties of diligence enforceable against sponsors in PFCs, the optimal seniorities of claims, or the optimal responsibility of managers (sponsors) in the vicinity of SPV insolvency. I will dedicate Chapter 10 to these postulates. Just as above, these are refinements of rules of reasons. Thus, they are judicially operative without prior legislative reforms.

7.4.2.3 Covering the needs of unattended by the current legal treatment and correcting the existing legal mechanisms with distortive objectives in all PFCs

Finally, third, sponsors spend efforts for a twofold objective:

- a. they correct the effects of existing rules whose objectives (not only their optimal application) are necessarily distortive in PFCs. These can be default rules that they simply modify. Alternatively, they may be mandatory norms whose effects they circumvent functionally. *E.g.*, the limitations to the spaces within which the SPV can invest in distinct projects.
- b. they provide solutions to strategic needs of all PFCs (not just of a single project as in the first objective) that today remain unattended by legislators and judges. *E.g.*, the fiduciary duties also protecting the FP in PFCs or the control responsibility of sponsors in PFCs.

Let us now list the elemental objectives of provisions modifying the legal environment. Observe how all modifications will hold efficient in all PFC scenarios. Moreover, notice how all modifications are always functional to dismantling the mechanisms of current corporate types oriented at facilitating diversified investments. Moreover, such adaptations hold efficient because of their functionality to the strategic features inherent of PFCs.

Finally, note also, albeit they are all (and always) efficient in PFCs, not all clauses will reflect in legal modifications in the following chapters (paternalism). In the same way, not all proposals of the following chapter will come associated with only one of these corrections. *Cf.* The principle for the *pre-emptive* objective of clauses, or *in dubio pro creditore* whose desirability result from strategic aspects and needs that parties protect with diverse solutions.

Let us observe these contractual arrangements individually. Under each item, I will make a reference to which of the three objectives belongs each contractual purpose.

7.4.3 Preserving the indispensable limited liability protection

The legal personality of the SPV allows the organisation to acquire rights and obligations that she enforces and fulfils via its representatives. Similarly, the legal personality also permits that the SPV holds ownership of assets independently from the wealth of individual sponsors.

In PFCs, the legal personality of the SPV comes with three critical functionalities. First, by consolidating resources and contractual relationships, it facilitates the implementation of contractual arrangements at lower transaction costs.⁷⁸⁴ Second, the allocation of the project under the ownership of the SPV lets sponsors distribute property rights (expectations to shares of dividends) as a means for incentivising fully non-contractible actions.

The third benefit of the legal personality of the SPV consists of risk isolation. As described in Chapter 3, the legal personality of the SPV impedes double way risk contamination between the creditors of the sponsors and project assets.⁷⁸⁵ However, fundamentally, for the protection of sponsors from the creditors of the project, the corporate type of the SPV must necessarily also allow for limited liability protection. An identical consideration holds for the functionality of the non-recourse nature of the debt.

Intuitively, without limited liability, after failing to receive debt repayment from the SPV, the FP could seek compensation from the sponsors as owners of the SPV. This possibility would functionally leave the non-recourse clause without strategic effect. This violation of the risk isolation functionality of the SPV would then jeopardise the prevention of distress costs (the impact of senior debt in their balance sheets) - a critical reason for which sponsors recur to PFCs.⁷⁸⁶

⁷⁸⁴ As characterised in chapters 2 and 4, as a corollary from the above, in PFCs, the allocation of the project under the property of a SPV permit that the FP uses such assets as collateral of the obligations of individual sponsors. This possibility comes with efficient incentives for sponsors to spend non-contractible enforcement efforts protecting company resources (for the boundaries of this functionality see Chapter 7).

⁷⁸⁵ The legal personality of the SPV assures that project assets will be safe from the actions of creditors of sponsors. We have seen a consideration of these benefits in chapters 2 and 4.

⁷⁸⁶ See the analyses of the benefits of PFCs against the limitation of diversified collateralised financing in Chapter 3.

Accordingly, when adapting the legal environment as provided by the corporate type of the SPV, parties in PFCs will not alter the limited liability protection rule. Remarkably, the limited liability protection and the capacity of the SPV to own assets will be the only two features indispensable to the corporate forms (corporate types) of choice for the SPV that that parties will never modify in PFCs.

7.4.4 Restricting features of the legal personality I – Excluding the contracting for alternative sources of inputs

Let us recall the canonical characterisation of the legal personality of an organisation as its capacity to own assets and, via its representatives, to acquire rights and obligations independent from those of its owners. In conjunction with the limited liability protection, the legal personality permits that delegated managers capture multiple simultaneous business opportunities as they appear to her, and advance them with funds from passive investors while interacting with independent contractors.

However, as described, in PFCs, parties do not avail from the legal personality of the SPV for advancing a diversified portfolio of projects. On the contrary, in PFCs, the SPV advances a single time-limited project whose components and technological features parties regulate before incorporating the strictly instrumental SPV that will own them formally. Moreover, as characterised in chapters 2 and 4, the feasibility of PFCs depends on the capacities of parties to enforce responses from sponsors under all eventualities. To this end, the spaces within which the SPV can diversify the contracting for inputs (as provided by corporate business types) appear as a source of uncertainty to all parties.

Accordingly, ex-ante, the FP will inspect contractual arrangements whose objects will include contributions from sponsors whose personal characteristics the FP will also consider. Moreover, in PFCs, the (losses of) material or technological capacities of sponsors to deliver contributions as desirable will be the object of technical default provisions. The FP will then limit the events in which the SPV will be allowed to contract for critical inputs from parties other than the sponsors. This observation is identical to the ones provided above when remarking the value of not diversifying contractors. This effectively constitutes a limitation to the contracting capacities (a feature of the legal personality) that legislators otherwise preserve via the business

company types.^{787 788}

Additionally, observe how, in PFCs, the FP not only limits the spaces within which the SPV will contract with third parties but -in a manifestation of the same interests- the lender also reserves to herself the possibilities of intervening in such interactions under certain circumstances. These are the so-called step-in rights allowing the lender to substitute some sponsors or the SPV in their interactions with off-takers. See Chapter 2.

Independently from the above, notice how, while these restrictions reveal a limitation to the exercise of the rights of the legal personality of the organisation (the rights to acquire entitlements and obligations with third parties), the object of the restriction also evidences the *intuitu personae* nature of these interactions that shape PFCs. I will come back to this observation below and in Chapter 9.

Further below, I will recall these propositions when introducing the limitations to the capacities of sponsors to assign their contractual positions to third parties. The functionalities of both limitations are identical. Their legal implications are, however, distinct.

7.4.5 Restricting features of the legal personality II – Excluding the contracting for alternative financing (the monopolies of financing sources)

Above, I have remarked the limitations that the FP imposes to the spaces within

⁷⁸⁷ This limitation is not to be confused with the distinct restriction of assigning contractual positions that binds individual sponsors as input providers to the SPV (see below).

⁷⁸⁸ At this point, it is worth noting how -in rigour- the FP does not undercut the capacities of the legal entity. The lender simply enforces control covenants that she implements with the controllers of the company. Observe how, to third parties acting in *bona fides*, the SPV will not be capable of opposing the provisions of her covenants (or the covenants of sponsors) with the FP as a way of rejecting the enforcement of obligations that the SPV acquired with third parties via its representatives. Parties cannot contractually modify certain aspects of the legal personality from legal types (including the rules of representation of company officers under their charters whenever relevant) that legislators enforce in the protection of third parties in good faith. For this, we speak about the mandatory features of corporate types or forms and their functional circumvention. I will come back to this point in Chapter 9.

which the SPV exercises her capacities to interact with third parties contracting for material inputs. However, in PFCs, the FP also limits the exercise of rights of the legal personality of the SPV (and, indirectly, the features of its corporate type) when restricting the scenarios in which it may receive debt financing from third parties. This is how parties pursue the objectives of eliminating all spaces for diversifying financing sources observed in the above sections.

Concretely, as characterised in chapters 2 and 4, in PFCs, the FP will exert control of the provision of senior debt to the SPV. In PFCs, parties regulate the access of the SPV to extra debt as a strictly necessary means for preventing debt dilution of the FP (Chapter 3). Intuitively, by regulating the access to subsequent provisions of (senior) debt, the FP prevents that she competes with such other subsequent creditors for the same cash flow from the project (the repayment capacity of the SPV).

Additionally, strategically, the SPV accepting extra debt from third parties implies a *de facto* readjustment of the hierarchy of claims held by sponsors. Intuitively, extra debt increases the value expected by sponsors and the FP in not identical ways. There is not only a welfare transfer effect from this modification but also -more relevantly- an incentive effect that affects the sponsors and FP differently. Maintaining control of the capacities of the SPV to contract with debt providers is consequently crucial for the FP to both preserve the value expected from the capacities of the project, and also the strengths of incentives that sponsors perceive for behaving as socially desirable as conditions and incentives deteriorate (*Cf.* chapters 4 to 6).⁷⁸⁹ Parties will implement these limitations and precautions in the *cash waterfall* clauses that will also define the capital contributions expected from sponsors as the project evolves (see further below).

These limitations to the functionalities of the legal personality are strange to the legal types that parties use for the SPV. Finally, these restrictions to the access of financing by creditors are not commonly seen in contractual practices as they affect the investment capacities of companies -the object that shareholders pursue when investing in corporate vehicles advancing diversified portfolios.

7.4.6 Adapting corporate forms, I – Excluding all alternative investment spaces (the single predefined project)

In PFCs, parties deliberately exclude all possibilities of choosing projects other than

⁷⁸⁹ This is the rationale that identifies the optimal seniority of claims FPCs advanced in Chapter 9.

that initially agreed by the lender. This restriction to the capacities of the legal personality defines the project-specific functionality of the SPV. In chapters 2 and 4, have elaborated the strategic value of this indispensable provision in non-recourse project financing. Fundamentally, the predefinition of the single project (against the diversification of investments, see above) is critical to the capacities of parties to anticipate contingencies whose effects will dictate the strength of incentives that parties implement via the allocation of residual expectations (chapters 4 to 6). The exclusion of investment alternatives is precisely on the contrary to the objectives for which legislators and judges provide default rules in regular corporate investing.

7.4.7 Adapting corporate forms II – Excluding the transferability of property rights (shares in the SPV)

In sharp contrast with what we see in diversified corporate investing, in PFCs, the FP (a creditor) will enforce covenants regulating the transferability of ownership in the SPV. In PFCs, the capacity of the FP to restrict the transferability of property rights is functionally indispensable for securing political control of the SPV indispensable to the feasibility of the risk allocation mechanism. As also advanced, parties consequently exclude the diversification of investors (see above in this chapter).

The transferability of shares is not the default rule in all limited liability corporate types.⁷⁹⁰ However, restricting the transferability of participations comes directly against the objectives of corporate businesses advancing large capital-intensive projects with funds from dispersed (passive) investors.

However, in contrast with the scenario of regular corporate businesses, in PFCs, restricting the transferability of shares without the consent of the FP preserving the enforceability of the risk allocation mechanism is not a matter of circumstantial convenience of parties adopting a corporate type capable of adjusting a default rule, but a feasibility requirement. I have introduced the contractual practices in Chapter 2. In Chapter 4, I remarked the strategic value of this limitation. We will finally see the strategically indispensable value of this limitation reflected in an interpretation proposal (the consideration of the positions of sponsors as *intuitu personae*) in Chapter 9.

⁷⁹⁰ *I.e.*, the *Limited Liability Partnership*, the *Société à Responsabilité Limitée*, the *Gesellschaft mit beschränkter Haftung*, or the *Sociedad de Responsabilidad Limitada*.

7.4.8 Adapting corporate forms III – Excluding the transferability of contractual positions

In PFCs, parties regularly request that the sponsors deliver critical aspects of the project. Consequently, the technical and economic capacities of the individual sponsors are crucial to the features of the risk allocation mechanism that dictates the feasibility of PFCs. Accordingly, in PFCs, the FP will impose limitations to the transferability of contractual positions of sponsors as input providers to the project. These provisions reveal PFCs as *intuitu personae* organisations with effects upon all contractual interactions amongst sponsors, the instrumental SPV and the FP (Chapter 9). These objectives reflect the value of eliminating the diversification of contractors for material inputs advanced above in this chapter.

Notice, in PFCs, the FP does not control the SPV. Hence, functionally, the restriction comes to provide discipline to the management of the SPV (the sponsors collectively) in its interaction with sponsors as individual contractors. Remarkably, as a feature strategically indispensable of PFCs, formally, we see a creditor enforcing a provision regulating the interaction between its debtor and its contractors. This aspect reveals both the functional multi-party nature of PFCs and the *intuitu personae* nature of the commitments for material inputs to the individual project.

All the above comes precisely in contrast with both the default rules and contractual practices in diversified corporate contracting where the risks that lender internalises depend on the collateral value of a portfolio of assets and business opportunities rather than on the success of a single project as defined by responses from input providers (chapter 4 to 6).

7.4.9 Adapting corporate forms IV – Imposing enforceable capital contributions from shareholders

In PFCs, the FP obliges sponsors to maintain capital levels of the SPV as parties predefine them in control accounts. Moreover, in PFCs, the FP and the sponsors define how capital contribution commitments will adapt as the project evolves. Remarkably, parties regulate these obligations before incorporating the single project instrumental SPV. Instrumentally, parties will implement these commitments via the *cash waterfall* (cascade) clause whose enforceability will be supported by collateral protection from sponsors or third parties.^{791 792} These provisions reflect the objective

⁷⁹¹ Cf. chapters 2 to 4.

of eliminating the diversification of sources of capital contributions advanced above.

In PFCs, the predefinition of capital contributions is strategically indispensable for three fundamental objectives. First, for securing the enforceability of provisions of the risk allocation mechanism against the SPV; second, for increasing the capacities of the SPV to complete the project with resources distinct from those of the non-recourse debt (interest alignment); and finally, third, for preserving the strengths of efficient incentives that parties construct on expected residual benefits (see chapters 4 to 6). However, due to incompleteness (uncertainty about project needs) and consequent risks of paternalism, we cannot translate these contractual practices into legal propositions. Thus, the objectives reflect in contractual practices typical of FPCs.

In diversified corporate contracting, the functionality of these commitments is incompatible with the perspectives of receiving capital contributions from dispersed investors.⁷⁹³

7.4.10 Adapting corporate forms V – Imposing control responsibility to all shareholders (sponsors)

In PFCs, the FP enforces provisions whose objects require full control of the SPV by sponsors. In PFCs, the full control (*de iure* and *de facto* of project assets) is strictly indispensable to the functionality of the risk allocation mechanism. I have elaborated on the value of control in Chapter 4, and here above.

Intuitively, sponsors must control the SPV for the FP to rely on the completion of the project and repayment of the senior debt in response to the risk allocation mechanism that she enforces. Accordingly, the FP will also impose penalties against individual sponsors whose enforceability will be protected by collateral from sponsors or third parties.

In PFCs, the FP may enforce such control covenants against sponsors directly but not against the SPV. In some jurisdictions, this precaution is often necessary for

⁷⁹² Recall the analyses in Chapter 2, the supervening incapacity (insolvency) of sponsors to provide these capital contributions will be the object of technical default provisions.

⁷⁹³ Remarkably, this does not mean that, in diversified corporate contracting, creditors use capital level (debt-to-equity and other ratios) as a technical default mechanism with various consequences.

preventing control responsibility to extend against the lender.⁷⁹⁴ In the absence of default rules of general application from the corporate type, all parties must define the individual obligations that with sponsors will comply with by controlling the SPV.

Chapter 8 will bring forward a proposal for imposing managerial *de iure* control responsibility to all sponsors in PFCs. This proposition is strictly incompatible with the rationality of dispersed investors in regular corporate environments as regulated by current corporate types.

7.4.11 Adapting corporate forms VI – Imposing both general and individual obligations to inform

Distinctively, in PFCs, the FP -a creditor- obliges both the sponsors and the SPV to inform about generic and specific aspects of the evolution of the predefined project. Similarly, as shown in Chapter 2, the FP will request that the sponsor and the SPV inform periodically about certain variables that parties use as references of sponsors capacities. Regularly, the least qualified lender will recur to expert advisors to receive and process that information.^{795 796}

These duties to inform are uncommon to corporate business-diversified environments where -unless highly inefficient restrictive covenants are in place-⁷⁹⁷ information about projects would not serve as an accurate proxy for the repayment capacities of debtors and where the risk of creditors rests on the value of the collateral -not on the capacities of any single project. Under insolvency and bankruptcy laws, managers and controlling shareholders respond to a duty to reveal information to creditors only after the insolvency of the company becomes foreseeable.

In PFCs, the obligations to provide general and specific information are inherent to the objectives of the risk allocation mechanism and lasts as long as the senior claims of the lender remain unpaid. In chapters 8 and 10, I will elaborate on the optimal scopes of enforcement of these obligations in PFCs.

⁷⁹⁴ Cf. page 393 in Z. COHEN, “Fiduciary Duties of Controlling Shareholders: a Comparative View”, *University of Pennsylvania Journal of International Business Law*, vol. 12, 3, 1991.

⁷⁹⁵ In addition to the descriptions of Chapter 2, notice the role of external advisors in the charters of case studies of Chapter 4.

⁷⁹⁶ Cf. p. 392 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

⁷⁹⁷ For whose enforcement the revelation of such information would be necessary.

7.4.12 Adapting corporate forms VII – Incorporating the lender to the decision-making system of the SPV

In PFCs, parties will allow the FP -a creditor- to intervene in the decision-making process of the legal entity. Sponsors will agree with the lender that she intervenes in the processes of dealing with decisions of critical relevance after the environment has changed expectedly or unexpectedly (*news*). Additionally, sponsors often involve the FP in the decision-making system of the SPV when enforcing penalty clauses. That is, parties habitually agree that, after the SPV or sponsors have failed to comply with regulations of the risk allocation mechanism, the lender be allowed to hear debates or have a veto on critical decisions.

Regularly, -as under the current legal treatment- the intervention of the FP may be kept formally remote from the decision-making process of the company as a means to prevent the application of *de facto* control responsibility against the lender. Hence, the intervention may be formally indirect and implemented via control covenants. Often, sponsors will request from the FP inputs or her conformity with some decisions that sponsors will implement within the company.

Currently, corporate types do not include provisions allowing creditors to intervene in the decision-making system of debtor companies. However, a legal proposal for a default rule (encapsulating a rule of reason) defining scenarios where the lender would enjoy these capacities would be not easy to implement. Accordingly, we will not see these precaution in a legal proposal.

7.4.13 Adjusting corporate forms VIII – Pledge security on company shares

In PFCs, parties often pledge the equity capital of the SPV (company shares) as security to the FP. Functionally, this means that after certain (critical) events of default have been verified, the non-recourse lender will gain ownership (political control) of the SPV, all its resources and its contractual relationships.⁷⁹⁸

⁷⁹⁸ *Vid. pp. 289, 301 and 302 in S. GATTI, Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects, cit. Pp. 227, 310 to 312, E. R. YESCOMBE, Principles of Project Finance, cit. P. 411 in E. R. YESCOMBE; E. FARQUHARSON, Public-Private Partnerships for Infrastructure -Principles of Policy and Finance, cit. Pp. 62, 203, 266 H. A. DAVIS, Project Finance: Practical Case Studies, cit., vol. II. Pp. 291 and 293 in J. CROTHERS, "Project Finance in Central and Eastern Europe from a Lender's Perspective: Lessons Learned in Poland and*

Strategically, the incentive effect of such sureties is similar but more drastic than the step-in rights. However, in contrast with such provisions, ownership of the SPV allows the lender residual rights of (political and material) control of the company and its assets. Crucially, within the spaces allowed by the framework of the risk allocation mechanism, ownership permits that the FP enforces provisions diligently against sponsors or third parties. The FP can also decide beyond contractual matters. For instance, the lender can decide on expanding capital, contracting inputs from third parties, finding debt from alternative sources, filing corporate insolvency procedures, or -if feasible- liquidate the company with the assets it owns.

From the strategic stance, these contractual precautions have the same limitations of step-in rights. Intuitively, the FP and its external advisors are not the best qualified to run the single project. Hence, except for cases of severe opportunism or plain mismanagement, the lender will not be capable of reviving the highly specific (technologically often unique) project or the SPV in severe distress. Yet, just as step-in rights, pledges over SPV securities function as an unquestionable disciplining mechanism as well as increasing the bargaining power of the FP in all readjustment stages.

These provisions are indeed not natural or typical diversified corporate contracting. Their functionality affects the position of subsequent creditors as well as capital providers facing the possibility of losing control or finding that other less qualified controllers now administer the company.

The pledging of SPV's shares as security is a common practice in PFCs. Their implementation is contractually easy. Additionally, the interpretation of the events of default that parties must specify expressly follows the same principles as other clauses. Because of paternalism concerns, this is one of the practices typical of FPCs that will not be reflected in propositions for the legal treatment in chapters 8 to 10.

7.4.14 Adjusting optimalities I - Imposing a hierarchy of claims

In PFCs, via the *cash waterfall* clause, parties agree on a hierarchy order for the claims held by the non-recourse lender and the expectations of sponsors from contracts and dividends. As suggested in chapters 5 and 6, there is an optimal allocation of seniorities that maximise both the likelihood of debt repayment and the

Romania”, cit. Pp. 135 and 137 in A. FIGHT, *Introduction to Project Finance*, cit. Pp. 514 to 516 and 519 in M. F. K. KHAN; R. J. PARRA, *Financing Large Projects - Using Project Finance Techniques and Practices*, cit.

strength of incentives for sponsors to choose socially desirable responses to the project for the range of foreseeable evolutions of the environment. Additionally, this hierarchy of claims not only maximises total welfare but it also functions as a distinct obstacle for the SPV to seek alternative financing (when exceptionally allowed to) whose benefits would accrue to sponsors and the FP differently.

Accordingly, as it protects a single creditor, the functionality of the cash waterfall clause results in debt dilution with externalities to both earlier and later creditors. The optimal seniority of claims in PFCs consequently comes against both the rationales of default rules (and bankruptcy laws) and the judicial interpretative inertia (*pari passu* treatment) natural of diversified corporate contracting environments. The characterisation of the optimal seniority of claims in PFCs will be the object of Chapter 10.

7.4.15 Adjusting optimalities II - Predefining a distinct scope of administrative delegation

As Chapter 10 will show, in PFCs, the mandates for delegated administrators of the SPV will include a scope a delegation distinct (narrower) than what we see in regular (diversified and collateralised) corporate investing. This distinct optimality results necessarily from the predefinition of critical aspects by sponsors before incorporating the SPV, by the low costs of *itineri* dealing with undelegated matters, the high expertise, and the low number of sponsors.

This estimation from models is coherent with anecdotal empirical evidence about the shape of reward functions (compensation schemes) typical in PFCs.⁷⁹⁹ In Chapter 10, I will refer to how the analysis of this optimality permits the efficient reconstruction of mandates in PFCs.

This proposition relates to the interaction between the SPV and delegated administrators. Hence, it holds irrespective of the responsibility that sponsors have over the SPV control -the object of a specific proposal in Chapter 8.

7.5 The inherent strategic needs, the negative value of diversification, and the feasibility of legal treatment in PFCs

Today, judges enforce in PFCs company laws with company types oriented at facilitating the diversification of investments, investors, and relationships of companies with reciprocally unrelated contractors. In this environment, legislators

⁷⁹⁹ *Vid.* p. 14 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

and judges enforce solutions preventing the conflicting interests that, in regular corporate environments, take place within company spheres and by administrators or controllers of corporations. Moreover, today, such solutions combat forms of opportunism that affect the interests of creditors by harming the actual resources (current assets and opportunities) of corporate debtors.

However, parties do not use PFCs for advancing diversified portfolios. In PFCs, parties implement *intuitu personae* relationships between a non-recourse lender and sponsors who remain in their positions during the entire life of the project and the loan agreement. Additionally, in PFCs, strategic tensions arise against the provisions of the risk allocation mechanism governing the responses expected from sponsors. Hence, in PFCs, opportunism manifests in the responses from the contractors for inputs (the sponsors), beyond corporate spheres. When preventing conflicts in PFCs, legislators should consequently focus not (only) on preserving SPV's resources from the abuses from their managers or controllers (sponsors within the company) but on improving the feasibility of implementation of the risk allocation mechanism -to which the FP is a party- that governs the choices of sponsors when delivering their contributions to the project.

As analysed in all chapters of the study, in the absence of collateral or recourse to third parties, the feasibility of non-recourse debt depends on the quality with which parties implement a risk allocation mechanism. This set of clauses brings confidence that, under all eventualities, the sponsors will bring all inputs necessary for the SPV to complete the single project and repay the non-recourse debt. For this, because SPVs do not advance portfolios with multiple growth options, in PFCs, parties do not appreciate spaces for diversification or any form of discretion that could limit the implementation capacities of parties.

Then, because diversification is a disvalue in PFCs, in these environments, we find contractual solutions that we do not see in regular diversified contracting -where they would jeopardise the investment or contracting capacities of companies. In PFCs, we find contractual solutions correcting the distortive effects from the current legal treatment and supplying parties the strategic protection that is today missing from legislators and judges enforcing norms from corporate types oriented to facilitating diversified investments and contracting.

Above, we have seen how, in PFCs, when implementing such contractual solutions, the sponsors and the FP preserve some (not all) capacities that the rule of the legal personality allows the SPV. Additionally, for risk isolation purposes, sponsors always value limited liability protection -which is also strategically indispensable for implementing the non-recourse clause.

Aside from these two legal institutions, parties leave without effect the bulk of the remaining regulations from corporate types and put in force a distinct set of provisions oriented exclusively at completing the single project as predefined. Remarkably, whereas some of those contractual amendments derive from idiosyncratic project aspects, many others come to attend strategic needs that are inherent to the positions of parties in PFCs. Along with the analyses of the strategic tensions of chapters 4 to 9, in chapters 8 to 10, the objectives of these clauses covering the necessary strategic needs of parties will serve for verifying market-mimicking efficiency of the consideration of possible proposals for legal solutions.

7.6 Conclusions

7.6.1 General aspects

The chapter is the first work focusing on how the elemental structural features of PFCs and the characteristics of the strategic positions of PFCs make, in these contexts, the current legal treatment -including the rules of corporate types- inefficient. The chapter is also the first study of the contractual objectives of clauses with which parties correct the current legislative and judicial legal treatment to their needs in PFCs. These include limiting the exercise of capacities of the legal personality of the SPV and substituting the bulk of the aspects defining the current corporate types.

As in other parts of the study, the propositions of the chapter build on components and strategic features of the positions of parties that are essential in PFCs. In the same vein, all postulates hold validity robustly (irrespective of evolutions of the environment or variations in PFCs structures). Thus, the propositions of this chapter serve for later building postulates for the treatment of PFCs under all legal and factual environments.

The chapter had three main sections after the introduction with strategic considerations and a fourth short section with final remarks. The first of these (section 3) reviewed the objectives of parties, the conflicting interests, the forms of opportunism, and the efficiency of the current legal mechanisms (general principles and corporate types) as well as of contractual solutions available to parties in regular (collateralised and diversified) corporate settings.

Section 4 then examined the same aspects but now concentrating on the scenario of PFCs. Concretely, the second section revisited earlier analyses of the strategic objectives, the conflicts of interests and forms of opportunism in PFCs. In contrast with the first section, this second part of the study remarked the distinct needs for legal treatment and the resulting inefficiencies of the current legal solutions available

to parties in PFCs.

The third larger part after the introduction of the chapter (section 5), analysed the objectives of the contractual mechanisms with which parties correct the distortive incentive effects from the current legal treatment. This last section shows how parties keep the functionality of the limited liability protection and some aspects of the legal personality and leave without effect (replacing) most of the remaining body of regulations of the current corporate types.

7.6.2 Findings

The elemental rationality of the lender. As described in Chapter 3, amongst other critical reasons, parties recur to non-recourse financing for the implementation of a single project whose capital requirements exceed the funding capacities of its owners. Because of such extraordinary capital needs, the material characteristics of such projects are often unique in the market. Consequently, the assets that shape these projects are regularly highly or fully specific. That is, such project's goods and resources have little or no redeployment value that can serve as collateral to the non-recourse lender.⁸⁰⁰

Accordingly, as shown extensively in all earlier chapters, in PFCs, for rationality, the lender will ex-ante substitute the missing asset-based collateral protection with the enforceability of what I called a risk allocation mechanism. This risk allocation mechanism is a set of contracts whose enforceability allows the non-recourse lender to trust that, under all foreseeable eventualities, the SPV will receive from the sponsors all desirable inputs, complete the single project as predefined, and use wealth for the servicing non-recourse claims. Before internalising risks from the project, the FP verifies the value that she can obtain from her claims as a function of the completeness and enforceability of this risk allocation mechanism (individual rationality -participation- constraints).

The position of the non-recourse lender and the functionality of the risk allocation mechanism. In this setting, we can see the sponsors expecting residual benefits from the project. However, as conditions deteriorate and the SPV loses its capacities to repay the debt, the residual risk-taker will be the non-recourse lender (the FP).

Intuitively, ex-ante, parties spend implementation efforts so that at least one party

⁸⁰⁰ See, chapters 2 and 4 for concrete examples of the use PFCs and literature references to the industry-oriented literature.

internalises each foreseeable risk (task) of the project. Then because of the interplay among the non-recourse nature of the debt, the specificities of assets, and the limited liability protection, the risks that parties fail to regulate contractually (the imperfections of the risk allocation mechanism⁸⁰¹) will result in insolvency risks accruing to the non-recourse lender -not to the sponsors who, as the owners and controllers of the SPV, via *shirking*, *risking*, and *shading*, can extract all benefits not defined by parties expressly.

Recall, the SPV advances highly specific assets -thus, the company does not have resources that may serve as collateral protecting the FP. The valuables that parties can extract from the SPV are the resources that sponsors may keep from delivering to the project -a matter that the sponsors will decide (fail to enforce against themselves within the spaces allowed by the incompleteness of the risk allocation mechanism) as owners and controllers of the SPV. This capacity to owners (shareholders) to preserve their capacities under contractual uncertainty is commonplace in the literature of property rights theories of the firm.⁸⁰²

The position of the FP consequently appears as one of a principal in a principal-multiagent organisation for single time-limited projects. In this setting, the principal spends implementation efforts expanding the value of expected responses from input providers (the several agents). In the absence of collateral or protection from third parties, these implementation efforts expanding the quality of the risk allocation mechanism appear as the only sources of expected value to the non-recourse lender (the PF).

Accordingly, because the value expected by the non-recourse lender depends on the performance of the single project as defined ex-ante, the choices of implementation efforts will be, in all PFCs, higher than what we observe in collateralised environments.⁸⁰³ Furthermore, for the same reasons, the personal implementation capacities of parties (a function of material expertise or parties or their external

⁸⁰¹ Clauses are incomplete, and there is an array of actions that the FP fails to verify.

⁸⁰² In PFCs, as owners, the sponsors hold residual rights of *control over the firm's assets: the right to decide how these assets are to be used except to the extent that particular usages have been specified in an initial contract*. In PFCs, the lender is the principal and she is not the owner of the SPV. Cf. page 1120 in O. D. HART; J. MOORE, "Property Rights and the Nature of the Firm", cit.

⁸⁰³ Vid. page 9 in B. ESTY, "The Economic Motivations for Using Project Finance", cit.

advisors⁸⁰⁴) for such unique project -not for a market sector- will dictate the feasibility of PFCs.

This is precisely contrary to what we see in regular collateralised diversified corporate investing and contracting where investors and contractors are dispersed. This is also opposed to the standard environment in which managers advance a diversified portfolio of materially independent projects in the interest of an ongoing company that serves as the investment vehicle for also dispersed (passive and diversified) investors holding transferable ownership interests in the company.

The functionally multiparty nature of PFCs. In PFCs, the clauses that define the feasibility of the non-recourse loan agreement are not those implemented between the creditor (the PF) and the formal debtor (the SPV), but those in place between the creditor and the sponsors. It is in response to the risk allocation mechanism that sponsors control the SPV both *de iure* and *de facto* and expand the repayment capacities of the SPV with their material contributions to the project. These are the expected responses that the FP anticipates as a reference of SPV's capacities allowing her to verify individual rationality -participation- constraints.

Thus, in PFCs, the willingness of the FP to internalise non-recourse risks in a contract with the SPV results from a meeting of minds (*consensus ad idem*) involving her (the lender) and parties other than the formal debtor. Furthermore, these provisions become valid not only before the FP implements the non-recourse loan agreement but also before the sponsors incorporate the single-project strictly instrumental SPV. Thus, irrespective of the fact that sponsors may implement PFCs with formally independent clauses, from the strategic (functional) stance, PFCs appear as a principal-multiagent organisation that -at least functionally- is necessarily multiparty. This observation is precisely coherent with the position of the FP as principal and the sponsors as the multiple agents interacting both individually and collectively with the principal.

Additionally, the risk allocation mechanism includes provisions invariably focusing on strategic aspects that are inherent to all PFCs. Parties know the necessary features of their strategic positions in PFCs. They adopt contractual mechanisms regulating the responses they expect from each other under the incentives that they perceive in all evolutions of the environment. These positions (incentives and vulnerabilities)

⁸⁰⁴ See how the lenders recur to external advisors (independent consultants) in the case-studies of Chapter 4.

define private responses as conditions change (*Cf.* chapters 4 to 6). Those positions inherent to all PFCs also dictate the contractual regulations of expected reactions that parties -in particular the FP- verify before internalising non-recourse risks.

Furthermore, distinct from the above, in PFCs, the sponsors deliver private responses whose outputs depend on the choices of other sponsors (the outputs of complementary actions are reciprocally dependent). This material interdependence induces sponsors to implement relational interactions causing other sponsors to deliver socially desirable contributions beyond the obligations enforceable by the FP; this is the second tier of incentives that sponsors put in place beyond the contracting capacities of the FP (*cf.* chapters 4 and 6).

The lender does not interact with sponsors in these agreements. However, in the conjectures that she builds about the repayment capacities of SPV, the FP does internalise the value of the responses expectable from sponsors to such arrangements as the project evolves. Moreover, by enforcing cross-default mechanisms, the FP induces sponsors to interact with each other exerting discipline as a means of preventing penalties that the FP will enforce against the SPV -a source of value common to all sponsors.

The consideration of the FP and sponsors interacting in a multiparty organisation is relevant to the articulation of legal solutions protecting the lender. See the examination of postulates for competing clauses between the FP and sponsors in PFCs in Chapter 9.

The instrumentality of the SPV within a multi-party principal-multiagent organisation. Notably, in PFCs, for risk isolation purposes (and for the functionality the non-recourse debt) parties implement the loan agreement between the lender and the SPV. Nonetheless, this does not mean that the lender implements the risk allocation mechanism, or decides the feasibility of the non-recourse loan agreement with the SPV (or its manager).

In PFCs, parties recur to the corporate type of the SPV for three purposes exclusively: First, the parties avail from the strategically indispensable SPV for risk isolation. That is, for holding ownership of assets under the protection of the legal personality, thus preventing double way risk contamination among sponsors, the FP, and the unique project as ex-ante precisely predefined, and for implementing the non-recourse mechanism. Second, the strategically indispensable project-dedicated SPV permits the implementation of contracts of the risk allocation mechanism with sponsors and with the FP only (not with other parties except for daily provisions). This includes the enforcement of cross-default mechanisms against interests common to all sponsors. Finally, third, the SPV holding assets of the unique project permits allocating

company shares with expectations to dividends (residual benefits) as a means for implementing incentives for sponsors to choose socially desirable fully non-contractible actions. This is the standard incentive function of property rights.

The consideration of the SPV as a strictly single project-instrumental component of a broader contractual arrangement that all parties implement for protecting the least-informed not controlling principal internalising the bulk of total risks is critical to the provision of a legal treatment focusing on protecting single-contract implementation -not on diversification. Acknowledging the instrumentality of the SPV to an agreement to which the lender is a party, is also necessary for bringing forward proposals for legal solutions that come in contradiction with the purposes for which legislators and judges protect dispersed creditors in current corporate types (and insolvency laws). *Cf.* chapters 8 to 10.

The sources of tensions and the needs for legal treatment. As also analysed, today, in regular corporate environments, the legal protections against opportunism focuses on the abuses of managers and controllers against company resources. However, in PFCs, the conflicting interests endangering the repayment capacities of the SPV (of the single project) do not result in abuses of company administrators or *de facto* controllers against company valuables. Moreover, in PFCs, such opportunism does happen within corporate spheres.

In contrast, in PFCs, opportunism manifests in the interactions between the company and its contractors for inputs. That is, it happens beyond corporate spheres, in the responses from sponsors to the risk allocation mechanism. These are the conflicting interests, and opportunistic actions inherent to all PFCs analysed in chapters 5 and 6: *shirking*, *risking*, and *shading*, in individual responses, in sub-coalitions, or as result of unanimous collusions of sponsors (in their input responses) against the FP.

The fact that all these forms of opportunism take place as decisions of input providers and beyond company spheres is crucial to the (current vs the necessary) orientation of legal treatment. Today, legislators do not take into account the strategic peculiarities (objects and vulnerabilities, incentives, and forms of opportunism) of parties in PFCs. As analysed, when enforcing legal solutions to PFCs, judges apply norms devised against opportunistic actions that take place at the company level, by company controllers, and under conflicting interests dominant in diversified arrangements. As described in chapters 5 and 6, in PFCs, opportunism occurs predominantly in the responses from contractors, away from the managerial control of the SPV. That is, legislators and judges fail to assist parties to PFCs in protecting the contractual relationships that dictate the feasibility of PFCs as in the objectives of the risk allocation mechanism (*cf.* chapters 4 to 6).

The feasibility of contractual solutions and legal treatment. As also shown, in PFCs, parties do not value the diversification capacities of the SPV. On the contrary, all parties -in particular, the FP- perceive discretion as indicative of contractual deficiencies. That is, the FP observes all forms of diversification (of contractors for inputs and finance, investors, and investments) as imperfections of the risk allocation mechanism. In the lender's eyes, these imperfections allow for opportunism, *i.e.*, *shrinking*, *risking*, and *shading*, individually, within sub-coalitions, and unanimously as the environment deteriorates beyond the initially contracted. Consequently, in PFCs, we will observe parties implementing contractual solutions not protecting diversification but instead eliminating its feasibility (*cf.* Chapter 2 and hereabove). Moreover, because diversification is not a protectable good in PFCs, we will also observe parties enforcing contractual mechanisms that we do not see in regular corporate (diversified and collateralised) contexts.

Accordingly, when adjusting the legal environment contractually, parties will rescue only the single aspects of corporate types that serve for the three objectives defined above, *i.e.*, risk isolation, contract implementation with sponsors and the FP only, and incentive distribution via allocation of property rights. Then, they will replace the rest of all regulations that legislators devised originally for facilitating diversified businesses with solutions improving their capacities to implement the critically relevant risk allocation mechanism for the single project they (*i.e.*, all parties including the FP) predefine it before internalising risks.

The sponsors consequently construct an entirely distinct legal environment with features in contradiction with the objectives for which legislators and judges offer corporate types today.⁸⁰⁵ Most notably, of the rules of the SPV's corporate types, parties also restrict some of the elemental features of the legal personality.

That is, the FP confines the capacities of the SPV to acquiring rights and obligations only from the sponsors, the FP, and to advancing the single project as pre-defined. Parties consequently benefit from (only) some aspects of the legal personality (*e.g.*, a limited capacity to contract) and the limited liability protection. The limited liability rule is perhaps the only norm that escapes -directly or indirectly- unchanged the adaptations of the risk allocation mechanism.

The FP and the sponsors modify most of the regulations of corporate types and adapt

⁸⁰⁵ The costs necessary for adapting the legal environment result in under-investment of socially desirable projects, necessarily.

them to their objectives as in an *intuitu personae* organisation dedicated to implementing a single project. Parties limit the transferability of ownership (necessary for political control). They also impede the transferability of contractual positions of sponsors as input providers.

Additionally, ex-ante, sponsors eliminate the three types of decisions of financial nature that managers adopt during company life. Parties impede that the SPV advances alternative projects (the investment decision). They also regulate the access of financing for the SPV (both on equity and debt that only the sponsors and FP will provide. In the same vein, the sponsors and the lender agree on project-specific seniority of claims so that the SPV can repay contracts for inputs progressively while serving the non-recourse debt -all these variables relating to the financing decision. The sponsors and the FP also order the dividend policies of the SPV (the dividend distribution decision). Parties also reduce the scope of delegated decisions that managers will adopt on behalf of the company. The FP (a creditor) also enforces general and specific duties to inform. The sponsors agree that the FP gains participation in the decision-making system after certain undesirable events take place. All these modifications are precisely on the contrary to the objectives with which legislators and judges enforce mechanisms of current corporate types oriented at facilitating diversified investments and mitigating the conflicting interests in such regular environments.

The objects of these adaptations of the legal treatment result from strategic needs that are inherent to the positions of parties in all PFCs. That is, their functionalities lead to efficient outcomes in all environments -*news*- and in all variations of PFCs. Because these clauses come precisely to limit the scopes of diversification (and discretion in expected responses) these solutions are efficient in PFCs, but we do not see them in regular corporate contracting and investing. For the same reason, legislators should implement legal solutions limiting instead of protecting diversification capacities of the SPV, and we would not see such solutions in contexts other than that of PFCs (*cf.* the solutions proposed in chapters 8 to 10). The analysis of the legal solutions efficient in PFCs must interrupt the interpretative inertia with which commentators assess the value of mechanism in corporate law.

Finally, with eyes on the objectives of these contractual practices and the analyses of chapters 4 to 6, we can identify normative postulates with which legislators and judges should protect the positions of parties in PFCs. We can then use the objects of contractual practices as observed empirically (*Cf.* Chapter 2) for both confirming strategic analyses (chapters 4 to 6) and verifying market-mimicking efficiency of postulates for a legal treatment (chapters 8 to 10).

7.6.3 Towards the institutionalisation of PFCs

Based on the above, in chapters 8 to 10, I will advance considerations about the possible efficiency of hypothetical legal rules in this highly stylised environment of PFCs. As ways for legal research, these are considerations of legal rules that could substitute many of the institutions that today sponsors correct contractually.⁸⁰⁶ All propositions find a base on mechanisms that are convergent in comparative contract and company law.⁸⁰⁷ Hence, under each section of the three chapters, we will see a proposal, an analysis of their efficiency, a reference of why such institutions are not efficient (or often seen) in regular diversified and collateralised corporate investing and contracting, and how such hypothetical norms would correlate with contractual practices as described in Chapter 2.

Concretely, in Chapter 8, I will reflect on the needs for advancing five legal propositions: first, a postulate for institutionalising PFCs in a dedicated corporate form; second, a norm enforcing a *iuris et de iure* SPV control responsibility of sponsors; third, a characterisation of a fiduciary duty of loyalty protecting the interest of the lender ruling that sponsors must adopt decisions as if completing the risk allocation mechanism -to which the FP is a party; fourth, a rule for limiting the capacities of the organ of representation of the SPV; fifth, an identification of efficient fiduciary duties to inform *bad news* enforceable against the sponsors by the creditor (the FP).

Additionally, the consideration of PFCs as a single multiparty arrangement where parties value implementation quality in substitution of collateral protection should lead to the refinement of three principles for the ex-post interpretation of clauses. These include: First, a consideration of the *pre-emptive objectives* of all clauses; second, an *in dubio pro creditore* principle as per which judges should interpret or complete provisions ex-post with eyes in the vulnerabilities of the non-recourse lender -the highest risk-taker who is also the ex-ante and ex-post least informed; third, an *intuitu personae* characteristic of commitments from the sponsors. These considerations will be the object of Chapter 9.

⁸⁰⁶ The inadequacy of default rules induces sponsors to spend transaction costs with subsequent under-investment of socially desirable project whose outputs do not allow parties to verify individual rationality -participation- constraints.

⁸⁰⁷ R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

Finally, from the necessary features and the strategic needs of parties, in Chapter 10, we will identify four optimalities in PFCs. These are: first, the postulates for characterising the optimal scope of the managerial delegation with which the SPV interact with its administrators; second, the optimal seniority of claims and expectations held by sponsors and the FP; third, the optimal fiduciary duties of diligence enforceable against sponsors who, as per the proposition in Chapter 8 should be *de iure* controllers of the SPV; and lastly, four, the optimal scope of responsibility enforceable against managers (sponsors and delegated administrators) of the SPV in the vicinity of its insolvency. The considerations of Chapter 10 require less refinement than the earlier ones of chapters 8 and 9 before their implementation.

Chapter 8

Towards the legislative institutionalisation of PFCs. The PFC company form

Abstract. In the first part of the study, chapters 2 and 3 characterised PFCs as seen today in management and finance literature. In the second part of the work, chapters 4 to 6 identified the elements of PFCs and the strategic aspects (tensions and forms of opportunism) inherent to the positions of parties in PFCs. In the beginning of the third part, Chapter 7 remarked the distinct needs for legal treatment in PFCs.

Chapter 8 now identifies five pillars for the legislative institutionalisation of PFCs. These pillars show places where refinements of the legal treatment of legislative origin are both necessary and feasible; *de lege ferenda*.

These include, first, the registration and publicity projects in a PFC corporate form; second, the fiduciary duties of loyalty in the protection of all parties (critically, including the PF) in PFCs; third, the *iuris et de iure* control responsibility enforceable against sponsors in PFCs; fourth, the intervention of the lender in the contracting for debt from third parties (a modification of the capacities of the organs of representation) in PFCs -a solution under the current EU Law; and fifth, the general duties to inform in PFCs.

These pillars provide for protection in five critical places: implementation, responsibility, ex-post completion, the crucial cash flows preservation, and the revelation of enforcement information.

Table of Contents

8	CHAPTER 8 - TOWARDS THE LEGISLATIVE INSTITUTIONALISATION OF PFCs. THE PFC COMPANY FORM	575
	TABLE OF CONTENTS	577
8.1	INTRODUCTION	581
8.1.1	Revisiting the needs for legal treatment	581
8.1.2	Research question	588
8.1.3	Object of the study and the value of propositions	588
8.1.4	Sequence of the presentation	591
8.2	1ST PILLAR. TOWARDS A PFC CORPORATE FORM; DEFAULT AND MANDATORY RULES, REGISTRATION AND PUBLICITY	591
8.2.1	Introduction	591
8.2.2	Proposal	592
8.2.3	Identifying PFCs	592
8.2.3.1	The sponsors	593
8.2.3.2	The financing party	593
8.2.3.3	The SPV	593
8.2.3.4	The single project (the limited object of the enterprise)	593
8.2.3.5	The registration of PFCs	594
8.2.4	Needs for a corporate type and the registration (publicity) of PFCs	594
8.3	2ND PILLAR. THE FIDUCIARY DUTIES OF LOYALTY TO THE NON-RECOURSE LENDER (THE FP)	597
8.3.1	Introduction	597
8.3.2	Efficiency of current fiduciary duties of loyalty in diversified corporate investments	597
8.3.2.1	Analytical dimensions and the functionalities of the duties of loyalty	600
8.3.2.2	The efficiency of duties of loyalty under insolvency rules	602
8.3.2.3	Low incentives for colluding with contractors	604
8.3.3	Current duties of loyalty and their inefficiency in PFCs	604

8.3.3.1	In PFCs, as enforced today, duties of loyalty do not result in their purported benefits	605
8.3.3.1.1	<i>In PFCs, parties do not value duties of loyalty in the benefit of dispersed investors</i>	605
8.3.3.1.2	<i>In PFCs, the risk-averse manager does not value protection for adopting risky decisions</i>	606
8.3.3.1.3	<i>In PFCs, investors (sponsors) do not value duties of loyalty for preventing intra-class tensions</i>	607
8.3.3.2	In PFCs, as enforced today, duties of loyalty are ineffective against opportunism	608
8.3.3.2.1	<i>In PFCs sponsors are both the parties in distress (in need for opportunistic readjustments) and the controllers of the SPV renegotiating under fiduciary duties of loyalty</i>	608
8.3.3.2.2	<i>In PFCs, the spaces for relational interactions amongst sponsors controlling the SPV are large</i>	610
8.3.3.2.3	<i>In PFCs, today insolvency rules enforce duties of loyalties come too late in the protection of the main risk-taker (the FP)</i>	611
8.3.4	Managerial duties of loyalty in PFCs.....	612
8.3.4.1	Proposal.....	612
8.3.4.2	Spaces for the application of the rule.....	613
8.3.4.3	Incentives of the rule.....	613
8.3.4.3.1	<i>Incentives ex-post</i>	613
8.3.4.3.2	<i>Incentives ex-ante</i>	614
8.3.5	Contract rationale.....	615
8.3.6	Contractual practices	615
8.3.7	Proposal for fiduciary duties of loyalty in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)	616
8.4	3RD PILLAR. CONTROL RESPONSIBILITY TO SPONSORS IN PFCs	616
8.4.1	Introduction.....	616
8.4.2	Sequence of the analyses	617

8.4.3	The rule today in (diversified) corporate finance	617
8.4.4	The functionality of the responsibility rule in corporate finance	618
8.4.5	The needs of PFCs	620
8.4.6	Alternative proposals.....	621
8.4.7	Incentive effects of the alternative proposals	622
8.4.7.1	Direct efficiency effects of a <i>iuris tantum</i> presumption.....	622
8.4.7.2	Direct efficiency effects of <i>iuris et de iure</i> presumption.....	623
8.4.8	Other indirect incentive–efficiency effects of both alternatives...	625
8.4.9	Observed contractual behaviour	628
8.4.10	Robustness.....	629
8.4.11	Proposal for a rule enforcing control responsibility of sponsors in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)	629
8.5	4TH PILLAR. THE PUBLICITY OF A CORPORATE FORM. THE LIMITATION OF THE REPRESENTATION ORGANS OF THE SPV.....	630
8.5.1	Introduction.....	630
8.5.2	SPV control, implementation, and the vulnerabilities of the FP in PFCs	631
8.5.3	Two solutions for two problems	632
8.5.4	The value of registration in PFCs and third parties in good faith	634
8.5.5	A PFC corporate form. Limiting the capacities of the representation organ. The intervention of the FP in debt financing contracts	635
8.5.6	Contractual practices	636
8.5.7	Robustness and consistency with other proposals	637
8.6	5TH PILLAR. THE FIDUCIARY DUTIES TO INFORM <i>DISTRESS</i> IN PFCs ...	639
8.6.1	Introduction.....	639
8.6.2	The rule and its efficiency in diversified corporate businesses ...	640
8.6.3	Inefficiency of solvency tests and bankruptcy laws in PFCs.....	642
8.6.3.1	PFCs depend on incentive quality, not on collateral value; the earlier exacerbation of opportunistic incentives in PFCs.....	643

8.6.3.2	The failure of current insolvency tests to identify incentive distortions	644
8.6.3.3	The specificity of assets; the failure of insolvency tests to preserve value to creditors	646
8.6.4	Dependence of PFCs on contractual arrangements; the imperfect access to information	646
8.6.5	Proposal	648
8.6.6	Verifiability of distress.....	648
8.6.7	Efficiency of the rule.....	649
8.6.8	Ex-post and ex-ante incentives of the rule.....	650
8.6.9	Contractual practices.....	651
8.6.10	Robustness.....	652
8.6.11	Towards a later refinement	653
8.6.12	Proposal for a general fiduciary duty to inform in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)	653
8.7	CONCLUSIONS	653

8.1 Introduction

Let us now enter the analysis of postulates for legal research in chapters 8 to 10. In Chapter 8, I will advance a proposition for the legislative implementation of a PFC corporate form. Besides from this legal reform, the proposal for a legal treatment of PFCs will include the analyses of four principles for the interpretation all clauses of the strategically critical risk allocation mechanism (Chapter 9), and the characterisation of four optimalities in PFCs (Chapter 10).

I will now revisit the elemental aspects that define the needs for legal treatment in PFCs. Below, I will complete the introduction as in other chapters. I will then refer to the research question, the object of the chapter, the value of the contribution, and the presentation sequence.

8.1.1 Revisiting the needs for legal treatment

Based on the industry-oriented literature, in Chapter 2, I characterised the contractual practices with which, today, business operations implement PFCs. Building on the literature of corporate finance, in Chapter 3, I remarked the reasons why parties incur exceptionally high transaction costs⁸⁰⁸ for implementing the very costly non-recourse financing facilities. Chapter 3 showed how PFCs allow parties to escape the implementation boundaries of their debt capacities.

In Chapter 4, I offered a first approach to the essential strategic aspects of PFCs. I then introduced the rationality of parties, the elements of all PFCs, and the contractual mechanism's objectives with which sponsors and lenders give structure to these functionally multiparty organisations. Chapters 5 and 6 finally analysed the strategic tensions, the form of opportunism, and consequently the feasibility boundaries of PFCs.

The strategic environment. From distinct stances, chapters 4 to 7 showed how, because the projects that the SPV advances are regularly highly specific, in the

⁸⁰⁸ Recall, the feasibility of uncollateralized non-recourse financing (FPCs) depends on the quality with which the FP implements the risk allocation mechanism. The feasibility of FPCs consequently depends on the weight of transaction costs relative to total welfare -a function of the quality of default rules (legal institutionalization). Chapter 3 showed how, even without such institutionalization, parties spend such implementation efforts finding in FPCs a way to escape the limitations of regular collateralised financing.

absence of collateral to third parties (the nature of non-recourse debt) the rational lender builds her expectations⁸⁰⁹ in the quality of what I called a risk allocation mechanism. As described extensively, the risk allocation mechanism is a set of clauses that the FP enforces against both the sponsors (collectively and individually) and the SPV assuring that, under all eventualities, the SPV will count on all inputs necessary for completing and operating the project. Hence, the risk allocation mechanism dictates the responses that all parties expect from the sponsors in all foreseeable evolutions of the environment to the project to produce wealth sufficient for the SPV to repay the non-recourse debt.

The quality of the said risk allocation mechanism dictates the conjectures that the FP can build about her claims' expected values. Then, because the FP is a necessary party, the robustness (completeness and enforceability) of the risk allocation mechanism defines the feasibility of PFCs. This reveals the critical strategic value of parties' implementation capacities in PFCs that the legal system should enhance with both default and mandatory rules.

As mentioned above, in chapters 5 and 6, I have identified the strategic tensions and forms of opportunism in PFCs. These tensions define the needs for legal treatment. Recall, in PFCs, the sponsors hold residual (junior and variable) expectations to the claims in the hand of the FP. That is, the sponsors hold claims from contracts that may be partially or totally subordinated to the senior non-recourse debt. Additionally, as owners of the SPV, the sponsors expect dividends from the company. The claims in the hands of the FP are regularly senior but fixed face value.

In conjunction with the legal personality of the SPV and the limited liability protection, the above results in strategic tensions that are distinct from those described in the literature of company law and economics.⁸¹⁰ These tensions result from the structural features inherent to PFCs. *E.g.*, in PFCs, the sponsors are the input providers of the SPV which advance a single project that parties predefine imperfectly. The sponsors also own and control the SPV both politically and *de facto*. Additionally, the sponsors interact with each other relationally after updating information asymmetrically. This results in a space within which they can implement incentives beyond the enforcing capacities of the lender.

⁸⁰⁹ *V.gr.*, she builds conjectures about the expected value of her claims that allow her to verify individual rationality -participation- constraints.

⁸¹⁰ *Cf.* for all, with literature references, *pp.* 35 and *ff.* in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

Accordingly, the sponsors will deliver responses to three tiers of incentives. The first tier includes those implemented contractually (the risk allocation mechanism that the FP enforces imperfectly). The second tier results from the incentives that the sponsors implement amongst some or with all of them. That is within sub-coalitions, or in unanimous collusions against the lender. Finally, the third tier of incentives comes from the individual allocations of property rights (shares) with entitlements to dividends incentivising non-contractible actions.

As known, as the project evolves, *news* will materialise to sponsors and the SPV.⁸¹¹ This will always come with two consequences. First, as the SPV loses its capacities to produce wealth beyond the costs of serving the senior non-recourse debt, it will also lose its powers to generate returns for (the rewards expected from) the non-contractible efforts from the sponsors. Consequently, the incentives for sponsors to respond with privately costly but socially desirable actions will necessarily deteriorate. Second, because of the contractual incompleteness of the risk allocation mechanism, with time, the sponsors find new spaces for delivering inputs individually, renegotiating opportunistically with some, or with all other sponsors without the intervention of the FP. This possibility allows them to respond to the changing incentives as privately or collectively (but not always socially) desirable.

Chapters 5 and 6 consequently showed how, as the single project's capacities deteriorate (with *news*), the sponsors perceive stronger incentives for *shirking*, *risking*, and *shading*. That is, individually, within sub-coalition, or unanimously, the sponsors withhold socially desirable efforts (*shirking*). They choose riskier than socially optimal technological solutions (*risking*). Finally, they implement innovations to save costs of complying with the risk allocation mechanism's obligations without internalising the marginal losses from such alterations (*shading*). At the beginning, the sponsors will behave opportunistically individually. Then, with *bad news*, they will form growing sub-coalitions that will grow in size. Under *very bad news*, they will collude unanimously against the lender.

It is this opportunism and not (only) the impact of contingencies (*news*) what leads the company to its insolvency.⁸¹² Consequently, ex-ante, the FP spends implementation efforts for two distinct objectives: First, to preserve project capacities

⁸¹¹ Incompleteness of the risk allocation mechanism enforceable by the lender is necessarily a function of time terms (of the duration of the originally predefined contractual interaction).

⁸¹² *Vid.* chapters 5 and 6.

directly (by so doing, the lender preserves repayment capacities but also protects the efficient incentives to sponsors). Second, to anticipate the opportunistic actions with which the sponsors may respond to the deteriorating incentives.

In other words, ex-ante, the FP spends implementation efforts (transaction costs) expanding the range of the first tier of incentives over the second and third tiers, while also procuring that with the second tier of incentives the sponsors coordinate solutions as socially desirable. Finally, by preserving project capacities, the FP protects property rights' incentive strengths (expected dividends) inducing socially desirable fully non-contractible actions.

The objectives of the non-recourse lender and the feasibility of PFCs. Crucially, the above remarks the many strategic aspects that I have first characterised in this study.

The feasibility of PFCs depends on the quality with which parties predefine a single project. The quality of these definitions outlines the risks that the lender will internalise via her non-recourse debt contributions. Additionally, in all scenarios, the FP is the least-informed, least-capable of updating information (and conjectures), and finally, the highest risk-taker in the setting.

Consequently, as anticipated in chapters 4 and 7, in all PFCs, we find a principal who, in exchange for a fixed face value rewards (interests), internalises risks after implementing incentives for a group of agents to deliver responses expanding residual benefits from a single time-limited project.

Moreover, in all PFCs, the sponsors interact with each other and the FP functionally and contractually. This reveals PFCs as -at least from the functional stance- multiparty organisations. Legally, this is proven by the use of cross-default mechanisms that parties enforce against persons other than those obliged by individual commitments.

Finally, as identified strategically in chapters 5 and 6, as evidenced in the rationality of contractual precautions shown in Chapter 7, and illustrated in Chapter 2, because the risks internalised by the FP (the vulnerable party) depend on the quality with which parties implement incentives around the needs of a single project, in PFCs, parties spend implementation efforts (transaction costs) limiting the spaces for diversification. In other words, precisely in contrary to what we observe as the objectives of legislators facilitating diversification of businesses, the feasibility of PFCs depends on the quality with which parties can ex-ante restrict all spaces for the sponsors to diversify investments (the single project), the investors providing the full equity capital, the contractors bringing all critical inputs for the single project, and sources of debt financing (the single FP preventing debt dilution).

The distortive effects of current legal treatment. As remarked in the second part of Chapter 7, the above objectives of parties in PFCs are precisely contrary to those for which legislators provide the legal treatment to business legal entities. Today, legislators protect companies' capacities to generate value from diversified investment portfolios that delegated managers produce from the resources that dispersed (passive) shareholders bring behind limited liability protection.

Consequently, in regular diversified corporate businesses, we will see broad scopes of investment spaces in companies' objects. The managers will act under a duty of loyalty to shareholders. Only in the vicinity of company insolvency will managers protect creditors' interest, and such protection will become enforceable with eyes on collateral (portfolio) value.

For the same reasons, the standards of diligence enforceable against the risk-averse managers adopting decisions about many projects with expertise in some industry sectors will be low. The shares and property rights of sponsors will be habitually freely transferable. Then, because the companies advance many projects with sequential financing needs, beyond the standard precaution of requesting collateral or protection from third parties, the lenders will not enforce special seniorities of claims or other protections that would jeopardise financing diversification capacities.

Additionally, habitually, in attention to the opportunity costs to diversification capacities, habitually, the lenders do not agree on other protections as, *e.g.*, enforcing step-in rights or the assignments of contractual positions, using the shares of companies as collateral, as allowing creditors to interfere with the decision-making system of companies. Finally, because regularly, companies advance several projects, the objects of diversified companies are broad. Hence legislators protect third parties in good faith and tend to see contractual arrangements within companies' core activities.

The necessarily inefficient (functionally limited and strategically precarious) contractual solutions. As analysed in Chapter 7, the objectives for which the legislators protect stakeholders are precisely opposite to the purposes of implementing a single project and limiting all forms of diversification that parties pursue in PFCs. Consequently, in PFCs, ex-ante parties will spend efforts supplementing the protection missing from legislators and -crucially- correcting (or functionally circumventing) the effects of legal mechanism oriented to preserving diversification capacities.

Recall the analysis in the second part of Chapter 7. When implementing PFCs, for the critically necessary risk isolation and the functionality of the non-recourse nature of the debt, parties will preserve the functionality of the limited liability protection.

However, besides this, they will then modify most of the rest of the critical solutions that characterise the current corporate forms. Remarkably, this includes limiting the application of features of the legal personality -*e.g.*, they will limit the acceptability of contracting with parties other than the sponsors (for other sources of inputs) or the FP (for alternative sources of debt).

Notably, in PFCs, parties will limit the transferability of shares as well as of the position (delegation) of sponsors as input providers. Crucially, parties will limit the SPV object to the single project -as precisely defined including its contracting parties, providers of financing, and buyers of its proceeds (the off-taker). Via the strategically indispensable *cash waterfall* clause, parties will regulate both a sequence of contract repayments (and dividend distribution) as well as a hierarchy of claims. The FP will also agree with sponsors on commitments to provide capital -*v.gr.*, to maintain coverage or debt-to-equity ratios- during critical stages of the project.

Moreover, the FP will enforce protections that resemble those typical of pre-bankruptcy (insolvency) regulations. The lender will implement general and specific commitments to inform concrete events or the status of progress. Remarkably, the FP will agree with parties that, after the verification of specific (technical default) events, she may gain access to the control of project assets as well as to (in extreme cases) the ownership of company shares. Commonly, via step-in rights, the lender will also interfere in the contractual relationships between the SPV and third parties. Additionally, as we will see in following chapters, in PFCs, most the interactions will build upon *intuitu personae* basis -*v.gr.*, the lender will enforce cross-default mechanism based on technical default provisions reflecting characteristics of individuals (say, their financial or material solvency). Some of these cross-default mechanisms will replicate the functionality of control responsibility solutions against all sponsors. Finally, in PFCs, from the enforcement of these idiosyncratic mechanisms, parties will not internalise an opportunity cost -but rather observe value- from the minimisation of diversification spaces.

The indispensable functionality of contractual and legal protection in PFCs. All the above results from needs that are inherent to the positions of parties in all PFCs. In all PFCs, in the absence of collateral protection from the specific assets or third parties, the repayment capacities of the SPV result from the interplay between two factors: first, the unforeseen events from the environments affecting the project directly (*i.e.*, *news*, a manifestation of contractual incompleteness); and second, the responses that parties can expect from sponsors in such circumstances affecting project capacities indirectly.

As identified in chapters 4 to 7, in all cases, the feasibility of PFCs depend on the

quality with which parties -both sponsors and the FP- ex-ante implement, and ex-post renegotiate and enforce provisions regulating responses from sponsors under all eventualities affecting a single project. These are the capacities that legislators should protect with both mandatory and default rules -in all scenarios, irrespective of project configuration or other variables.

Towards a legislative institutionalisation of PFCs. Based on the strategic needs that are inherent to all PFCs, as a series of ways for legal research, in chapters 8 to 10, I will explore the value of providing a legal treatment to PFCs. Each of these three chapters will elaborate on one of the three dimensions of the legal treatment - PFC legislative institutionalisation, principles for ex-post contract implementation, and the identification of optimalities. All proposals build on strategic features of the essence of the positions of parties in PFCs. Thus, all proposals hold efficient in all environments, irrespectively of project configurations, or evolutions of the circumstances.

Chapter 8: towards a legislative institutionalisation of PFCs. Chapter 8 will include five pillars with critical norms that require legislative implementation. These pillars allow for the definition of a PFC corporate form. These are: first, the registration and publicity of a PFC corporate form; second, the fiduciary duties of loyalty in the protection of all parties (including the lender); third, the *iuris et de iure* control responsibility of sponsors; fourth, the intervention of the lender in the contracting for debt from third parties (a modification of the capacities of the organs of representation); and fifth, the general duties to inform. These pillars provide for protection in five critical places in this order: implementation, responsibility, ex-post completion, cash flows protection, and enforcement information.

Chapter 9: three postulates for the ex-post completion of contracts. The second dimension will include an identification of three postulates for the interpretation of all clauses of the risk allocation mechanism. First, the pre-emptive purposes of contracts; second, the *in dubio pro creditore*, third the *intuitu personae* value of interactions.

Chapter 10: four optimalities in PFCs. Chapter 10 characterises four postulates for identifying optimalities in PFCs. The optimal responsibility standards of diligence (the fiduciary duties of care), the optimal responsibility of sponsors in the vicinity of SPV insolvency, the optimal seniority of claims, and the optimal scopes of managerial delegation.

In all chapters, in different sequences and variations, we will always see: the efficiency of the current legal treatment in regular diversified corporate businesses, the inefficiencies of such solutions in the distinct case of PFCs, the needs for legal

treatment that are inherent to the position of parties in all PPCs, the functionality of each proposal (incentives ex-post and ex-ante), the robustness of the proposition (efficiency in all environments irrespective of project variations), and finally, the consistency of each postulate with the other recommendations of the three chapters.

8.1.2 Research question

Chapter 8 answers the question:

What rules are necessarily efficient in all PFC scenarios, and how we should consider such norms towards the legislative institutionalisation of PFCs in a dedicated corporate form?

8.1.3 Object of the study and the value of propositions

The chapter will offer ways forward for later research focusing on five pillars.

The first pillar, the registration and publicity of the corporate form. The legislative institutionalisation of PFCs in a dedicated corporate form permits the enforcement of mandatory norms (e.g., the fiduciary duties of loyalty, the fiduciary duties to inform, the *iuris et de iure* responsibility of sponsors, the limitations to the organ of representation) as well as the legislative offering of default rules to parties (e.g., in other chapters, the optimal seniority of claims, and the optimal scopes of delegation). Critically, the legislative institutionalisation of PFCs facilitates registration and publicity with the known effects in terms of information to parties and contractors (e.g., the exclusion of third parties in good faith). Legislative institutionalisation induces judges to apply concrete norms. This facilitates the advances of jurisprudential standards and allows scholars to advance studies upon solid strategic and legal categories.

The second pillar, the fiduciary duties of loyalty in the protection of all parties (including the lender) comes to enhance ex-ante implementation capacities of parties that define the feasibility of PFCs. This second pillar induces parties and judges to ex-post complete all contracts of the risk allocation mechanism in consideration of the initial *consensus ad idem* (and strategic objectives) of all parties -critically, including FP (a creditor). The rule reorients the current severely distortive fiduciary duties of loyalty optimal for organisations that maximise profits from diversified portfolios for passive shareholders with risks externalised (behind limited liability protection) to also dispersed creditors.

Recall, in PFCs, in the absence of collateral, the lender relies on the quality with which all parties predefine the single project ex-ante. Today, in PFCs, the principal is the FP, the least qualified, least-capable of implementing precautions, updating

information, or enforcing entitlements. The rule treats PFCs as the single time-limited projects funded from risks internalised mostly by a single and least qualified principal whose expectations define the feasibility of such agreements. In this context, the rule induces all parties and judges to adopt decisions as if completing the risk allocation mechanism also defined by the FP (a creditor).

Crucially, because the SPV is a legal solution devised strictly instrumental to the financing of the single project, the rationality of fiduciary duties of loyalty in PFCs should also govern the decisions that the sponsors should adopt for the administration of the SPV as well as the collective actions in exercise of their political rights as shareholders of the SPV. As above, the proposition is always efficient in PFCs, irrespective of configurations or project variations, or legal traditions.

The third pillar, the iuris et de iure control responsibility of sponsors. This principle constitutes a responsibility rule under which the sponsors should be treated (always) as controllers of the SPV.

The proposition is precisely in line with evidence -*v.gr.*, the sponsors do always control the SPV -and they implement control covenants requiring that control. The proposal reduces the costs of enforcing claims against the sponsors, thus inducing them to internalise more of the impact of their opportunistic actions. Because control is indispensable to the feasibility of PFCs, the proposition holds efficiently irrespective of project configurations, evolutions of the environment, or the laws governing the SPV and the interactions amongst parties.

The fourth pillar, the intervention of the lender in the contracting for debt from third parties (the capacities of the organs of representation of the PFC corporate form).

In PFCs, the non-recourse lender does not receive protection from collateral or resources from third parties. The value of her claims depends exclusively on the capacities of the project and the SPV to produce cash flows. Recall the analyses of Chapter 3. The debt dilution problem refers to the situation faced by the earlier creditor who, as the businesses evolve, find herself competing for collateral value or cash flows with subsequent lenders. Debt dilution implies externalities from older to newer creditors and consequently leads to under-investment of the earlier. In PFCs, the FP is particularly sensitive to debt dilution because her claims' value depends exclusively on the cash flow capacities of the project that she predefines ex-ante contractually.

In PFCs, as shareholders of the SPV, the sponsors hold residual rights of control over the company and its assets. Hence, irrespective of provisions of the risk allocation mechanism (control covenants) the sponsors (the SPV) can implement contracts with

third-party creditors. In such a case, the FP and sponsors' control covenants will not affect the validity of debt contracts with third parties. In the prevention of such opportunism from the sponsors, ex-ante, the FP will request sufficient collateral from the sponsors or third parties. Nevertheless, collateral is a scarce resource. Consequently, in PFCs, backwards induction, the moral hazard problem of debt dilution risks will result in under-investment on the side of the lender, necessarily.

Today, the legislators protect the third parties in good faith. However, in light of the latest EU directives, it is possible to prevent the problem by limiting the capacities of the organ of representation via the regulations of the company form.⁸¹³ Concretely, the legislator should restrict representatives' capacity to implement contracts for debt without the consent of the FP -a party necessary in the configuration of the company type. The rule should not only prevent the said problem but, functionally, it would also institutionalise a practice of allowing non-recourse lenders a monopoly in the provision of debt financing to the non-recourse debtor. Just as all other proposals, this postulate for later research builds on the strategic features inherent to the positions of parties in PFCs. Thus, it holds efficiently in all environments and irrespective of project configurations -or legal traditions.

The fifth pillar, the general duties to inform. In PFCs, opportunistic incentives begin to grow not with *very bad news* or with the insolvency of the SPV, but much earlier, as soon as the project or sponsors experience the smallest contingencies (*bad news*) and the SPV begins losing its capacities to distribute residual benefits (the returns from non-contractible efforts) to the sponsors. Additionally, in PFCs, the current insolvency tests fail to detect the moment in which distortive incentives whose responses from sponsors accelerate the deterioration of the project arise.

Hence, in all PFCs, in the absence of collateral, the enforcement capacities of the FP depend on the timely access to relevant information. The proposal postulates a fiduciary duty to inform *distress* -a verifiable threshold of incentive deteriorations. By enhancing enforcement capacities, backwards induction, the postulate improves the implementation quality of the risk allocation mechanism that dictates the feasibility of non-recourse financing. As derived from strategic features of the positions of parties in all PFCs, the postulate is robust (efficient in all circumstances and project configurations) and consistent with (imperfect) contractual practices.

⁸¹³ *Vid.* Art. 9 of the Directive (EU) 2017/1132 of The European Parliament and The Council of 14 June 2017 relating to certain aspects of company law (codification). Official Journal of the European Union - L 169/46 - 30.6.2017.

8.1.4 Sequence of the presentation

The sequence of the analysis will be the one followed above when presenting the five pillars for the legislative treatment of PFCs.

As I have already indicated, in a distinct order, in all chapters, we will analyse: the efficiency of the current legal treatment in regular diversified corporate businesses; the inefficiencies of such mechanism when applicable to parties in PFCs; the needs for legal treatment to the position of parties in all PFCs; the functionality (incentives ex-post and ex-ante) of each proposal, the robustness of propositions (efficiency in all scenarios); and finally, the coherence and functionality with other postulates from this and other chapters.

8.2 1st pillar. Towards a PFC corporate form; default and mandatory rules, registration and publicity

8.2.1 Introduction

I will now propose a way forward for researching the value of institutionalising PFCs via the legislative implementation of a PFCs-dedicated corporate form. As a choice of legislators, this type should build upon the base of any existing corporate form allowing for limited liability protection.⁸¹⁴ The propositions of this study should override all aspects of such corporate types with which they could be incompatible.

The use of the PFCs-specific corporate type for implementing the project should be optional to the sponsors and the lender. Accordingly, during the stage of designing the project and the risk allocation mechanism, parties should freely choose any corporate type, including the PFC-dedicated form.

Whenever accepting that PFC-type, sponsors should accept or adjust the default provisions (*cf. e.g.*, in other chapters, the optimal seniority of claims, and the optimal

⁸¹⁴ *E.g.*, the American Incorporation (Inc.), the German Aktiengesellschaft (A.G.), Italian Società per azioni (S.p.A.), the French Société Anonyme (S.A.), Spanish Sociedad Anónima (S.A.), or the typically closely held companies like the US or British Limited Liability Company (L.L.C.), the German Gesellschaft mit beschränkter Haftung (GmbH), the French Société à responsabilité limitée (S.A.R.L.), the Italian Società a responsabilità limitata (SRL) or the Spanish Sociedad Limitada (S.L.). *Vid.* generally, with references to legislative provisions, page 17 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

scopes of delegation). However, once the parties complete the registration, naturally, all mandatory norms should apply. As I will analyse below, these are responsibility standards enforceable in the protection of the FP (the vulnerable principle) or rule that legislators often implement for preventing strategic tensions with third parties (*cf. e.g.*, the fiduciary duties of loyalty, the fiduciary duties to inform, the *iuris et de iure* responsibility of sponsors, the limitations to the organ of representation, or the exclusion of third parties in good faith).

Finally, this first pillar proposing the registration and publicity of a PFC form is indispensable to the legislative institutionalisation of PFCs necessary for implementing the other four pillars.

In the rest of the analysis, the articulation of propositions will be as follows. In the second section, I will remark the needs for a corporate type and the registration of PFCs. In the third and fourth parts, I will present the individual proposal and the items that that parties should register when incorporating the SPV. In the fifth part, we will observe how registration facilitating institutionalisation improves the implementation of default rules, standards, optimalities, and mandatory norms.

8.2.2 Proposal

The corporate type. Legislators should create a PFC-dedicated corporate form whose regulations would govern the SPV as well as the interaction between the SPV, the FP and the sponsors.

The choice of the corporate form with mandatory and default rules. The sponsors and the FP should have the choice of registering the project under the PFC form. Registration would result in the application of mandatory norms and the choices of default rules, and allow publicity to third parties.

The name of the project and the legal entity. The choice of a PFC-dedicated corporate form and its registration should include an explicit reference to such corporate type *Project Financing Company* or the short version *P.F.C.* next to the name of the SPV.

The registrable information. Parties should register: the identities of sponsors and the FP, the elemental features of the single project (the object of the company), the material and financial (capital) contributions from sponsors and the FP (the value of the non-recourse debt), and the seniorities of claims held by the sponsors and non-recourse lender.

8.2.3 Identifying PFCs

Let us shortly observe the items that parties should register when choosing to implement projects under the PFC form.

8.2.3.1 The sponsors

The sponsors are physical or judicial persons (companies) who are, at the same time, owners of the SPV and contractors for inputs to the predefined project.

8.2.3.2 The financing party

The financing party is a physical or judicial person who provides financial resources to the SPV without receiving sufficient collateral from the debtor or their parties. The FP (*v.gr.*, the parties that form the FP) should be registered as such with the project and the SPV.

Notice three aspects. First, the obligation to register and the access to protections of default rules implies coordination (a decision-making system) that lenders must implement amongst themselves for interacting with the SPV and sponsors. This dynamic could resemble that of lending syndicates.

Second, the above characterisation does not speak about the moment in which the FP enters the project, nor refers to the legal form of such contributions. The description consequently includes bondholders and outside equity holders, or other investors bringing valuables financial in nature. However, without registration, such parties should be considered creditors or investors, but not part of the FP enjoying the protection of default rules as described above in a distinct proposal.

Third, the registration of the project requires the consent or the intervention of the FP. The registration of the FP is necessary for the enforcement of a distinct proposal requiring her intervention in agreements through which the SPV receives debt from third-party creditors. Effectively, besides of the aspect of the registration, the fourth pillar limiting the capacities of the organ of representation and requesting the participation of the FP in debt financing contracts realises the treatment of the FP as a party to a multiparty organisation.

8.2.3.3 The SPV

The SPV is a legal entity -or groups of legal entities- dedicated to the advancement of the single project as predefined by parties. The SPV must confer limited liability protection to shareholders. The SPV may not hold assets (resources) other than those associated with the single project or sustain contractual relationships with parties other than those related to it.

8.2.3.4 The single project (the limited object of the enterprise)

The single project includes the contractual organisation of resources for a predefined time-limited purpose whose resources should serve for repaying the non-recourse

financing and other contributions as defined by all parties ex-ante. The general aspects of the project must be characterised by all parties and registered.

8.2.3.5 The registration of PFCs

As elaborated in a distinct proposition below, all the above elements should be registered when incorporating the SPV. Note how of all items, the FP is the only one whose identity and claims legislators do not regularly require today for company registration and publicity.

8.2.4 Needs for a corporate type and the registration (publicity) of PFCs

The value of registration and publicity in regular corporate businesses is of critical relevance to the enforcement of Corporate Law. Registration allows for the institutionalisation of company types and forms. It permits that such regulations be enforceable against stakeholders entering and leaving the organisation. Publicity then allows third parties to be aware of the risks they internalise when interacting with legal entities. The rules of limited liability protection, capital requirements, managerial and control responsibility, the regimes of company delegation and representation capacities of company organs require (or greatly benefit from) registration for both enforcement and publicity to third parties.

All those benefits assist parties in PFCs too. However, in addition to the above, there are further reasons for which registration and publicity are beneficial in PFCs. Remarkably, such registration should come associated with the legislative implementation of a PFC-dedicated corporate form -a legislative institutionalisation of PFCs.

The benefits of this approach are several.⁸¹⁵ Let us observe five dimensions of these benefits and how they manifest in the concrete proposals for legal research.

The identification of default rules and jurisprudential approaches. The registration and publicity of a PFCs-dedicated corporate form facilitate the institutionalisation of contractual arrangements that today exist only informally as business practices. This permits the treatment of PFCs from the stance of Contract and Company Law as well

⁸¹⁵ Note how, in essence, the objectives identified below are no distinct to the benefits for which registration serves regular corporate businesses (above) -facilitating the choices of the corporate forms with all their benefits, control, enforcement, and publicity.

from other legal perspectives -*e.gr.*, taxes, and public procurement programs.⁸¹⁶

Additionally, the legislative institutionalisation of PFCs facilitates the elaboration of jurisprudential criteria based on clear categories. Institutionalisation and the availability of jurisprudential criteria also allow scholars to advance strategic and strictly legal considerations upon solid categories. In other words, the legal institutionalisation of PFCs in a dedicated corporate form whose rules induces judges to begin building a jurisprudence refining criterion for the enforcement of the other propositions of this study.

The identification and enforceability of default rules. As analysed in all chapters, the characterisation of the strategic aspects that define the positions of parties in PFCs permits the implementation and enforcement of standards of responsibility and other mandatory norms efficient in PFCs. Some of these rules that in a corporate form would be mandatory can be today implemented contractually -*e.g.*, the fiduciary duties of loyalty, the fiduciary duties to inform. Some others, however, do require a legislative institutionalisation for their enforceability -*e.g.*, the *iuris et de iure* responsibility of sponsors, the limitations to the organ of representation, or the exclusion of third parties in good faith.

The corporate forms and the mandatory norms. The institutionalisation of PFCs in a corporate form also facilitates the enforcement of legal provisions in the protection of third parties -both creditors for inputs and investors.⁸¹⁷ These mechanisms require the enforcement of mandatory rules. Hence, judges cannot apply, or the parties cannot implement them without the legislative institutionalisation of a PFC-dedicated company form with its registration and publicity requirements. A corporate form permits that parties choose this set of mandatory rules when registering the company.⁸¹⁸

Concretely, the *iuris et de iure* control, the fiduciary duties of loyalty, general fiduciary duties to inform, and the higher fiduciary duties of diligence should stem from mandatory provisions. The rule limiting the capacities of the organ of representation (*cf.* below the fourth pillar) must be implemented via a mandatory

⁸¹⁶ See in Chapter 2 the use of PFCs in the context of Public-Private Partnerships.

⁸¹⁷ *Cf. pp. 22-3* in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁸¹⁸ *Vid. generally, pp. 17-25* in *Ibid.*

norm in the corporate form.⁸¹⁹

The distinct responsibility standards. With the sole exception of the proposition of the optimal scope of managerial delegation between the SPV and its appointed manager, all other optimalities explored in this study function as responsibility standards. Observe the responsibility standard nature of the optimal fiduciary general (not specific) duties to inform, the optimal fiduciary duties of diligence (care), the optimal (scope of enforcement of the) responsibility of sponsors in the vicinity of SPV insolvency, and the remark about the correct interpretation of the scope of specific (not general) duties to inform.⁸²⁰ Today, without some type of legal institutionalisation, no norms or jurisprudential criteria enforce such standards.

Indeed, parties attempt to implement these optimalities contractually. I will point this out when advancing the above propositions and remarking the consistency of postulates with the observed contractual behaviour. However, critically, the ex-post judicial completion does not follow the yet unknown needs and capacities of parties that dictate the optimalities of such standards in PFC scenarios. As mentioned above, the legislative institutionalisation of a PFC corporate type should accelerate the jurisprudential consideration of these optimalities as described here.

The postulates for completing and interpreting clauses ex-post and identifying optimalities. Finally, the legislative institutionalisation of PFCs facilitates the identification and enforcement of jurisprudential criteria for completing contracts ex-post,⁸²¹ the optimalities that function as responsibility standards,⁸²² or those that serve as default rules.⁸²³ These will be the object of chapters 9 and 10.

⁸¹⁹ *Vid.* Article 9 of the Directive (EU) 2017/1132 of The European Parliament and The Council of 14 June 2017 relating to certain aspects of company law (codification), Official Journal of the European Union - L 169/46 - 30.6.2017.

⁸²⁰ *Cf.* p. 39-40 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁸²¹ *V.gr.*, the pre-emptive objective of clauses, the *in dubio pro creditore*, and *intuitu personae*.

⁸²² *V.gr.*, the standards of diligence, and the responsibility of sponsors in the vicinity of insolvency.

⁸²³ *V.gr.*, the optimal seniority of claims, and the optimal scope of managerial delegation.

8.3 2nd pillar. The fiduciary duties of loyalty to the non-recourse lender (the FP)

8.3.1 Introduction

Based on the analyses of chapters 4 to 7, we can identify the efficiency of a PFCs-dedicated rule of fiduciary duties of loyalty. The postulate constitutes the second pillar oriented at enhancing implementation capacities.

The fiduciary duties of loyalty induce sponsors to complete all provisions of the risk allocation mechanism in the protection of all parties -remarkably, including the lender.

Legally, this results from the fact that in PFCs are not ongoing investing organisations but legal mechanisms for financing a completing a single project as predefined by all parties as defined by the risk allocation mechanism to which the FP -the principal internalising the bulk of total risks is also a party. Hence, the sponsors should adopt all decisions as if completing the initial meeting of minds of all parties to the to risk allocation mechanism -including the non-recourse lender. Such fiduciary duties should apply as a criterion for adopting both managerial decisions as well as the collective actions in exercise of their political rights as shareholders of the strictly project-instrumental.

Functionally, the reorientation of the fiduciary duties of loyalty now protecting also the vulnerable creditor expands the implementation capacities of parties and consequently the feasibility of PFCs. As I will show below, the fiduciary duties of loyalty protecting the lender are always efficient in PFCs, irrespective of configurations or project variations, or legal traditions.

Next, in second place, I will describe the fiduciary duties of loyalty in their current form and their efficiency in diversified corporate investing contexts. Under the third section, I will remark why, today, fiduciary duties of loyalty do not result in efficient incentives when enforced in PFC scenarios. In fourth place, I will introduce the proposal, its functionality, and the incentives it provides. Under the fifth section, I will shortly refer to the coherence between the functionality of the fiduciary duties of loyalty and the objects of the risk allocation mechanism. In the sixth place, I will point out the contractual practices. The last section will observe the consistency of the proposal with other postulates in the study.

8.3.2 Efficiency of current fiduciary duties of loyalty in diversified corporate investments

The shape of the rule. Today, it is a principle convergent in comparative company law

that delegated managers should administer the companies to expand corporate value. That is, in legal entities implemented for commercial purposes, administrators must advance the profit-maximising aims as defined by shareholders as a class. This is especially true when such objectives appear in conflict with their interests as decision-makers.^{824 825}

The protective scope of the rule. Regularly, the duty of loyalty to the company takes the form of a duty to preserve (maximise) the interests of shareholders as a class. Additionally, under the criteria of insolvency rules, managers are bound to fiduciary duties of loyalty to shareholders only until the moment in which the company reveals its state of insolvency. As per the application of bankruptcy regulations, after that

⁸²⁴ Remarkably, the concept of corporate utility or value that defines the managerial goals is not understood unanimously by the comparative legislator. In some cases, such postulate depends on the object of the company as defined by corporate charters. In other cases -especially for legal types where charters do not define a range of business activities- such object will be defined by the orientation of collective decisions by owners. For a description of the shape of the rule and its enforcement challenges in Common Law and Civil Law jurisdictions with a mention to the case of Japan, *cf.* page 178 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, *cit.* For a functional approach to the enforceability of duties of loyalty of *cf.* 78, 94, 99, 103, 166, 173-4, 178, and 227 in *Ibid.*

⁸²⁵ Directors are considered to be “fiduciaries” as they are appointed to manage assets (the company) that belong to the shareholders and not to themselves; they must therefore act in good faith with due regard to the interests of the company, and must subordinate their own interests to those of the company. Under the company laws of all our jurisdictions, a director will breach his duty of loyalty (a standard) if he causes the company to make a decision that damages it while benefiting himself. This standard leaves directors free to manage the company as they see fit until they do something disloyal. Such decisions can only arise when the director has some direct or indirect personal interest in the transaction. Therefore, if we know that directors might act disloyally when they have such an interest in a transaction, we can attempt to neutralise the interest through a rule requiring that such transactions be approved by directors that have no interest in the deal or by shareholders. *Vid.* page 333, in A. CAHN; K D. DONALD, *Comparative Company Law - Text and Cases on the Law Governing Corporations in Germany, the UK and the USA*, *cit.*

moment, duties of loyalty will habitually switch from maximising value to the owners of the company to preserving the collateral value of assets in the benefit of creditors. Hence, in distinct periods, managers will be the agents of two principals: the shareholders embodied by the company and its creditors.⁸²⁶ Rather exceptionally, as mentioned, the standards also protect minority shareholders from the abuses of corporate decisions by majority shareholders.⁸²⁷ Up to a minor extent, legislators and judges have also observed a duty of loyalty to other stakeholders (namely workers).⁸²⁸

The subject of the rule. Typically, the duty of loyalty will be binding to managers but not to owners (shareholders or partners) of companies. However, to the best of my knowledge, all legislators design fiduciary duties (both loyalty and diligence) to be binding also to shareholders or third parties exerting *de facto control* of the company.^{829 830 831}

⁸²⁶ For a description of the general treatment of fiduciary duties in distress firms see pp. 137 and 142 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit. For an elaboration on duties to preserve capital in page 133 in *Ibid*.

⁸²⁷ For a reference to the (exceptional) duties of loyalty protecting minority shareholders in German GmbH see page 109 in M. SCHULZ; O. WASMEIER, *The Law of Business Organizations: A Concise Overview of German Corporate Law*, Springer - Verlag, Berlin - Heidelberg, 2012.

⁸²⁸ Cf. page 104, R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁸²⁹ Cf. generally, Chapter 12, *Directors' duties of loyalty, good faith and care*, page 332 and ff. in A. CAHN; K D. DONALD, *Comparative Company Law - Text and Cases on the Law Governing Corporations in Germany, the UK and the USA*, cit. See also pp. 97, 99, 138-141 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁸³⁰ For a functional description of duties of loyalty applicable to controlling shareholders cf. pp. 37, 138-9, 175-6, 227. in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit. For a reference to the fiduciary duties of loyalty in the context of corporate groups, *vid.* page 173 in *Ibid*.

⁸³¹ This sensitivity of the legislator as reflected in the rule is in line with both the implications of the *iuris et de iure* treatment of sponsors as controllers of the SPV and the application of the duties of loyalty as proposed here to the collective actions of sponsors as shareholders of the SPV.

The object of the rule. The current fiduciary duties of loyalty cover all decisions adopted by delegated managers (the agents) relevant to the company (the principal). Generally, today, the efficiency of the duty of loyalty manifests in investment and financing decisions, in compliance with contractual obligations to some parties, as well when distributing dividends to classes of shareholders. In concrete cases, we will also see tensions against the enforceability of these fiduciary duties whenever the company contracts directly with decision-makers or with related parties, or when managers act in competence with the company, or when they benefit from corporate opportunities, corporate assets, or inside information.

Fundamentally, these fiduciary duties will also apply to scenarios where managers (re)negotiate under terms other than those controlled by the market. This includes cases where they refrain from enforcing obligations against related parties, or where they withhold information necessary for the company to enforce provisions against third parties. Notice the choice of these examples and their resemblance with the forms of opportunism -*shirking*, *risking*, and *shading* -within sub-coalitions and via unanimous collusions in PFCs (*cf.* Chapter 6).

The implementation mechanism. Legislators enforce duties of loyalty based on either concrete rules or abstract standards.⁸³² The particular implementation style observed in each jurisdiction is not relevant to our analysis. However, regularly, legislators implement duties of loyalty (or good faith) in conjunction with duties of care (or diligence). A proposition for an application of duties of diligence in PFCs will be the object of a separate postulate in Chapter 10.

8.3.2.1 Analytical dimensions and the functionalities of the duties of loyalty

We can analyse the fiduciary duties of loyalty in three dimensions and two functionalities.

First, *the orientation dimension as a rule for contract completion.* Functionally, the fiduciary duties of loyalty orient the manager towards a profit-maximising objective and serve as a rule for the completion of abstract mandates as the project evolves. The fiduciary principle *fills in the blanks and oversights with the terms that people would have bargained for had they anticipated the problems and have been able to*

⁸³² *Cf.* the comparative analysis including the use of both rules and standards in *pp.* 332 -368 in A. CAHN; K D. DONALD, *Comparative Company Law - Text and Cases on the Law Governing Corporations in Germany, the UK and the USA*, cit.

*transact costlessly in advance.*⁸³³ This is the managerial orientation functionality of fiduciary duties of loyalty.

Second, *the risk distribution dimension (efficiency ex-ante)*. Indirectly, fiduciary duties of loyalty function as an ex-ante norm for risk distribution. The dispersed and passive shareholders know the types of (market) risks they internalise when investing in the company.

Third, the managerial protection dimension. The fiduciary duties of loyalty function as risk distribution between the manager and the company. Intuitively, recall, in virtue of the protection of the limited liability rule, the risk preferences of dispersed (passive and diversified) shareholders are necessarily higher than those of the manager. Within the scope of her mandates that define her duties of loyalty, the manager can advance risky opportunities -as preferred by shareholders- without internalising the consequences of such decisions whenever risks verify (*i.e.*, whenever projects do not evolve as expected). This protective functionality is identical to that of the fiduciary duties of diligence identified in the following chapters.

Forth, the functionality of duties of loyalty at facilitating delegation and diversification. In regular (collateralised and diversified) corporate investments, fiduciary duties are fundamental to the feasibility of the managerial delegation. In conjunction with the critically important protection of limited liability rules, fiduciary duties of loyalty allow investors to reasonably trust that their investments will evolve as desirable and at tolerable risks independently from their lack of involvement in corporate decisions. Investors can minimise the costs of dealing with matters by adopting collective decisions. The managerial delegation also permits that the dispersed investors (who may be not experts on any field) benefit from the higher qualifications of the appointed administrators. The perspectives of the above also facilitate the transferability of shares in the subsequent formation of investment portfolios.⁸³⁴

⁸³³ *Vid.* page 212 in F. H. EASTERBROOK; D. R. FISCHER, "The Corporate Contract", in Lucian Arye Bebchuk (ed.) *Corporate Law and Economic Analysis*, Cambridge University Press, Cambridge, 1990.

⁸³⁴ Notice how, without a duty of loyalty, higher managerial qualifications would result in broader spaces within which the expert manager would find privately optimal but socially undesirable solutions as incentives implemented via residual benefits deteriorate. Consequently, without duties of loyalty, higher qualifications of

Fifth, the fiduciary duties of loyalty prevent intra-class tensions. Legislators and judges habitually materialise duties of loyalty as an obligation to preserve the interests of shareholders as a class. Consequently, the principle protects minority (outside, dispersed) investors from opportunistic behaviour by majority shareholders. The protection to minority shareholders manifests in two moments. First, whenever majority shareholders exert *de facto* managerial control over the company. Second, whenever shareholders vote to direct the interests of the corporation in detriment of some shareholders. That is, in violation of equal treatment rules.⁸³⁵

This efficiency naturally grows as a function of the degrees of dispersion of property rights held by passive investors and with the smaller the quota of total corporate ownership necessary for controlling the legal entity. The economic rationality of these observations is simplest. The smaller the shares of ownership held by opportunistic decision-makers, the smaller it will also be the fraction of the total marginal loss of welfare (losses to the company) that the control group will internalise in their objective functions -hence, the higher the externality relative to the benefits they extract opportunistically from the company. The positive relationship between the dispersion of property rights and the smaller sizes of control blocks is commonplace in the empirical literature.⁸³⁶

8.3.2.2 The efficiency of duties of loyalty under insolvency rules

Regularly, duties of loyalty protect creditors only after the company has entered the

the manager would require higher choices of monitoring efforts by shareholders and stronger incentive powers (and premiums) in the reward functions offered to managers for them to respond to the company as socially desirable.

⁸³⁵ *Vid.* page 109 in M. SCHULZ; O. WASMEIER, *The Law of Business Organizations: A Concise Overview of German Corporate Law*, cit. *Vid.* pp. 271-273 and 485 in A. MADS; F. WOOLDRIDGE, *European Comparative Company Law*, cit. *Vid.* page 99 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁸³⁶ *Cf.* R. LA PORTA; F. LOPEZ DE SILANES; A. SHLEIFER, "Corporate Ownership Around the World", *The Journal of Finance*, February, 2001. M. FACCIO; L. H. P. LANG, "The ultimate Ownership of Western European Corporations", *Journal of Financial Economics*, vol. 65, 2002. *Vid.* page 29 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

process regulated by insolvency laws. Until that moment, unless contractually arranged for expressly, in principle, managers are not bound by any duties to protect (or even inform) creditors.⁸³⁷ However, in diversified corporate businesses, the late orientation of duties of loyalty towards the protection of creditors at a later stage is socially acceptable (Kaldor-Hicks efficient) for three reasons. Fundamentally, the three aspects are efficient only when in place one conjunction with the other.

First, in regular corporate businesses, companies exploit a portfolio of materially distinct projects. Assets attached to each of these projects are not fully specific. Such assets -e.g., equipment, vehicles, raw materials-, will still have redeployment value that serves as collateral to creditors.

Second, in compliance with duties of loyalty -now to creditors- bankruptcy laws induce managers (and allow third parties) to file insolvency procedures as soon as the company reveals incapable of passing solvency tests defined legally. Managers may find the company in difficulties for complying with corporate obligations without recurring to exceptional means of financing, or after the value of capital drops below certain thresholds.

Notice, in diversified corporate business, the incentives for controlling shareholders to behave opportunistically grow as corporate insolvency manifests.⁸³⁸ Under the current form of duties of loyalty, this is the moment in which the obligation to protect creditors from abuses that take place within corporate spheres and by company managers and controllers arises. In this scenario, a rule providing discipline to managers via the enforcement of duties of loyalty to creditors is consequently efficient (timely and oriented to the tension).

Third, in regular corporate businesses, contractors and financial creditors are also diversified in their contracting portfolios. Diversification allows creditors to dissipate the impact from such defaults within their portfolios.⁸³⁹ The tolerance of diversified creditors to these risks is the reason why contractors do not implement restrictive covenants or request sureties from third parties at a high opportunity costs to

⁸³⁷ For a comparative approach to the duty of loyalty in protection to creditors, *vid. pp.* 141-2 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁸³⁸ Recall the description in Chapter 3 about the incentives for implementing *asset substitution (risk shifting)* responses as company value decreases.

⁸³⁹ *Vid.* Chapter 3 for a description of the volatility-induced distress costs.

diversified businesses. This capacity of creditors to tolerate these externalities in the rare default scenarios makes limited liability shelter incentivising investments a socially Kaldor-Hicks efficient rule. I have mentioned this intuition in Chapter 7.

8.3.2.3 Low incentives for colluding with contractors

In regular corporate financing, the dispersion of investments opportunities that companies advance with independent contractors reduces the incentives for managers to depart from loyalty standards. This results from the incremental costs of colluding.

Notice two key aspects: first, in regular corporate businesses, contractors do not own or control the company with which they enforce contracts. Hence, the interaction between the contractor under distress and the manager of the contracting party is, in regular diversified corporate contracting, aggressive.

Second, the different contractors of the company work in materially independent projects. Thus, they do not interact with each other materially in a way that can allow them to sustain cooperation relationally *-i.e.*, they do not find opportunities for exchanging favours. In other words, the spaces for colluding between a manager and its many contractors are, in the case of diversified corporate financing, *small*.

As a result, from the above, every time that a contractor finds herself under distress, she will attempt to bribe the manager in exchange for colluding opportunistically against the company she administers (shareholders). Then, the fact that such contractor does not own or control the company implies that she will not be capable of liberating the manager from the costs of likely enforcement by shareholders after she trespasses her duties of loyalty to the company. Additionally, in diversified business environments, the lack of interaction (relational cooperation) with other contractors deprives the manager of a capacity to comfortably accommodate the impact from the opportunistic responses by the contractor under distress. Then, the incentives for managers to respond in violation of duties of loyalty in connivance with company contractors and controllers are, in the case of corporate financing, *low*.

I will now show how the above does not hold in the case of PFCs revealing opposite characteristics.

8.3.3 Current duties of loyalty and their inefficiency in PFCs

I will now show two dimensions of inefficiencies. First, the fiduciary duties that managers owe to the companies they administer (the SPV) do not provide for the benefits that make them efficient in diversified corporate business. Thus, modifying the shape of the rule, adapting it to the needs of parties in PFCs would come at no

opportunity costs in terms of total welfare. Second, as enforced today, fiduciary duties of loyalty are also ineffective at preventing the distinct types of opportunism that are both inherent and distinctive of PFCs and that remained unknown before this study.

8.3.3.1 In PFCs, as enforced today, duties of loyalty do not result in their purposed benefits

As remarked in Chapter 7, PFCs are not diversified endeavours for which delegation and duties of loyalty would be necessary. In contrast, in PFCs, parties recur to the use of SPV precisely for avoiding diversification that would otherwise jeopardise the crucially relevant risk allocation mechanism. Additionally, in PFCs, the manager is still risk-averse (personally poorly diversified), but she is not expected to adopt any risky decisions. Finally, in PFCs, there are no intra-class conflicts between controllers and outside (dispersed and passive) shareholders. Consequently, as enforceable today, in PFCs, duties of loyalty have none of the values for which legislators devised them originally for diversified corporate investing and contracting environments. Let us shortly see these points.

8.3.3.1.1 In PFCs, parties do not value duties of loyalty in the benefit of dispersed investors

The SPV does not value duties of loyalty for advancing diversified investments. As said, in PFCs, the feasibility of the risk allocation mechanism requires that the SPV implements a single project. Additionally, such a project will come predefined by sponsors who, as input providers, will be experts on the industrial sector of the project. Moreover, in PFCs, the fact that only a few shareholders own the SPV implies that, as the project progresses, the costs of dealing with contingencies by adopting decisions directly collectively by sponsors -that is, without delegating to a manager bound by her duties of loyalty- will be low. Furthermore, the quality of such collective undelegated decisions will be high also because, with few individuals contributing with non-contractible inputs expanding the value of the collective output, the under-investment associated with the individual contributions to the team output will be mild.⁸⁴⁰ Finally, the output of such collective undelegated action will also be high in

⁸⁴⁰ This is the moral hazard in team problem faced by sponsors contributing with opinions (costly non-contractible actions) to the team output embodied by the collective decision. Recall, team members cannot possibly escape this feasibility boundary. Beyond an equilibrium where the team size depends on the

virtue of the highest qualifications of the sponsors in the industry sector of the project to which they contribute with specific inputs. These aspects are precisely consistent with the elaborations about the optimal scope of delegation in other places of this study.

Consequently, in PFCs, managerial duties of loyalty lose their strategic value for facilitating delegation as a means for saving the costs and inefficiencies associated with the collective actions of owners advancing diversified investments. Similarly, in PFCs, the value of the institution of fiduciary duties of loyalty as a means for facilitating managerial delegation to a highly qualified administrator hunting diverse business opportunities is also absent.

The SPV does not value duties of loyalty for diversifying sources of debt and investments (ownership). As also mentioned in chapters 2 and 4, and further analysed in Chapter 7, in PFCs, the SPV receives equity funds from a small group of sponsors. In PFCs, sponsors are both equity investors and contractors for the critical inputs of the project -they are well informed and interact materially with project assets. Moreover, due to the need for controlling the SPV, save for exceptional (predefined) cases, in PFCs parties do not appreciate the transferability of property rights in the project company. Effectively, PFCs are *intuitu personae* agreements -the object of a dedicated proposition in Chapter 9.

Accordingly, in PFCs, the company does not receive investments from dispersed (passive) investors that require a loyal manager to protect their interests when dealing with ongoing projects. In PFCs, the low number of sponsors providing capital funds permits that all investors adopt active roles in the management of the SPV. Then, the fundamental value of duties of loyalty as a means for inducing the manager to advance projects in the protection of passive and dispersed investors is not observable in PFCs.

8.3.3.1.2 In PFCs, the risk-averse manager does not value protection for adopting risky decisions

As described in call chapters, the feasibility of PFCs depends on the quality with which parties anticipate contingencies and regulate contractually the responses expected from all contracting parties. Consequently, in PFCs, parties do not value

complementarities of inputs, they will under-invest as a function of the growing number of sponsors that will be *low*. The seminal and classical reference is B. HOLMSTRÖM, “Moral Hazard in Teams”, cit.

discretion at the managerial level. Moreover, in PFCs, parties -especially the FP- see both contingencies and discretion as indicative of contractual imperfections and sources of opportunism.

Thus, in PFCs, the managers are not expected to adopt relevant decisions on behalf of the SPV. Moreover, not only the sponsors and the FP adopt all these decisions (as foreseeable) before incorporating the SPV, but the costs that sponsors assume for solving them (also with the participation of the FP) as the project evolves is low. Hence, the scope of decisions that the manager adopts during the life of the project is narrow, and -critically-such decisions are not relevant (they are low value-at-risk). Finally, in PFCs, the risk-averse manager does not require the protection of managerial duties of loyalty for adopting risky decisions (as socially desirable) whose undesirable consequences she should not internalise.

This proposition is precisely consistent with an elaboration on other chapters about the optimal scope of delegation in PFCs. The observation is also in line with anecdotal evidence seen in the literature of finance about the reward functions that sponsors offer to administrators in PFCs.⁸⁴¹

8.3.3.1.3 In PFCs, investors (sponsors) do not value duties of loyalty for preventing intra-class tensions

Additionally, in PFCs, the few sponsors will arrange elemental aspects of the project before internalising risks -that is, before contracting with the manager. Also, in PFCs, sponsors are contractors for inputs to the project. This comes with two implications. First, in PFCs, all shareholders are involved actively in the control of the SPV and its assets. Hence, the relevant decisions take place before the eyes and with the intervention of all shareholders. Second, because of the flow of information of high quality that sponsors receive by interacting with project assets directly, the spaces within which a delegated administrator may operate in the benefit of only one or a few of the shareholders is *narrow*.

Notice, as identified in Chapter 6, under certain circumstances, sub-coalitions amongst opportunistic sponsors will exist in PFCs. These sub-coalitions will implement *shirking*, *risking*, and *shading* amongst themselves. However, as analysed in Chapter 7, these are forms of opportunism that take place at the input choice level by sponsors -not at the SPV level by managers. Consequently, in PFCs, the fiduciary duties of loyalty to the company or to the shareholders as a class does not serve its

⁸⁴¹ Cf. page 14 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

purposes of preventing intraclass conflicts between controllers and the dispersed and passive shareholders.

As seen, in PFCs, duties of loyalty do not serve for the objectives for which legislators and judges intend the institution. Fiduciary duties of loyalty do not serve for facilitating diversified investments. They do not protect dispersed investors (sponsors are not dispersed nor passive). Parties do not value the protection it provides to the risk-averse manager, who does not take relevant decisions. Finally, the fiduciary duties do not serve for preventing conflicts between controlling shareholders and outsiders (in PFCs, all sponsors are controllers of the SPV).

8.3.3.2 In PFCs, as enforced today, duties of loyalty are ineffective against opportunism

Above, I showed how duties of loyalty do not serve for the purposes intended by legislators and judges. Let us now see how duties of loyalty result in distortive incentives in PFCs.

Before advancing, let us recall the elemental intuition about the distribution of risks and the objectives of the lender (the primary risk taker) in PFCs. In PFCs, a non-recourse lender internalises the bulk of total risks involved in the project. This lender is also the least informed party who does not control (legally or materially) the project assets. The lender is also the least qualified and least capable to implement and enforce legal protections ex-ante. Finally, in the absence of collateral or recourse to third parties, in PFC, the FP relies exclusively on the quality of the inherently imperfect risk allocation mechanism regulating the responses expected from sponsors under all foreseeable eventualities. Is the implementation quality of the risk allocation mechanism what dictates the risks that the lender internalises, her willingness to participate in the project, and consequently the feasibility of PFCs. Let us keep in mind these elemental observations when following the articulation of the next propositions.

I will now point out three critical aspects of PFCs and observe how, in their current form, duties of loyalty are outright dysfunctional (produce distortive effects) to sponsors -the controllers of the SPV.

8.3.3.2.1 In PFCs sponsors are both the parties in distress (in need for opportunistic readjustments) and the controllers of the SPV renegotiating under fiduciary duties of loyalty

As introduced above, one of the functionalities of duties of loyalty resides on their effect at inducing managers (decision-makers) of companies to interact with third parties in defence of the interests of the legal entity or the shareholders they

represent. This proposition assumes that the manager takes advantages of company resources by either behaving opportunistically individually beyond the sights of shareholders⁸⁴², or by colluding with third party contractors against the interests of the company embodied by the dispersed shareholders.

Critically, in the regular setting considered by the legislator, the manager and the parties appropriating benefits are third-party contractors or a group of shareholders. Then, when the company is solvent, the parties receiving the negative externalities are the dispersed (passive) shareholders. Only after the company becomes insolvent, the parties deserving protection are the creditors.

However, the case of PFCs is structurally distinct. In PFCs, the shareholders controlling the SPV *de iure* are the sponsors⁸⁴³ who are also the best-informed contractors for inputs. Additionally, the sponsors are also themselves the parties under possible distress. That is, sponsors are the parties that, along with the SPV, can receive *news* and find difficulties for complying with obligations enforceable by the FP -the risk allocation mechanism that shapes the 1st tier of incentives to which sponsors respond.

Consequently, the individual sponsors under distress will be part of a group of closely interacting individuals (the sponsors) who also control the SPV. Consequently, as identified in Chapter 6, after one of the sponsors finds herself in distress, an opportunistic readjustment with the rest of the sponsors will take place. Critically, as also seen in Chapter 6, part of this renegotiation will include the values that sponsors will exchange in reciprocity (promises and favours in their long-term interaction about project assets). This readjustment will result in a loss of value and the subsequent externalities to the FP.

Thus, formally, in PFCs, the sponsors (the owners and the best-informed asset controllers) can behave opportunistically in three ways.

- First, the sponsors in control of the SPV can directly orient the SPV as per their interests within the spaces allowed by the incompleteness of the risk allocation mechanism enforceable by the FP.
- Second, alternatively, as both *de facto* and *de iure* controllers, the sponsors

⁸⁴² See in Chapter 3 the analyses of all forms of opportunism resulting from the free cash flow problem (managerial indiscipline) in diversified corporate contracting.

⁸⁴³ See the third pillar for the institutionalization of PFCs in the following section.

may provide instructions to the manager (who is loyal to them) for directing the company in the benefit of shareholders and withhold information from the FP.

- Third, as owners of the company, under certain circumstances, the sponsors can also adopt collective decisions legitimising such orders to the manager ex-post.

Note, whenever the sponsors exert control clandestinely, the FP faces a problem of asymmetries of information. Critically, legislators can dramatically reduce the spaces for advancing opportunistically under the second and third alternatives (both problems of incompleteness) by correcting the fiduciary duties of managers so that sponsors adopt decisions completing the risk allocation mechanism in the protection of all parties -including the vulnerable lender- as the project evolves.

Crucially, such duties of loyalty should be enforceable against all sponsors as they are all necessary controllers of the SPV. Finally, also fundamentally, such duties of loyalty to the creditor should exist during the entire life of the SPV. That is, duties should protect the creditor in times in which sponsors control the SPV for implementing *shirking*, *risking*, and *shading* - not only after the SPV is insolvent and the FP has lost all perspectives of recovering the value from highly specific assets. I will elaborate on these aspects further below.

8.3.3.2.2 In PFCs, the spaces for relational interactions amongst sponsors controlling the SPV are *large*

In addition to the above, note how the spaces for behaving opportunistically are, in the case of PFCs, necessarily larger than what we observe in regular diversified corporate investing and contracting.

Above, I mentioned how, in regular corporate contracting, the manager behaving opportunistically against the dispersed shareholders found the limit drawn by the asymmetries between herself and the controlling shareholders. Alternatively, when colluding with controlling shareholders, the manager could behave opportunistically only within the space allowed by the asymmetries determined by the (poor) capacities of passive and dispersed shareholders to access information. In any case, because such investors are dispersed, and they do not interact with the company materially, there are no spaces for interacting relationally with (and amongst) them. In other words, the manager or the controlling shareholders cannot build reciprocity (exchange favours and promises associated with distinct projects) with dispersed investors. This is the scenario in regular diversified corporate investing.

The structural features of PFCs show a distinct scenario. In PFCs, the manager finds

minimal or no space for adopting decision privately. Additionally, as analysed in Chapter 7, in PFCs, opportunism does not happen within the company, but as a result of the responses from input providers. Indeed, as analysed in Chapter 6, in PFCs asymmetries amongst some of the sponsors exist -these asymmetries give rise to opportunistic sub-coalitions.

However, two aspects we must consider here. First, -less relevantly- the asymmetries amongst sponsors are always (necessarily) smaller than the asymmetries between the sponsors and the FP. And second, now more relevantly, sponsors can sustain cooperation relationally with each other. That is, because sponsors deliver sequential or simultaneous long-term material contributions to the project, they can sustain reciprocity-based cooperation. In other words, the sponsors can gain spaces for colluding unanimously against the FP by exchanging favours -*i.e.*, each of these favours builds an expectation of reciprocity that parties internalise in the bargaining outputs in exchange for tolerance to welfare socially-decreasing responses with externalities to the FP (the party in need for legal protection). Hence, the spaces for colluding opportunistically in detriment of the FP are now *large*.

8.3.3.2.3 In PFCs, today insolvency rules enforce duties of loyalties come too late in the protection of the main risk-taker (the FP)

Indeed, today, via fiduciary duties of diligence, company laws and insolvency rules habitually prevent managers and controlling shareholders from adopting grossly negligent or wrongful decisions that -beyond affecting the interests of shareholders- put the company on the verge of its insolvency -eventually, in detriment of creditors.⁸⁴⁴

However, in PFCs, the SPV advances projects whose assets are fully specific (*i.e.*, assets that have no redeployment -collateral value). Thus, as analysed in most of the earlier chapters, *ex-ante*, the lender protects debt claim-value by preserving the capacities of the SPV to deliver residual benefits to sponsors -the sources of incentives for them to choose socially desirable responses.⁸⁴⁵

Consequently, the current duties of loyalty under which -within the spaces allowed by the incompleteness of the risk allocation mechanism- the sponsors can adopt

⁸⁴⁴ *Cf.* the proposition about the imitate fiduciary duties of diligence in other parts of the study.

⁸⁴⁵ See the analyses of the pre-emptive objectives of clauses in PFCs. See also the considerations leading to the optimal seniority of claims in PFCs.

decisions in detriment of SPV capacities does not protect the interests of the party vulnerable in the setting. As shaped today, duties of loyalty permit *shirking*, *risking*, and *shading* that -even if accidentally verifiable- would not result directly in the insolvency of the company (and subsequent responsibility) but would bring a depletion of SPV capacities and subsequent exacerbation of opportunistic incentives or, would simply leave the SPV more vulnerable to contingencies resulting greater likelihood of corporate insolvency.

In other words, fiduciary duties of loyalty and insolvency laws (applicable within insolvency procedures) come too late for preserving the interests the lender once the clandestine *shirking*, *risking*, *shading* and *shading* have already deprived the company of its repayment capacities.

8.3.4 Managerial duties of loyalty in PFCs

8.3.4.1 Proposal

The proposal for considering a rule of fiduciary duties of loyalty includes four components.

- First, as the project evolves, the sponsors must adopt decisions as completing the risk allocation mechanism that defines the single project. In other words, the sponsors must solve eventualities replicating the solutions that all parties - including the FP- would have adopted should have they ex-ante known.
- Second, in the application of the above, fiduciary duties of loyalty should guide the actions of managers -all of which the sponsors adopt in strict compliance with the risk allocation mechanism.
- Third, similarly, as an extension of the ex-ante objectives of the lender expressed in the clauses of the risk allocation mechanism, the sponsors must adopt collective decisions in the exercise of their collective political rights as owners of the SPV.
- Fourth, fiduciary duties of loyalty must govern the decisions of sponsors on behalf of the SPV as long as the project coexists with non-recourse debt.

The proposition is consistent with the functionality (teleology) of the risk allocation mechanism for regulating eventualities affecting the single project that all parties define ex-ante. This is also consistent with the needs for protecting the non-recourse lender, the least capable of implementing provisions or updating information, who does not control project assets, and who internalises the most significant risks as a function of the implementation quality of the risk allocation mechanism.

8.3.4.2 Spaces for the application of the rule

As already described, in PFCs, parties not only do not appreciate, but they spend costly efforts preventing all forms of diversification which they perceive as indicative of contractual imperfections and spaces for opportunism.

Consequently, in PFCs, managerial delegation loses one of its two functions in diversified corporate business completely. That is, delegation loses its desirability as a means of finding alternative business opportunities. However, delegation still retains its value as a means for long-term contractual completion. In other words, parties still appreciate delegation as a means for identifying unforeseen solutions without recurring to collective actions by shareholders as the environment changes.

Then, because in PFCs, the creditor expects that the SPV advances a single project as predefined by the risk allocation mechanism -not a portfolio of opportunities- the spaces within which managers and sponsors may act completing (the incomplete) instructions will be restricted to the provisions of the risk allocation mechanism for the single project.

However, because the non-recourse lender internalising the bulk of total risks relies exclusively on the success of the single project as (incompletely) predefined ex-ante, the relevance of the criteria for the ex-post completion of the risk allocation mechanism under a duty of loyalty to all parties (including the FP) -not to the company embodied by the interests of shareholders as a class- will be strategically significant.

8.3.4.3 Incentives of the rule

8.3.4.3.1 Incentives ex-post

Recall, behind limited liability protection, the risk preferences of sponsors (shareholders) and the FP (a creditor) can never be identical. In this context, the fiduciary duty of loyalty inducing managers and sponsors to administer the SPV in completion with the objectives of the risk allocation mechanism (that the sponsors should reconstruct) effectively reduces the spaces within which the sponsors can adopt decisions expanding value to shareholders with externalities to the FP without internalising enforcement risks.⁸⁴⁶ This is the direct result of the ex-post completion

⁸⁴⁶ *E.g.*, under a fiduciary duty of loyalty based on the objectives of the risk allocation mechanisms (*v.gr.*, the interests of the FP), the sponsors can no longer avail from the spaces allowed by contractual incompleteness of the risk allocation mechanism for

functionality of the fiduciary duty of loyalty.

More specifically, the ex-post completing function of the fiduciary duties of loyalty limits the spaces for *risking* and *shading*, the two forms of opportunism that sponsors implement within the spaces allowed by incompleteness. The desirable effects of the ex-post completing function of fiduciary duties mitigate *shirking* only indirectly -as much as such incompleteness results in wider spaces for moral hazard.

8.3.4.3.2 Incentives ex-ante

The fiduciary duties improving the quality with which parties complete the risk allocation mechanism would result in efficiencies that parties could perceive in the pre-contractual stage. Backwards induction, this reaction is common to all contractual arrangements.

Concretely, in the case of PFCs, sponsors would anticipate that, later, they will enjoy narrower leeway for *shirking*, *risking*, and *shading*. *Ex-ante*, sponsors would consequently perceive stronger incentives for bargaining with the FP the terms under which they would react to deteriorations in the environment. This is effectively an improvement of the signalling process. Moreover, indirectly, such better signalling further improves the capacities of sponsors to latter complete provisions for additional improvement of the quality of managerial responses as the project evolves.

Finally, the superior quality of the risk allocation mechanism comes with two extra effects on the capacities of sponsors to deliver managerial responses. First, finer provisions dealing with more contingencies effectively reduce the spaces within which the manager will be expected to adopt discretionary decisions in compliance with duties of loyalty as described here. This equates to a smaller scope of delegation, to an optimally flatter reward scheme in the interaction between SPV and delegated manager. Additionally, delegated managers will also deal with lower value at risk decisions -this is a consequence of rational sponsors focusing on important matters when signalling. Second, all the above results in lower losses of utility to the poorly diversified risk-averse manager. Finally, this predicts flatter (weaker bonuses) and lower salaries (smaller premiums) to managers -in precise coherence with empirical (anecdotal but reliable) observations.⁸⁴⁷

renegotiating between themselves individually and the SPV before *risking* and *shading* without internalising enforcement risks.

⁸⁴⁷ Cf. page 14 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

Finally, all the above results in higher project value and consequently greater capacity of debt repayment and issuing residual benefits to sponsors. All aspects increase the possibilities that the lender ex-ante verifies individual rationality -participation-constraints thus reducing the necessary under-investment due to limited implementation capacities, for higher social welfare.

8.3.5 Contract rationale

Interestingly, the postulate could also be constructed from the stance of the general principles of contract law. When allowed by legal traditions, a teleological interpretation could pave this way.

Note, as said, in PFCs, the SPV is operative for the completion of the single project as defined by parties. Moreover, in PFCs, all parties benefit from delegation as a mechanism for ex-post completion of the risk allocation mechanism -never for facilitating diversification (especially diversification of the project). Consequently, it is not against the general principles of the interpretation of contracts that sponsors manage the strictly instrumental to the single project SPV for the purposes defined by the risk allocation mechanism.

However, today, without PFCs institutionalisation, a claim based on these arguments would collide with legal provisions that today define the managerial fiduciary duties of loyalty expressly.

8.3.6 Contractual practices

The object of defining how sponsors will react to unforeseen contingencies as the environment deteriorates is common to all provisions that shape the risk allocation mechanism as assessed by the FP. The ex-post completion of all clauses taking into consideration the vulnerabilities of the non-recourse lender consequently improves the strategic effect of all contractual arrangements in PFCs. Parties regularly *agree on an abstract duty of sponsors to take any action -via the controlled SPV- in order to maintain the lenders' security interests*.⁸⁴⁸ The purposes of inducing parties to behave in consideration of the interest of the lender are also visible in the general obligations to inform (see a distinct proposal in this chapter).

⁸⁴⁸ Cf. page 393 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

8.3.7 Proposal for fiduciary duties of loyalty in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)

Let us finally remark the consistency of a rule enforcing fiduciary duties of loyalty protecting the non-recourse lender with other postulates of this study.

The strategic aspects that serve as the basis for the fiduciary duties of loyalty in the protection of the non-recourse lender in PFCs are the same that sustain the efficiency of in *dubio pro creditore* principle, the general fiduciary duties to inform, and the scope of specific duties to inform. All these postulates protect the non-recourse lender in its lower capacities to implement and enforce protections as well as in the greater risks she internalises.

Additionally, parties and judges must interpret fiduciary duties of loyalty (the criteria for completing clauses) in light of the pre-emptive objectives of all clauses and ultimately in attention to the said *in dubio pro creditore* criteria.

Finally, just as many of other propositions, it is a matter of legal traditions whether judges could enforce criteria for interpreting contracts after taking in consideration the strategic features of the positions of parties (their risks and implementation capacities) in all PFCs. However, the institutionalisation of PFCs would serve for implementing the rule legislatively. Legislative implementation would then induce judges to apply the principle in all circumstances, thus facilitating the evolution of jurisprudential criteria.

8.4 3rd pillar. Control responsibility to sponsors in PFCs

8.4.1 Introduction

Let us now analyse the third pillar for the legislative institutionalisation of PFCs. By implementing a responsibility rule, the postulate enhances the strategically critical enforcement capacities of the FP who relies on incentives quality rather than on collateral value.

The study offers two alternative propositions for the treatment of control responsibility of sponsors in PFCs. The first of the two postulates propose a presumption *iuris tantum* of control. In this regime, there is a presumption about a *de facto* control that sponsors exert over the SPV. This presumption is, however, weak. This means that, for escaping responsibility, the sponsors can always bring evidence that they do not control the legal entity. This first *iuris tantum* approach, could -perhaps- be implemented jurisprudentially after the judges (the literature) takes better consideration of the indispensable value of the SPV control by sponsors

to the feasibility of the risk allocation mechanism.

The second alternative involves a presumption *iuris et de iure* of control. In contrary to the above, this presumption is strong *-v.gr.*, not refutable by defendants. That is, the sponsors are not allowed to bring evidence that they do not control the SPV. Under this alternative, sponsors are *ipso iure* managers of the SPV. As shown below, this second articulation is strictly preferable to the earlier one. However, the presumption *iuris et de iure* requires a legal reform -a legislative institutionalisation of PFCs (*de lege ferenda*).

The rationales behind both propositions are similar. Moreover, the third pillar implements a strictly realistic responsibility rule (the sponsors always control the SPV -and implement contracts having control as their objects). The differences between the two lies in informational aspects of enforcement *-i.e.*, the allocation of burdens of evidence and information costs. Indirectly, in addition to enhancing enforcement quality, both propositions result in cross-monitoring incentives amongst sponsors, in higher costs of implementing opportunistic sub-coalitions, and ex-ante in higher ex-ante implementation quality for invariably higher social welfare. Both proposals lead to outputs necessarily superior to those of the current rule.

The efficiency of postulates stems from strategic aspects (asymmetries of information and control) that are inherent to all PFCs. Hence, propositions hold irrespective of structural variations of PFCs, changes of scenarios (*news*), choices of corporate types of the SPV, or jurisdictions. The objectives of both alternative proposals coincide with the purposes of clauses that we see today in PFCs (*Cf.* Chapter 2). Finally, the proposals are also strictly coherent (functionally concomitant) with other propositions-ways for legal research of the study (*Cf.* chapters 8 and 10).

8.4.2 Sequence of the analyses

In the same path of other proposals, I will now describe the rule as enforceable today and its efficiency in diversified corporate settings. Then, I will remark the distinct strategic needs of PFCs and announce the two alternative proposals with their direct and indirect incentive effects. Before showing the robustness of the analysis, I will point out the correspondence between the functionality of the two alternative propositions and the objectives of the control and cross-default mechanisms that the FP enforces today in PFCs (*cf.* chapters 2, 4, and 7).

8.4.3 The rule today in (diversified) corporate finance

In regular corporate financing settings, in principle, neither its input providers nor shareholders are considered *de facto* controllers (*de facto* managers) of the company they own or with whom they implement contracts. In all cases, effective control by its

contractors or its dispersed owners is an extreme the evidence of which the claimants must bring up.

Therefore, today, before advancing their claims, plaintiffs internalise the burden of bringing evidence about two extremes: first, that individuals exerted effective control over managerial decisions of the diversified company; second, that sponsors exercised such control in some legally reproachable (both wrongful and harmful) way.⁸⁴⁹

Accordingly, today, in their roles of defendants, owners or contractors can escape *de facto* control responsibility after showing only one of two extremes: first, that they do not control the managerial decision-making system of the company; or second, that, if existed, such control has been exercised in a rightful (or harmless) manner.

Recall, in diversified corporate contracting, both shareholders and contractors are dispersed. Hence, the costs of revealing information will be high. However, to controlling shareholders, the ways to escape such responsibility will be ample (twofold). With this respect, the idea that we must retain is that today, shareholders and contractors face such costs (and enjoy ways to escape responsibility) only after plaintiffs have invested in efforts bringing evidence about such control and harmful wrongfulness beforehand. Hence, the costs of building claims (to poorly informed creditors) are high, and the burdens of defending against such claims (by dispersed shareholders and contractors) are also costly, but the ways for shareholders to escape responsibility are broad.

8.4.4 The functionality of the responsibility rule in corporate finance

In environments where owners and contractors are dispersed -*i.e.*, diversified as socially desirable- the current configuration of the rule is efficient. This is true for two reasons.

First, in diversified businesses, investors are regularly passive. Hence, habitually, they do not exert control over the managerial decision-making systems of the

⁸⁴⁹ *I.e.*, from such wrongful managerial decisions, losses must have arisen to claimants; that is, such decisions must have come in detriment of other shareholders or affected the collateral value of assets in disadvantage of the interests of creditors. That is, losses may stem from actions taking place after the insolvency event, or during a retrospective period -*e.g.*, the object of the canonical anti-fraud *Actio Pauliana*- while the company was still solvent.

company the own. The same we can say about contractors. They contribute with inputs for many materially independent projects of large portfolios. Consequently, their capacity to manipulate company decisions based on their influences over individual projects is -habitually- not substantial.

Second, in regular corporate contracting, dispersed owners and contractors do not receive accurate information about the evolution of the project. Hence, informationally, they are not the cheapest costs avoiders and best prepared to reveal information for escaping responsibility (*i.e.*, to bring evidence about their lack of control, or the rightfulness of their managerial decisions). Consequently, the norm as articulated today comes in the protection of diversified investors and contractors. The current rule is necessary for preserving the feasibility of the diversification of investments and contracting in regular corporate businesses.

The best way to further illustrate the above is to observe the impact of a distinct rule (as the one proposed here for PFCs). Consider the effect of presuming *iuris tantum* that all shareholders (or contractors) control the company *de facto*. As the most direct effect from such rule, shareholders (or contractors) would perceive strong incentives for either exerting privately costly actions monitoring the company or for participating in the decision-making system of the company actively. Investors and contractors would spend such efforts for minimising the likelihood of facing responsibility after other administrators (*de iure* or *de facto*) departed from the expected with loses to creditors. Such a rule would jeopardise the benefits of delegation to the company receiving investments from disperse (passive) contributors.

The nature of such trade-offs remains unchanged independently from company sizes or the degrees of diversification of investments. However, such inefficiencies would grow as a function of the degrees of diversification of investment portfolios, of the dispersion of contractual relations and ownership distribution.

Finally, recall the objectives that legislators pursue when offering solutions in regular corporate businesses. In the protection of creditors, the legal treatment preserves the collateral value of company assets but without jeopardising the diversification capacities of the debtor. This is precisely the equilibrium that legislators preserve with the current configuration of the rule protecting dispersed (passive) investors from being accused in relation to actions associated with the several projects that they cannot monitor.

Before analysing other features of the postulates, I will now remark how the above rationality is not efficient in PFCs where parties do not value diversification and when the access of sponsors to information about the company is best and comes at lowest

costs. Finally, the above does not hold in PFCs where -in compliance with a feasibility requirement- sponsors not only do control the SPV always, but they also implement control covenants with the FP (*Cf.* chapters 2, 4, and 7).

8.4.5 The needs of PFCs

In chapters 2, 4 and 7, I have described the necessary control of the SPV by sponsors in PFCs. Sponsors control the SPV both *de iure* and *de facto*. These two aspects correspond to the structural (ownership), and the contractual dimensions.

The structural dimension. In PFCs, SPVs are closely-held companies owned totally by sponsors. In the exceptional cases in which sponsors do not own the SPV entirely (and its subsidiaries) fully, the outside investors will be invariably not capable of controlling the entity politically.⁸⁵⁰

As described, in PFCs, the SPV must be closely-held for reasons observable both *ex-ante* and as the project evolves. During the life of the project, in the exercise of political rights as owners, shareholders (sponsors) must be capable of coordinating collective decisions as defined by the risk allocation mechanism -to which the SPV is strictly operative. *Ex-ante* shareholders (sponsor) must also be capable of contracting for the advancement of the project by the SPV. Hence, the control block should not change as the project evolves -or such changes should result from a renegotiation (*cf.* in the next chapter, the references to the *intuitu personae* nature of PFCs). Effective political control of the SPV is consequently a feasibility requirement in PFCs. Note how nothing of the above is incompatible with the presence of dispersed owners who are not sponsors. These investors are passive (or not capable of colluding); moreover, they do not provide material inputs to the project -the capacity in the nerve of strategic tensions in PFCs. Notice the presence of equity investors in case-studies 1 to 3 in Chapter 4.

The contractual dimension. For the contractual approach, we can also provide both as the project evolves and *ex-ante* observations. During the life of the project, sponsors are the contractors for the critical inputs of the single project advanced by the SPV. *Ex-ante*, sponsors must be capable of anticipating their capacities to deliver

⁸⁵⁰ As characterised in Chapter 4, exceptions to these are the cases of equity investors who are not sponsors -that is, the case in which the SPV receives investors who are not contractors for inputs to the project.

such contribution.⁸⁵¹ Also this need for contracting with sponsors with eyes on their capacities will later serve for remarking the *intuitu personae* nature of critical relationships within PFCs. Intuitively, in PFC, to the FP, it is not strategically tolerable that she implements control agreements with the sponsors holding political rights over the SPV while third parties control the project and the company *de facto*.

The above comes with further informational implications. Control of the project and the SPV allows that sponsor access information of the highest quality at the lowest costs. As described in other places,⁸⁵² such information comes from their roles of owners of a closely held company, but more relevantly, from their capacities to manipulate project assets materially. I will come back to this intuition below.

Critically, two ideas we must fix concerning these informational aspects. First, such access to information about the material and financial status of the project and the SPV makes them capable of revealing information about the rightfulness of their exercise of control, as necessary, at lowest costs *-v.gr.*, when in need for rejecting responsibility claims. Second, such costs of revealing information will always be lower than the costs that claimants incur for litigating (bringing evidence) about the rightfulness of such exercise of control -or the existence of such control in the first place.

Independently from the reality of the presumptions (sponsors always control the FPV), this PFC-inherent and invariable relationship between these two costs of accessing, revealing, and bringing evidence about the existence and rightfulness or wrongful harmfulness of control will define the necessary efficiency of both alternative proposals and their preferability to the current rule. For completeness, let us shortly announce both propositions and see how the above happens.

8.4.6 Alternative proposals

There are two alternative proposals for treating sponsors as controllers of the SPV.

- a) The sponsors should be deemed controllers of the SPV under a presumption *iuris tantum* (refutable).

⁸⁵¹ Notice the how control is not something that happens as an evolution of the project or the company, but in contrary, it is something that parties require before contracting. This is further evidence of the strategic unicity indispensable in PFCs described in Chapter 7.

⁸⁵² *Cf.* chapters 2, 4 and 7.

- b) The sponsors should be treated as controllers of the SPV under a presumption *iuris et de iure* (non-refutable).

8.4.7 Incentive effects of the alternative proposals

Let us now observe the elemental strategic effects of rules imposing responsibility to sponsors for controlling the SPV.

8.4.7.1 Direct efficiency effects of a *iuris tantum* presumption

Let us begin with the first (the least efficient) of the two proposals. Let us observe the incentive effects of a rule treating sponsors as controllers of the SPV under a presumption *iuris tantum* (refutable). Such a rule would still allow sponsors to bring evidence of their lack of control of the project company. This rule would come with two implications.

First, with a rule *iuris tantum* about sponsors control in force, the creditors would now need to show *only* the wrongfulness of (and harms stemming from) their actions -but not the control of the SPV by sponsors. Then, because in PFCs sponsors do always control the SPV, the presumption about the control of the SPV allowing the claimants to restrict their attention to the matter of wrongfulness (and losses) is socially desirable, always. For this reason alone, the rule enforcing a presumption *iuris tantum* of SPV control by sponsors is necessarily better than the current legal treatment where plaintiffs must always show both control and harmful wrongfulness.

Second, recall, the presumption *iuris tantum* is weak. That is, under such rule, legislators would allow sponsors to bring evidence reverting the presumption -*v.gr.*, showing that they do not control the SPV. Then, in virtue of the spaces allowed by judicial errors,⁸⁵³ in certain circumstances, sponsors will attempt to bring evidence about the lack of a sufficient capacity to influence the decision-making system of the SPV. In these scenarios, the claimants will find themselves debating judicially about the existence of control. This equates to under-enforcement as result of the *iuris tantum* (weak, *v.gr.*, refutable) nature of the presumption about control.

As shown further below, this inefficiency will not exist in the other alternative proposal in which legislators and judges enforce an undisputable (*iuris et de iure*)

⁸⁵³ The error is necessary because sponsors always control the SPV. *Cf.* chapters 2, 4 and 7. In PFCs SPV control by sponsors is indispensable for the feasibility of the risk allocation mechanism -and sponsors and the FP have such control in the object of contractual arrangements.

presumption about SPV control. However, despite this inefficiency, the *iuris tantum* presumption of SPV control does lower the costs incurred by the least informed claimant requesting compensations. Hence, the *iuris tantum* proposition is necessarily better than the current legal treatment where plaintiffs must always show both control and harmful wrongfulness. That is, the proposition is necessarily an improvement from the current norm under which judges do not presume that, as shareholders and contractors of critical inputs, the sponsors control SPV.⁸⁵⁴

8.4.7.2 Direct efficiency effects of *iuris et de iure* presumption

Let us now observe the strategic implications of a rule imposing SPV control responsibility against sponsors via a *iuris et de iure* (irrefutable) presumption. Directly, the norm brings two effects. One of them is undesirable but mild. The other one is desirable and strong -*v.gr.*, it dominates the earlier, necessarily. In virtue of the interplay between these two aspects, the proposal of implementing control responsibility through a *iuris et de iure* (irrefutable) presumption reveals as socially preferable to both the current norm and to the proposal of enforcing a *iuris tantum* (weak) presumption of control. Let us see how this happens.

First, the *iuris et de iure* (irrefutable) nature of the postulate eliminates all possibilities that -in virtue of judicial unawareness of the strategic environment⁸⁵⁵ - the sponsors attempt to revert the presumption about SPV control. Consequently, the least-informed claimants will now not only advance requests for compensations without bringing evidence about how the sponsors control of the SPV, but they will also be free from any risks of finding themselves litigating with the sponsors about such extreme. Hence, for this reason, the proposition of treating sponsors as

⁸⁵⁴ On the side of sponsors, the presumption of control would come with an undesirable impact (of minor relevance). Intuitively, the reduction in the costs of enforcement not only will permit that claimants advance socially desirable requests. Under exceptional circumstances, it will also facilitate that creditors demand compensation from sponsors opportunistically -that is, without legitimate causes. The magnitude of this inefficiency will be a function of the (low) quality of judicial enforcement. This effect is not only negligible but its welfare effects are necessarily controlled by the above benefits -*v.gr.*, the sponsors can always best show at a cost lower than what other claimants would internalise for advancing claims showing actual control.

⁸⁵⁵ Recall, sponsors always control the SPV. *Cf.* chapters 2, 4, and 7.

controllers of the SPV is more efficient than both the current rule and the proposal implemented via a *iuris tantum* presumption.

Second, as said, the presumption about control reduces the overall costs of claiming. Consequently, not only the scenarios in which creditors seek compensation for their losses will grow. Under this rule, due to the lower costs of litigating, the cases in which some plaintiffs will seek the enforcement of opportunistic claims against the (well behaving) sponsors will also proliferate. Intuitively, without a need of discussing control, the opportunistic creditors can now use more of their limited budgets for focussing on bringing (false) evidence about the wrongfulness (and harmfulness) of managerial actions from sponsors. The returns from such undesirable strategies will also grow as a function of the spaces for judicial errors -the likelihood that judges believe their opportunistic claims.

Two aspects we must remark with this respect. First, the impact of these inefficiencies is not considerable. Second, the losses from these distortions cannot outweigh the gains of the benefits pointed out above.

Intuitively, as described above, sponsors are always best-informed in the setting. Hence, they can defend themselves by (at some cost) revealing their high-quality information about the rightfulness of their actions. Thus, despite judicial errors, generally, the costs of litigating (opportunistically) without information are higher than the costs of defending (rightfully) with refined information. This relationship dissuades creditors from advancing opportunistic claims. Hence, the inefficiencies associated with the expanded incentives for litigating with opportunistic objectives are small.

On the other hand, the honest creditors (consider the FP) are always the least informed in the setting. Consequently, the inefficiencies associated with the exceptional cases where creditors attempt to enforce claims against sponsors opportunistically will be necessarily milder than the benefits internalised by other least-informed creditors when bringing forward legitimate claims without the costs of bringing evidence or judicially debating about the existence of control with the best-informed sponsors -who necessarily do control the SPV.⁸⁵⁶

⁸⁵⁶ Note how the inefficiencies associated with the incentives for advancing opportunistic claims are also seen under the *iuris tantum* presumption. The *iuris tantum* presumption albeit weak, it still reduces costs of advancing opportunistic

The rule enforced via a *iuris et de iure* (irrefutable presumption) configuration is, therefore, more efficient than the same responsibility enforced through a *iuris tantum* (the refutable presumption). However, depending on legal traditions, whereas the *iuris tantum* alternative could be implemented judicially -that is, after judges take note of the strategic needs for SPV control by sponsors that are inherent to PFCs- the second most efficient *iuris et de iure* rule should require a legislative institutionalisation (*de lege ferenda*).

8.4.8 Other indirect incentive-efficiency effects of both alternatives

Independently of the configuration, the rule of control applicable to all sponsors comes with other effects in terms of implementation and enforcement incentives. We observe this efficiency gains in three distinct but dependent aspects.

First, *de facto responsibility rule against all sponsors induces cross disciplining efforts*. Control responsibility equates to the communication of responsibilities to all sponsors from the undesirable managerial actions or decisions of only some of them. Hence, as said, under the above propositions, for escaping liability, *ex-post*, the individual sponsors would have to prove either their lack of effective control (in the case of the *iuris tantum* rule) or the rightfulness of their behaviour as individuals (in both cases). As the project evolves, this results in incentives for sponsors to spend efforts monitoring each other or intervening in the decision-making system of the SPV actively for preventing mismanagement.

Both such reactions are socially desirable responses. Furthermore, cross-monitoring results in better *ex-post* enforcement. Backwards induction, superior enforcement allows for also superior *ex-ante* implementation quality -the variable governing the willingness of the FP to enter the project and consequently, the feasibility of PFCs.

Observe how these benefits are only possible in PFCs environments. Recall, in scenarios where owners are dispersed (passive), any rule facilitating the communication of control responsibility would induce investors to adopt precautions incompatible with diversification (or transferability of shares). However, this is not the case of PFCs. In PFCs, sponsors are always few, and they are always highly qualified. They shape the project. They provide the critical inputs to the project. They implement the financing agreement with the FP. They shape the risk allocation mechanism whose quality defines the feasibility of non-recourse financing. Moreover,

claims. The effects are stronger in the case of the *iuris et de iure* rule than whenever the norm takes the form of a *iuris tantum* presumption.

In PFCs, control is not only strategically indispensable, but it is also the object of contractual arrangements between sponsors and the FP that pre-exist the SPV. As shown in Chapter 7, in this environment, parties not only do not appreciate, but they contractually eliminate spaces for diversification (discretion). Consequently, both propositions result in cross-monitoring, in relational enforcement, and the revelation of information with positive externalities to the FP. Remarkably, these are the same strategic outputs that today the FP pursues by enforcing cross-default mechanisms (see further below).

Second, de facto responsibility rule against all sponsors provides incentives for revealing and exchanging information, thus allowing the enforceability of higher optimal fiduciary duties of diligence against all parties for higher managerial outputs. As anticipated in Chapter 7, in Chapter 10, as a way for later research, I will propose an optimal fiduciary duty of diligence (care) enforceable against sponsors and managers in PFCs. Amongst other variables, in PFCs, such optimal duty of care grows as a function of the better access of information by managers in PFCs.

Now, observe how, today, under the current rule, without assuming that sponsors control the SPV, managerial liability would more likely be enforceable *only* against delegated managers (not against sponsors). However, the delegated administrators do not interact materially with the project. Hence, they would not receive information about material aspects of the project or the sponsors.

In contrast, a rule enforcing control responsibility (*iuris tantum* or *iuris et de iure*) against all sponsors and managers would effectively induce sponsors to reveal information about the project to the manager to increase managerial performance and decreasing likelihood of enforcement. This is also true for the information that sponsors exchange with each other for the same purpose. Consequently, either alternative for implementing a rule of control responsibility to sponsors (*iuris tantum* or *iuris et de iure*) would increase the outputs of managerial decisions from both the sponsors and the delegated managers and also the optimal fiduciary duties of diligence enforceable against both the sponsors and the appointed administrators.

Third, the enforceability of control responsibility against all sponsors reduces the size of optimal opportunistic sub-coalitions and the likelihood (feasibility) of unanimous collusions against the lender. Uniquely of PFCs, sponsors are themselves, owners and contractors of the SPV. In conjunction with the control responsibility rule, this double capacity comes with an extra incentive efficiency: it increases the costs of colluding opportunistically at the managerial level.

That is, the rule of control effectively deters individual sponsors from forming opportunistic sub-coalitions or unanimous collusions against the FP. This is a

consequence of the flow of information amongst them and the subsequent reduction of the spaces within which subgroups can deliver responses hidden from other now better-informed sponsors. This results from the increased awareness of all sponsors about the losses they will internalise as a result of opportunism.

Intuitively, after receiving *bad* or *very bad news* against her cost structures, the individual sponsors will perceive incentives for readjusting opportunistically with some sponsors (in a sub-coalition) against other sponsors. As analysed in Chapter 5, the opportunistically optimal the sub-coalition depends on many factors. But, in particular, the feasibility of the clandestine organisation depends on the spaces within which its members can coordinate opportunistic responses (further *shirking*, *risking*, and *shading*) beyond the sight of other sponsors (moral hazard). In this context, the rule of control responsibility decreases the asymmetries of information amongst the individual sponsors, ultimately lowering the chosen size of the opportunistic group.

Superior information consequently permits that the sponsors better observe the individual choices of opportunistic actions and their impact on the project capacities affecting them all. In other words, because they actively monitor each other and exchange information about individual actions, the impact of *shirking*, *risking*, and *shading* from sub-coalitions and unanimous collusions become more noticeable to all sponsors. That is, now all sponsors now become more aware of the further losses from opportunism as well as of the greater likelihood of enforcement of control responsibility affecting them all. This then affects the magnitudes of the compensations that the sponsors under distress will transfer as part of the bribes to some or to all sponsors.⁸⁵⁷ By increasing the costs of compensations and bribes, both alternative rules of control responsibility enforceable against all sponsors reduce the optimal size of sub-coalitions and the likelihood (feasibility) of unanimous collusions of all sponsors against the FP. These are positive externalities to the lender.

Parties cannot achieve these purposes in diversified corporate settings where the perspectives of responsibility would dissuade passive investors. Just as above, these efficiencies appear as a result of strategic aspects inherent to all PFCs -the control of the SPV by few and highly qualified sponsors actively involved in the decision-making process of the SPV. Hence, they do not vary with configurations of PFCs or with jurisdictions. Similar to what I mentioned above, in all aspects, the efficient effect of

⁸⁵⁷ See the analysis of the bargaining processes in Chapter 5.

the rule is highest when legislators implement the solution via a *iuris et de iure* presumption.

Finally, as anticipated in Chapter 7, in Chapter 10, I will propose an optimal duty of diligence growing as a function of the better access of information by managers in PFCs. Now, observe how, without assuming that sponsors control the SPV (the rule as configured today), managerial liability would more likely be enforceable *only* against delegated managers (not against sponsors). These administrators do not interact materially with the project. Therefore, they do not receive information of the high quality accessible to sponsors. Consequently, a rule enforcing control responsibility (*iuris tantum* or *iuris et de iure*) would effectively increase the flow of information (a precaution from sponsors) and consequently increase the optimal rigour of duties of diligence (of care) enforceable against managers (of both kinds) in PFCs.

8.4.9 Observed contractual behaviour

Today, in PFCs, parties replicate the benefits of a rule of managerial control contractually. This is particularly evident in the functionality of requirements that the FP enforces via cross-default mechanisms and actual control agreements.

The cross-default mechanisms. As described in Chapter 2, in PFCs, the FP will oblige the SPV to comply with specific requirements. Then, in parallel, the lender will enforce against sponsors a penalty after the SPV has failed to verify the completion with such obligation. This exposes the desirability of communicating responsibilities amongst sponsors for aspects that the FP considers of critical value.

Importantly, albeit cross-default mechanisms reveal the efficiency of communicating control responsibilities, a rule of managerial control as the ones proposed here would not result in the disuse of such clauses. Intuitively, although the functionality of the rule and the contractual mechanisms pursue identical benefits, control liability rules are enforceable only in the imminence of corporate insolvency (and require the realisation of a loss to the claimants). The enforceability of the provisions mentioned above does not require insolvency or current losses. Those are technical default provisions. Parties utilise them with pre-emptive objectives (*cf.* Chapter 9). Hence, such clauses will still coexist with either of the two alternative regimes for control responsibility.

Parties contract for control of the SPV. In PFCs, the sponsors and the FP implement agreements dedicated precisely to controlling SPV. I have analysed these clauses extensively in chapters 2, 4, and 7. Moreover, as also shown, the control of the SPV is strategically indispensable to the feasibility of the risk allocation mechanism regulating how the SPV will use its resources for completing the single project and

repaying the senior debt that the FP brings to a highly specific company without recourse to third parties or the sponsors. Consequently, as shown in many chapters, in PFCs, the FP will verify the comprehensiveness of control agreements even before incorporating the SPV. Control of the SPV by sponsors is a feature inherent to all PFCs, and this is visible in contractual practices.

8.4.10 Robustness

Above, mentioned how a rule eliminating (or reducing) the costs associated with the burden of bringing evidence about control could expand the incentives for creditors to advance opportunistic claims. I have also described how these inefficiencies cannot overweight the benefits that such a rule brings to legitimate claimants who are the least informed in the setting. This results from the fact that, in PFCs, the sponsors always control the SPV. Moreover, they always receive information of a quality superior to that reaching creditors. Hence, the sponsors are always the most capable of revealing information about the rightfulness of their actions. This aspect is inherent to the strategic position of sponsors in PFCs.

Also, recall, rules of responsibility for *de facto* managerial control come to protect creditors -not shareholders or sponsors. The vulnerability of creditors to managerial misbehaviour only materialises in cases of insolvency. That is also true in scenarios where the SPV fails to comply with obligations allowing creditors to enforce penalties (technical default provisions) against the (solvent) company. For this, the rules will be strategically irrelevant in cases of *no news* or *good news* where the project performs as expected or better than expected, and creditors find their claims served. Consequently, the superiority of a rule of responsibility for *de facto* control implemented via a *iuris tantum* presumption holds under all scenarios or the jurisdictions in which parties register the SPV -that is, irrespective of the evolutions of the environment (*news*), or the number of sponsors, the SPVs used for the project. The relevance of all statements is also higher the material complexity of projects increasing the asymmetries of information and ultimately, the enforcement costs incurred today by creditors.

8.4.11 Proposal for a rule enforcing control responsibility of sponsors in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)

The object of the proposal is consistent with the rationales and the functionality of other propositions of the study.

Both forms of implementing the proposition -*iuris tantum* or *iuris et de iure*-constitute responsibility rules. Both proposals reflect how control is an element

inherent to the position of sponsors in PFCs. From the stance of incentives, control allows access to information permitting that sponsors internalise rules of responsibility efficiently. The interplay of control and information -the two elements that the control responsibility rules reflect- constitutes the basis for the rationales of general fiduciary duties to inform, the optimal fiduciary duties of diligence in PFCs, the responsibility of sponsors before SPV insolvency, and the remarks about the scopes of interpretation of specific duties to inform (all responsibility standards). Additionally, the capacities of sponsors to exert control of the SPV and its assets, and the access to information are two of the elements sustaining the efficiency of fiduciary duties of loyalty in PFCs.

Finally, as analysed above, whereas the proposition *iuris tantum* could be enforced by judges after taking consideration of how control is a strategic feature inherent to all PFCs, the responsibility rule implemented *iuris et de iure* should require a legislative institutionalisation.

8.5 4th pillar. The publicity of a corporate form. The limitation of the representation organs of the SPV

8.5.1 Introduction

Let us now observe the fourth pillar of the legislative institutionalisation of PFCs. The fourth pillar comes to preserve cashflows from the SPV -the sole source of benefits that the FP expects ex-ante.

The postulate shows how the combination of a PFC corporate form including a modification of the capacities of the organ of representation and the publicity of registration can reduce the spaces within which the sponsors exercising rights of control may behave opportunistically by contracting with third parties in good faith.

The proposal is twofold. One aspect refers to how the institutionalisation of PFCs in a project-dedicated corporate form that requires publicity should serve for excluding third parties in good faith. The second aspect shows how, within the framework of such institutionalisation, the legislator can restrict the capacities of the organ of representation of the SPV and require the intervention of the lender for all contracts with providers of debt. This is precisely the aspect that the European legislator requires for excluding third parties in good faith -the protection advanced in this proposition. Like all other proposals, these postulates are robust (they hold valid in all scenarios and project configurations) and consistent with contractual practices where parties regularly allow the FP a monopoly on the provision of debt to the SPV.

Finally, as a reference, I will use the Art. 9 of the Directive (EU) 2017/1132 of The European Parliament and The Council of 14 June 2017 relating to certain aspects of

company law (codification).⁸⁵⁸ The rule has been transposed into the national laws of all European Union member states, thus serves for representing the legal treatment in jurisdictions representative of the traditions in the Western world.

Next, I will analyse the vulnerabilities of parties in PFCs (this includes an observation of the current solutions as applied to regular diversified corporate contracts). Thirdly, I will remark the application of the rule from the EU Legislator. Under the fourth section, I will show how a PFC-dedicated corporate form and its publicity should serve for excluding their parties in good faith. In fifth place, I will show how in light of the existing norms (Art. 9 of the Directive (EU) 2017/1132 *contrario sensu*) a PFC company form could allow for limiting the capacities of the organs of representation which in conjunction with a rule requiring the intervention of the lender would institutionalise the regular practice of allowing the FP a monopoly on the provision of debt to the SPV. Under the sixth and seventh sections, I will remark how this implementation strategy is consistent with contractual practices and how such postulate holds valid in all scenarios, irrespective of project configuration or evolutions of the environment.

8.5.2 SPV control, implementation, and the vulnerabilities of the FP in PFCs

As analysed in all chapters, the feasibility of PFCs depends on the quality with which parties define the risk allocation mechanism. In the absence of collateral to their parties, and because the SPV advances a highly specific project, the lender constructs a web of contractual provisions inducing sponsors to respond as socially desirable and build the project as necessary for the repayment of the non-recourse debt under all eventualities.⁸⁵⁹ The FP implements these agreements with the FP and directly with the sponsors.⁸⁶⁰

However, independently of the precision with which they define eventualities and expected solutions, the FP does not hold ownership or control of the SPV or its assets. Consequently, irrespective of their obligations with the FP, the sponsors always retain the capacity to use the SPV for contracting with third parties for purposes other than

⁸⁵⁸ *Vid.* Official Journal of the European Union - L 169/46 - 30.6.2017.

⁸⁵⁹ See the strategic analyses of the rationalities of parties in chapters 4 and 7.

⁸⁶⁰ See the characterization of these clauses in chapters 2 and 4, and the strategic observations of Chapter 7.

those defined in the project (residual rights of control).⁸⁶¹

Indeed, ex-post, the FP will verify these opportunistic actions and likely seek compensation directly from the sponsors. However, the agreements that the SPV implements with third parties (in good faith) will, in most of the cases (see below), remain valid.

Strategically, backwards induction, the above results in the FP requesting sureties or collateral from the sponsors themselves or third parties so that she can obtain indemnity after verifying such trespasses.⁸⁶² Yet, collateral from the company or third parties⁸⁶³ is a limited resource. Thus, such needs created by residual control rights over the SPV expand the costs of building a reliable risk allocation mechanism, ultimately resulting in under-investment on the side of the FP.

8.5.3 Two solutions for two problems

Historically, judges could prevent the above problem by enforcing *ultra vires*-based doctrines. Today, generally, such shields can hardly protect the lender against third parties holding claims against the company whose representatives implement agreements beyond the scopes of its company objects.⁸⁶⁴ The legislator now protects third parties in good faith, and such protection is strong.

Concretely, the European Legislator provides that,

⁸⁶¹ *Vid.* page 1120 in O. D. HART; J. MOORE, “Property Rights and the Nature of the Firm”, cit. The standard reference is S. J. GROSSMAN; O. D. HART, “The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration”, cit.

⁸⁶² In a didactical exaggeration, we could consider how the lender should require collateral equivalent to the value of debt -so that she can recover her contributions from the sponsors after the SPV has failed to complete the project due to the violations of control covenants from sponsors.

⁸⁶³ Recall the analyses in chapters 4 and 7, these collaterals protect the enforcement of technical default provisions -in this case, control covenants. They are consequently compatible with the non-recourse nature of debt. Moreover, such collateral protections are indispensable to the enforceability of contractual mechanisms that shape the risk allocation mechanism.

⁸⁶⁴ For a discussion on the matter see L. ENRIQUES, “EC company law directives and regulations: How trivial are they?”, *University of Pennsylvania Journal of International Economic Law*, vol. 27, 1, 2006.

Article 9. - Acts of the organs of a company and its representation

1.- Acts done by the organs of the company shall be binding upon it even if those acts are not within the objects of the company, *unless such acts exceed the powers that the law confers or allows to be conferred on those organs.*

However, Member States may provide that the company shall not be bound where such acts are outside the objects of the company if it proves that the third party knew that the act was outside those objects or could not in view of the circumstances have been unaware of it. Disclosure of the statutes shall not of itself be sufficient proof thereof.

2.- The limits on the powers of the organs of the company, arising under the statutes or from a decision of the competent organs, may not be relied on as against third parties, even if they have been disclosed.

3.- (...) ⁸⁶⁵ ⁸⁶⁶

Below, I will show how the norm offers two solutions for two trespasses. The first solution relates to the acts adopted beyond the objects of the company (Section 1). The second solution applies to scenarios in which the organ of representation acts beyond its capacities (Section 1, second paragraph and Section 2). In light of the two alternatives, legislating a PFC corporate form could benefit from both solutions.

The key to the above is to identify two distinct problems from the earlier narrative. One problem relates to the awareness of the third party about how her agreements with SPV representatives escape the objects of the company. The second solution relates to the identical problem in the specific cases in which the SPV seeks debt financing from parties other than the FP.

The crucial difference between the two categories is that, in the second case, parties cannot claim that the contractual procurement of debt financing is an activity beyond the scopes of actions that the legal entity must pursue towards the completion of its objects. Thus, the legal treatment of the second problem requires a distinct approach. Remarkably, the EU legislator allows for it. Let us shortly observe the two cases and the two solutions.

⁸⁶⁵ *Vid.* Article 9 of the Directive (EU) 2017/1132 *Of The European Parliament And Of The Council of 14 June 2017 relating to certain aspects of company law (codification)*. Acts of the organs of a company and its representation.

⁸⁶⁶ The handwritten is mine.

8.5.4 The value of registration in PFCs and third parties in good faith

Let us observe the first case, the scenario in which the sponsors attempt to implement contracts with third parties in trespass of company objects (beyond completing the single project). To this scenario, the EU legislator responds,

1. Acts done by the organs of the company shall be binding upon it even if those acts are not within the objects of the company, *unless such acts exceed the powers that the law confers or allows to be conferred on those organs.*⁸⁶⁷

However, Member States may provide that the company shall not be bound where such acts are outside the objects of the company if it proves that the third party knew that the act was outside those objects or could not in view of the circumstances have been unaware of it. Disclosure of the statutes shall not of itself be sufficient proof thereof.

The EU legislator consequently requires actual third-party awareness of the excess with which representatives exercise their capacities. Thus, we must make a distinction between the scenarios in which the representatives attempt to implement contracts with third parties from the market, from the cases in which such contracts involve sponsors.

In scenarios in which the representative attempts to implement opportunistic contracts with the sponsors, the second paragraph of Art. 1 applies. This results from the observations of contractual practices of Chapter 2, and the strategic analyses from chapters 4 and 7. As analysed, in PFCs, the sponsors intervene in the design of the project to which the SPV with its single object is strictly instrumental.

Moreover, in PFCs, the sponsors implement a web of contractual arrangements oriented at supplying the SPV of all its material and financial inputs necessary for advancing the single project. These are strategic aspects inherent to PFCs that lead to the proposal about the *iuris et de iure* control of the SPV by sponsors. Finally, under a rule institutionalising a PFCs corporate form, the sponsors would participate in the constitution and registration of the legal entity. These necessary aspects should serve for building judge's confidence about the awareness of sponsors about the boundaries of the objects of the SPV as required by the legislator (*cf.* 2nd paragraph, Art. 1).

A distinct analysis deserves the case of contractors who are not sponsors. In this case,

⁸⁶⁷ The handwritten is mine.

however, the knowledge of this opportunistic contractor about the boundaries of the company's objects should be built upon the awareness of the single project-dedicated purposes of the PFC corporate form. Recall, the identification of its single-project dedicated corporate form would appear next to the company name. In virtue of this publicity of the single purpose object of the company, judges should esteem that, the diligent party *knew* that the act was outside those objects *or could not in view of the circumstances have been unaware of it*.

Finally, note how the second paragraph of Art. 1 excludes the capacity of companies to claim that the third party was not in good faith after the disclosure of company statutes. Remarkably, the rule applies to regular corporate scenarios where the objects of the companies are wide precisely to allow the legal entity and its managers to advance diversified portfolios of projects. In this context, the wise legislator protects the third party who faces difficulties (uncertainties and subsequent under-investment) in identifying the boundaries of generic business objectives.

This is however not the case of PFCs where *ex-ante*, parties predefine the elemental characteristics of the single project and reflect such project in the single object of the SPV -as registered, published, and shown in signals of the corporate form in the company name. In PFCs, the legislator has no reason to protect third parties in good faith capable of identifying the small boundaries of such objects of the company at little costs. The current rule, where even the disclosure of corporate chapters does not serve for excluding the good faith in the third parties is paternalistic when applied to cases of PFCs where not only the objects of the company are predefined, but in which such definition includes descriptions of critical aspects of the single project that the SPV advances.

8.5.5 A PFC corporate form. Limiting the capacities of the representation organ. The intervention of the FP in debt financing contracts

Let us now observe the distinct case in which the representatives of the company behave opportunistically by seeking debt from parties other than the FP. Recall the observations in chapters 2 to 4, and 7. In PFCs, the non-recourse lender prevents the SPV from receiving debt financing from third parties as a means for avoiding debt dilution -the situation where earlier lenders find themselves competing for collateral (or, in our case, cashflows) with subsequent creditors. Debt dilution results in externalities that, in PFCs, the FP prevents by regulating the access of the SPV to debt via the *cash waterfall* clause.

Notably, as advanced, in contrast with the scenario described above, in this case, the sponsors and the SPV cannot claim that contracts for debt do not fall within the activities that the SPV must pursue for advancing its single project. To fix ideas,

contracting for debt financing cannot be understood as being beyond company objectives.

However, in this case, the solution will not stem from the first paragraph of article 9 of the Directive (EU) 2017/1132, but from the second paragraph of the same provision *contrario sensu*, and the legislative institutionalisation of PFCs (*cf.* the first pillar). The legislator writes:

2. The limits on the powers of the organs of the company, arising under the statutes or from a decision of the competent organs, may not be relied on as against third parties, even if they have been disclosed.⁸⁶⁸

As we see, the rule prohibits that the company uses its regulations limiting the capacities of company organs against third parties in good faith. However, *contrario sensu*, the norm allows the exclusion of the good faith of the third party when the act trespasses the capacities of the organ of representation of the corporate form as defined by the legislator. In other words, the SPV can reject a claim from third parties when its representatives have acted beyond the powers that laws permit for such organs under corporate statutes.

Consequently, within the framework of a legislative institutionalisation of a PFC corporate form, from the stance of the EU legislator, it is possible to restrict the capacities of the organ of the representation and implement a rule under which for their validity, all financing contracts other than those involving capital contributions (shares) should require the intervention of the FP -the lender as registered (*cf.* the first pillar).

The rule would induce third parties and the representatives of the SPV (the appointed administrators of the sponsors) to request that the FP manifests (documents) its consent for the validity of contracts for financing with third parties. Remarkably, this consent must be explicit but not formal. The FP could manifest its consent with a signature in documents or via electronic communications from its officers (or independent advisors) directly to the contracting party. Moreover, the consent from the lender could be extended for a range of scenarios and shown to third-party debt providers in concrete cases. Legislators may also offer the solution as a default rule.

8.5.6 Contractual practices

The above configuration of the organ of representation not only eliminates the

⁸⁶⁸ The handwritten is mine.

possibilities that the sponsors implement debt contracts opportunistically with third parties but it also incorporates as a rule of the PFC form a norm that today parties regularly implement in PFCs. This is the monopoly in the provision of debt resources by the FP that they regulate in the critically relevant *cash waterfall* (cascade) clause. See chapters 2, 4, and 7.^{869 870 871 872}

8.5.7 Robustness and consistency with other proposals

Finally, both the enforcement of the boundaries of company objects and the monopolies on the provision of debt financing are of critical value for preserving the capacities of the FP to harvest benefits from SPV cashflows. As remarked in all other pillars, these aspects result from the strategic needs of parties (the FP) that are inherent to their positions in PFCs. Thus, they hold valid irrespective of project

⁸⁶⁹ It is important that the banks exercise control and therefore, additional indebtedness should only be permitted if the banks grant their approval. Limitations on additional indebtedness therefore typically figure in a project finance loan documentation. *Vid.* page 120 in A. FIGHT, *Introduction to Project Finance*, cit.

⁸⁷⁰ Parties implement obligations not to incur, create, or permit to subsist any other financial indebtedness (unless expressly allowed in the project contracts). Any supplemental financial resources made available to the borrower would increase indebtedness toward third-party lenders, who would enjoy the same level of credit rights as the original project finance lenders. Clearly, the original lenders can allow a waiver to this prohibition, and occasionally further indebtedness be allowed if the rights of the new financiers are subordinated to those of the original lenders. *Vid.* page 289 in S. GATTI, *Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects*, cit.

⁸⁷¹ If extra capital cost is incurred, it will obviously not have been taken into account in the original financing plan—one approach is to require the Project Company to raise additional finance and adjust the Contract Payments accordingly. However, there is another monopoly problem here: the existing lenders have to agree to the terms of any new financing, and to any new lenders sharing in their security as this will create intercreditor problems (...). *de facto*, therefore, the Project Company can only raise new finance through its existing lenders. *Cf.* page 140 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

⁸⁷² In PFCs, parties implement commitments no to *incur any additional debt or issue guarantees for third parties*; *Cf.* page 393 in *Ibid.*

configurations and scenarios.

Note, in the scenario of *good news*, it is possible to conceive a case where the rule becomes an obstacle for the SPV (the sponsors) to receive additional debt financing for increasing project capacities. In these circumstances, we can conceive an opportunistic response from the lender renegotiating aggressively about the conditions for offering extra financing. It is also possible to consider how this would result in under-investment on the side of sponsors (hold-up) failing to harvest the full residual benefits from the scenario of *good news*.

However, two aspects we must remark concerning this possibility. First, as analysed in Chapter 2, non-recourse financing projects are highly complex organisations involving lengthy contracting processes. This observation is commonplace in the finance and industry-oriented literature.⁸⁷³ As a result, the parties regularly define the conditions under which the SPV may access financing from the FP. Regularly, these provisions involve basic standards -e.g., debt-to-equity ratios, debt coverage ratios. Thus, to the SPV, *good news* would likely improve its repayment capacities and consequently, its access to debt financing from the lender. Hence, such a hold-up problem should be negligible in magnitude.⁸⁷⁴

Second, most relevantly, even if assuming that the hold-up in *good news* scenarios is significant, the FP will still be, always, the least-qualified, and consequently least capable of implementing the critically relevant contractual precautions of the risk allocation mechanism. The non-recourse lender will also always be party least capable of updating information necessary for enforcing provisions. Finally, she will also be the highest risks-taker. Consequently, the inefficiencies from the hold-up problem associated with the opportunistic (too strict) enforcement of this rule's entitlements will be always less significant than the social losses resulting from the under-investment from the lender in the absence of the protection. Evidence of this is the popularity of the said clauses allowing the lender to intervene in SPV access to debt financing.

⁸⁷³ See page 8 in B. ESTY, "The Economic Motivations for Using Project Finance", cit.

⁸⁷⁴ Asides from the analysis, note how opportunism from the lender is not only rare but also comes at high costs to the reputation of the creditor offering debt in the small market.

8.6 5th pillar. The fiduciary duties to inform *distress* in PFCs

8.6.1 Introduction

Let us finally observe the fifth pillar for the legislative institutionalisation of PFCs. As a way for legal research, the proposition postulates a fiduciary duty to inform the lender about the *distress* of the sponsors or the SPV. The fifth pillar comes to protect the enforceability of the crucial risk allocation mechanism.

Today, insolvency tests fail to detect the exacerbation of incentives that follow all deteriorations of incentives in PFCs (*cf.* chapters 5 and 6). Besides, in PFCs, the SPV advances highly specific assets. Hence, when the protection of bankruptcy laws arrives, the FP finds little or no collateral value left from project assets.

Accordingly, in PFCs, the FP always implements obligations for the sponsors to reveal information as the project evolves. Based on this information, the lender implements contractual precautions for the pre-emptive objectives characterised in many other places of this study (*Cf.* Chapter 9). However, such information commitments are costly, and they are always imperfect. The study now advances a proposition for, as a way forward for later research, considering inherent efficiency, enforceability, and robustness of a rule enforcing a general fiduciary duty for the sponsors to inform about *news* of certain severity -*v.gr.*, *distress* as defined below- affecting the sponsors or the project.

As in the same sequence of other proposals, I will now show the efficiency of the different rules in regular corporate businesses and the inefficiency of current insolvency tests in PFCs. I will then remark the dependence of PFCs on the enforceability of the risk allocation mechanism -critically, a function of the access to information. I will then announce the proposal and remark the verifiability of the standard and the efficiency of the rule with ex-post and ex-ante incentives. As in the analyses of all other proposals, I will then include observations of contractual practices, robustness considerations and the consistency with other postulates for later legal research in this study.

Let us begin by recalling the boundaries of the threshold of *bad* and *very bad news*. The scenario of *bad news* represented the case in which a sponsor updates information and observes that conditions (expected returns) have deteriorated to her or to the project. Thus, she also realises that after choosing her privately optimal responses to all incentives, she will now receive returns lower than initially expected. Importantly, note how she will still obtain profits.

In all earlier chapters, I also referred to the case of *very bad news*. When I defined *very bad news*, I always consider events of a magnitude such that, after updating

information and renegotiating unanimously, *all* the sponsors anticipate that they will obtain no residual benefits from the project. Consequently, as shown in chapters 5 and 6, under *very bad news*, the sponsors always *shade*. Moreover, they devote their entire resources to exclusively *shading*.

I will now consider the threshold of *distress*. In the scenario of *distress*, after updating information, the *individual* sponsor anticipates that, after choosing the privately optimal responses to all incentives, she will obtain no profits from the project. Effectively, the scenario of *distress* reflects a case of *very bad news* to only one (or more) sponsors.

Notice, two aspects. First, the threshold of *distress* includes episodes of *news* affecting either the individual sponsor or the project (the SPV). *I.- news* may affect the individual sponsor directly in her production (marginal costs or marginal benefit) functions. Say, because of the costs of her inputs grew unexpectedly. *II.- news* may also affect the project (the SPV) indirectly putting a sponsor under *distress*. *E.g.*, the needs of the project change, so the SPV buys inputs under less favourable terms -or stops buying from such individual- now leaving that sponsor under *distress*. Thus, circumstances may affect the SPV and put one or more individual sponsors under *distress*. Second, naturally, the scenario of *very bad news* involves a case of *distress* affecting all the sponsors individually.

Consequently, after updating information about *news* affecting her directly or indirectly (via the SPV) with such severity, the sponsor must inform the FP in compliance of her fiduciary duties to inform. I will refine this proposition below.

8.6.2 The rule and its efficiency in diversified corporate businesses

Today, in diversified corporate businesses, regularly, neither delegated managers, nor controllers, or shareholders respond to any fiduciary duties to inform creditors about events affecting the company or its contractors. To this, there are only two exceptions.

- First managers may agree (contractually) to provide information when contracting with creditors.
- Second, managers and controlling shareholders reveal information about the legal entity's insolvency in compliance with mandatory norms of bankruptcy

laws.⁸⁷⁵

In diversified corporate businesses, the above is efficient for three reasons:

First, the risks internalised by financial creditors or contractors for inputs do not depend on the status of the input providers to individual projects of the broad portfolio. Hence, parties do not value such information about contingencies affecting some of the many business units. Additionally, the dispersed creditors and contractors cannot process such information, and they do not appreciate it as a reference of the value they expect from their claims -as said, a function of portfolio aggregated capacities, not of circumstantial events affecting unrelated growth options.

Second, if desirable, company contractors can request information about the state of corporate affairs. Creditors may value such information for enforcing contractual provisions. This is often the case of financial instruments whose costs parties link to critical ratios.⁸⁷⁶ Moreover, creditors can enforce restrictive covenants of distinct nature and request sureties from the debtor and collateral from third parties.⁸⁷⁷

Third, after the company's insolvency becomes apparent to managers, insolvency (and often, criminal) laws protect the redeployment value of project assets. This is also the moment when, in regular diversified businesses, the incentives for controlling shareholders and managers to behave opportunistically increase at most.⁸⁷⁸ Accordingly, such is the moment in which legislators make managers and controlling shareholders responsible for informing the creditors about the solvency status of the company while filing for insolvency protection.

Thus, in regular corporate businesses, duties to inform work in conjunction with an insolvency rule that comes to protect the collateral value of an ongoing portfolio of

⁸⁷⁵ In Chapter 10, see the proposal about an optimal responsibility of managers under bankruptcy laws in PFCs.

⁸⁷⁶ With literature references, see the financial mitigations against distress costs in Chapter 3.

⁸⁷⁷ Notice, however, also in diversified investment scenarios, these solutions are of constrained efficiency. The availability of collateral protection is limited, and restrictive covenants jeopardise investment flexibility. Moreover, parties must define these obligations expressly which, critically, in addition to costly, they are also always imperfect.

⁸⁷⁸ *Cf.* Chapter 3.

projects. Finally, such legal protection -the interplay between the duty to inform and bankruptcy laws- arrives timely for its purposes -*v.gr.*, for implementing risk externalities creditors only as socially desirable levels.⁸⁷⁹

For this, in regular diversified corporate businesses, legislators oblige controlling shareholders and managers to reveal information about corporate affairs only in the vicinity of its insolvency.

8.6.3 Inefficiency of solvency tests and bankruptcy laws in PFCs

I will now show how the above does not hold in PFCs. First, in PFCs, the repayment capacities of the SPV depend on the quality of the incentives that govern the responses from sponsors -not on collateral value. Second, current insolvency tests (and duties to inform) fail to identify the moment in which such incentives no longer guide sponsors towards the delivery of privately costly but socially desirable responses. Third, in PFCs, the specificities of assets make the late protection of bankruptcy laws ineffective at preserving value to the non-recourse lender. Fourth, contractual provisions (ex-ante collateralised precautions) are necessarily incomplete.

Finally, for the enforceability of such contractual provisions (the crucial risk allocation mechanism), it is strategically efficient that the sponsors reveal information about deteriorations of the environment at earlier stages -*v.gr.*, as soon as receiving *bad news*. This is true in all circumstances and for all configurations of projects.

Let us now observe how bankruptcy laws fail to protect the non-recourse lender in PFCs. Later, I will refer to the contractual reactions to the needs of the FP. After this, I will announce the proposal and proceed with the sequence of the research.

⁸⁷⁹ See the analyses in Chapter 7. In diversified corporate businesses, the interplay between the institutions of the legal personality and limited liability protection results in certain insolvency risks being externalised to creditors. This is a socially efficient (Kaldor-Hicks) solution. Beyond certain point -defined by insolvency tests (see below)- the protection to shareholders ceases. That is the moment beyond which duties to inform and managerial responsibility in the protection to creditors exist. *Vid. pp. 6 and ff. and 9 and ff.* in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

8.6.3.1 PFCs depend on incentive quality, not on collateral value; the earlier exacerbation of opportunistic incentives in PFCs

The first aspect to note is that, whereas the current insolvency regulations focus on preserving collateral value -and repayment capacities of debtors, the value that the FP expects from her claims depends on the incentives to which sponsors deliver their non-contractible responses.

As analysed in all chapters, in the absence of collateral or recourse to third parties, in PFCs, the lender relies on quality with which a risk allocation mechanism (a web of contractual precautions) that she enforces against the SPV and sponsors. The quality of these contracts allows her to trust that, under all foreseeable circumstances, the SPV will count on all inputs necessary for completing and operating the predefined project. However, the risk allocation mechanism is, in nature, imperfect. That is, eventualities will arise, and the sponsors will find spaces for choosing actions hidden from the lender.

Additionally, in PFCs, the sponsors also hold claims that they regularly subordinate to those of the FP. The sponsors also control the SPV both as owners and *de facto* as input provider to the single project. As characterised in chapters 5 and 6, these two features in conjunction with the interplay between the legal personality of the SPV, the limited liability protection, and the non-recourse nature of debt result in sponsors exerting forms of opportunism distinct from those observables in regular corporate environments, *risking*, *risking*, and *shading*.

Sponsors implement these responses in individual actions, within opportunistic sub-coalitions, or in unanimous collusions against the FP. Additionally, because sponsors hold expectations that are residual to the FP's claims, the incentives for sponsors controlling the SPV to behave opportunistically grow as a function of their conjectures about the deteriorating capacities of the SPV to comply with residual expectations.⁸⁸⁰

⁸⁸⁰ Remarkably, the effect of opportunism against the solvency of the company is not unique of PFCs. Indeed -as analysed extensively in Chapter 3- also in regular diversified contracting and investing, there are distortive incentives that exacerbate as the company approaches its insolvency or loses its capacities to reward shareholders. This is particularly evident in the case of risk-shifting (asset substitution problem). The forms of opportunism to which SPV are vulnerable are distinct simply because the sponsors are not only the controlling shareholders of the

The opportunistic responses to such incentives harm project capacities. Consequently, the SPV's incapacity to repay the non-recourse debt will not arise only due to the impact of unforeseen events (*news*) against the capacities of the project alone. Instead, in PFCs, insolvency will result from sponsors' opportunistic responses to such deteriorations in the environment. This, I have shown in chapters 5 and 6.

Critically, such incentives begin deteriorating not whenever the company evidences an irremediable incapacity to complete the project but much earlier, as soon as sponsors update information about *news* affecting project capacities and consequently the returns to sponsors from their privately costly, socially desirable non-contractible actions. This is how *shirking*, *risking*, and *shading* accelerate the process that leads to the SPV to its insolvency.

Therefore, to fix ideas, two aspects are of critical relevance to the proposition. First, in PFCs, the SPV results' insolvency -prevalently- from the opportunistic responses of sponsors (*risking*, *risking*, and *shading*). Second, the distortions to incentives for sponsors to deliver non-contractible undesirable responses (thus, the FP's vulnerabilities to imperfections of the risk allocation mechanism) grow as soon as the project begins deteriorating -*v.gr.*, after the sponsors update information about *news*. Crucially, this -and not the moment of the later insolvency as defined today- is when a legal treatment becomes necessary in the protection of the FP. This is also the moment in which the FP values information for enforcing whatever contractual precautions she puts in places for each project.

Finally, from this and the above, two implications become visible. First, the current legal treatment -reacting to actual or imminent insolvency (not to incentive distortion triggering that consequence)- comes too late to serve the purposes (prevent vulnerabilities) in PFCs. Second, in addition to the late-arriving of insolvency protections, because the SPV holds only specific assets, much of the guards of current insolvency law will not be effective in PFCs. Let us see how this happens.

8.6.3.2 The failure of current insolvency tests to identify incentive distortions

Let us now observe how, in their current form, the insolvency tests fail to detect the exacerbation of opportunism -the source of vulnerabilities of the FP and the variable

SPV but also the providers for material inputs to the project. See the analyses of Chapter 3. See also B. ESTY, "The Economic Motivations for Using Project Finance", cit.

governing the feasibility of PFCs.

Today, from a comparative stance, we find (often a combination of) two families of tests. Under the first groups of tests, the debtor is insolvent when *it is durably unable to pay its debts as they fall due*. These are the *cashflow* or *commercial* insolvency tests. Alternatively, a debtor is also insolvent whenever its current liabilities exceed its assets. These are the *balance-sheet* or *over-indebtedness* tests.⁸⁸¹

In the first case, the *cashflow* or *commercial* insolvency tests identify the capacities of the company to repay its obligations with existing cashflows as current debts become due. These tests consequently measure the likelihood that the company will fail to serve its commitments as parties defined them -not its capacity to compensate creditors after failed to repay its debts. In other words, these tests focus on the repayment (debt servicing) capacities -not on collateral value.

Let us note two aspects of PFCs scenarios. First, during the lengthy construction periods and early operation stages, projects do not produce substantial revenues. Consequently, parties regularly agree that the bulk of the company's obligations become due only at later stages after projects become operational. Second, during these long periods, both the sponsors and the FP inject cash as capital needs arise as the project progresses. This is the risk distribution functionality of the *cash waterfall* clause.

Accordingly, during these long periods, debt levels will be low, and the repayment capacities of the company to internalise *news* without endangering its debt servicing capacities will remain high. Consequently, -critically-, during these periods, the sponsors will update information about the deteriorations of expected returns, they will react opportunistically as privately desirable, and insolvency tests will not yet reflect company distress.

The second assessment method, the *balance-sheet* or *over-indebtedness* test identifies the ratio between the redeployment value of assets (the valuation criterion relevant in insolvency scenarios) and current debts. In contrast with the above, these

⁸⁸¹ *Vid. pp. 122 (footnotes 30) and 133-4 in R. R. KRAAKMAN ET AL, The Anatomy of Corporate Law: A Comparative and Functional Approach, cit. See also P. 173 in F. TOLMIE, Corporate & Personal Insolvency Law, cit. Pp. 123-5 in V. FINCH, Corporate Insolvency Law - Perspectives and Principles, cit. See also, in many places and with reference to European jurisdictions A. MADS; F. WOOLDRIDGE, European Comparative Company Law, cit.*

tests are sensitive to the company's capacity to compensate creditors should the debtor find difficulties in complying with its obligations as stipulated. Consequently, these tests focus on the collateral capacity of the company -not on repayment capacities as above.

For two reasons, also the tests of this second family fail to identify the events that result in (the incentive distortions and subsequent) insolvencies of SPVs.

First, as said in many places, PFCs advance projects whose assets are highly or fully specific. As a result, events affecting the company will not result in losses of redeployment capacities that will be, in any case, low or nil. This is the least relevant of the two aspects.

Second, now critically, as characterised in chapters 2, 4 to 6, in many cases, *news* will not affect project assets but the costs of efforts or input capacities of sponsors. This changes in their costs and values from their actions will induce them to readjust responses privately, form sub-coalitions, or collude unanimously with all other sponsors for *shirking*, *risking*, and *shading*. Neither the impact of *news* against individual capacities nor the incentive effects from those unforeseen contingencies will appear in the SPV balance sheets. These events will consequently pass undetected by current insolvency tests.

Thus, conditions will deteriorate, sponsors will update conjectures and readjust responses opportunistically, and the SPV will *not* fail insolvency tests.

8.6.3 The specificity of assets; the failure of insolvency tests to preserve value to creditors

Finally, as already mentioned, in addition to the informational aspects, a second challenge lies in the fact that, in PFCs, when insolvency protection becomes available, the SPV will hold only low-value resources (collateral) to protect. Note, this does not only result from the time that sponsors enjoyed for responding opportunistically but from the fact that the SPV advances a single project whose assets are highly specific.

8.6.4 Dependence of PFCs on contractual arrangements; the imperfect access to information

In PFCs, the interplay among the late protection of bankruptcy laws, the specificity of assets, and the lack of recourse to third parties implies that, ex-ante, the FP can only rely on the enforcement perspectives of the risk allocation mechanism. This, I have analysed from distinct perspectives in chapters 2, and 4 to 7. This risk allocation mechanism includes a web of provisions allowing the lender to trust that the sponsors (and the SPV) will bring all necessary inputs for the project in all foreseeable

scenarios under all considerable eventualities.

Crucially, strategically, by regulating all aspects of the project including the expected responses from sponsors in all scenarios, this risk allocation mechanism substitutes the missing protection of collateral from the SPV (that advances only specific assets), the lack of recourse to third parties, and finally the late and ineffective safeties of bankruptcy laws. Critically, by defining the responses that the FP will enforce from sponsors, the non-recourse lender reduces the spaces within which, as conditions deteriorate, the sponsors will later respond with *shirking*, *risking*, and *shading* individually, within sub-coalitions, or in unanimous collusion against the lender.

Critically, the enforcement capacities of the FP depend on her access to information. As also analysed, in PFCs, the efforts that the FP spends increasing the access to information govern the implementation quality of the risk allocation mechanism which ultimately define the value she can rationally expect from the project and her non-recourse claims ex-ante.

This information must be of high quality and, crucially, must reach the lender timely. The FP must receive this information not after the deterioration of project capacities and consequently of the incentives of sponsors are irreversible (as whenever the SPV fails to pass solvency tests or receives *very bad news*), but as soon as such deterioration of both capacities and incentives begins. The need for information is inherent to the strategic position of the non-recourse lender and the lender's capabilities to receive such information timely -as soon as incentives begin deteriorating- dictates the feasibility of the risk allocation mechanism and consequently of PFCs.

Hence, in all scenarios and projects, ex-ante, parties agree on informational requirements that the sponsors will internalise during the project's life until the SPV can finish repaying its senior debts. As illustrated in Chapter 2 and other places in this chapter, the information requirements will take many forms. The FP may request information about valuable material aspects, or the evolution of certain variables of each project. The lender may also expect that the sponsors inform about the maintenance of certain capacities -i.e., the solvencies of parties providing collaterals for the commitments of the risk allocation mechanism. Additionally, parties will habitually require the maintenance of data associated with ratios of critical relevance to the FP. These include *Interest Coverage Ratios*, *Debt Service Coverage Ratios* or *Annual Debt Service Coverage Ratios*, *Average Debt Service Coverage Ratios*, *Loan*

*Life Coverage Ratios, Project Life Coverage Ratios, Drawdown Coverage Ratios.*⁸⁸²

However, the above provisions implementing obligations to inform about predefined contingencies are necessarily imperfect. The implementation of all commitments and ratios depends on the identification of critical variables. The capacities of these variables to identify risk or project evolution will change as the project evolves. Additionally, the enforcement of all mechanisms (the revelation of information about such variables) depends on the FP's access to information as the project evolves.

In other words, as it is the case of all contractual interactions, the feasibility of information commitments is bound by both incompleteness and moral hazard. Then, because the position of the lender depends on implementation and enforcement quality, these information boundaries will function as feasibility limitations to PFCs.

The above proposition is true for all externally enforceable contractual interactions. However, in PFCs, both limitations grow as a function of the low qualifications of the FP and the high risks she internalises via non-recourse debt. In PFCs, both aspects also increase her exposure not only to *news* but also to the opportunism of sponsors controlling assets materially that grow as a function of the greater weight of FP's claims relative to total project welfare (*cf.* chapters 5 and 6).

8.6.5 Proposal

An individual sponsor should reveal to the FP and other sponsors whenever, after updating information, she finds herself in *distress*.

The threshold of distress is defined by circumstances in which the sponsor anticipates that after choosing her privately desirable responses to all incentives, she will fail to obtain profits from her participation in the project.

The consequences of a violation of fiduciary duties to inform (responsibility and liability) should be similar to those following trespasses to other fiduciary duties (loyalty, or diligence). The enforceability of the obligations should also be similar.

8.6.6 Verifiability of *distress*

Remarkably, as defined, *mutatis mutandis*, the principle can be articulated with an approach similar to that of the *cashflow* or *commercial* insolvency tests.⁸⁸³ If such

⁸⁸² *Vid. pp.* 541-2 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

⁸⁸³ *Vid. pp.* 122 (footnotes 30) and 133-4 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit. See also P. 173 in F.

insolvency tests oblige managers to reveal cases in which the company is *durably unable to pay its debts as they fall due*, fiduciary duties to inform should induce the sponsors to report scenarios in which the sponsor anticipates that will fail to obtain positive value in return from her contributions (total net cashflows in the end of the project).

Parties and judges can ex-post verify the threshold of *distress* by reconstructing cost functions ex-post.

Finally, the enforceability of the responsibility standard involves a belief that the sponsors should build about the impact of *news* on her expectations. The standards of diligence with which the sponsor builds her conjectures should be those defined in Chapter 10.

8.6.7 Efficiency of the rule

Indeed, just as what we see with contractual provisions, the enforcement of fiduciary duties is also vulnerable to judicial uncertainty. However, for several other reasons, the proposition induces efficient responses from both the sponsors and the FP. Moreover, as shown below (*cf.* the analysis of robustness), such efficiency manifests in all environments, irrespective of other variables as project configuration.

First, critically, fiduciary duties to inform enforceable against the sponsors allow the lender to receive information timely. Albeit the opportunistic incentives begin exacerbating as soon as the minor contingencies affect them or the project, as a verifiable threshold, the information about *distress* permits the lender to implement solutions when it is still possible to induce sponsors to respond as socially desirable. That is, before the deterioration of project capacities induces sponsors to reveal the insolvency of the SPV in compliance with bankruptcy laws.

Second, fiduciary duties function as a default rule. The rule can evolve jurisprudentially. See below the reference to the refinement path. The principle can be stretched to include industry-standard profits. Thus, making the threshold of *distress* approach that of the optimal *bad news*.

Third, the efficiency of fiduciary duties grows with the differences in parties'

TOLMIE, *Corporate & Personal Insolvency Law*, cit. Pp. 123-5 in V. FINCH, *Corporate Insolvency Law - Perspectives and Principles*, cit. See also, in many places and with reference to European jurisdictions A. MADS; F. WOOLDRIDGE, *European Comparative Company Law*, cit.

qualifications and their access to information. These differences also dictate the parties' capacities to implement and enforce provisions.

Fourth, in sharp contrast with what we observe with the protections coming from bankruptcy laws, fiduciary duties to inform *distress* are *forward-looking*. They induce the sponsors to react based on their best-informed expectations about their (lacks of) expected profits. The sponsor is the party best-prepared to reveal the information of highest quality at the lowest costs, timely.

Fifth, the efficiency of the fiduciary duties to inform increases with the total risks internalised by the FP. This variable dictates the strength of the opportunistic incentives to which sponsors respond as the environment deteriorates whenever the lender fails to update information necessary for enforcing contractual precautions.⁸⁸⁴

Let us now observe the ex-post and ex-ante efficient incentive-effects of the rule.

8.6.8 Ex-post and ex-ante incentives of the rule

The duties to inform as described above, come with the ex-post and ex-ante benefits. These are efficient incentives common to all contractual interactions under asymmetries of information and bounded rationality.

Ex-post, as said, the imposition of fiduciary duties to inform *distress* allows the FP to enforce contractual precautions counterbalancing the opportunistic incentives that grow to sponsors as conditions deteriorate. In other words, the early revelation of information about to the FP dramatically reduces the periods within which sponsors can adopt opportunistic responses. The above holds for *shirking*, and *risking*. However, likely, the highest efficiency gains would come via the prevention of the most harmful *shading*.⁸⁸⁵

Additionally, the timely revelation of information permits that the non-recourse lender withholds further contributions of uncollateralised debt to the SPV. These are

⁸⁸⁴ The level of risks defines the magnitude of externalities associated with the incompleteness in the obligations to inform that the general fiduciary duties to inform come to prevent.

⁸⁸⁵ Recall, *shading* is the strategy under which sponsors dedicate efforts at innovating for lowering the costs of complying with provisions enforceable under the risk allocation mechanism but without internalising the effects from such innovations that will accrue to the FP who, after *bad news*, will extract more of the total benefits from the project.

the effects perceived on the side of the lender.

Ex-ante (backwards induction) the FP can anticipate that she will later receive high-quality information from sponsors. These possibilities come with two implications. On the FP side, she can now implement contractual precautions whose enforceability will later become possible in virtue of such information. On the side of sponsors, most interestingly, the now enhanced capacity of the FP to enforce provisions results in incentives for them to reveal information to prevent the implementation of unnecessary restrictions (signalling). Fiduciary duties to inform consequently result in improvements in the quality of ex-ante signalling by sponsors.

8.6.9 Contractual practices

Contractual provisions evidencing the need of the non-recourse lender for information about the progress of the project -the reference of sponsors expectations defining the strengths of their incentives- are many.

As illustrated in Chapter 2, via technical default mechanisms, the FP obliges the sponsors to reveal information of general scope or about particular material aspects of the single project. The FP is also allowed to request new information as the project evolves.⁸⁸⁶ Some other of these information mechanisms take the form of financial, coverage, liquidity, efficiency ratios measuring performance. Amongst the *coverage ratios*, we find references to projections of the expected capacities of the project or repay its senior debt with its resources and cashflows.^{887 888} Regularly, this information becomes available before the lender proceeds to transfer further non-recourse funds to the SPV.⁸⁸⁹

⁸⁸⁶ The sponsors will agree to provide the lenders' advisors with *reasonable access to the project, and all information reasonably requested*. Vid. p. 392 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

⁸⁸⁷ Amongst others, we find Interest Coverage Ratios, Debt Service Coverage Ratios or Annual Debt Service Coverage Ratios, Average Debt Service Coverage Ratios, Loan Life Coverage Ratios, Project Life Coverage Ratios, Drawdown Coverage Ratios. Vid. pp. 541-2 in B. C. ESTY, *Modern Project Finance: A Casebook*, cit.

⁸⁸⁸ See also pp. 95-100 in A. FIGHT, *Introduction to Project Finance*, cit. Pp. 322 and ff. in E. R. YESCOMBE, *Principles of Project Finance*, cit. Pp. 55 and ff. in A. MERNA ET AL, *Project Finance in Construction - A Structured Guide to Assessment*, cit. Pp. 46-54 in W. TAN, *Principles of Project and Infrastructure Finance*, cit.

⁸⁸⁹ Cf. p. 379 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

Failure to provide such information results in events of technical default with distinct effects. These may involve simple warnings, the application of distinct types of financial penalties, or other consequences typical of PFCs -*e.g.*, loss of complete autonomy of managerial control, or the acceleration of loan terms.

Remarkably, many of these practices replicate the precautions that legislators enforce against managers and shareholders in protecting creditors after verifying the insolvency of companies under bankruptcy laws. Consider the case of step-in rights or the intervention of the lender in the decision-making system of the SPV (*Cf.* chapters 2 and 7). These reactions are consistent with the needs of the lender for controlling the project at an early stage.

Strategically, these contractual provisions confirm two aspects. First, they verify the value that the FP attaches to identifying scenarios of *bad news* (broader than those of *distress*) before enforcing contractual solutions preventing both the deterioration of SPV capacities and the opportunism from sponsors. Second, they also reveal the strategic objectives of contractually enforcing protections that are incompatible with the parties' strategies in regular diversified environments. The desirability of these protections and their distinctively timely enforcement needs indicates the value of a distinct default rule regarding information revelation duties.

8.6.10 Robustness

As in all other propositions of the study, the above postulates depend on strategic aspects that are inherent to PFCs.

The fiduciary duties to inform become enforceable only after the (diligent) sponsor becomes aware of *distress* affecting her directly or via *bad news* harming the SPV. Such duties to inform consequently include *very bad news* but not *good news*. Under *very bad news*, all the sponsors must reveal *distress* to the FP. Hence, the rule functions ex-post efficiently as analysed above. Thus, the proposition appears efficient in all evolutions of the environment.

There is a range of *bad news* scenarios in which the sponsor still obtains (minor) profits. These cases will not fall under the threshold of *distress* as defined here. However, it is possible to refine the scope of *distress* to include profits standard in the markets. See further below.

Finally, the sponsors are the best-prepared to reveal information of the highest quality involving expectations, at lowest costs. This is always true. The FP values information for enforcement as a function of the types of non-recourse uncollateralised risks she internalises and her incapacity to further implement and enforce informational incentives contractually. When the environment evolves as

expected -or better than expected- the risks of overenforcement (excessive compliance costs) are minimal. When the conditions -and incentives- deteriorate, the value of information becomes of greatest strategic relevance to the FP and the feasibility of PFCs. Thus, the efficiency of fiduciary duties to inform *distress* holds irrespective of configurations of projects, or evolutions in the environment.

8.6.11 Towards a later refinement

As proposed, the principle induces the sponsors to reveal information to the FP about scenarios of *distress*. I am here defining *distress* as the incapacity to obtain profits. This prudent approach does not capture many circumstances in which incentives deteriorate with milder *bad news -v.gr.*, the cases in which news affect individual profits only partially.

However, a jurisprudential evolution of the principle to include partial losses of profits under the threshold of *distress* seems possible. References for standard profits for the different markets exist. Judges use these references for enforcing legal provisions of different kinds. Advancing in this direction would bring the scenario of *distress* closer to that of *bad news* -the moment in which incentives begin distorting, and the information becomes valuable to the non-recourse lender.

8.6.12 Proposal for a general fiduciary duty to inform in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)

Below, I will mention how parties should enforce the *specific* clauses regulating punctual obligations to inform. Parties should carry out such enforcement in light of the pre-emptive objectives of all clauses, in accordance with the *in dubio pro creditore* principle, and the fiduciary duties of loyalty. However, in this case, we are considering a general fiduciary duty to inform *distress* enforceable against sponsors in all PFCs -irrespective of contractual precautions. As such, for its enforcement, judges will require a prior legislative institutionalisation of PFCs and a rule regulating it.

Finally, judges should find the boundaries of a general fiduciary duty to inform in light of the standards of diligence optimal in PFCs.

8.7 Conclusions

Chapter 8 elaborated on the ways forward toward the legislative institutionalisation of PFCs. The chapter identified five pillars that should shape a PFC corporate form. These are: first, the registration and publicity projects in a PFC corporate form; second, the fiduciary duties of loyalty in the protection of all parties (critically,

including the PF) in PFCs; third, the *iuris et de iure* control responsibility enforceable against sponsors in PFCs; fourth, the intervention of the lender in the contracting for debt from third parties (a modification of the capacities of the organs of representation) in PFCs; and fifth, the general duties to inform in PFCs.

These pillars provide for protection in five critical places, in this order: implementation, responsibility, ex-post completion, cash flows protection, and enforcement information.

The institutionalisation of a PFC corporate form. The first pillar advanced the proposal for the institutionalisation of PFC via a dedicated corporate form. This PFC form should build upon existing corporate types. Hence, I only consider four items other than the need for registration. Registering the SPV under the PFC corporate form should be an option to parties. However, once registration completes, mandatory rules should become enforceable.

In addition to the information required habitually for registering the incorporation of companies, when registering the SPV, parties should include information about all sponsors, the FP, about the project (the single object of the company), the non-recourse debt contribution, and the inputs expected from the sponsors. The name of the SPV must include a reference to its corporate form (PFC).

Some of the benefits of institutionalising PFCs are common to those allowed by all other corporate types. The registration of projects under a PFCs company form also induces judges to adopt resolutions based on clear categories, thus facilitating the evolution of jurisprudential criteria and derivative scholarly legal studies. The institutionalisation of PFCs permits the definition of features that today appear as dispersed business practices. A corporate form also facilitates the implementation of mandatory rules and the offering of default solutions to sponsors. Consider the case of the other propositions of this study. The postulates for implementing fiduciary duties of loyalty, the fiduciary duties to inform, the control responsibility of sponsors, and the limitations of the capacities of representation organs, they all require legislative modifications. Finally, the legal institutionalisation and the derivative generation of jurisprudential standards facilitate the enforceability of criteria for the ex-post interpretation of clauses as introduced in Chapter 9, and the judicial enforcement of the optimality references characterised in Chapter 10.

The de iure control responsibility of sponsors. The second pillar analysed a rule imposing *iuris et de iure* (or *iuris tantum*) control responsibility of sponsors.

In diversified corporate investments, it is efficient that managerial responsibility rules (to both delegated managers and owners exerting control) be enforceable only after plaintiffs have verified two extremes: effective control of the company, and

wrongfulness of (and harm from) control decisions.⁸⁹⁰ In regular corporate businesses, this configuration of control responsibility is not only efficient but also indispensable for dispersed investors to bring their contributions to the company. A rule depriving the investors of this protection (functionally, a presumption of innocence) would result in inefficient incentives for these dispersed and poorly informed individuals to spend costly efforts monitoring or, even worse, for intervening actively in the decision-making process of the company. Such effects would limit the incentives for investing, with subsequent social under-investment results. As devised today, the rule of *de facto control* is efficient and strategically indispensable for the diversified corporate investments.

However, the above is not efficient in the scenario and for strategic needs of parties in PFCs. First, in PFCs, sponsors always control the management system of the SPV. Second, this is not only true as the project evolves, but it is also strategically indispensable *ex-ante* -for the concretion of the implementation process.

In PFCs, the sponsors always control the SPV both as shareholders and (*de facto*) as the critical input providers to its single project. In PFCs, *ex-ante*, all parties require that sponsors control the SPV simply because the SPV is precisely an element instrumental of a broader arrangement for the completion of a project and its financing via non-recourse debt. The control of the SPV is therefore strictly indispensable for the SPV (holding ownership of project assets) to remain in the object of the risk allocation mechanism.

Functionally, ownership and control come with two implications. First, they allow the sponsors residual rights of control over the SPV and its assets (irrespective of covenants with the FP, the sponsors can administer the SPV as desirable). Second, material control of the project and the material interaction with its assets gives them access to information of higher quality as the project evolves. This permits that sponsors update conjectures about the evolution of the capacities of the SPV to distribute residual benefits that dictate the strengths of the incentives they perceive for responding as socially desirable or opportunistically beyond the enforcement capacities of the lender.

Thus, in PFCs, legislators should provide for a rule under which sponsors should be presumed controllers of the SPV *iuris et de iure*. This rule would induce them to

⁸⁹⁰ Vid. pp. 97, 99, 138-141 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

internalise more of the effects of their opportunistic actions in the control of the SPV.

In the same vein, as a corollary, the sponsors should not be allowed to bring evidence about their lack of capacities to provide administrative directives to the SPV. Under this rule, claimants -the FP or third parties- would restrict their limited enforcement resources to bringing evidence of wrongfulness (and losses) of managerial decisions but not of actual SPV control. The rule would consequently result in a relaxation of the burdens of bringing evidence faced today by creditors of the SPV, thus lowering enforcement costs.

Remarkably, today, the FP and sponsors replicate the strategic effects of such (yet inexistent) responsibility rule via side covenants. Because implementation requires a legislative modification, the postulate is not directly (judicially operative). Like all other postulates, the proposition results from strategic aspects inherent to the lender's position (risks and low implementation capacities) and sponsors (control) in PFCs. Hence, the postulate holds efficiently in all environments, and irrespective of project configurations -or jurisdictions.

The fiduciary duties of loyalty in PFCs. The third pillar proposed the enforcement of fiduciary duties of loyalty in PFCs. The postulate induces the sponsors to complete all provisions of the risk allocation mechanism by reconstructing all parties' ex-ante rationality, including the FP (a creditor of the SPV).

Legally, this results from the fact that PFCs are not ongoing investing organisations. They are legal mechanisms for financing and completing a single project as all parties predefine it in the risk allocation mechanism to which the FP -the principal internalising the bulk of total risks. Hence, the sponsors should adopt decisions completing the initial meeting of all parties' minds, including the sponsors and the FP. Such fiduciary duties should apply as a criterion for adopting both managerial decisions and the collective actions in exercising their political rights as shareholders of the strictly project-instrumental.

The fiduciary duties of loyalty in PFC come to correct the severe distortions resulting from the current shape of fiduciary duties under which managers are expected to adopt inherently risky decisions for advancing a portfolio to benefit dispersed shareholders who invest behind limited liability protection.

The fiduciary duties of loyalty in PFCs should remain in force until the full repayment of the non-recourse debt. Finally, for its enforceability, the postulate requires a legal modification of corporate rules enforcing fiduciary duties of loyalty that today protect shareholders only (the sponsors). As in all other pillars, the proposition is robust and holds valid in all environments, irrespective of project configurations.

The PFCs corporate form and the preservation of the seniority of claims.

The fourth pillar postulated a limitation of the capacities of the organ of representation and the lender's intervention in the contracting for debt from third parties.

The postulate follows two critical objectives. First, it preserves the FP's access to cash flows from the project -the unique source of value in the absence of collateral or protection from third parties. Second, it protects the SPV and the project from the opportunism from sponsors holding residual rights of control over the SPV, the project, and its assets.

Today, ex-ante, the FP puts in place contractual precautions limiting the spaces within which the sponsors will be allowed to contract with third parties via the SPV.⁸⁹¹ However, irrespective of control covenants, as shareholders and managers of the SPV, the sponsors retain residual rights of control over what they own -the SPV and its assets.⁸⁹² Thus, regardless of the completeness of the risk allocation mechanism -*v.gr.*, of control covenants- as shareholders of the SPV, the sponsors can still use the SPV for implementing opportunistic contracts with third parties. In these scenarios, the control covenants between the SPV or sponsors and the FP will not deprive such agreement between the SPV and the third parties in good faith of their validity.

To prevent this, backwards induction, for protecting the enforceability of the said covenant of the risk allocation mechanism, the FP will request collateral from third parties. However, collateral is a limited resource. Today, the parties cannot prevent the opportunism without incurring opportunity costs (under-investment).

The first pillar showed how today, the European legislator does protect the company (not third parties) whenever the acts of representatives go beyond the powers that legislators permit that the company statutes allow to its organs of representation for the company type. Consequently, by limiting the scopes of representation of the organ by law, the legislator would be securing that third parties could not seek protection as third parties in good faith when implementing agreements beyond mandates. Note how the EU legislator is no longer using the company objects as the

⁸⁹¹ *Cf.* in Chapter 7 the restrictions to the diversification of the investment decisions.

⁸⁹² *Vid.* page 1120 in O. D. HART; J. MOORE, "Property Rights and the Nature of the Firm", cit. The standard reference is S. J. GROSSMAN; O. D. HART, "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration", cit.

boundary of representation but the scope of representation capacities of the organs defined by the Law (*i.e.*, by the company form).

Thus, by limiting the capacities of the organ of representation, the legislator could also prevent third parties from claiming good faith and attempting to enforce such agreements against the SPV. The EU Laws and the national legislators allow for this possibility. The pillar consequently proposes that when institutionalising the PFC corporate form, the legislator defines the capacities of the SPV organ of representation of the SPV and provides that the FP intervenes in all agreements for debt involving parties other than the non-recourse lender.

The rule would be robust (desirable in all circumstances) and consistent with contractual practices. Effectively, the rule would institutionalise the regular practice of allowing the lender for a monopoly in the provision of debt financing to the SPV. Critically, this privilege is not a form of distributing benefits but a way of preventing debt dilution from the SPV. Today, the *cash waterfall* clause implements this solution contractually (and imperfectly).

The general duties to inform in PFCs. Finally, the fifth pillar proposed the enforceability of fiduciary duty to inform *distress*.

Today, neither legislators nor judges enforce duties to inform against managers in diversified corporate contracting. There are only two exceptions: the obligations under bankruptcy laws, and the commitments to reveal information as contracted specifically ex-ante.

In diversified corporate businesses, this is efficient in virtue of three aspects. First, habitually, contingencies associated with individual projects do not result in corporate insolvency. Second, the protection of collateral value that already exists under bankruptcy laws. Third, parties have the possibility of requesting information contractually.

However, the above propositions hold only in diversified environments -not in PFCs cases.

First, in PFCs, events affecting the feasibility of the single predefined project result -invariably- in changes in the SPV capacities to repay its obligations. These capacities dictate the incentives for *shirking*, *risking*, and *shading*. Therefore, the time in which the sponsors reveal unforeseen events is strategically relevant to the lender in PFCs.

Second, the sponsors perceive incentives for responding opportunistically, not (later) when the company becomes insolvent, but as soon as they update information about contingencies affecting the SPV's capacities to distribute residual benefits to sponsors. Recall, such capacities of the SPV dictate the strengths of the incentives

that sponsors perceive for choosing privately costly but socially desirable efforts. Hence, these are the *news* and the incentives that induce sponsors to respond with *shirking*, *risking*, and *shading*, whose effects will accelerate the deterioration of project capacities towards the SPV's insolvency. This is when the lender needs updated information that she can use to enforce contractual precautions. This is the moment in which duties to inform become efficient.

Asides, today, the current solvency tests react to solvency states, not to the deteriorations in project capacities. Consequently, when the time comes in which the company fails to pass solvency tests, the protection of bankruptcy laws will arrive after the sponsors had a long period for responding opportunistically with *shirking*, *risking*, and *shading* against the SPV and the FP. The protection of insolvency regulations oriented to advancing diversified businesses and allowing externalities to the disperse creditors (the Kaldor-Hicks efficiency of limited liability rules) comes too late for serving the FP as the main risk-taker whose interests and implementation capacities dictate the feasibility of PFCs.

Third, in addition to the above, in PFCs, the SPV advances a single project whose assets are highly specific. Thus, in addition to the bankruptcy legislator's untimely response, the protection from bankruptcy laws is also less effective in PFCs because of the low redeployment value of project assets.

For these reasons, in PFCs, the FP always value receiving timely information about the environment's deterioration. Ex-post, the revelation of information increases the quality of enforcement. Ex-ante, backwards induction, the expectation of later receiving such information permits the implementation of better contractual precautions, thus improving the quality of the risk allocation mechanism and consequently increasing the feasibility of PFCs.

Finally, the postulate uses the threshold of *distress* covering scenarios of total losses of profits because of its verifiability. Ex-post, costs functions can be reconstructed more easily than profits based on conjectures about alternative placement opportunities that never occurred. However, the jurisprudence could advance in this direction permitting that the threshold of distress includes losses of profits. So, the FP would receive information about milder deteriorations in the environment (bad news) sooner.

A fiduciary duty to provide earlier information about distress would be minimally paternalistic only in some scenarios with negligible effects to total welfare. The sponsors are always the best information providers. The costs of revealing information when such information is not necessary (the risks of overenforcement under *no news* or *good news*) is minimal compared to the critical value that such

information brings to the lender as conditions and incentives deteriorate with distress and *very bad news*.

Lastly, the efficiency of the five postulates of this chapter results from strategic aspects inherent to the positions of parties in PFCs. Thus, they provide desirable incentives irrespective of project configurations, evolutions of the environment, or jurisdictions.

Chapter 9

Three postulates (principles) for the interpretation of clauses in PFCs

Abstract. Based on the analyses of the strategic tensions in PFCs (Chapters 4 to 6), and on the remarks about the needs for legal treatment and functionality of contractual solutions characterised in Chapter 7, as a way forward for legal research, Chapter 8, has proposed five pillars the legislative institutionalisation of PFCS via a PFC-dedicated corporate form. Chapter 9 now advances four postulates for the interpretation ex-post of all contracts of the strategically fundamental risk allocation mechanism. The four principles serve for supplementing the five pillars upon which the legislators should implement the PFC corporate form. Judges and parties should enforce these postulates in precise conjunction with the characterisations of optimalities offered in Chapter 10.

Table of Contents

9	CHAPTER 9 - THREE POSTULATES (PRINCIPLES) FOR THE INTERPRETATION OF CLAUSES IN PFCs.....	661
	TABLE OF CONTENTS	663
9.1	INTRODUCTION	665
9.1.1	Research question.....	665
9.1.2	The object of the study and the value of propositions	665
9.1.3	Sequence of the presentation	666
9.2	THE PRE-EMPTIVE FUNCTION OF CLAUSES	666
9.2.1	Postulate	666
9.2.2	The default rule in regular corporate finance (the rule today)	667
9.2.3	The functionality of the proposal in PFCs.....	668
9.2.4	Optimal scopes of enforcement (objects) and penalties in PFCs	669
9.2.5	Paternalism and robustness	670
9.2.6	Contractual practices	671
9.2.7	Proposal for interpreting the pre-emptive objectives of clauses in PFCs; its consistency with other recommendations of the study (towards the institutionalisation of PFCs)	671
9.3	IN DUBIO PRO CREDITORE	672
9.3.1	Introduction.....	672
9.3.2	Interpretation of contracts today	673
9.3.3	Distinct strategic needs in PFCs	674
9.3.3.1	Necessarily distinct implementation capacities	674
9.3.3.2	Risk distribution structural features of PFCs, enforcement uncertainty and <i>risking</i>	676
9.3.4	Postulate	677
9.3.5	Ex-post and ex-ante incentives	678
9.3.6	Optimal deviation from the pari passu treatment	678
9.3.7	In dubio pro creditore, favor debitoris, pari passu approaches ..	679
9.3.8	Paternalism and robustness	680
9.3.9	Principle in contractual practices.....	680

9.3.10	In dubio pro creditore principle in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs).....	681
9.4	INTUITU PERSONAE INTERACTIONS	682
9.4.1	Introduction.....	682
9.4.2	Elemental aspects of intuitu personae or intuitu rei relationships	682
9.4.3	The needs of project PFCs – the critical relevance of the risk allocation mechanism.....	683
9.4.4	The intuitu personae value of sponsors	684
9.4.5	The value of the characteristics of the FP	685
9.4.6	The intuitu rei position of the FP in PFCs.....	686
9.4.7	Interpretative implications.....	686
9.4.8	Contractual practices.....	687
9.5	SPECIFIC COMMITMENTS TO INFORM (FROM INDIVIDUAL CLAUSES) ...	687
9.5.1	Introduction.....	687
9.5.2	Current (lack of) interpretation criteria.....	688
9.5.3	Interpretation of the risk allocation mechanism	688
9.5.3.1	Fiduciary duties of loyalty (the subjects of the protection)	689
9.5.3.2	The pre-emptive objectives of clauses (the objects of the protection)	689
9.5.3.3	<i>In dubio pro creditore</i> (the protectable vulnerabilities).....	690
9.5.4	The consistency of the remark with contractual practices	690
9.6	CONCLUSIONS	691

9.1 Introduction

9.1.1 Research question

As a way forward for later research, Chapter 9 will now answer the question:

What postulates can we derive for the ex-post interpretation of contracts in PFCs?

9.1.2 The object of the study and the value of propositions

The chapter focusses on four postulates for the ex-post completion and interpretation of all clauses that shape the risk allocation mechanism.

First, in PFCs, all clauses enforceable by the FP (the risk allocation mechanism) should be interpreted ex-post as if implemented with pre-emptive (not compensatory) objectives. In this context, *pre-emptive* refers to implementing provisions preserving the strategic environment⁸⁹³ that generates further incentives for the sponsors to deliver socially desirable -but non-contractible- efforts. Thus, the preservation of value comes only as a mediate objective. I call this proposition *the pre-emptive function of clauses in PFCs*.

Second, in PFCs, the principal (the FP) internalises non-recourse risks without material access to assets, without residual rights of control over the project, and without accessing accurate information about sponsor (agents) actions. Moreover, ex-ante, the FP is not the party best-qualified for implementing contractual protections in substitution of collateral value. However, the non-recourse lender still internalises the greater shares of total risks from the project. In PFCs, judges should consequently interpret clauses ex-post with attention to the more significant vulnerabilities and the lower marginal value of implementation efforts of the FP. I named this postulate as *the in dubio pro creditore* principle in PFCs.

Third, in PFCs, sponsors' obligations under the risk allocation mechanism should be interpreted as implemented *intuitu personae*. In contrast, parties and judges should ex-post interpret the position of the FP as *intuitu rei*. The consideration of both aspects should serve for interpreting clauses defining the transferability of their

⁸⁹³ Concretely, as shown in Chapters 5 and 6, this environment consists of the capacities of the project to produce value beyond the costs of the senior non-recourse debt. These capacities of the SPV to distribute residual benefits are the source of all incentives for non-contractible socially desirable actions. Preserving these capacities (not liquidating actual damages) is the sole purpose of the risk allocation mechanism.

contractual positions and for other aspects of the legal treatment provided by legislators.

Fourth, in PFCs, sponsors should interpret the scope of specific commitments to provide information as if implemented with pre-emptive objectives, in compliance with the fiduciary duties of loyalty and diligence as characterised. These specific duties to inform stemming from individual clauses are not to be confused with the general fiduciary duties to inform *bad news* articulated in Chapter 8.

The four propositions allow parties and judges to more accurately ex-post complete and interpret all clauses shaping the critically relevant risk allocation mechanism in PFCs. The efficiency of these four propositions results from strategic aspects inherent to the positions of parties in all PFCs -*v.gr.*, resulting from the objectives, vulnerabilities, and the (implementation, performance, and enforcement) capacities of both sponsors and FP in all PFCs. Consequently, the four postulates apply to all PFCs, irrespective of structural variations, numbers of sponsors, qualifications (expertise), numbers of SPV, evolutions in the environment, and -assumedly- legal traditions.

9.1.3 Sequence of the presentation

The sequence of the analysis will be the one described above when presenting the object of the chapter. Additionally, with variations in the sequences, under all four sections, I will analyse: the proposal; the functionality of the current default rule in diversified corporate environments; how the current norm fails to treat the strategic needs of parties in PFCs; the efficient strategic functionality of the postulate in PFCs; the boundaries of application and contractual practises. Finally, I will offer robustness and paternalism observations.

9.2 The pre-emptive function of clauses

9.2.1 Postulate

As analysed in earlier chapters, in PFCs, the SPV's insolvency does not result directly from the influences of nature against the project (*news*) but rather from the opportunistic responses from sponsors to such contingencies. As analysed in chapters 4 to 6, the incentives for sponsors to respond with socially undesirable actions depend on their private beliefs about the SPV's capacities to repay contractual subordinated claims and issue dividends to them -the returns from their non-contractible actions. These strategic aspects are inherent to the positions of sponsors and the FP in all PFCs.

Consequently, in PFCs, ex-ante, the FP does not design contractual provisions of the

risk allocation mechanism only to preserve the company's solvency directly or prevent opportunism that causes insolvency indirectly. In PFCs, the FP also orients such clauses to preserve project capacities so that sponsors' incentives to behave opportunistically remain minimal.

Unlike what we see in diversified environments where creditors focus on collateral value, the FP spends implementation efforts procuring that the *shirking*, *risking*, and *shading* that could ultimately accelerate the deterioration of the project capacities do not become the dominant responses from sponsors in any foreseeable circumstances. These pre-emptive (incentive preservation) objectives should guide the ex-post completion of all clauses shaping the risk allocation mechanism defining the feasibility of all PFCs.

9.2.2 The default rule in regular corporate finance (the rule today)

In diversified corporate businesses, clauses' functionality providing for penalties varies greatly with jurisdictions and legal traditions. Regularly, judges will be inclined to enforcing penalties whenever such penalties correspond to a reference of actual damages as foreseen by parties -i.e., liquidated damages.^{894 895}

Additionally, in regular corporate contracting, parties are habitually diversified, solvent, and more or less evenly qualified. Hence, judges find no rationale for enforcing provisions with either compensatory or pre-emptive objectives. Consequently, unless they perceive rationality for implementing dissuasive mechanisms, the judicial operators will fall back on the compensatory spirit with which legislators treat scenarios of contractual defaults.

Accordingly, for the enforceability of penalties with deterrence effects, judges will often require rationality for such penalty in the actual strategic context. Without a clear description of the pre-emptive strategic objectives of clauses, or a robust functionality (as expressed by parties), in most of the jurisdictions, judges will tend to see clauses as having a compensatory (damage liquidating) functionality -and, under

⁸⁹⁴ In many jurisdictions penalty clauses are outright forbidden. With literature review, Cf. G. DE GEEST; F. WUYTS, "Penalty Clauses and Liquidated Damages", cit.

⁸⁹⁵ Generally, see also, U. MATTEI, "The Comparative Law and Economics of Penalty Clauses in Contract", cit. M. I. GARCÍA, "The Enforcement of Penalty Clauses in Civil and Common Law: A Puzzle to be Solved by the Contracting Parties", cit. A. N. HATZIS, "Having the cake and Eating it too: efficient penalty clauses in Common and Civil contract law", *International Review of Law and Economics*, vol. 22, 2003.

this spirit will complete and enforce them ex-post. As shown next, this rationale is distinct to the objectives that parties pursue when devising commitments of the risk allocation mechanisms in PFCs.

9.2.3 The functionality of the proposal in PFCs

As analysed in chapters 4 to 6, in PFCs, insolvency does not result directly from the influences from nature affecting the project or the cost (value) functions of individual sponsors. In PFCs, the final deterioration of the project capacities comes from the opportunistic actions that the sponsors implement individually, within sub-coalitions, or unanimously. In particular, as they perceive a deterioration of the SPV's capacity to repay their subordinated claims or distribute dividends after repaying the senior non-recourse debt, sponsors will behave opportunistically against the projects in ways that I have characterised.

First, and most simply, sponsors will withhold socially desirable inputs (*shirking*). Second, they will choose technologies that will be riskier than socially desirable (*risking*). Third, as per their capacities to innovate, they will implement alternative solutions for minimising costs of complying with contracts enforceable by the FP (the risk allocation mechanism) but without internalising the impact (losses) from such innovations to the project that will be externalised to the FP (*shading*). Finally, as shown in Chapter 6, the strength of undesirable influences from nature will define whether sponsors implement opportunism individually or after coordinating with some (within sub-coalitions), or with all other sponsors (colluding unanimously) against the FP.

Consequently, ex-ante, the FP implements provisions not (only) preserving the project's capacity to produce value sufficient for repaying the non-recourse debt, but mostly, for generating wealth sufficient for also complying with subordinated contractual claims and distributing dividends. These are the sources of incentives for sponsors to deliver socially desirable non-contractible actions. By securing such higher capacities, the FP maintains incentives for sponsors to behave opportunistically low. This is the pre-emptive objective orienting the implementation of the FP ex-ante's risk allocation mechanism in the light of which judges should complete and interpret clauses ex-post.

Remarkably, sponsors' propensity to form wider sub-coalitions or renegotiate with all sponsors stems from their capacities to innovate collectively with highly synergetic efforts. Fundamentally, as the environment deteriorates, by innovating, sponsors find spaces for delivering socially undesirable solutions within the spaces allowed by contractual incompleteness of the risk allocation mechanism. Hence, ex-ante, the FP will also focus on limiting the spaces within which sponsors can find collective

solutions as opportunistically desirable. The lender will consequently spend efforts implementing penalties with pre-emptive (*v.gr.*, with deterrence, not compensatory) objectives that she will also enforce against parties other than those obliged by each commitment. See the functionality of cross-default mechanisms in chapters 2 and 4.

Accordingly, in PFCs, judges should complete or interpret clauses in both the scopes of their objectives and the rigour of penalties with pre-emptive purposes. Judges should find the objects and their penalties as oriented to: first, inducing sponsors to deliver socially desirable inputs thus preserving the deterioration of project capacities and consequently the strengths of socially desirable incentives; and second, to impede the technological innovations and cooperation for adapting responses to their opportunistic incentives. Both objectives show deterrence and not compensatory functions.

Because the proposition derives from strategic features that are inherent to the positions of parties in PFCs, the postulate holds irrespective of project configurations, the number of sponsors or SPVs, corporate types of the SPV, or evolutions of the environment (robustness).

9.2.4 Optimal scopes of enforcement (objects) and penalties in PFCs

From the above, we can make a most intuitive approach to an optimal scope of application (the range of events that the contractual norm should capture) and the penalties optimal in PFCs.

Most simply, parties will ex-ante implement -and judges will ex-post enforce- the optimal clauses in which the marginal costs of compliance to sponsors equals the marginal benefits of:

- First, minimising the undesirable *direct* consequences of some events (failures to comply) to the capacities of the SPV.
- Second, minimising the effects that such initial deterioration of SPV capacities would bring to the incentives for sponsors to respond opportunistically thus further harming the capacities of the SPV and consequently the value of claims held by the FP.

The above criterion identifies the optimal pair of events that the contractual norm characterises (the technical default provision) and the penalty it enforces in all clauses of the risk allocation mechanism -the sole source of expectations of the non-recourse lender in PFCs.

9.2.5 Paternalism and robustness

In the scenarios of *good news*, it is possible to imagine how, the enforceability of clauses inducing sponsors to deliver certain types of responses oriented at preserving incentives under *no news*, *bad news*, or *very bad news*, could lead to a hold-up problem caused by the lender forcing sponsors to renegotiate before implementing uncontracted socially desirable innovations.⁸⁹⁶ This comes from the assumption that a clause interpreted pre-emptively will be seen as having both the scopes of implementation (the range of events it captures) and enforcement (the weight of the penalty when not clearly defined) broader than whenever parties implement such mechanism with compensatory purposes only.

However, in any case, the losses associated with that anecdotal hold-up problem would not control the benefits of minimising distortive incentives in other environments. This is especially true in the events of *bad* and *very bad news*. The hold-up problem itself will also be mitigated by the impact that positive externalities that the FP would receive from such innovations would have in the bargaining outputs when renegotiating with sponsors. In terms of costs, the losses associated with such -hypothetical- hold-up would be necessarily less than the gains from enforcing clauses pre-emptively also because of the risk aversion of parties.

⁸⁹⁶ Let us imagine the case in which the FP fears the impact of price volatility in the market of fuels for the project. The FP consequently forces the SPV to keep in stores some fixed stock of fuel until the SPV repays the non-recourse debt fully. The clause must be implemented with pre-emptive objectives in mind. Thus, the penalty must be optimised so that the marginal costs of the precaution equal the marginal benefit of avoiding not only the direct impact of a possible rise in prices to the SPV but also de subsequent deterioration of incentives and the consequent (further) increase in the likelihood of project default. Now, consider the case in which, as the project evolves, a solar energy technology becomes available to the company. This technology saves costs to the project (*good news*). The sponsors must now renegotiate the original clause with the FP. Any response from the non-recourse lender that departs from the full acceptance of the new technology will backwards induction result in under-investment of innovation-implementing efforts from sponsors (holdup). Generally, beyond the case of PFCs, Cf. P. W. SCHMITZ, "The Hold-up Problem, Innovations, and Limited Liability", *Economics Letters*, vol. 117, 3, 2012, Elsevier B.V. B. E. HERMALIN; M. L. KATZ, "Information and the Hold-Up Problem", *The RAND Journal of Economics*, vol. 40, 3, 2009.

9.2.6 Contractual practices

As characterised in Chapter 2 and analysed strategically in chapters 4 to 7, in PFCs, the rationality of the position of non-recourse lender depends on the quality with which parties implement the risk allocation mechanism. In virtue of the high specificity of project assets, it is the robustness of this set of clauses and its capacity to define the responses from sponsors -and not the collateral value of investment portfolios- what governs the feasibility of these financing mechanisms.⁸⁹⁷

Accordingly, parties will shape this risk allocation mechanism with contractual provisions defining commitments associated with technical default mechanisms. These technical and full default clauses regulate all technical aspects of projects include penalties that the FP enforces against the SPV and sponsors. Parties and judges should interpret these clauses and their penalties that shape the risk allocation mechanism with pre-emptive objectives and as if implemented optimality as described above.

9.2.7 Proposal for interpreting the pre-emptive objectives of clauses in PFCs; its consistency with other recommendations of the study (towards the institutionalisation of PFCs)

Let us finally remark the consistency and interplay of a postulate for ex-post interpreting clauses with pre-emptive objectives and other postulates of this study.

The pre-emptive objectives of all clauses stem from two aspects inherent to the position of the non-recourse lender in all PFCs: First, her necessary needs to preserve enforcement and interest alignment rather than collateral value. Second, her lower capacities to implement and enforce clauses.

Precisely these values are those that inform the fiduciary duties of loyalty, the general fiduciary duties to inform, the *in dubio pro creditore* and the general duties of diligence. These are the principles that should guide the ex-post completion of all clauses in the risk allocation mechanism. I will revisit this observation about the complementarities of these criteria when offering remarks about the interpretation of specific duties to inform.

The intention to implement and enforce clauses with pre-emptive objectives is an element inherent to the positions of non-recourse lenders in PFCs. As in other cases

⁸⁹⁷ Cf. pp. 367 y ff., 386 and ff., 389 and ff., 394 - 395, and 398 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

above, whether the consideration of the necessary element suffices for judges to shade light on the interpretation of clauses without a legislative reform is a matter of legal traditions.

9.3 In dubio pro creditore

9.3.1 Introduction

In Comparative Contract Law, the general principle is that judges treat contracting parties *pari passu*. In other words, beyond the increasing number and scopes of exceptions,⁸⁹⁸ judges are to treat parties equally when interpreting clauses, estimating the consequences from their actions, or the extension of their enforcement.

In this section, I will show how judges should consider the vulnerabilities of the sponsors and the FP distinctly. We will see how, in PFCs, judges should weigh the vulnerabilities of parties differently with greater attention to the needs of the non-recourse lender. The reasons sustaining the need for this postulate in all PFCs are two.

First, in PFCs, the lender is always the least-informed and the least-capable of spending implementation efforts devising and enforcing contractual precautions. That is, in PFCs, the marginal value of implementation efforts of the lender is lower than that of sponsors, -always.

Second, in PFCs, as a creditor, the FP brings the bulk of total resources and internalises non-recourse risks by bringing non-recourse debt. On the other hand, the sponsors expect benefits that albeit junior, they are also unlimited *-v.gr.*, the sponsors harvest unlimited benefits after the SPV has managed to repay the senior non-recourse debt. The interplay between these features inherent to the positions of lenders and sponsors in all PFCs results in distinct risk preferences -this is the conflict underlying the problem of *risking* analysed in chapter 5 and 6. In this scenario, the enforcement uncertainty induces the sponsors to extract positive benefits in detriment of claims in the hands of the lender. In other words, judicial errors affect the FP more than sponsors -hence, the sponsors perceive stronger incentives for challenging provisions of the risk allocation mechanism.

Note how the two inefficiencies (the distinct capacities and the distinct

⁸⁹⁸ *E.g.*, the treatment of workers under Labour Law, Consumer Protection Law, certain tenants of family residences.

internalisations of risks) are independently sufficient for sustaining the proposition. However, the two problems interact with each other further exacerbating the needs for legal treatment. Simply, the incapacities of the FP make it more difficult that she adopts precautions to the distinct ways in which she internalises risks. Similarly, because of such incapacities, the sponsors perceive stronger incentives for ex-ante preventing further refinements of the risk allocation mechanism.

As shown next, the proposition is not only ex-post efficient but ex-ante, it also induces all parties to spend efforts improving the quality of the risk allocation mechanism. The proposal holds robustly and without paternalism in all environments, corporate types of the SPV, numbers of sponsors, and configurations of PFCs. The postulate is also consistent with all other proposals for the institutionalisation of PFCs. Let us now observe how this happens.

Just as in the same sequence of other proposals, I will now recall the default rule (the interpretation of contracts) today. I will then remark the distinct needs of PFCs and how the current enforcement criteria do not function as desired in this distinct environment. In this third sub-section, I will refer to the two independently sufficient but closely interacting reasons for which the equal treatment of parties results in incentive distortions in PFCs. I will then announce the proposition and remark the efficient incentives it produces both ex-post and ex-ante. In the final part of the analysis, I will point out the compatibility of the proposal with the general principals convergent in Comparative Contract Law. I will then remark the robustness and lack of paternalism, and conclude with a mention about the functioning of the proposition with other proposals towards the institutionalisation of PFCs.

9.3.2 Interpretation of contracts today

Contract laws provide criteria for interpreting and reconstructing the legally binding meetings of minds when their elements are not clear. Often, legislators will induce judges to observe the actual expressions used by parties as documented or revealed by them. Judicators will often recur to the general principles of local contract law, the standard practices in the business sector (*mores*), or the objective of parties including the rationality of their precautions as a function of their perceived vulnerabilities.⁸⁹⁹

⁸⁹⁹ *Vid.* S. SHAVELL, “On the Writing and the Interpretation of Contracts”, *Journal of Law, Economics, and Organization*, vol. 22, 2, 2006, Oxford Univ Press. G. M. COHEN, “Implied Terms and Interpretation in Contract Law”, *Encyclopedia of law*

Additionally, excepting for some conspicuous exceptions -namely, regulations protecting workers in labour law- today, legislators and judges do not interpret or complete contracts protecting some parties more than others. Commonly, when reconstructing agreements, especially in business settings where parties are highly qualified, and business practices function as efficient default rules, judges reconstruct meeting of minds with eyes in individual interests (vulnerabilities) with a *pari passu* approach.

9.3.3 Distinct strategic needs in PFCs

For two reasons, judges must consider the vulnerabilities of non-recourse lenders in PFCs. First, the capacities of the FP to implement and enforce contractual precautions of the non-recourse lender are lower than those of sponsors, always. Second, the position of the FP as a creditor internalising the bulk of total risks whose benefits sponsors extract behind limited liability protection result in distinct risks preferences that sponsor exploit by creating enforcement uncertainty.

Whereas the first aspect is one of an optimal distribution of risks as a function of qualifications (the distinct marginal value of implementation efforts), the second one results from a structural characteristic of PFCs and the position of the lender internalising the bulk of risks via non-recourse contributions. Let us now observe these two aspects.

9.3.3.1 Necessarily distinct implementation capacities

Let us now observe how the implementation and enforcement capacities of the lender are lower than those of the sponsors and how that requires distinct legal treatment. Let us note two aspects.

First, the FP embodies a group of financial entities who are not experts on the industrial field of the project. Accordingly, ex-ante, during the implementation stage, the marginal value of implementation efforts spent by the FP will be necessarily lower than those of sponsors. The capacities of sponsors to bring information and devise contractual provisions foreseeing eventualities (the bounded of rationalities) of sponsors and the FP are therefore different.

The FP will be consequently more vulnerable to uncontracted evolutions of the environment than the sponsors who are better capable of anticipating contingencies.

and economics, vol. 3, 2000. R. A. POSNER, "The Law and Law Economics of Contract Interpretation", *Texas Law Review*, vol. 83, 15, 2004, bepress.

Unforeseen evolutions of the environment will more likely benefit sponsors (harm the FP). This results from the higher likelihood that sponsors anticipate such eventuality but remained ex-ante silent.

Second, as described in chapters 2 and 4, the FP does not interact materially with the project. As a result, *itineri*, the capacities of the FP to access information about the inputs choices from sponsors will be smaller than those of the input providers. This will affect the enforcement capacities of the FP -ultimately permitting the spaces for *shirking*, *risking* and *shading* identified in chapters 4 to 6.⁹⁰⁰

Consequently, sponsors will obtain more benefits, and the FP will internalise higher losses from the spaces for opportunism allowed by enforcement uncertainty. Ex-ante, this results in the sponsors further jeopardising the implementation process as a means for preserving the value that enforcement ambiguities may bring to them. Finally, also backwards induction, the above vulnerabilities result in under-investment from the FP.

Consequently, judges must reconstruct contractual provisions with an eye on the more significant vulnerabilities and, as said, the solutions that parties would have implemented should have they known.

Notice, modifying the enforcement criteria in the protection of the party least-capable of implementing efforts corresponds to a redistribution of risks ex-post. Backwards induction, this then implies a redistribution of incentives for the ex-ante choices of implementation efforts from the least informed to the highest qualified parties. Most intuitively, a rule allowing a judge to ex-post protect the FP induces the sponsors now more vulnerable to enforcement uncertainty to clarify expected responses and solutions to such scenarios. Because the sponsors can implement contracts and

⁹⁰⁰ Moreover, recall, the fact that sponsors deliver sequential contributions interacting materially with the project allows them to sustain cooperation relationally. That is, as the project evolves, sponsors update information and implement readjustments based on observable information that they use for constructing reciprocity amongst them. As time passes by, the FP cannot interact in this way, nor can she readjust provisions with sponsors.

In contrast, because the lender does not provide material inputs to the project, she cannot avail from the spaces of actions allowed by incompleteness for behaving opportunistically against the sponsors -or for implementing innovations defensively as per such contingencies.

enforce them at lower costs and higher benefits (the marginal value from their finer contributions is -always- higher) the output of the rule is both ex-post and ex-ante efficient. I will come back to this point below when remarking the incentives of the rule after announcing the postulate.

9.3.3.2 Risk distribution structural features of PFCs, enforcement uncertainty and *risking*

Let us now observe how the structural features of PFCs -concretely, the position of sponsors as input providers and shareholders and the FP as the non-recourse creditor- result in distinct capacities to internalise the effects of enforcement uncertainty -the variable in which, under this proposition, judges should protect the lender.

We can articulate the description of the underlying problem in a way similar to what we saw when analysing the problem of *risking* in Chapter 5. In PFCs, there is a strategic tension that exists in virtue of the distinct ways in which parties internalise the consequence of risks in PFCs.

Recall the observations of chapters 4 and 7, as also mentioned above, in PFCs, the non-recourse lender holds senior claims of fixed face value. On the other hand, the sponsors expect residual benefits. That is, without limitations, the sponsors harvest all benefits that the SPV can keep after repaying the senior non-recourse debt. Additionally, the contributions of sponsors are smaller than those of the FP.

The above structural features of PFCs result in the sponsors extracting benefits from volatility. In Chapter 5, we saw how the above lead to the sponsors altering the choices of technological solutions opportunistically. Intuitively, by increasing volatility, the sponsors extract greater value whenever innovations turn out to be successful. Whereas greater volatility also expands the losses that the sponsors externalise to creditors (the FP) whenever such innovations do not produce value as expected (the scenarios of *L*, as I referred to them in Chapter 5). Sponsors will consequently choose riskier solutions even if these innovations result in some (not controlling) losses of project welfare -more of which, behind limited liability shelter, they will externalise to the lender.

In precisely the same manner in which in Chapter 5 I showed how the volatility associated with the (opportunistically) technological innovations benefited sponsors, we see the same strategic effects from the volatility stemming from enforcement uncertainty. The enforcement uncertainty of judges will affect the FP more than the sponsors. From a different stance, whenever judges allow the sponsors to respond as they claim under their interpretation of the risk allocation mechanism and such

responses result in gains to the SPV, they will extract a greater difference between the costs of debt and total welfare. However, because of the strategic positions of the sponsors and the FP, whenever the decision of the judge results in a solution leading to a loss in project capacities, more of such losses will accrue to the lender.

Indeed, in a first approach, we may be tempted to believe that the severity of the problem associated with judicial uncertainty is milder than the inefficiencies of *risking*. However, note, both aspects result from the same contractual imperfection. Both conflicts stem from the spaces allowed by contractual incompleteness -crucially, a manifestation of which is judicial uncertainty.

Consequently, should we articulate this analysis formally, we would find that algebraic expressions would be identical in both problems. In both analyses, we would see how -on average- the spaces for departing from what parties would have accepted as optimal (should have they have ex-ante known) result in benefits to sponsors and losses to the FP. In other words, judicial uncertainty tends to favour the sponsors in detriment of claim value to the FP.

Critically, in the formal articulations of both problems, we would also see how backwards induction, both tensions result in incentives for sponsors to withhold efforts refining the quality of the risk allocation mechanism. Below, I will remark how the rule partially corrects these ex-ante incentive distortions.

Finally, also similar to what we saw in the case of *risking*, the value that sponsors will extract from judicial uncertainty will grow with the greater likelihood that the SPV fails to repay its non-recourse debt whenever the judicial interpretation of contractual solutions results in losses of project capacities. In the simple expressions of Chapter 5, this would correspond to the likelihood that the capital $L > d$. Accordingly, in empirical observations, we should see sponsors arguing judicially about the spaces for innovating that would grow as conditions deteriorate after (indistinctively) the SPV or sponsors receive, *bad* or *very bad news*.

Finally, notice how both problems can sustain the proposition that follows independently. However, the second conflicts associated with the problem of *risking* exacerbates as a function of the lower capacities of the FP to implement contractual solutions ex-ante and to enforce them ex-post (the first problem). Hence, judges should protect the FP in virtue of the two problems also in attention to the synergistic ways in which both issues interact.

9.3.4 Postulate

Ex-post, when interpreting clauses enforceable by the FP (the risk allocation mechanism), parties and judges should not protect the interests of sponsors as a class

and of the FP with equal rigour. In a departure from the regular *pari passu* criteria, in PFCs, clauses should be ex-post completed favouring the position (*i.e.*, with attention to the stronger vulnerabilities) of the non-recourse lender.

9.3.5 Ex-post and ex-ante incentives

As advanced, ex-post, the completion of clauses under an *in dubio pro creditore principle* permits the mitigation of the effects associated with the disparities in contracting capacities as well as to the distinct exposures to risks.⁹⁰¹ The rule consequently prevents under-investment from the FP who otherwise anticipates negative externalities from sponsors receiving a *pari passu* treatment.

The *in dubio pro creditore* approach also comes with efficient effects ex-ante. To sponsors, a rule protecting the lender under uncertainty provides further incentives for them to reveal information during the contracting process. Simply, the best-informed sponsors anticipating the behaviour of judges protecting the lender will perceive greater value for allowing the FP to agree on solutions desirable also to them for such cases. That is, during the implementation process, sponsors -the best-informed parties- will perceive greater returns from both revealing information for improving the quality of contracting as well as from committing (permitting enforcement) to such solutions (signalling).

Finally, directly, the revelation of information ex-ante allowing for better signalling and superior implementation quality of the risk allocation mechanism allows for the FP to expect better responses from sponsors for a greater likelihood of debt servicing. This equates to higher participation of lenders in a more significant number of projects (milder under-investment). From the social welfare stance, this means higher welfare to all parties including sponsors not favoured in particular cases by the *in dubio pro creditore* treatment -a Kaldor-Hicks improvement.

9.3.6 Optimal deviation from the *pari passu* treatment

From the above, it is easy to formulate a three-variable criterion for characterising the optimal protection that judges should allow the lender in PFCs. The consideration of the vulnerabilities of the FP in PFCs should grow as a function of:

- *The differences in the expertise (qualifications) of parties.* Parties enjoy different qualifications on the technologies of the project. These capabilities

⁹⁰¹ This is from the limited liability protection to sponsors and from the overall weight of contributions from the FP.

dictate the marginal value of their actions implementing the risk allocation mechanism relative to their costs of efforts.

- *The impact of innovations in the capacities of the SPV to repay its non-recourse debt.* That is, the protection to the lender should grow the more that interpreting provisions as alleged by sponsors (*v.gr.*, from which the sponsors would benefit) could result in an incapacity of the SPV to repay the non-recourse debt.
- *The differences in the degrees of risk aversion.* This aspect relates to the tolerance of the sponsors and the FP to the above likelihood that reinterpretations result in SPV failure to distribute benefits to both parties. For a normative consideration of how risk aversion of parties should reflect in reward functions (the optimal risk-sharing), we can recur to the canonical Bosch rule.⁹⁰²

9.3.7 In dubio pro creditore, favor debitoris, pari passu approaches

Note the compatibility of the propositions with the general principles for the interpretation of contracts convergent in the Comparative Law. Critically, in PFCs, *in dubio pro creditore* does not interact with the frequently-seen approaches of reading contractual provisions restrictively in their capacities to generate obligations when such obligations are not clearly defined (*favor debitoris*). Similarly, the postulate does not imply that judges should treat parties differently within a multilateral (onerous) contract.

In contrasts, the postulate comes to remark the distinct exposures of parties in PFCs. That is, the distinct risks they internalise in virtue of their position and the nature of their contributions and claims in the contractual arrangement. For this, the postulate refers to who judges should be distinctly sensitive when analysing the strategic positions of parties before completing provisions ex-post.

The postulate is also compatible with teleological interpretations. Note how, by completing features missing in expressions of the meeting of minds, induce judges to

⁹⁰² The seminal is K. H. BORCH, “Equilibrium in a Reinsurance Market”, *Econometrica*, vol. 30, 1962. More recently H. M. MÜLLER, “The First-Best Sharing Rule in the Continuous-Time Principal–Agent Problem with Exponential Utility”, *Journal of Economic Theory*, vol. 79, 2, 1998. *Vid.* also, generally, Page 13 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

protect the parties most affected by bounded rationalities. In PFCs, the lender is always the least-qualified to ex-ante refine (complete) contractual precautions.

In any case, the discussion about the implantation of optimality postulates into the individual legal systems escapes the object of this Law and Economics (optimality oriented) descriptive and later normative strategic analysis that should indispensably precede all considerations of legal dogmatic nature towards the legislative or judicial institutionalisation of PFCs.

9.3.8 Paternalism and robustness

The rule provides incentives for the cheapest cost avoider to ex-ante reveal information. The proposal also permits the enforcement of provisions whose result mimics what parties would have accepted should have they known.

The above criterion is a consequence of the distinct implementation and enforcement capacities, and the different risks that they internalise as per their positions in all PFCs. Consequently, the efficiency of in *dubio pro creditore* holds for the entire range of possible influences from nature -from *good news* to *very bad news*. The principle is consequently not paternalistic, and it is robust to all scenarios and structural variations of PFCs.

9.3.9 Principle in contractual practices

The needs for protecting the lender under uncertainty reflect in many contractual practices that are idiosyncratic of PFCs.

Regularly, the FP will enforce provisions allowing her to request for information as the environment changes unexpectedly.⁹⁰³ Additionally, the FP will also preserve some spaces for reacting to such uncertainties and unforeseen evolutions of the environment in the enforcement of penalties to technical default provisions. *E.g.*, once certain events of default have realised, the FP will enjoy discretion for the enforceability of step-in rights, or for assigning entitlements of the SPV to third parties, or for participating in the administration of the SPV.⁹⁰⁴ Moreover, typically, the FP will request that the sponsors solicit permission before the SPV renegotiates

⁹⁰³ *Cf.* page 392 in E. R. YESCOMBE, *Principles of Project Finance*, cit. See also the analysis of contractual practices in the proposal for general duties to inform.

⁹⁰⁴ With literature references, see the analyses of these clauses and their functionalities in chapters 2, 4, and 7.

contracts for inputs with the sponsors.⁹⁰⁵ All these mechanisms come to protect the FP who internalises non-recourse risks and is more vulnerable to incompleteness and enforcement uncertainty.

These practices are not seen in regular diversified corporate contracting or investing where creditors are dispersed, where their contributions are minor within their portfolios of contracts, where their returns depend on collateral value -not on the (enforcement quality sensitive) risk allocation mechanism-, and where they are less (and equally) vulnerable to enforcement uncertainty.

9.3.10 *In dubio pro creditore* principle in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)

Let us now observe the correlation amongst the functionalities of the *in dubio creditore* principle and other propositions in the study.

As analysed, the *in dubio creditore* principle builds on two aspects inherent to the position of non-recourse lenders in all PFC: First, her lower capacities to implement and enforce clauses. Second, the different and more significant risks that the non-recourse lender internalises in PFCs.

As already mentioned, these are also the bases that sustain the efficiency of fiduciary duties of loyalty (the completion ex-post reconstructing the intentions of the lender). Additionally, in conjunction with the specificities of assets, and the non-recourse nature of the debt, the lower implementation capacities of the lender and the greater risks she internalises serve for building the pre-emptive objectives of all clauses.

Consequently, in PFCs, parties and judges should ex-post interpret all clauses of the risk allocation mechanism with pre-emptive objectives, reconstructing the ex-ante teleology of parties (the fiduciary duty of loyalty), and in consideration of the distinct vulnerabilities, implementation, and enforcement capacities of the non-recourse lender (*in dubio pro creditore*).

Just as observed already, the above propositions result from strategic features that are inherent to the positions of the FP in PFCs. Whether judge's awareness of these necessary aspects can serve as the basis for the judicial application of these principles without a prior legislative reform is a matter of legal traditions.

⁹⁰⁵ Cf. the analysis of permissions, waivers and amendments in page 394 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

9.4 *Intuitu personae* interactions

9.4.1 Introduction

Let us now refer to the *intuitu personae* nature of the clauses that shape PFCs. Innovatively, I will point out how the *intuitu personae* features of clauses defining obligations of sponsors and the FP are not equal.

As all the propositions of chapters 8 to 10, these observations show ways forward for legal research. Notably, this sub-section contains observations that are robust in their functional (strategic) aspects but whose legal implications depend heavily on legal traditions -*v.gr.*, on the treatment that jurisdictions and contract laws provide to interests of parties to interact with individual parties (*intuitu personae*) or with any other individual capable of responding as expected (*intuitu rei*).

9.4.2 Elemental aspects of *intuitu personae* or *intuitu rei* relationships

The categories of *intuitu personae* and *intuitu rei* relate to the value that parties attach to the personal characteristics of the other individuals with which they relate contractually. Whenever one individual appreciates the personal (*v.gr.*, unsubstitutable) characteristics that define an individual, we say that the interaction between the two is *intuitu personae*.⁹⁰⁶ On the contrary, in scenarios in which parties commit to delivering goods or services that they can otherwise obtain from other parties or sources (*e.g.*, financing), we say that the relationship is *intuitu rei*. Extensively, the categories apply to sophisticated relationships and also to corporate types. For instance, publicly traded companies will be said to result from *intuitu rei* interactions,⁹⁰⁷ whereas some partnerships are often said to be *intuitu personae*.

Remarkably, it is not the multilateral or bilateral relationship what it is *intuitu rei* or *intuitu personae* but the obligation of each of the parties.⁹⁰⁸ Habitually, two

⁹⁰⁶ Cf. page 45 in J. M. SMITS, *Contract Law - A Comparative Introduction*, cit. Page 362 in B. MARKESINIS ET AL, *The German Law of Contract - A Comparative Treatise*, cit.

⁹⁰⁷ Shares of open held companies, or publicly traded entities will be consequently (regularly) freely transferable.

⁹⁰⁸ *E.g.*, when we request that a highly appreciated painter makes a portrait for us, the obligation to pay fees is *intuitu rei*. In contrast, the commitment of that unique artist (the value that the creditor attaches to his personal characteristics) is *intuitu personae*.

consequences derive from the *intuitu nature of intuitu rei* of each commitment:

First, when completing clauses ex-post, judges will be induced to interpret provisions relating to the substitutability of parties restrictively. *E.g.*, mechanisms restricting the free transferability of shares are commonly acceptable in closely held companies without unlimited liability. The opposite is not true for publicly traded (paradigmatically *intuitu rei*) investments. This is true despite -or, should we say, consequently with-, how under the general principles of contracts law, the assignment of the position of debtors (the transfers of debt) regularly requires the consent from creditors (the risks takers).⁹⁰⁹

Second, the legal treatment of default scenarios is also often distinct. In *intuitu rei* relationships, the creditor may request that the debtor procures the same services of goods from third parties. On the contrary, in *intuitu personae* commitments, because the performance depends on the characteristics of the debtor, the creditor can only choose between accepting the delayed provision of the goods or service plus damages, or compensation for damages exclusively. Let us now shortly observe how all this applies to the case of PFCs.

9.4.3 The needs of project PFCs – the critical relevance of the risk allocation mechanism

As analysed in all chapters of the study, in PFCs, the non-recourse lender does not have recourse to third parties. Additionally, the assets owned by its debtor, the SPV, are regularly highly or fully specific -they do not serve as adequate collateral. Accordingly, as described, the feasibility of PFCs depends on the capacity of the FP to regulate the solutions expected from sponsors under all foreseeable eventualities.

To this end, the characteristics of the individual sponsors are of critical importance for their capacities to comply with the requirements of the risk allocation mechanism for the predefined project. Critically, as analysed in chapters 4 and 7, we can subdivide these capacities into two dimensions: First, the capacities of sponsors to deliver the material inputs as necessary for the single project. Second, their solvency to respond to their commitments to bring further capital to the SPV as predefined in the *cash waterfall* clause. Based on these two dimensions is that ex-ante -i.e., before internalising any non-recourse risks- the FP will devise contractual precautions that will later shape the risk allocation mechanism.

⁹⁰⁹ Vid. page 114 in A. MADS; F. WOOLDRIDGE, *European Comparative Company Law*, cit.

Concretely, with eyes on those two dimensions, the FP will request collateral from third parties, will instruct external advisors to audit the material capacities as the project evolves, or will request the implementation of insurance protections. The FP will also put in place contractual precautions securing that, should the sponsors become insolvent, other parties can cover the capital needs of the SPV. The object of these precautions -*v.gr.*, the cost of implementing (the feasibility of) PFCs- depend on the individual characteristics of sponsors.

9.4.4 The *intuitu personae* value of sponsors

Moreover, as shown in chapters 5 and 6, as part of the two elemental dimensions described above, the FP will also consider that capacities of sponsors to innovate for delivering socially desirable responses as the environment deteriorates. The lender may also observe at the reputation of sponsors in the market as a value that they will attempt to preserve -and save the project- should conditions evolve unexpectedly.

The quality of these provisions -the inputs that the FP expect from sponsors in response to them- defines the initial conjectures that the FP builds about the likelihood that the project produces value sufficient for the SPV to serve the non-recourse debt. These private beliefs allow the lender to verify her individual rationality constraints and enter the project instead of allocating her resources somewhere else. These strategic features inherent of PFCs evidence the *intuitu personae* value of the position of the sponsors to the project that defines the participation of the FP -the main risk-taker in the setting.

Furthermore, the lender will ex-ante implement such precautions via cross-default mechanisms. As analysed in chapters 2, 4, and 7, by allowing the enforcement of penalties against parties other than the persons expected to deliver certain responses, cross-default mechanisms induce other sponsors to exert socially desirable disciplining actions in the benefit of the project and the FP enforcing such provisions. Notice, all obligations of sponsors whose defaults the FP uses for enforcing penalties against the SPV (owned by all sponsors) are, in nature, cross-default mechanisms. Hence, in one way or the other, cross-default mechanisms exist in all PFCs.

Thus, in all scenarios, the FP will also consider how sponsors can interact with each other in anticipation of the responses that she can implement (or the measures that she can adopt) against the SPV. Whereas such functionality of cross-default mechanisms reveals the multiparty functionality of PFCs,⁹¹⁰ it also remarks the

⁹¹⁰ Cf. chapters 4 and 7.

intuitu personae value of the positions of sponsors in their interactions with the SPV and the FP.

9.4.5 The value of the characteristics of the FP

The value of the individual characteristics of the non-recourse lender in PFCs is remarkably distinct to that of sponsors. Whereas the later bring the material inputs necessary to the project and deliver responses under incentives that change as conditions deteriorate, the FP brings cash -a commodity available from money markets.

Indeed, especially in the initial stages of the project and during operation, the position of the FP is highly specific. That is, in this period, the FP is not only the creditor in all clauses of the risk allocation mechanism, but she also builds knowledge of the characteristics and capacities of sponsors for contributing to the single predefined project. The degree of individual specificities of the FP correlates with the transaction efforts (a specific contribution) that she spends for setting up the organisation.⁹¹¹ Crucially, these specific efforts also benefit (and correlate functionally with the implementation efforts of) the sponsors. Hence, during implementation and construction phases (before operation) the FP is, effectively, a specific -thus, *intuitu personae*- party.⁹¹²

However, once the project begins operating, and the sponsors have brought all inputs whose absence could have endangered the feasibility of the project, the position of the FP as an enforcing agent is no longer crucial to project success. The lender now adopts the passive position of a regular lender. Moreover, once the project has revealed its real capacities, the FP may obtain benefits from assigning its claims to cash flows from the project to third parties of lower risk appetites.

Remarkably, the capacities of the FP to discount credits against the SPV expands the

⁹¹¹ Cf. pp. 2, 9, and 10 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

⁹¹² B. KLEIN, “Vertical Integration as Organizational Ownership: The Fisher Body-General Motors Relationship Revisited”, *Journal of Law, Economics, & Organization*, vol. 4, 1, 1988. P. L. JOSKOW, “Vertical Integration and Long-term Contracts: The Case of Coal-burning Electric Generating Plants”, *The Journal of Law, Economics, & Organization*, vol. 1, Spring, 1985. M. ELLMAN, “Specificity Revisited: The Role of Cross-Investments”, *Journal of Law, Economics, and Organization*, vol. 22, 1, 2005.

value that the lender can extract from the project -concretely, it shortens the repayment terms. Backwards induction, this increases the feasibility of the lending facility in the benefit of sponsors. This is what we see in practice with equity investors and bondholders entering the project at later stages. *Cf.* the real-life case-studies in Chapter 4.

9.4.6 The *intuitu rei* position of the FP in PFCs

In PFCs, beyond a certain stage of advances, the individual characteristics of the lender or her contractual position is no longer elemental to the success of the project. Consequently, her presence in the multiparty arrangement is no longer *intuitu personae* but becomes *intuitu rei*. This distinct value of the positions of sponsors and the FP comes with ex-post interpretative implications.

9.4.7 Interpretative implications

The scope of the implications associated with the *intuitu personae* or *intuitu rei* value of the positions of sponsors and the FP is a matter of legal traditions. However, from a strictly functional approach, we observe the following.

The position of sponsors in PFCs should be interpreted as *intuitu personae*. Consequently, all agreements regulating the capacities of sponsors to assign contractual positions to third parties should be completed restrictively. In the same vein, also restrictively must parties and judges interpret the capacities of sponsors to deliver contributions with the aid of third parties whenever such capacities are not clearly defined contractually.

The same (or the opposite) is true for the position of the FP. During the implementation and construction phases, the position of the lender must be observed as *intuitu personae*. Consequently, during these periods, the capacities of the lender to assign her position to third parties should be interpreted restrictively.

However, after a certain stage of progress when her knowledge of the project is no longer necessary, and the lender has delivered the bulk of her debt contributions, the contractual provisions regulating the capacities of the FP to assign her claims to third parties should be completed extensively. Concretely, unless otherwise stated, provisions should be interpreted as favouring her possibilities to discount such credits allowing lower risk appetite investors to take her position once after the project has verified its capacities.

A final remark is relevant in this place. What parties must interpret extensively are the capacities of the FP to assign her contractual position to third parties. This does not apply to the interpretation or completion of other contractual precautions

preserving her capacities to harvest value from the project. Doing so would affect the value of her claims irrespective of the identity of the lender. This is particularly true for the exclusivity in the provision of debt funds to the SPV. See the analysis of the debt dilution problem in Chapter 3.

9.4.8 Contractual practices

The restrictions to the transferability of the positions of sponsors and to the capacities of the SPV to seek debt financing from alternative sources are typical in PFCs. The sole exceptions to this criterion are the *de minimis* interactions with providers of daily inputs (*e.g.*, for leasing a photocopier).⁹¹³ Precisely the opposite is true for the position of the non-recourse lender who, as shown in chapters 2 and 4 (see case-studies and literature references), will regularly preserve her capacity to transfer (discount) credits to third parties as the project evolves.

9.5 Specific commitments to inform (from individual clauses)

9.5.1 Introduction

Let us now make a remark relating to the ex-post completion and interpretation of commitments to inform that parties implement contractually. These are the clauses defining obligations to provide information that the FP considers of critical value to the progress of each project. Hence, this is not a way for later research about a distinct principle for the interpretation of clauses but a remark about how other principles should apply to provisions for obligations to inform.

Accordingly, these obligations must not be confused with the fiduciary duties to inform analysed in Chapter 8. Whereas such fiduciary duties obliged sponsors to reveal *bad news* affecting the project or sponsors, here I am referring to obligations to reveal information as predefined by parties ex-ante with provisions of the risk allocation mechanism.

Examples of these obligations to inform are many. We have seen them in chapter 2, 4, and 7. The FP will request that sponsors report information about ratios of variables that serve for monitoring the progress of the project. The FP may also oblige sponsors to actively confirm compliance with certain obligations -*e.g.*, the arrangement of insurance coverage against political risks. The sponsors may be expected to inform about variables of the market, the solvency or the capacities of peers to deliver inputs

⁹¹³ Cf. page 393 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

of capital contributions as expected. Finally, the FP may also request that off-takers bring confirmations of satisfaction (progress reports) that she will evaluate with independent advisors.⁹¹⁴

9.5.2 Current (lack of) interpretation criteria

Today, legislators, parties and judges interpret contractual obligations to provide information under the same principles used for enforcing other arrangements. In regular contracting settings, judges will also observe the objectives that parties had when implementing information duties. However, nothing of the structure of regular (diversified and collateralised) corporate settings serves for interpreting the extent of application of such clauses more efficiently. In other words, today, judges do not interpret duties to inform with eyes on the strategic objectives of creditors beyond their needs for preserving collateral value as reflected in technical default provisions as often seen in the banking industry (the efficient in the context of collateralised lending).

9.5.3 Interpretation of the risk allocation mechanism

Above and in Chapter 8, I have introduced three criteria in the light of which parties and judges must interpret and complete clauses of the risk allocation mechanism in PFCs. These are the fiduciary duties of loyalty, the pre-emptive objectives of clauses, and *in dubio pro creditore*.

This remark about the application of these principles to the case of clauses with obligations to inform is of special value for two reasons. First, in a paradigmatic way, the objectives of these clauses focus on permitting the functionality of other objectives within the organisations. Concretely, obligations to inform serve for allowing the FP to enforce other provisions. This exposes the strategic interdependence of clauses involving different parties that make PFCs functionally multiparty organisations. Second, for the same reason, the analysis of the case of these information clauses serves as an exercise for exemplifying how parties and judges should ex-post interpret and complete all provisions of the risk allocation mechanism.

⁹¹⁴ In Chapter 4, note the position of independent advisors in case-study 2 - The A2 Highway of Poland.

9.5.3.1 Fiduciary duties of loyalty (the subjects of the protection)

In PFCs, fiduciary duties of loyalty require that, when interpreting and completing provisions of the risk allocation mechanism, parties orient their decisions at reconstructing what all parties should have decided should they have ex-ante known the evolution of the environment. Crucially, this implies that the ex-post completion and interpretation of clauses must be carried out with eyes in the vulnerabilities of the FP too. That is the proposition (an application of duties of loyalty) under which parties should find the scope of the information that the sponsors and the managers should reveal in compliance with concrete obligations to inform.

9.5.3.2 The pre-emptive objectives of clauses (the objects of the protection)

The principle of the pre-emptive objective of all clauses orients parties towards the interpretation and completion of clauses in their objectives of preserving incentives - not protecting actual collateral value or defining compensatory (damage liquidating) mechanisms.

Recall, in PFCs, because of the lack of collateral protection from specific resources of the SPV or recourse to third parties, the FP relies on the capacities of the risk allocation mechanism to induce sponsors to respond with inputs as socially desirable in all scenarios. Crucially, the objects of all clauses should be interpreted for both objectives. First, preserving actual project capacities of the project that dictate the extent to which the SPV will distribute residual benefits to sponsor -the sources of socially desirable incentives. Second, implementing deterrence mechanisms in prevention of the opportunism (*shirking*, *risking*, and *shading*, individually, within sub-coalitions, or unanimously) against the SPV and the FP. These are the strategically pre-emptive (not compensatory) objectives of clauses.

Accordingly, parties and judges should complete and interpret the scopes of all clauses providing obligations with eyes on the information that is necessary for the non-recourse lender to enforce other clauses with the said pre-emptive objectives. In other words, in PFCs, parties and judges must ex-post read clauses defining obligations to inform as if the lender was expecting to receive information sufficient for her to enforced other clauses pre-emptively. This is the type of information that should sufficiently serve for the pre-emptive purposes for which the non-recourse lender implements all provisions of the risk allocation mechanisms. Hence, is the need for information relating to the other mechanisms what dictates the boundaries of the information duties that stem from individual clauses.

9.5.3.3 *In dubio pro creditore* (the protectable vulnerabilities)

Finally, the *dubio pro creditore* states that, in case of doubt, judges should interpret clauses in attention to the distinct capacities to implement contractual protections and the different risks and capacities to internalise such risks of sponsors and the FP.

The principle consequently protects the non-recourse lender in the greater imprecision and more severe incompleteness with which she devises the requirements to provide information. This stance should induce parties and judges to interpret and complete ex-post clauses as including information about relevant scenarios that the lender should not have failed to predefine should she have had better implementation capacities.

Note the precise consistency of this output with the solution resulting from the enforcement of the fiduciary duties of loyalty. There is, however, a difference between the scopes of application of both principles. This difference is perhaps only theoretical -and this is a positive aspect as we consider enforcement robustness. Whereas fiduciary duties of loyalty guide parties towards the completion of contracts with eyes in what all parties would have decided, the *in dubio creditore* principle brings the eyes of parties and judges to the greater vulnerabilities of one of these parties.

9.5.4 The consistency of the remark with contractual practices

Recall, this sub-section brings a remark about the application of earlier principles to the individual case of clauses providing for specific obligations to inform. Based on these principles, the sponsors and the FP should interpret the subjective (protect the FP) and objectives scopes of application of such commitments. Therefore, everything said about the consistency of the *in dubio pro creditore*, the pre-emptive objective of clauses, and the fiduciary duties of loyalty with the contractual practices observed in PFC scenarios applies identically here.

However, it is worth noting how the objectives that the FP pursue when implementing obligations to inform become visible in the functionality that the lender can give to such information. In particular, observe the type of information that the FP requests that sponsors, the SPV, or the off-taker provide to the independent advisors in technical default mechanisms. Such information allows the lender to assess general aspects of the evolution of the project (not the actual value of collateral). Such information also permits that the FP enforces other provisions inducing sponsors to take particular precautions (*e.g.*, insurance mechanisms, stocks

of critical material, authorisations for performing certain activities, refraining from delivering contributions to third parties).⁹¹⁵

The FP consequently implements information requirements for enforcing other provisions whose scopes of application parties should find in light of the *in dubio pro creditore* and pre-emptive principles in compliance with fiduciary duties of loyalty. This scope of application of other clauses defines the purposes of the FP implementing information commitments. Finally, critically, this criterion not only applies to obligations to provide information about particular material aspects but also to the variables that control accounts and other ratios should capture.⁹¹⁶

9.6 Conclusions

In chapters 2 to 4, we have seen the contractual practices that today shape PFCs. In chapters 4 to 6, I have advanced the analyses of elemental strategic features of PFCs. Then, in Chapter 7, we observed the strategic needs of parties in PFCs and how these needs do not find protection under the current legal treatment.

Finally, in Chapter 8, as a way forward for legal research, I proposed the legislative implementation of a PFC-dedicated corporate form. In that chapter, we saw the strategic value of four critical aspects (the pillars for the institutionalisation of PFCs). I remarked the efficiency of fiduciary duties of loyalty under which parties should complete agreements and deliver responses in the protection of the FP, the *de iure* control responsibility of sponsors, the fiduciary duties to inform *bad news*, and the invariable efficiency of allowing the FP to intervene in all contractual arrangements between the SPV and debt providers in the prevention of debt dilution.

Chapter 9, has now brought forward four propositions for the interpretation ex-post of all contracts that shape the strategically fundamental risk allocation mechanism. Three of them are postulates with distinct functionalities. The fourth proposal (the interpretation of specific commitments to inform) results from an application of all the above. The four proposals serve for supplementing the five pillars upon which the legislators should implement the PFC corporate form. Additionally, judges and parties should enforce these postulates in precise conjunction with the characterisations of optimalities offered in Chapter 10 with which they complete the regulation of PFCs.

⁹¹⁵ See the characterisation of provisions of these type in Chapter 2.

⁹¹⁶ For a list with examples of informational requirements *vid.* p. 392 in E. R. YESCOMBE, *Principles of Project Finance*, *cit.*

The principle of the pre-emptive objectives of clauses. In PFCs, all clauses enforceable by the FP (the risk allocation mechanism) should be interpreted ex-post as if implemented with pre-emptive objectives -*v.gr.*, for deterrence, not for compensatory objectives. I call this proposition *the pre-emptive function of clauses in PFCs*. The validity of the principle stems from the objectives with which the sponsors implement protections against the strategic needs that are inherent in PFCs.

Recall, the assets and resources under the ownership of the SPV are, in PFCs, highly or fully specific -hence, they do not serve as collateral protecting the FP. Additionally, as analysed in chapters 5 and 6, projects will collapse not only as a result from *news*, but from the *shirking*, *risking*, and *shading* that sponsors implement (via innovations) as their expected residual returns decrease as a consequence of such *news*.

Consequently, ex-ante, the FP will implement the precautions of the risk allocation mechanism not oriented at liquidating actual or estimated damages, but for two objectives. First, directly, preventing the deterioration of the capacities of the project that governs the incentives for sponsors to deliver socially desirable responses. Second, to limit the spaces within which the sponsors may respond with *shirking*, *risking*, and *shading* as the capacities of the project deteriorates after receiving *news*.

This proposition serves to interpret all clauses of the risk allocation mechanism. Because the pre-emptive objectives result from the conflicting interests and forms of opportunism that are inherent to PFCs, the legal proposition holds robustly. That is, irrespective of evolutions in the environment, project configurations, or jurisdictions.

The in dubio pro creditore principle. Above, we have also seen how, in regular diversified corporate businesses, judges are equally sensitive to the also habitually similar capacities of parties to implement contractual precautions and to internalise default risks. Subsequently, in regular corporate contracting, judges treat parties under *pari passu* criteria.

However, as shown in the early chapters, in PFCs, the positions of the FP and sponsors are not strategically equivalent. Moreover, this inequivalence is in the essence of their strategic positions in all PFCs.

First, in PFCs, there is always a principal, the FP, internalising uncollateralised risks from the actions chosen by agents. This aspect results in the lender internalising more of the risks associated with contractual imperfections.

Second, in PFCs, the interplay between the benefits of limited liability rule (protecting sponsors), the specificities of assets, and the non-recourse nature of debt further results in the FP will internalises more of the total risks associated with

contractual incompleteness and the asymmetries of information. These aspects are not unique to PFCs; however, how sponsors exploit these differences is distinctive of PFCs.

Third, finally, in PFCs, the FP is a financial entity, and sponsors are experts on the field of the project. This aspect equates to the lender being less capable of adopting precautions against contractual incompleteness. This is true even though lenders implement and enforce the risk allocation mechanisms with the aid of external consultants.

Consequently, in PFCs, efficiency calls for judges to complete clauses in attention to the distinct vulnerabilities and different implementation and enforcement capacities of parties. This is the judicial approach that induces parties to ex-ante choose implementation efforts as socially desirable, necessarily.

Finally, the efficiency of the proposition stems from features natural to the positions of parties in PFCs. The FP always internalises non-recourse risks as a function of project implementation. The sponsors always are best qualified and best capable of implementing solutions as well as updating information as the project evolves. Finally, in all scenarios, the FP internalises more of the consequences stemming from implementation imperfections. The postulate remains efficient in all environments and irrespective of project configurations.

The *intuitu personae* and *intuitu rei* interactions. In PFCs, the capacities of the project to produce value sufficient for the SPV to repay the senior debt result from the material and financial capabilities of sponsors. Accordingly, ex-ante, with eyes on these individual characteristics is that the FP implements all contractual precautions of the critically relevant risk allocation mechanism.

Consequently, in PFCs, the clauses regulating the responses expected from sponsors should be treated as *intuitu personae* with the legal effects that legislators could attach to it in the distinct legal traditions. Amongst others, this should include a restrictive interpretation of the capacities of sponsors to substitute (or delegate) their positions in PFCs.

However, the above propositions do not always hold for the non-recourse lender. In PFCs, as the project evolves, the position of the FP loses its specificity. That is, the value of the interaction between the non-recourse lender and parties (sponsors and the SPV) based on the knowledge of the project decreases after the project enters its operation phase. Thus, as the project evolves, it is a common practice that lender discount credits against the SPV. Parties and judges should consequently treat the position of the FP in PFCs as *intuitu personae* or *intuitu rei* as a function of the evolution of the project.

The specific duties to inform. Finally, the chapter has remarked how, in PFCs, the sponsors should interpret the scope of specific commitments to provide information as if implemented with pre-emptive objectives, in compliance with the fiduciary duties of loyalty and (higher) diligence, and *in dubio pro creditore*. These specific duties to inform stemming from individual clauses are not to be confused with the general fiduciary duties to inform *bad news* articulated in Chapter 8.

The four propositions serve for ex-post completing and interpreting all provisions of the critically relevant risk allocation mechanism in PFCs. These principles supplement the set of rules that legislators implement via the PFC corporate form. Judges and parties should apply these postulates in conjunction with the optimalities identified in Chapter 10 with which they complete the regulation of PFCs.

Finally, the efficiency of these four propositions results from strategic aspects that are inherent to the positions of parties in all PFCs -*v.gr.*, they stem from the objectives, vulnerabilities, and the (implementation, performance, and enforcement) capacities of both sponsors and FP in all PFCs. Consequently, the four postulates apply to all PFCs, irrespective of structural variations, numbers of sponsors, qualifications (expertise), numbers of SPV, evolutions in the environment.

Chapter 10

Four legally enforceable optimalities in PFCs

Abstract. Chapter 8 identified five pillars of a proposal for a PFC corporate form. Chapter 9, then characterised four principles for the ex-post legal interpretation of all clauses of the critically relevant risk allocation mechanism. Chapter 10 now analyses four optimalities in PFCs: first, the optimal fiduciary duties of diligence in PFCs; second, the optimal responsibility of managers and sponsors in the vicinity of SPV insolvency in PFCs; third, the optimal hierarchy of claims in PFCs; and fourth, the optimal scope of managerial delegation in PFCs.

Table of contents

10 CHAPTER 10 - FOUR LEGALLY ENFORCEABLE OPTIMALITIES IN PFCS	695
TABLE OF CONTENTS	697
10.1 INTRODUCTION	701
10.1.1 Research question.....	701
10.1.2 Object of the study and the value of propositions	701
10.1.3 Sequence of the presentation	701
10.2 OPTIMAL FIDUCIARY DUTIES OF DILIGENCE IN PFCS	702
10.2.1 Introduction.....	702
10.2.1.1 Value of the contribution	702
10.2.1.2 Sequence of the formulation	702
10.2.2 Current legal configuration of standards of diligence	703
10.2.2.1 Concept of fiduciary duties of diligence today	703
10.2.2.2 Twofold function (objectives and managerial protection)	704
10.2.2.3 Best efforts configuration of the norm.....	704
10.2.2.4 Mandate implementation and enforcement challenges and their strategic implications.....	705
10.2.2.5 Managerial reactions to risk.....	706
10.2.2.6 Relaxation of standards.....	707
10.2.3 Approaching the features of an optimal fiduciary managerial duty of diligence (care)	708
10.2.3.1 Duties of diligence in the objective function of the manager	708
10.2.3.2 Duties of diligence and the boundaries of bilateral contracting under asymmetries of information and risk aversion	709
10.2.3.3 Too high or too low standards of diligence	713
10.2.3.4 Critical variables defining the optimal fiduciary duties of managerial diligence.....	714
10.2.3.4.1 <i>The risk appetite of the principal</i>	714
10.2.3.4.2 <i>The managerial qualifications of shareholders and the manager</i>	714

10.2.3.4.3	<i>The dispersion of shareholders (the value of delegation).....</i>	<i>715</i>
10.2.4	The optimal fiduciary duties of diligence (care) in diversified corporate scenarios.....	716
10.2.5	The optimal fiduciary duties of diligence (care) in PFCs.....	716
10.2.6	Contractual practices and empirical evidence	719
10.2.7	Robustness and paternalism	720
10.2.8	The proposal for an optimal standard of diligence in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)	720
10.3	THE OPTIMAL RESPONSIBILITY OF SPONSORS AND MANAGERS IN THE VICINITY OF SPV INSOLVENCY	721
10.3.1	Introduction.....	721
10.3.2	The proposal	722
10.3.3	The current rule in regular corporate finance; feasibility and efficiency	722
10.3.3.1	The norm and its protective purposes	722
10.3.3.2	Causality of events.....	723
10.3.3.3	Availability of information and the enforceability of the rule	724
10.3.4	The needs of PFCs	724
10.3.4.1	The causality of events	724
10.3.4.2	The availability of information and the enforceability of the rule	725
10.3.5	PFCs-context oriented application of insolvency norms	727
10.3.6	Incentive effects of the rule in PFCs.....	727
10.3.6.1	The incentives in the imminence of SPV insolvency (ex-post)	727
10.3.6.2	Incentives during the implementation stage (ex-ante)	728
10.3.7	Observed contractual behaviour	728
10.3.8	Robustness and paternalism	731
10.3.9	Proposal for an optimal responsibility of sponsors and managers in the vicinity of SPV insolvency; its consistency with other proposals of the study (towards the institutionalisation of PFCs)	731

10.4	OPTIMAL SENIORITY FOR NON-RECOURSE CLAIMS IN PFCs	732
10.4.1	Introduction.....	732
10.4.2	Characterising the optimality.....	732
10.4.3	The rule and its functionality in regular corporate environments.....	732
10.4.4	The contracting parties in PFCs	734
10.4.5	The incentive effects of the seniority of claims in PFCs.....	735
10.4.5.1	<i>News</i> before and after the choices of inputs.....	735
10.4.5.2	Too high seniority to the FP (too low seniority of sponsors).....	737
10.4.5.3	Too low seniority to the FP (too high seniority of sponsors).....	738
10.4.6	Observed contractual behaviour	739
10.4.7	Legal value	740
10.4.8	Paternalism and robustness	740
10.5	OPTIMAL DELEGATION AND MANAGERIAL COMPETENCES (MANDATES)740	
10.5.1	The proposal	741
10.5.2	Predicted and the observed contractual behaviour	742
10.5.3	Legal value	743
10.5.4	Robustness and paternalism	743
10.6	CONCLUSIONS	743

10.1 Introduction

10.1.1 Research question

Chapter 8 identified five pillars of a proposal for a PFC corporate form. Chapter 9, then characterised four legal postulates for the ex-post interpretation of all clauses that shape the critically relevant risk allocation mechanism. As a way forward for later research, the last chapter of the third part of the study answers the following question:

What legally enforceable optimalities can we characterise in PFCs?

10.1.2 Object of the study and the value of propositions

The chapter identifies the features of four legally relevant optimalities in PFCs: First, the optimal fiduciary duties of diligence in PFCs; second, the optimal responsibility of managers and sponsors in the vicinity of SPV's insolvency in PFCs; third, the optimal hierarchy of claims in PFCs; and fourth, the optimal scope of managerial delegation in PFCs.

The first and second characterisations of optimal standards of diligence (care), permit the efficient enforcement of all responsibility rules against delegated managers and sponsors in control of the SPV during the life of the project and in the vicinity of corporate insolvency. These first two postulates identify optimal responsibility standards.

The third and fourth propositions characterise implementation optimalities. The third postulate identifies the optimal hierarchy of claims and shades light on three aspects. First, as all optimality postulates, it serves for reconstructing clauses -*v.gr.*, the *cash waterfall* mechanisms- ex-post. Second, it assists on the ex-post completion of clauses associated with readjustments after sponsors, or the SPV, receive *news*. Third, the criteria for identifying optimal seniorities of claims permit the improvements of the judicial readjustments as part of bankruptcy processes.

Finally, the fourth way for later research, the framework for an optimal delegation scope, facilitates the judicial ex-completion of administrative mandate agreements more accurately. Indirectly, it also serves for identifying decisions and actions adopted beyond mandates.

10.1.3 Sequence of the presentation

Just as in Chapter 9, I will articulate the analyses in the order described above. Additionally, under all of the sections, in different sequences, I will shortly revisit the functionality of the rule as enforceable today in diversified businesses; I will then

recall the strategic needs of PFCs, revisit the functionality of the proposal, and recall the contractual behaviour observed today. In the last parts of the analysis will include robustness and paternalism observations.

10.2 Optimal fiduciary duties of diligence in PFCs

10.2.1 Introduction

Let us now consider a proposal for an optimal rigour of fiduciary duties of diligence in PFCs. The section builds on the conclusions of a work advanced in parallel to this study. The object of such investigation escapes the purposes of this research, and its conclusions have not yet been published. Hence, the following articulation is presented here as a way forward for later research.

10.2.1.1 Value of the contribution

The analysis serves for allowing judges to enforce duties of diligence efficient in the environment of PFCs. Additionally, the postulates provide the basis for ex-post completing mandates to managers in PFCs. A refinement of these propositions permits the advancement of a distinct proposal for regulating the responsibility of sponsors in the vicinity of SPV's insolvency. The postulates also hold equally valid for assessing the responses of delegated administrators as well as the positions of sponsors as *de iure* controllers of the SPV -a distinct proposition in another chapter. The analysis also predicts the shape of the optimal reward functions that SPVs should offer managers in PFCs. Anecdotal evidence manifests in consistence with these estimations.

10.2.1.2 Sequence of the formulation

Next, I will analyse the current legal configuration of the fiduciary duties of diligence as applicable to today's diversified corporate environments. In this first part, I will elaborate on the objectives and jurisprudential approach to this institution. In the third sub-section, I will advance a Law and Economics (strategic) analyses of the variables dictating the optimality of standards of diligence (care). In the fourth section, I will show how such optimality corresponds to what we see today in the context of diversified investments. In the fifth part, I will contrast the above with the features of PFCs and highlight the distinct optimality of fiduciary duties in the case. In the remaining sections, I will correlate the above with the anecdotal evidence in the literature of finance describing the shape of contractual rewards that sponsors offer to managers in PFCs. Before concluding, I will emphasize the robustness and lack of paternalism in the analysis and the consistency of the proposition with other postulates for the legal treatment advanced in other parts of this study.

10.2.2 Current legal configuration of standards of diligence

10.2.2.1 Concept of fiduciary duties of diligence today

In the core of managerial responsibility rules, we find the fiduciary duties of loyalty and diligence. Whereas the fiduciary duties of loyalty designate the objectives that managers should pursue with their decisions,⁹¹⁷ legislators, the jurisprudence, and academic legal literature describe the fiduciary duties of diligence as the standard levels of efforts (care) expected from managers when adopting decisions within the scopes of their mandates.⁹¹⁸

The criteria for enforcing standards of managerial duties of care vary with jurisdictions, with the corporate types, and other variables of companies under consideration. However, convergently, all of the most representative legislators in Western traditions impose at least some broad duty of care on corporate directors and company officers. When referring to them, legislators and judges habitually speak about *reasonable care* that managers must exert when acting in the exercise of their offices.⁹¹⁹ Authors and judges also point out the misconduct that violates such duties of care as that of *negligence* or *gross negligence*.⁹²⁰

Additionally, legislators can produce regulations that are more precise to concrete legal environments. For instance, managers may internalise a negligence-based responsibility to creditors before and after corporate insolvency.⁹²¹ In some jurisdictions, managers may also face criminal prosecution in connection with violations of statutory duties; this is often true in scenarios where managerial trespasses equate to *grossly negligent* misbehaviour.⁹²² Nevertheless, in most of the cases, legislators will not impose penal consequences but enforce obligations to compensate for the losses resulting from managerial misbehaviour in conjunction with

⁹¹⁷ In other parts of this study, see a proposal dedicated to the fiduciary duties of loyalty enforceable against delegated managers and sponsors in PFCs.

⁹¹⁸ Cf. page 79 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁹¹⁹ Cf. pages 39, 79, and 136 in *Ibid.*

⁹²⁰ Cf. page 79 in *Ibid.*

⁹²¹ Cf. pages 134 and 136 in *Ibid.*

⁹²² Cf. pages 134 and 137 in *Ibid.*

corporate insolvency.⁹²³

10.2.2.2 Twofold function (objectives and managerial protection)

As understood today, in regular corporate investing and contracting, the functionality of the abstract principle is understood to be twofold. First, most simply, along with duties of loyalty, fiduciary duties of care permit that the company and third-party contractors and investors anticipate a level of diligence expectable from managers. Second, just as what we see with fiduciary duties of loyalty, the duties of care allow the manager to adopt risky decisions -as socially desirable- without internalising the undesirable (high impact) consequences that, irrespective of her choices of inputs, the inherently risky projects will sooner or later bring to the company.

10.2.2.3 Best efforts configuration of the norm

Because of its functionality at protecting managers when choosing (socially desirable) risky projects, legislators and judges enforce a legal mechanism inducing managers to deliver a certain level of *best efforts*. Accordingly, in diversified investments, managers do not respond to the success of their decisions. Instead, administrators and *de facto* controllers are accountable only for the meticulousness with which they select and implement risky business within the scope of competences that the company trust to them.

Subsequently, the judgment about whether a manager has behaved in compliance with fiduciary duties of care corresponds to a discussion about the *choices of efforts* that legitimise managerial mistakes -her diligent but still ruinous administrative decisions.⁹²⁴ This is the approach of the jurisprudence enforcing *standards*.⁹²⁵

⁹²³ In addition to the *actio pauliana* canonical in the traditions of continental Europe and Latin America, we find actions against fraudulent convenience in the United States and Japan and against undervalue transactions in the United Kingdom. Japan also enforces compensation after managers grossly fail to comply with duties to monitor the administration of the company. *Cf.* pages 136 and 141 in *Ibid.*

⁹²⁴ Additionally, for a company (shareholders) or creditors (ex-post insolvency) to advance a claim of responsibility against a negligent manager, they must first bring evidence of harmful managerial decisions. That is, for claims of responsibility to advance, creditors (owners or third parties) must bring evidence of sub-standard action and losses experienced as result of such misbehaviour.

Remarkably, the object of the rule identifying levels of care (choices of efforts) is very much in line with the modelling style of law and economic studies.

10.2.2.4 Mandate implementation and enforcement challenges and their strategic implications

The abstract nature and the contextual changes in the investment and decision-making scenarios have made the precise characterisation of the said duties of *reasonable care* difficult. In the literature, we find studies about the nature and objectives of fiduciary duties, but we rarely find characterisations of corollaries that could help judges to apply the principle in groups of cases consistently. This has resulted in legal (enforcement) uncertainty. The above observation finds its roots in many aspects.

First, generally, the standards are abstract principles, and the obligations of managers are of *best efforts*. However, their enforceability requires the judgment of concrete (verifiable) outputs that judges use as indirect references of managerial choices of inputs. The imperfection of these signals of individual actions results in both moral hazard and enforcement uncertainty. Both aspects come with known effects to the feasibility of the contractual interaction (see further below).

Second, more tangibly, judges are poorly-equipped to evaluate highly contextual business decisions. Consequently, the enforcement of such general standards results from an action of relative performance evaluation of concrete cases. That is, judges will compare outputs of individual situations with casuistic observations of other scenarios where they assume that managers have behaved in compliance with diligence standards. This task is difficult in environments of diversified investments where the manager adopts decisions in often unrepeatable circumstances.

Third, the difficulties for judges to assess managerial attitudes (good or bad faith, diligence, or negligent errors) also results from the conditions of uncertainty that managers experience when adopting decisions. *Ex-post*, the judges do not face these assessment challenges. Better informed perceptions can make even the most reasonable managerial decision seem reckless *ex-post* (hindsight bias).⁹²⁶

Forth, in diversified contracting, managers receive mandates for advancing projects

⁹²⁵ Cf. page 39 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

⁹²⁶ Cf. page 79 in *Ibid*.

that shareholders do not know at the time of contracting -such projects do not exist when contracting. As conditions may change, backwards induction, the manager faces uncertainties about the outputs she may harvest from her contributions. This is a problem of incompleteness that affects the risk-averse manager more than the companies.⁹²⁷

Fifth, in scenarios of diversified investments, the manager receives a mandate for advancing inherently risky projects. These risks levels are desirable to both the company and society. The riskiness of projects affects the tolerance of the risk-averse manager to the stronger incentives powers that the company must offer under asymmetries of information (see below). This is a feasibility boundary that results in either lower standards of diligence (compliance) or weaker incentive powers for lower total welfare in equilibrium.

Sixth, the values at risk of decisions adopted by managers in diversified businesses are regularly high. As above, this further reduces the tolerance of the risk-averse manager to the incentive powers inducing higher choices of efforts. This also results in the same feasibility boundaries indicated above.

Seventh, in regular diversified corporate investing, managers deal with matters that stem from materially unrelated businesses. This lessens the capacities of managers to learn about the material features risk exposures of each project. This aspect distorts the capacities of managers to adopt individual decisions for each business unit. I will come back to these and the above observations when exposing the contrasts with the scenario of PFCs.

10.2.2.5 Managerial reactions to risk

To a risk-averse manager, the above provides further incentives for either behaving opportunistically or *ex-ante* refraining from contracting. Both aspects result in under-investment. In this second case, as well-described in the literature, behind asymmetries of information, the manager will capture business opportunities that

⁹²⁷ This problem allows for a holdup situation on the side of the administrator. *Vid.* A. S. EDLIN; S. REICHELSTEIN, "Holdups, Standard Breach Remedies, and Optimal Investment", *The American Economic Review*, vol. 86, 3, 1996. Y.-K. CHE; J. SAKOVICS, "A Dynamic Theory of Holdup", *cit.* S. SHAVELL, "Contracts, Holdup, and Legal Intervention", *The Journal of Legal Studies*, vol. 36, 2, 2007. J. CHE, YEON-KOO; SAKOVICS, "Hold-up problem", (2008) *The New Palgrave Dictionary of Economics*, L. Bloom and S. Durlauf (eds.).

will be less risky than the optimal to the company he represents.⁹²⁸

Ex-ante, she can also request an increase in the salary in compensation for the loss of utility associated with output volatility (uncertainty of returns). However, risk-aversion grows convexly. Regardless of the fixed tranche of her salary (the insurance component of the optimal reward function), there will be a point beyond which the poorly diversified individual will no longer tolerate the risk of internalising losses that her actions could generate to the company (*cf.* the optimality identified further below).⁹²⁹

10.2.2.6 Relaxation of standards

The legislators consequently reduce compliance diligence standards as a means of preserving the returns of the risk-averse managers (avoiding the risks of internalising losses), thus allowing them to advance riskier projects as socially desirable. Today, the references of care enforceable in corporate environments are lower (more lenient) than those associated with the good father of a family (*pater familiae*) in bilateral (not corporate) contracting.⁹³⁰ The rigour of standards of diligence further decreases

⁹²⁸ Note how this moral hazard problem is not one of the standard hidden actions but of one of the less familiar hidden information ex-post. This is a category that in the literature of the economic theory of contracts examined in the decade of 1980 and in later years included as a sub type of the standard problem of hidden actions. Notice how the manager does not act clandestinely. Moreover, in fear, she may record all her orders to subordinates and administrative decisions. The moral hazard here arises from the failure of the less qualified principals (the shareholders) to interpret such opportunistic (less risky than socially desirable) decisions. *Vid.* page 9 in O. D. HART; B. HOLMSTRÖM, “The Theory of Contracts”, *cit.*

⁹²⁹ Given hazy standards and hindsight bias, the risk of legal error associated with aggressively enforcing the duty of care might lead corporate decision-makers to prefer safe projects with lower returns over risky projects with higher expected returns. Ultimately, shareholders may stand to lose more from such ‘defensive management’ than they stand to gain from deterring occasional negligence. *Vid.* Chapter 3 in J. KRAAKMAN, REINIER ARMOUR ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, *cit.*

⁹³⁰ For a comparative approach to the rigor with which legislators and judges enforce standards of diligence *Cf.* page 134-7 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, *cit.*

with the degrees of diversification of investments and investors.

In these environments, the last barrier against managerial opportunism appears with the known *business judgment rule*. Such principle effectively insulates from legal challenges all business decisions taken in good faith. In these scenarios, *bona fides* includes all informed decisions (information being the reference of diligence) that the managers adopt without the objective of harming. The above postulates are commonplace in the jurisprudence and the general literature of company law and company Law and Economics.⁹³¹

Nonetheless, the necessary features of the strategic scenario and the position of delegated managers in PFCs are not those described above. Furthermore, with a closer look, we observe that the variables inducing legislators and judges to reduce the standards of care adopt opposite values PFCs.

I will come back to these observations below. Let us now most shortly pay a closer look at the feasibility of contractual compensations and the impact of the standards of diligence in such rewards function.

10.2.3 Approaching the features of an optimal fiduciary managerial duty of diligence (care)

10.2.3.1 Duties of diligence in the objective function of the manager

Let us begin by noting how in her private objective function, the manager sees the standards of diligence as reflecting a level of efforts below which she may face an obligation to compensate damages to the company. Strategically, this potential obligation to compensate for losses functions as an incentive power whose effects (a negative reward) the company enforces against the manager for only for some lower choices of inputs.

Should we put the private objective function of the manager in a curve, we would see that the rewards that she would expect from the company including the enforceability of such duties of diligence would show a positive slope with a cliff-shaped form in its centre.⁹³² On the right of this cliff, the manager would observe higher value rewards;

⁹³¹ Cf. pp. 39, 77, 79, 80, 134-7, 164, 165, 174 and 181 in *Ibid*.

⁹³² The function is continuous on the choice of efforts but it is discrete on the rewards it defines. On the precise point dividing the acceptable from the unacceptable choices of inputs, the reward function is discrete. On the (low) left side we see a negative (dramatic) reward equivalent to an obligation to compensate damages. On the (high)

these would be her salaries and bonuses associated with her diligent (careful) choices of efforts. The cliff edge would show the point below which -*v.gr.*, on the left of which- she would find the negative rewards -the obligations to compensate losses- corresponding with her choices of inputs failing to comply with her fiduciary duties of diligence. The manager would then not concern for any aspect of such standards whenever she delivers inputs surpassing such thresholds, in which case, as said, she would receive her salary and bonuses.

In the nerve of the problem associated with the optimality of the duties of diligence, we find two aspects. First, the said incentive powers enforceable as a consequence of lower-than-desirable inputs are exceedingly strong. Second, in virtue of asymmetries of information, the enforceability of such incentives is harmfully uncertain to the risk-averse agent. Still, parties cannot modify the strength of such a reward (the obligation to compensate). Thus, in regular diversified corporate settings, for allowing the manager to accept adopting high value-at-risk decisions, parties will reduce the scenarios in which such powers should become enforceable. They will then reduce the rigour of the duties of diligence (the range of causes of the harmful legal effect to the risk-averse manager). This is what we see today in the jurisprudence. However, this is not optimal in the case of PFCs.

10.2.3.2 Duties of diligence and the boundaries of bilateral contracting under asymmetries of information and risk aversion

Before focusing on the differences between the optimal duties of diligence in regular corporate settings and PFCs, we must most briefly return to the path of the economic analyses of the company-manager bilateral interaction as in the standard frameworks. Let us most shortly revisit the strictly elemental components of the most straightforward compensation function that a less risk-averse principal (the company) offers to a more risk-averse agent (the manager) under uncertainty (incompleteness) and asymmetries of information (moral hazard). This optimality will serve for later identifying the features of the efficient standards of diligence in PFCs.

Most simply, the asymmetries of information parties cannot verify individual actions precisely. Hence, they cannot contract on the managerial choices of inputs directly. Under asymmetries of information, parties will then recur to indirect proxies for such

left side we see bonuses as a function of choices of managerial efforts (enforced imprecisely).

actions. However, such informational references, albeit verifiable, they are also imperfect. These signals are subject to influences of external factors in the causality between the choices of diligence and the verifiable outputs. As pointed out above, these informational imprecisions equate to uncertainties of returns and a loss of utility to a risk-averse manager.

Asymmetries of information also permit spaces for hidden actions -a distinct but correlated problem. Especially in the case of highly diversified corporate investing, moral hazard also results from the distinct qualifications of shareholders and managers adopting decisions that company owners fail to interpret.⁹³³

To induce the manager to deliver costly responses at the socially desirable levels, the company builds a conjecture⁹³⁴ about the optimal choice of inputs.⁹³⁵ The company then offers the agent a reward that, to the agent, is preferable only in that point. Say, such function offers a reward that, only in that point, is minimally higher than the costs of efforts to the manager, and lower than her costs anywhere else. This induces the rational manager to respond precisely as socially desirable for her interest.⁹³⁶

However, for this to happen, the reward must cover both the costs of efforts and the loss of utility associated with the volatility of returns from the imprecision of the contractible signals. Moreover, such value must be higher than the value that she may expect from her next best alternative placement opportunity. In other words, for entering the project, the manager must expect a value that at the optimal choice of

⁹³³ Or, more precisely, as described above, hidden information ex-post -the case where the agent discloses (registers) her decisions but not the underlying reasons or its effects. *Vid.* page 9 in O. D. HART; B. HOLMSTRÖM, "The Theory of Contracts", cit.

⁹³⁴ The imperfections of the conjecture lead to adverse selection problems, a distinct object of research.

⁹³⁵ This is the choice that equalises the marginal benefits to the principal and the marginal costs that the agent will replicate in the compensation that she will request from the company for verifying individual rationality -participation- constrains or else will allocate her resources somewhere else, in her next best alternative placement opportunity.

⁹³⁶ These are incentive compatibility constraints (ICC). In an algebraic formulation, we would observe this function as the first order condition of the private objective function of the agent with respect to the choice of costly inputs. *Cf. pp.* 19, 20, 35, 53, 64, 66, 78 and others in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

inputs (that she will surely choose in response to the incentive powers⁹³⁷) should cover both the costs of efforts and the loss of utility due to risk aversion -and such value must be higher than the returns that she would receive should she go and allocate her resources somewhere else. These are the individual rationality - participation- constraints of the agent.^{938 939}

Thus, to induce the manager to enter the project, ex-ante, the company will offer the agent a fixed-value transfer that, critically, will be not contingent on verifiable outputs. This is an insurance premium from the least adverse principal to the more risk-averse agent.^{940 941} Thus, the incentive power (the variable component of the

⁹³⁷ Individual compatibility constraints (ICC).

⁹³⁸ The algebraically inclined reader could note that, in an optimised expression of the objective function of the agent (its first order condition with respect to the choice of efforts) we would not see the premium, but we would see the costs of risk aversion growing as a function of such choice of efforts (the exposure of the agent to uncertainties from all sources). Optimally, the value of the premium will be identical to (or minimally higher than) the value adopted by the variable describing the loss of utility to the risk averse agent. We then indicate the verification of individual rationality -participation- constraints (IRC) by presenting the value expected by the agent after delivering inputs as privately optimal and including the premium (subject to) being greater than the alternative placement value often normalised to be zero. *Vid.* page 343 in J. WATSON, *Strategy*, cit. See also *pp.* 94, 250-1, 258, in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

⁹³⁹ For an example of the use of these elemental postulates maximising rewards to agents in project scenarios and Private-Public Partnership cases, see E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit. D. MARTIMORT; J. POUYET, “To Build or not to Build: Normative and Positive Theories of Public-Private Partnerships”, cit.

⁹⁴⁰ The optimal coinsurance mechanism requires the equalisation of the ratio of marginal utilities throughout all states of nature. The seminal is K. H. BORCH, “Equilibrium in a Reinsurance Market”, cit. *Vid.* also, generally, Page 13 in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit.

⁹⁴¹ This observation is standard in diversified corporate environments where the manager is risk-averse and the least risk-averse company is the best capable to internalise some risks. Remarkably, this is not the case in PFCs where the principal is

reward function) will induce the rational agent to choose efforts at socially desirable levels. The insurance term (the fixed component of the optimal reward function) will allow the agent to obtain positive value from such choices of efforts at socially desirable levels; she thus enters the contract.

As we see, optimally, the strength of incentives will grow as a function of the asymmetries of information. The higher the asymmetries of information, the stronger the incentive power that the manager will offer the agent. However, because asymmetries of information correlate with stronger incentives and higher choices of inputs, the stronger the incentive powers leading to higher choices of inputs, the more resources of the agents that will be exposed to enforcement uncertainty (her exposure). Subsequently, with stronger incentives (a function of asymmetries), we will also see higher premiums that the agent will require for entering the project.⁹⁴²

Finally, both the reward function costs (bonuses) and the premiums deprive the principal (the company) of the total value. Hence, the greater the asymmetries of information and the higher the agent's risk aversion, the fewer scenarios in which the company will expect positive returns and comply with her individual rationality - participation- constraints. Thus, for a given standard of diligence, there will be a point of asymmetries of information and values at risk (choices of responses by the agent) dictating implementation costs that will exceed the value produced by the agent thus leaving the company without positive returns. Beyond such point, the pair company-agent cannot advance higher value-at-risk projects in company portfolios.⁹⁴³

The above points out a feasibility boundary. However, distinct from the projects and reward functions that demark that boundary, there is a distinct compensation pair (incentive power and premiums) that maximises the value that the company can extract from riskiest projects at the minimum compensation (incentive power and premium) costs. This is the optimal compensation that the company can offer the manager. Crucially, this optimal compensation depends on the rigour of the duties of diligence. The rigour of the fiduciary duties of diligence defines the costs of premiums that the risk-averse manager will request under uncertainty.

the FP (a creditor), and sponsors (the agents who control project's assets) externalise risks behind limited liability protection.

⁹⁴² Individual rationality -participation- constraints (IRC).

⁹⁴³ The spaces of investments depend on market pressure.

Thus, parties (and legislators, and judges in their default solution) will optimise the range of scenarios in which such incentive powers -e.g., the standards of diligence that, when breached, trigger an obligation to compensate damages- should be enforceable. *V.gr.*, they will optimise (*v.gr.*, reduce) the rigour of the duties of diligence. Under exceptional cases of highly diversified (say, publicly traded) companies advancing risky projects with the aid of managers dealing with high values-at-risk decisions, such standards will be low as those of gross negligence or *dolus*. This is what we see today in the jurisprudence and the literature.⁹⁴⁴

10.2.3.3 Too high or too low standards of diligence

Before advancing, to fix ideas, let us remark most swiftly the strategic consequences of standards of diligence being higher or lower than the socially optimal. What follows holds for all scenarios.

- *The too-high standards of diligence.* The higher-than-optimal standard of diligence results in the manager requiring higher than desirable insurance premiums with consequent under-investment on the side of the principal failing to extract positive value from many projects. Here we find companies not advancing projects.
- *The too-low standards of diligence.* The lower-than-optimal standard of diligence results in moral hazard on the side of the manager and consequently, lower total value harvested by the principal. If well informed, ex-ante the principal will fail to verify individual rationality constraints (will anticipate losses) and will stay away of the project -here again, we see the company failing to advance projects. *Ex-post*, if, by errors in such conjectures, the optimistic principal entered the project, then the principal will find profits lower than initially expected.

The above identifies the optimal standards of diligence in a framework that treats such standards as part of the total reward scheme in the objective function of the manager. Let us now most briefly observe the impact of variables that are inherent and critical to the interaction between companies and their managers under fiduciary duties of diligence. I will then compare the two extreme scenarios of a highly diversified (in investments and investors) company and the case of PFCs.

⁹⁴⁴ *Vid.* Chapter 3 in J. KRAAKMAN, REINIER ARMOUR ET AL, *The Anatomy of Corporate Law - A Comparative and Functional Approach*, cit.

10.2.3.4 Critical variables defining the optimal fiduciary duties of managerial diligence

I will now remark the impact of first, the risk appetite of the principal (the company). That is, the value that the diversified shareholders extract from the riskier and higher value-at-risk decisions of the manager. Second, I will focus on the impact of the differences in managerial qualifications of shareholders and the agent. In the third place, I will observe the effects of the degree of dispersion of shareholders.

10.2.3.4.1 The risk appetite of the principal

Recall, the manager is risk-averse. Then, in a first approach, it may seem that the value that behind limited liability shelter the diversified investors extract from portfolios of riskier projects increases their willingness (the capacity of the company) to reward the agent for internalising higher risks. Then, in principle, this would make both principal and agent more tolerant to higher standards of diligence.

However, in a closer look, we see how the costs of volatility affect the agents and the principal differently. Hence, the above observation does not hold. Intuitively, from extra risks and higher values of decisions, the losses of utility to a risk-averse manager will grow faster than that of the principal. Hence, as levels of risk and value at risk grow, the manager will lose its capacities to internalise risks faster than the company. The premiums that the agent will request from the manager will consequently grow faster than the loss of tolerance of the principal to such growing risks.

Thus, as risks grow, the principal should internalise more of the consequences from such risks (lower managerial diligence standards) rather than assuming (faster-growing) premiums payable to the agent. The lower optimal fiduciary duty of diligence here results from the distinct ways in which both the company and the agent are gradually more sensitive to higher risks and higher value at risks decisions.

10.2.3.4.2 The managerial qualifications of shareholders and the manager

The higher managerial qualifications (expertise) increase the value and consequently, the scope of delegation. This simple postulate is the same mentioned in another place of this study, where I focus directly on the optimal scope of delegation. Throughout a broader range of decisions, the company extracts more value from the same decisions whenever such solutions come from the manager.

Recall, the marginal value of qualifications (expertise) grow concave as a function of the choices of inputs. The choices of efforts also increase with more valuable

decisions. Then, if both the marginal value of adopting decisions grow concave on the choices of inputs and such concavities are more pronounced (decreasing faster) for the least qualified shareholders, it follows that the difference in the marginal values of qualifications (expertise) from shareholders and managers will become more pronounced the riskier and more valuable the decisions under consideration.⁹⁴⁵

However, the capacities of the manager to internalise risks decreases exponentially (the impact of risk aversion grows convex). Then, the increasing differences in the qualifications of managers and shareholders should further induce the company to internalise risks away from the manager. This corresponds to an optimal duty of diligence (risks internalised from managers) decreasing as the qualifications of the managers grow relative to those of the shareholders and as the values at stake and risks (volatility of outputs) increase.

This conclusion is identical to the one in the earlier section. However, here the preference of lower duties of diligence results from the value of qualifications that increases as complexity and values-at-risk grow.

10.2.3.4.3 The dispersion of shareholders (the value of delegation)

The dispersion of shareholders comes with two distinct but reciprocally dependent consequences. The first is that, as the number of dispersed owners grows, the fraction of them that become administratively passive also increases. We can build this observation from two perspectives. From the stance of corporate finance (which often feeds the literature of company law and economics), we speak about rational control apathy that arises when smaller stakeholders see that the returns from their managerial contributions decrease with the dissipation of ownership.⁹⁴⁶ From the stance of contract theory, the identical intuition results from observing the moral hazard in team problem -in essence, a free-rider problem- amongst all shareholders contributing to the same team output (the managerial or decision-making output) with non-contractible actions.⁹⁴⁷

⁹⁴⁵ In a framework focussing on the optimal delegation (see a distinct proposition in this study) this observation calls for a broader delegation for riskier, higher value, and materially complex decision-matters.

⁹⁴⁶ *Vid.* M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit.

⁹⁴⁷ *Vid.* B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. E. RASMUSEN, “Moral Hazard in Risk-Averse Teams”, cit.

Both aspects lower the capacities of the team to adopt decisions. Hence, the quality of the collective decision-making efforts will decrease the larger the number of shareholders of the company. As advanced in other parts of this study, this equates to a higher appreciation for the delegation of managerial decisions and consequently broader scopes of delegation in that organisation. As already mentioned, a higher value from managerial decisions -as in the above articulation behind the first observation of the impact of higher managerial qualification of the agent- calls for lower fiduciary duties of diligence enforceable against the agents as a means of inducing them to adopt risky decisions on behalf of the company.

The second implication from the dispersion of shareholders is the increased capacity of individuals to tolerate higher risks (from both volatility and values at stake). Most intuitively, more people can pool greater resources from smaller individual contributions. They can also better dissipate the potential losses associated with such contributions. Diversification of investments increases risk preferences with the consequences pointed out above. The company should then enforce lower fiduciary duties of diligence (remove risks from the agent) thus inducing the agent to adopt riskier -and higher value at stake- decisions benefiting dispersed investors contributing behind limited liability protection.

10.2.4 The optimal fiduciary duties of diligence (care) in diversified corporate scenarios

The above can explain the relaxation of standard duties of diligence in larger companies, where managers adopt high value-at-risk decisions for highly diversified portfolios in the benefit of highly dispersed (passive) investors.

In these scenarios, the companies internalise most of the consequences from the decisions of the risk-averse manager. The managers receive both high premiums (the fixed components of salaries) and bonuses on project performance. This is coherent with the high asymmetries of information and higher risks that the risk-averse manager internalises as a result of enforcement uncertainty (the necessary consequence from asymmetries and incompleteness). However, administrators will internalise the implications of their actions only when contractible signals indicate gross negligence (or mala fide) from her side. In other parts of the study, as a distinct way forward for research, I will also refer briefly to how these features also correspond with wider scopes of delegation in these highly diversified scenarios.

10.2.5 The optimal fiduciary duties of diligence (care) in PFCs

The strategic features that are inherent to PFCs are precisely opposite to those described above as calling for lower standards of fiduciary duties of diligence.

Moreover, because of the higher qualifications (expertise) of project-dedicated managers, the predefinition of the single project, and -critically- the precision of enforcement, in PFCs, fiduciary duties of diligence should resemble the standards under which judges assess the completion of obligations in bilateral contracts for predefined obligations -the risk allocation mechanism reflecting the very nerve of the objectives of parties in PFCs. Let us see these differences and their implications.

First, in PFCs, as originators of the single project and as its critical input providers, the sponsors (shareholders, not the agent) are best qualified in the technological aspects of all decisions. Hence, sponsors do not value delegation as a means for benefiting from the expertise of the manager. Moreover, the differences between the marginal value of qualifications as a means for adopting decisions of sponsors and the manager grow with the higher values at risk and more complex matters; this evolution is opposite to the one described above.⁹⁴⁸ Hence, in PFCs, sponsors do not value lowering standards of diligence for protecting the manager so that the manager can adopt these decisions. The sponsors can deal with these matters directly and obtain higher outputs. Consequently, judges should ex-post interpret that, when adopted by managers, such decisions must either respond to higher standards of diligence or not be delegated. Note how, from this observation, we can bring a postulate for interpreting the scopes of managerial mandates -the object of a distinct proposal further below.

Second, in PFCs, the sponsors are few. Hence, both the fixed costs associated with the processes of adopting collective actions as well as the under-investment resulting from the moral hazard in team problem in which they interact does not affect the costs of the outputs of the decisions they adopt directly. Hence, the sponsors can deal with matters directly, at the higher output. And crucially, they can do this after updating information as the project evolves (without internalising costs from ex-ante incompleteness of delegation contracts). Just as above, in PFCs, sponsors do not value lowering diligence standards for inducing managers to adopt risky decisions that they will not delegate.

Third, an identical observation holds for the ex-post completing function of a delegation that sponsors do not value in PFCs. Intuitively, in PFCs, the SPV does not hunt for business opportunities that parties do not know at the time of incorporating the company and implementing the mandates for delegation. In sharp contrast, in

⁹⁴⁸ This corresponds with a scope of delegation that *decreases* for these types of most relevant decisions.

PFCs, the sponsors and the FP spend efforts anticipating contingencies and regulating them in the risk allocation mechanism for the single project. Thus, as the project evolves, the manager receives these instructions on how to complete a project. As pointed out, in PFCs, contingencies will be solved as they arise directly by shareholders -remarkably, with the likely intervention of the non-recourse lender. Just as in the last paragraph, in PFCs, the sponsors do not benefit from lower standards of diligence for allowing a manager to adopt risky decisions that they either predefine or they can solve directly (without delegating competences) for higher welfare.

Fourth, in PFCs, the shareholders can appoint a manager who is not only an expert in the industry sector but who also is an expert in the single project. Hence, the marginal value of efforts from the single manager to deal with the least relevant daily matters under her competence is higher than the capacities of administrators dealing with portfolios of materially independent projects. To higher marginal value, correspond stronger incentive powers -here in the form of a negative reward (the obligation to compensate losses from substandard contributions). However, remarkably, because in PFCs the enforcement capacities of sponsors and judges are higher, in these unique scenarios such stronger incentives are strictly compatible with lower premiums to the risk-averse manager who not only delivers higher value decisions but also faces lesser uncertainty about the output of her privately costly actions.

Fifth, finally, in virtue of the highest qualifications of sponsors -that is, of their highest capacities to receive, process, and reveal verifiable information directly from the project- in PFCs, the risks of enforcement errors are lower than in regular diversified environments. Intuitively, shareholders can assess the quality of managerial decisions relating to the single project on an individual basis. This permits that they provide concrete instructions and deliver information for judges to reconstruct the behaviour of managers with accuracy. The enforcement risks that result in the value of lowering the rigour of fiduciary duties of diligence for protecting the risk-averse manager do not hold in the scenario of PFCs, where the asymmetries of information are minor. Crucially, because in PFCs the sponsors are of highest qualifications, they can not only verify individual actions of the manager (the orders she sends to other employees), but they can also better interpret their objectives -thus

mitigating the problem of hidden *information ex-post*.⁹⁴⁹

Finally, in PFCs, managers follow instructions and implement concrete orders about a predefined project that they receive from shareholders. The spaces within which managers adopt decisions appear confined to the least relevant matters. These are aspects of lower values at stake that result in mildest losses of utility to risk-averse agents and are also the matters that sponsors can most rigorously inspect. Consequently, in PFCs, standards of diligence should be not lower but higher than what we observe in diversified businesses.

In PFCs, the duties of diligences -the standards of compliance- should resemble those enforceable against agents as in the literature of labour law and economics. In particular, the case of the manager in PFCs should resemble one of a worker who is of the highest qualifications (expertise) but who still work under precise instructions and sharp monitoring and enforcement from the principal. This is precisely consistent with anecdotal evidence. See next.

10.2.6 Contractual practices and empirical evidence

The above description of the contractual interaction predicts that, in PFCs, SPVs should offer managers low or nearly flat incentive powers (bonuses) combined with also low salaries (risk premiums). Remarkably but unsurprisingly, the above observations correspond with anecdotal evidence in the finance literature of non-recourse project financing.⁹⁵⁰

⁹⁴⁹ As remarked in an earlier footnote, the moral hazard here arises from the failure of the less qualified principals (the shareholders) to interpret such opportunistic (less risky than socially desirable) decisions. *Vid.* page 9 in O. D. HART; B. HOLMSTRÖM, “The Theory of Contracts”, *cit.*

⁹⁵⁰ One indication that project governance systems work is the fact that project managers have relatively “flat” pay-for-performance compensation schemes. The typical chief executive of a project company receives (1) a base salary; and (2) a performance bonus equal to a relatively small fraction (0-50%) of the executive’s base salary. Although the absence of high-powered incentives is consistent with the resolution of agency conflicts by other means, an alternative interpretation is that high-powered incentives are not needed in the first place. Like managers of regulated businesses, project managers make very few, if any, strategic decisions. Most of the important strategic decisions (*e.g.*, should we build the pipeline? over which route? with which partners, how big? etc.) are made before the project begins. Instead,

The objectives of all parties (FP and sponsors collectively) of implementing a relationship in which the spaces for managerial discretion appear most restricted and standards of compliance are higher than in regular diversified investing manifest in the concrete specifications of all (technical default) regulations of the risk allocation mechanism.⁹⁵¹ These standards of compliance are not compatible with the interaction between companies and dispersed investors, contractors, and creditors in regular corporate environments where managers advance materially independent projects as opportunities arise with time and where creditors rely on corporate value rather than on the success of individual opportunities.

10.2.7 Robustness and paternalism

The proposals are robust and result from features that are inherent to the components and positions of parties in PFCs. The description of an optimality cannot be paternalistic.

10.2.8 The proposal for an optimal standard of diligence in PFCs; its consistency with other proposals of the study (towards the institutionalisation of PFCs)

The stricter fiduciary duties of diligence in PFCs apply to all actions from the appointed managers and sponsors in control of the SPV. The same standards serve for ex-post interpreting what the FP can expect from sponsors in all clauses of the risk allocation mechanism. The stricter fiduciary duties of care also apply to the enforcement of general and specific duties to inform, and naturally to the responsibilities of sponsor in the vicinity of the SPV's insolvency (see below). Critically, also from the enforcement perspective, the fiduciary duties to which sponsors respond in PFCs should be understood in conjunction with their treatment as controllers of the SPV -as advanced in Chapter 8.

As a function of the capacities of judges to enforce decisions based on efficiency rationales, the postulate could be judicially enforced without legislative reform. However, a legislative institutionalisation of PFCs should facilitate the publicity of the registration of the project under a PFC corporate form. In conjunction with the evolution of jurisprudential approaches, registration and publicity should then

project managers make tactical and day-to-day operating decisions. B. ESTY, "The Economic Motivations for Using Project Finance", cit.

⁹⁵¹ With literature references, see the analysis of contractual practises in Chapter 2.

facilitate the enforcement by creditors other than the FP.

10.3 The optimal responsibility of sponsors and managers in the vicinity of SPV insolvency

10.3.1 Introduction

In PFCs, the SPV advances a single highly specific project. Hence, the risks of the SPV -and the FP- are the risks of the project's specific inputs (and its input providers). In PFCs, the sponsors are also best-informed about the progress of the single project. As contractors and controllers of the SPV, as soon as they observe a deterioration of the capacities of the SPV, incentives for behaving opportunistically exacerbate to them in ways distinct to what we observe in diversified corporate environments (*cf.* chapters 5 and 6). As conditions deteriorate, these peculiar incentives and forms of opportunistic responses deprive SPV's of their remaining capacities, further raising the likelihood of corporate insolvency.

As a result, in PFCs, as enforceable today, the current insolvency standards fail to induce sponsors to respond in the protection of corporate resources in the benefit of creditors timely and effectively. In PFCs, the sponsors should respond under insolvency laws as soon as they become aware of the imminent incapacity of the SPV to serve its obligations irrespectively of whether such events affect the single project, the capacities of its input providers, or other critical resources (*e.g.*, competitors). Moreover, sponsors should react under insolvency regulations independently of whether such a revelation of the imminence of SPV's insolvency results from events within or beyond company control spheres.

The rule provides incentives that are efficient *ex-post* and *ex-ante*. *Ex-post*, they reduce the spaces for *risking*, *shirking*, and *shading* and induce sponsors to reveal information useful for enforcing project-idiosyncratic contractual precautions. *Ex-ante*, the availability of information of superior quality expands the implementation quality of the risk allocation mechanism and consequently also the feasibility of PFCs. The contractual practices verify the needs of parties for legal protection and the market-mimicking efficiency of the proposal. The postulate is robust to all environments, structural variations of PFCs, and corporate types of the SPV.

Let us see the proposition -a way forward for later research- with more details.

10.3.2 The proposal

In the context of PFCs, as *de iure* controllers⁹⁵² and delegated managers, the sponsors should be responsible for revealing information about events that indicate the imminent incapacity of the SPV to pass the solvency tests as currently defined irrespective of whether such events take place within or beyond the spheres of company control.

The postulate does not require a change in insolvency standards or tests. Instead, the proposition seeks a readjustment of the judicial criteria of the scopes of responsibilities of managers and controllers and their obligations to reveal information about the imminence of the failure of the SPV to pass solvency tests as generally defined today. The critical distinction between the proposal and the current approach resides on the events that should serve for revealing the imminent incapacity of the SPV to pass such tests. Consequently, assuming a reconsideration of the jurisprudential approach, the proposal reveals itself as directly operative.

10.3.3 The current rule in regular corporate finance; feasibility and efficiency

10.3.3.1 The norm and its protective purposes

Today, the comparative legislator uses several legal mechanisms for defining the thresholds of solvency and consequential initiation of solvency responsibility obligations of managers. However, in the vast majority of Western jurisdictions, we always find some combination of two criteria. First, a debtor is insolvent when its liabilities exceed its assets. These are the *balance-sheet* or *over-indebtedness* tests. Alternatively, second, the debtor is also insolvent when *it is durably unable to pay its debts as they fall due*. These are the *cash flow* or *commercial* insolvency tests.⁹⁵³

The jurisprudence accepts many indicatives of characteristics of businesses that make

⁹⁵² Cf. the proposition about the *de iure* control treatment of sponsors in other chapter of this study.

⁹⁵³ Vid. pp. 122 (footnotes 30) and 133-4 in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit. See also P. 173 in F. TOLMIE, *Corporate & Personal Insolvency Law*, cit. Pp. 123-5 in V. FINCH, *Corporate Insolvency Law - Perspectives and Principles*, cit. See also, in many places and with reference to European jurisdictions A. MADS; F. WOOLDRIDGE, *European Comparative Company Law*, cit.

companies fail either of the insolvency tests mentioned above. However, in regular diversified corporate scenarios, legislators and judges will build such tests -or find relevant indicatives of company capacities- based on elements that take place at the corporate level. *E.g.*, they may observe the capacity of the company to comply with its obligations without recurring to exceptional means of financing; they may also recur to capitalisation ratios signalling repayment capacities. Additionally, legislators may also use the redeployment value of assets (collateral) relative to the current liabilities.

In all cases, managerial responsibility begins as soon as the manager becomes (or should become⁹⁵⁴) aware of the actual or imminent insolvency. Since that moment, managers and *de facto* controllers are responsible for adopting decisions preserving the collateral value of assets. In other words, once the company is insolvent -unless they are substituted judicially- managers must act in protection of creditors under the postulates of insolvency or bankruptcy regulations.

From the stance of incentives, in regular corporate scenarios, the above tests are accurate at identifying the moment in which a company passes a point beyond which two consequences arise: first, under limited liability shelter, controlling shareholders will perceive stronger incentives for adopting decisions transferring externalities to creditors beyond socially desirable levels (*i.e.*, risk shifting, *cf.* Chapter 3). Second, such actions will come in detriment of collateral value, thus allowing the materialisation of risks higher than the willingly internalised by creditors *ex-ante*.

10.3.3.2 Causality of events

In their current form, from the stance of causality, in diversified corporate environments, the above tests are efficient at detecting the objective elements that lead effectively to the incapacity of the company to repay its obligations.

In these scenarios, the above is true because the companies extracting benefits from diversified portfolios are *less* sensitive to events external to the organisation affecting only one or few projects. Intuitively, the probabilities that events affecting some projects, or that some providers of some projects, or that some costs of inputs faced by some of the input providers of one or more projects bring the company closer to its insolvency are, in diversified environments, *low*.

Hence, the tests used for identifying insolvency states recur to references of the state

⁹⁵⁴ Observe the strategic impact of the proposition about the higher optimal duties of diligence of the best-informed sponsors in PFCs.

of affairs of the entire legal entity -*e.g.*, as remarked, capitalisation ratios, or capacities to comply with obligations without recurring to exceptional financing means (both cash flow references). These tests reflect the sources of insolvency as revealed within the company, or under the company control (*cf.* Chapter 7).

10.3.3.3 Availability of information and the enforceability of the rule

As enforced today, in the environment of diversified corporate investing, from the information stance, solvency tests and responsibility rules are efficient. In diversified businesses, managers are the least-informed about the status of the several materially independent projects. Their returns from monitoring the many materially independent projects they manage decrease as a function of portfolio diversification. Thus, current insolvency responsibility rules induce managers to react as soon as information manifests at the portfolio level.

In highly diversified environments, a distinct rule inducing managers to react responsibly from events affecting providers of individual projects or other circumstances remote to their informational capacities would otherwise result in socially undesirable responses and subsequent under-investment. Managers would increase monitoring efforts inefficiently; more drastically, administrators would choose investment options that could be more easily monitorable, or that they are less vulnerable to unforeseen contingencies. These inefficiencies would grow as a function of managerial risk-aversion -a problem of regular corporate businesses where the poorly diversified manager is expected by diversified shareholders to adopt riskier positions in the benefit of the company.

10.3.4 The needs of PFCs

The case of PFCs is different in all those aspects. As analysed in other chapters, in PFCs, the SPV advances a single predefined project whose assets are highly specific. Consequently, in PFCs, the repayment capacities of the SPV depend on the success of the single project. Moreover, in PFCs, such project results from the interaction between the SPV controlled by sponsors collectively and themselves as individual input providers. This comes with remarkable implications to both the causality stance and the informational dimensions. Both aspects are critical to the inefficiency of the insolvency tests and the insolvency responsibilities as applicable today (not to their abstract postulates).

10.3.4.1 The causality of events

In PFCs, the value expected from claims held by the non-recourse lender depends on events (*news*) affecting the unique project defining the repayment capacities of the

SPV. These events include contingencies taking place within the company as well as beyond the material sphere of control of managers.

Intuitively, the SPV advancing a single project will not count on the cash flows generated by a portfolio of other business opportunities for compensating for the losses of capacities of the single project affected by such remote events. In PFCs, severe contingencies affecting a highly specific input provider (a sponsor) could well bring the entire project to its collapse. To the same effect, an extraordinary event affecting the availability of a critical input may also put the SPV in default to its obligations to delivering services to the open market or to an off-taker timely. Events affecting sponsors may be of a material or financial nature. The sponsor may become insolvent, or for any reason, find difficulties in delivering outputs specific to the project.

Consequently, events that, under diversified environment would come at some costs associated with the capacities of some businesses, but that would not result in the insolvency of the company, in the case of PFCs, may (should foreseeably) lead to a catastrophic deterioration of SPV's repayment capacities. As observed next, the imminence of distress resulting from such events can be anticipated by the best-informed sponsors. The efficient rule should produce incentives for them to react based on this superior quality information.

10.3.4.2 The availability of information and the enforceability of the rule

In sharp contrast with what we observe in diversified corporate management, in PFCs, the administrators and the sponsors are themselves the input providers of the single project. Moreover, sponsors interact materially with project assets and exchange information with each other and with administrators about operational aspects. Hence, the sponsors and the managers are best-informed about the circumstances and progress of the unique project -the sole source of value to the SPV in PFCs.

Consequently, in PFCs, both the sponsors and the delegated manager are best-prepared to identify contingencies affecting either the project, or the sponsors, or other aspects that should lead to the failure of the project to produce value as expected.⁹⁵⁵ Observe how, in PFCs, such events do not affect the company

⁹⁵⁵ Note, this is the value expected not only for repaying the non-recourse debt but also for repaying contracts and distributing residual benefits to sponsors. These are

immediately, and the information about such circumstances does not reach third parties immediately. Both the impact of such events and the information reaching third parties -including, critically, the FP- materialise long after sponsors have become aware of them and enjoyed a time for behaving as privately desirable and feasible.

Accordingly, two aspects result from the above. First, unless the FP requests ex-ante that sponsors reveal that information expressly,⁹⁵⁶ for a while, such events will remain undisclosed from other parties-including the lender. Second, recall, in PFCs, opportunistic incentives to sponsors grow as they perceive a loss in the capacities of the SPV to repay subordinated claims and distribute dividends (both expectations junior to the claims of the FP). This, I have analysed in chapters 4 to 6. Hence, during the period until the information about the SPV's imminent distress becomes available to third parties and the FP, the sponsors will enjoy a space for implementing *risking*, *shirking*, and *shading* in detriment of project value and consequently of the (remaining) capacities of the SPV to repay its senior claims.

Note how *risking*, *shirking*, and *shading* are responses to tensions that manifest in the responses by sponsors to contractual arrangements between themselves as input providers and the SPV. These are forms of opportunism that verify beyond the spheres of SPV control. These are opportunistic forms that stem from reactions by contractors and that often involve the collusion amongst them. Effectively, as enforced today to the best and earlier-informed sponsors, in PFCs, the insolvency tests and the managerial (and control) responsibility come too late to preserving SPV capacities as well as the interests of the FP efficiently.

the events of *very bad news* that -even if they do not result in insolvency as defined today, they may still come with severe deteriorations of incentives. This is the access to information that results in the efficiency of general and specific duties to inform in PFCs.

⁹⁵⁶ The reader may here observe the relevance of the general and specific duties to inform in PFCs proposed in other parts of the study. Similar duties to inform do not exist today. Hence, the vulnerable FP internalises the informational costs of incompleteness (the costs of failing to request information expressly ex-ante).

10.3.5 PFCs-context oriented application of insolvency norms

Consequently, in the context of PFCs, as *de iure* controllers,⁹⁵⁷ the sponsors and delegated managers should be responsible for revealing information about events that indicate the imminent incapacity of the SPV to pass the solvency tests as currently defined irrespective of whether such events take place within or beyond the spheres of company control.

The proposal pursues a readjustment of the judicial criteria of the scopes of responsibilities of managers and controllers and their obligations to reveal information about the imminence of the failure of the SPV to pass solvency tests as generally defined today. Consequently, as already mentioned, assuming a reconsideration of jurisprudential approach, the proposal reveals directly operative.

10.3.6 Incentive effects of the rule in PFCs

Let us now observe the incentives that such rules should generate during the enforcement of responsibility rules (ex-post), and before contracting, during implementation stages (ex-ante).

10.3.6.1 The incentives in the imminence of SPV insolvency (ex-post)

Strategically, a judicial stance more prone to identifying events leading to insolvency scenarios sooner, that is, when events take place afar from the company, and before they have produced their effects to the project and the SPV, would come with three implications:

First, via a responsibility rule, it would induce sponsors to reveal information necessary for triggering contractual protections and insolvency regulations timelier than whenever such events have already caused its effects against the project. These are contractual protections of the risk allocation mechanism whose quality dictate the capacities of the lender to verify individual rationality constraints and hence the feasibility of PFCs.

Second, the rule would permit that third parties receive such information about such events and file for insolvency procedures more timely. Consider the case of the FP receiving information from independent advisors. The creditor could now claim judicial protection as the incentives to respond opportunistically via *shirking*,

⁹⁵⁷ *Cf.* the proposition about the *de iure* control treatment of sponsors in other chapter of this study.

risking, and *shading* begin growing. The identification of the insolvency procedure should also allow the timely (earlier) enforceability of contractual precautions preventing that the FP could implement with sponsors -not only with the SPV.

10.3.6.2 Incentives during the implementation stage (ex-ante)

Ex-ante, backwards induction, all parties anticipate that during the evolution of the project, sponsors will be induced to reveal information of higher quality. This allows all parties to implement solutions -i.e., to predefine penalties from distinct default mechanisms and collateral protections- associated with events whose information would otherwise fail to receive. Effectively, a rule obliging sponsors to reveal information about the imminence of SPV's distress and its expected incapacity to repay its obligations serves for ex-ante improving the capacities of parties to implement the risk allocation mechanism (implementation feasibility). This then allows for higher distributable welfare and -via compliance with individual rationality (participation) constraints- more numerous projects taking place.

10.3.7 Observed contractual behaviour

The contractual behaviour of parties in PFCs correlates with the needs for legal treatment and the objectives of the proposal. In most of the cases, the following provisions are incompatible with the diversification objectives of parties in regular corporate environments. Both aspects reveal the market-mimicking efficiency of the postulates.

First, in PFCs, the lender implements solutions that she enforces timely to prevent opportunism. Concretely, in PFCs, it is a common practice that parties include what they call potential events of default. These are circumstances in which an event of default can be foreseen but has not yet occurred, thus allowing early action on the lender's part. *Lenders may wish to include 'potential Events of Default,' i.e., an Event of Default that can be foreseen but has not yet occurred, thus allowing early action on the lenders' part. This should be acceptable to the Project Company provided that it is quite clear that the occurrence of the event is only a matter of time.*⁹⁵⁸ Concretely, parties often agree that the FP will intervene in the decision-making system of the SPV. This permits the timely intervention of the FP of critical value whenever the SPV renegotiates with sponsors under opportunistic incentives (*shading* and *risking*). In these scenarios, the lender can consequently verify that

⁹⁵⁸ Cf. p. 397 in E. R. YESCOMBE, *Principles of Project Finance*, cit.

renegotiations take place under market-controlled terms. Strategically, this capacity mitigates the costs associated with the incompleteness of the risk allocation mechanism.

Second, in PFCs, parties implement contractual provisions replicating the protections missing from insolvency laws. In PFCs, parties habitually pledge the equity capital of the SPV (company shares) as security to the FP. Functionally, this means that after certain (critical) events of default have been verified, the non-recourse lender will gain ownership (political control) of the SPV, all its resources and its contractual relationships.⁹⁵⁹ As said, the FP requests the intervention in the decision-making system of the SPV. *Once an event of default has occurred, the Project Company is effectively no longer able to manage the project without lender involvement.*⁹⁶⁰ When allowed by jurisdiction, parties also agree on the implementation of floating charges.⁹⁶¹

Additionally, in a contractual practice peculiar of PFCs, parties will agree on so-called *step-in* rights as per which, after verifying certain events indicative of project distress, the FP substitutes the SPV or one (or more) sponsors in their positions as providers to the off-taker. More often, the FP may also accelerate loan terms. In the extreme, the non-recourse lender may also take possession of funds kept under control

⁹⁵⁹ *Vid. pp. 289, 301 and 302 in S. GATTI, Project Finance in Theory and Practice - Designing, Structuring, and Financing Private and Public Projects, cit. Pp. 227, 310 to 312, E. R. YESCOMBE, Principles of Project Finance, cit. P. 411 in E. R. YESCOMBE; E. FARQUHARSON, Public-Private Partnerships for Infrastructure -Principles of Policy and Finance, cit. Pp. 62, 203, 266 H. A. DAVIS, Project Finance: Practical Case Studies, cit., vol. II. Pp. 291 and 293 in J. CROTHERS, "Project Finance in Central and Eastern Europe from a Lender's Perspective: Lessons Learned in Poland and Romania", cit. Pp. 135 and 137 in A. FIGHT, Introduction to Project Finance, cit. Pp. 514 to 516 and 519 in M. F. K. KHAN; R. J. PARRA, Financing Large Projects - Using Project Finance Techniques and Practices, cit.*

⁹⁶⁰ The accurate of the sentence makes it recurrent in the literature of authors on the field. *Cf. p. 415 in E. R. YESCOMBE; E. FARQUHARSON, Public-Private Partnerships for Infrastructure -Principles of Policy and Finance, cit. P. 218 E. R. YESCOMBE, Public-Private Partnerships - Principles of Policy and Finance, cit. Cf. p. 395 in E. R. YESCOMBE, Principles of Project Finance, cit.*

⁹⁶¹ *Vid. page 137 in A. FIGHT, Introduction to Project Finance, cit. Pp. 151-6 in G. VINTER ET AL, Project Finance - A Legal Guide, cit.*

accounts -the so-called cash traps (*Cf.* case studies in Chapter 4). Other noticeable examples of these practices include assignments of rights to receive funds from debtors of the project.⁹⁶²

Third, in PFCs, parties implement technical default provisions based on events that may be internal or external to the spheres of SPV control. Examples of technical default provisions capturing events remote to the SPV are the majority of the scenarios that they predefine. The most representative of these perhaps relates to the incapacities of critical providers to deliver their inputs as expected, or their insolvencies (*i.e.*, their capacities to internalise contractual provisions). Other examples include the verification of legal obstacles to specific activities or inputs necessary for the single project. Consider a scenario where the SPV can no longer import some critical machinery for the single project.

Forth, in PFCs, the relational interaction between the FP and sponsors allows the lender discretion of enforcement. This is necessary for parties not to induce the FP to withhold the enforcement of provisions that may result in project losses against her interests. Parties regularly enforce many of these clauses after bargaining aggressively and also informally. *For example, the lenders are likely to consider the failure to produce management accounts in a reasonable period a symptom of something seriously wrong with the Project Company's operations, and therefore this should give them a basis to intervene. Lenders always make the point that they will not automatically use Events of Default to destroy the project (which is seldom in their interests) and that they are just there to get everybody around the table, but obviously, once an Event of Default occurs, the Sponsors and Project Company are at a disadvantage in any discussions that take place with the lenders.*⁹⁶³ Remarkably, from the strictly functional approach, this discretion on the side of creditors is compatible with the efficiency of the pre-liquidation stages of insolvency processes in which committees of creditors decide on the perspectives of the business and opt between reducing the amounts of their claims or forcing liquidation. These features of insolvency procedures correlate functionally with what we see in PFCs with creditors enjoying discretion in the exercises of clauses allowing for insolvency-like protections.

Remarkably, all these contractual entitlements result from events of technical default that the FP puts in place during the implementation stage. Hence, the efficiency of

⁹⁶² See the description of these mechanisms in Chapter 2.

⁹⁶³ *Cf. pp. 395-7* in E. R. YESCOMBE, *Principles of Project Finance*, cit.

these provisions appears confined by the bounded rationalities of parties (the necessary incompleteness and the imperfections of the screening-signalling process). This limitation does not exist whenever the reaction expected from managers results from a default rule where sponsors react as socially desirable in virtue of a legal standard -irrespective of (and beyond) the quality of concrete contractual precautions.

10.3.8 Robustness and paternalism

A rule (strictly, as said, an enforcement criterion) failing to identify events leading irremediably to the insolvency of the SPV would come at the social costs of *shirking*, *risking*, and *shading* feasible during the period between such events and the later manifestation of their consequences at the SPV level. Under other scenarios, the rule would bring no strategic effects (robustness).

Additionally, sponsors are best-informed; consequently, they are the best prepared (cheapest cost avoiders) for gathering verifiable information about the *low* impact of events to the solvency of the SPV. Consequently, the costs of escaping the enforcement of a responsibility rule with sporadic distortive effects -false claims of events potentially leading to the insolvency of the SPV- (paternalism) are *low* and preferable.

The rule is valuable in virtue of the strategic features that are inherent to the positions of parties in all PFCs. Thus, the proposal reveals its efficiency in all jurisdictions and corporate types.

10.3.9 Proposal for an optimal responsibility of sponsors and managers in the vicinity of SPV insolvency; its consistency with other proposals of the study (towards the institutionalisation of PFCs)

The optimal scopes of responsibility of managers in the vicinity of insolvency can be derived on the same basis sustaining the (higher) optimal duties of diligence in PFCs. Additionally, remarkably, the responsibility of sponsors to reveal information about the imminent insolvency can also be built as a direct application of the fiduciary duties to inform *bad news* in PFCs.

Everything observed above about the value of institutionalising PFCs legislatively, of the jurisprudential evolution, and of registering and publishing projects to the capacities of third parties to enforce responsibility standards against sponsors controlling the SPV applies identically here.

10.4 Optimal seniority for non-recourse claims in PFCs

10.4.1 Introduction

The proposition for later research advances the elemental considerations of an optimal seniority of claims and expectations in PFCs.

This optimality maximises total welfare and the likelihood of the non-recourse debt repayment by also optimising the incentives that sponsors perceive for responding with socially desirable non-contractible actions under all evolutions of the environment (*news*). Consequently, this optimality does not necessarily allow the highest hierarchy to the claims of the non-recourse lender.

10.4.2 Characterising the optimality

In Chapter 5, I have advanced the critical aspects of this optimality. Intuitively, allowing higher seniority of claims to the FP implies that, for milder deteriorations of the environment, the likelier it will be that sponsors lose their incentives for choosing socially desirable inputs and respond with *shirking*, *risking*, and *shading*. In the opposite extreme, too low seniority of claims to the lender will result in the FP internalising risks (too low expected value) with sponsors extracting (too high) otherwise residual benefits. For completeness of the analysis, note how, with absolute seniority of sponsors' expectations (including dividends that, by nature, are unlimited), the FP never receives its payment -even if the SPV produces infinite value.

Finally, because the feasibility of PFCs depends on the likelihood of repayment of the senior debt, by permitting the participation of the FP in the project, allowing protection to the FP higher seniority of non-recourse debt will also produce value to sponsors. Consequently, the optimal seniority protects the lender by allowing seniority to her non-recourse claims that is high, but not so high that may induce sponsors to respond opportunistically (after losing incentives to expand residual claims) for an exceedingly wide range of evolutions of the environment -that is, for milder unforeseen deteriorations in project capacities.

10.4.3 The rule and its functionality in regular corporate environments

In regular diversified corporate businesses, we see the consideration of seniorities in few occasions. Parties optimise seniorities of claims when assessing the value (opportunity costs) of allowing collateral or sureties to creditors. During insolvency-related renegotiations, judicial intervenors choose seniority rules when readjusting the distributions of risks and benefits between creditors and owners of insolvent

companies. Moreover, bankruptcy legislators provide criteria relating to hierarchies of claims when protecting certain groups of individuals who are either more sensitive to losses -*e.g.*, workers- or protectable for other reasons -*e.g.*, tax agencies, or attorneys involved in judicial liquidation processes.

In these diversified contexts, when implementing contracts, to debtors, the allowance of higher seniorities in the access to cash flows or collateral to some creditors comes to the detriment of other creditors. Moreover, because the capacity of the company to provide sureties and entitlements to cash flows is limited, allowing protection to some contractors or creditors today comes with the opportunity costs of limiting the possibilities of later accessing credit necessary for funding successive projects. This trade-off is in the nerve of the debt dilution problem analysed in Chapter 3.

In diversified corporate contracting, managers do internalise such opportunity costs associated with issuing senior claims. However, in regular corporate businesses, administrators do not consider the incentive effects that such seniority protection can bring for other less protected contractors (as well as for the debtor she manages) to deliver higher or lower choices of inputs when complying with their obligations. Additionally, in regular diversified and collateralised environments, contractors cannot solve this problem without affecting the access of the company to subsequent financing for any of the many other projects within their portfolios. Finally, as a result, in regular corporate contracting, provisions restricting the access to alternative financing (from finance providers or from contractors for inputs) are legally possible but rarely justifiable or reasonable (efficient).

We can make the same observation for judicial intervenors within bankruptcy renegotiations. As mentioned, readjustments take place with eyes on the vulnerabilities of some creditors as defined by the law (*e.g.*, of workers). However, legislators do not define the hierarchies of claims that intervenors should implement when enforcing bankruptcy readjustments with a consideration of the incentives that such renegotiations bring to parties delivering non-contractible contributions to the insolvent company. The rationale described in Chapter 3 relating the opportunity costs of contracting with subsequent providers applies identically here.

In addition to the above, the reluctance of parties to optimise seniorities of claims with eyes on incentives to input providers may result from many aspects: First, in diversified businesses, the capacities of individual input providers to alter the capacity of the company to produce wealth by improving the performance of a

broader portfolio of investments is minimal.⁹⁶⁴ Second, the calculus of the seniority rule that maximises incentive-total welfare becomes more difficult as business diversification grows. Third, in regular corporate contracting, we find creditors of distinct types, many of which are highly diversified (for their low value at risk claims); these creditors do not spend transaction costs necessary for bargaining on seniorities of claims. Finally, fourth, during the life of companies, contracting takes place under uncertainty about the future.

As a result of all the above, in diversified business scenarios, delegated managers cannot easily estimate an optimal seniority of claims. Perhaps, for this reason, the matter of the optimal hierarchy of claims of contractors providing inputs to the company has not been tackled by the literature. Remarkably, this is true despite the vast literature analysing the strategic effects of debt levels (the optimal capital structure⁹⁶⁵).

10.4.4 The contracting parties in PFCs

Strategically, the case of PFCs shows a scenario distinct from the one described above. The simplicity (predictability) of undiversified PFCs permits that sponsors take into consideration the incentive effects of seniority when contracting. Let us note

⁹⁶⁴ There is a moral hazard in team problem amongst contractors expanding team output that materialises in the (return) impact that their actions have in the total solvency of the company (the common debtor). In diversified environments such impact (returns) from their actions to the solvency of their common creditor will be *low*. This output is similar to that in a moral hazard in team problem where team members are of a great number.

⁹⁶⁵ M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit. M. T. LEARY; M. R. ROBERTS, “The Pecking Order, Debt Capacity, and Information Asymmetry”, *Journal of Financial Economics*, vol. 95, 3, 2010, Elsevier. M. Z. FRANK; V. K. GOYAL, “Trade-off and Pecking Order Theories of Debt”, cit. E. TALMOR, “The Determination Corporate Optimal Capital Structure Under Value Maximization and Informational Asymmetry”, *The Journal of Economics and Business*, vol. 36, 1984. M. BRADLEY ET AL, “On the Existence of an Optimal Capital Structure: Theory and Evidence”, cit. T. R. LEWIS; D. E. M. SAPPINGTON, “Optimal Capital Structure in Agency Relationships”, *The RAND Journal of Economics*, vol. 26, 3, 1995. S. TITMAN; S. TSYPLAKOV, “A Dynamic Model of Optimal Capital Structure”, cit.

four reasons behind this statement.

First, in PFCs, the SPV does not advance diversified projects. Second, in PFCs contractors for inputs -the sponsors- are highly qualified, and they do not change during the life of the project. Third, because the SPV advances a single project with few contractors, the impact of their choices of contributions to the capacities SPV will be high; this increases the value of ex-ante considering the incentive effect of the hierarchies of claims to contractors. Fourth, in contrast to what we see in diversified corporate settings where many creditors and contractors interact sequentially with the company, in PFCs, there is a single FP who intervenes in the design of the single project. This facilitates the forecast of financing needs and the optimisation of the seniority of such claims in conjunction with the incentives that such optimality generates to the few contracting sponsors.

For these four reasons, the implementation of an optimal seniority of claims is feasible in PFCs. Moreover, we can contrast the rationality of the considerations that follow below with the typical (perhaps indispensable) clauses with which parties define the seniorities of claims in PFCs -e.g., the *cash waterfall (cascade)* mechanism.

10.4.5 The incentive effects of the seniority of claims in PFCs

Before remarking how sponsors internalise seniority considerations in their contractual arrangements and readjustments, let us first revisit very intuitively the effects that too high or too low seniority protection to the FP or sponsors could bring to total project value.

As said above, I have advanced many of these considerations in Chapter 5. For simplicity, I will now recall the incentive effects taking place before and after delivering inputs. Then, I will remark the incentive effects that stem from protecting the FP or the sponsors excessively.

10.4.5.1 News before and after the choices of inputs

Before advancing, for analytical rigour, let us note, *news* may affect the project before or after the sponsors deliver their contributions. Strategically, the distinction is relevant because the sponsors will only find a space for (desirably or undesirably) readjusting their input choices in the second case -when they update information before delivering their contributions. This is the scenario in which the seniority of debt (and its weight relative to total welfare) will first affect the capacities of the SPV to distribute residual benefits, and the sponsors will update this information timely for them to readjust effort choices as privately desirable. Hence, it is for this type of *news* that debt (its face value and seniority) will come with undesirable effects over

the incentive compatibility constraints of sponsors.

In the other scenario, the case where *news* affects the sponsors or the project after parties deliver their contributions, the unforeseeable events will not affect the choices of efforts simply because the sponsors will not update information timely. Accordingly, in this case, the seniority of claims affecting the returns from efforts (sensitive to contingencies) will not affect incentives (incentive compatibility constraint) but only the value that parties can expect from the project and ultimately (backwards induction) their decision to enter the contract (individual rationality - participation- constraints).

For two reasons, we must restrict our attention only to the *news* of first type -the type of *news* that manifest before the sponsors choose their efforts. First, as they come without incentive effects (over input choices), the analysis of the impact of debt and *news* of the second type is identical to the current wisdom. *V.gr.*, the higher the seniority of debt claims, the greater the protection of creditors against contingencies and the greater the risks internalised by the sponsors as residual claimants. Moreover, allowing higher hierarchy to debt is efficient as it induces the sponsors - the best-informed parties- to reveal information for adopting precautions or bargaining with the least informed lender. Hence, our analysis should stop after indicating -the known aspect- that the seniority of claims in conjunction with the perspectives of this *news* affecting project capacities does have an impact to the values that parties expect from the project and consequently to the willingness of parties to participate in such endeavour (incentive compatibility -participation-constraint).

Second, PFCs are long term organisations in which the sponsors deliver sequential contributions (PFCs are not *one-shot* games). In FPCs, unforeseen events (*news*) affect the sponsors and the project in ways that allow all parties to update information before choosing efforts in all following stages of the project. The cases in which events affect returns after parties delivered all their contributions exist only theoretically. In practice, because of the risk allocation needs of non-recourse project financing, the sponsors remain in control and internalise risks (the enforceability of the risk allocation mechanism) until the SPV has finally repaid the senior debt. Hence, we can safely restrict our attention to the types of *news* that affect the sponsors or the SPV before the sponsors choose their contributions -*i.e.*, the types of *news* that come with incentive effects⁹⁶⁶ as the project evolves.

⁹⁶⁶ It affects incentive compatibility constraints.

Let us now observe the incentive effects from allowing too high or too low seniorities of claims to parties.

10.4.5.2 Too high seniority to the FP (too low seniority of sponsors)

Let us begin by observing the welfare and incentive effects of allowing the FP the strictly highest seniority for her claims. Strategically, this means that irrespective of the evolutions of the environment, the SPV will use funds from the project for repaying the non-recourse debt first. Only with the remaining resources will the project company repay the entirely subordinated contracts and distribute dividends to sponsors.

Let us now note the strategic impact from the above whenever the SPV or sponsors experience *bad news*. In a logic (not chronologic) sequence, we see the following:

First, directly, the capacity of the FP to extract resources from the SPV until her claims are fully satisfied results in fewer cases in which the SPV will manage to repay the junior claims and issue dividends to sponsors after servicing the senior non-recourse debt. In this scenarios, milder undesirable influences from the environment against the project or sponsors (*bad news*) will more likely deprive the SPV of a capacity to satisfy expectations of sponsors after using more of its resources for repaying the senior debt claims held by FP.

Second, indirectly, as shown in Chapters 5 to 6, the more significant difficulties for the SPV to distribute benefits to sponsors corresponds to more scenarios where they will perceive stronger incentives for responding opportunistically. That is, sponsors will more often (and more intensely) respond with *shirking*, *risking* and *shading* with broader sub-coalitions, and more likely unanimous collations against the SPV (FP).

Third, recall, *shirking*, *risking*, and *shading* involve the implementation of socially undesirable innovations. These responses come in detriment of project value, further affecting the capacity of the SPV to repay its obligations to the FP too.

Fourth, a more significant risk to the FP implies higher non-recourse debt interests (weaker willingness to participate in the project⁹⁶⁷) reducing the capacity of sponsors to extract residual benefits from the project.

Fifth, too strong protection to the FP results in likelier and stronger incentives for sponsors to respond opportunistically, which in turns (backwards induction) affects

⁹⁶⁷ These are stronger individual rationality -participation- constraints of the lender.

not only the value that both the FP and the sponsors, but backwards induction, their willingness to enter projects.

Finally, recall, outputs from the SPV are always stochastic. Conditions may well improve or deteriorate. However, the welfare impact of volatility will be more substantial in the cases *bad news*; this exacerbates inefficiencies to the party internalising risks beyond the socially optimal. This is not because of the desirable or undesirable value of innovations but because of their exponential (dis)utility -in the case of profit-maximising companies, their sensitivity to volatility -*i.e.*, distress costs.⁹⁶⁸

10.4.5.3 Too low seniority to the FP (too high seniority of sponsors)

Let us now describe the opposite scenario. This is the case where sponsors confer the FP a too low hierarchy of claims. This could be the case where sponsors agree that the SPV will repay all its contractual obligations to sponsors and issue large dividends before repaying the (now junior) non-recourse debt to the FP.⁹⁶⁹

The strategic impact of allowing the lender too low seniority of her claims is analogous but symmetrical to the above. Directly, lower seniorities of debt will result in sponsors extracting residual benefits under more variate evolutions of the environment. Such high seniorities of claims protecting sponsors reduce the likelihood that they respond with *shirking*, *risking*, and *shading* in all scenarios - particularly whenever the conditions deteriorate to the SPV.

However, also directly, weaker protection of the FP equates to higher volatility of cash flows available for repaying her now subordinated claims. Such volatility will ultimately affect interests. Higher risks and interests charged by the FP will result in fewer projects receiving financing, and in weaker residual benefits to sponsors in the fewer cases in which project receive funding.

Just as described in the other extreme case, the description holds identically irrespective of *good* or *bad news*. Also, similarly, welfare losses will exist in all scenarios, and the distortions will be stronger whenever *news* affects the SPV or

⁹⁶⁸ Cf. Chapter 3.

⁹⁶⁹ *Nb.* Parties cannot rationally subordinate the claims of the FP to issuance of dividends indefinitely. This would annihilate the enforceability of claims held by the lender. So, we cannot analyse the extreme case precisely opposite to the scenario describe above in which the FP held claims senior to all expectations of sponsors.

sponsors before they choose their responses.

Consequently, in PFCs, there will be an optimal hierarchy of claims held by sponsors and the non-recourse lender. This optimality will expand total welfare by: first, maximising the likelihood of debt repayment; second, maximising the capacities of the SPV to issue residual benefits to sponsors; and third, minimising the incentives for sponsors to respond opportunistically. Backwards induction, this optimality minimises risks to the lender, for minimum interests, and the highest likelihood of participation of all parties (optimally social investment levels).

Without distracting the reader, note how this hierarchy of claims not only maximises total welfare but also functions as a distinct obstacle for the SPV to seek alternative financing (when exceptionally allowed to by the lender) whose benefits would accrue to sponsors and the FP differently. For this, the *cash waterfall* clause ought to be a sophisticated mechanism considering scenarios, including regulations of debt-to-equity ratios (and consequently commitments to capitalise) and habitually a monopoly to the lender on the provision of debt to the SPV.⁹⁷⁰

10.4.6 Observed contractual behaviour

Today, management and financial literature on non-recourse project financing often considers that claims from the FP should be allowed highest hierarchy only second to operative expenses that the SPV cannot cover with capital contributions by sponsors. Authors regularly associate seniority of claims with interest alignment; as such, the intuition is a commonplace in the literature beyond the case of PFCs.

However, in PFCs, via the so-called *cash waterfall (cascade)* clauses, the non-recourse lender and the sponsors regulate how the SPV will allocate cash in and out from the project.⁹⁷¹ Functionally, by defining who will receive what benefits under what scenarios, the rule effectively enforces a rule for a hierarchy of claims in PFCs.

Moreover, as pointed out in the last sub-section, the cascade agreements also specify not only entitlements to receive rewards from contracts or dividends but also the obligations of parties to provide further contributions (equity from sponsors or cash from debt in the case of the FP) as the project progresses. Most interestingly, *cash waterfall* clauses habitually allow the SPV to repay greater tranches of claims from

⁹⁷⁰ Cf. the analyses of the *cash waterfall (cascade)* agreement in chapters 2, 4, and 7.

⁹⁷¹ E.g., 92 B. HOWCROFT; S. FADHLEY, “Project Finance: A Credit Strategy Based on Contractual Linkages”, cit.

contracts and usually permit that sponsors receive some dividends as the SPV approaches the final repayment of its obligations to the FP.

10.4.7 Legal value

The postulate characterising an optimal seniority of non-recourse debt shades light on two aspects. First, it assists on the ex-post completion of clauses involving seniority choices, including the critically relevant *cash waterfall* (cascade) mechanism or their readjustments after sponsors or the SPV receive *news*. Second, the criteria for identifying optimal seniorities of claims permit the improvements of the renegotiation process that take place as part of bankruptcy processes.

10.4.8 Paternalism and robustness

The rule provides a logic for optimising a hierarchy of claims allowed to sponsors and the FP in PFCs. The criterion internalises the welfare effects from the responses that parties can anticipate from the likely evolutions of the environment. The optimality nature of the criterion is necessarily robust (desirable under all possibilities) and excludes paternalism concerns. The postulates are consequently valid irrespective of configurations of the SPV, the numbers of sponsors, or the evolutions of the environment (*news*).

10.5 Optimal delegation and managerial competences (mandates)

The descriptions of Chapters 4 to 6 have allowed the progress of a research project parallel to this study. Such work includes a model allowing for the identification (and rich characterisations) of the optimal scopes of delegation and the optimal managerial reward schemes in closely held legal entities.

Amongst other critical variables, the framework describes the impact of managerial qualifications of the manager and owners, the number of owners, and the synergies amongst their contributions to the decision-making efforts. The model also characterises the optimal scope of delegation for SPVs -that is, for companies owned by a few shareholders dedicated to a single activity. The case of PFCs appears as a sub-case-type of SPVs where owners enjoy extremely high qualifications (expertise) - *v.gr.*, higher than those of the manager. Due to the incompleteness of such analyses, I can present its preliminary findings as a way for later research of this study.

The ongoing study is economical. However, its implications are strictly legal. That is true for both the descriptive and normative parts. Descriptively, the work shades light on the rationalities of parties implementing delegation in PFCs. Normatively, it allows for the identification of postulates under which a more accurate legal treatment can be provided to PFCs when the completion of mandate contracts is

necessary ex-post -*e.g.*, for judicial enforcement requiring the finding the scopes of delegation, or the composition of reward functions. Let us see the key features of this way forward.

10.5.1 The proposal

In regular corporate businesses, delegation comes with benefits that have been well-described in the literature. Indirectly, in conjunction with the institution of legal personality and limited liability, delegation allows for the transferability of corporate ownership and finally diversification of investments (*cf.* Chapter 7). These aspects refer to the investors' side, so they remain beyond the scope of interest of this section.

Delegation comes with other known benefits to how owners manage the company. First, delegation permits the saving of collective action costs associated with the adoption of decisions directly by shareholders; Second, delegation allows that managerial decisions come from individuals qualified in the specific industry sector in which companies advance their business opportunities. These are marginal benefits of delegation.

However, the delegation also comes at a cost associated with the implementation of mandates with administrators. These costs are inherent to the contracting under asymmetries of information and bounded rationalities. To companies, delegation implies the allocation of resources to managers who, within the spaces for actions permitted by contractual imperfections, will adopt decisions advancing individual rather than the collective interests (the canonical principal-agent problem). These are the agency costs of delegation -or the marginal costs of augmenting the scope of delegation. As in the most straightforward optimisation problems, the optimal delegation equalises both marginal costs and benefits from broadening the scope of decision matters allocated under the competence of a manager (or a board).

The case of PFCs appears as a punctual case-scenario of characteristics that are intrinsic to that environment. Let us note four aspects.

First, in PFCs, the manager is highly qualified; however, second, sponsors are few, not diversified, and more qualified than the manager (they designed the project, and they are experts on the industry sector of the project). Consequently, the owners (sponsor) can adopt decisions without delegating them at lower costs (mild collective action and moral hazard in team problems⁹⁷²), and highest outputs. Third, the SPV

⁹⁷² In PFCs, the moral hazard in team problem appears very mild as the number of sponsors is small. Additionally, the high marginal value (expertise) of contributions

implements a single project that comes predefined to the manager; therefore, the three administrative decisions generating most of the strategic tensions (the investment decision, the financing decision, and the dividend distributing decision) will be given to the manager before she receives her mandate. Finally, fourth, the range of high quality of decisions expected from the few and highly qualified sponsors includes the single ex-ante collective action implementing the mandate contract with the manager.

Consequently, the model applied to the case of PFCs, predicts: first, that managers will deal only with the least relevant (lowest value at risk) decisions that will also be of lowest material complexity -critical matters will be solved directly by the highly qualified sponsors without incurring agency costs. Second, the implementation quality of her contract for delegation (scopes of competences and reward function) will be of the highest quality; intuitively, she will receive precise instructions before and during the implementation of the project; or else, if sponsors cannot implement such delegation with precision, they will not delegate and deal with such matters directly for highest outputs. Third, the spaces for the manager to exert hidden actions (bilateral moral hazard and consequently, agency costs of delegation) will be minimal; this results from the high implementation quality. Fourth, the optimal reward function offered to the delegated manager (compensation schemes implemented in a bilateral agreement with the SPV) should have feeble incentive powers (small variable bonuses tight to contractible managerial outputs) and consequently also low premiums (small fixed risk-free compensation terms).

10.5.2 Predicted and the observed contractual behaviour

The model predicts that, in the industry of PFCs, we should find project managers receiving salaries that -concerning the values at stake involved in such large projects-would be low and fixed. That is, they should receive both little variable bonuses and also low fixed salaries. Most interestingly, but not surprisingly, anecdotal evidence and references from scholars confirm the characteristics of PFCs salaries as predicted

from the sponsors result in the number of sponsors approaching the size of an optimal team where the value of such qualifications remains higher than the losses associated with the free riding problem amongst sponsors in the team of non-contractible contributions. The high value of team outputs calls for smallest scopes of delegation. B. HOLMSTRÖM, "Moral Hazard in Teams", cit.

by the model.⁹⁷³

10.5.3 Legal value

A framework for an optimal delegation permits completing delegation agreements *ex-post* (judicially) more accurately. Indirectly, it also serves for identifying decisions and actions adopted by delegated managers beyond their mandates.

10.5.4 Robustness and paternalism

The framework describes PFCs as a particular case of well-characterised features. The general framework is capable of characterising delegation contracts in closely-held companies formed for advancing a predefined project irrespective of the sources of financing. The optimal nature of the postulate excludes the need for analysing robustness or paternalism considerations.

10.6 Conclusions

In Chapter 8, as a way forward for legal research, we saw an elaboration of the five pillars upon which legislators should build a PFC-dedicated corporate form. The first pillar consisted on a fiduciary duty of loyalty inducing sponsors to adopt decisions as if completing the provisions of the risk allocation mechanism -that is, parties should interpret contracts in consideration of the interests of the FP. The second pillar advanced a rule for the sponsors to be responsible for the control of the SPV. The third pillar provided for fiduciary duties to inform *bad news*. Finally, the fourth pillar limited the capacities of the representation requiring the consent of the non-recourse lender for the provision of further debt to the SPV.

Chapter 9 then introduced four postulates for the *ex-post* completion or interpretation of clauses of the crucially relevant risk allocation mechanism: first, the pre-emptive objectives of clauses; second, the *in dubio pro creditore* principle, third, the *intuitu personae* and *intuitu rei interactions*; and finally, the interpretation of specific commitments to inform. These postulates for the interpretation of agreements of the risk allocation mechanism complement the legislation of the five pillars for the legislative institutionalisation of PFCs advanced in Chapter 8.

Finally, Chapter 10 has remarked ways forward for identifying optimality postulates in PFCs. The first two of these are responsibility standards. These are the optimal fiduciary duties of diligence in PFCs, the optimal responsibility of managers in the

⁹⁷³ Cf. p. 14 in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

vicinity of SPV insolvency. The third and fourth of them are implementation optimalities: the optimal seniority of claims, and finally, the optimal scope of managerial delegation.

The optimal fiduciary duties of diligence. Let us recall, in PFCs, the sponsors (and the appointed managers) administer the SPV in compliance with control covenants of the risk allocation mechanism that they ex-post complete under fiduciary duties of loyalty also to the lender. In this context, Chapter 10 has remarked how, the optimal fiduciary duties of enforceable upon the appointed managers and the sponsors -who always control the company- are higher than those desirable in regular diversified corporate environments.

This results from two elemental aspects: First, the marginal value and the marginal costs of decisions from sponsors are, respectively higher and lower than in other contexts; second, the lack of value in protecting risk-averse decision-makers for her to adopt risky decisions in this context. The two aspects dictate the optimality of the standards under which they should adopt decisions.

The marginal value of managerial responses. In the context of diversified portfolios, managers deal with many independent projects, with unrelated contractors, and with sources of financing simultaneously. Additionally, in regular corporate organisations, managers and controlling shareholders are indeed experts on market sectors but not on the individual projects that the company implements. These generic qualifications (expertise) place limitations on the marginal value of managerial decisions and consequently to the capacity to take actions in compliance with higher standards of care.

In sharp contrasts, in PFCs, the capacities of managers to adopt decisions is higher because the administrators receive high-quality information, and because they are also more highly qualified. Notice, in PFCs the quality of the information that managers access about the single project, the sponsors, and the few contractors, is necessarily better (and less costly) than that reachable by administrators in diversified corporations. This is true in two dimensions. First, in PFCs, the controlling shareholders are also input providers and interact closely with managers. Second, in PFCs, parties implement agreements (cross-default mechanisms enforceable against the SPV) that result in incentives for the best-informed sponsors to reveal information to each other. Additionally, in PFCs the manager is better qualified simply because parties appointed her for her capacities to advance similar projects, and because -especially in the case of sponsors- parties know the project since its conception -often before the incorporation of the SPV. Better information and higher qualifications result in higher marginal value from inputs and

consequently better capacity to respond to higher standards of care, as socially desirable.

The costs of risk aversion. Additionally, in diversified corporate investments, the risk-averse manager is expected to adopt risky decisions. These are the decisions (the riskier projects) that maximise limited liability shelter value to the diversified shareholders. Consequently, in regular diversified corporate businesses, the manager will require protection from the (low) responsibility standard so that she can adopt such socially desirable risky decisions without internalising the costs of losses to the company in the events of projects failing to generate value as desired. This is the efficiency of rules of reason as the canonical *business judgment rule*.⁹⁷⁴

In contrast, in PFCs, managers and sponsors are not expected to advance many alternative risky business opportunities but a single project. Accordingly, in PFCs, most of the decisions come predefined to the manager before incorporating the SPV - this is precisely the function of the risk allocation mechanism. Finally, in virtue of the minimal scope of delegation, in PFCs, during the life of the project, all critical decisions will be adopted by sponsors directly. Hence the risk-averse manager or the sponsors do not need a low standard of diligence for adopting any risky decisions.

Hence, in PFCs, the optimal fiduciary duties of diligence are higher than those optimal in scenarios where companies advanced diversified portfolios. Because in PFCs, the SPV always advances a single project predefined by all parties, and because in all PFCs the sponsors are the critical input providers thus best-qualified to adopt decisions, is that the proposition holds valid in all environments irrespective of project configurations, numbers of sponsors, or choices of corporate types.

The optimal responsibility of managers and sponsors in the vicinity of SPV insolvency. Chapter 10 also remarked how, in corporate financing, the diversification of projects defines the likelihood that events external to the spheres of material control of the company affect the solvency of legal entities. Intuitively, the higher the diversification of portfolios, the milder it will be the impact from events affecting individual projects against the capacity of the portfolio to produce cash flows. That is, such events remote to the control of the company will unlikely result in corporate insolvency (portfolio benefits).

From this observation derive two implications. First, in regular diversified corporate scenarios, judges will be reluctant to consider contingencies affecting individual

⁹⁷⁴ Cf. Chapter 7 for literature references on this and other rules.

projects as indicative of corporate insolvency -as said, such events cannot usually affect the solvency of the diversified company. Second, from the informational stance, managers' capacities to advance a multiplicity of projects to identify events affecting individual business units as sources of corporate insolvency will also decrease with the degree of diversification of the portfolio they administer. This is especially true for events affecting managers capacities or for *bad*, or *very bad news*) that materialise beyond the spheres of corporate administrative control. The interplay between the two aspects results in standards of diligence optimally lowering as diversification grows.

In this chapter, we saw how such characterisations do not hold in PFCs. In PFCs, the SPV advances a unique project. Moreover, in PFCs, parties identify the contingencies that could affect that single project during its construction and operation phases. This observation comes with two implications. The first aspect relates to the causality between such contingencies and the repayment capacities of the SPV. The second implication is informational.

Concerning the first observation, the fact that the SPV is not diversified implies that external events jeopardising the capacities of the unique project will increase most significantly the likelihood that the SPV fails to produce value as expected. In PFCs, the SPV does not advance a portfolio of growth options that can dissipate the impact from failing project to the solvency of the company (there are no portfolio benefits). Hence, as a function of the access of managers to relevant information (see below), judges should be consequently ready to interpret events taking place beyond the material sphere of control of the SPV as sufficiently effective to affect SPV's solvency. Accordingly, also third parties (the FP) should be capable of requesting judicial protection under bankruptcy law in such scenarios.

The informational implication from the above also comes with two consequences. First, because the SPV advances a single project which is partially predefined, the capacity of managers to access information about such (apparently) remote events will be higher than under diversified corporate contracting. Second, - distinct from the above- managers accessing information of higher quality should be now responsible for identifying such events that can effectively cause SPV's insolvency even if such events relate to third parties, or whenever they are materially remote to the company spheres of administration.

The above results in higher optimal standards of responsibility enforceable upon sponsors and managers in the vicinity of SPV insolvency. Finally, because in all cases the SPV advances a single project, and because the sponsors are always the input providers of the company interacting materially with project assets, the above

propositions hold in all environments (*news*) irrespective of project configurations, numbers of sponsors or SPVs, or legal traditions.

The optimal seniority of claims in PFCs. In chapter 3, we saw how, in diversified corporate contracting, managers act under the awareness that granting seniority protection to some lenders will come with opportunity costs that companies will realise when contracting with subsequent creditors. This is the debt dilution problem. Later creditors compete with earlier debt providers for collateral or cash flows from the same debtor.

I have also observed how, in regular corporate contracting, parties do not choose hierarchies of claims with eyes on the incentives that such seniorities may bring to contractors delivering inputs to the company they administer. In diversified environments, this is efficient for many reasons. In contexts where companies advance many projects, finding and implementing an optimal hierarchy of claims is difficult as creditors for financing and contractors for inputs are many. This is also true because their input contributions produce little impact to companies relative to the high costs of implementing such precautions -especially when uncertainty about the evolution of the portfolio is high. Consequently, in regular corporate contracting, we see creditors requesting collateral from the debtor or third parties, but we do not often see contractual provisions regulating the seniorities of claims that debtors will allow to subsequent contractors. These regulations would be costly to implement and costly to enforce as they would also jeopardise the access of the company to further financing.

The case of PFCs is notably distinct. In PFCs, the sponsors are few, and the FP -the provider of debt- is only one. Additionally, the FP and sponsors contract on a single non-recourse financing facility for the funding of a single project that all parties predefine in all phases of evolution.

Asides, in PFCs, the choices of non-contractible actions from providers delivering inputs to the single project come with significant impact on the solvency of the project-dedicated SPV. Consequently, in PFCs, parties can -and regularly do- contract on sureties, the sequence of repayments, and other mechanisms that result in stronger protections to some creditors (the FP) in detriment of others (the sponsors). *Cf.* the analysis of the so-called *cash waterfall (cascade)* clauses in chapters 2, 4 and 7.

Moreover, critically, because in PFCs sponsors choose non-contractible inputs to the project as a function of expected returns -*v.gr.*, of the capacities of the SPV to distribute residual benefits albeit its obligations to serve the non-recourse debt- the seniority of claims in the hands of the lender comes with incentives stronger than

those perceived by contractors in regular diversified corporate environments.

Consequently, it is possible to characterise a postulate for identifying an optimal hierarchy of claims whose features are distinctive of PFCs.

Under this postulate, parties do not allow the highest privileges to the FP. The optimal seniority will be such that will maximise the protection (seniority) to the non-recourse lender (the principal) but will also maximise the ranges of possible undesirable influences from the environment that the SPV will tolerate while also conserving its capacity to distribute benefits to sponsors. This hierarchy maximises the protection to the lender by optimising the exposure of the project to the (less likely) incentives that sponsors may perceive for responding opportunistically.

Intuitively, by lowering the seniority of non-recourse claims, parties preserve the capacities of the SPV to reward (the now more highly ranked and better protected) sponsors; thus, they also minimise the range of scenarios in which *shirking*, *risking*, and *shading*, individually, within sub-coalitions, or unanimously become the dominant responses from sponsors in detriment of project (FP) value.

The identification of criteria for optimising hierarchies of claims in PFCs comes with two legal benefits. First, it facilitates the reconstruction of contractual renegotiations between parties; second, it serves for improving the criteria under which judicial intervenors redistribute claims within bankruptcy readjustment processes.

In PFCs, the sponsors are always providers for material inputs who find spaces for delivering hidden actions to the project. In PFCs, the SPV always advances a single project, and the FP is always the least qualified party who internalises the highest risks. The above postulate for identifying the optimal seniority of claims consequently holds in all PFC scenarios, irrespective of *news*, numbers of SPV or sponsors, or legal traditions.

The optimal scope of managerial delegation. Chapter 10 has remarked how the scopes of mandates defining the interaction between companies and managers in diversified businesses are regularly broad. This results from the degrees of dispersion of shareholders, the lower qualifications and passivity of investors, and the range of contingencies that managers solve in highly diversified environments. We also saw how the above was the frequent observation in large, highly diversified companies capable of intervening in the implementation and financing of long-term high and capital-intensive projects.

In PFCs, the characteristics, the diversification, ownership dispersion, and qualifications of sponsors and delegated managers of SPVs are precisely the opposite of those described above. First, in PFCs, the SPV advances a single project whose

critical variables parties predefine before incorporating the company; hence, the range of critical matters that parties will solve as the project evolves is small.

Second, in their capital structures, SPVs in PFCs are closely held ownership *-i.e.*, sponsors are few; therefore, the costs and inefficiencies⁹⁷⁵ of solving issues directly by sponsors *-i.e.*, without delegating- will be low.

Third, the qualifications of sponsors are always the highest. Intuitively, in PFCs, the owners of the SPV are the critical input providers to the single project that they design. The sponsors are also experts in the market to which the SPV will deliver its proceeds. Accordingly, in PFCs, sponsors will not expand the scopes of delegation for benefiting from managerial qualifications of the administrators.

Then, in all PFCs, the spaces within which the sponsors will delegate competences for benefiting from managerial qualifications or for avoiding collective action costs will be smaller than what we observe in regular highly diversified corporate investing. The proposition holds in all PFCs irrespective of evolutions of the environments, configurations of the project, the number of SPVs, or the legal legislations governing the corporate form of SPVs. Moreover, these observations are coherent with anecdotal evidence about the shapes of reward functions offered to project administrators in PFCs.⁹⁷⁶

A postulate for identifying an optimal scope of delegation serves for better reconstructing the boundaries of mandates conferred by SPV to managers and the consequential responsibilities. Remarkably, the propositions of Chapter 12 relating to this optimality hold for all cases in which input providers advance projects by allocating them under the control of a SPV *-independently of the non-recourse nature of the debt or the sources of financing.*

⁹⁷⁵ Decision-making efforts are not contractible. Hence, shareholders choose inputs expanding expected dividends from the company (a team output). Then, when choosing inputs, shareholders will be bound by the moral hazard in team problem from which they cannot possibly escape. The problem appears mitigated in PFCs with fewer sponsors adopting collective decisions. The seminal and classical reference is B. HOLMSTRÖM, “Moral Hazard in Teams”, *cit.*

⁹⁷⁶ Cf. p. 14 in B. ESTY, “The Economic Motivations for Using Project Finance”, *cit.*

Conclusions

11.1 The three parts of the study

The study consisted of three parts. Each part had a different objective: first, the illustration of practices; second, the Identification of PFCs and strategic aspects inherent to the positions of parties; third, the legal implications.

The first part. The first part included chapters 2 and 3 and illustrated the contractual practices and financial benefits of PFCs as they are known today. This first part served for building the assumptions of the strategic analyses of the second part of the study. This first two chapters also offered descriptions that contributed to verifying the accordance of the legal propositions of the third part of the work with the objectives of parties in PFCs.

The second part. In chapters 4 to 7, the second part of the study isolated the components of PFCs and identified the strategic features (including tensions and forms of opportunism) inherent to the positions of parties in all PFCs. This second part also characterised the ways in which the opportunistic incentives grow as project capacities deteriorate. Moreover, it also identified how the sponsors collude within sub-coalitions and collectively against the non-recourse lender as the SPV capacities decrease. This second part identified the strategic aspects that reveal the object of contractual solutions and the distinctive needs for legal treatment.

The third part. Based on illustrations and strategic analyses of the two earlier parts, the third part of the study analysed critical points where a reconsideration of the legal solutions to parties in PFCs is necessary. Chapter 7 emphasized the differences between the objectives of parties in regular diversified corporate environments and PFCs. In Chapter 8, the study identified five pillars for the legal institutionalisation of a PFC company form. Chapter 9 characterised three principles for the ex-post completion of all clauses of the critically relevant risk allocation mechanism. Finally, in Chapter 10, the study advanced the criteria for identifying four legally relevant optimalities in PFCs.

11.2 Chapter 2 - Contractual practices in PFCs

Based on the management and industry-oriented literature, the second chapter has illustrated the contractual practices with which parties shape PFCs today. Chapter 2 has consequently answered the 1st research question:

What are the typical characteristics of contractual practices of PFCs as seen today in the industry-oriented literature?

Non-recourse project financing involves the placement of senior non-recourse debt in a project-dedicated company (a special purpose legal vehicle, SPV, or a group of them) owned and controlled by its material input providers (the sponsors). Under the

SPV ownership, the sponsors allocate the single time-limited project and all associated contracts as ex-ante predefined.

In all PFCs, we find sponsors who own and control the SPV and bring the inputs to the project by contracting with the project company, a lender who provides non-recourse debt, and the SPV. Very often, we also find insurance companies and governmental agencies agreeing on the purchase of the proceeds from the project.

As a distinctive feature, in PFCs, the SPV covers most of its needs with non-recourse debt. In this context, non-recourse nature of debt means that should the SPV fail to repay its debts with resources from the single project, the non-recourse lender (the financing party, FP) would not be capable of seeking repayment or compensation from third parties including the sponsors.

Additionally, as shown in Chapter 3, parties recur to PFCs to implement and finance projects whose capital needs exceed the debt capacities of sponsors. Hence, projects funded under PFCs are regularly highly costly. Finally, because of their high costs, these projects are regularly highly specific or unique in their kinds. Moreover, their assets -that often require long design and development periods- are habitually highly or fully specific (with low redeployment value). Hence, they do not serve as collateral protection of the non-recourse lender. From the interplay between the non-recourse nature of debt and the high specificities of project resources it follows that, in PFCs, for the repayment of its debt claims, the FP relies exclusively on the capacity of the SPV to produce value as ex-ante expected from the single project, as predefined.

Accordingly, ex-ante, that is, before internalising the non-recourse risks, the FP (and all parties) will inspect the robustness of a web of contractual interactions securing that, under all eventualities, the SPV will count on all resources necessary for the SPV to implement and operate the project as desirable. The FP will then enforce these contractual arrangements relating to the provisions for inputs against the SPV -its formal debtor- or directly against the sponsors or third parties (*e.g.*, insurance companies providing coverage for foreseeable risks).

To this bundle of contracts, I refer to as the *risk allocation mechanism*. This strategically indispensable feature of PFCs substitutes the protection that, in other environments, the lenders would obtain from the collateral value or recourse to third parties. The functionality of this risk allocation mechanism reflects the rationality of the non-recourse lender, and its implementation quality dictates the feasibility of all PFCs. Moreover, because the feasibility of non-recourse financing depends on the quality with which the risk allocation mechanism regulates expected responses in all environments, is that the risk allocation mechanism will effectively ex-ante define the project and its boundaries. This, I have initially characterised in Chapter 2, I have

analysed in Chapter 4, and described from different strategic perspectives in chapters 5 and 6.

Today, in the industry-oriented literature, there are no systematic analyses of the clauses that parties use typically in PFCs or their functionalities. Authors describe them in their typical uses in the different industry sectors. Many of these provisions are project-specific. However, some other clauses serve to prevent strategic tensions inherent to the positions of parties in PFCs.

Clauses of these second type are distinctive in these strategic environments. Consequently, the analyses of their functionalities serve for later revealing the needs for legal treatment (*Cf.* Chapter 7). Beyond the early characterisation of clauses for the industry-oriented literature in this chapter, the systematic analysis of the risk allocation mechanism is a contribution of this study (*Cf.* Chapters 4 to 7).

The parties involved. In PFCs, we can distinguish the clauses that involve the FP from those to which the sponsors are only parties. The risk allocation mechanism involves all clauses enforceable by the non-recourse lender. Critically, the FP will not only implement precautions against the SPV. The lender will also enforce technical default provisions directly against sponsors.

Moreover, the lender will habitually implement cross-default mechanisms to enforce consequences against parties (sponsor or the SPV) other than those failing to respond to their commitments as desired. Cross-default mechanisms provide incentives for third parties to exert disciplining efforts in the benefit of the FP -the main risk-taker. Finally, in many cases, the FP will also enforce agreements against third parties. In particular, the FP may often interact directly with off-takers -the parties buying the proceeds from the project (habitually, government agencies in the context of Private-Public Partnerships). See below, the references to step-in rights.

Full default or technical default provisions. As part of the risk allocation mechanisms, the lender will also enforce regulations refining the technological aspects that shape the project. These include not only technical aspects of the contributions from the sponsors (the actual material characteristics of the project) but also the coverage of all other risks that parties may anticipate. Some others also involve the protection from insurance mechanism, the solvency of sponsors (their financial and material capacities), the interaction with regulatory agencies, and the commitments from parties other than the sponsors.

To preserve sponsors capacities, the FP will often also request that the sponsors obtain certification of their capacities, or abstain from providing certain services to their parties. These are known as (positive or negative) pledges or commitments. The enforcement of these provisions will take place in the form of the known technical

default agreements that we can distinguish from full default events. Both categories come with different implications and enforcement scopes. Technical default mechanisms are all those defining obligations other than those of the primary purpose of the financing (the debt) or that the FP considers of critical relevance to her willingness to internalise non-recourse risks (the events of full default).

Control mechanisms. The FP will also request that the sponsors manage the SPV towards the unique objective of completing the project as predefined. As part of control covenants, the FP will also regulate the types of contracts that the SPV can enter with parties other than the sponsors or the FP. Typically, the FP will request that critical inputs be provided only by sponsors and that debt financing comes only from the non-recourse lender. Strategically, this precaution equates to a monopoly in the provision of debt financing in favour of the FP. This precaution comes to prevent debt dilution problems (*Cf.* chapters 3, 4, 7 and 8).

Information mechanisms. As part of the risk allocation mechanism, the FP will request the enforceability of obligations to provide general or specific information. General information will include the provision of data about distinct ratios.⁹⁷⁷ Other commitments may include obligations to inform particular events -*e.g.*, the insolvency of parties, the illegality of certain activities, or the availability of critical inputs.

Dispute resolution and enforcement. Finally, the FP will implement provisions for dispute resolution and enforcement. As we expect in contractually complex cases, dispute resolution will regularly orbit about arbitration procedures. However, as part of enforcement mechanisms, we will see clauses that are typical of PFCs. Some of these include the so-called step-in rights. Under these clauses, the lender substitutes some of the sponsors or the SPV in their interactions with the SPV or third parties. Other clauses include the capacities of the lender to intervene in the decision-making

⁹⁷⁷ *E.g.*, Cash Available for Debt Service (CADS); Debt Service Reserve Accounts (DCRA); Earnings Before Interests and Taxes (EBIT) and Earnings Before Interests and Taxes plus Depreciation and Amortisation -both measures regularly used in diversified corporate businesses-; Free Cash Flows (FCF) defined as EBIT after taxes, plus depreciation and amortisation, minus capital expenditures and increases in net working capital; Annual Debt Service Ratios (ADSCR); minimum Debt Service Coverage Ratio (Minimum DSCR) and Average Debt Service Coverage Ratio (Average DSCR); Loan Life Coverage Ratio (LLCF); Project Life Coverage Ratio (PLCR); and Drawdown Coverage Ratio (DCR).

system of the SPV, or gaining access to the property rights of the shares owned by sponsors.

Clauses amongst sponsors. The sponsors also implement provisions without the intervention of the FP. Some of them focus on project implementation. Some other remain undisclosed (see the tiers of incentives below). Examples of the earlier are the back-to-back and pass-through mechanisms. Under the back-to-back clauses, the individual sponsors and the SPV agree that predefined parties will internalise certain types of risks or extra requirements from an off-taker. The pass-through mechanisms define how parties will cover such costs as they arise with funds from the client with minimal SPV intervention.

The sponsors also implement agreements that escape the enforcement capacities of the FP. They can do this because, as contractors to the company manipulating project assets materially and owners of the SPV, the sponsors receive superior information about the evolution of the project (which dictates the strengths of socially desirable incentives) and the actions of peer sponsors. As the chapter advanced, and as I analysed in chapters 4 and 7, these contractual interactions amongst the sponsors constitute the second tier of incentives to which the sponsors deliver their costly responses in PFCs. The other tiers are, the risk allocation mechanism enforceable by the FP (the first tier of incentives), and the allocations of property rights in the SPV (company shares) with expectations to dividends that the sponsors expand by increasing desirable input levels (the third tier of incentives).

Additionally, in PFCs, for interest alignment, the sponsors will subordinate some of their claims from contracts with the SPV to servicing the non-recourse debt commitments to the FP. For these contracts, and their expectations to dividends, the sponsors will hold residual (junior and variable) claims. Thus, the three tiers of incentives will also result in two objectives that the sponsors pursue with their contributions to the project. First, the sponsors will comply with the obligation of the risk allocation mechanism (*i.e.*, they will minimise enforcement). Second, the sponsors will expand residual benefits *-v.gr.*, they will deliver efforts beyond the FP's enforcing capacities, expanding the likelihood of repayment of subordinated contracts and dividends.

The implementation processes. The chapter has also briefly illustrated the implementation process of PFCs. Habitually, in different stages, PFCs involve independent advisors, insurance companies, contractors for inputs (the sponsors) and several financing entities acting under the coordination of lead arrangers and underwriters. During these costly and transaction costs consuming processes, the parties identify the feasibility of the project and its financing, isolate the material

aspects of the projects with risks and task needed, and implement the risk allocation mechanism including control covenants and technical definitions. All this takes place even before incorporating the SPV -the formal debtor of the non-recourse financing that defines the nature of PFCs.

Chapter 2 also remarked the compatibility of the non-recourse nature of debt in PFCs with the collaterals that the FP will always request for protecting the enforceability of provisions of the risk allocation mechanism. Intuitively, what is *non-recourse* in PFCs is the debt, not the components of the risk allocation mechanism that the FP implements for assuring that the SPV will count on all inputs necessary for the project. The enforceability of all clauses of the risk allocation mechanism and their enforceability, if necessary, with collateral or other sureties from third parties is strictly indispensable to the functionality of the risk allocation mechanism.

11.3 Chapter 3 - PFCs beyond corporate financing (the indispensable PFCs)

In project finance contracts (PFCs) parties spend costly efforts implementing a risk allocation mechanism whose completeness and enforceability substitutes the functionality of the missing collateral and recourse to third parties. Moreover, the quality with which parties implement these provisions defines the feasibility of non-recourse financing. Remarkably, today, parties have access to more traditional solutions for more straightforward implementation (corporate financing).

Based on existing PFC-specific literature,⁹⁷⁸ Chapter 3 has answered the 2nd research question:

What are the strategic benefits from PFCs relative to the limitations that parties find in (collateralised) corporate-financed alternatives when funding exceptionally costly, materially complex, long-term projects?

Alternatively,

What are the strategic benefits of PFCs that make them indispensable for the financing of exceptionally costly, materially complex, long-term projects?

In PFCs, the use of non-recourse debt and the allocation of both project assets and all contractual arrangements under the legal sphere of a project instrumental SPV comes with several benefits. Authors have already characterised many of these in the

⁹⁷⁸ *Vid.* B. C. ESTY, *Modern Project Finance: A Casebook*, cit. Also B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

literature of corporate finance.⁹⁷⁹ Eight of these benefits are relevant to our strategic and legally oriented study.

First, PFCs prevent distress costs. PFCs avoid distress costs caused by debt exhaustion in corporate finance. Intuitively, in regular corporate businesses, covering financing needs with debt necessarily increases debt-to-equity ratios. Additionally, in balance sheets, the exceptionally large and costly project jeopardises the company portfolio diversification capacities. Both aspects raise volatility, thus increasing the costs of debt (an opportunity cost) to other projects -volatility-induced distress costs.

However, in PFCs, parties place the project under the ownership of a distinct SPV. As a result, in PFCs, distress costs exist only associated with the burden of relatively small capital contributions. These risk isolation benefits cannot be replicated in standard corporate settings.

Second, PFCs avoid risk-shifting. PFCs make impossible asset substitution (*risk shifting*) strategies. Under corporate financing, shareholders perceive incentives for adopting riskier than socially optimal projects. By doing this, they maximise the value of limited liability shelter (extra dividends from the well-performing company, but externalities to creditors after the company default). In PFCs, this form of opportunism is not possible with parties predefining the single project and its financing before incorporating the SPV -*i.e.*, in PFCs, the managers are precluded from chasing alternative projects. Risk shifting cannot be prevented in corporate settings where shareholders extract benefits by hunting for riskier opportunities.

In chapters 5 and 6, I described the problem of *risking* in PFCs. Indeed, in PFCs, strategic tensions resulting from the distinct risk preferences exist. However, the spaces for opportunism in regular corporate financing depend on the freedom within which managers adopt alternative projects. In PFC, that scope is instead limited by the incompleteness of the risk allocation mechanism.

Third, PFCs prevent asset dilution hazards. Asset dilution includes all opportunistic ways under which controlling shareholders extract wealth from the company's assets or resources. In corporate finance, the spaces for this opportunism grow as a function of unallocated resources and asymmetries of information -both aspects common to large projects. In PFCs, the SPV count on an information system

⁹⁷⁹ *Vid.* B. C. ESTY, *Modern Project Finance: A Casebook*, cit. Also B. ESTY, "The Economic Motivations for Using Project Finance", cit.

dedicated to the single project. Sponsors also perceive stronger incentives for monitoring the single project from which their returns come. Moreover, they do this at a lower marginal cost from the better access to information resulting from their material interaction with the project as input providers. These informational benefits cannot be reproduced in corporate settings with owners controlling assets (and cashflows) from different departments.

Fourth, PFCs prevent debt dilution strategies. In corporate finance, debt dilution occurs whenever earlier (unsecured) contractors find themselves competing with later creditors for the same cash flows or collateral value of company assets. Contractually, dealing with the problem requires consuming collateral assistance from third parties or placing restrictive covenants limiting the company's access to later debt for other projects (an opportunity cost).

In PFCs, debt delusion cannot happen. First, in PFCs, the SPV access to debt comes regulated contractually ex-ante; second, the FP holds a monopoly for the provision of subsequent debt; and third, the SPV is not allowed to pursue other business opportunities whose creditors may compete with the FP for collateral value. Parties cannot achieve these benefits in corporate finance without incurring exceedingly high opportunity costs associated with restrictive covenants (under-investment of side projects).

Fifth, PFCs avoid the debt overhang induced under-investment problem. Companies funding exceptionally costly projects increase debt levels in their balance sheets. In regular corporate settings, high debt-to-equity ratios imply that more of the total marginal value of capital investments will be used for servicing debt claims rather than for distributing dividends. Backwards induction, high debt-to-equity ratios result in a deterrence of equity investments and the company under-investing in socially desirable growth options.

In PFCs, the sponsors require debt (on their balance sheets) only for funding the costs of complying with their obligations to the project. On the SPV side, there cannot be overhang induced under-investment with the company advancing a single project financed by third parties (the predefined FP). Debt overhang cannot be avoided in corporate settings where shareholders need debt for funding opportunities sequentially.

Sixth, PFCs prevent inefficiencies from managerial misconducts (the free cash flow problem). The materially complex projects increase the cost of tracking (monitoring) cashflows within complex organisations. Unallocated cash flows then allow the masking of managerial indiscipline. Additionally, by increasing volatility, large projects owned by companies distort (further decrease) the risk

preferences of the poorly diversified (risk-averse) managers. Risk aversion provides further incentives for managers to respond opportunistically with unallocated resources.

In PFCs, the spaces for managerial misbehaviour decrease as a function of first, the lack of unallocated resources from other business units; and second, from the better informational systems dedicated to the single project owned by the project-dedicated SPV. These cash flow control (reduction) and informational benefits are not feasible under corporate settings with managers administering distinct projects that they select.

Seventh, PFCs mitigate opportunism by concentrated debt providers. In PFCs, concentrating debt in fewer hands comes with several benefits -especially concerning transaction costs and opportunities for readjusting (*cf.* the opposite case of bondholders). However, keeping debt in fewer hands comes with hazards from contractual incompleteness permitting that creditors renegotiate (over enforce technical default provisions) opportunistically.

In PFCs the risks of finding lenders enforcing technical default provisions opportunistically appear greatly minimised. Without collaterals or other projects under the same corporate umbrella, the lender internalises more of the losses she externalises to the SPV (her debtor) from her opportunism. This interest alignment effect cannot be possibly reproduced in corporate-financed settings.

Eighth, PFCs favour information flows, thus reducing tensions with dispersed investors and debt providers. Large projects bring volatility to companies. To third parties internalising corporate risks, volatility results in ex-ante needs for spending transaction costs internalising information and implementing sureties. In corporate-financed settings, volatility then impedes the participation of (*v.gr.*, increases the interests charged by) dispersed creditors. This affects companies' capacity to seek funding for the large project and other business units under the same ownership umbrella.

In PFCs, the use of a SPV permits that parties evaluate the single project on its own merits -that is, without risk contamination⁹⁸⁰ or subsidising benefits from other business units. Note, in PFCs, the FP takes part actively in the verification of project capacities before contracting. Moreover, the lender controls the access of the SPV to further financing. Consequently, the FP will reveal information to dispersed investors

⁹⁸⁰ See the entry “risk contamination” in the glossary.

and debt providers free-riding on her initial implementation efforts. This reduces the well-known adverse selection induced under-investment problems faced by dispersed investors and creditors. Parties cannot replicate these informational benefits in corporate finance settings.

11.4 Chapter 4 - Identifying PFCs: The necessary components and strategic positions of parties in PFCs

Today, the literature does not characterise the elements and features of the positions of parties in PFCs in a defining manner. As shown in Chapter 2, the illustrations of PFCs appear dispersed in management and corporate finance literature. The identification of the necessary elements and the strategic aspects inherent to the positions of parties in PFCs is indispensable before analysing the strategies of parties and the legal solutions applicable in this environment. Chapter 4 consequently responds to the 3rd research question:

What are the characteristics of the necessary parties, elements, objective functions and strategic tensions inherent to PFCs?

After Chapter 2 offered illustrations of contractual practices as seen dispersed in the industry and management-oriented literature, now from a strictly strategic approach, chapter 4 has isolated the necessary elements and strategic positions of parties in PFCs: First, all PFCs have six indispensable components that define their contractual and strategic nature. Second, in PFCs, we always find six strategic characteristics that are inherent to the positions of sponsors and the SPV. Based on these identifications, the chapter characterised the private objectives of parties in all PFCs, the items that govern the feasibility of all PFCs, and the necessary contrasts with other financing techniques. Finally, the chapter has illustrated the above with the concrete evidence of four exceptionally diverse real-life scenarios as published in the literature on project financing.

The six necessary components that identify PFCs.

First, in all PFCs, parties finance a costly project with non-recourse debt. Strategically, the non-recourse nature of debt provides the primary benefit of PFCs of allowing the sponsors to fund a project beyond their debt capacities (individual, or with third-party support). As analysed in Chapter 2, the non-recourse nature of debt is compatible with the strategically indispensable enforceability of clauses of the risk allocation mechanism for which the lender will verify the sufficiency of collateral protection or recourse to third parties.

Second, in all PFCs, there is always a single predefined time-limited project. PFCs are legal and financial structures that parties implement for completing and financing

a single project. Note the contrast with the rationality of dispersed investors advancing portfolios of projects in regular corporate investing businesses. In PFCs, there is always a single, time-limited project that serves for producing the wealth from which the SPV will repay the non-recourse debt. This project must be definable by parties before internalising non-recourse (or any other type of) risks.

Third, in all PFCs, there is always a risk allocation (task distribution) mechanism. As first identified and strategically characterised in this study, in PFCs, the risk allocation mechanism is strictly indispensable for the non-recourse lender to rely on sponsors' responses upon which the SPV will produce value sufficient for repaying the non-recourse debt in all foreseeable scenarios. The implementation quality of the risk allocation mechanism defines the feasibility of non-recourse debt.

Forth, in all PFCs, there is always, at least, one sponsor. In PFCs, the sponsors originate (design) the project. They own the SPV and, as contractors of critical inputs, they also control its assets and receive high-quality information. Strategically, the sponsors -and, crucially, their effective control of both the SPV and its assets-, are indispensable for the implementation and enforcement of the risk allocation mechanism. This evident aspect served for shaping a *iuris et de iure* control responsibility rule in Chapter 8.

Fifth, in all PFCs, there must be at least one SPV. The allocation of both project resources (assets) and contractual relationships is strategically indispensable for four reasons. The project dedicated SPV isolates project assets from the creditors of the sponsors. The SPV with limited liability protection is strictly indispensable for impeding risk contamination (and the unbearable distress costs -*v.gr.*, exhaustion of debt capacity) to the sponsors. The project instrumental SPV preserves information distortions and risk contamination from other projects -a matter that is strictly indispensable for the project-dedicated risk allocation mechanism's feasibility. Finally, the allocation of the single project under the ownership of a single project-instrumental SPV is indispensable for implementing incentives via distribution of property rights -expected dividends- for the sponsors to choose socially desirable but fully non-contractible privately costly actions of any kind (implementation, monitoring, relationally enforcing, material quality-enhancing, or innovation-implementing efforts).

Sixth, in all PFCs, there is always one or more non-recourse lenders acting coordinated. During the initial stages of contract implementation, project completion, and project operation, there must be at least one non-recourse lender capable of implementing and enforcing the risk allocation mechanism before and during the project's evolution. The strategically indispensable FP can include a group

of coordinated lenders (as in a syndicate), and her position is not incompatible with the presence of dispersed investors or bondholders free-riding on her contributions.

The six necessary strategic features of PFCs

First, in all PFCs, sponsors control the SPV and its project. As mentioned above, in all PFCs, the sponsors must control the SPV and its assets. Strategically, this requirement is indispensable for the sponsors' capacities to implement and comply with the risk allocation mechanism. Loss of control of the SPV or its critical assets (the transfer of shares or the contractual position of sponsors without authorisation) will be regularly identified as an event of technical or full default in the loan agreement.

Second, in all PFCs, the value of non-recourse claims depends on contributions from the sponsors. In all PFCs, in the absence of recourse to third parties, and because the SPV advances highly or entirely specific assets (the single project), the FP's perspectives to find her claims served depend exclusively on the capacities of the single project to perform as expected. Project capacities then depend on the interplay between the (contractible and non-contractible) contributions from sponsors and the unforeseen events from nature dictating both the SPV's capacities and the incentives to sponsors. Both project capacities and how the sponsors respond to changing incentives are functions of the critically important implementation quality of the risk allocation mechanism that all parties predefine.

Third, in all PFCs, the sponsors respond to three tiers of incentives. In all PFCs, the sponsors respond to the critically relevant risk allocation mechanism that the FP enforces against sponsors based on the low-quality information she receives -the first tier of incentives. Second, the sponsors respond to the incentives that they implement contractually amongst them (within sub-coalitions or unanimously) based on the high-quality information they receive from the project and on the conjectures that they can build about the capacities of the SPV to repay subordinated claims and issue dividends. Third, individually, each sponsor chooses fully non-contractible efforts expanding the benefits that each one expects as a function of their allocations of property rights in the SPV (expected dividends). Critically, as shown in chapters 5 and 6, the incentives for the sponsors to respond to the three tiers depend on their individual and collective beliefs about the project's expected capacities to produce wealth after servicing the senior non-recourse debt.

Fourth, in all PFCs, the seniority of claims lies in the nerve of strategic tensions (Cf. Chapters 5 and 6). In all PFCs, the sponsors subordinate some of their claims from their contracts for inputs with the SPV to the titles of the FP. Additionally, in all PFCs, as owners, the sponsors expect dividends from the legal entity. Both

subordinated contracts (in risk) and future dividends (both in risk and value) are expectations residual to the FP's entitlements. In other words, in all PFCs, the sponsors expect from the project value that is junior and variable as a function of the SPV's capacity to repay the senior non-recourse debt.

In this context, the hierarchy (the seniority rule) that parties use for channelling cashflows to either the FP or sponsors defines the likelihood of repayment as a function of the *news* affecting the project. However, by defining the magnitudes of expectations and their vulnerability to changes in the environment, the hierarchies of claims also dictate the exposures of incentives for sponsors to deliver socially desirable responses. Therefore, in all PFCs, there will be an optimal seniority of claims that we can characterise. This optimality maximises the values expected by the FP and sponsors by also considering incentive effects that govern the responses from sponsors and consequently the value that parties may expect from the SPV for all the range of possible evolutions of the environment (*news*). The analysis of this optimality is the object of a dedicated postulate in Chapter 10.

Fifth, in all PFCs, the opportunism realises beyond company spheres (v.gr., not only against company resources but in tension with the risk allocation mechanism). In PFCs, opportunism takes place via the opportunistic responses of sponsors as inputs providers to the SPV. Observe, in PFCs, shirking, risking, and shading happens on the side of input providers -that is, beyond company control spheres. This is true irrespective (or, should we say, in virtue of) the fact that in PFCs, the sponsors control the SPV. Notice the contrasts with what we see in the many objectives of the legal treatment of legislators and judges in regular corporate contracting or investing where opportunism takes place by managers and controllers against company resources (against the resources of the investment portfolios) -that is, within company control spheres.^{981 982}

⁹⁸¹ All forms of debt dilution, asset substitution (risk shifting), asset dilution and all types of opportunism associated to the canonical free cash flow problems happen within the company at the managerial level. In prevention of these abuses from managers and controllers against investment portfolio resources is that legislators and judges enforce legal protections against strategic tensions in diversified and collateralised corporate investing and contracting scenarios.

⁹⁸² I will recall this most relevant contrasts in the conclusions of Chapter 7 when exposing the inefficiencies of the current legal solutions and the needs for a legal treatment in PFCs.

Sixth, in all PFCs, diversification spaces are always undesirable threats against implementation quality. In PFCs, the value expected by the FP -the least-qualified, least-capable of implementing and enforcing contractual precautions, and the only party not controlling project assets-, depends on her capacity to foresee contingencies and predefine the responses that she expects from sponsors in all scenarios. This is particularly true for the range of contingencies that may reduce the SPV's capacities to produce wealth beyond the burdens of debt, thus depleting the incentives for parties to deliver socially desirable responses.

To this end, all the protections that today shareholders and managers receive for investing, contracting and financing alternative projects is undesirable -in detriment of implementation capacities- to parties in PFCs. Consequently, as shown in Chapter 7, today, ex-ante, parties spend implementation efforts adapting the norms with which legislators protect diversifications capacities in the current corporate forms' regulations. These differences in the core objectives of legislators as revealed in the corporate forms and the purposes of parties in PFCs (diversification *vs* single-project implementation) will dictate the shape of the proposition for a legislative institutionalisation of PFCs via a dedicated company type in chapters 8 to 10.

The three feasibility determinants of PFCs.

First, the capacities of sponsors. The feasibility of PFCs requires two types of capacities of sponsors: the financial capacities, and technical capacities. The financial capacities are necessary for funding the full *capital* contributions of the SPV -which, as said, do not cover the majority of financing needs of the project. Second, the sponsors must be capable of delivering the material contributions (and innovating for finding solutions) necessary for completing and operating the single predefined project. These capacities will be the object of regulations by the risk allocation mechanism. *Cf.* in Chapter 9, the elaboration about the *intuitu personae* treatment of the positions of sponsors in PFCs.

Second, the capacities of the project. As remarked, in all PFCs, there must be a project -a foreseeable and contractible combination of resources- whose capacities should serve for producing wealth sufficient for repaying the senior non-recourse debt. The cashflow producing capacities of the project must be easily predictable. For this, in addition to other reasons, PFCs, are popular in public-procurement processes.

Third, the implementation capacities of the FP. Finally, the feasibility of PFCs depends on the quality (robustness and enforceability) of the risk allocation mechanism. In PFCs, the sponsors have objectives in tension with those of the FP. Ex-ante, this results in implementation efforts oriented at distinct (privately desirable) objectives. The implementation capacities of lenders are critical for them

to rely on the quality of the risk allocation mechanism. As shown in Chapter 2, in PFCs, during the contract implementation stage, the FP (the lead arranger) will habitually advance with the aid of independent advisors experts on industry sectors.

The distinctions with other financing alternatives

Finally, in terms of the risks internalised by parties, the aspects that define PFCs strategically, are two.

First, in PFCs, the resources that allow the risk-taker (the FP) to build conjectures about the values of her claims do not exist at the time of contracting and will never exist unless the project performs as expected as a function of the responses from all contracting parties. This separate PFCs from all asset-based alternatives: traditional diversified corporate investing, derivatives, securitisations, commodity-based financial products and all other mechanisms where underlying resources with collateral capacities exist.

Second, in PFC, the FP receives senior, but fixed face-value claims and she enforces contractual provisions actively but (save violations of technical default provisions) she does not intervene in the management of the project. This separate PFCs from private equity investment mechanisms in which investors receive senior and variable rewards and take active roles in the evolution of the enterprises in which they invest.

11.5 Chapter 5 - Necessary tensions (conflicting interests) and opportunism between the sponsors and the lender in PFCs

Chapter 5 is the second chapter of the second part of the study examining strategic aspects of the positions of parties in PFCs. The chapter has answered the 4th research question:

What incentives common to all sponsors exist in tension with the interests of the non-recourse lender and what forms of opportunism appear in PFCs?

The chapter identifies three forms of opportunism that correlate to the strategic tensions between the sponsors collectively and the non-recourse lender (the FP). To these, I refer to as *shirking*, *risking*, and *shading*. Thus, the names serve for identifying both the tension and the form of opportunism in the context.

Directly, the problem of *risking* and *shirking* is one of pure moral hazard. *Shading* stems from contractual incompleteness. However, the three problems result from the SPV's incapacity to produce wealth from the risk allocation mechanism without using the value that the sponsors generated with their non-contractible efforts for creating residual benefits. Thus, indirectly, the three problems come as a result of imperfections of the risk allocation mechanism (both its incompleteness and the

spaces it allows for hidden actions).

Recall, the sponsors are residual claimants *-v.gr.*, they expect dividends and wish to receive payment in exchange for their responses to subordinated contracts. In other words, they expect to harvest the wealth that is left after the SPV has paid the senior non-recourse debt. Also, ex-ante, parties implement the (enforceable) risk allocation mechanism for producing wealth sufficient for the SPV to repay such debt. The FP needs this comfort before internalising uncollateralised risks.

Recall, because they have access to superior information about the project (they interact with project assets materially) the sponsors can choose actions non-contractible to the FP. Then, because the sponsors are residual claimants, after (beyond) complying with the risk allocation mechanism, they will choose further efforts expanding the value that the SPV will produce beyond the costs of debt. As said, these actions escape the enforcing capacities of the FP *-v.gr.*, these efforts are distinct to the responses that the sponsors deliver in compliance with the enforceable risk allocation mechanism.

Now, consider the case in which, the wealth that the project generates from the inputs that the sponsors delivered in compliance with the risk allocation mechanisms is not sufficient for repaying the senior debt. Because of the seniority of claims, the SPV will now use some of the wealth that the sponsors produced to expand residual benefits for repaying the senior non-recourse claims. Ex-ante (or after updating conjectures about the SPV's capacities), the above perspectives distort the incentives for the sponsors to produce such benefits from their costly non-contractible efforts. This aspect is the source of the three tensions.

Risking. The chapter has identified *shirking* as the distortion to sponsors' risk preferences choosing efforts for expanding residual benefits and anticipating that, as said, some of those benefits will accrue to the FP. Recall, the sponsors choose efforts behind limited liability protection. The debt is non-recourse. Furthermore, the sponsors choose inputs expanding residual benefits beyond the enforceability of the SPV or the FP.

Hence, when choosing innovations, the sponsors realise that, if the technological solutions they choose do not perform as expected, they may likely receive zero returns from their costly efforts, the SPV could default on the trench of debt that remains unpaid, but they will never internalise the costs of debt. This protection of the limited liability rule and the non-recourse nature (and the burden of) senior debt

affect the risk preferences of the sponsors choosing non-contractible efforts.

Intuitively, by increasing risk levels,⁹⁸³ the sponsors extract higher benefits in the cases in which the technology works as desired. However, the higher likelihood of project failure and the lower value that the SPV would produce in such cases would result in externalities to the FP after the company defaults on its debts. The sponsors will consequently choose non-contractible efforts selecting solutions that will be riskier than socially optimal.

Shirking. Consider the same scenario. The sponsors anticipate that some of the marginal outputs from their efforts will accrue to the FP. Then, independently from the technologies they choose (*risking*), they will also withhold costly efforts expanding residual benefits. The intuition is also simple. By *shirking* efforts, the sponsors internalise the full marginal value of such savings but internalise only a fraction of the risks that such savings would produce in the form of likelier defaults on the senior debt. As above these risks will externalise to the FP. The sponsors' objective function appears as a loss of incentive power (a flattening of the curve of marginal returns) that calls for lower choices of costly inputs in equilibrium. As the case of *risking*, *shirking* grows as a function of the weight of debt extracting residual benefits and the likelihood of insolvency whose risks the SPV will externalise to the non-recourse lender.

Shading. Finally, as *risking*, the case of *shading* also involves innovation-implementing efforts. However, *shading* relates to the technologies with which the sponsors now respond to the risk allocation mechanism -the obligations enforceable (imperfectly) by the FP.

Intuitively, the risk allocation mechanism is inherently incomplete. Thus, the sponsor has space for choosing how she will comply with such technological requirements. When doing this, the sponsors observe the externalities that implementing such technologies could bring to total value -of which she perceives residual benefits. Now, as in the other cases, as conditions deteriorate, the sponsor will no longer internalise the effects that such innovations for complying with the risk allocation mechanism could bring to the total capacities of the SPV more of which will accrue to the lender. Hence, she will now implement cost-saving technologies that will reduce total welfare at the SPV level with the consequential externalities to the FP.

⁹⁸³ *V.gr.*, the dispersion of possible outputs now being of higher value but also of lower value when not resulting as desired

The problems of *shirking*, *shirking*, and *shading* exist under *no news*, they exacerbate with *bad* and *very bad news* and minimise (tend to disappear) under *good news*. Most remarkably, in all scenarios, the three problems are interdependent and exacerbate each other.

Under *no news*, the tensions exist as a function of the imperfections of the risk allocation mechanism. That is, contractual provisions are always imperfect (mainly, they are incomplete). Thus, projects are inherently risky. Then, the expected (loss of) value from the risks that the SPV fails to produce wealth as desired and managers use residual benefits for repaying the senior debt will generate the three problems. Here, there is *shirking*, *risking*, and *shading* in light of the project's initial conditions -say, as a result of the information that the sponsors withhold opportunistically during the implementation process.

Under *good news*, the likelihood that the manager finds herself in need for using otherwise residual benefits for repaying the senior debt diminishes. As shown, under *good news*, the sponsors perceive incentives for revealing rather than withholding information and exerting *hidden actions*. Under complementarities, revealing information about the higher choices of inputs results in incentives for other team members to increase input levels, further expanding the marginal values of all efforts. *Good news* induces the expansion of synergetic efforts.

Under *bad news*, the capacities of the project deteriorate. *Shirking*, *risking*, and *shading* exacerbate as a reaction from the sponsors after updating information. This remark is critical to the legal treatment because it shows the three tensions as a function of sponsors' capacities to update conjectures based on the information, they receive from their closer interaction with project assets. Fiduciary duties to inform, fiduciary duties of diligence and control responsibility in PFCs (*Cf.* chapters 7 to 9) derive from this aspect.

From the strategic stance, see how the three problems interact. *Shirking* affects total project capacities, thus exacerbating *risking*. Then, when implementing *risking*, independently from the welfare redistribution effect of volatility under limited liability protection (and non-recourse debt) the change in the technology -*v.gr.*, the departure from the first best technological solution- comes with a loss of total project capacities further aggravating the incentives for *shirking*. Then, by harming the project, both *risking* and *shirking* further exacerbate *shading* -which further incentives *shirking* and *shading*. The three problems consequently coexist, and they are interdependent irrespective of where or how undesirable *news* affects the project or the capacities of sponsors.

Under *very bad news*, in the scenario in which the sponsors perceive no returns from

their non-contractible efforts, we cannot speak about *shirking* or *risking*. Notably, in this scenario, the sponsors devote their entire resources of innovation-implementing efforts to implement solutions for complying with the risk allocation mechanism without internalising any of the effects from such innovations to total welfare.

The relevance of the findings of the study to the problems of the costs overruns in large projects is evident. The study shows the evolution of the tensions and the incentives that the sponsors dictating project capacities evolve as conditions from the environment deteriorate unexpectedly with time. There is a need for building bridges between the critical findings of this research and the casuistic management literature of costs overruns. Such tasks exceed the scope of this work.

The identification of tensions and characterisation of the forms of opportunism that are inherent to the positions of parties in PFCs is also critical to the provision of adequate legal treatment. Fundamentally, in PFCs, legal solutions of company forms should orient to facilitating implementation and enforcement of the single-project risk allocation mechanism. These objectives are precisely contrary to the purposes of facilitating diversification that legislators and judges pursue when shaping the features of business company types allowing for limited liability protection to dispersed (passive) investors. After isolating the necessary components that identify PFCs in Chapters 3 and 4, from the strategic characterisations of chapters 5 and 6, the study later built three sets of legal postulates for their legal institutionalisation: five propositions for institutionalising PFCs in a PFC corporate type, three postulates for ex-post interpreting and completing all clauses of the risk allocation mechanism, and four optimalities enforceable legally in PFCs scenarios.

11.6 Chapter 6 - Individual responses, sub-coalitions and unanimous collusions against the lender in PFCs

Chapter 6 is the third chapter of the second part of the study focussing on the strategic aspects inherent to the positions of parties in PFCs.

Chapter 6 answers the twofold 5th research question:

How are the individual strategies of the sponsors under asymmetries of information and bounded rationality when allowed to renegotiate with some or with all other sponsors as the environment changes?

Or, alternatively:

How do individual sponsors respond to changes in the environment when they can readjust with some or with all other sponsors?

The chapter has identified how, as the environment changes and capacities of the

SPV to distribute residual benefits deteriorate, the sponsors perceive increasing incentives for behaving opportunistically after renegotiating and coordinating with some or with all other sponsors. The chapter consequently characterised the correlation between the influences from the environment and the likelihood that the sponsor delivers their responses (*shirking*, *risking*, and *shading*) individually, after forming opportunistic sub-coalitions, or after colluding unanimously with the other sponsors against the FP.

Moreover, the study demonstrated how the strengths of the incentives for *shirking*, *risking*, and *shading* correlate with the spaces for responding individually, with the optimal size of opportunistic sub-coalitions, and the likelihood of unanimous renegotiations. Finally, the chapter has also mapped the factors that facilitate each alternative, *e.g.*, the asymmetries of information amongst the sponsors and the FP, the complementarities of quality-enhancing and innovation-implementing efforts, and the spaces for interacting relationally -*v.gr.*, the capacities of sponsors to sustain reciprocity-based cooperation.

The individual responses. The first alternative involves delivering responses to incentives without renegotiating or revealing information to any other sponsor (or, formally, the SPV). The individual sponsors will consequently exert *shirking*, *risking*, and *shading* as a function of the asymmetries of information between her, and all other sponsors, the SPV, and the FP. This is the prevalent response under *no news* or *good news*, when conditions appear as expected or better than expected. A sponsor will prefer choosing only private efforts when the asymmetries of information between her and any other sponsors (and the FP) are high. The sponsor will choose inputs individually also when the capacities of parties to interact relationally high, the stake of shares in the SPV held by the sponsors are small, the complementarities of quality-enhancing efforts are also high, and the synergies of innovating contributions are low. These variables dictate the costs of bribing other sponsors after they become aware of the impact of the opportunism they may internalise.

The opportunistic sub-coalitions. The second alternative consists of delivering inputs to the project after renegotiating with some sponsors clandestinely. The sponsors will adopt this decision as a function of the value of bribing some peers in exchange for their withholding of enforcing information. By doing so, the sponsors can expand the spaces for *shirking*, *risking*, and *shading* in detriment of sponsors outside the sub-coalition and the FP -both of which will internalise losses in the project capacities. The feasibility of briberies and the optimal size of sub-coalitions depend on the same factors remarked above.

The optimal sizes of sub-coalitions will then grow as a function of the severity of *news*

affecting the sponsor initiating the sub-coalitions (the severity of *news* dictates the willingness to bribe). Sub-coalitions will grow with the lower asymmetries of information between the sponsor under distress and the sub-coalition members, and the broader asymmetries between sponsors inside and outside the sub-coalition and the FP. The sub-coalition will also expand with the lower complementarity of quality-enhancing efforts of members of the sub-coalition and with the higher the marginal values and complementarities of innovation-implementing efforts of members of the sub-coalition (valuable for adapting opportunistic technology readjustments). The sub-coalition will grow with the better capacities of sub-coalition members to sustain reciprocity-based cooperation for enforcing opportunistic innovations and with the lower the capacities of outsiders to monitor and retaliate relationally. Finally, the scopes of sub-coalitions will expand with the smaller SPV ownership shares (expected dividends) in their members' hands. The interplay of these factors determines the spaces for delivering *shirking*, *risking*, and *shading* opportunistically, as a function of the costs they internalise, their capacities to innovate and coordinate efforts, and the total fraction of project losses they internalise as a result of their opportunistic responses.

The unanimous renegotiations. Finally, as a function of the asymmetries of information between all the sponsors collectively and the FP, the individual sponsor may deliver her contributions after renegotiating with all peers. We see these cases whenever the asymmetries between her and all other sponsors are very low, and the asymmetries with the FP are high. The likelihood that the sponsors renegotiate unanimously depends on the same factors that expand sub-coalitions: the value of capacities of all sponsors to innovate opportunistically, the asymmetries of information amongst all parties, the complementarity and marginal values of innovating and quality-enhancing efforts, and on the spaces for interacting relationally (enforcement capacities).

Let us shortly observe the characterisation of the responses of sponsors in all environments.

No news. Under *no news*, the sponsor perceives no incentives for renegotiating because the environment's conditions appear as contracted initially. Thus, the case of *no news* is identical to what we saw in Chapter 5.

Good news. As also analysed in Chapter 5, under *good news*, the sponsors will reveal rather than withhold information about their cost functions. By revealing information, the sponsors allow other sponsors to anticipate her higher choices of inputs that, under complementarities, also define (in this case, expand) the marginal value of (returns from) their contributions.

Bad news. Under *bad news* incentives and spaces for delivering opportunistic responses in cooperation with other sponsors grow. After receiving *bad news*, the sponsor under distress will obtain more benefits (opportunistic savings) at the marginal costs of bribing one or more other sponsors in exchange for withholding enforcement. Under *bad news*, as the sub-coalitions grow, we observe changes in the strategic value of complementarities of both quality-enhancing and innovation-implementing efforts, the ownership distributions, and the capacities for enforcing relationally within and outside the sub-coalition. With *bad news*, as a function of the same factors, unanimous renegotiations become more likely thus maximising the spaces for responding with *shirking*, *risking*, and *shading*. Naturally, under *bad news*, as the optimal size of sub-coalitions grows, the spaces for opportunistic responses *shirking*, *risking*, and *shading* with consequential externalities to the FP and the sponsors outside the sub-coalition will necessarily increase beyond what we find whenever the sponsor does not renegotiate.

Very bad news. Finally, under *very bad news*, the case in which the sponsors no longer spend non-contractible inputs expanding residual benefits and chooses efforts simply for minimising enforcement of the risk allocation mechanism, the likelihood that the sponsor under distress finds it optimal to renegotiate with all other parties is highest. Remarkably, after renegotiating unanimously, the enforcement capacities of the opportunistic (unanimous) sub-coalition involving all sponsors will be highest and not bound by outside sponsors revealing information (*v.gr.*, enforcing the risk allocation mechanism). Thus, the implementation capacities of unanimous collusions will be, for that reason, broadest. In this scenario, without the sponsor expanding residual benefits, the socially desirable incentive function of property rights depletes completely. Under *very bad news*, with sponsors withholding all efforts expanding residual benefits, we can no longer speak about *shirking* or *risking*. In this scenario, the sponsors spend all innovation-implementing capacities for *shading*, and the externalities to the FP and the likelihood of SPV insolvency are necessarily highest.

The value of the contribution. The chapter isolated the incentives that govern the spaces for opportunistic cooperation in PFCs. It shows how, as conditions deteriorate, the sponsors will deliver opportunistic responses (*shirking*, *risking*, and *shading*) with externalities to the lender individually and within growing clandestine sub-coalitions. Beyond a certain threshold, the sponsors will collude exclusively for *shading*. In other words, the chapter has identified the evolutions of conditions that shape the strategic environments in which the sponsors collude for innovating for complying with their obligations to the FP but without generating project welfare.

As remarked, the findings of chapters 5 and 6 are critical to the understanding costs overruns in large projects. The strategic understanding of how the sponsors

coordinate socially desirable or opportunistic efforts in PFCs is also crucial not only for the design of the legal treatment but for better understanding the functionality of clauses that we do not see in other environments. *V.gr.*, in PFCs, we see the extensive use of cross-default mechanisms. We also find step-in rights, and entitlements for the FP to advance over the contractual relationships of parties other than those obliged under the technical default provisions. By enforcing penalties against parties other than those expected to deliver input responses, the FP implements contractual pressure for the sponsors to exert disciplining efforts relationally -that is, beyond the enforcement capacities of the lender. These clauses reflect the multi-party functionality of PFCs, a matter that requires legal treatment via the institutionalisation in a PFC corporate form, not by the isolated interpretation of clauses.

11.7 Chapter 7 - Needs for legal treatment in PFCs

This is the first chapter of the third part of the study focusing on legal implications from the strategic analyses. Chapter 7 responds to the 6th research question that is twofold:

What are the general contrasts between the objectives of the legal solutions allowed today to parties in diversified corporate contracting and the needs for legal treatment in PFCs?

And,

How these needs for legal treatment manifest in the objectives of contractual solutions with which parties readjust the rules of the current corporate types in PFCs?

The chapter had three sections. This first one observed the strategic needs, legislative purposes, and legal solutions efficient in the current legal treatment that legislators and judges allow to parties in regular (diversified and collateralised) corporate businesses. These are the objectives that shape the legal structures (default and mandatory norms) of general business-oriented corporate forms.

The second part of the chapter exposed how the objectives, strategic environment, and needs for legal protection of parties in PFCs are characteristically different to those considered by legislators and for which legislators and judges provide a legal treatment to parties in PFCs. This second part of the chapter also showed how, when applied to the environments of PFCs, the functionality of the rules that shape corporate forms oriented at facilitating diversified and collateralised scenarios result in costly distortions to parties in PFCs.

The third part of the chapter remarked the contractual solutions that parties

implement in PFCs for circumventing the effects of the distortive rules. This third part of the chapter also showed how many of such contractual solutions are feasible in PFCs but not in diversified environments where they would jeopardise the objectives for which legislators offer corporate forms to parties.

Finally, the chapter exposed how, in virtue of the distinct objectives of parties in PFCs (oriented to implementation instead of diversification), many of the critical objectives of contractual solutions can (and should) be replicated in legal (legislative and judicial) solutions.

Based on this identification of solutions to the strategic tensions of chapters 4 to 6, the following three chapters 8 to 10 defined critical aspects that permit the legislative institutionalisation of PFCs via a dedicated corporate form (towards the legislative institutionalisation of PFCs). Chapters 8 to 10 also provide for postulates for the interpretation of contracts and legally enforceable optimalities. All legal propositions are functional in protecting parties in their strategic needs that are inherent to their positions in PFCs. Hence, all legal postulates are robust to evolutions in the environment irrespective of project configurations.

The objectives and legal functionality of current corporate forms and the contractual practices in diversified corporate investing and contracting.

Today, business-oriented corporate forms shape their legal solutions with the objectives of facilitating business diversification. This reflects in the protection that legislators allow to the capacities of companies to advance diversified portfolios of materially and financially distinct projects. These objectives also appear on how legislators preserve the possibilities of contracting for financing and material inputs with third parties who are independent of each other. Additionally, legislators implement legal solutions facilitating companies' access to capital from shareholders who are dispersed, passive, and likely least-informed about the companies' evolution. These manifests in the features that are common to most business corporate forms.

Today, the limited liability rules protect diversified investors who can provide resources without internalising risks beyond their contributions. The same rule facilitates the transferability of shares to least-informed investors. The limited liability protection of investors makes business delegation possible for additional value to such dispersed shareholders.

In regular diversified corporate businesses, the functionality of delegation benefits from the interplay of fiduciary duties of loyalty to shareholders and the fiduciary duties of diligence that also protect risk-averse managers when fulfilling their high-risk decision-making mandates. Additionally, and in the same vein, because they

advance diversified businesses, today, managers are not required to inform creditors about the evolution of individual projects. The managers and controllers only inform creditors in the vicinity of company insolvency.

Finally, the limited liability rule results in sporadic externalities to creditors. However, the investors in organisations who take the role of punctually frustrated creditors are also diversified and protected behind limited liability rules. Diversification allows them to dissipate the impact of such defaults in their cashflows. Accordingly, in diversified environments (regular corporate contracting and investing) limited liability rules then function as a Kaldor-Hicks efficient legislative solution.

The above objectives also reveal in the contractual practices of companies, contractors, financing providers and investors interacting with each other advancing diversified businesses. The most evident practice that characterises business corporate contracting and investing is the rarity of contractual provisions (and rules in corporate forms) restricting companies' investment capacities beyond their objects as defined in their charters. Note, restricting the spaces within which companies can invest is an alternative that parties can achieve contractually via control covenants. However, despite certain circumstances that are somehow effective at protecting collateral value, in the vast majority of cases, such solutions come at a high cost in jeopardising portfolio benefits (against cashflow volatilities) -an aspect critical to the objectives of dispersed (minority) shareholders. The same comment applies to the restrictions to the transferability of shares (especially in open held and public companies), or the interferences with dividend policies. These solutions are not in the regulations of company forms and not frequently seen in contractual solutions.

Similarly, aside from the scenarios in which parties use companies for individual projects -the case of SPVs in general, the restrictions on companies' capacities to interact with third-party contractors come against the general objectives of legislators and are rarely seen in contractual practices. Except for infrequent cases, third party contractors comply with their obligations for inputs with the help of the third parties that they identify and choose freely.

Additionally, in regular diversified contracting, input providers of distinct projects do not interact with each other or internalise the consequence of other parties' responses (except for the common solvency risks that they share). Thus, parties do not implement contractual provisions enforcing penalties against some contractors of some projects as a result of the substandard performance of other contractors of other projects. Consequently, save for rare exceptions in financial contracts, cross-default provisions are not seen in contracts for inputs in regular corporate businesses.

A similar observation is valid for the rules of corporate forms or the contractual interactions with providers of debt. As shown in Chapter 3, in diversified businesses, earlier lenders face debt dilution problems when they find themselves competing for collateral or cashflows with subsequent (later coming) creditors bringing debt funds necessary for financing other business units -there are externalities between the two. To prevent this, lenders can restrict the access of the company to further debt. This is contractually possible but exceedingly costly against the legal entity's capacities to finance later projects when diversifying investments.

The restrictions on companies' access to financing do not belong to the spirit of company forms, and we rarely see them in contractual practices. The same is true for regulations of hierarchies of claims -*v.gr.*, note, the subordination of claims imply a restriction to the conditions of acquiring later debt. Moreover, for the same reasons, debtors and creditors do not agree on the enforcement of other severe consequences from violations of technical default provisions that could be contractually implementable but would come at unacceptable costs to the company. *E.g.*, parties do not allow creditors to intervene in the company's decision-making process or interfere in the contractual relationships between the company and third parties (contractors, other financiers, or clients).

The vocation for advancing diversified businesses is also visible in both the legal treatment and contractual practices regulating delegation. Additionally, legislators no longer restrict *the capacities* of companies and interpret the scopes of mandates generously. In diversified company businesses, where shareholders are dispersed, delegation permits not only avoiding collective action costs and other inefficiencies but also allows the company to benefit from the high qualifications of appointed managers.

In this context, legislators will protect third parties in good faith when contracting with managers beyond their mandates. However, this protection comes precisely to reduce transaction costs that business oriented to a wide range of activities would otherwise face when interacting with third parties adopting costlier precautions under a different rule.

Finally, the object of facilitating diversified businesses by delegated managers using funds from dispersed investors manifests also in management and control responsibility rules. In regular corporate businesses, creditors and contractors do not collude with each other but only with the opportunistic managers. Hence, in regular diversified corporate investing and contracting, opportunism takes place - prevalently- within company spheres. That is, opportunism happens as a result of abuses from managers and controlling shareholders -not in the responses from

contractors colluding with each other or with the managers. Consequently, the legislators and judges have developed a body of rules and jurisprudential wisdom for focusing on administrative abuses from managers and *de facto* controllers.

However, note how such regulations come to protect minority shareholders. Only indirectly -in the vicinity of company insolvency and for actions leading to the company's insolvency- will habitually the managers and controllers respond to creditors. Moreover, with eyes on the needs for protecting managers in their duties to adopt riskier decisions in the protection of shareholders, duties of diligence (and consequently, indirectly, also of loyalty) are today, weak.⁹⁸⁴ Today, legislators and judges enforce *low* fiduciary standards and bringing evidence about *de facto* control requires internalising the costs of bringing costly evidence to third parties.

The above corresponds with protections of corporate forms and contractual practices efficient in scenarios in which dispersed investors provide funds for, behind limited liability protection, delegated managers to identify and advance risky projects that are materially and financially independent. However, these are not -and can never be- the objectives of parties in PFCs.

The distinct strategic environment and the needs of parties in all PFCs.

In sharp contrast with the diversification objectives for which legislators design corporate forms, in PFCs, parties do not avail from the possibilities of diversifying investors, but for the financing and implementing of a time-limited highly specific project. Moreover, for this objective is that, in PFCs, the sponsors and the FP constitute and manage the strictly-instrumental SPV.

Moreover, in PFCs, there is always a single principal who provides non-recourse financing for a group of agents to complete a predefined project, the only source of wealth for repaying her debt claims. In this setting, this principal (the FP) is the least-informed, least-capable of implementing and enforcing contracts, the only party who does not interact with debtor's assets directly, who cannot update information about responses of the agents or the evolution of the project that dictates the incentives to which the agents deliver their critically valuable responses.

Remarkably, in these environments, the agents (the sponsors) are always best-qualified in the industry sector of the project they design. Hence, they can ex-ante cooperate for devising contractual solutions as convenient to them both collectively

⁹⁸⁴ *Cf.* in the body of Chapter 7 the observations about the functionality of the canonical business judgment rule.

and individually. Additionally, as SPV's owners and the contractors for its project's inputs, the agents (the sponsors) interact with project assets materially. This interaction allows them to update information about the responses from peer sponsors and update conjectures about the expected evolution of the single and predefined project that defines the strengths of their incentives. With this information, the sponsors sustain cooperation relationally beyond the enforcement capacities of the principal. Thus, as the project evolves, the sponsors can deliver socially desirable contributions, or, on the contrary, they can respond with *shirking*, *risking*, *shading*, with negative externalities to the single principal.

Remarkably, it is in this context in which the principal (the FP) internalises non-recourse risks covering the bulk of the project's financial needs. Moreover, she does this based on the beliefs she can construct about the perspectives that the SPV manages to repay the non-recourse debt as a function of the quality with which she enforces risk allocation mechanism. This is the risk allocation mechanism that regulates all responses from sponsors internalising all foreseeable risks and bringing all estimable inputs for the unique, time-limited, SPV pre-existing project as imperfectly predefined.

Accordingly, in PFCs, parties naturally do not use the SPV for channelling resources for diversifying businesses *-v.gr.*, as for the functionality desired by the legislator. As shown, the feasibility of PFCs depends on the capacities of parties to foresee and regulate responses to eventualities. Accordingly, in PFCs, in sharp contrast to what we saw in regular corporate settings, the FP sees any spaces for the diversification of projects, contractors, investors, and sources of financing as room for opportunism - that is, as manifestations of contractual imperfections.

Then, besides, in PFCs, the parties avail from the legal structure of the SPV for three purposes: first, for preventing double way risk contamination between the project and the sponsors (their creditors and projects); second, for simplifying the implementation of all contracts including those involving the interests of all sponsors (contracts with the FP, and cross-default mechanisms); and third, for distributing property rights (shares) as a means for incentivising fully non-contractible actions from the sponsors.

Consequently, in PFCs, the SPV type does not implement a Kaldor-Hicks benefit of facilitating business opportunities at the acceptable costs of externalities to circumstantial creditors. On the contrary, in PFCs, parties benefit from the legal personality, and the limited liability protection of the SPV legal form for purposes strictly instrumental to the financing, material completion and operation of a single project as predefined, as finally as qualifications and marginal implementation costs

permit.

Moreover, accordingly, because in PFCs, diversification is undesirable, parties internalise no opportunity costs from the implementation of contractual solutions limiting the freedom of sponsors to adopting decisions or solutions to contingencies away from the objectives that all parties -critically, including the principal- had in mind when designing the single project and implementing the necessarily incomplete risk allocation mechanism. Furthermore, naturally, the identical observation holds for the value of spending implementation efforts modifying the provisions of the SPV company types under the applicable company law. In PFCs, parties will regulate all aspects necessary for defining the sponsors' responses under all evolutions of the environment. Consequently -and most remarkably-, they will do this with absolute disrespect of the functionality or the objectives of the current default rules oriented at facilitating diversification, most of which they will correct contractually.

Consequently, when shaping the PFCs and its legal structure -of which the SPV as a mere implementation component- parties will restrict the company's investment alternatives to the single project as materially and financially predefined (*cf.* Chapter 2). Then, via control covenants associated with technical default provisions, precisely contrary to what legislators offer as defaults rules in corporate forms, the sponsor will predefine the three critical decisions of financial nature that administrators adopt during the life of companies. They will predefine the investment decision to a single project. They will regulate the access of the FP to equity and debt -*v.gr.*, the *cash waterfall* clause will allow the FP a *de facto* monopoly in the provision of debt to the SPV. Also, via the *cash waterfall* clause, parties will regulate the dividend policy of the SPV. This includes the implementation of seniority of claims and requires the subordination of claims from contracts for inputs to the compliance with the senior non-recourse debt's repayment schedule. Parties will also condition the transferability of SPV shares (political control of the company and its assets) to the consent of the FP (a creditor). Parties will also regulate precisely the obligations of shareholders to provide capital contributions to maintain debt-to-equity ratios or other debt coverage capacities of the SPV as the project progresses. All this reveals strategic needs and objectives that parties pursue contractually that are strange to the perspectives with which legislators and judges interpret stakeholders' position under the rules of the current company forms.

Moreover, in PFCs, the sponsors will enforce contractual regulations of the critically relevant risk allocation mechanism via cross-default mechanisms against parties other than those obliged by each commitment. That is, the FP will implement provisions obliging some contractors for inputs (some sponsors) with penalties enforceable against other contractors for inputs or controllers of the SPV (other

sponsors) or the SPV (all sponsors). This also exposes the multiparty functionality of PFCs involving creditors and contractors for inputs who are also owners of the strictly single project-instrumental SPV.

Accordingly, notice three more aspects. First, in PFCs, the strategic tensions do not materialise within company spheres (in abuses from managers or de facto controllers) but in material input providers' responses. That is, in PFCs, opportunism comes in tension with the provisions of the risk allocation mechanism. Additionally, the value that the FP expects (or the collateral she expects to protect) does not correlate with the status of resources within company spheres (project assets are highly specific), but with the value of the responses from sponsors. Hence, as said in many parts of this study, ex-ante, in PFCs, parties will implement contractual solutions not only protecting company resources but more importantly to regulating the responses from sponsors as conditions change to them or the SPV. Today, legislators fail to attend these needs. Besides, as shown in Chapter 8, today, the protection of bankruptcy law comes too late to preserve company value when opportunism exacerbates as soon as the deterioration of the environment begins.

Second, PFCs result from a consensus amongst parties other than the formal lender and debtor (SPV). Moreover, the feasibility of the non-recourse loan agreement depends on contractual interactions amongst the sponsors and the FP -not between the FP and the SPV (the non-recourse creditor and debtor). Concretely, the SPV's capacity to repay the non-recourse debt results from the responses from sponsors to covenants enforceable by the FP, as the unique project evolves. Finally, the feasibility of PFCs depends on the quality with which the sponsors and the FP foresee and regulate responses to eventualities for the time-limited predefined project within the context of a -at least functionally- multiparty organisation.

Accordingly, such regulations include the full control of the strictly single project-instrumental SPV. The control of the SPV allows sponsors to internalise the responsibilities they acquire under the risk allocation mechanism -consider the case of all commitments that adopt the form of control covenants. Then, in PFCs, control is not only a factual reality (the sponsors own the SPV, and they are the critical input providers to the single project it advances) but it is also a functional strategically indispensable requirement that parties also predefine.⁹⁸⁵

Then, because of the necessary control of the SPV, and the sponsors access

⁹⁸⁵ See above, the restrictions to the transferability of shares.

information of higher quality, the FP can implement the cross-default mechanisms mentioned above. Cross-default mechanisms provide incentives for the sponsors to exert efforts for cross-monitoring and cross-disciplining each other relationally. Cross-default mechanisms then allow the FP to enforce regulations beyond her information and enforcement capacities.

Additionally, the availability of higher information to sponsors -who always control the SPV- permits that the FP enforces obligations to inform about aspects of the single project that are not feasible -or useful- in regular diversified contracting. This remark later served as the basis for postulating a fiduciary duty to inform in PFCs. The SPV control by highly qualified sponsors permits that all parties also regulate such control enforcing managerial decisions under standards higher than those defined jurisprudentially for the fiduciary duties of diligence.

Moreover, the multiparty implementation of the risk allocation mechanism for the unique time-limited predefined project also involving predefined parties permits the enforceability of precautions not feasible in diversified environments. *E.g.*, in PFCs, after the verification of trespasses to technical default provisions, the FP may request her intervention in the decision-making system of the project-instrumental company. In the extreme, parties may agree with the pledge of SPV's shares as security for the compliance with provisions of the risk allocation mechanism. This further exposes the functionally multiparty features of PFCs, the efficiency of contractual regulations that are not feasible in diversified scenarios, and the lender's critical role in this interaction.

Finally, third, recall, in PFCs, the sponsors are not only highly qualified, but they are also few, they all receive information of high quality about the evolution of the project, and they all participate in the decisions of the company. The interplay of these three aspects deprives managerial delegation of two critical functionalities. First, the sponsor can now adopt collective actions at low costs. Second, the managers' qualifications (expertise) make delegation less valuable as a means for benefitting from the expertise of appointed administrators. As shown in Chapter 10, the above results in lower scopes of managerial delegation that we can correlate with anecdotal evidence.⁹⁸⁶

All the above contractual precautions reveal purposes contrary to the objectives with which legislators and judges enforce mechanisms of current corporate types oriented

⁹⁸⁶ *Cf. p. 14* in B. ESTY, "The Economic Motivations for Using Project Finance", cit.

at facilitating diversified investments and mitigating the strategic tensions in such regular environments.

Accordingly, when adjusting the legal environment contractually, parties will rescue only the single aspects of corporate types that serve for the three objectives defined above, *i.e.*, risk isolation, contract implementation with sponsors and the FP only, and incentive distribution via allocation of property rights. Then, they will replace the rest of all regulations that legislators devised originally for facilitating diversified businesses with solutions improving their capacities to implement the critically relevant risk allocation mechanism for the single project they predefine before internalising any risks -and before incorporating the SPV.

Sponsors consequently construct an entirely distinct legal environment with features in contradiction with the objectives for which legislators and judges offer corporate types today. Most notably, of the rules of the SPV's corporate types, parties also restrict some of the features of the very essence of the legal personality, *e.g.*, the spaces (objects and parties) within which the SPV will be allowed to acquire rights and obligations interacting with third parties for inputs, financing, and project proceeds.

Notice how the above contractual solutions come to protect strategic needs inherent to the positions of parties in PFCs. Notably, from the strategic needs characterised in chapters 4 to 6, and from the observations of these chapters that we confirmed with the illustration of practices of chapter 2, we can identify norms, interpretation criteria, and enforceable optimalities that legislators and judges could offer to parties after the legislative institutionalisation of PFCs. Chapters 8 to 10 will advance towards the explorations of ways in which these objectives should be best achieved.

11.8 Chapter 8 - Towards the legislative institutionalisation of PFCs. The PFC company form

In the first part of the study, chapters 2 and 3 characterised PFCs as seen today in the management and finance literature. Then, in the second part of the work, chapters 4 to 6 identified the elements of PFCs and the strategic aspects (the tensions -*v.gr.*, conflicting interests- and the forms of opportunism) that are inherent to the positions of parties in PFCs. In the beginning of the third part, Chapter 7 remarked the distinct needs for legal treatment of parties in PFCs. Consequently, towards the legislative institutionalisation of PFCs, Chapter 8 has answered the 7th research question:

What rules are necessarily efficient in all PFC scenarios, and how we should consider such norms towards the legislative institutionalisation of PFCs in a dedicated corporate form?

As a way for later research, Chapter 8 identified five pillars for the legislative institutionalisation of PFCs. These are: first, the registration and publicity of projects in a PFC corporate form; second, the fiduciary duties of loyalty in the protection of all parties (critically, including the PF) in PFCs; third, the *iuris et de iure* control responsibility enforceable against sponsors in PFCs; fourth, the intervention of the lender in the contracting for debt from third parties (a modification of the capacities of the organs of representation) in PFCs -a solution under the current EU Law; and fifth, the general duties to inform in PFCs.

These pillars provide for protection in five critical places, in this order: implementation, responsibility, ex-post completion, the critical cash flows protection, and the revelation of enforcement information.

The institutionalisation of a PFC corporate form. The first pillar advanced the proposal for the institutionalisation of PFC via a dedicated corporate form. This PFC form should build upon existing corporate types, and its use should be optional to parties. However, once a registration has been completed, mandatory rules should become enforceable.

In addition to the information required habitually for other company forms, when registering the SPV, parties should include details about all the FP, about the project (the single object of the company), the non-recourse debt contribution, and the inputs expected from the sponsors. The name of the SPV must include a reference to its corporate form (PFC).

Many benefits stem from the legislative institutionalisation of PFCs in a dedicated corporate form. Some of them are common to those allowed by all other corporate types. The institutionalisation of PFCs permits the definition of features that today appear as dispersed business practices. The registration of projects under a PFC company form induces judges to adopt resolutions based on clear categories, thus facilitating the evolution of jurisprudential criteria and scholarly legal studies.

The postulates for implementing fiduciary duties of loyalty, the fiduciary duties to inform, the control responsibility of sponsors, and the limitations of the capacities of representation organs, they all require legislative modifications. From the legislator's stance, a corporate form facilitates the implementation of mandatory rules and the offering of default solutions to sponsors. Finally, from the perspective of judicial operators, the legal institutionalisation and the derivative generation of jurisprudential standards facilitate the enforceability of criteria for the ex-post interpretation of clauses as introduced in Chapter 9, and the judicial use the optimality references characterised in Chapter 10.

The de iure control responsibility of sponsors. The second pillar considered

the enforceability of a *iuris et de iure* (or a *iuris tantum*) control responsibility norm against sponsors.

Chapter 7 observed the efficiency of enforcing in diversified corporate contexts the current managerial responsibility rules (to both delegated managers and owners exerting control) after plaintiffs have verified two extremes: effective control of the company, wrongfulness of (and harm from) managerial decisions.⁹⁸⁷ In such regular corporate businesses, this configuration of the control responsibility rule is indispensable for allowing dispersed investors to bring their contributions to the company. Without this protection, the dispersed and poorly informed investors facing high collective action costs would perceive incentives for monitoring or for intervening actively in the company's decision-making process. Such effects would limit the incentives for investing, with subsequent social under-investment. As devised today, the rule of *de facto control* is efficient and strategically indispensable for the diversified corporate investments.

Nevertheless, the above does not hold in PFCs. Intuitively, in PFCs, as a feasibility requirement of the FP, the sponsors must always control the SPV management system both politically (as owners) and materially (as input providers they control project assets). This is a corollary of the project-instrumentality of the SPV to the risk allocation mechanism. Additionally, the project's material control gives the sponsors access to higher quality information as the project evolves. The sponsors consequently update conjectures about the evolution of the capacities of the SPV to distribute residual benefits. These beliefs then dictate the strengths of the incentives they perceive for responding as socially desirable or opportunistically beyond the lender's enforcement capacities.

Accordingly, the sponsors should not be allowed to bring evidence about their lack of capacities to provide administrative directives to the SPV. In other words, albeit a rule implemented *iuris tantum* would be superior to the current treatment, the most efficient alternative is a rule assimilating the sponsors' position to administrators or directors *iuris et de iure*. Under this norm, claimants -*i.e.*, the FP or third parties-would devote their limited resources to bringing evidence of wrongfulness (and losses) of managerial decisions but not of actual SPV control. The rule would consequently result in a relaxation of the burdens of bringing evidence faced today by creditors of the SPV, thus lowering enforcement costs. The implementation requires

⁹⁸⁷ Vid. pp. 97, 99, 138-141 in R. R. KRAAKMAN ET AL., *The Anatomy of Corporate Law: A Comparative and Functional Approach*, cit.

legislative modification -*v.gr.*, the postulate is not directly (judicially) operative.

Notably, today, in PFCs, the FP and sponsors do replicate the strategic effects of such a rule in the risk allocation mechanism via side covenants. Just as all other postulates, the proposition results from strategic aspects inherent to the lender's position (risks and low implementation capacities) and sponsors (indispensable control) in PFCs. Hence, the postulate holds efficiently in all environments, irrespective of project configurations.

The fiduciary duties of loyalty in PFCs. The third pillar postulates the enforcement of fiduciary duties of loyalty in PFCs. The principle induces the sponsors to complete all provisions of the risk allocation mechanism, shaping the single project by reconstructing all parties' ex-ante rationality, including the FP (a creditor of the SPV).

Recall, PFCs are not ongoing business organisations but *ad-hoc* contractual infrastructures that the parties use to implement and finance a single project as predefined by all parties by the risk allocation mechanism to which the FP -the principal internalising the bulk of total risks- is also a party. Hence, the sponsors should adopt all decisions as if completing the initial meeting of minds of all parties to the risk allocation mechanism. Such fiduciary duties should apply as a criterion for adopting both managerial decisions as well as the collective actions in exercise of their political rights as shareholders of the strictly project-instrumental SPV.

The fiduciary duty of loyalty in PFC corrects the distortions that today result from the current fiduciary duties under which appointed administrators adopt inherently risky decisions expanding portfolio value in the benefit of dispersed shareholders behind limited liability protection.

The fiduciary duties of loyalty in PFCs should remain in force until the full repayment of the non-recourse debt -the moment beyond which the interests of the FP are no longer strategically relevant. For their enforceability, a legislative modification of corporate rules enforcing fiduciary duties of loyalty that today protect shareholders only (the sponsors) is necessary. As in the case of all other pillars, the proposition is robust and holds valid in all environments, irrespective of project configurations.

The PFCs corporate form and the preservation of the seniority of claims.

Using as reference Art. 9 of the Directive (EU) 2017/1132⁹⁸⁸ the fourth pillar postulated a limitation of the capacities of the organ of representation and the lender's intervention in the contracting for debt from third parties.

The proposition achieves two critical purposes. First, it protects the cashflows that FP expects from the project -the unique source of value in the absence of collateral or third parties' protection. Second, it isolates the SPV from sponsors' opportunism holding residual rights of controls over the company and its assets.

Today, ex-ante, the FP puts in place contractual precautions limiting the spaces within which the sponsors will be allowed to contract with third parties via the SPV.⁹⁸⁹ However, irrespective of how parties enforce covenants, as shareholders and managers of the SPV, the sponsors retain residual rights of control over their resources (the SPV and its assets).⁹⁹⁰ Thus, regardless of the risk allocation mechanism's completeness, the sponsors can still use the SPV for implementing opportunistic contracts with third parties that will remain valid irrespective (independent of) regulations between the SPV or sponsors and the FP.

For protecting the enforceability of the said covenant of the risk allocation mechanism, backwards induction, the FP will request collateral from third parties. However, collateral is a scarce resource. Consequently, parties cannot avoid the problem costlessly.

The first pillar showed how, today, the European legislator does protect the company (not third parties) whenever such acts go beyond the powers that legislators permit that the company statutes allow to its organs of representation for the company type. Consequently, by limiting the scopes of representation of the organ by law, the legislator would be securing that third parties could not seek protection as third parties in good faith for such an array of contracts.

Remarkably, the EU legislator no longer uses the company objects as the boundary of representation but the scope of the organs' representation capacities. Additionally,

⁹⁸⁸ *Vid.* Directive (EU) 2017/1132 of *The European Parliament and The Council of 14 June 2017 relating to certain aspects of company law (codification)*. Official Journal of the European Union - L 169/46 - 30.6.2017.

⁹⁸⁹ *Cf.* in Chapter 7 the restrictions to the diversification of the investment decisions.

⁹⁹⁰ *Vid.* page 1120 in O. D. HART; J. MOORE, "Property Rights and the Nature of the Firm", *cit.* The standard reference is S. J. GROSSMAN; O. D. HART, "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration", *cit.*

today, a PFCs company form does not yet exist. Consequently, when institutionalising PFCs legislatively, the national legislators could find spaces under EU law for limit the capacities of the organ of representation and ultimately prevent third parties from claiming good faith and enforcing such agreements against the SPV. The pillar consequently proposes that when institutionalising the PFC corporate form, the legislator defines the capacities of the organ of representation of the SPV and provides that the FP intervenes in all agreements for debt involving parties other than the non-recourse lender.

The rule would be robust (desirable in all circumstances) and institutionalise the regular practice of allowing the lender for a monopoly in the provision of debt financing to the SPV -the object of *cash waterfall* clauses. Critically, this privilege is not a form of distributing benefits but a form of preventing debt dilution from the SPV.

The general duties to inform in PFCs. Finally, the fifth pillar proposed the enforceability of fiduciary duty to inform *distress*.

Currently, neither legislators nor judges enforce duties to inform against managers in diversified corporate contracting. There are only two exceptions to this: the obligations under bankruptcy laws, and the commitments to reveal information as contracted specifically ex-ante.

In diversified corporate businesses, the two exceptions are efficient in virtue of three aspects; first, habitually, contingencies associated to individual projects do not result in corporate insolvency; second, the protection of collateral value that already exists under bankruptcy laws; and third, parties have the possibility of requesting information contractually ex-ante, before internalising risks.

For three reasons, the above does not hold only in PFCs cases. First, in PFCs, events affecting the feasibility of the single predefined project invariably alter the capacities of the SPV to repay its obligations in a way that the sponsors can anticipate more accurately (see other proposal relating to the responsibilities of sponsors in the vicinity of insolvency).

Second, the sponsors perceive incentives for responding opportunistically, not (later) when the company becomes insolvent -*v.gr.*, not when the company fails to pass solvency tests as applicable today-, but as soon as they update information about *news* affecting the capacities of the SPV to distribute residual benefits to sponsors. Recall, such capacities of the SPV dictate the strengths of the incentives that sponsors perceive for choosing privately costly but socially desirable efforts. Therefore, these are the *news* and the incentives that induce sponsors to respond with *shirking*, *risking*, and *shading*, whose effects will accelerate the deterioration of project

capacities towards the SPV's insolvency. This is when the lender values updating information that she can use to enforce contractual precautions timely.

Additionally, the current solvency tests react to solvency states, not the deteriorations in project capacities. Consequently, when the company fails to pass solvency tests, and the protection of bankruptcy laws arrives, the sponsors have had a long period for responding opportunistically with *shirking*, *risking* and *shading* against the SPV and the FP. The protection of insolvency regulations oriented at advancing diversified regulations and allowing for externalities to the disperse creditors (the Kaldor-Hicks efficiency of limited liability rules in diversified environments) comes too late for serving the needs of the main risk-taker whose interests and implementation capacities dictate the feasibility of PFCs.

Third, finally, in the case of PFCs, the SPV advances a single project whose assets are highly specific. Thus, in addition to the bankruptcy legislator's untimely response, the protection from bankruptcy laws is also less effective in PFCs because of the low redeployment value of project assets.

Accordingly, a fiduciary duty inducing sponsors to reveal *distress* defined as the individual incapacity to extract profits from the project always comes with desirable effects. *Ex-post*, the revelation of information increases the quality of enforcement. *Ex-ante*, backwards induction, the expectation of later receiving such information permits the implementation of better contractual precautions, thus improving the quality of the risk allocation mechanism and consequently expanding the feasibility of PFCs.

Additionally, the sponsors are always the best prepared to reveal information about their private conjectures regarding profits and losses. The costs of likely over-enforcement in the scenarios of *good news* or *no news* would be negligible relative to the strategic value of information under *distress* and *very bad news*. Paternalism is acceptable in the case. This would be true also in cases where the principle evolved to include profits as per market standards.

Finally, the efficiency of the five postulates of the chapter results from strategic aspects inherent to the positions of parties in PFCs. Thus, they provide for desirable incentives irrespective of project configurations or evolutions of the environment.

11.9 Chapter 9 - Three postulates (principles) for the interpretation of clauses in PFCs

Based on the identification of the strategic tensions in PFCs (Chapters 4 to 6), and the remarks about the needs for legal treatment and functionality of contractual solutions characterised in Chapter 7, Chapter 8, has proposed five pillars for the legislative

institutionalisation of PFCs via a PFC-dedicated corporate form. Chapter 9 has now answered the 8th research question:

What postulates can we derive for the ex-post interpretation of contracts in PFCs?

Chapter 9 advanced four propositions for the ex-post interpretation of all contracts that shape the strategically fundamental risk allocation mechanism. Three of them are postulates with distinct functionalities. The fourth proposal (the interpretation of specific commitments to inform) is a corollary of the other three. The four principles serve for supplementing the five pillars upon which the legislators should implement the PFC corporate form. Additionally, judges and parties should enforce these postulates in precise conjunction with the characterisations of optimalities offered in Chapter 10 with which they complete the proposed regulation of PFCs.

The principle of the pre-emptive objectives of clauses. The chapter postulates that in PFCs, all clauses enforceable by the FP (the risk allocation mechanism) should be interpreted ex-post as if implemented with pre-emptive objectives -*v.gr.*, for deterrence, not for compensatory objectives.

The above is consistent with the objectives of contractual provisions with which the FP protects herself contractually against the vulnerabilities inherent to her position in PFCs.

The SPV owns assets and resources that are highly or fully specific -hence, these goods do not serve as collateral protecting the FP. Additionally, as analysed in chapters 5 and 6, projects will collapse not only as a result from *news*, but from the *shirking*, *risking*, and *shading* that sponsors implement (via innovations) as their expected residual returns decline. Finally, in virtue of the exceptionally high values at risks, the sponsors are regularly not capable of compensating the full impact of their actions -say, return the non-recourse debt. This last aspect is one of the reasons they recur to PFCs ex-ante.

Thus, ex-ante, the FP will implement the risk allocation mechanism's precautions not oriented at liquidating actual or estimated damages, but for two objectives. First, directly, to prevent the deterioration of the project's capacities (the expectations to residual benefits) that govern the incentives for sponsors to deliver socially desirable non-contractible (quality-expanding and innovation-implementing) efforts. Second, to limit the spaces within which the sponsors may respond with *shirking*, *risking*, and *shading* as the project's capacities deteriorate after updating information.

Because the pre-emptive objectives result from the strategic tensions and forms of opportunism inherent to PFCs, the legal proposition holds robustly to interpret all clauses of the risk allocation mechanism. That is, irrespective of evolutions in the

environment, project configurations, or jurisdictions.

The in dubio pro creditore principle. As shown in the early chapters, in PFCs, the FP and sponsors' positions are not strategically equivalent. The overall risks they internalise from the responses expected from other parties, their access to information and material control, their contract implementation and enforcement capacities and their exposures to *news* are necessarily distinct.

First, as the principal, in PFCs, the FP, internalises uncollateralised risks from the actions chosen by agents. This aspect results in the lender internalising more of the risks associated with contractual incompleteness and asymmetries of information. This aspect is not unique of PFCs -instead, it is a situation faced by most principals. However, the FP's non-recourse exposure to the imperfections of the risk allocation mechanism is of the essence of PFCs.

Second, in line with the above, in PFCs, from the specificities of assets, the benefits of the limited liability rule (protecting sponsors), and the non-recourse nature of the debt, it follows that the FP internalises more of the total risks at stake. As above, these aspects are not unique to PFCs. However, this disproportion of risks and the incapacity of sponsors to internalise the impact of their opportunistic actions is necessary in PFCs.

Third, in PFCs, -critically to the problem of offering an optimal default rule- whereas the sponsors are experts on the project's industry sector, the FP is a financial entity without any technological qualifications (expertise). This aspect equates to the lender being less capable (the worse costs avoider) of adopting precautions against news that she cannot foresee (incompleteness and imperfect signalling from the sponsors). This is true even though lenders receive help from independent consultants to implement and enforce the risk allocation mechanisms.

To fix ideas, in PFCs, the FP is always the least qualified and highest risk-taker. In PFCs, treating both parties (the sponsors and the FP) in equally results in the sponsors externalising risks to the FP failing to protect herself contractually and subsequent under-investment (individual rationality -participation- constraints of the lender⁹⁹¹).

Thus, in PFCs, efficiency calls for judges to complete clauses in attention to the distinct vulnerabilities and different parties' implementation and enforcement capacities. Efficiency manifests both ex-post and ex-ante. This is the judicial

⁹⁹¹ The same problem should lead to both holdup and an adverse selection.

approach that induces parties to ex-ante choose implementation efforts closer to socially optimal levels.

Lastly, the efficiency of the proposition stems from features natural to the positions of parties in PFCs. The postulate remains efficient in all environments and irrespective of project configuration.

The intuitu personae and intuitu rei interactions. In PFCs, the material and financial capacities of sponsors are critical to the project's capacities to produce value sufficient for the SPV to repay the senior debt. Consequently, ex-ante, the FP implements all contractual precautions of the critically relevant risk allocation mechanism with eyes on these individual characteristics.

Accordingly, in PFCs, the clauses regulating the responses expected from sponsors should be treated as *intuitu personae* with the legal effects that legislators could attach to it in the distinct legal traditions. Among others, this should include a restrictive interpretation of sponsors' capacities to substitute (or delegate) their positions in PFCs.

The same criteria do not always hold for the non-recourse lender. In PFCs, as the project evolves, the position of the FP loses its specificity. That is, the value of the interaction between the non-recourse lender and parties (sponsors and the SPV) based on the knowledge of the project decreases after the project enters its operation phase. Thus, as the project evolves, it is a common practice that the lender discount credits against the SPV. Parties and judges should consequently treat the FP position in PFCs as *intuitu personae* or *intuitu rei* as a function of projects' evolution phases.

The specific duties to inform. The Chapter has offered a final remark about how, in PFCs, the sponsors should interpret the scope of specific commitments to provide information as if implemented with pre-emptive objectives, in compliance with the fiduciary duties of loyalty, higher standards of diligence, and *in dubio pro creditore*. These specific duties to inform stemming from individual clauses are not to be confused with the general fiduciary duties to inform *bad news* (*Cf.* Chapter 8).

Finally, as advanced in the introduction and remarked here above, the efficiency of the four propositions of the chapter results from strategic aspects that are inherent to the positions of parties in all PFCs. They result from the objectives, vulnerabilities, and the (implementation, performance, and enforcement) capacities of both sponsors and FP in all scenarios. Consequently, the four postulates apply to all PFCs, irrespective of structural variations, numbers of sponsors, qualifications, numbers of SPV, and jurisdictions.

11.10 Chapter 10 - Four legally enforceable optimalities in PFCs

Chapter 8 identified five pillars of a proposal for a PFC corporate form. Chapter 9, then advanced four principles for the ex-post legal interpretation of all clauses of the critically relevant risk allocation mechanism. As a way forward for later research, the last chapter of the third part of the study answered the 9th research question:

What legally enforceable optimalities can we characterise in PFCs?

Chapter 10 analysed four optimalities in PFCs: first, the optimal fiduciary duties of diligence in PFCs; second, the optimal responsibility of managers and sponsors in the vicinity of SPV insolvency in PFCs; third, the optimal hierarchy of claims in PFCs; and fourth, the optimal scope of managerial delegation in PFCs.

The optimal fiduciary duties of diligence. In PFCs, the sponsors and the appointed administrators manage the SPV in compliance with control covenants of the risk allocation mechanism that they ex-post complete under fiduciary duties of loyalty also to the lender. In this context, Chapter 10 has shown how, the optimal fiduciary duties enforceable upon the appointed managers and the sponsors -who always control the company- should be higher than those enforceable today in regular diversified corporate scenarios.

The reasons that lead to this conclusion are two: First, in PFCs, the sponsors adopt decisions of higher marginal value, and they do it after incurring in lower marginal costs. Second, in PFCs, there is little or no value in protecting risk-averse decision-makers for them to adopt risky decisions. Both aspects define the optimality of the standards to which they should respond.

Let us observe the marginal value of managerial actions. In the context of regular diversified businesses, managers deal with many independent projects, with unrelated contractors, and with sources of financing simultaneously. Consequently, in regular corporate entities, appointed administrators and shareholders, exerting *de facto* control are indeed experts on their market sectors but not on the individual projects that the company advances. This merely generic expertise governs (limits) the marginal value of the convexly costly-growing administrative decisions.

Let us now observe the costs of risk aversion. In regular corporate environments, the shareholders expect the manager to advance inherently risky opportunities for the benefit of owners. Consequently, the manager will adopt riskier decisions for riskier projects that maximise the limited liability shelter's value to the diversified shareholders. Then, the manager will require the protection of the (low) responsibility standard so that she can adopt such socially desirable risky decisions without internalising the subsequent losses to the company in the events of projects

failing to generate value as desired. This is the efficiency of rules of reason as the canonical *business judgment rule*.⁹⁹²

However, in PFCs, the position of managers and sponsors (who always control the SPV) is distinct. This is true for their qualifications, their degrees of risk aversion, and their exposure to risky decisions.

Recall two aspects. First, in PFCs, the controlling shareholders are also material input providers and interact closely with managers. Second, in PFCs, parties implement agreements (cross-default mechanisms enforceable against the SPV) that result in incentives for the best-informed sponsors to reveal information to each other. Thus, in PFCs the quality of the information that managers access about the single project, the sponsors, and the few contractors, is necessarily better (and less costly) than the one reachable by administrators in diversified corporations. This increases the marginal value of managerial actions and their capacity to respond to higher standards -as socially desirable.

Second, in PFCs, managers and sponsors are not expected to advance risky projects about alternative risky business opportunities. In PFCs, in contrast, most of the decisions come predefined before incorporating the SPV -this is precisely the function of the risk allocation mechanism. Finally, in virtue of the minimal scope of delegation (cf. Chapter 10), in PFCs, all critical decisions will be adopted by sponsors directly during the life of the project. Hence the risk-averse manager or the sponsors do not need a low standard of diligence for the earlier to commit to adopting risky decisions. The managers can (should) now respond to higher standards of diligence without losses of utility (incentive distortions) associated with her degrees of risk aversion.

Hence, in PFCs, fiduciary standards of diligence are optimally higher than in typical diversified corporate scenarios. Then, in PFCs, the SPV always advances a single project predefined by all parties; the sponsors are always the critical input providers who are also invariably best-qualified to adopt decisions. The proposition consequently holds in all environments irrespective of project configurations, numbers of sponsors, or corporate types of choice (upon which parties build the PFC form).

The optimal responsibility of managers and sponsors in the vicinity of SPV insolvency. In corporate financing, the diversification of projects dictates the likelihood that events external to the spheres of material control of the company

⁹⁹² Cf. Chapter 7 for literature references on this and other rules.

affect the SPV's solvency. Intuitively, the higher the diversification of portfolios, the milder will be the impact of events affecting individual projects against the portfolio's capacity to produce cash flows. In other words, such events remote to the control of the company will unlikely result in corporate insolvency. These are the benefits of diversification for lowering the volatility of cash flows from distinct projects (*Cf.* the analysis of distress costs in Chapter 3).

Additionally, in regular corporate investing, the managers advancing diversified portfolios will be least capable of identifying events affecting individual projects (say, de insolvency of a contractor for a single project) and how such contingencies could affect the solvency of the entire portfolio. Intuitively, the manager's capacities to monitor events affecting individual projects -or the capacities of inputs providers of each project- decrease with diversification. The same is true for shareholders' willingness to intervene directly or actively in decisions relating to individual projects of broader investment portfolios.

Two implications come from the above. First, today, judges are reluctant to consider contingencies affecting individual projects as indicative of corporate insolvency as such events usually cannot affect the solvency of the diversified company. Second, today, judges do not consider managers as capable of assessing the risks that such events beyond the spheres of corporate administrative control affecting individual business could bring to the entire company's solvency. The interplay between the two aspects results in standards of diligence and solvency tests (expected awareness and duty to file insolvency procedures) enforceable based only on the company's financial or economic status or events taking place within the spheres of administrative (informational) control of the company. Remarkable, this is efficient in diversified contexts. The above reflects the value of the canonical *business judgment rule*.⁹⁹³

However, as shown in Chapter 10, such characterisations do not hold in PFCs. The above enforcement approaches are not efficient when applied to SPVs. In PFCs, the SPV advances a unique project after parties identify the contingencies that may affect it during its construction and operation phases -the risk allocation mechanism for the single project. This observation comes with three implications. The first aspect relates to the causality between such contingencies and the repayment capacities of the SPV. The second implication is informational. The third implications relate to the feasibility of opportunistic responses and the timely responses from the bankruptcy legislator and judges.

⁹⁹³ *Cf.* Chapter 7 for literature references on this and other rules.

First, concerning the causality aspect, in PFCs, the SPV does not advance a portfolio of growth options that can dissipate the impact from a failing project to the company's solvency (there are no portfolio benefits in PFCs). Hence, in PFCs, external events jeopardising the capacities of the unique project (or any of its contractors) will more dramatically raise the likelihood that the SPV fails to generate welfare as expected with the consequential incentive distortions expanding insolvency risks.

Second, from the informational stance, in PFCs, the managers receive information from the sponsors who own the SPV and deliver material contributions to the project. In PFCs, the sponsors are always the best-informed parties capable of receiving information about such (apparently) remote events. In all scenarios, their capacity to identify contingencies affecting the project's capacities and the SPV will be higher than those of managers in diversified corporate investment scenarios.

Third, the interplay between these two points comes with implications to the feasibility of opportunism in PFCs. Recall, the incentives for sponsors to respond opportunistically begin exacerbating as soon as the sponsors assess that the SPV will lose its capacities to distribute residual benefits -the returns from their privately costly, non-contractible, socially desirable, efforts. Consequently, the sponsors will begin responding with *shirking*, *risking* and *shading* as soon as they become aware of any events affecting the project. As shown in Chapter 10, the protection from bankruptcy laws and judges come too late to prevent the opportunism from sponsors responding to incentives that begin exacerbating as soon as they receive information about the deterioration of SPV's capacities. This occurs much before the moment in which the SPV fails to pass insolvency tests (and managerial insolvency responsibility to creditors) as enforceable today.

The above corresponds to higher optimal standards of responsibility enforceable against sponsors and managers in the vicinity of SPV insolvency. In PFCs, as a function of managers' access to relevant information (see below), judges should be consequently ready to interpret events taking place beyond the material sphere of control of the SPV as sufficiently effective to affect SPV's solvency. In such scenarios, also third parties (the FP) should be capable of requesting judicial protection under bankruptcy law.

Finally, because in all cases the SPV advances a single project, and because the sponsors are always the input providers of the company interacting materially with project assets, the above propositions hold in all environments (*news*) irrespective of project configurations, numbers of sponsors or SPVs, or legal traditions.

The optimal seniority of claims in PFCs. In regular diversified contracting,

parties habitually do not agree on rules defining hierarchies (seniorities) of claims to creditors. That is, parties do not often define which creditors will receive payment in the detriment of others. As a result, earlier creditors find themselves sharing the protection of collateral or expected cashflows with later contractors. This is the debt dilution problem described in Chapter 3.

Similarly, in regular corporate contracting, we do not often see restrictive covenants regulating the spaces for managerial decisions of the debtor, including her investment decisions, or her dividend policies with which parties could mitigate the debt dilution problem contractually. Also, in diversified investing and contracting, whenever they do protect earlier creditors (say, by allowing sureties), the shareholders do not choose hierarchies of claims with eyes on the incentives that such seniorities may bring to contractors delivering inputs to the company they administer. Habitually, only for the costlier contracts, we find agreements for receiving protection from shareholders or third parties, or from the company in the forms of liens or other *ius in re* (e.g., mortgages).

In regular corporate environments, there are three reasons for these observations. First, in diversified businesses, there is an opportunity cost of allowing higher hierarchies of claims to earlier creditors. Intuitively, regulating seniority of claims affects the company's capacities to seek debt financing from subordinated creditors for subsequent projects. Second, implementing such restrictive covenants would be complex to large companies advancing diversified portfolios of sequential (future) opportunities that parties do not know when contracting for debt financing (this is a problem of bounded rationality). Third, in regular corporate investing, the incentive effects associated with the seniorities of input providers' claims are small. Intuitively, each input provider's choices of efforts will come with minor impact to the solvency of the company advancing several materially independent projects. Hence, the value of allowing different treatments to the claims of independent contractors is low relative to the transaction cost and other losses of freedoms necessary for implementing such mechanisms.

The case of PFCs is, however, distinct in three critical aspects. First, in PFCs, the sponsors are few, and the FP -the provider of debt- is only one (or there is a group of them acting coordinated). So, parties can implement contracts without incurring in complex interactions. Additionally, the FP and sponsors implement a single non-recourse financing facility to fund a single project that all parties predefine -with its financing needs- before incorporating the SPV -the formal debtor. For this, they implement the so-called *cash waterfall* clause. Second, in PFCs, there are no side projects for which the SPV may need debt financing from third-party creditors or contractors. Hence, parties can anticipate financing needs and cover them

contractually without affecting subsequent creditors. Third, critically, as shown in chapters 5 and 6, to contractors (the sponsors) competing with the FP (the senior creditor) for cashflows, the perspectives of losing returns from their residual (less senior) claims come with strong incentives for them to withhold socially desirable contributions and respond opportunistically to the deteriorating conditions (*shirking, risking, and shading*). This is the opportunity costs of allowing the FP too high hierarchies of entitlements. In other words, too low seniority of claims to sponsors equates to greater scenarios (*news*) in which they will not receive residual benefits and will consequently react opportunistically in detriment of project value and FP expectations.

Therefore, as a way for later research, chapter 10 has remarked how it is possible to characterise a postulate for an optimal hierarchy of claims distinctive of PFCs. Under this postulate, parties do not allow the highest privileges to the FP. Instead, the optimal seniority will protect the lender by increasing the seniorities of claims of sponsors. Higher seniority to sponsors should induce the SPV to distribute benefits to them -the critical input providers choosing non-contractible efforts- in more scenarios (*bad news*). This would then minimise the chances that *news* impeded that the SPV distribute benefits (returns) to them, thus inducing them to respond with *shirking, risking, shading* and *shading* in detriment of the FP.⁹⁹⁴

Two legal benefits stem from the identification of criteria for optimising hierarchies of claims in PFCs. First, the awareness of optimal seniority of claims facilitates the reconstruction of contractual renegotiations between parties. Second, the postulate serves for improving the criteria under which judicial intervenors redistribute claims within bankruptcy readjustment processes.

In PFCs, the sponsors are always providers for material inputs who find spaces for delivering hidden actions to the project. In PFCs, the SPV always advances a single project, and the FP is always the least qualified party who internalises the highest risks. The above way for later research advancing a postulate for identifying the optimal seniority of claims consequently holds in all PFC scenarios, irrespective of *news*, numbers of SPV or sponsors, or legal traditions.

⁹⁹⁴ Intuitively, by lowering the seniority of non-recourse claims, parties preserve the capacities of the SPV to reward (the now more highly ranked and better protected) sponsors; thus, they also minimise the range of scenarios in which *shirking, risking, and shading*, individually, within sub-coalitions, or unanimously become the dominant responses from sponsors in detriment of project (FP) value.

The optimal scope of managerial delegation. Chapter 10 has remarked how the scopes of mandates defining the interaction between companies and managers in diversified businesses are regularly broad. This is the consequence of the dispersion, the lower qualifications (expertise), investors' passivity, and the range of contingencies that managers solve in highly diversified environments. We also saw how the above was the most frequent observation in the larger and more highly diversified companies. In these diversified organisations, by expanding the scopes of mandates, the passive shareholders avoid the costs and inefficiencies of collective actions while benefiting from the qualifications of experts while internalising agency costs of delegation.

However, the characteristics, the diversification, ownership dispersion, and qualifications of sponsors and delegated managers of SPVs are precisely the opposite of those described above. First, in PFCs, the SPV advances a single project whose most important variables parties predefine before incorporating the company; hence, the range of critical matters that parties will solve as the project evolves will be limited. Second, in PFCs, SPVs are closely held companies *-i.e.*, sponsors are few; thus, the costs and inefficiencies⁹⁹⁵ of solving issues as they appear with time directly by sponsors *-i.e.*, without delegating- are always low. Third, as analysed, in PFCs the sponsors are the SPV owners and the critical input providers to the single project that they design; sponsors are also experts in the market to which the SPV will deliver its proceeds. Consequently, in PFCs, their qualifications are always highest. As a result, the value of delegation as a means for benefiting from managerial qualifications is, in the case of PFCs, minor.

Then, as a way for later research, chapter 10 pointed out how, in all PFCs, the spaces within which the sponsors will delegate competences for benefiting from managerial qualifications or avoiding collective action costs will be smaller than what we observe in regular highly diversified corporate investing. In PFCs, the manager will typically deal with the least complex and lowest values at risk matters. Moreover, the quality with which the sponsors will implement delegation mandates will be highest.

⁹⁹⁵ Decision-making efforts are not contractible. Hence, shareholders choose inputs expanding expected dividends from the company (a team output). Then, when choosing inputs, shareholders will be bound by the moral hazard in team problem from which they cannot possibly escape. The problem appears mitigated in PFCs with fewer sponsors adopting collective decisions. The seminal and classical reference is B. HOLMSTRÖM, "Moral Hazard in Teams", cit.

Notably, these observations are coherent with anecdotal evidence about the nearly flat reward functions offered to project administrators in PFCs.⁹⁹⁶

The characterisation of an optimal scope of delegation in PFCs serves for ex-post reconstructing the boundaries of mandates conferred by SPV to managers and administrators' consequential responsibilities. Notably, the propositions advanced as ways for latter research in Chapter 10 hold for all cases in which input providers advance projects by allocating them under the control of a SPV -independently of the debt's non-recourse nature or the sources of financing. As mentioned in all postulates, the above is true irrespective of project configurations, evolutions of the environments, or the SPV internal regulations.

⁹⁹⁶ *Cf. p. 14* in B. ESTY, “The Economic Motivations for Using Project Finance”, cit.

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Annexe A

Definitions

Bad news. The scenario of *bad news* describes any deterioration in the value of the contributions of sponsors or any increments in the costs of their efforts. Notice how, in the scenario of *bad news*, the sponsors still obtain positive returns from their efforts.

Corrupted sponsors. The sponsors accepting bribery for entering opportunistic sub-coalitions. (*Cf. Corruption*).

Corrupting sponsors. The sponsors offering bribery to other sponsors for entering opportunistic sub-coalitions (*Cf. corruption*).

Corruption. The implementation process in which some sponsors bribe other sponsors in exchange for implementing opportunistic innovations and withholding information necessary for enforcing agreements under the risk allocation mechanism. (*Cf. Corrupted, Bribery*).

Distress. The scenario in which the sponsor anticipates that, after choosing privately optimal responses to all incentives, she will harvest no profits from the project. The scenario of distress is analogous to that of *very bad news* (*which affects all sponsors, see below*) but affect the sponsors individually. The sponsors must reveal distress to the lender in compliance with *fiduciary duties to inform*.

Financing Party. The single lender of non-recourse debt, or the group of them acting in a coordinated manner.

FP. *Vid. Financing party.*

Good news. *Good news* indicates the scenario in which, after updating information, the sponsors observe a decrease in the costs of efforts or an increment in the value of their contributions beyond the considered when contracting.

No news. *No news* represents the scenario where sponsors update information and observe that their all variables materialise as initially foreseen.

Non-recourse debt. The debt that a lender allows a debtor without receiving protection (recourse to) third parties. Functionally, this implies that, in the scenario of debtor's default, the creditor will not be capable of seeking repayment or compensation from third parties (including sponsors).

Off-taker. The off-taker is the contractor buying the proceeds of the project. The off-taker often implement off-taking agreements before parties implement the FPCs organisation (including the SPV). Habitually, but not necessarily, the off-taker is a State (governmental) agency. The off-taker may interact with the sponsors, the SPV, and the FP directly, but it is not a party necessary to PFCs.

Parties. Parties are only the sponsors and the Financing Party (FP). The study treats

the special purpose vehicle (SPV) as instrumental to the object of contractual provisions between the sponsors and the FP. The off-taker is a third-party contractor who buys the goods or services from the project and contract.

Risking. The opportunistic response in which the sponsors in FPCs implement innovations of technologies riskier than socially optimal. With *risking*, the sponsors expand the values that they harvest after the SPV repays the senior non-recourse debt whenever the technology functions as desired. However, cases in which the higher risks materialise, the more likely and more severe losses will externalise to the non-recourse lender.

Shading. As the project capacities deteriorate and the SPV loses its capacities of distributing residual benefits, the sponsors anticipate that more of the marginal value of their non-contractible efforts expanding total welfare (residual benefits) will accrue to the FP. The sponsors will consequently implement technological innovations for complying with the obligations under the risk allocation mechanism with lower-costs solutions. However, they will fail to internalise the negative impact from undesirable innovations to total welfare (over-investment with externalities to the non-recourse lender).

Shirking. After observing the deterioration of the capacities of the project, the sponsors anticipate that the SPV will use some of the value that they produce from their non-contractible inputs expanding residual benefits for repaying the senior non-recourse debt. As a function of these conjectures, the sponsors will under-invest in socially desirable non-contractible privately costly contributions.

Sub-coalition. The clandestine sub-group of sponsors coordinating actions for implementing opportunistic innovations and withholding information from other sponsors and the FP.

Special Purpose Vehicle (SPV). *The project-dedicated FPCs instrumental legal entity that holds ownership of project assets and intervenes in the bilateral interaction with the lender implementing the non-recourse loan agreement. The sponsors hold the majority of the ownership of the SPV and control its assets materially.*

Sponsors. The individuals designing the project and implementing it contractually amongst them and with the FP. The sponsors are the critical input providers to the project, and they control the strictly instrumental SPV.

SPV. *Vid. Special Purpose Vehicle.*

Unanimous collusion. The collective renegotiation involving all sponsors that takes place after the project or parties receive *news* (as the project evolves). In the

context of the study, the unanimous renegotiation escapes the enforcing capacities of the FP. Regularly, *v.gr.*, within the thresholds identified in the study, serves for implementing solutions with negative externalities to the FP.

Very bad news. Under *very bad news* conditions deteriorate beyond *good news* the sponsors collectively anticipate that, after renegotiating without the intervention of the lender, they will receive no positive value for providing further contributions to the project. Distinctively of *very bad news*, in this scenario, the sponsors implement innovations for saving costs of complying with contractual obligations but without internalising the impact of such solutions to the project.

Annexe B

Glossary

Asset substitution. In diversified corporate investments (not in project finance contracts), behind limited liability protection, shareholders perceive incentives for adopting riskier than socially desirable projects and expanding both dividends and externalities to the creditors (over-investment).⁹⁹⁷

Asset dilution. Behind asymmetries of information, appointed administrators and controlling shareholders extract benefits from company resources. This affects the interests of the dispersed (passive) shareholders and creditors.⁹⁹⁸

Benchmark Case-Scenario. The hypothetical (unrealistic) scenario in which the sponsors deliver responses as socially desirable (in a tensionless manner). The BCS serves for comparing the social first best with the outputs and welfare that the parties produce in the strategic environment under consideration.

BCS. *Vid. Benchmark Case-Scenario.*

Best response(s). The selection of the action that maximises benefits to a party under the given incentives.⁹⁹⁹

Complementarities. The study uses the expression complementarities and synergies (synergetic efforts) similarly. Efforts are synergetic when their collective outputs are more valuable than the individual contributions. Strategically, the degrees of complementarities describe how much of the marginal value of individual actions to total welfare depends on the choices of efforts from other parties.¹⁰⁰⁰

⁹⁹⁷ For the seminal papers, *Vid.* M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, *cit.* and D. GALAI; R. W. MASULIS, “The Option Pricing model and the Risk Factor of Stock”, *cit.* H. E. LELAND, “Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Structured Finance”, *cit.* R. C. GREEN; E. TALMOR, “Asset Substitution and the Agency Costs of Debt Financing”, *cit.* B. GAVISH; A. KALAY, “On the Asset Substitution Problem”, *cit.*

⁹⁹⁸ *Cf. pp.* 116 and *ff.* and 131 and *ff.* in R. R. KRAAKMAN ET AL, *The Anatomy of Corporate Law: A Comparative and Functional Approach*, *cit.* Moreover, *pp.* 84, 103 and 45 in V. FINCH, *Corporate Insolvency Law - Perspectives and Principles*, *cit.* Also, generally, on contractual preventions *pp.* 126, in C. W. SMITH; J. B. WARNER, “On Financial Contracting: An Analysis of Bond Covenants”, *cit.*

⁹⁹⁹ *Vid. p.* 49 in J. WATSON, *Strategy*, *cit.*

¹⁰⁰⁰ *Vid. pp.* 81 – 97 in *Ibid.*

Conditions precedent. The set of requirements that a party requires before allowing the enforceability of obligations. In the case of our study, in conditions precedent, the FP will list all requirements of the project and parties that she must verify before allowing the SPV to receive non-recourse debt.

Contractual imperfections. Contracts are necessarily incomplete. Parties fail to regulate all possible scenarios. The problem of incompleteness grows with material complexity (relative to the qualifications of parties) and time terms. Beyond the scope of the study, backwards induction, contractual incompleteness leads to the hold-up problem (*Cf.* the entry hold-up). Additionally, parties fail to obtain information about the actions of other parties. This leads to the problem of hidden actions ex-post and moral hazard.

Debt dilution. In regular diversified corporate contracting, companies obtain debt sequentially. Old creditors find themselves competing with subsequent lenders for the same collateral and cash flows from their common debtor. This results in negative externalities from the later to the earlier (under-investment).¹⁰⁰¹

Debt overhang. In regular corporate investing environments, higher debt-to-equity ratios deprive shareholders from valuable dividends. This increases the costs of capital, resulting in companies missing socially desirable growth opportunities (under-investment).¹⁰⁰²

Distress costs. As companies reveal information about the status of their business portfolios, they allow third-party contractors to update conjectures about their debt repayment capacities. This results in creditors and input providers increasing the contractual precautions preventing insolvency scenarios. These precautions affect the interaction between the company and third parties ultimately jeopardising the enterprise's capacities to advance new and more diverse opportunities (under-investment).

Double-way risk contamination. *Vid.* Risk contamination.

External (judicial enforcement). The enforcement of contractual agreements by Courts of Justice. External enforcement is costly and depends on the availability of

¹⁰⁰¹ A. SCHWARTZ, "Priorities and Priority in Bankruptcy", cit. A. SCHWARTZ, "A Theory of Loan Priorities", cit. D. S. BIZER; P. M. DEMARZO, "Sequential Banking", cit.

¹⁰⁰² S. C. MYERS, "Determinants of Corporate Borrowing", cit. For empirical observations *cf.* B. MINTON; C. SCHRAND, "The Impact of Cash Flow Volatility on Discretionary Investment and the Costs of Debt and Equity Financing", cit.

verifiable information. (Cf. Relational Contracting).

Free cash flow problem. The levels of unmonitored cash flows (or other redeployable resources) allow for managerial indiscipline. In diversified corporate investments, within the spaces allowed by asymmetries of information, the good performance of some project (their cash flow producing capacities) serves for managers to mask managerial misbehaviour in other business units.¹⁰⁰³

Fundamental transformation. The process in which resources become specific to a project. After the fundamental transformation, assets cannot be redeployed without internalising significant costs. Strategically, specificities come in detriment of the value of resources as collateral to creditors. Specificities also affect bargaining powers.¹⁰⁰⁴

Incentive compatibility constraints (ICC). The set of incentives in response to which the individual sponsors choose their costly contributions to a contract. The function of Incentive Compatibility Constraints can be obtained by deriving the First Order Condition of the Objective Function with respect to the choice of efforts. The expression of Incentive compatibility constraints permits the identification of the equality between marginal benefits and marginal costs that find the choice of effort that maximise returns to the contracting party.¹⁰⁰⁵

¹⁰⁰³ M. C. JENSEN; W. H. MECKLING, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, cit. M. C. JENSEN, “Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers”, cit. For an empirical verification of over-investment policies including a literature review *vid.* S. RICHARDSON, “Over-Investment of Free Cash Flow”, cit. For a study of the distortions from perquisite consumption incentives over leverage ratios *Vid.* E. MORELLEC, “Can Managerial Discretion Explain Observed Leverage Ratios?”, cit. *Vid.* also, A. V. S. DOUGLAS, “Capital Structure and the Control of Managerial Incentives”, cit. S. J. GROSSMAN; O. D. HART, “Corporate Financial Structure and Managerial Incentives”, cit.

¹⁰⁰⁴ O. WILLIAMSON, “Transaction-Cost Economics: The Governance of Contractual Relations”, cit.

O. E. WILLIAMSON, *The Economic Institutions of Capitalism*, cit. B. KLEIN ET AL, “Vertical Integration, Appropriable Rents, and the Competitive Contracting Process”, cit.

¹⁰⁰⁵ For an example of the identification of incentive compatibility constraints in a work analysing the responses from sponsors, see the expression number 7 in p. 14 in

Individual rationality -participation- constraints (IRC). For rationality, parties will only enter the project after estimating that, after choosing inputs as desirable (to the observable incentives), they will obtain value higher than the next alternative opportunity for such resources. Without such a perspective, parties will allocate such efforts somewhere else.¹⁰⁰⁶

Hold-up. The problem that arises when parties investing in specific resources anticipate that, after conditions change beyond contracting, the value of their contributions will be shared with other parties after an inefficient renegotiation process. The hold-up problem leads to under-investment of specific resources.¹⁰⁰⁷

Informativeness principle. For efficiency, contracting parties should incorporate in contractual provisions (v.gr., in reward functions) all direct or indirect references of individual actions. As a corollary, parties should recur to allocating property rights (shares with entitlements to expected dividends) for incentivising fully non-contractible actions.¹⁰⁰⁸

Iuris et de iure: A *praesumptio iuris et de iure*, or *irrebuttable presumption*, or *conclusive presumption*, is a presumption in which the defendants are not allowed to bring evidence to the contrary. Cf. *Iuris tantum*.

Iuris tantum: A *praesumptio iuris tantum* or *rebuttable presumption*, is a presumption under which the legal system assumes certain events or characteristics as being true but allow defendants to bring evidence to the contrary. Cf. *Iuris et de iure*.

Junior claims. Claims of a hierarchy lower than that of other creditors. Vid. Seniority (hierarchies) of claims.

E. IOSSA; D. MARTIMORT, “The Simple Microeconomics of Public-Private Partnerships”, cit.

¹⁰⁰⁶ For an example of the identification of individual rationality -participation- constraints in a work analysing the responses from sponsors, see the expression number 8 in page 14 in *Ibid*. See also pp. 343 and 404 in J. WATSON, *Strategy*, cit.

¹⁰⁰⁷ S. SHAVELL, “Contracts, Holdup, and Legal Intervention”, cit. A. S. EDLIN; S. REICHELSTEIN, “Holdups, Standard Breach Remedies, and Optimal Investment”, cit. W. P. ROGERSON, “Contractual Solutions Hold-Up Problem”, *The Review of Economic Studies*, vol. 59, 4, 1992.

¹⁰⁰⁸ The seminal and classical reference is B. HOLMSTRÖM, “Moral Hazard and Observability”, cit.

Moral hazard. Parties receive distinct information about the responses that parties deliver to contractual obligations. These asymmetries of information allow for space within which parties exert hidden actions after contracting. Strategically, moral hazard affects the rewards functions (calling for stringer incentives), it comes at costs to both the risk-averse agent and a principal and functions as a boundary to the feasibility of contractual relationships (projects).¹⁰⁰⁹

Moral hazard in team problem. Consider a scenario in team members contribute with non-contractible (unobservable) efforts for a common (team) output. When selecting the choices of inputs, each team member will internalise the full costs of her actions. However, of the total benefits that she generates at the team outputs, she will only receive a fraction corresponding to her individual entitlements. In the case of a partnership, the team member would receive returns only as a function of the dividends that she can harvest in proportion to her stake of ownership in the company. Because she internalises the full (marginal) costs of efforts but receives only a fraction of the total (marginal) benefits, the team member exerting private efforts will necessarily under-invest.¹⁰¹⁰

Optimal seniority of claims. Chapters 5, 6, and 10 show how, in FPCs, there is an optimal hierarchy of claims of the non-recourse lender and sponsors that maximises value to the FP (the senior claimant) while preserving the incentives for the sponsor to choose non-contractible efforts increasing residual benefits (with externalities to the FP).

Private objective function(s). The objective functions include the sources of value and costs that parties observe when entering a contract. Some of these values may depend on the choices of inputs (incentives). Cf. Incentive Compatibility Constraints (ICC).

Redeployability. Redeployable resources can be allocated to alternative placement opportunities without experiencing significant losses of value. The concept of

¹⁰⁰⁹ Vid. pp. 20 and ff., 30 and ff. and 129 and ff. in P. BOLTON; M. DEWATRIPONT, *Contract Theory*, cit. Pp. 145 and ff. in J.-J. LAFFONT; D. MARTIMORT, *The Theory of Incentives - The Principal-Agent Model*, cit.

¹⁰¹⁰ The seminal and classical reference is B. HOLMSTRÖM, “Moral Hazard in Teams”, cit. E. RASMUSEN, “Moral Hazard in Risk-Averse Teams”, cit. L. RAYO, “Relational Incentives and Moral Hazard in Teams”, cit. M. BATTAGLINI, “Joint Production in Teams”, cit.

redeployability is contrary to that of specificities.

Relational banking. In the banking industry, where one of the parties lends cash to the other (the borrower), the spaces for sustaining cooperation relationally (based on the value of expected reciprocity) are smaller than in other cases. However, relational interaction (relational banking) permits that parties exchange information about each other in a way that can bring both parties confidence about the reactions expected from the other. Based on this trust, banks may accept internalising higher risks. In this context, the value of defecting that cooperation correlates with the value of the trust build during the interaction. For this, it is often the case that sponsors implement FPCs with banks with which they already have a relationship before beginning the implementation stage.¹⁰¹¹ Relational banking improves the quality of readjustments and increases managerial discipline.¹⁰¹² Relational pressure over covenant violating firms results in value to shareholders.¹⁰¹³

Relational contracting (interaction). Parties that deliver contributions sequentially can sustain cooperation based on reciprocity -that is, based on the value expectations to receiving favours from other parties in later stages. Unlike judicial enforcement, parties can enforce relational agreements on merely observable information. Relational enforcement capacities depend on the value of expected responses, on the access to information, and the number of expected interactions before the end of the contract. In PFCs, the sponsors find spaces for sustaining reciprocity-based cooperation.¹⁰¹⁴

¹⁰¹¹ C. JAMES, “Some Evidence on the Uniqueness of Bank Loans”, cit. S. L. LUMMER; J. J. MCCONNELL, “Further Evidence on the Bank Lending Process and the Capital-Market Response to Bank Loan Agreements”, cit. D. PREECE; D. J. MULLINEAUX, “The Role of Lending Syndicates”, cit.

¹⁰¹² R. GERTNER; D. SCHARFSTEIN, “A Theory of Workouts and the Effects of Reorganization Law”, cit. A. BRUNNER; J. P. KRAHNEN, “Multiple Lenders and Corporate Distress: Evidence on Debt Restructuring”, cit.

¹⁰¹³ G. NINI ET AL, “Creditor Control Rights, Corporate Governance, and Firm Value”, cit.

¹⁰¹⁴ J. LEVIN, “Relational Incentive Contracts”, cit.K. DOORNIK, “Relational Contracting in Partnerships”, cit. G. BAKER ET AL, “Relational Contracts and the Theory of The Firm”, cit. S. GOLDLÜCKE; S. KRANZ, “Delegation, Monitoring, and Relational Contracts”, *Economics Letters*, vol. 117, 2, 2012, Elsevier B.V. For a didactical

Residual benefits (residual expectations, residual claims). Claims are residual when they are the most junior (of lowest hierarchy) with respect to other claimants of the same resources, and such claims are variable in value. *E.g.*, dividends are residual benefits because the company will distribute them only after complying with contracts.

Residual rights (of control). The capacity of sponsors as owners to decide on the use of the SPV and its assets for all matters not included in contracts with the lender.

Risk contamination. The situation in which assets co-owned by many parties are exposed to the creditors of such parties. Similarly, the scenario in which materially independent assets from distinct projects of a portfolio internalise the solvency risks associated with the volatility that a larger and riskier project brings to the company.

Risk shifting. *Vid. Asset substitution.*

Robust (robustness). In this context, a proposition (a rule) is robust (or robustly efficient) when it produces desirable incentives in all environments, or whenever the desirable effects in some scenarios control the inefficiencies expected in other situations.¹⁰¹⁵

Senior claims. Claims of a hierarchy higher than that of other creditors. *Vid.* Seniority (hierarchies) of claims.

Seniority (hierarchies) of claims. The hierarchy of claims defines the sequence in which the debtor uses limited resources for servicing the claims of her many creditors. Consequently, in principle, higher seniority (higher hierarchy, higher seniority) of claims relate to a higher likelihood that claims will be repaid after news affect the welfare capacities of the debtor. Conversely, from lower seniority of (junior) claims follow a higher likelihood that minor contingencies result in the debtor failing to repay its debts to the junior creditor.

Specificities. The degrees of *specificities* correlate to the losses expected when assets or resources are allocated to their next best placement opportunity. Alternatively, specificities indicate the difference between the value of resources when applied to one project or when allocated to its second-best possibility. We may

introduction to the game theory aspects of repeated games and reputation, *vid. pp.* 291 and *ff.* in J. WATSON, *Strategy*, *cit.*

¹⁰¹⁵ *Vid.* page 1121 in O. D. HART; J. MOORE, “Property Rights and the Nature of the Firm”, *cit.*

think of dedicated information software systems, custom-made machinery, or human familiarity with the local environment, or buildings. The concept of specificity is opposed to that of redeployability.¹⁰¹⁶

Strategic tensions. *Vid.* Tensions.

Strategies. The menu of all alternative responses available to a party in a given environment.

Synergies. *Vid.* Complementarities.

Tensions. The differences in the preferences for the responses of other parties. The text uses the expression tensions and conflicting interests similarly.¹⁰¹⁷

Volatility contamination. In the literature of finance, volatility describes the expected variations in cash flows from a company or a source (a project). Higher volatility corresponds to higher risks. Companies prevent the costs of volatility with the diversification of resources (portfolio benefits). Volatility contamination takes place when highly volatile assets coexist under the same corporate umbrella. Large projects come in detriment of diversification, resulting in the volatility of the portfolio resembling the volatility of the large project. The term risk contamination is often used for the same concept. *Vid.* Risk contamination.

Without loss of generality. An assumption will affect the choices of efforts and the willingness of parties to enter the project but will not affect the conclusions about how variables interact in the setting.¹⁰¹⁸

¹⁰¹⁶ B. KLEIN ET AL, “Vertical Integration, Appropriable Rents, and the Competitive Contracting Process”, cit. O. WILLIAMSON, “Transaction-Cost Economics: The Governance of Contractual Relations”, cit. O. E. WILLIAMSON, “Credible Commitments: Using Hostages to Support Exchange”, cit. P. JOSKOW, “Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence”, cit. O. E. WILLIAMSON, *The Economic Institutions of Capitalism*, cit.

¹⁰¹⁷ *Vid.* pp. 52 and ff. in J. WATSON, *Strategy*, cit.

¹⁰¹⁸ For examples of the use of the expression, cf. footnote 16 in p. 1200 in J. MOORE; R. REPULLO, “Subgame Perfect Implementation”, *Econometrica*, vol. 56, 5, 1988. Also, p. 186 in T. PFEIFFER, “The Value of Information in the Hold-Up Problem”, cit. Or, page 491 in O. D. HART; B. HOLMSTRÖM, “A Theory of Firm Scope”, cit.

Annexe C

Case-studies

- I. Iridium LLC Satellite Communications.¹⁰¹⁹
- II. The Beijing 2008 Olympic Games Stadium BOT project.¹⁰²⁰
- III. A2 Toll Highway in Poland by Autostrada Wielkopolska S.A.¹⁰²¹
- IV. PPL Global, Pennsylvania Power & Light Company.¹⁰²²
- V. Calpine Corporation (electric power).¹⁰²³

¹⁰¹⁹ *Vid. pp. 485 and ff. in B. C. ESTY, Modern Project Finance: A Casebook, cit.*

¹⁰²⁰ *Vid. pp. 130 and ff. in H. W. ALFEN ET AL, Public-Private Partnership in Infrastructure Development Case Studies from Asia and Europe, cit.*

¹⁰²¹ *Vid. pp. 301 to 320 in B. C. ESTY, Modern Project Finance: A Casebook, cit.*

¹⁰²² *Vid. page 441 and ff. in Ibid.*

¹⁰²³ *Vid. pages 112 and ff. in Ibid.*

Summary

Project finance contracts (PFCs) involve incorporating a special purpose legal vehicle company (SPV) for implementing a single predefined project that parties finance with non-recourse debt. In PFCs, the SPV and the project are fully controlled by the sponsors. The sponsors are the specific input providers of the also highly specific project -*v.gr.*, they are contractors of the SPV they own. The non-recourse debt comes prevalently from a group of lenders acting collectively -the financing party (FP).

In this context, the expression *non-recourse* means that, should the borrower (the SPV) fail to repay the loan, the FP will not be capable of seeking repayment or compensation from third parties, including the sponsors. In conjunction with the specificities of project resources, the non-recourse nature of debt implies that the FP's expectations depend exclusively on the success of the project as predefined -*i.e.*, on its capacity to produce value beyond the SPV's costs of debt.

Accordingly, before internalising non-recourse risks, the uncollateralised lender verifies the robustness (enforceability and completeness) of a risk allocation and task distribution mechanism. This is a web of enforceable provisions bringing confidence to parties that, in all foreseeable eventualities, the SPV will count on all resources necessary for completing the predefined project before repaying the non-recourse debt. Hence, the feasibility of PFCs depends on the parties' capacities to predefine all components, features, and solutions for the single project. This includes all project's material aspects, the identification of material and financial inputs providers (and their conditions), the necessary insurance coverage, and the terms under which the SPV will sell its outputs to a pre-arranged off-taker or the public.

Effectively, in the absence of collateral or recourse to third parties, the *implementation quality* of the risk allocation mechanism for *a unique project* dictates the feasibility of the non-recourse loan agreement in the core of all PFCs. Consequently, parties' transaction costs -as seen in the number and sophistication of contracts- are notably higher in PFCs than in regular collateralised and diversified corporate financing environments.

Today, PFCs have not been legally (legislative or jurisprudentially) institutionalised. Moreover, few academic works identifying their strategically inherent aspects (objectives and vulnerabilities of the necessary parties) exist. In light of the above, this exposes two main problems:

First, the sponsors and the FP construct PFCs with legal tools (existing company forms) that legislators designed for purposes distinct to what the earlier value in

these contexts. Today, the existing company forms come to facilitate that risk-averse managers advance diversified business-investment portfolios with funds from dispersed investors by contracting with unrelated sources of material inputs and debt financing -all this, with eyes on the availability of collateral from the debtor or third parties. These objectives of legislators and functionalities of default rules are precisely contrary to the purposes and values that parties pursue in PFCs whose feasibilities depend on the quality with which they predefine a unique, highly specific, time-limited project. In PFCs, the spaces for diversification that company forms default rules protect appear as leeway for opportunism against the lender, relying on single-project implementation quality.

Second, because PFCs have not been institutionalised and few studies have focussed on their defining features -the necessary objectives and vulnerabilities of parties- and the forms of opportunism idiosyncratic of these environments, judges cannot rely on robust criteria for adequately interpreting ex-post the purposes that parties express incompletely in their risk allocation mechanism. Today, judges enforce clauses and norms following the inertia of the literature and traditions of regular corporate (collateralised and diversified) financing and investing whose diversifying objectives and functionalities exacerbate the strategic vulnerabilities of the non-recourse lender in PFCs.

These two aspects come with two further implications:

First, contractual provisions are inherently imperfect, and implementation capacities are limited. Thus, irrespective of the (incrementally costly) implementation efforts that they spend correcting the currently distortive default rules, the parties cannot entirely modify the underlying judicial business diversification-oriented criteria with which judges interpret the necessary incomplete clauses ex-post.

Second, the transaction costs that parties spend correcting (legislative and judicial) default rules and the remaining judicial enforcement uncertainty result in losses of project value. Thus, some projects will not occur. This is transaction costs-induced underinvestment as a function of the default rules being far from (in many cases, precisely opposite to) the socially optimal.

Remarkably, the above problems are common to all contractual interactions. However, in PFCs, the underinvestment associated with the inadequacy of the legal treatment is particularly acute because of the transaction costs that grow with material complexities (implementation costs), the extended terms (exposure to contingencies), the high degrees of specificities (low collateral values), the non-recourse nature of the debt covering the bulk of financing needs of the project, and the fact that such uncollateralised debt comes from a single source. The feasibility limiting effects of transaction costs in PFCs are commonplace in the management

literature and in conversations among practitioners who often refer to project financing as *contract financing*.

A reconsideration of the legal treatment of PFCs -*v.gr.*, the default rules of company forms and the judicial enforcement and ex-post interpretation criteria- is necessary for allowing parties default rules minimising the transaction cost-induced underinvestment. The study shows how a more efficient when offered as an *opt-in* alternative with a set of default to parties. Such legal treatment should allow for legal personality and limited liability protection -of crucial relevance to the risk isolation functionality of the SPV- and provide for a set of default rules facilitating single project-implementation purposes in the protection of the non-recourse lender the party internalising the build of total risks uncollateralised and without recourse to third parties.

Critically, for the robustness of such propositions, the initial identification of the essential elements and strategic features inherent to PFCs must precede all consideration of legal proposals that the study introduces as ways for derivative legal research.

Accordingly, the thesis first observes contractual practices as seen in the management and finance literature and considers the benefits of PFCs that parties cannot replicate in regular corporate settings. Second, it isolates the necessary components and features that identify PFCs before analysing the strategic tensions and forms of opportunism inherent to the positions of all parties in all PFCs. Third, it identifies the needs for legal treatment (the inefficiencies in the current legal solutions) and offers three sets of postulates for the legal institutionalisation of PFCs: five pillars for a PFC corporate form, three principles for interpreting clauses ex-post, and four optimalities in PFCs.

These three parts evolve as follows.

- *Part I analyses the contractual practices and strategic advantages of PFCs. This first part builds on management and finance literature and builds the factual basis for the strategic and legal analyses of Parts II and III. Part I includes chapters 1 to 3.*

Concretely, Part I shows how the sponsors, the non-recourse lender, and often the off-taker implement the risk allocation mechanism directly amongst them and via the fully controlled SPV. The work then identifies technical default, cross-default, and full default provisions that parties put in place for objectives common to all PFCs. This includes the definition of the single project, the SPV's control, the capital and debt finance provisions via the cash waterfall clause, and the pass-through and back-to-back mechanisms for distributing all risks to the sponsors.

This first part also analyses the solutions and benefits unique to PFCs. It shows how

PFC mitigate distress costs, the free cash flow problem (managerial indiscipline), the debt overhang problem, the asset substitution (risk shifting) strategies, the debt dilution and the asset substitution problems, the opportunism from (over enforcing) concentrated creditors, and the adverse selection problems in both equity and debt. These are feasibility boundaries associated with financing exceptionally costly projects with traditional corporate structures that parties do not experience when recurring to PFCs.

— *Based on the contractual practices as observable in the management and finance literature, Part II now isolates the necessary elements, parties, and features that identify PFCs. This second part then categorises the strategic tensions, the characteristic forms of opportunism, and the incentives that the sponsors perceive for cooperating with some or with all other sponsors against the non-recourse lender. These are economic strategic (incentive) analyses of features inherent to the positions of all parties in all PFCs. Part II comprises chapters 4 to 6 and builds the strategic basis for the legal propositions of Part III.*

Specifically, Part II distinguishes the sponsors from other input providers, the financing party from other lenders and capital contributors, the single project, the SPV, the non-recourse debt, and the risk allocation mechanism. These are the parties and components necessary to all PFCs. Additionally, Part II isolates six strategic features of PFCs: first, the dependence of FP's claims on the contributions by sponsors and the agreements amongst parties other than the lender (FP) and the debtor (SPV); second, the sponsors' necessary control of the SPV; third, the three tiers of incentives to which the sponsors deliver their material contributions; fourth the seniority of non-recourse debt in the nerve of strategic tensions; fifth, the opportunism beyond the spheres of the SPV; and finally, sixth, the invariable undesirability of diversification in PFCs. The study shows all the above in four real-life example-projects chosen for their extremely diverse structural configurations.

In this Part II, the study then classifies three types of incentives and subsequent opportunistic responses feasible in all PFCs. The sponsors withhold socially desirable uncontractible contributions (*shirking*). They implement technology solutions riskier than the optimum to the SPV (*risking*). Finally, the sponsors develop innovations for lowering the cost of complying with the risk allocation mechanism without fully internalising the undesirable effects they bring to the project, the SPV, and consequently, the non-recourse lender. To both the evolving incentives and the three forms of opportunism, the study refers to respectively as *shirking*, *risking*, and *shading*.

Part II describes how, as conditions change unexpectedly within the thresholds of *bad* or *very bad news*, the sponsors perceive increasing incentives for renegotiating

amongst them (excluding the FP) before responding opportunistically with private actions. As conditions evolve undesirably, the sponsors no longer implement *shirking*, *risking*, and *shading* exclusively privately, but they begin forming opportunistic sub-coalitions involving some peers. As the environment further deteriorates in the scenario of *bad news*, the sub-coalitions proliferate and grow in size, and unanimous renegotiations become likely. Finally, under *very bad news*, the sponsors lose all hopes of harvesting residual benefits. Accordingly, before delivering their individual responses, they renegotiate unanimously against the non-recourse lender exclusively for *shading*. Under *very bad news*, effectively, the FP will most likely find her claims not fully repaid. However, with legal implications, the *very bad news* scenario is not identical to those described in the habitual solvency tests of bankruptcy laws.

The study shows how the incentives for *shirking*, *risking*, and *shading* privately, within sub-coalitions, or after renegotiating unanimously evolve as conditions deteriorate with *news*. Accordingly, the work demonstrates how it is not only *news* but also the sponsors' opportunistic reactions to such *news* what drives the projects to its collapse. The study emphasises the relationship between these opportunistic responses and the problem of cost overruns.

For completeness, the study analyses the case of *good news* that is not symmetrical to those of *bad* or *very bad news*. Under *good news*, the sponsors perceive incentives for revealing information about their choices of complementary actions and can sell the verifiable inputs that they can commit not to deliver.

Finally, Part II describes how opportunistic cooperation evolves as a function of several other variables beyond *news* -the dominating factor. These include the allocations of property rights, the asymmetries of information among the sponsors, and between the sponsors (individually and collectively) and the non-recourse lender, the complementarities (synergies) of quality-enhancing inputs and innovation-implementing efforts, the spaces for sustaining cooperation relationally among some or all the sponsors, or the externalities inside and outside sub-coalitions. Analytically but intuitively, the study describes how the above variables affect the bargaining processes: the weight of compensations necessary for building acceptable sub-coalitions, the joint surpluses, and the feasibility of bribes as functions of the severity of *news*. Finally, the study emphasises how the flow of information among the sponsors allowing for the update of conjectures dictates the proliferation of opportunistic renegotiations. For this, the work observes the impact of expectations in the scenarios of *opportunism* and *pessimism* as rational (not behavioural) reactions.

— *After the strategic analyses (strategic tensions and forms of opportunism) of Parts I and II, Part III identifies the needs for legal treatment and proposes*

five pillars for the legal institutionalisation of PFCs via a dedicated corporate form, three principles for completing clauses, and four postulates for identifying optimalities when treating PFCs legally. Part III contains chapters 7 to 10.

Part III begins by emphasising the stark contrasts between corporate laws' objectives and the parties' needs for legal treatment in all PFCs. The study shows how, in PFCs, parties use the legal personality and the limited liability protection of the SPV for purposes distinct to those of shareholders in regular corporate investing. Corporate laws focus on facilitating the diversification of investments (projects), investors (shareholders), and (debt and equity) financing sources. Company laws implement fiduciary duties of loyalty and diligence, indirectly protecting the risk-averse managers when adopting risky decisions as socially desirable when advancing diversified portfolios for dispersed investors by contracting with independent providers. Legislators tend to protect the transferability of shares. Additionally, under bankruptcy laws, managers only offer information to creditors in the vicinity of the company's insolvency. Today, legislators protect creditors against forms of opportunism that occur within the company by managers and *de facto* controllers. Finally, shareholders are not deemed in *de facto* control of the SPV.

Remarkably, in typical corporate scenarios, the contractual behaviour of shareholders and other parties is coherent with such diversification objectives. Consequently, there are contractual solutions that could protect financing providers and contractors for inputs that parties do not implement as they jeopardise companies' diversification capacities (an opportunity cost to shareholders). Aware of these strategic values, judges interpret these clauses efficiently according to their purposes in these environments.

The study exposes the strategic objectives of parties in PFCs precisely contrary to those for which legislators offer their legal protection via company laws. Moreover, the thesis remarks how the sponsors and the FP rescue the few aspects efficient to their objectives (*e.g.*, the legal personality of the SPV and its limited liability protection for objectives contrary to the functionalities that legislators give current company forms) before modifying the vast majority of the remaining default rules of existing company forms. In PFCs, parties replace these regulations with provisions focusing on restricting all forms of diversification that the non-recourse lender perceives as spaces for opportunism in tension with the strategically critical risk allocation mechanism predefining the single project (her sole source of value).

Consequently, in PFCs, we see solutions opposite to what the shareholders and the contracting parties appreciate in regular corporate settings. Ex-ante, the FP eliminates the three spaces for financing decisions: the investment decisions, financing decisions, and the dividend distribution decisions. Concretely, via direct

covenants, the FP and the sponsors restrict the investment capacities of the SPV to the sole time-limited project as predefined in the risk allocation mechanism. The sponsors and the FP regulate the flows of capital contributions and debt to the company and the sequence with which the SPV will serve its commitments to all parties before issuing dividends (the company's capital structure). Similarly, parties agree that all debt will come from the FP or the third parties under her supervision. Parties effectively allow the non-recourse lender a monopoly on the provision of debt to the SPV. This privilege not seen in diversified scenarios serves for preventing debt dilution -of critical relevance to the FP in the absence of collateral. Moreover, in PFCs, parties restrict the possibilities that the SPV obtains material resources from parties other than the sponsors. The FP also curbs the transferability of shares in the SPV. This restriction is anti-natural in regular environments where shareholders are dispersed, but is indispensable in PFCs for securing the SPV political control contractually -an aspect necessary for implementing the risk allocation mechanism.

In PFCs, parties implement obligations to inform the lender. These relate to generally undefined events that may affect the project capacities and concretely predefined aspects -*e.g.*, financial and coverage ratios or progress reports. These duties to inform allow the FP to enforce precautions (pre-emptively) before the project is under distress and incentives begin deteriorating. The FP also places enforcement precautions not habitually seen in regular diversified environments. *E.g.*, the sponsors pledge SPV shares as security to the FP, the lender may intervene in the decision-making system of the SPV, the FP may enforce penalties or liquidated damages against the sponsors for technical default events at the SPV level. This evidences the functional multi-party nature of PFCs whose feasibility depends on agreements among parties beyond the bilateral loan in its core.

This contractual behaviour explored in Part I and analysed strategically in Part II signals the disparity of parties' objectives in PFCs and regular corporate scenarios. This discrepancy of objectives reveals strategic vulnerabilities that norms from current corporate forms do not attend.

In the last three chapters of Part III, the study advances three sets of legal considerations for later research. Chapter 8 introduces five pillars -default (not mandatory) in nature, for institutionalising PFCs legislatively: First, the implementation of a PFCs company form requiring registration. Second, the fiduciary duties of loyalty to the non-recourse lender. This principle serves for interpreting provisions ex-post and for the sponsors to control the SPV completing the risk allocation mechanism with managerial decisions (and collective actions as shareholders) in the protection of the interests of all parties, including the lender. Third, the enforcement of control responsibility upon the sponsors -*i.e.*, treating them as managers of the SPV to all effects. Fourth, the limitation of the

representation capacities of the SPV -a legislative measure in line with EU company law directives. Finally, fifth, the enforcement of fiduciary duties to inform *distress* to the non-recourse lender. This is a fiduciary duty to inform certain deteriorations of the environment (a refinement of the *bad news* threshold) that do not amount to corporate insolvency as defined by bankruptcy laws. The enforcement perspectives of fiduciary duties to inform facilitate the ex-ante implementation of the risk allocation mechanism.

In Chapter 9, the study isolates three necessarily efficient principles for completing clauses ex-post in PFCs: First, the pre-emptive objectives of all clauses. This principle calls for interpreting provisions as oriented not to prevent direct losses (as in liquidated damages) but to preserve project value as a means for preventing the growth of incentives for *shirking*, *risking*, and *shading*. Second, *in dubio pro creditoris* induces judges to consider the lower expertise, the lack of asset control, and the lower implementation and enforcement capacities of the FP internalising the bulk of total risk without collateral or recourse to third parties. Under *in dubio pro creditoris*, judges should take into account how the FP internalises more of the total marginal costs of the opportunism that, in virtue of her necessarily low expertise on the industrial sector of the project, she cannot prevent contractually. Finally, third, the *intuitu personae* nature of the relationships between the sponsor and the FP. In PFCs, the FP interacts with the sponsor with eyes on their capacities to control the SPV and deliver inputs as predefined. The *intuitu personae* consideration serves to interpret restrictively the (invariably undesirable) capacities of the sponsors to transfer their shares in the SPV and their contractual positions without the lender's consent.

Before the conclusions, as ways forward for later research, the study identifies four optimalities in PFCs. First, the optimally stricter fiduciary duties of diligence in PFCs. This results from the invariably highest expertise and superior access to information that they find and exchange about the single predefined project with which the sponsors interact materially. Second, for the same reasons -i.e., the sponsors anticipate contingencies sooner and farther from the single project-, in PFCs, there is also a stricter optimal responsibility of project-controlling sponsors in the vicinity of the company insolvency. Third, the optimal seniority of claims in PFCs. This hierarchy of claims maximises FP value by also minimising the incentives for *shirking*, *risking*, and *shading* under broader scenarios (*news*). Finally, fourth, the optimal managerial delegation in PFCs. The scope of managerial delegation in PFCs is narrowest and restricted to lower values-at-risk decisions. This corresponds with mandates of the highest implementation quality, low incentive powers (small variable bonuses), and low fixed components (premiums) in salaries -as found in anecdotal evidence.

The legal propositions of Part III derive from strategic aspects (objective and vulnerabilities) inherent to the positions of parties in all scenarios. Thus, they are efficient both ex-post and ex-ante, irrespective of project configurations and evolutions of the environment (robustness). Thus, the value of institutionalisation is secured by the flexible (opt-in) nature of the PFC form that parties choose only when desirable and before adjusting default (flexible) rules at a (preferable) cost. Finally, all postulates are consistent with the functionalities of the clauses as observed in the management and finance literature, as shown in Part I and as analysed strategically in Part II.

Samenvatting

Projectfinancieringscontracten (PFC's) hebben betrekking op de realisatie van een zeer specifiek project door dit te plaatsen onder een specifieke rechtspersoonlijkheid bezittende special purpose vehicle (SPV) alvorens deze te financieren met een schuld zonder verhaalmogelijkheden (zonder onderpand). Deze SPV is eigendom van en staat onder volledige zeggenschap van sponsors, die de verschaffers zijn van alle essentiële (specifieke) materiële input voor het project. Bij afwezigheid van een onderpand of verhaalmogelijkheid op derden, is de haalbaarheid van financiering zonder verhaalmogelijkheden dus afhankelijk van de kwaliteit waarmee de geldverschaffer een reeks regelingen oplegt aan de sponsors, waardoor de onder volledige zeggenschap staande SPV in alle voorzienbare eventualiteiten alle financiële en materiële input ontvangt, vereist voor de realisatie van het vooraf gedefinieerde project en de schuld terugbetaalt.

Vervolgens is de verdeelbare bijdrage in PFC's afhankelijk van de volledigheid en afdwingbaarheid, waarmee partijen alle aspecten van een uniek in tijd gelimiteerd project contractueel vastleggen. Dit staat in tegenstelling tot de bedrijfsdiversificatiedoelstellingen waarvoor wetgevers de regels ontwerpen voor bedrijfstvormen. In PFC's redden partijen dus de functionaliteit van de rechtspersoon en de beperkte aansprakelijkheidsbescherming en wijzigen het merendeel van de resterende niet-nakomingsregels van toepassing op de SPV (het bedrijfstype daarvan). Als gevolg van de strategische spanningen karakteristiek voor PFC's, passen de sponsors en de geldverschaffer zonder verhaalmogelijkheden dus bepalingen toe die we in alle PFC's tegenkomen, maar niet in andere scenario's. Omdat deze strategische spanningen vandaag de dag niet goed begrepen worden, slaagt ook de rechter er uiteindelijk niet in om deze noodzakelijke bepalingen toe te passen overeenkomstig hun gewenste functionaliteit. Dit alles leidt tot dramatische transactiekostengerelateerde onderinvestering en kostenoverschrijding – zowel een cliché in de financierings- als in de managementliteratuur.

Het onderzoek richt zich op drie doelstellingen in drie delen (10 hoofdstukken). Ten eerste, gebaseerd op observatie van praktijken en strategische overwegingen, onderscheidt het werk de elementen en kenmerken die nodig zijn in PFC's. In PFC's zijn er altijd sponsors, een of meerdere SPV's, een uniek vooraf gedefinieerd project, een geldverschaffer zonder verhaalmogelijkheden (of een groep van hen die samenwerken) en een risicoverdelingsmechanisme. Bovendien hebben de sponsors in PFC's altijd de zeggenschap over de SPV en zijn activa, zijn zij altijd de best-geïnformeerde partijen en reageren zij altijd op dezelfde reeks prikkels die we niet in andere omgevingen zien -bijv. bepalingen toegepast door de geldverschaffer, bepalingen alleen afdwingbaar door de sponsors en individuele toekenning van

eigendomsrechten (verwachte dividenden van de SPV). Tot slot is de haalbaarheid van PFC's altijd afhankelijk van contractuele interacties gedefinieerd door andere partijen dan de formele schuldenaar van de schuld zonder verhaalmogelijkheden (*d.w.z.* de onder volledige zeggenschap staande enkelvoudige aan het project dienstbare SPV). Bij afwezigheid van onderpand of verhaalmogelijkheid op derden, leiden de onvolkomenheden van de overeenkomsten altijd tot niet in de prijs doorberekende kosten voor de geldverschaffer zonder verhaalmogelijkheden.

Ten tweede stelt het onderzoek de strategische kenmerken vast inherent aan de positie van alle partijen in PFC's. Er zijn noodzakelijke spanningen tussen de sponsors (individueel en gezamenlijk) en de geldverschaffer zonder verhaalmogelijkheden, en tussen de sponsors. De sponsors zien altijd kenmerkende prikkels voor het achterwege laten van sociaal waardevolle bijdragen (*zich onttrekken aan*), kiezen van technologieën die risicovoller zijn dan sociaal wenselijk is (*riskeren*) en innoveren voor kostenbesparing zonder internaliseren van gevolgen (*schakeren*). De sponsors reageren op deze prikkels individueel, in opportunistische subcoalities of na samenspanning tegen de geldverschaffer zonder verhaalmogelijkheden. Alle spanningen groeien met veel factoren, waarvan de verslechtering van verwachtingen van restvoordelen steeds domineert.

Tot slot stelt het onderzoek in het derde deel de plaatsen vast waar de huidige juridische behandeling (*bijv.* de reeks diversificatiegerichte niet-nakomingsregels voor bedrijfspvormen) noodzakelijkerwijs vervormd is. Als juridisch onderzoek voert het onderzoek dus drie groepen voorstellen voor juridische behandeling aan, ten eerste: vijf pilaren voor de wetgevende institutionalisering van PFC's in een PFC-vorm, ten tweede: drie beginselen voor de realisatie achteraf van bepalingen en ten derde: vier vereisten die optimalisering in PFC's kenmerken. Alle voorstellen –zowel de strategische analyse als de juridische voorstellen- bouwen op kenmerken inherent aan de positie van partijen in alle PFC's. Zij blijven dus krachtig van toepassing ongeacht projectconfiguraties, juridische uitvoering en wijziging van externe voorwaarden (ontwikkeling van prikkels en verwachtingen).