MARC B.J. SCHAUTEN

Valuation, Capital Structure Decisions and the Cost of Capital

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Valuation, Capital Structure Decisions and the Cost of Capital

Waardering, vermogensstructuurbeslissingen

en de vermogenskostenvoet

PROEFSCHRIFT

ter verkrijging van de graad doctor aan de
Erasmus Universiteit Rotterdam
op gezag van de rector magnificus

Prof.dr. S.W.J. Lamberts

en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op
donderdag 2 oktober 2008 om 11:00 uur

door

Maximilien Bernard Joseph Schauten

geboren te 's-Gravenhage

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Erasmus Research Institute of Management (ERIM)
RSM Erasmus University / Erasmus School of Economics
Erasmus University Rotterdam

Internet: http://www.erim.eur.nl

ERIM Electronic Series Portal: http://hdl.handle.net/1765/1

ERIM PhD Series in Research in Management, 134

ISBN 978-90-5892-172-7

Acknowledgements

This thesis was written while I was an assistant professor of finance at the Finance Group at the Erasmus School of Economics in Rotterdam. I gratefully thank my supervisors Professor Jaap Spronk and Professor Dick van Dijk for their support, encouragement and many stimulating discussions. It is an honour for me to have you as supervisor and as co-author of several papers which are included as chapters in this thesis.

Many students wrote their bachelor, master and doctorandus thesis under my supervision. I benefited from their cooperation and enthusiasm for Corporate Finance. Therefore I would like to thank my former students and especially Jasper Blom, Joris van den Braak, Willem-Jan Merckel, Floris Pot, Marijke Scheerder, Rudolf Stegink, Jorrit Swieringa, Boudewijn Tans, Richard Tieleman, Arjan Vos and Jan-Paul van der Waal.

Valuable support was given by a number of practitioners who provided me with ideas and data. I especially like to mention Gijs de Graaff at Shell, Rolf Metz at Ecart Invest, and Kritof Ho Tiu and Jean-Nicolas Caprasse at RiskMetrics (previously Deminor). I am greatly indebted to RiskMetrics for providing me with the corporate governance dataset used in this thesis. I would like to thank sincerely the anonymous respondents of the Vita case. They invested many hours in solving this merger and acquisition case.

I thank for the generated comments and ideas: seminar participants of the Finance Day in Leuven (September 2005), participants of the Meetings held by the Euro working Group in Financial Modeling in Nice (November 2006) and Lisbon (November 2007), and participants of the European Conference on Operational Research in Prague (July 2007). I further thank the National Association of Certified Valuation Analysts (NACVA) for their invitation to present Chapter 6 during the Fifteenth Annual Consultants' Conference in Las Vegas (June 2008).

I am grateful to Jeffrey Bouwer, Bert Slingerland and my colleagues at the Finance Group and former colleagues Ward van den Berg, Winfried Hallerbach, Jan van der Meulen, Thierry Post, and Aloy Soppe for their support, and humor. Special thanks go to Martijn van den Assem for his positive spirit and cooperation during our PhD courses. I would like to thank Henk Berkman for his vision as well. He was my

supervisor when I wrote my doctoral thesis in 1991 and he was the person who indirectly invited me to join the Finance Group in November 1991. The support of my colleagues Hélène Molenaar, Ursula David, Betty Rietveld and Trudy van Florestein is greatly appreciated. They gave great support on the completion of the thesis and create a very fruitful atmosphere.

Finally I want to thank my family and friends who despite the fact that most are entrepreneurs or businessmen (and did not have many ideas about what scientists do) enthusiastically kept asking about my research. Marna, thank you for not taking me seriously and your endless patience. Noor, Nikki and Marcus, thanks for taking me outside, to play hockey, tennis and soccer. It gives me lots of fun and energy. Please keep doing so.

Marc Schauten
April 1, 2008

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Outline

This dissertation consists of six chapters in Corporate Finance. Each chapter is based on a paper that deals with valuation, capital structure decisions and/or the cost of capital.

In Chapter 1 we examine the relation between the quality of corporate governance and the value of excess cash for large European firms. We use Deminor ratings which can be subdivided into four corporate governance categories: shareholder rights; range of takeover defences; disclosure and board structure. Following the method of Dittmar and Mahrt-Smith (2007), we first estimate a cash model to determine the level of normal cash holdings and subsequently the level of excess cash. Then we analyse the influence of governance on the value of excess cash. Given prior empirical research for U.S. firms, we expect to find a positive relation between the quality of governance and the value of excess cash. Our unique dataset enables us to uncover which governance component, i.e. shareholder rights, range of takeover defences, disclosure or board structure, is of highest influence on the value of excess cash holdings.

In Chapter 2 we examine the relation between the quality of corporate governance and the cost of debt for large European firms. We use the Deminor ratings from Chapter 1 as proxies for the quality of corporate governance. As proxy for the cost of debt we use the yield and yield spread of 319 bonds issued in the years 2001-2005. In this chapter we conduct a comprehensive analysis of the effects of different components of corporate governance on the cost of debt. We do not limit ourselves to examining the effects of the various components on the cost of debt, but explore the possibility of interaction effects as well. In this chapter we introduce and test the 'share rights or disclose' hypothesis which states that the relevance of the quality of disclosure depends on the level of shareholder rights.

In Chapter 3 we show that despite a vast literature on the capital structure of the firm, there still is a big gap between theory and practice. Starting with the seminal work by Modigliani and Miller, much attention has been paid to the optimality of capital structure from the shareholders' point of view. In this chapter, we give an overview of the different objectives and considerations that have been proposed in the literature and show that capital structure decisions can be framed as multiple criteria decisions.

Chapter 4 discusses a merger and acquisition case as illustration of the multi-criteria framework developed in Chapter 3. We analyse financing solutions as proposed by different financing specialists. We ask each specialist to construct three financing proposals: the first would focus on the interests of current shareholders; the second would center on the interests of management; and the third would examine how the specialist should advise the management of the bidder. We compare the resulting proposals using criteria described in Chapter 3 along with additional criteria mentioned by the specialists.

Chapter 5 deals with the valuation of debt tax shields and the implied required return for the government. We discuss a valuation framework of the total firm which aims to improve the understanding of 'the tax shield valuation discussion'. The value of the debt tax shield is presented in textbooks as the present value of the future debt tax shields, i.e. the present value of the tax savings due to the use of debt instead of equity. Alternatively, the value of the debt tax shield is equal to the difference between the present value of the expected tax payments to the government by an unlevered firm and a levered firm. We derive the implied required return for the government and compare this implied return for various valuation models.

Chapter 6 is about the cost of capital for the separate valuation of intangible assets. The need for separate valuation partly arises from new international accounting standards of the International Accounting Standards Board. Under certain conditions, these accounting standards allow the value of intangible assets to be determined using the discounted cash flow method, which requires the determination of the cost of capital of the relevant intangible assets. In this chapter, the required return of intangible assets for 8 different business sectors is determined by means of an empirical study of companies from the U.S. Standard & Poor's 500 Index. The resulting required return is subsequently compared with proxies for the required return on intangible assets used in practice, such as the weighted average cost of capital.

Chapter 1

Corporate governance and the value of excess cash holdings of large European firms[1]

Abstract

We examine the relation between the quality of corporate governance and the value of excess cash for large European firms (FTSEurofirst 300 Index). We use Deminor ratings for Shareholder rights, Takeover defences, Disclosure and Board as proxies for the quality of corporate governance. We find that the value of excess cash is positively related to the Takeover defences score only. It seems that governance mechanisms—except the market for corporate control—are not strong enough to prevent managers from wasting excess cash. For non-UK firms we find that the value of €1 of excess cash in a poorly governed firm is valued at only €0.89 while the value is €1.45 for a good governed firm. We show that poorly governed firms dissipate excess cash relatively quickly with a negative impact on their operating performance as a result.

1.1. Introduction

We study the impact of corporate governance on the value of excess cash holdings by firms. Jensen (1986) argues that poorly monitored managers of publicly listed companies waste free cash by investing money in value decreasing projects. In this context corporate governance could be of great value, if it protects shareholders against mismanagement and irresponsible dissipation of cash.

In the absence of any market imperfections, the value of €1 on the bank account of firms should be valued equally by the capital market. However, in practice it is possible that management invests this €1 in a project that is worth less. These agency costs (see Jensen and Meckling, 1976) imply that the €1 held within the firm will be valued at a discount. The higher the probability of misallocation of cash holdings under management's control, the lower its market value. Good corporate governance could lower this probability of wasting by management and as such increase the value of firms' cash holdings.

[1] This chapter is based on Schauten, Van Dijk and Van der Waal (2008).

If firms held only little amounts of cash, the sketched problem would be of minor importance. However, firms' cash holdings often are substantial. For the largest listed European non-financial firms the sum of cash and cash equivalents was more than 13% of net assets (total assets minus cash) in the year 2000, while by 2005 this percentage had even increased to almost 17%.[2] For some individual firms these percentages are much higher. For example, cash holdings by H & M Hennes & Mauritz from Sweden were 52% and 103% of net assets in 2000 and 2005, respectively. Firm's cash holdings also are very volatile. For example, AFC Ajax NV's cash holdings varied from 79% in 1998 (the IPO year of ACF Ajax) via 18% in 2000 to 27% in 2005. If agency problems did not exist, there would be no valuation problem, even if the cash holdings are at such high levels as observed in practice. However, if shareholders fear misallocation of firm's cash by the incumbent management, the negative effects on the valuation of the firm can be huge.[3]

A large body of literature explores the influence of corporate governance on the return on equity, firm value and firm performance, see Nesbitt (1994, 1995), Yermack (1996), Core et al. (1999), Gompers et al. (2003), Bauer et al. (2004), Bebchuk et al. (2005), Cremers and Nair (2005), Brown and Caylor (2006) and Core et al. (2006), among others. However, previous literature has not related the quality of corporate governance directly to the value of firm-level cash holdings. A notable exception is Pinkowitz et al. (2006), who study the relationship between cash holdings and firm value and the influence of governance on that relationship in an international context using a sample of firms from 35 countries. Pinkowitz et al. (2006) find that a dollar increase in cash holdings is worth roughly a dollar in countries with strong investor protection, but much less than a dollar in countries with poor investor protection. Other papers that deal with the value of cash are Faulkender and Wang (2006) and Pinkowitz and Williamson (2005). Both papers study the marginal value of cash but without taking into consideration corporate governance. Faulkender and Wang (2006) find, amongst other things, that the marginal value of cash holdings declines with

[2] Or 11.5% and 14.5% as percentage of total assets. The percentage of cash holdings for large publicly traded U.S. firms in 2003 was 13%, see Dittmar and Mahrt-Smith (2007).

[3] According to Maarten Oldenhof, former director of Ajax, Ajax' selection and investment in new soccer players ('aankoopbeleid') is 'a drama for years', and 'the more liquid assets, the more unwise - within Ajax - the allocation' (NRC Handelsblad, February 16, 2008). See Myers and Rajan (1998) who hypothesize that more liquid assets can lead to increased agency problems.

larger cash holdings and higher leverage, while Pinkowitz and Williamson (2005) document that the value of cash depends on both the investment and financing opportunity sets of the firm.[4]

In this chapter we focus on the effect of corporate governance on the value of excess cash, as this part of cash holdings is most easily accessible by management to derive 'private benefits'. As pointed out by Myers and Rajan (1998), it is easier to make cash disappear than to make a plant disappear. We argue that it is even easier to make excess cash disappear, as this part of the firm's cash holdings is not needed for other, economically motivated purposes such as financing new investment opportunities. We are interested in the valuation of excess cash by the market and especially in the influence of corporate governance on this valuation. A first attempt to examine this issue was made by Dittmar and Mahrt-Smith (2007) for U.S. firms. Dittmar and Mahrt-Smith (2007) find that governance has a positive effect on the value of excess cash and on the marginal value of total cash. In particular, the market value of excess cash for firms that have poor internal or external corporate governance in the form of extensive anti-takeover provisions and a low level of large shareholder monitoring, respectively, is found to be approximately one-half of the value of excess cash for firms that are well governed. Depending on the measure of corporate governance, the marginal value of $1.00 held by a poorly governed firm varies between $0.42 and $0.88, compared to $1.27 to $1.62 for a well governed firm. Dittmar and Mahrt-Smith (2007) further show that poorly governed firms dissipate cash more quickly[5] and in such a way that they experience lower operating performance.[6] Explanations given by Dittmar and Mahrt-Smith (2007) for the lower

[4] Pinkowitz and Williamson (2005) find that firms with good growth options have their cash valued at a premium to those with poor growth prospects and that nearer financial distress and access to capital decreases the value of cash.

[5] This finding is in accordance with Harford et al. (2008) who document for U.S. firms a positive relation between corporate governance and cash reserves. They explain this finding by the fact that weak governed firms dissipate their cash reserves more quickly (primarily on acquisitions) than do managers of firms with stronger governance (they call this the 'spending hypothesis'). Note that cross-country (worldwide) evidence shows that greater shareholder rights are associated with lower cash holdings, see e.g., Dittmar et al. (2003) and Pinkowitz et al. (2004).

[6] Dittmar and Mahrt-Smith (2007) find that operating performance lowers, if poorly governed firms with positive excess at *t-1* reduce their cash between *t-1* and *t*. They do not find this for well governed firms. This finding is confirmed by Harford et al. (2008), who find for U.S. firms that management's

value of (excess) cash for poorly governed firms are that these firms invest (more) money in negative NPV projects (poorly governed firms spend more on acquisitions)[7] and may make managers 'lazy' in the sense that it reduces their incentives to control costs, improve margins etc.[8]

In contrast to Dittmar and Mahrt-Smith (2007), our study analyses the relation between *four* different governance mechanisms and excess cash, i.e. Shareholder rights, Takeover defences, Disclosure and Board functioning. Our unique governance dataset provided by Deminor[9] makes it possible to pinpoint which governance provisions influence the value of excess cash and which ones do not. In addition, we focus on the effects of corporate governance on the value of excess cash for a sample of large publicly listed European firms.

To determine the effects of governance on the value of excess cash we follow the methodology of Dittmar and Mahrt-Smith (2007). We use a cash model based on Opler et al. (1999) to determine the normal cash holdings and define excess cash as the difference between the actual cash holdings and the predicted normal cash holdings. We use value regressions as employed in Fama and French (1998) and

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spending of poorly governed firms, 'often on capital expenditures and acquisitions, reduces firm value. Nonetheless, as documented in Bliss and Rosen (2001) for acquisitions and Harford and Li (2007) for both acquisitions and large capital expenditures, CEO compensation and wealth increase after such investments, even if those investments destroy value. Given these incentives and the potential for external discipline arising from accumulating large cash reserves, weakly controlled managers choose to spend the cash quickly on acquisitions or capital expenditures.' Ibid, p.537. Note that Mikkelson and Partch (2003) find that prior large cash reserves do not hinder operating performance and do not represent conflicts of interests between managers and shareholders. This contradicts the findings by Dittmar and Mahrt-Smith (2007), Harford et al. (2008) and Harford (1999). Harford (1999) shows that cash-rich firms are more likely to make acquisitions and that their acquisitions are more likely to be value decreasing; he suggests (without investigating the influence of corporate governance) relating shareholders of these cash rich firms have a reason to be concerned.

[7] Note, Dittmar and Mahrt-Smith (2007) find that acquisitions undertaken by both well and poorly governed (high excess cash) firms may lower firm's return on assets.

[8] After controlling for the effect of acquisitions Dittmar and Mahrt-Smith (2007) still find that initial excess cash holdings have a negative impact on future operating performance of poorly governed firms that dissipate cash.

[9] Deminor offers since 1993 corporate governance ratings. Deminor was acquired by Institutional Shareholder Services (ISS) in 2005. ISS was acquired by RiskMetrics in 2007.

return regressions as used by Faulkender and Wang (2006) to determine the value of (positive) excess cash.[10]

We find that the level of (excess) cash as well as the value of excess cash is positively related to the score for the corporate governance measure of Takeover defences.[11] These findings indicate that firms with less anti-takeover provisions (low management rights) hold more cash than well protected firms (high management rights), and that excess cash held by the first type of firms is valued higher. Other corporate governance measures do not explain differences in (excess) cash holdings nor in the valuation of excess cash. For non-UK firms we find that the value of € 1 of excess cash is only €0.89 for the lower Takeover defences quartile and €1.45 for the upper quartile. We interpret these findings as follows. The value of excess cash of firms with high management rights is relatively low, because the capital market cannot correct nor prevent the misuse of these cash holdings. Cash holdings of these firms are accordingly valued below 'face value'. On the other hand, firms with low management rights run the risk of being taken over if they destroy value (now or probably in the future) by investing in negative NPV projects or by operating extremely inefficient. Because of this threat of control over the amount of excess cash, the probability that it will be allocated wrongly is smaller and hence excess cash is valued higher. We find empirical evidence that firms with high management rights spend their excess cash more quickly *and* on less profitable investments than firms with low management rights (that is, high governance scores). This indicates that indeed well governed firms operate under the fear of the capital market for misallocation of their excess cash holdings. The other governance mechanisms do not seem to be strong enough to convince the capital market that management will act in the shareholders' best interests.

The structure of this chapter is as follows. In section 2 we discuss the Deminor governance data. In section 3 we present the models we use to estimate normal and excess cash and the relation between corporate governance and the value of excess

[10] Note that Dittmar and Mahrt-Smith (2007) use the value regressions to determine the value difference of excess cash between poor and well governed firms and the return regressions for the determination of marginal value of total cash.

[11] Anti-takeover provisions that prevent a successful acquisition by a bidder are seen as an indication of poor corporate governance. This is comparable with the interpretation of the Gompers, Ishii and Metrick (2003) measure.

cash. Data and summary statistics on cash are provided in the same section. In section 4 we report our empirical results. We conclude in Section 5.

1.2. Governance data

We use Deminor ratings to measure the quality of firm-level corporate governance. These ratings cover firms included in the FTSEurofirst 300 Index for the years 2000-2004. The Deminor ratings are based on 300 different governance indicators that refer to internationally accepted standards, as outlined by the International Corporate Governance Network (ICGN), the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the Conference Board (Deminor Rating, 2004).[12,13] The different indicators or criteria can be classified into four categories: rights and duties of shareholders (referred to as Shareholder rights in the remainder of the chapter); range of takeover defences (Takeover defences); disclosure on financial matters and corporate governance (Disclosure); and Board structure and functioning (Board). For each category a rating is available on a scale from 1 to 10, where a score of 10 (1) corresponds to the best (worst) possible governance quality. The total governance score is simply the sum of the rating scores of the four categories.[14]

The first category of governance criteria, Shareholder rights, concerns the question whether shareholders can exert sufficient power to determine corporate action. The score is based on i) the 'one share - one vote - one dividend' principle; ii) access to and voting procedures at general meetings, and iii) maintenance of pre-emptive rights. Firms that respect the control and ownership roles of shareholders, score high on the 'one share - one vote - one dividend' principle. Deminor evaluates whether companies submit voting issues that are perceived as particular significant to the general meeting

[12] The Deminor rating methodology further takes into consideration the main orientations chosen by national Codes of Best Practice, among which: the Combined Code in the UK (2003); the Vienot reports and the Bouton report in France (1995, 1999 and 2002); the Kodex in Germany (2002); the Preda Code in Italy (1999); the Tabaksblat Code in The Netherlands (2003).

[13] About the same criteria are used by Standard & Poor's for their corporate governance score (Standard & Poor's, 2002). This, taken together with the fact that all of these institutions have more or less the same ideas concerning good corporate governance, leads us to conclude that the Deminor rating is a representative measure for the quality of a firm's corporate governance.

[14] According to Deminor (2004), the rating score reflects the extent to which a company adopts and complies with the 'best practice'. Hence, the highest score represents best practice and the lowest the most questionable standard.

of shareholders and assesses the voting structure. Furthermore, companies should respect the pre-emptive rights of the existing shareholders as these stakeholders would like to prevent dilution of their voting or economic power.

The second category, Takeover defences, examines the extent to which the firm attempts to decrease the likelihood of a hostile takeover through the adoption of anti-takeover provisions. Deminor examines the presence and strength of anti-takeover devices such as poison pills, golden parachutes, core shareholdings and extensive cross-shareholdings. To achieve a high score for this aspect of governance, the range of takeover defences should lead to a favourable bidding process and not preclude the success of a takeover attempt per se.

The third category, Disclosure, measures whether shareholders are able to obtain convenient and comprehensive information about the company's financial matters as well as its governance characteristics. Deminor analyses for instance the quantity and quality of non-financial information, such as the diversity and independence of board members, board committees, accounting standards and information on major shareholders of the company.

The fourth category, Board, measures issues relating to the governance of a Board, such as the presence of independent directors, the division between the role of Chairman and Chief Executive and the election of the board.

Table 1 presents descriptive statistics of the governance scores for our sample, comprising 271 large European firms over the period 2000-2004 (905 firm-year observations). We observe a positive trend in the overall governance scores, as well as in the sub-scores. The average total score in 2000 is equal to 19.02, which gradually increases to 23.84 in 2004. This trend is in line with the increased attention paid to governance structures by policy makers, see footnote 12 for a list of National Codes of Best Practice, and the subsequent firm actions to improve their corporate governance.[15]

[15] We note that the cross-section of firms varies across the different years in the sample period. We find a similar positive trend when restricting the sample to those firms for which ratings are available over the complete sample period.

Table 1. Corporate governance scores per year, 2000-2004

Year	Governance total		Shareholder rights	Takeover defences	Disclosure	Board	N
	Mean	Standard deviation					
2000	19.02	6.38	6.01	3.82	4.88	4.35	150
2001	20.69	6.58	6.26	4.14	5.65	4.64	166
2002	20.98	6.27	6.36	3.86	6.03	4.74	191
2003	22.48	6.19	6.58	3.89	6.73	5.28	194
2004	23.84	5.65	6.89	4.05	7.06	5.83	204
All	21.57	6.39	6.45	3.95	6.15	5.02	905

Note: The table presents average Deminor corporate governance scores per year for Shareholder rights, Takeover defences, Disclosure and Board. For the total governance score the standard deviation is shown as well. The rightmost column shows the number of observations.

Table 2. Corporate governance scores by country, 2000-2004

Country	Governance total		Shareholder rights	Takeover defences	Disclosure	Board	N
	Mean	Standard deviation					
Austria	17.61	2.01	7.36	0.81	5.83	3.61	3
Belgium	17.45	3.17	6.51	1.64	4.67	4.63	21
Switzerland	16.61	6.05	5.58	2.28	4.78	3.96	53
Denmark	15.60	3.90	6.05	1.35	4.86	3.35	17
Finland	23.55	3.97	6.98	5.64	6.12	4.80	18
France	20.79	4.59	6.40	3.42	5.83	5.14	163
Germany	18.92	3.97	7.18	2.88	5.48	3.38	113
Greece	16.80	3.06	6.97	1.29	4.84	3.71	7
Ireland	28.09	2.11	6.65	8.09	6.90	6.45	11
Italy	19.55	3.00	6.18	1.42	6.97	4.98	40
Luxembourg	12.08	5.35	4.01	0.50	3.96	3.61	2
Netherlands	17.23	5.47	4.89	1.97	5.99	4.39	71
Norway	18.95	4.06	7.59	2.91	4.66	3.79	16
Portugal	12.13	3.23	4.13	0.25	4.68	3.07	8
Spain	16.60	3.38	5.58	1.08	5.26	4.68	43
Sweden	19.27	4.95	5.93	4.09	5.13	4.12	55
United Kingdom	27.93	4.77	7.02	6.79	7.56	6.56	264
All	21.57	6.39	6.45	3.95	6.15	5.02	905

Note: The table presents average Deminor corporate governance scores by country for Shareholder rights, Takeover defences, Disclosure and Board. For the total governance score the standard deviation is shown as well. The rightmost column shows the number of observations.

Tables 2 and 3 present the governance scores by country and industry, respectively.[16] The extensive investor rights in common law countries such as the United Kingdom and Ireland (LaPorta et al., 1998) are confirmed by the relatively high governance scores for firms in these countries. The average scores for the United Kingdom and Ireland are equal to 27.93 and 28.09, respectively. The average scores for these countries are higher than the overall European average for all four categories, with the difference being most pronounced for Takeover defences.

[16] See Appendix A for Industry codes.

Interestingly, even when leaving the UK and Ireland out of consideration, the cross-country variation in the average score for Takeover defences is considerably larger than for the other three governance categories, ranging between 0.25 for Portugal and 5.64 for Finland. Also note that the number of observations varies widely across countries, from just 2 for Luxembourg to 264 for the UK.

Table 3. Corporate governance scores by industry, 2000-2004

Industry	Governance total		Shareholder rights	Takeover defences	Disclosure	Board	N
	Mean	Standard deviation					
Aerospace	18.73	2.06	5.22	0.25	7.32	5.93	12
Apparel	21.71	5.85	7.25	5.15	5.65	3.67	3
Automotive	19.59	4.42	6.30	3.73	5.58	3.98	43
Beverages	23.30	6.40	7.12	3.89	6.54	5.75	23
Chemicals	21.02	6.59	6.46	4.12	5.74	4.70	76
Construction	24.98	5.13	6.75	6.05	6.51	5.67	32
Diversified	20.45	5.09	6.52	3.67	5.59	4.67	59
Drugs, cosmetics and health care	20.53	6.72	6.62	3.22	5.99	4.74	67
Electrical	21.45	4.15	6.36	3.91	6.02	5.16	18
Electronics	21.75	5.78	6.39	4.20	6.23	4.93	60
Food	22.58	7.06	6.06	4.46	6.77	5.38	35
Machinery and equipment	21.39	5.32	6.46	5.96	5.14	3.83	27
Metal producers	25.57	5.74	6.59	4.60	7.60	6.77	15
Metal product manufacturers	25.55	7.52	6.84	6.69	6.50	5.52	10
Oil, gas, coal and related services	22.69	6.45	6.35	3.56	6.92	5.86	30
Paper	20.57	4.71	6.14	4.38	5.67	4.37	15
Printing and publishing	22.86	7.30	5.82	4.99	6.60	5.45	36
Recreation	21.73	5.32	7.12	3.13	6.34	5.15	18
Retailers	23.19	6.86	6.88	4.73	6.20	5.37	68
Textiles	22.21	0.30	8.11	0.50	7.03	6.57	2
Tobacco	26.30	6.19	6.81	6.40	6.87	6.21	19
Transportation	19.53	5.56	6.19	2.09	6.44	4.81	22
Utilities	19.53	6.74	6.17	2.59	6.01	4.76	149
Miscellaneous	22.91	6.69	6.70	4.70	6.27	5.24	66
All	21.57	6.39	6.45	3.95	6.15	5.02	905

Note: The table presents average Deminor corporate governance scores by industry for Shareholder rights, Takeover defences, Disclosure and Board. For the total governance score the standard deviation is shown as well. The rightmost column shows the number of observations.

Across industries, we observe from Table 3 that Construction, Metal producers, Metal product manufacturers and Tobacco have relatively high total governance scores. These relatively high scores are (at least partly) due to the UK country effect given that 10 of the 32 Construction observations, 14 of the 15 Metal producers observations, 5 of the 10 Metal product manufacturers observations and 14 of the 19 Tobacco observations concern UK (or Irish) firms. However, controlling for country

(and year effects), we still find higher total governance scores for the Construction, Metal product manufacturers and Tobacco industries.[17]

1.3. Models and data

1.3.1. Models

To determine the level of excess cash we first need to estimate the level of normal cash holdings for a firm. The regression model that we use for this purpose includes variables that are used in prior literature on the determinants of cash holdings in imperfect capital markets, including Kim et al. (1998), Opler et al. (1999), Ferreira and Vilela (2004), and Ozkan and Ozkan (2004). Our main specification for the determination of the level of normal cash holdings is given by[18]

$$\frac{Cash_{i,t}}{NA_{i,t}} = \beta_0 + \beta_1 LN(RealAssets_{i,t}) + \beta_2 \frac{CF_{i,t}}{NA_{i,t}} + \beta_3 \frac{NWC_{i,t}}{NA_{i,t}} + \beta_4 Sigma_{i,t} + \beta_5 \frac{MV_{i,t}}{NA_{i,t}} + \beta_6 \frac{RD_{i,t}}{NA_{i,t}} + YFE + FFE + \varepsilon_{i,t} \quad (1)$$

where (data source codes are listed in Appendix B): $Cash_{i,t}$ = Cash and Cash Equivalents of firm i at time t, $NA_{i,t}$ = Net Assets (= Total Assets minus Cash and Cash Equivalents) at time t, $RealAssets_{i,t}$ = Total Assets at time t inflated to 2005 prices, $CF_{i,t}$ = Cash Flow over year t, $NWC_{i,t}$ = Net Working Capital (= Working Capital minus Cash and Cash Equivalents) at time t, $Sigma_{i,t}$ = industry average of prior 6 year standard deviation of CF/NA, $MV_{i,t}$ = Year-End Market Capitalization plus Total Debt at time t, $RD_{i,t}$ = Research and Development expenses (set to 0 if missing) over year t, YFE = Year Fixed Effects, and FFE = Firm Fixed Effects.

[17] To control for country and year effects we regress the total governance scores on country dummies and year dummies and compute industry averages for the residuals from this model. In that case we find that besides Construction, Metal product manufacturers and Tobacco also Automotive, Chemicals, Electrical, Electronics, Machinery and equipment and Textiles have mean scores above the overall average. Lower mean scores are found for Aerospace, Drugs, cosmetics and health care, and Paper and Transportation.

[18] In our main specification we follow Dittmar and Mahrt-Smith (2007). In alternative models (see Opler et al., 1999, and Ferreira and Vilela, 2004) we include Leverage (Total Debt divided by Net Assets), a Dividend dummy (the dummy equals 1 if a firm pays out dividend and 0 otherwise) as well as Capital Expenditures (Capital Expenditures divided by Net Assets). Our main value results are robust to these alternative specifications.

Our main specification includes measures for size, cash flow, cash substitutes, risk, growth options, and costs of financial distress. These variables are commonly used as proxies for the determinants of normal cash holdings that arise through the transactions motive and the savings motive, where the latter refers to the incentive to accumulate cash for financing new investment opportunities when external finance is costly, see Opler et al. (1999). Size plays a double role, in the sense that it acts both as a measure of the transactions motive as well as a proxy for access to financial markets. Cash flow and net working capital are interpreted as substitutes for cash. The market-to-book ratio and R&D expenses serve as proxies for growth opportunities, information asymmetry, and financial costs of distress. We expect a negative coefficient for size and net working capital and a positive coefficient for growth opportunities, R&D expenses and risk. The expected sign for cash flow is positive according to the pecking order theory and negative according to the trade-off theory. The year dummies are included to account for macroeconomic factors which may influence overall demand and supply of liquidity. The firm fixed effects control for the fact that due to idiosyncratic reasons some firms may consistently hold higher or lower normal cash levels than required for economic reasons. Excess cash is defined as the difference between the actual cash holdings and the estimated normal cash holdings, that is, the residual from (1). Following Dittmar and Mahrt-Smith (2007), however, we do include the firm fixed effects as part of excess cash, as this does not reflect the generally accepted economic reasons for holding cash, such as operational needs or future investments.[19] As Dittmar and Mahrt-Smith (2007), we include the year fixed effects as part of excess cash as well.

Following Dittmar and Mahrt-Smith (2007), to determine the effect – if any – of corporate governance on the value of excess cash, we estimate value regressions based on Fama and French (1998).[20] The dependent variable is the market-to-book ratio, which is taken as a measure of total firm value (equity and debt). The regression model includes control variables representing factors that are likely to affect investors' expectations of future net cash flows. Specifically, the control variables are past changes, future changes, and current levels of earnings, R&D expenses,

[19] For example, Foley et al. (2007) show that US multinationals hold cash, in part, as a consequence of the tax costs associated with repatriating foreign income.

[20] For value regressions of cash see also Pinkowitz and Williamson (2005) and Pinkowitz et al. (2006).

dividends, interest expenses, as well as past and future net assets, and future changes of the market value of the firm. Given that we aim to measure the effect of excess cash on firm value and, in particular, the influence of corporate governance on this effect, we also include excess cash (scaled by net assets) and the interaction between the governance score and excess cash. In addition, the governance score itself is included to control for the fact that corporate governance may affect firm value also through other channels besides excess cash. In sum, for each governance measure, i.e. the Total governance score and the sub-scores on Shareholder rights, Takeover defences, Disclosure and Board, we estimate the following regression:

$$\begin{aligned}\frac{MV_{i,t}}{NA_{i,t}} &= \beta_0 + \beta_1\frac{E_{i,t}}{NA_{i,t}} + \beta_2\frac{dE_{i,t}}{NA_{i,t}} + \beta_3\frac{dE_{i,t+1}}{NA_{i,t}} + \beta_4\frac{RD_{i,t}}{NA_{i,t}} + \beta_5\frac{dRD_{i,t}}{NA_{i,t}} \\ &+ \beta_6\frac{dRD_{i,t+1}}{NA_{i,t}} + \beta_7\frac{Div_{i,t}}{NA_{i,t}} + \beta_8\frac{dDiv_{i,t}}{NA_{i,t}} + \beta_9\frac{dDiv_{i,t+1}}{NA_{i,t}} + \beta_{10}\frac{I_{i,t}}{NA_{i,t}} + \beta_{11}\frac{dI_{i,t}}{NA_{i,t}} \\ &+ \beta_{12}\frac{dI_{i,t+1}}{NA_{i,t}} + \beta_{13}\frac{dNA_{i,t}}{NA_{i,t}} + \beta_{14}\frac{dNA_{i,t+1}}{NA_{i,t}} + \beta_{15}\frac{dMV_{i,t+1}}{NA_{i,t}} + \beta_{16}\frac{XCash_{i,t}}{NA_{i,t}} \\ &+ \beta_{17}GOV_{i,t} + \beta_{18}GOV_{i,t}\frac{XCash_{i,t}}{NA_{i,t}} + YFE + FFE + \varepsilon_{i,t}\end{aligned} \tag{2}$$

where $dX_{i,t}$ indicates a change in variable X from time t-1 to t, and $MV_{i,t}$ = Year End Market Capitalization plus Total Debt at time t, $NA_{i,t}$ = Net Assets (= Total Assets minus Cash and Cash Equivalents) at time t, $E_{i,t}$ = Earnings Before Interest and Taxes (EBIT) over year t, $RD_{i,t}$ = Research and Development expenses (set to 0 if missing) over year t, $Div_{i,t}$ = Common Dividends over year t, $I_{i,t}$ = Interest Expenses over year t, $XCash_{i,t}$ = Excess Cash (= Total Cash and Cash Equivalents minus the normal level of cash from equation (1)) at time t, $GOV_{i,t}$ = Governance measure, which is the governance score for Shareholder rights, Takeover defences, Disclosure or Board, or the overall score for these four categories, *YFE* = Year Fixed Effects and *FFE* = Firm Fixed Effects. We include year fixed and firm fixed effects to capture macroeconomic and time trend effects and unobserved heterogeneity and fixed industry effects, respectively.

Because we are interested in the value of a firm's cash 'surplus' we estimate the value regression on all firms with positive excess cash. The coefficient of key interest in model (2) obviously is β_{18}. If the quality of corporate governance positively influences the value of excess cash, this coefficient for the interaction term between the governance score and excess cash should be positive.

In addition to the value regression model as given in (2), we estimate an alternative model where we focus on value effects of *changes* in excess cash instead of levels. In this model, which is based on Faulkender and Wang (2006), the dependent variable is the excess stock return, while the regressors of interest are the change in excess cash and its interaction with the governance score. The main specification of this return model is given by:

$$
\begin{aligned}
r_{i,t} - R_{i,t} = {} & \beta_0 + \beta_1 \frac{dXCash_{i,t}}{ME_{i,t-1}} + \beta_2 \frac{dE_{i,t}}{ME_{i,t-1}} + \beta_3 \frac{dNA_{i,t}}{ME_{i,t-1}} + \beta_4 \frac{dRD_{i,t}}{ME_{i,t-1}} \\
& + \beta_5 \frac{dI_{i,t}}{ME_{i,t-1}} + \beta_6 \frac{dDiv_{i,t}}{ME_{i,t-1}} + \beta_7 \frac{XCash_{i,t-1}}{ME_{i,t-1}} + \beta_8 L_{i,t} + \beta_9 \frac{NF_{i,t}}{ME_{i,t-1}} \\
& + \beta_{10} \left(\frac{XCash_{i,t-1}}{ME_{i,t-1}} \times \frac{dXCash_{i,t}}{ME_{i,t-1}} \right) + \beta_{11} \left(L_{i,t} \frac{dXCash_{i,t}}{ME_{i,t-1}} \right) + \beta_{12} \left(GOV_{i,t} \frac{dXCash_{i,t}}{ME_{i,t-1}} \right) \\
& + \beta_{13} GOV_{i,t} + YFE + FFE + \varepsilon_{i,t}
\end{aligned}
\tag{3}
$$

where, $dX_{i,t}$ indicates a change in X from time t-1 to t, and $r_{i,t}$ = stock return over year t, $R_{i,t}$ = market model[21] return over year t, $XCash_{i,t}$ = Excess Cash (= Total Cash and Cash Equivalents minus the normal level of cash from equation (1)) at time t, $ME_{i,t}$ = Market Value equity (= Market Capitalization) at time t, $E_{i,t}$ = Earnings Before Interest and Taxes (EBIT) over year t, $NA_{i,t}$ = Net Assets (= Total Assets minus Cash and Cash Equivalents) at time t, $RD_{i,t}$ = Research and Development expenses (set to 0 if missing) over year t, $I_{i,t}$ = Interest Expenses over year t, $Div_{i,t}$ = Common Dividends over year t, $L_{i,t}$ = Leverage (= Total $\text{Debt}_{i,t}$ / ($Total\ Debt_{i,t}$ + $ME_{i,t}$)) at time t, $NF_{i,t}$ = New Finance (= Net New Equity Issues (Sale of Common & Preferred stock minus Purchase of Common & Preferred Stock) + New Debt Issues (Long Term Debt Issuance minus Long Term Debt Reduction)) over year t, $GOV_{i,t}$ = Governance measure and *YFE* = Year Fixed Effects and *FFE* = Firm Fixed Effects. In addition to the excess return we will also use as dependent variable $(ME_{i,t}\text{-}ME_{i,t-1})/ME_{i,t-1}$.

The control variables in the return regression as given in (3) account for firm-specific characteristics that may be correlated with both returns and cash holdings due to changes in profitability ($E_{i,t}$), investment ($NA_{i,t}$ and $RD_{i,t}$) and financing ($I_{i,t}$, $Div_{i,t}$, $L_{i,t}$ and $NF_{i,t}$), see Dittmar and Mahrt-Smith (2007).

Again we are interested in the value of a cash surplus, and therefore we estimate the return regression on all firms with positive excess cash at t-1. The key coefficient

[21] We estimate the market model using the year t-1 arithmetic returns derived from the daily stock return index of each firm and the FTSEurofirst 300 Index.

in this model is β_{12}. If the quality of one or more corporate governance measures positively influences the value of excess cash, the coefficient for the interaction term between the governance score and the change in excess cash should be positive. Using the estimates of (3) we can determine the difference in marginal value of €1 held by poorly governed firms compared to well governed firms.

1.3.2. Data

Our sample consists of publicly traded European firms that were included in the FTSEurofirst 300 Index at some point between 2000 and the end of 2004 and were given a governance rating by Deminor. We retrieve data items for these firms—as far as available—for the longer period from 1990 to 2005. Firm data is obtained from the Worldscope database, Datastream and Thomson Financial Database. Variable identifiers are listed in Appendix B. We exclude financial firms (Worldscope Industry Group 4300), because their business involves inventories of marketable securities that are included in cash, and because of their need to meet statutory capital requirements.[22] Some firms were excluded from the sample due to data problems.[23] As discussed in Section 2, various aspects of the corporate governance quality of the firms is measured by means of the Deminor ratings, which are available for the years 2000-2004. Year *t* ratings are published at the beginning of year *t+1*.

To mitigate the impact of outliers on our results, we winsorize all variables except the governance scores at the mean plus or minus three times the standard deviation. In case of ratios, only the ratio is winsorized. The effects of price inflation are handled by inflating the variables to 2005 prices, using the Harmonized Index of Consumer Prices (HICP) obtained from the European Central Bank.

We estimate the normal cash model as given in (1) over the years 1990-2005, and both the value regression in (2) and the return regression in (3) over the years 2000-

[22] We do not exclude the Utilities sector as in Dittmar and Mahrt-Smith (2007) since this would seriously limit the size of our sample.

[23] No reliable data could be obtained for Allied Domecq (FIN), Sonera (FR), Orange (FR), Pchiney (FR), Rexel (FR), Telecom Italia Mobile (IT) and Terra Networks (SP). Due to mergers also no reliable data could be obtained for Royal Dutch Shell and LogicaCMG (UK). In addition, we exclude Dampskbselsskabet Svendborg for this company was incorporated twice, with different governance ratings. We also exclude Vivendi Environment for this company is a subsidiary of Vivendi which also has a Deminor rating.

2004. The maximum number of firm-year observations for the period 1990-2005 is 3,831, while the maximum number for the period 2000-2004 is 1,340. The sample includes observations for 271 firms.

Table 4. Summary statistics cash-to-assets ratio by country, 1990-2005
The cash-to-assets ratio is defined as Cash and Cash Equivalents divided by Net Assets, where Net Assets is Total Assets minus Cash and Cash Equivalents. The cash-to-assets ratio is winsorized at the mean plus and minus three times the standard deviation.

Country	Mean	25th Percentile	Median	75th Percentile	Std. Dev.	N
Austria	0.038	0.007	0.027	0.051	0.038	41
Belgium	0.109	0.035	0.071	0.173	0.101	93
Switzerland	0.263	0.091	0.225	0.376	0.208	235
Denmark	0.176	0.086	0.141	0.240	0.131	54
Finland	0.137	0.027	0.044	0.152	0.209	61
France	0.152	0.062	0.104	0.179	0.157	691
Germany	0.150	0.048	0.101	0.204	0.153	466
Greece	0.156	0.012	0.057	0.150	0.238	46
Ireland	0.458	0.190	0.405	0.738	0.265	37
Italy	0.123	0.042	0.093	0.158	0.116	212
Luxembourg	0.119	0.053	0.080	0.125	0.120	32
Netherlands	0.147	0.051	0.090	0.194	0.151	238
Norway	0.178	0.064	0.087	0.342	0.176	56
Portugal	0.060	0.003	0.013	0.060	0.096	24
Spain	0.095	0.017	0.060	0.137	0.104	239
Sweden	0.177	0.050	0.108	0.197	0.209	204
United Kingdom	0.157	0.043	0.093	0.194	0.178	1,102
All	0.156	0.046	0.099	0.197	0.172	3,831

Table 4 shows the number of firm-year observations and summary statistics for the cash-to-assets ratio per country for the period 1990-2005. The overall mean of the cash-to-assets ratio (Cash and Cash Equivalents divided by Net Assets) is 15.6%. Although for most countries the average cash-to-assets ratio is close to this overall mean, for some countries it deviates considerably. Switzerland and Ireland have relatively high average cash-to-assets ratios of 26.3% and 45.8%, respectively. Countries with relatively low cash-to-assets ratios are Austria, Portugal and Spain with averages equal to 3.8%, 6.0% and 9.5%, respectively. According to Ferreira and Vilela (2004), this cross-country heterogeneity can be a consequence of different accounting standards as well as different institutional environments, including bankruptcy laws, the state of development of capital markets, and patterns of corporate governance.[24]

[24] We note that these cross-country differences in our sample should be interpreted with care, as the number of observations for countries such as Ireland, Austria and Portugal are limited. Nevertheless, Ferreira and Vilela (2004) also report a relatively high average cash-to-assets ratio for Ireland and

Appendix C presents the same summary statistics for the cash-to-assets ratio per country for the shorter period 2000-2004 that is used to estimate the value and return regressions. Generally, these correspond quite closely to the numbers in Table 4.

Table 5. Summary statistics cash-to-assets ratio by industry, 1990-2005
The cash-to-assets ratio is defined as Cash and Cash Equivalents divided by Net Assets, where Net Assets is Total Assets minus Cash and Cash Equivalents. The cash-to-assets ratio is winsorized at the mean plus and minus three times the standard deviation.

Industry	Mean	25th Percentile	Median	75th Percentile	Std. Dev.	N
Aerospace	0.223	0.170	0.200	0.253	0.083	40
Apparel	0.154	0.029	0.119	0.255	0.134	31
Automotive	0.167	0.086	0.137	0.200	0.126	149
Beverages	0.093	0.038	0.071	0.127	0.077	110
Chemicals	0.091	0.038	0.065	0.129	0.073	274
Construction	0.146	0.067	0.115	0.171	0.132	235
Diversified	0.155	0.063	0.106	0.175	0.143	247
Drugs, cosmetics and health care	0.283	0.121	0.244	0.389	0.215	234
Electrical	0.128	0.082	0.108	0.157	0.073	53
Electronics	0.283	0.127	0.203	0.338	0.234	241
Food	0.188	0.072	0.100	0.258	0.179	118
Machinery and equipment	0.193	0.050	0.183	0.271	0.165	99
Metal producers	0.129	0.067	0.107	0.155	0.102	64
Metal product manufacturers	0.110	0.050	0.066	0.141	0.100	60
Oil, gas, coal and related services	0.066	0.031	0.052	0.084	0.052	133
Paper	0.034	0.021	0.030	0.042	0.017	45
Printing and publishing	0.128	0.026	0.064	0.150	0.173	148
Recreation	0.109	0.038	0.077	0.130	0.105	119
Retailers	0.158	0.053	0.086	0.163	0.193	280
Textiles	0.153	0.113	0.135	0.196	0.048	7
Tobacco	0.122	0.045	0.097	0.181	0.094	52
Transportation	0.209	0.075	0.132	0.243	0.204	97
Utilities	0.082	0.014	0.039	0.101	0.116	553
Miscellaneous	0.214	0.059	0.154	0.253	0.221	442
All	0.156	0.046	0.099	0.197	0.172	3,831

Table 5 presents summary statistics for the cash-to-assets ratio by industry for the period 1990-2005, while Appendix D shows these for the period 2000-2004. We observe substantial differences across industries, with the mean ratio ranging from a minimum of 0.034 for Paper to a maximum of 0.283 for Drugs, cosmetics and health care, and Electronics. As far as these industry effects are not accounted for by our economic regressors in the normal cash model and as long as they are constant over time, they will be captured by the firm specific dummies included in (1).

relatively low averages for Austria and Portugal, see also Dittmar et al. (2003). Our overall average ratio of 15.6% is rather close to the mean of 14.8% reported by Ferreira and Vilela (2004) for a sample of firms from EMU countries over the period 1987-2000.

1.4. Results

1.4.1. Cash model

The results of the cash model are presented in Table 6. Model [1] presents the results of our main specification. The results of this model are used to determine excess cash. Model [2] and [3] are variations and based on Opler (1999) and Ferreira and Vilela (2004).[25] We find that cash-to-assets increases with investment opportunities (market to book), the magnitude of the cash flow (Cash Flow / Assets), industry risk (sigma industry) and R&D expenditures (R&D / Assets). Cash-to-assets decrease with liquidity (Net Working Capital / assets). The relation with leverage is significantly positive; however there is neither a relation with capital expenditure nor with dividend and size. The findings are mainly consistent with previous empirical studies on the determinants of cash holdings (see e.g., Ferreira and Vilela, 2004, Opler et al., 1999, Ozkan and Ozkan, 2004, Dittmar and Mahrt-Smith 2007).

To analyse the influence of the quality of corporate governance on the *total* level of cash holdings, models [4] and [5] include—in addition to the variables of model [1] — the corporate governance scores. Actual cash holdings are positively related to the total governance rating (see model [4]), which is driven by the government measure Takeover defences (see model [5]). Note that the positive coefficient for Takeover defences means that firms with less anti-takeover provisions hold more cash than firms with more takeover defences. Since we do not include governance variables in our cash model, because we are interested in the normal level of cash holdings, this result implies that firms with a high quality of the corporate governance measure Takeover defences hold more excess cash.[26] This result is consistent with Harford et al. (2008) who find that firms in the U.S. with weaker corporate governance have smaller cash reserves.[27] Further tests by Harford et al. (2008) suggest that firms with weaker corporate governance dissipate their cash reserves more quickly than do

[25] In the appendix E we test the hypothesis that cash holdings are mean reverting. We find a significant negative correlation between delta cash and the lagged cash level.

[26] If we regress excess cash on the four corporate governance scores, including firm fixed and year fixed effects, we find a significant coefficient for governance measure Takeover defences (coefficient is 0.005 and a p-value of 0.000) and insignificant coefficients for the other three governance measures.

[27] Our results contrast with Dittmar et al. (2003) who find that corporations in countries (worldwide) where shareholder rights are not well protected hold up to twice as much cash as corporations in countries with good shareholder protection.

managers of firms with stronger governance and that rather than investing internally, they spend the cash primarily on acquisitions. See also Dittmar and Mahrt-Smith (2007) for similar results.

To analyse differences in spending between well and poorly governed firms, we form a sample with firms that both have positive excess cash at time *t*-1 and reduce their excess cash between *t*-1 and *t*. We then regress the change in excess cash on the four governance scores including year fixed and firm fixed effects. The regression equation is as follows:

$$\frac{XCash_{i,t} - Xcash_{i,t-1}}{Assets_{i,t-1}} = \beta_0 + \beta_1 ShareholderRights + \beta_2 TakeoverDefences + \beta_3 Disclosure + \beta_4 Board + FFE + YFE + \varepsilon_{i,t} \quad (4)$$

where $Assets_{i,t}$ = Total Assets minus Cash and Cash Equivalent at time t-1.

The results are presented in column 1 of Table 7. The positive coefficient for Takeover defences indicates that the reduction in excess cash is indeed higher for firms with a low takeover defences governance score. Put differently, spending firms with a high score for Takeover defences, spend their money less quickly. This finding is in accordance with the results by e.g. Dittmar and Mahrt-Smith (2007) and Harford et al. (2008).[28] In column 2 we present the results where the change in Excess cash is normalized by the market value of equity at time t-1. The results are similar as in model 1.[29]

[28] Pinkowitz (2000) finds that the probability that a firm will be acquired decreases with cash and states that managers may hold cash to entrench themselves at shareholder's expense. Following this line of reasoning, firms with a high score for Takeover defences may hold higher levels of cash to protect themselves from being targeted.

[29] To analyse whether governance influences the decision to accumulate excess cash, we form a sample with firms that both have negative excess cash at time *t*-1 and increase their excess cash between *t*-1 and *t*. If we then regress the change in excess cash on the four governance scores, we do not find any relation between the accumulation of excess cash and governance. This finding is in accordance with Dittmar and Mahrt-Smith (2007).

Table 6. Cash models

This table shows the regression results of the cash models. In all variables Assets are net of Cash. The dependent variable is the ratio Cash / assets. The independent variables include: Size (natural logarithm of the Total Assets), Market-to-Book ((Market capitalization + Total Debt) / Assets), Cash Flow / Assets, NWC / Assets (Net Working Capital / Assets), Sigma (Industry Cash Flow volatility over past 6 years), R&D / Assets (Research and Development, set to zero if missing), Leverage (Total Debt / Assets), Capex / Assets (Capital Expenditures / Assets), Dividend Dummy (set to 1 if the firm pays dividend, zero otherwise), Governance total (sum of Shareholder rights, Takeover defences, Disclosure and Board), Shareholder rights, Takeover defences, Disclosure and Board. Regressions are made with firm fixed and year fixed effects. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	Expected sign	[1]	[2]	[3]	[4]	[5]
Size	?	0.006	0.002	0.002	-0.010	-0.011
		(0.007)	(0.007)	(0.008)	(0.015)	(0.016)
Market to Book	+	0.018***	0.018***	0.021***	0.011	0.011
		(0.004)	(0.004)	(0.004)	(0.010)	(0.010)
Cash Flow / Assets	+	0.379***	0.445***	0.482***	0.271***	0.281***
		(0.095)	(0.104)	(0.104)	(0.094)	(0.099)
NWC / Assets	-	-0.233***	-0.193***	-0.191***	-0.271***	-0.268***
		(0.030)	(0.032)	(0.031)	(0.062)	(0.059)
Sigma	+	0.625***	0.602***	0.673***	0.440***	0.445***
		(0.074)	(0.077)	(0.071)	(0.150)	(0.156)
R&D / Assets	+	1.144***	1.114***		2.237***	2.243***
		(0.143)	(0.139)		(0.356)	(0.373)
Leverage	?		0.115***	0.122***		
			(0.020)	(0.016)		
Capex / Assets	+		-0.037			
			(0.061)			
Dividend Dummy	-		-0.008	-0.010		
			(0.006)	(0.007)		
Governance total					0.002**	
					(0.001)	
Shareholder rights						-0.002
						(0.004)
Takeover defences						0.005***
						(0.001)
Disclosure						-0.003
						(0.003)
Board						-0.001
						(0.006)
Constant		-0.031	-0.024	-0.009	0.049	0.128
		(0.072)	(0.068)	(0.074)	(0.150)	(0.176)
Adjusted partial R^2		0.200	0.208	0.185	0.254	0.255
Sample Size		3154	3142	3154	842	842

Table 7. Delta excess cash and corporate governance
This table shows the regression results of the change in Excess Cash on the Governance scores. Assets are net of Cash. The dependent variable in model [1] is the ratio ($ExcessCash_{i,t}$- $ExcessCash_{i,t-1}$) / $Assets_{i,t-1}$ and in model [2] ($ExcessCash_{i,t}$- $ExcessCash_{i,t-1}$) / $ME_{i,t-1}$ where $ME_{i,t-1}$ = Market value of Equity at time t-1. The independent variables include the Governance scores Shareholder rights, Takeover defences, Disclosure and Board. The sample is the intersection of firms with positive lagged excess cash and firms for which excess cash declined over the year; i.e. for model ($ExcessCash_{i,t}$- $ExcessCash_{i,t-1}$) / $Assets_{i,t-1}$ < 0 and for model [2] ($ExcessCash_{i,t}$- $ExcessCash_{i,t-1}$) / $ME_{i,t-1}$ <0. Regressions are made with firm fixed and year fixed effects. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	Expected sign	[1]	[2]
Shareholder rights	+	0.005	0.001
		(0.016)	(0.025)
Takeover defences	+	0.016**	0.022**
		(0.007)	(0.009)
Disclosure	+	-0.010	-0.025
		(0.013)	(0.024)
Board	+	-0.010	0.003
		(0.010)	(0.033)
Constant		-0.062	-0.039
		(0.099)	(0.155)
Adjusted partial R^2		0.578	0.443
Sample Size		119	119

1.4.2. Governance and the value of excess cash

We estimate our value regression (equation 2) on all firms with positive excess cash at time *t*. Table 8 presents the results. Model [1] uses the sum of the four separate governance scores as governance measure, while models [2]-[5] are based on the sub-scores for Shareholder rights, Takeover defences, Disclosure and Board, respectively. We find that good governance, as measured by the total score, has a significantly positive effect on the value of excess cash. The results of models [2]-[5] reveal that this relation is driven purely by the quality of governance measure Takeover defences. The coefficient on the interaction variable between excess cash and this governance measure is positive (0.508) and significant (p-value of 0.038).[30] We interpret this outcome as follows. The management of firms with a low score for Takeover defences have good possibilities to prohibit being acquired by a hostile bidder. The so-called 'management rights' for these firms are high. If these firms hold excess cash and destroy value because of negative NPV projects (such as overpaid acquisitions) or

[30] In untabulated results, we use excess cash as estimated by models [2] and [3] in Table 6. The results confirm the finding that Takeover defences have a significant and positive influence on the value of excess cash.

inefficiency, the capital market is in the worst case not able to take over the firm and to disgorge the cash in order to prevent it from being wasted. The value of their excess cash is accordingly, relatively low. However, if well governed firms hold excess cash, the capital market can, if she wishes, take over the firm and extract the cash if necessary. Because of this threat of control over the amount of excess cash, the probability that it will be allocated wrongly is smaller and, hence, excess cash is valued higher.

In Table 9, where the governance score is Takeover defences, we report the results of alternative specifications. Model [1] includes normal cash as obtained from the cash model as extra control variable, whereas model [2] includes normal cash and the additional interaction term between normal cash and the corporate governance measure Takeover defences. As expected, the coefficient on the additional interaction term is insignificant. Normal cash as part of cash reserves for daily operations and investments is not valued differently between well and poorly governed firms. However, the interaction term on corporate governance and excess cash remains positive and significant, in model [1] as well as model [2]. In models [3] and [4] we exclude insignificant control variables from our main value specification (model [3] in Table 8). Our results are robust for these alternative specifications.

Note that since we use the M/B ratio as proxy for growth opportunities in our cash model and as proxy for firm value in our value model, it is plausible that the excess cash variable in the value model is related to firm value because of investment opportunity hedging needs rather than to direct value implications. However, our coefficient of interest is not the coefficient for Excess cash (in total) but primarily the coefficient on the interaction term between excess cash and governance. Although the total effect of excess cash on the value of the firm could be biased by the use of M/B as proxy for growth in the cash model, we assume this is not the case for the coefficient of the interaction term (see Dittmar and Mahrt-Smith, 2007).[31]

[31] If we estimate the cash model with the three year lagged sales growth instead of the M/B ratio as proxy for growth opportunities or without proxy for growth opportunities, we still find a significantly positive coefficient for the interaction term between excess cash and governance measure Takeover defences. The results of these alternative cash models are consistent with the results presented in Table 8 and Table 9.

Table 8. Value models

This table shows the regression results for the value regressions. All models are estimated with firm and year fixed effects. In all variables Assets are net of Cash. The dependent variable in all models is the ratio of firm's market value to assets. The independent variables include the following variables over assets: Earnings, R&D, Dividend, Interest, Assets, Market Value and Excess Cash. Excess cash is computed as the residual from model [1] in Table 6. In model [2]-[5] X is equal to, Shareholder rights, Takeover defences, Disclosure and Board respectively. In model [1] X is equal to the sum of Shareholder rights, Takeover defences, Disclosure and Board. Δ L Y indicates a change in Y from time t-1 to t. Δ Y indicates a change in Y from time t to t+1. All models use only firms with positive excess cash. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	[1]	[2]	[3]	[4]	[5]
Earnings / Assets	2.507***	1.979***	2.788***	2.013***	1.984***
	(0.616)	(0.709)	(0.757)	(0.614)	(0.716)
Δ L Earnings / Assets	-0.256	0.074	-0.376	-0.036	0.066
	(0.246)	(0.173)	(0.285)	(0.178)	(0.198)
Δ Earnings / Assets	1.062	1.008	1.142*	1.017	1.024
	(0.652)	(0.807)	(0.645)	(0.673)	(0.792)
R&D / Assets	7.525**	5.265**	10.059***	5.026**	6.092*
	(3.273)	(2.602)	(3.377)	(2.118)	(3.157)
Δ L R&D / Assets	1.744	2.951	1.554	1.720	3.025
	(3.485)	(3.405)	(2.848)	(3.812)	(3.277)
Δ R&D / Assets	8.127***	8.195***	8.786***	8.271***	8.553***
	(2.479)	(2.820)	(2.153)	(2.274)	(2.826)
Dividend / Assets	1.541***	1.824***	1.394***	1.588***	1.852***
	(0.324)	(0.277)	(0.287)	(0.322)	(0.317)
Δ L Dividend / Assets	2.624*	1.551	3.283***	2.585	1.427
	(1.545)	(1.229)	(1.052)	(1.696)	(1.485)
Δ Dividend / Assets	-0.009	-0.072	0.001	0.042	-0.097
	(0.283)	(0.315)	(0.292)	(0.208)	(0.273)
Interest / Assets	-11.462	-15.611	-9.618	-10.183	-17.429
	(12.375)	(12.643)	(7.936)	(12.846)	(11.633)
Δ L Interest / Assets	-0.450	-1.650	-0.508	-1.440	-1.389
	(1.881)	(2.135)	(3.535)	(2.213)	(2.034)
Δ Interest / Assets	-15.169	-18.300	-14.273	-14.094	-19.046
	(13.614)	(12.733)	(10.122)	(12.737)	(12.344)
Δ L NA / Assets	0.250*	0.289*	0.192	0.301***	0.263
	(0.149)	(0.147)	(0.121)	(0.107)	(0.162)
Δ NA / Assets	0.429**	0.458**	0.349***	0.463**	0.466**
	(0.194)	(0.178)	(0.130)	(0.214)	(0.207)
Δ MV / Assets	-0.513***	-0.499***	-0.496***	-0.518***	-0.491***
	(0.084)	(0.078)	(0.085)	(0.070)	(0.075)
Excess Cash / Assets	-1.175	2.652	0.191	-0.556	2.151
	(1.214)	(1.750)	(0.633)	(2.258)	(1.414)
Governance X	-0.006	0.062	-0.078	0.066*	-0.007
	(0.019)	(0.039)	(0.052)	(0.035)	(0.031)
Governance X x Excess Cash / Assets	0.145**	-0.152	0.508**	0.377	-0.080
	(0.069)	(0.288)	(0.242)	(0.396)	(0.292)
Constant	1.270**	0.941***	1.274***	0.854***	1.361***
	(0.514)	(0.139)	(0.195)	(0.123)	(0.211)
Adjusted partial R^2	0.629	0.620	0.649	0.630	0.618
Sample Size	256	256	256	256	256

Table 9. Alternative value models (robustness)
This table shows the regression results for the value regressions. All models are estimated with firm and year fixed effects. In all variables Assets are net of Cash. The dependent variable in all models is the ratio of firm's market value to assets. The independent variables include the following variables over assets: Earnings, R&D, Dividend, Interest, Assets, Market Value, Normal Cash and Excess Cash. Normal cash is computed with the estimated model [1] in Table 6; Excess cash is computed as the residual from model [1] in Table 6. Gov. t.d. is the governance score for Takeover defences. Δ L Y indicates a change in Y from time t-1 to t. Δ Y indicates a change in Y from time t to t+1. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	[1]	[2]	[3]	[4]
Earnings / Assets	2.981***	2.963***	2.250***	2.331***
	(0.823)	(0.770)	(0.709)	(0.631)
Δ L Earnings / Assets	-0.365	-0.311		
	(0.286)	(0.252)		
Δ Earnings / Assets	1.206*	1.206*	0.865	0.918
	(0.692)	(0.676)	(0.685)	(0.615)
R&D / Assets	10.768***	10.425***	14.387**	13.635**
	(3.195)	(3.504)	(6.202)	(6.145)
Δ L R&D / Assets	1.511	1.301		
	(2.798)	(2.979)		
Δ R&D / Assets	8.640***	8.276***	12.058***	11.399***
	(2.192)	(1.999)	(1.829)	(2.087)
Dividend / Assets	1.368***	1.348***	1.650***	1.604***
	(0.272)	(0.281)	(0.341)	(0.362)
Δ L Dividend / Assets	3.494***	3.464***	3.675***	3.631**
	(0.844)	(0.958)	(1.334)	(1.427)
Δ Dividend / Assets	-0.002	0.012		
	(0.285)	(0.277)		
Interest / Assets	-9.871	-10.180		
	(7.983)	(8.456)		
Δ L Interest / Assets	-0.679	-0.877		
	(3.582)	(3.911)		
Δ Interest / Assets	-14.487	-14.589		
	(10.094)	(9.641)		
Δ L NA / Assets	0.189	0.220*	0.232	0.261
	(0.119)	(0.124)	(0.186)	(0.188)
Δ NA / Assets	0.383**	0.395**		
	(0.157)	(0.159)		
Δ MV / Assets	-0.501***	-0.500***	-0.522***	-0.517***
	(0.090)	(0.093)	(0.072)	(0.076)
Normal Cash / Assets	-0.609	0.264	-0.204	1.304
	(0.993)	(1.610)	(0.830)	(1.599)
Excess Cash / Assets	0.217	0.086	0.161	-0.115
	(0.618)	(0.561)	(0.690)	(0.692)
Gov. t.d.	-0.078	-0.052	-0.080	-0.040
	(0.051)	(0.057)	(0.056)	(0.057)
Gov. t.d. x Normal Cash / Assets		-0.163		-0.259
		(0.161)		(0.246)
Gov. t.d. x Excess Cash / Assets	0.514**	0.531**	0.418**	0.471**
	(0.241)	(0.235)	(0.173)	(0.205)
Constant	1.332***	1.210***	1.119***	0.892***
	(0.277)	(0.354)	(0.180)	(0.336)
Adjusted partial R^2	0.648	0.655	0.629	0.640
Sample Size	256	256	257	257

Governance may be endogenously determined with value as well (see Dittmar and Mahrt-Smith, 2007). In untabulated results, we estimate our value regression using the 2 year lagged governance score to avoid this endogeneity issue. The results confirm that Takeover defences have a significant and positive impact on the value of excess cash holdings.

The results in Tables 8 and 9 indicate that poorly governed firms do not allocate their excess liquidity as well as the well governed firms do. In section 1.4.1. we have shown that spending firms with excess cash at t-1 and with a high score for Takeover defences, spend their money less quickly than firms with low governance scores. To analyse whether spending poorly governed firms with excess cash at t-1 lower their return on assets relatively (ROA) during the period t-1 to t we estimate the following regression[32]:

$$ROA_{i,t} = \beta_0 + \beta_1 \frac{XCash_{i,t-1}}{Assets_{i,t-1}} + \beta_2 GOV_{i,t-1} + \beta_3 \frac{XCash_{i,t-1}}{Assets_{i,t-1}} GOV_{i,t-1} + \beta_4 LN(RealAssets_{i,t}) + \beta_5 \frac{PPE_{i,t}}{Assets_{i,t}} + \beta_6 ROA_{i,t-1} + YFE + FFE + \varepsilon_{i,t} \quad (5)$$

where $ROA_{i,t}$ = EBIT in year t divided by Assets at time t minus Cash and Cash Equivalents at time t minus industry average ROA, $XCash_{i,t}$ = Excess Cash at time t = Total Cash and Cash Equivalents minus the normal level of cash from equation (1) at time t, $GOV_{i,t-1}$ is the governance score takeover defences at t-1, $Assets_{i,t-1}$ = Total Assets minus Cash and Cash Equivalents at time t-1, $RealAssets_{i,t}$ = Total Assets at time t inflated to 2005 prices, $PPE_{i,t}$ = Property, Plant and Equipment at time t.

We are interested in the coefficient of the interaction term lagged excess cash times the lagged governance measure. A positive coefficient (β_3) on this interaction term indicates that for every euro of excess cash held at time t-1, firms with bad corporate governance who used up excess cash experienced a lower ROA in that year compared to firms with good corporate governance. The results in Table 10 show that this indeed is the case, cf. Dittmar and Mahrt-Smith (2007). The coefficient on the interaction term is significantly positive except—surprisingly—for the corporate governance measure Takeover defences (see model [3]). However, if we replace

[32] The equation is similar to equation (3) of Dittmar and Mahrt-Smith (2007) and controls for size, asset structure and lagged industry adjusted ROA.

$ROA_{i,t}$ by $ROA_{i,t+1}$ we find a significantly positive coefficient for takeover defences, while the coefficients of the other governance scores remain significantly positive.[33]

Table 10. The impact of the use of excess cash and corporate governance on the ROA
This table shows the regression results for the return on assets regressions. The dependent variable is ROA (EBIT over Assets) minus industry average ROA. Assets are computed net of cash. In model [2]-[5] X (X in governance X) is equal to, Shareholder rights, Takeover defences, Disclosure and Board respectively. In model [1] X is equal to the sum of Shareholder rights, Takeover defences, Disclosure and Board. Independent variables are: one-year lagged excess cash to assets, one-year lagged governance scores X, the interaction between lagged excess cash and lagged governance, Size (LN RealAssets), property, plant and equipment to assets (PPE/Assets), and lagged industry adjusted ROA. The sample is the intersection of firms with positive lagged excess cash and firms for which excess cash declined over the year; i.e. $(ExcessCash_{i,t} - ExcessCash_{i,t-1}) / Assets_{i,t-1} < 0$. Regressions are made with firm fixed and year fixed effects. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	[1]	[2]	[3]	[4]	[5]
Lagged Xcash	-0.247	-0.198	0.058	-0.976***	-0.478
	(0.310)	(0.291)	(0.179)	(0.236)	(0.285)
Lagged Governance X	-0.001	-0.014	-0.004**	-0.008	-0.002
	(0.002)	(0.012)	(0.002)	(0.008)	(0.008)
Lagged Xcash x Lagged Governance X	0.018*	0.057*	0.018	0.172***	0.108***
	(0.009)	(0.031)	(0.013)	(0.029)	(0.032)
Size	-0.112***	-0.132***	-0.137***	-0.091***	-0.103***
	(0.037)	(0.037)	(0.034)	(0.032)	(0.036)
PPE / Assets	-0.807*	-0.856*	-0.900*	-0.660*	-0.787*
	(0.425)	(0.457)	(0.457)	(0.379)	(0.408)
Lagged ROA	0.104	0.123	0.111	0.055	0.114
	(0.117)	(0.102)	(0.116)	(0.111)	(0.119)
Constant	1.278***	1.548***	1.541***	1.079***	1.190***
	(0.326)	(0.369)	(0.252)	(0.308)	(0.308)
Adjusted partial R^2	0.363	0.237	0.207	0.477	0.417
Sample Size	143	143	143	143	143

The lower value of excess cash held by poorly governed firms could thus be explained by the negative influence of their spending on the ROA. Because of the lack of corporate control, managers of firms with high management rights can potentially destroy value. If these firms had no anti-takeover provisions, the capital market would probably have made corrective actions by taking over control in order to prevent future wasteful spending.[34]

[33] If we regress acquisitions divided by net assets on the lagged amount of excess cash and on total governance - including fixed firm and fixed year effect - and we restrict the sample to firms with positive lagged excess cash, we find no relation between acquisitions and the quality of corporate governance. And we do not find evidence that acquisitions have a significant impact on the return on assets.

[34] Faleye (2004) investigates the role of proxy fights in relation to cash holdings. Faleye (2004) finds that proxy fight targets hold 23% more cash than comparable firms and that following a contest, executive turnover and special cash distributions to shareholders increase.

To further check the robustness of our results and to assess the marginal value of excess cash holdings we estimate the return model as presented in section 6.3.1. Table 11 presents the results. Given the results from the value regressions, we expect that the governance measure Takeover defences significantly increases the value of excess cash. Models [1]-[3] present the results where we use the percent increase of market capitalization as dependent variable, model [4]-[6] present results where the market model excess return is the dependent variable.

Table 11. Return models (robustness)
This table shows the regression results for the return regressions. All models are estimated with firm and year fixed effects. ME is the market value of equity at t-1. The dependent variable in models [1]-[3] is ME_t minus ME_{t-1} divided by ME_{t-1}. De dependent variable in models [4]-[6] is the annual market model excess return. Model [1] and [4] include all observations. Model [2] and [5] include the observations for non-UK firms only and model [3] and [6] for UK firms only. Models [1]-[6] include observations only if $XCash_{t-1}$ is positive. Δ L X indicates a change in X from time t-1 to t. Governance t.d. is the governance score for Takeover defences. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	[1]	[2]	[3]	[4]	[5]	[6]
Δ L XCash / ME	1.418**	1.183*	0.377	0.998	0.931	-8.438
	(0.563)	(0.669)	(2.696)	(0.665)	(0.663)	(16.061)
Δ L Earnings / ME	1.231***	0.399	1.238	0.206	0.428***	0.739
	(0.256)	(0.484)	(1.458)	(0.422)	(0.111)	(4.002)
Δ L Net Assets / ME	0.110**	-0.136	0.359	-0.085	-0.045	4.227
	(0.053)	(0.111)	(0.366)	(0.122)	(0.108)	(2.061)
Δ L R&D / ME	0.053	-0.516	-11.183	2.924***	1.918	-82.567
	(1.149)	(1.380)	(14.072)	(0.941)	(1.383)	(146.365)
Δ L Interest / ME	-2.801***	-1.288	16.495	-6.112**	-5.952***	13.518
	(0.796)	(1.999)	(23.495)	(2.917)	(1.386)	(24.454)
Δ L Dividend / ME	4.104*	1.658	5.539	-1.968	0.739	-18.536
	(2.202)	(1.691)	(8.132)	(2.129)	(1.382)	(34.370)
Lagged Xcash / ME	3.052***	2.329***	3.093	2.313***	2.268***	8.062**
	(0.738)	(0.748)	(1.922)	(0.689)	(0.467)	(2.041)
Leverage	-1.297***	-1.382***	-1.746	-1.279***	-1.731***	1.846
	(0.414)	(0.325)	(1.052)	(0.286)	(0.207)	(3.017)
New Finance / ME	0.029***	0.228	0.010	-0.063	0.008	-4.318**
	(0.008)	(0.362)	(0.017)	(0.447)	(0.341)	(0.954)
Lagged XCash / ME x Δ L XCash / ME	2.101	5.519***	-3.631	1.041	2.180	-5.974
	(1.474)	(1.084)	(7.760)	(0.737)	(1.584)	(8.949)
Leverage x Δ L XCash / ME	-0.872	-3.938***	-1.532	-0.051	-1.215**	-15.227
	(0.727)	(0.443)	(5.575)	(0.920)	(0.568)	(30.944)
Governance t.d. x Δ L XCash / ME	0.086***	0.197***	0.559	-0.012	0.110***	2.932
	(0.031)	(0.067)	(0.320)	(0.030)	(0.028)	(3.359)
Governance t.d.	0.035	0.014	0.009	-0.007	0.038	-0.212
	(0.022)	(0.038)	(0.119)	(0.031)	(0.037)	(0.181)
Constant	-0.037	0.175	0.299	0.165	0.178	0.327
	(0.118)	(0.231)	(0.619)	(0.172)	(0.138)	(1.443)
Adjusted partial R^2	0.542	0.579	0.735	0.374	0.449	0.645
Sample Size	192	147	45	188	147	41

The results in model [1] confirm that the stock market places a higher value on excess cash for well governed firms relative to poorly governed firms. If we split the sample in non-UK and UK firms then we find that the coefficient is highly significant for non-UK firms.[35]

Model [4] with excess return as dependent variable does not indicate that governance pays off. However, if we again split the sample in non-UK and UK firms, we find a highly significant positive coefficient on the interaction term GOV t.d. x ΔL XCash / ME for the non-UK firms. This implies that for non-UK firms, the marginal value of excess cash is higher for well governed firms than for poorly governed firms. For the non-UK firms we calculate the marginal value of €1 of excess cash, which is equal to the sum of the coefficient on the change in excess cash (Δ L XCash) and the coefficients on the interaction variables that include the change in excess cash times the 'in sample means' of the regressors interacting with the change in excess cash. The results are remarkable. The marginal value of €1 XCash for the non-UK firms following model [5] then is equal to € 1.14 on average. However, the value of €1 excess cash is only €0.89 for the lower Governance t.d. quartile and €1.45 for the upper quartile. This finding is consistent with Dittmar and Mahrt-Smith (2007).

1.5. Summary

In this chapter we examine the relation between the quality of corporate governance and the value of excess cash for large European firms (FTSEurofirst 300). We use Deminor ratings for Shareholder rights, Takeover defences, Disclosure and Board as proxies for the quality of corporate governance. Following the approach of Dittmar and Mahrt-Smith (2007) we first estimate a cash model to determine the level of normal cash holdings and subsequently the level of excess cash. Then we analyse the influence of governance on the value of excess cash. We find that the *level* of excess cash as well as the *value* of excess cash is positively related to the governance Takeover defence score. Spending firms with excess cash and a low quality of corporate governance seem to spend more than firms with a high quality of corporate

[35] The difference in the results between non-UK and UK firms could imply that the relevance of Shareholder rights for the valuation of unexpected changes in the level of excess cash is higher for non-UK firms than for UK firms. Alternatively, it could be that for this small sample of UK-firms with in general high scores for governance component Takeover defences, it is difficult to capture the effect of governance on the value of excess cash.

governance. We further find that governance positively influences the ROA in the years after the year of spending. If we assume that projects that lower the ROA are negative NPV projects, the 'value destructive investing behaviour' of poorly governed firms could explain the value differential of excess cash between well and poorly governed firms. For non-UK firms we find that the value of €1 of excess cash is only €0.89 for the lower Takeover defences scores quartile and €1.45 for the upper quartile. Firms that (potentially) invest in negative NPV projects, and cannot be corrected by being taken over, are valued lower accordingly. We find no relation between the level nor the value of excess cash and the quality of firms' corporate governance categories Shareholder rights, Disclosure and Board. Given our empirical results, only the market for corporate control seems strong enough to prevent managers from wasting excess cash.

Appendix A. Industry codes

Worldscope Industry codes. Industry represents a four digit numeric code assigned to the company to represent its industry group. Each company is classified into a major industry group and subsequent minor industry groups. We only use the major industry group classification.

Table A.1 Industry codes

Industry	Description	Industry	Description
1300	AEROSPACE	5200	METAL PRODUCERS
1600	APPAREL	5500	METAL PRODUCT
1900	AUTOMOTIVE		MANUFACTURERS
2200	BEVERAGES	5800	OIL, GAS, COAL &
2500	CHEMICALS		RELATED SERVICES
2800	CONSTRUCTION	6100	PAPER
3100	DIVERSIFIED	6400	PRINTING &
3400	DRUGS, COSMETICS		PUBLISHING
	HEALTH CARE	6700	RECREATION
3700	ELECTRICAL	7000	RETAILERS
4000	ELECTRONICS	7300	TEXTILES
4300	FINANCIAL	7600	TOBACCO
4600	FOOD	7900	TRANSPORTATION
4900	MACHINERY &	8200	UTILITIES
	EQUIPMENT	8500	MISCELLANEOUS

Appendix B. Variables and variable codes

The first column shows the variable name and the second columns shows the database identifiers. WS stands for Worldscope database. DS stands for Datastream database, TF stands for Thomson Financial Database.

Table B.1 Data variables identifiers

Variable	Identifier
Acquisitions	WS.NetAssetsFrAcquisitionsCFStmt
Capital Expenditures	WS.CapitalExpendCFstd
Cash and Cash Equivalents	WS.CashAndEquivGeneric
Cash Flow	WS.CashFlow
Dividend	WS.CommonDividendsCash
EBIT	WS.EarningsBeforeInterestAndTaxes
EBITDA	WS.EarningsBeforeIntTaxesAndDepr
Income Tax	WS.IncomeTaxes
Industry code	WS.IndustryGroup
Interest expenses	TF.InterestExpenseonDebt
Long Term Debt Issuance	WS.LTDebtIssuanceCFStmt
Long Term Debt Reduction	WS.LTDebtReductionCFStmt
Market capitalization	WS.YrEndMarketCap
Working Capital	WS.WorkingCapBalSht
Property, Plant & Equipment	WS.TotalPropPlantEquipNet
Purchase of Common & Preferred Stock	WS.PurchOfComAndPfdStkCFStmt
R&D	WS.ResearchAndDevelopmentExpense
Return index	DS.ReturnIndex
Return on Assets	WS.ReturnOnAssets
Sale of Common & Preferred Stock	WS.SaleOfComAndPfdStkCFStmt
Sales Growth 3Yr	WS.Sales3YrGrowth
Share Price	DS.PriceClose
Total Assets	WS.TotalAssets
Total Debt	WS.TotalDebt
Total shares outstanding	DS.CommonSharesOutstanding

Appendix C. Cash-to-assets per country, 2000-2004

Table C.1 Summary statistics of cash-to-assets by country, 2000-2004.
The cash-to-assets ratio is defined as Cash and Cash Equivalents divided by Net Assets, where Net Assets is Total Assets minus Cash and Cash Equivalents. The cash-to-assets ratio is winsorized at the mean plus and minus three times the standard deviation. The rightmost column in the table shows the number of observations.

Country	Mean	25th Percentile	Median	75th Percentile	Std. Dev.	N
Austria	0.030	0.005	0.027	0.041	0.032	15
Belgium	0.118	0.043	0.088	0.174	0.088	30
Switzerland	0.244	0.101	0.225	0.357	0.174	90
Denmark	0.126	0.062	0.113	0.158	0.088	24
Finland	0.172	0.018	0.028	0.159	0.291	20
France	0.167	0.055	0.106	0.186	0.184	234
Germany	0.126	0.035	0.075	0.162	0.143	165
Greece	0.172	0.010	0.045	0.149	0.274	25
Ireland	0.455	0.160	0.322	0.830	0.319	15
Itlay	0.094	0.043	0.083	0.125	0.089	73
Luxembourg	0.066	0.047	0.056	0.083	0.031	15
Netherlands	0.164	0.053	0.099	0.219	0.158	80
Norway	0.169	0.073	0.097	0.256	0.153	20
Portugal	0.081	0.012	0.027	0.184	0.096	10
Spain	0.114	0.024	0.079	0.137	0.123	80
Sweden	0.168	0.044	0.082	0.156	0.230	70
United Kingdom	0.133	0.037	0.070	0.156	0.162	374
All	0.149	0.041	0.087	0.177	0.173	1,340

Appendix D. Cash-to-assets per industry, 2000-2004

Table D.1 Summary statistics of cash-to-assets by industry, 2000-2004.
The cash-to-assets ratio is defined as Cash and Cash Equivalents divided by Net Assets, where Net Assets is Total Assets minus Cash and Cash Equivalents. The cash-to-assets ratio is winsorized at the mean plus and minus three times the standard deviation. The rightmost column in the table shows the number of observations.

Industry	Mean	25th Percentile	Median	75th Percentile	Std. Dev.	N
Aerospace	0.210	0.127	0.179	0.245	0.109	15
Apparel	0.100	0.028	0.109	0.156	0.062	10
Automotive	0.144	0.071	0.107	0.137	0.128	50
Beverages	0.063	0.026	0.052	0.088	0.046	35
Chemicals	0.100	0.033	0.065	0.151	0.088	99
Construction	0.129	0.068	0.118	0.151	0.089	80
Diversified	0.134	0.046	0.084	0.161	0.134	80
Drugs, cosmetics and health	0.262	0.115	0.253	0.367	0.197	85
Electrical	0.157	0.083	0.134	0.210	0.097	22
Electronics	0.314	0.107	0.217	0.399	0.273	80
Food	0.170	0.062	0.087	0.224	0.164	40
Machinery and equipment	0.190	0.042	0.068	0.349	0.200	35
Metal producers	0.089	0.052	0.070	0.112	0.073	25
Metal product manufacturers	0.107	0.045	0.060	0.160	0.086	20
Oil, gas, coal and related	0.053	0.032	0.041	0.068	0.036	44
Paper	0.023	0.017	0.024	0.027	0.008	15
Printing and publishing	0.154	0.024	0.053	0.159	0.231	48
Recreation	0.074	0.022	0.049	0.101	0.084	40
Retialers	0.143	0.052	0.087	0.146	0.175	89
Textiles	0.143	0.106	0.135	0.175	0.043	5
Tobacco	0.142	0.058	0.131	0.181	0.103	20
Transportation	0.232	0.074	0.108	0.251	0.250	39
Utilities	0.090	0.019	0.050	0.107	0.125	203
Miscellaneous	0.181	0.048	0.118	0.203	0.208	161
All	0.149	0.041	0.087	0.177	0.173	1,340

Appendix E. Mean reversion in total cash holdings

To test whether total cash holdings are mean reverting, we estimate the following regression:

$$(Cash / Assets)_{i,t} - (Cash / Assets)_{i,t-1} = \beta_0 + \beta_1 (Cash / Assets)_{i,t-1} + \varepsilon_{i,t}$$

The estimation results presented in Table E.1 show a significantly negative relation between the change in cash and the lagged cash level, providing evidence for a mean reversion effect in total cash holdings. Put differently, the cash-to-assets ratio is stationary around an overall mean of 0.156 (= 0.066/0.423).

Table E.1 Results of mean reversion model
The dependent variable is the change in Cash to Net Assets and the independent variable lagged Cash position divided by lagged Net Assets. The regression period is 1990-2005, the number of observations 3560. Year fixed and fixed effects are included. The adjusted partial R^2 is 0.21. T-Statistics are based on White cross-section standard errors.

	Coefficient	t-Statistic	Prob.
Lagged Cash / Assets	-0.423	-10.782	0.000
Constant	0.066	10.802	0.000

Chapter 2

Corporate governance and the cost of debt
of large European firms[36]

Abstract

This chapter examines the relation between the quality of corporate governance and the cost of debt for large European firms (FTSEurofirst 300 Index). We use Deminor scores for Shareholder rights, Takeover defences, Disclosure and Board as proxies for the quality of corporate governance. As a proxy for the cost of debt we use the yield and yield spread of 319 bonds issued in the years 2001-2005. After adjusting for issuer characteristics, issue characteristics and market characteristics, we find a negative relation between disclosure and the cost of debt. We uncover that this relation is in fact nonlinear and crucially depends on the quality of shareholder rights. If the quality of shareholder rights is high, the effect of disclosure on the cost of debt is insignificant. However, if the quality of shareholder rights is low, the negative effect of disclosure is statistically and economically significant. This novel interaction effect between shareholders rights and disclosure on the cost of debt is explained by our 'share rights or disclose' hypothesis. According to this hypothesis, agency conflicts between the management and the providers of capital are negatively related with the quality of shareholder rights. We argue that firms with higher shareholder rights exhibit lower information risk.

2.1. Introduction

In this chapter we examine the relation between European firm's quality of corporate governance and their cost of debt. The quality of corporate governance is measured by means of the corporate governance rating constructed by Deminor. This rating contains four different components i.e., 1) rights and duties of shareholders; 2) range of takeover defences; 3) disclosure on financial matters and corporate governance; and 4) supervisory board structure and functioning. The cost of debt is measured by the yield to maturity on new debt issues and the yield spread of these issues.

[36] This chapter is a follow up of Blom and Schauten (2003). We thank Floris Pot and Marijke Scheerder for their excellent research assistance.

A large body of literature explores the influence of corporate governance on the return on equity, firm value and firm performance, see e.g. Nesbitt (1994, 1995), Yermack (1996), Core et al. (1999), Gompers et al. (2003), Bauer et al. (2004), Bebchuk et al. (2005), Cremers and Nair (2005), Brown and Caylor (2006) and Core et al. (2006). Previous literature on the effects of corporate governance on the cost of debt (which is discussed in more detail in Section 3) includes Sengupta (1998), Bhojraj and Sengupta (2003), Anderson et al. (2004), and Klock, Mansi and Maxwell (2005). These studies have in common that they only consider the effects of a specific aspect of corporate governance, such as shareholder rights or board structure.

In this chapter, we conduct a comprehensive analysis of the effects of different components of corporate governance on the cost of debt.[37] We do not limit ourselves to examining the effects of these components in isolation, but we also explore the possibility of interaction effects. In particular we formulate the hypothesis that the effects of disclosure on the cost of debt crucially depends on the level of shareholder rights. This 'share rights or disclose' hypothesis refers to the role that governance plays in agency conflicts between management and the providers of capital in combination with information risk.[38] We hypothesize that these agency problems and information risk are positively related. We find that firms' cost of debt is negatively associated with the quality of the corporate governance measure 'Disclosure'. We also uncover that this relation crucially hinges upon the quality of the corporate governance measure 'Shareholder rights' which is in accordance with the 'share rights or disclose' hypothesis. If the quality of shareholder rights is high, the relevance of Disclosure for the cost of debt is low. However, if the quality of Shareholder rights is low, the negative effect of disclosure is statistically and economically significant. We find that the credit spread for firms with shareholder rights lower than 5 (on a scale from 1-10) decreases with approximately 70 basis points if we move within this category from the lower quartile to the upper quartile of the governance measure

[37] Ashbaugh-Skaife et al. (2006) investigate whether U.S. firms with strong corporate governance benefit from higher *firms's* credit ratings relative to firms with weaker governance. They use variables based on the four governance components from Standard & Poor's framework.

[38] Bhojraj and Sengupta, (2003), p.456, define information risk as '…the risk that firm managers have private information that would adversely affect the default risk of the loan.' According to Bhojraj and Sengupta (2003) governance mechanisms can help reduce information risk by inducing firms to disclose information in a timely manner.

Disclosure. We do not find support for the hypotheses we formulate for the other governance components. We find no relation between Takeover defences and the cost of debt nor between governance component Board and the cost of debt.

This research contributes to the literature in two ways. First, our governance measure contains four different components of corporate governance from one independent source. This makes it possible to determine the relevance of each component as well as their interaction for the cost of debt. This makes our study more comprehensive than studies that take one aspect into account only. We introduce the 'share rights or disclose' hypothesis and present empirical evidence in favour of this new hypothesis. Second, we provide empirical evidence for European firms instead of U.S. firms.

The structure of the chapter is as follows. In section 2 we present the Deminor governance data. We discuss related prior empirical research in section 3 and formulate expected relations for each governance measure with the cost of debt. Section 4 describes our main model, our sample and some descriptive statistics. Section 5 presents the main empirical results. Section 6 gives a brief summary.

2.2. Governance data[39]

We use Deminor ratings to measure the quality of firm-level corporate governance. These ratings cover firms included in the FTSEurofirst 300 Index for the years 2000-2004. The Deminor ratings are based on 300 different governance indicators that refer to internationally accepted standards, as outlined by the International Corporate Governance Network (ICGN), the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the Conference Board (Deminor Rating, 2004).[40,41] The different indicators or criteria can be classified into four categories: rights and duties of shareholders (referred to as Shareholder rights in the remainder of the chapter); range of takeover defences (Takeover defences); disclosure on financial matters and corporate governance (Disclosure); and Board structure and functioning (Board). For each category a rating is available on a scale from 1 to 10, where a score of 10 (1) corresponds to the best (worst) possible governance quality. The total governance score is simply the sum of the rating scores of the four categories.[42]

The first category of governance criteria, Shareholder rights, concerns the question whether shareholders can exert sufficient power to determine corporate action. The score is based on i) the 'one share - one vote - one dividend' principle; ii) access to and voting procedures at general meetings, and iii) maintenance of pre-emptive rights. Firms that respect the control and ownership roles of shareholders, score high on the 'one share - one vote - one dividend' principle. Deminor evaluates whether companies submit voting issues that are perceived as particular significant to the general meeting of shareholders and assesses the voting structure. Furthermore, companies should

[39] The description of the governance data is copied from Chapter 1 to facilitate the reading of this chapter.

[40] The Deminor rating methodology further takes into consideration the main orientations chosen by national Codes of Best Practice, among which: the Combined Code in the UK (2003); the Vienot reports and the Bouton report in France (1995, 1999 and 2002); the Kodex in Germany (2002); the Preda Code in Italy (1999); the Tabaksblat Code in The Netherlands (2003).

[41] About the same criteria are used by Standard & Poor's for their corporate governance score (Standard & Poor's, 2002). This, taken together with the fact that all of these institutions have more or less the same ideas concerning good corporate governance, leads us to conclude that the Deminor rating is a representative measure for the quality of a firm's corporate governance.

[42] According to Deminor (2004), the rating score reflects the extent to which a company adopts and complies with the 'best practice'. Hence, the highest score represents best practice and the lowest the most questionable standard.

respect the pre-emptive rights of the existing shareholders as these stakeholders would like to prevent dilution of their voting or economic power.

The second category, Takeover defences, examines the extent to which the firm attempts to decrease the likelihood of a hostile takeover through the adoption of anti-takeover provisions. Deminor examines the presence and strength of anti-takeover devices such as poison pills, golden parachutes, core shareholdings and extensive cross-shareholdings. To achieve a high score for this aspect of governance, the range of takeover defences should lead to a favourable bidding process and not preclude the success of a takeover attempt per se.

The third category, Disclosure, measures whether shareholders are able to obtain convenient and comprehensive information about the company's financial matters as well as its governance characteristics. Deminor analyses for instance the quantity and quality of non-financial information, such as the diversity and independence of board members, board committees, accounting standards and information on major shareholders of the company.

The fourth category, Board, measures issues relating to the governance of a Board, such as the presence of independent directors, the division between the role of Chairman and Chief Executive and the election of the board.

Table 1 presents descriptive statistics of the governance scores for our sample from 2000-2004. As shown, there is a positive trend in the total governance scores (sum of the four categories) from 2000-2004 as well as in the sub-scores. The total score in 2000 is 19.36 while the score in 2004 equals 24.06. Disclosure increases from 5.20 to 7.24. This trend is in line with the increased attention paid to governance structures by policy makers, see footnote 40 for a list of National Codes of Best Practice.

Table 1. Corporate governance scores per year

Year	Governance total		Shareholder rights	Takeover defences	Disclosure	Board	N
	Mean	Standard deviation					
2000	19.36	6.24	5.78	3.77	5.20	4.61	61
2001	21.93	6.71	6.50	5.07	5.62	4.74	62
2002	21.05	6.25	6.31	3.80	6.07	4.87	96
2003	22.98	6.00	6.54	4.02	6.91	5.50	48
2004	24.06	5.38	6.76	4.05	7.24	6.01	52
All	21.68	6.32	6.35	4.12	6.13	5.07	319

Note: The table presents average Deminor corporate governance scores per year for Shareholder rights, Takeover defences, Disclosure and Board. For the total governance score the standard deviation is shown as well. The rightmost column shows the number of observations.

Tables 2 and 3 present the governance scores by country and industry respectively. The extensive investor rights in common law countries such as the United Kingdom and Ireland (Laporta et al., 1998) are confirmed by the governance scores in our sample. The average scores for the United Kingdom and Ireland are the highest at 27.92 and 29.02 respectively. Note that the number of observations for the UK is 93, but for Ireland only 2. Industries Beverages, Metal product manufacturers and Tobacco have relatively high total governance scores. These relatively high scores are probably influenced by the UK country effect since 6 of the 8 Beverages observations, 1 of the 2 Metal product manufacturers observations and 8 of the 10 Tobacco observations are UK firms. However, if we control[43] for country (and year effects) we still find higher total governance scores for Beverages and Tobacco.[44]

Table 2. Corporate governance scores by country, 2000-2004

Country	Governance total		Shareholder rights	Takeover defences	Disclosure	Board	N
	Mean	Standard deviation					
Austria	18.05	2.63	7.31	1.21	5.77	3.76	2
Belgium	15.85	4.30	6.06	1.75	4.15	3.89	4
Switzerland	17.64	6.14	5.69	3.12	4.72	4.10	17
Finland	19.16	2.55	5.99	2.00	6.11	5.06	4
France	21.34	4.62	6.44	3.78	5.90	5.23	78
Germany	18.63	4.17	7.09	3.01	5.32	3.20	43
Greece	18.52	NA	7.16	1.00	6.37	3.99	1
Ireland	29.02	0.04	6.51	8.00	7.50	7.01	2
Italy	19.83	3.17	5.90	1.00	7.48	5.45	15
Luxembourg	12.08	5.35	4.01	0.50	3.96	3.61	2
Netherlands	15.16	3.95	4.40	1.04	5.57	4.15	20
Norway	17.38	4.41	7.21	4.00	3.43	2.74	4
Portugal	7.78	NA	4.11	0.00	2.01	1.67	1
Spain	15.33	2.36	4.96	0.72	4.91	4.74	18
Sweden	21.51	5.36	6.12	5.76	5.40	4.23	15
United Kingdom	27.92	4.59	6.90	6.97	7.49	6.55	93
All	21.68	6.32	6.35	4.12	6.13	5.07	319

Note: The table presents average Deminor corporate governance scores by country for Shareholder rights, Takeover defences, Disclosure and Board. For the total governance score the standard deviation is shown as well. The rightmost column shows the number of observations.

[43] To control for country and year effects we regress the total governance scores on country dummies and year dummies and compute industry averages for the residuals from this model. Only the residuals of the industries Transportation, Tobacco, Metal producers, Machinery and equipment, Construction and Beverages are significant.

[44] Metal product manufacturers is not significant, this finding confirms our expectation. Further, we find that Metal producers and Transportation have lower adjusted scores and Machinery and equipment and Construction higher adjusted scores.

Table 3. Summary descriptives, governance scores per industry, 2000-2004

Industry	Governance total		Shareholder rights	Takeover defences	Disclosure	Board	N
	Mean	Standard deviation					
Aerospace	18.55	2.87	5.07	0.25	7.19	6.04	4
Apparel	24.46	NA	6.72	8.00	5.99	3.75	1
Automotive	18.88	4.63	6.43	3.34	5.41	3.71	28
Beverages	27.02	6.22	7.41	7.00	6.77	5.84	8
Chemicals	21.54	6.11	6.64	4.33	5.85	4.71	22
Construction	24.37	4.76	6.31	5.88	6.45	5.73	18
Diversified	22.10	5.13	6.34	4.74	5.89	5.13	19
Drugs, cosmetics and health care	22.21	9.17	6.20	4.40	6.29	5.33	10
Electrical	21.41	2.22	6.34	4.04	6.10	4.93	4
Electronics	21.24	5.74	6.19	4.47	5.78	4.80	15
Food	22.24	7.09	6.10	4.27	6.45	5.41	11
Machinery and equipment	21.85	5.96	7.01	6.91	4.47	3.46	11
Metal producers	23.86	5.36	5.63	4.00	7.59	6.64	5
Metal product manufacturers	28.06	5.42	6.54	7.97	7.46	6.10	2
Oil, gas, coal and related services	23.56	6.45	6.29	4.10	7.13	6.03	20
Paper	20.29	1.43	5.52	2.67	6.68	5.43	3
Printing and publishing	19.61	9.09	5.33	3.40	6.13	4.75	10
Recreation	26.38	5.96	6.87	6.52	7.04	5.95	6
Retailers	21.38	6.30	6.63	3.92	5.70	5.14	24
Tobacco	27.16	4.80	7.02	6.56	7.20	6.38	10
Transportation	18.40	2.56	5.71	0.70	6.60	5.39	10
Utilities	20.10	6.94	6.22	2.99	6.02	4.88	63
Miscellaneous	22.04	6.00	6.64	3.93	6.17	5.30	15
All	21.68	6.32	6.35	4.12	6.13	5.07	319

Note: The table presents average Deminor corporate governance scores by industry for Shareholder rights, Takeover defences, Disclosure and Board. For the total governance score the standard deviation is shown as well. The rightmost column shows the number of observations.

2.3. Prior empirical research and expected relations

This section is structured in two parts. First, we discuss seminal empirical research on the relation between corporate governance and the cost of debt. Second, we summarize empirical findings per governance measure and formulate expected relations for each of these four measures.

2.3.1. Prior empirical research

Sengupta (1998) shows a negative relation between the quality of a firms' disclosure and their cost of debt.[45] This finding would suggest that governance mechanisms can affect bond yields indirectly through a reduction in 'information risk'. The measure

[45] The relation between disclosure and the cost of equity is analysed by e.g. Welker (1995) and Botosan (1997). Welker (1995) documents a negative association between financial analysts' disclosure measurement and the bid-ask spread set by market makers. Botosan (1997) finds for the machinery industry a negative association between disclosures in annual reports and firm's cost of equity, but only for firms with low analyst following.

for the quality of the disclosure used by Sengupta (1998) is a rating of the firm by financial analysts (AIMR disclosure ratings). The research uses two different measures for the cost of debt: i) the yield to maturity on new issues and ii) the total interest expenses of the new issues. Results show both measures to be negatively related to the measure for the quality of the disclosure, taking other possible determinants of the cost of debt into account. Moreover, the results imply the specific importance of disclosure to firms with insecure future prospects, using the standard deviation of daily stock returns as a measure for future insecurity.

Bhojraj and Sengupta (2003) find that bond yields are negatively associated with the percentage of shares held by institutions and the fraction of the board made up by nonofficers. Bhojraj and Sengupta (2003) assume that governance mechanisms reduce potential conflicts of interest between the management and the providers of capital through effective monitoring their actions ('active monitoring' hypothesis). However they find that *concentrated* institutional ownership has an adverse impact on bond yields since the decisions made by the firm could be influenced by these institutions in their own advantage ('private benefits' hypothesis).[46]

Anderson et al. (2004) relate the cost of debt to characteristics of the board and document a negative relation between the cost of debt and board independence and board size. They also find that '…fully independent audit committees are associated with a significantly lower cost of debt financing. Similarly, yield spreads are also negatively related to audit committee size and meeting frequency. Overall, these

[46] Many hypotheses in literature refer to the same or partly the same effects or actions. We list a few hypotheses here: the 'active monitoring hypothesis' states that 'the existence of large shareholders leads to better monitoring of managers' (Agrawal and Mandelker, 1990, p. 143, see also Demsetz, 1983 and Shleifer and Vishny, 1986) while according to the 'passive monitoring hypothesis' large investors have limited incentives to monitor management actions due to the free-riding problem among large investors (Bhojraj and Sengupta, 2003). The 'management disciplining hypothesis' refers to 'the role governance plays in mitigating the agency conflicts between management and all stakeholders' (Ashbaugh-Skaife, 2006, p.207). The 'wealth redistribution hypothesis' states that certain governance features can be beneficial for shareholders but potentially harmful to bondholders and vice versa (Ashbaugh-Skaife, 2006). The 'private benefits hypothesis' states that *concentrated ownership* '…allows the blockholder to exercise undue influence over the management to secure benefits that are to the detriment of the other providers of capital (shareholders and bondholders).' (Bhojraj and Sengupta, 2003, p.457.) The 'shared benefits hypothesis' suggests that *concentrated ownership* leads to more efficient monitoring and that benefits are shared by all stockholders (Ibid).

results provide market-based evidence that boards and audit committees are important elements affecting the reliability of financial reports.' Ibid, p.315.

Klock, Mansi and Maxwell (2005) examine the relation between the Gompers et al. (2003) governance index and firm value from the view of the bondholders.[47] According to Klock et al. (2005) the expected relation is not straightforward since anti-takeover provisions might influence the value of debt in several ways. First, takeovers could reduce the cost of debt as a result of coinsurance (see Billet et al., 2004).[48] Anti-takeover provisions could in this perspective be interpreted as negative for the value of debt, since this coinsurance effect (which is positive for the debtholders of the target) is prohibited by the use of the anti-takeover provisions. Second, a takeover, could also have a negative effect on bondholders' wealth and increase the cost of debt if e.g. management increases leverage or increases the payout (excess cash) to shareholders (on behalf of the shareholders) after the takeover; in this perspective anti-takeover provisions reduce the cost of debt. Third, anti-takeover

[47] Gompers et al. (2003) have studied the influence of corporate governance on stock returns. Using 24 antitakeover indicators, the authors compose a 'governance index', which is used to estimate the rights of approximately 1500 firms' shareholders in the period 1990-1999. A low index score implies stronger shareholder rights (weak antitakeover provisions) and a high score vice-versa. The authors find a significantly negative relation between this index and stock returns. Furthermore firms with stronger shareholder rights have higher firm value, higher profits, higher sales growth, lower capital expenditures, and made fewer acquisitions. Bauer et al. (2004) perform the same kind of analysis for Europe (EMU countries versus UK) as Gompers et al. (2003) did for the U.S. Instead of using antitakeover indicators, Bauer et al. (2004) uses the Deminor corporate governance rating (total score) for 2000 and 2001 instead. Bauer et al. (2004) find some evidence that governance affects stock returns positively for UK firms but not for EMU countries. The impact of corporate governance on firm value is rather strong for EMU firms but not for the UK.

[48] Klock et al. (2005), p.694, suggest there is a negative relation between the premiums shareholders of the target capture and the cost of debt. We do not agree with this assumption. First, if the shareholders of the target are paid in cash, this payment negatively influences the value of the assets of the new combination. A positive relation between the premium and the cost of debt could be assumed then. Second, if the shareholders of the target are paid in new shares, the fraction that the shareholders of the target get, does not influence the value of the assets of the new combination, which implies no relation between the premium and the cost of debt. Of course, for the shareholders of the target, antitakeover provisions are positively rewarded if management can extract higher offers from the bidder.

provisions could improve capital investment decisions[49] which have a positive influence on shareholder *and* bondholder wealth and decrease the cost of debt. Fourth, if takeover defences make managers invulnerable for the market for corporate control (Jensen and Ruback, 1983) this could have a negative impact on firm performance (because of e.g. shirking of effort) as well as on the wealth of the shareholders and bondholders. This would increase the cost of debt. Fifth, anti-takeover provisions might decrease the risk of the firm and cost of debt if managers invest less in risky projects to protect their job and to reduce their human capital risk (Amihud and Lev, 1981). Klock et al. (2005) find a difference of about 34 basis points between the cost of debt of firms with the strongest management rights (strongest anti-takeover provisions) and the strongest shareholder rights (weakest anti-takeover provisions). Strong anti-takeover provisions are associated with a lower cost of debt while weak anti-takeover provisions are associated with a higher cost of debt.

Ashbaugh-Skaife, Collins and LaFond (2006) structure their analysis by using a framework developed by Standard & Poor's.[50] They find that firms overall credit ratings are 1) negatively associated with the number of block holders that own at least 5% ownership in the firm (this variable captures S&P's component Ownership Structure and Influence); 2) positively related to weaker shareholder rights in terms of takeover defences (S&P component Financial Stakeholder Rights and Relations); 3) positively related to the quality of 'working capital accruals' and the 'timeliness of earnings' (S&P component Financial Transparency); and 4) positively related to overall board independence, board stock ownership, board expertise and negatively related to CEO power on the board (S&P component Board Structure and Processes). (Ibid., p.204.) The relations are explained by the effect of the selected variables on agency conflicts between external stakeholders (bondholders and shareholders) and management ('management disciplining' hypothesis) and potential conflicts between bondholders and shareholders ('wealth redistribution' hypothesis).

[49] Stein's (1988) model suggests that managers of sheltered firms are more likely to invest in R&D like projects. Harris (1990) shows that e.g. golden parachutes positively influences managerial investment in specialized human capital beneficial for the shareholders.

[50] This framework focuses on four major components of governance: Ownership Structure and Influence, Financial Stakeholder Rights and Relations, Financial transparency and Board Structure and Processes (Standard & Poor, 2002).

2.3.2. Expected relations

Shareholder rights. Consistent with the 'management disciplining' hypothesis, governance systems in favour of shareholders are likely to provide better monitoring and control over management leading to more effective and efficient managerial decision making (Ashbaugh-Skaife et al., 2006). This would lead to a negative relation between shareholder rights and the cost of debt. Following the management disciplining hypothesis, we expect that firms with high scores for shareholder rights benefit more from active monitoring shareholders and make it easier for shareholders to take corrective action when it is deemed necessary. These actions have a positive effect on firm value and a negative impact on the cost of debt.[51] However, if large shareholders exercise their influence over management to secure benefits for themselves i.e., they expropriate wealth from (minor shareholders and) bondholders then a positive relation is possible as well (see Bhojraj and Sengupta, 2003). Examples of wealth expropriation of bond holders are the approval of mergers or acquisitions that only serve the interests of shareholders (Asquith and Wizman, 1990; Warga and Welch, 1993; and Billet et al., 2004) and asset substitution (Jensen and Meckling, 1976). Given the definition of our shareholder rights measure (see section 2.) we expect a negative relation between Shareholder rights and the cost of debt.

Take over defences. Klock et al. (2005) give several explanations for theoretical negative as well as positive relations of the level of anti-takeover provisions with the cost of debt. In their empirical research they find a negative relation between takeover defences and the cost of debt. Ashbaugh-Skaife et al. (2006) find a positive effect between takeover defences and firms credit ratings (in other words a negative relation with the cost of debt) and Cremers et al. (2007) document an interaction effect between shareholder control and takeover defences. They find that shareholder control (proxied by large institutional block holders) is associated with higher (lower) yields if the firm is exposed to (protected from) takeovers. Given these prior results, we leave the prediction for Takeover defences unsigned.

[51] Evidence by e.g., Nesbitt (1994, 1995), shows that firm value increases, the years after firms are being targeted by an active institutional investor (CalPERS). Cremers et al. (2007) find a negative association between shareholder control and bond yields only if the firm is protected from takeovers. In our sample, the median score for takeover defences is 4.00, which implies that the median firm is protected more from takeover than the shareholders wish (the higher the score, the better the outcome for the shareholders of a possible bidding process).

Disclosure. Sengupta (1998) finds a negative association between the quality of corporate disclosure and bond yields. Firms that consistently make timely and informative disclosures are assumed less likely to withhold important and relevant information.[52] Ashbaugh-Skaife et al. (2007) document a positive relation between the degree of financial transparency and firm's credit rating. This indicates that the yield is assumed to be lower for firms with high financial transparency. We further argue that the relevance of Disclosure might be higher for firms with low shareholder rights than for firms with high shareholder rights. Following Bhojraj and Sengupta (2003), we distinguish agency risk and information risk. We hypothesize that if agency risk is low i.e., the quality of shareholder rights is high, then information risk is relatively low as well. However if agency risk is high i.e., the quality of shareholder rights is low, the need for a high quality of Disclosure is relatively high. We suggest that the more rights shareholders have to discipline management, the less important disclosure is for the providers of debt. This suggests that bondholders benefit from more shareholder rights, which makes the quality of disclosure less relevant. A higher quality of shareholder rights would lead to better managerial decision making and would benefit all providers of capital, holders of equity and debt. Alternatively, low shareholder rights imply higher risk for the providers of capital which explains the additional need for Disclosure in order to reduce the information risk. For convenience, we refer to this interaction between Shareholder rights and Disclosure as the '*share rights or disclose'* hypothesis. Management that does not share rights with shareholders i.e., firms that do not score high on Shareholder rights, have higher costs of debt if their score for Disclosure is low. Firms that do not share rights but communicate relatively well, are rewarded with a lower cost of debt.

Board structure. Bhojraj and Sengupta (2003), Anderson et al. (2004), and Ashbaugh-Skaife et al. (2006) document significant relations between board composition, board size, independence of committees and the cost of debt directly or indirectly. Given the criteria the score for Board structure is based on, in combination

[52] Related empirical research to information risk is Mansi, Maxwell and Miller (2006). They argue that analyst disagreement about future earnings represent a measure of uncertainty about firm value and find that firms with more diverse analysts forecasts on future earnings have lower credit ratings.

with prior results, we expect a negative relation between Board structure and the cost of debt.[53]

In short, our main hypothesis states that Disclosure leads to a lower cost of debt and is negatively influenced by Shareholder rights. We further expect a negative relation between the cost of debt and Shareholder rights and Board. We leave the relation with Takeover defences unsigned.

2.4. Model and data

2.4.1. Model

The influence of a firm's corporate governance quality on the cost of debt is examined by the following model[54]:

$$COD_{t+1} = f(COGO_t, \text{Control variables}) \quad (1)$$

where COD_{t+1} is the cost of debt issued in year t+1; as proxies for the Cost of Debt in year t+1 we use i) the yield to maturity (YIELD) on debt issued in year t+1; and ii) the yield spread (SPREAD) on the first day of the issue in year t+1; SPREAD is defined as the YIELD minus the yield to maturity of a government bond at the same date, in the same currency and of similar maturity; $COGO_t$ is the measure for the quality of corporate governance measured over a period finishing in year t; COGO reflects the quality of Shareholder rights, Takeover defences, Disclosure and Board structure or the total governance score.

The control variables in (1) comprise issue characteristics (issue size, maturity, and special features of the debt); issuer characteristics (leverage, profitability, interest coverage, size and risk); and market characteristics (treasury yield and the yield spread of Moody's Aaa bonds).[55] The definitions of the control variables and their predicted relation with the cost of debt are listed in Table 4.

[53] Millstein and MacAvoy (1998) find that firms that have a higher quality structure and performance of the supervisory board overall perform better than firms that have a low quality structure and performance. According to the management disciplining hypothesis this would imply a negative relation with the cost of debt.

[54] The model used by Sengupta (1998) serves as a basis for the method used in this chapter.

[55] The control variables have been selected by using prior research into the determinants of bond ratings and yields, see Fisher (1959), Jaffee (1975), Sorensen (1979), Boardman and McEnally (1981),

Table 4. Control variable definitions and predicted signs.

Variable	Definition and predicted sign
Issue characteristics	
LNSIZE	Logarithm of the issue amount; as a result of the size-effect the measure for the cost of debt is expected to be negatively related to the issue amount.
LNMATUR	Logarithm of the maturity; bonds with a longer maturity are expected to have a higher yield, because of the increased exposure to interest rate risk.
CALL	1 if the obligation is callable and 0 if the bond is not callable from the date of issue. The issuer of the bond will have to pay extra if the bond is callable; therefore a positive relation between CALL and the yield is expected.
CONVERT	1 if the obligation is convertible into shares, otherwise 0; convertible bonds are expected to have a lower yield, because part of the compensation for investors comes from the value of the option.
SUBORD	1 if the bond is subordinated, otherwise 0; subordinated bonds are expected to have a higher yield.
Issuer characteristics	
DE	Book value of long term interest bearing debt divided by the market value of equity at the end of year t; firms with a higher DE ratio are expected to have a higher yield.
MARGIN	Net income before preferred dividends in year t divided by net sales or revenues in year t; firms with a higher profit margin are expected to have a lower yield.
TIMES	The sum of net income before interest and tax expense of year t divided by interest expense in year t; firms with a higher ratio are expected to have a lower yield.
LNASSET	Logarithm of the total assets at the end of year t; large firms are expected to have a lower yield.
STDRETN	Standard deviation of the daily stock return in year t corrected for dividends and stock splits. Standard deviation is a measure of total risk of equity. We assume a positive relation with the yield.
Market characteristics	
TREASURY	Yield to maturity of a government bond at the same date, in the same currency and of similar maturity; we expect a positive relation between the yield of the issued bonds and the treasury bonds.
BC	Yield (on the date of the company's bond issue) on Moody's US Aaa-bonds minus the yield on US government bonds with the longest maturity (also on the date of issue); the yield and spread of the issued bond are expected to increase with an increase of BC. We assume this U.S. risk spread is related to the European risk spread.

We estimate the model using the SPREAD and the YIELD as proxy for the cost of debt respectively, where we exclude TREASURY in the first model. To capture the influence of the quality of shareholder rights on the relation between disclosure and the cost of debt we include the interaction term Shareholder rights x Disclosure.

Kidwell et al. (1984), Wilson and Howard (1984), Fung and Rudd (1986), Lamy and Thompson (1988), Feroz and Wilson (1992), Ziebart and Reiter (1992), Sengupta (1998), and Bhojraj and Sengupta (2003).

The YIELD model we estimate including the interaction term[56]:

$$YIELD = \alpha_1 Shareholder\ rights + \alpha_2 Takeover\ defences + \alpha_3 Disclosure + \alpha_4 Board + \alpha_5 Shareholder\ rights\ x\ Disclosure + \alpha_6 DE + \alpha_7 MARGIN + \alpha_8 TIMES + \alpha_9 LASSET + \alpha_{10} STDRETN + \alpha_{11} LSIZE + \alpha_{12} LMATUR + \alpha_{13} CALL + \alpha_{14} CONVERT + \alpha_{15} SUBORD + \alpha_{16} TREASURY + \alpha_{17} BC + YRDUMMIES + \varepsilon \quad (2)$$

The expected signs of the governance coefficients are: $\alpha_1 < 0$, α_2 unsigned, $\alpha_3 < 0$, $\alpha_4 < 0$, and $\alpha_5 > 0$. Since we expect that the relevance of disclosure decreases as shareholders rights increase, we expect a positive sign for the coefficient of the interaction term Shareholder rights x Disclosure. We include year dummies since a positive trend in governance ratings (see section 2) and a negative trend in yields and or spreads might lead to spurious results.

2.4.2. Data

The original dataset consists of corporate governance ratings for European companies for the period 2000-2004. The corporate governance quality of the firms from the dataset has been measured by means of the Deminor corporate governance ratings for the years 2000-2004. Year t ratings are each year published at the beginning of year t+1. The ratings by Deminor rating as well as the research are based on publicly available information. We excluded financial firms (Worldscope Industry Group code 4300) as their financing decisions are affected by somewhat different factors than those of the industrial firms (Sengupta, 1998) and some accounting variables of financial firms are difficult to compare to those of non financial firms.

Information on bond issues in 2001-2005 was obtained from Bloomberg. Companies that issued bonds in either Japanese Yen or a Floating Rate Note (FRN) were removed because of their strongly deviating yields. The yield of the JPY-denominated bonds is low, and the yield of the FRN fluctuates along with the market interest rate. This complicates a comparison to the other observations. We further excluded Royal Dutch Shell, Unilever since no reliable data could be obtained about the identity of the issuing entity; an issue by Danone because the issue was in CZK and OTE because we could not find reliable data of this firm. All of this finally

[56] The firm and time subscripts are not shown.

resulted in a dataset consisting of 319 issues by 156 firms from 16 European countries.[57]

The issue characteristics of the 319 bonds (Size, Maturity, Callable, Convertible and Subordinated) have been obtained from Bloomberg. All the issue amounts (size) have been converted into Euro, using several exchange rates on the issue date.

The issuer characteristics are obtained from various sources. An overview of the variables used and their corresponding source and code can be found in Appendix A.

Market condition TREASURY is the yield of a comparable government bond (same maturity) in the same currency of the issued bond. European government bonds were used for bond issues in euros (source Ecowin). To calculate BC, Moody's Aaa-rated bonds were used as well as U.S. government bonds with the longest maturity. TREASURY and BC were calculated on the day the particular company issued its debt.

To reduce the weight of outliers, we winsorize the data except the governance variables. Observations exceeding the mean plus or minus three times the standard deviation have been set to this value.

Table B1 in Appendix B provides descriptive statistics for the variables we use throughout the analysis. Included are the mean, median, standard deviation and the 25th and 75th percentile values. The table shows that the mean YIELD is 4.88% whereas the mean SPREAD is 0.78%. The median issue size €500 million and the median time to maturity 7 years. The median size of the firms (total assets in book value) is about € 20 billion.

Table B2 in Appendix B, shows Pearson correlation coefficients among the variables. The correlation coefficients between the independent variables are all far below 80% except Disclosure and Board. The correlation between these governance measures is 80%. Because of this high correlation we run our models i) including the additional interaction term Board structure x Shareholder rights and ii) without Board structure. As will be shown in the next section, the results are not influenced by this alternate specification.

[57] Austria (2 issues), Belgium (4), Switzerland (17), Finland (4), France (78), Germany (43), Greece (1), Ireland (2), Italy (15), Luxembourg (2), The Netherlands (20), Norway (4), Portugal (1), Spain (18), Sweden (15), United Kingdom (93).

2.5. Results

The results for the SPREAD and YIELD model are given in Table 5 and 6 respectively. Model [1] includes the interaction term Disclosure x Shareholder rights and presents the results of our main hypothesis. The results show that the coefficients for Disclosure and Disclosure x Shareholder have the expected sign and are statistical significant (based on a two-tailed test). The coefficient for Disclosure in the SPREAD model is -0.288 and -0.295 in the YIELD model, while the coefficient for the interaction term is 0.041 and 0.043 respectively. The coefficients are statistically and economically significant. The results indicate for instance that the spread is approximately 7 basis points lower (-0.288 + 5.31 x 0.041) for each additional score on disclosure for firms from the lower quartile of the governance measure shareholder rights.[58] Model [2] and [3] provide the results without interaction term and show no relation between governance and the cost of debt, since the interaction is not captured in these models. However if we focus on the 50% firms with the lowest scores for shareholder rights, we again find a negative relation between Disclosure and the spread and yield respectively. The coefficient is -0.128 and -0.123 for the SPREAD and YIELD model respectively (see models [5] in Table 5 and 6). If we focus on firms with an even lower quality for shareholder rights, the negative effect of disclosure on the spread increases further. For example, we find that the credit spread for firms with shareholder rights lower than 5, decreases with approximately 70 basis points if we move within this category from lower quartile to the upper quartile of the governance measure disclosure.[59]

We do not find evidence for any relation between Takeover defences and the cost of debt nor between Board and the cost of debt. The coefficient for Takeover defences and Board are highly insignificant for the SPREAD model as well as the YIELD model.

[58] The 25% observation for the governance measure Shareholder rights, is 5.31.

[59] The results of this model are not published. The disclosure score for firms with a shareholder rights score lower than 5 is for the first quartile 4.6 and for the fourth quartile 6.9.

Table 5. Results SPREAD model

Model [1] includes the interaction term Disclosure x Shareholder rights and tests our 'share rights or disclose' hypothesis. Models [2] and [3] present the results for the total sample whereas the sample of models [4] and [5] include observations if shareholder rights < 6.655 (median) only. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	Expected sign	[1]	[2]	[3]	[4]	[5]
Corporate governance						
Shareholder rights	-	-0.246*		-0.013		-0.088
		(0.129)		(0.040)		(0.063)
Takeover defences	?	-0.002		0.004		-0.007
		(0.016)		(0.016)		(0.021)
Board structure	-	0.016		0.018		0.090
		(0.050)		(0.050)		(0.070)
Disclosure	-	-0.288**		-0.036		-0.128**
		(0.130)		(0.050)		(0.062)
Disclosure x Shareholder rights	+	0.041**				
		(0.020)				
Corporate governance total	-		-0.002		-0.015	
			(0.008)		(0.015)	
Issue characteristics						
LNSIZE	-	0.010	0.009	0.013	-0.030	-0.021
		(0.044)	(0.041)	(0.044)	(0.069)	(0.072)
LNMATUR	+	0.362***	0.338***	0.344***	0.313**	0.338***
		(0.115)	(0.113)	(0.114)	(0.125)	(0.129)
CALL	+	-0.247	-0.209	-0.203	-0.826	-0.882*
		(0.249)	(0.243)	(0.247)	(0.499)	(0.521)
CONV	-	-2.608***	-2.611***	-2.615***	-1.950***	-1.946***
		(0.257)	(0.258)	(0.260)	(0.468)	(0.474)
SUBORD	+	0.547**	0.530**	0.521**	0.123	0.123
		(0.254)	(0.253)	(0.254)	(0.217)	(0.205)
Firm characteristics						
DE	+	0.512***	0.518***	0.527***	0.755***	0.813***
		(0.115)	(0.111)	(0.114)	(0.205)	(0.205)
MARGIN	-	-0.011	-0.010	-0.009	-0.013	-0.015
		(0.008)	(0.008)	(0.008)	(0.014)	(0.015)
TIMES	-	0.004	0.005	0.005	0.018	0.021
		(0.010)	(0.010)	(0.010)	(0.018)	(0.018)
LNASSETS	-	-0.179***	-0.189***	-0.185***	-0.246***	-0.236**
		(0.048)	(0.048)	(0.049)	(0.092)	(0.095)
STDRETN	+	0.525***	0.519***	0.526***	0.521***	0.520***
		(0.092)	(0.093)	(0.092)	(0.141)	(0.140)
Market characteristics						
Treasury						
BC	+	0.352	0.333	0.338	0.309	0.349
		(0.268)	(0.277)	(0.275)	(0.344)	(0.338)
Year dummies						
2001		4.057***	2.822**	2.721**	5.137**	5.032**
		(1.495)	(1.313)	(1.329)	(2.438)	(2.476)
2002		4.199***	2.928**	2.845**	5.184**	5.107**
		(1.472)	(1.312)	(1.325)	(2.486)	(2.535)
2003		4.204***	2.925**	2.858**	5.110**	5.094**
		(1.469)	(1.341)	(1.340)	(2.525)	(2.519)
2004		4.167***	2.870**	2.824**	5.248**	5.326**
		(1.462)	(1.334)	(1.330)	(2.564)	(2.559)
2005		4.523***	3.236**	3.198**	5.467**	5.539**
		(1.472)	(1.340)	(1.334)	(2.498)	(2.487)
Adjusted R^2		0.521	0.520	0.516	0.390	0.393
Sample Size		319	319	319	159	159

Table 6. Results YIELD model

Model [1] includes the interaction term disclosure x shareholder rights and tests our 'share rights or disclose' hypothesis. Models [2] and [3] present the results for the total sample whereas the sample of models [4] and [5] include observations if shareholder rights < 6.655 (median) only. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	Expected sign	[1]	[2]	[3]	[4]	[5]
Corporate governance						
Shareholder rights	-	-0.253*		-0.013		-0.075
		(0.132)		(0.042)		(0.066)
Takeover defences	?	0.003		0.009		-0.007
		(0.018)		(0.017)		(0.022)
Board structure	-	0.020		0.022		0.083
		(0.051)		(0.051)		(0.071)
Disclosure	-	-0.295**		-0.036		-0.123*
		(0.130)		(0.050)		(0.064)
Disclosure x Shareholder rights	+	0.043**				
		(0.020)				
Corporate governance total	-		0.001		-0.014	
			(0.008)		(0.016)	
Issue characteristics						
LNSIZE	-	0.009	0.007	0.012	-0.035	-0.026
		(0.046)	(0.043)	(0.046)	(0.070)	(0.073)
LNMATUR	+	0.442***	0.426***	0.431***	0.330**	0.341**
		(0.128)	(0.127)	(0.129)	(0.153)	(0.157)
CALL	+	-0.274	-0.232	-0.226	-0.867	-0.928*
		(0.269)	(0.262)	(0.266)	(0.537)	(0.558)
CONV	-	-2.810***	-2.815***	-2.819***	-2.038***	-2.035***
		(0.291)	(0.291)	(0.294)	(0.491)	(0.498)
SUBORD	+	0.707***	0.695***	0.684**	0.237	0.222
		(0.265)	(0.266)	(0.265)	(0.259)	(0.241)
Firm characteristics						
DE	+	0.541***	0.544***	0.555***	0.774***	0.831***
		(0.118)	(0.115)	(0.118)	(0.215)	(0.217)
MARGIN	-	-0.013	-0.011	-0.011	-0.012	-0.014
		(0.008)	(0.008)	(0.009)	(0.015)	(0.016)
TIMES	-	0.002	0.003	0.003	0.013	0.017
		(0.010)	(0.010)	(0.010)	(0.018)	(0.019)
LNASSETS	-	-0.203***	-0.214***	-0.209***	-0.271***	-0.261***
		(0.049)	(0.050)	(0.051)	(0.093)	(0.097)
STDRETN	+	0.526***	0.518***	0.526***	0.523***	0.526***
		(0.098)	(0.099)	(0.097)	(0.144)	(0.142)
Market characteristics						
Treasury	+	0.816***	0.799***	0.802***	0.892***	0.919***
		(0.087)	(0.090)	(0.090)	(0.142)	(0.143)
BC	+	0.266	0.239	0.246	0.283	0.326
		(0.263)	(0.272)	(0.270)	(0.339)	(0.333)
Year dummies						
2001		5.495***	4.293***	4.177***	6.306**	6.075**
		(1.573)	(1.447)	(1.457)	(2.665)	(2.707)
2002		5.575***	4.332***	4.238***	6.367**	6.163**
		(1.556)	(1.445)	(1.452)	(2.716)	(2.769)
2003		5.407***	4.134***	4.062***	6.164**	6.044**
		(1.536)	(1.441)	(1.440)	(2.712)	(2.713)
2004		5.422***	4.132***	4.084***	6.330**	6.293**
		(1.536)	(1.443)	(1.438)	(2.756)	(2.756)
2005		5.662***	4.369***	4.333***	6.506**	6.479**
		(1.538)	(1.430)	(1.425)	(2.675)	(2.671)
Adjusted R^2		0.689	0.688	0.686	0.626	0.624
Sample Size		319	319	319	159	159

The total governance score does not reveal any relation with the cost of debt. This confirms the idea that corporate governance measures that combine different components obscure the separate effects and that models that focus on one of the components only suffer from the fact that relevant variables are omitted.

Since the correlation between Disclosure and governance measure Board structure is high (0.80), we estimate the main model again i) including an additional interaction term Board structure x shareholder rights (see models [2] and [4] in Table 7) and ii) without the governance measure Board structure (see models [1] and [3] in Table 7). Models [1] and [2] show the results for the SPREAD and models [3] and [4] for the YIELD as independent variable. The results show that the main hypothesis is still confirmed. The coefficients for Disclosure and the interaction term Disclosure x Shareholder rights are significant, have the expected sign and are comparable with the coefficients presented in Tables 5 and 6.[60]

All significant coefficients for the included control variables have their expected signs. Bond issues with a longer maturity have a higher cost of debt, as well as subordinate bonds. Convertibles have a lower cost. The coefficient for the subordinate dummy is 0.547 for SPREAD model [1] in Table 5 and 0.707 for YIELD model [1] in Table 6. The spread and yield for convertibles are respectively 2.608% and 2.810% lower compared with non convertible bonds. The coefficients for firm characteristics leverage, firm size and risk have the expected sign and are highly significant. Market characteristic government yield is significant in the yield model.[61]

In general, the estimated coefficients on Disclosure and the interaction term between Disclosure and Shareholder rights support our 'disclose or share rights' hypothesis that a lower quality of shareholder rights increases the importance of the quality of disclosure for the bondholders.

[60] If we include additional dummies for the industries Transportation, Tobacco, Metal producers, Machinery and equipment, Construction and Beverages and a country dummy for UK, the main hypothesis is still confirmed, although the significance level then is 10% (on a two sided basis).

[61] The magnitude of the coefficients of the significant control variables are comparable to those reported in Sengupta (1998). For instance, Sengupta reports for his YIELD model 0.434 for the subordinate dummy, and -2.450 for the convertible dummy.

Table 7. Alternative specifications SPREAD and YIELD model
Models [1] and [3] present the results for the SPREAD and YIELD models respectively where board structure is excluded from the model. Models [2] and [4] show the results for the SPREAD and YIELD models respectively where the additional interaction term board structure x shareholder rights is included. OLS regression is used with White's heteroskedasticity consistent standard errors. Standard errors are presented between parentheses. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Variables	Expected sign	[1]	[2]	[3]	[4]
Corporate governance					
Shareholder rights	-	-0.248*	-0.243*	-0.256*	-0.252*
		(0.128)	(0.131)	(0.131)	(0.135)
Takeover defences	?	-0.001	-0.002	0.004	0.003
		(0.016)	(0.016)	(0.017)	(0.018)
Board structure	-		0.142		0.086
			(0.229)		(0.236)
Board structure x Shareholder rights	+		-0.020		-0.010
			(0.034)		(0.035)
Disclosure	-	-0.276**	-0.385**	-0.281**	-0.347*
		(0.131)	(0.178)	(0.133)	(0.181)
Disclosure x Shareholder rights	+	0.042**	0.057**	0.043**	0.051*
		(0.020)	(0.028)	(0.020)	(0.029)
Issue characteristics					
LNSIZE	-	0.010	0.008	0.009	0.008
		(0.044)	(0.045)	(0.046)	(0.047)
LNMATUR	+	0.361***	0.357***	0.442***	0.439***
		(0.115)	(0.116)	(0.128)	(0.129)
CALL	+	-0.245	-0.245	-0.271	-0.273
		(0.249)	(0.250)	(0.269)	(0.270)
CONV	-	-2.607***	-2.613***	-2.809***	-2.812***
		(0.257)	(0.258)	(0.291)	(0.292)
SUBORD	+	0.553**	0.537**	0.715***	0.701***
		(0.253)	(0.256)	(0.265)	(0.267)
Firm characteristics					
DE	+	0.508***	0.511***	0.535***	0.541***
		(0.113)	(0.115)	(0.117)	(0.118)
MARGIN	-	-0.011	-0.011	-0.013	-0.013
		(0.008)	(0.008)	(0.008)	(0.008)
TIMES	-	0.004	0.004	0.002	0.002
		(0.010)	(0.010)	(0.010)	(0.010)
LNASSETS	-	-0.181***	-0.184***	-0.205***	-0.206***
		(0.048)	(0.048)	(0.050)	(0.050)
STDRETN	+	0.521***	0.527***	0.520***	0.527***
		(0.094)	(0.092)	(0.100)	(0.098)
Market characteristics					
Treasury	+			0.815***	0.817***
				(0.087)	(0.087)
BC	+	0.354	0.351	0.268	0.266
		(0.269)	(0.268)	(0.263)	(0.263)

Table 7 *(Continued)*

Year dummies	[1]	[2]	[3]	[4]
2001	4.126***	4.187***	5.582***	5.560***
	(1.501)	(1.480)	(1.580)	(1.555)
2002	4.263***	4.326***	5.656***	5.639***
	(1.481)	(1.461)	(1.566)	(1.543)
2003	4.269***	4.329***	5.488***	5.471***
	(1.482)	(1.454)	(1.548)	(1.517)
2004	4.230***	4.297***	5.502***	5.489***
	(1.473)	(1.447)	(1.547)	(1.516)
2005	4.587***	4.656***	5.742***	5.730***
	(1.482)	(1.456)	(1.545)	(1.516)
Adjusted R^2	0.522	0.520	0.690	0.688
Sample Size	319	319	319	319

2.6. Summary

We document a significant negative relation between the corporate governance measure Disclosure and the cost of debt, but only if Shareholder rights are low. This finding is new and confirms our 'share rights or disclose' hypothesis, which states that the higher the quality of shareholder rights are, the lower are the agency conflicts between management and the providers of capital (following the 'management disciplining' hypothesis), with a lower level of 'information risk' and need for disclosure as a result. Information risk is lower then, because i) shareholders will prevent managers to make decisions that will shift firm's distribution of future cash flows downward and ii) shareholders can make corrective actions afterwards, if needed. On the other hand, if shareholder rights are low, and information risk is high, then providers of debt reward firms with a lower cost of debt if these firms give them more insight in their financial situation and governance structure i.e., if their quality of disclosure is high. Alternatively, if shareholder rights are low and the quality of disclosure is low, then the firm is as a black box and the perceived risk by the bondholders is relatively high. We do not present evidence in support of any relation between Takeover defences nor Board and the cost of debt.

Appendix A. Data sources and codes

Table A1 shows an overview of all the variables and their corresponding source and code. The extra description provides extra codes if those codes were necessary for the acquiring of the particular variable.

Table A.1 Sources and Codes

Variable	Source	Code	Extra description
Yield	Bloomberg		
COGO rating	Deminor Ratings	Deminor Ratings	
Shareholder rights	Deminor Ratings	DEM1	
Takeover defences	Deminor Ratings	DEM2	
Disclosure	Deminor Ratings	DEM3	
Board structure	Deminor Ratings	DEM4	
Size	Bloomberg		
Maturity	Bloomberg		
Call	Bloomberg		
Convert	Bloomberg		
Subord	Bloomberg		
Long-term debt	Thomson financials	TF.TotalLTDebt	
Market value equity	Bloomberg	MKT_VAL_OF_EQY	
Total assets	Thomson financials	TF.TotalAssets	
Margin	Worldscope	WS.NetMargin	
Times	Worldscope	WS.FixedChargeCoverageRatio	
STDRETN	Bloomberg	STDRETN	HR (for Historical Returns)
TREASURY	Ecowin		
Yield US Aaa	Bloomberg	MOODCAAA	
Exchange rates	Bloomberg	CRNCY	WCV (for currency codes)

Appendix B. Descriptive statistics and correlations

Table B.1 Summary statistics
This table provides summary statistics of the test variables of 319 bond issues over the period 2001-2005. The variables are defined as follows: YIELD is the yield to maturity at issue date; SPREAD is the difference between YIELD and TREASURY; LNSIZE is natural log of the size of the issued bonds in euros; LNMATURITY is the natural log of number of years to maturity of the issued bonds; CALL = 1 if the debt is callable, 0 otherwise; CONVERT = 1 if the debt is convertible, 0 otherwise; SUBORD = 1 if the debt is subordinate, 0 otherwise; D/E is the book value of long term interest bearing debt at the end of year t divided by the market value of common stock at the end of year t; MARGIN the sum of net income before extraordinary items and equity income of year t divided by net sales in year t; TIMES the sum of net income before interest and tax expense of year t divided by interest expense in year t; LNASSET is the natural log of book value of total assets at the end of year t in euros; STDRETN is the standard deviation of the daily stock return in year t corrected for dividends and stock splits; TREASURY is the yield (on the bond issue date) of government bonds in the same currency and with approximately the same maturity as the issued bond; BC is the yield (on the date of the company's bond issue) on Moody's Aaa-bonds minus the yield on U.S. government bonds with the longest maturity (also on the date of issue); Shareholder rights, Takeover defences, Disclosure and Board are Deminor's corporate governance scores for the four categories; Governance total is the sum of the four governance scores.

Variables	Mean	Standard deviation	Median	25%	75%
YIELD	4.88	1.41	4.93	4.08	5.78
SPREAD	0.78	1.09	0.78	0.45	1.25
LNSIZE	19.84	1.08	20.03	19.52	20.44
LNMATURITY	2.02	0.47	1.95	1.61	2.30
CALL	0.09	0.28	0.00	0.00	0.00
CONVERT	0.09	0.29	0.00	0.00	0.00
SUBORD	0.05	0.22	0.00	0.00	0.00
D/E	0.47	0.44	0.34	0.14	0.64
MARGIN	5.18	9.62	5.36	2.25	8.82
TIMES	4.82	6.43	3.93	2.47	6.74
LNASSET	23.76	1.03	23.71	23.04	24.47
STDRETN	2.33	0.92	2.20	1.73	2.71
TREASURY	4.10	0.79	4.14	3.44	4.77
BC	0.94	0.42	0.69	0.59	1.16
Shareholder rights	6.35	1.36	6.66	5.31	7.39
Takeover defences	4.12	3.74	4.00	0.00	8.00
Disclosure	6.13	1.54	6.44	5.06	7.41
Board	5.07	1.55	5.38	3.75	6.45
Governance total	21.68	6.32	20.84	16.57	27.46

Table B.2 Correlations

This table presents the Pearson correlation matrix. The variables are defined as follows: YIELD is the yield to maturity at issue date; SPREAD is the difference between YIELD and TREASURY; LNSIZE is natural log of the size of the issued bonds in euros; LNMATURITY is the natural log of number of years to maturity of the issued bonds; CALL = 1 if the debt is callable, 0 otherwise; CONVERT = 1 if the debt is convertible, 0 otherwise; SUBORD = 1 if the debt is subordinate, 0 otherwise; D/E is the book value of long term interest bearing debt at the end of year t divided by the market value of common stock at the end of year t; MARGIN the sum of net income before extraordinary items and equity income of year t divided by net sales in year t; TIMES the sum of net income before interest and tax expense of year t divided by interest expense in year t; LNASSET is the natural log of book value of total assets at the end of year t in euros; STDRETN is the standard deviation of the daily stock return in year t corrected for dividends and stock splits; TREASURY is the yield (on the bond issue date) of government bonds in the same currency and with approximately the same maturity as the issued bond; BC is the yield (on the date of the company's bond issue) on Moody's Aaa-bonds minus the yield on U.S. government bonds with the longest maturity (also on the date of issue); Shareholder rights, Takeover defences, Disclosure and Board are Deminor's corporate governance scores for the four categories; Governance total is the sum of the four governance scores.

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
YIELD	A	1.00																		
SPREAD	B	0.83	1.00																	
LNSIZE	C	0.08	0.07	1.00																
LNMATURITY	D	0.26	0.11	0.12	1.00															
CALL	E	-0.06	-0.13	-0.06	0.18	1.00														
CONVERT	F	-0.43	-0.50	0.05	0.03	0.21	1.00													
SUBORD	G	0.26	0.21	-0.05	0.02	-0.02	-0.02	1.00												
D/E	H	0.17	0.28	-0.01	0.07	0.05	-0.05	0.13	1.00											
MARGIN	I	-0.01	-0.10	-0.06	0.09	-0.12	-0.26	-0.06	-0.26	1.00										
TIMES	J	-0.15	-0.16	-0.04	-0.03	0.00	-0.19	-0.10	-0.31	0.62	1.00									
LNASSET	K	-0.01	0.05	0.07	-0.06	-0.07	-0.23	-0.06	0.30	-0.16	0.03	1.00								
STDRETN	L	0.21	0.20	0.21	-0.04	0.06	0.41	0.12	0.16	-0.48	-0.44	-0.04	1.00							
TREASURY	M	0.57	0.03	0.05	0.33	0.10	-0.02	0.13	-0.12	0.13	-0.02	-0.08	0.09	1.00						
BC	N	0.38	0.21	0.07	-0.03	-0.11	-0.13	0.05	-0.07	0.11	0.01	0.11	0.16	0.40	1.00					
Shareholder rights	O	-0.05	-0.04	0.04	0.00	0.04	0.03	-0.02	0.04	-0.12	0.02	-0.02	-0.06	-0.03	-0.11	1.00				
Takeover defences	P	0.04	-0.02	-0.07	-0.09	-0.01	0.02	0.03	-0.13	-0.03	-0.02	-0.13	0.00	0.09	0.05	0.49	1.00			
Disclosure	Q	-0.13	-0.07	0.02	0.06	0.08	-0.05	-0.05	-0.01	0.02	0.00	-0.01	-0.18	-0.14	-0.31	0.19	0.35	1.00		
Board	R	-0.09	-0.08	-0.03	0.03	0.06	-0.07	0.01	-0.16	0.10	0.04	-0.12	-0.25	-0.06	-0.17	0.13	0.43	0.80	1.00	
Governance total	S	-0.04	-0.06	-0.04	-0.03	0.04	-0.01	0.00	-0.11	-0.02	0.00	-0.11	-0.12	-0.01	-0.11	0.59	0.89	0.69	0.73	1.00

Chapter 3

Optimal capital structure:
reflections on economic and other values[62]

Abstract

Despite a vast literature on the capital structure of the firm there still is a big gap between theory and practice. Starting with the seminal work by Modigliani and Miller, much attention has been paid to the optimality of capital structure from the shareholders' point of view. Over the last few decades studies have been produced on the effect of other stakeholders' interests on capital structure. Well-known examples are the interests of customers who receive product or service guarantees from the company. Another area that has received considerable attention is the relation between managerial incentives and capital structure. Furthermore, the issue of corporate control and, related, the issue of corporate governance, receive a lion's part of the more recent academic attention for capital structure decisions. From all these studies, one thing is clear: The capital structure decision (or rather, the management of the capital structure over time) has to deal with more issues than the maximization of the firm's market value alone. In this chapter, we give an overview of the different objectives and considerations that have been proposed in the literature. We show that capital structure decisions can be framed as multiple criteria decision problems which can then benefit from multiple criteria decision support tools that are widely available.

3.1. Introduction

Despite a vast literature on the capital structure of the firm (see Harris and Raviv, 1991, and Copeland et al., 2005, for overviews) there still is a big gap between theory and practice (see e.g. Cools, 1993, Tempelaar, 1991, Boot and Cools, 1997, Graham and Harvey, 2001, Brav et al., 2005). Starting with the seminal work by Modigliani

[62] This chapter is based on Schauten and Spronk (2006) and is presented at the XXXIX'th meeting of the EURO Working Group on Financial Modelling, CERAM, Antibes, France, November 2006. We thank J.O. Soares of the Technical University in Lisbon for his useful suggestions.

and Miller (1958, 1963), much attention has been paid to the optimality of capital structure from the shareholders' point of view.

Over the last few decades studies have been produced on the effect of other stakeholders' interests on capital structure. Well-known examples are the interests of customers who receive product or service guarantees from the company (see e.g. Grinblatt and Titman, 2002). Another area that has received considerable attention is the relation between managerial incentives and capital structure (Ibid.). Furthermore, the issue of corporate control[63] (see Jensen and Ruback, 1983) and, related, the issue of corporate governance[64] (see Shleifer and Vishney, 1997), receive a lion's part of the more recent academic attention for capital structure decisions.

From all these studies, one thing is clear: The capital structure decision (or rather, the management of the capital structure over time) involves more issues than the maximization of the firm's market value alone. In this chapter, we give an overview of the different objectives and considerations that have been proposed in the literature. We make a distinction between two broadly defined situations. The first is the traditional case of the firm that strives for the maximization of the value of the shares for the current shareholders. Whenever other considerations than value maximization enter capital structure decisions, these considerations have to be instrumental to the goal of value maximization. The second case concerns the firm that explicitly chooses for more objectives than value maximization alone. This may be because the shareholders adopt a multiple stakeholders approach or because of a different ownership structure than the usual corporate structure dominating finance literature. An example of the latter is the co-operation, a legal entity which can be found, in

[63] Corporate Control is defined by Jensen and Ruback (1983) as the rights to determine the management of corporate resources - that is, the rights to hire, fire and set the compensation of top-level managers.

[64] According to Shleifer and Vishney (1997) corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment. A broader definition is given by the OECD: 'Corporate governance is the system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as, the board, managers, shareholders and other stakeholders, and spells out the rules and procedures fro making decisions on corporate affairs. By doing this, it also provides the structure through which the company objectives are set, and the means of attaining those objectives and monitoring performance.'

among others, many European countries. For a discussion on why firms are facing multiple goals, we refer to Hallerbach and Spronk (2002a, 2002b).

In Section 2 we will describe objectives and considerations that, directly or indirectly, clearly help to create and maintain a capital structure which is 'optimal' for the value maximizing firm. In Section 3 we describe other objectives and considerations. Some of these may have a clear negative effect on economic value, others may be neutral and in some cases the effect on economic value is not always completely clear. Section 4 shows how, for both cases, capital structure decisions can be framed as multiple criteria decision problems which can then benefit from multiple criteria decision support tools. Section 5 gives a brief summary.

3.2. Maximizing shareholder value

According to the neoclassical view on the role of the firm, the firm has one single objective: maximization of shareholder value. Shareholders possess the property rights of the firm and are thus entitled to decide what the firm should aim for. Since shareholders only have one objective in mind—wealth maximization—the goal of the firm is maximization of the firm's contribution to the financial wealth of its shareholders. The firm can accomplish this by investing in projects with a positive net present value.[65] Part of shareholder value is determined by the corporate financing decision.[66] Two theories about the capital structure of the firm—the trade-off theory and the pecking order theory—assume shareholder wealth maximization as the one and only corporate objective. We will discuss both theories including several market value related extensions. Based on this discussion we formulate a list of criteria that is relevant for the corporate financing decision in this essentially neoclassical view.

The original proposition I of Miller and Modigliani (1958) states that in a perfect capital market the equilibrium market value of a firm is independent of its capital structure, i.e. the debt-equity ratio.[67] If proposition I does not hold then *arbitrage* will

[65] This view is seen as an ideal by many; see for example Jensen (2001).

[66] Financial decisions that influence the value of the firm are the capital budgeting decision and the corporate financing decision. In this chapter we focus on the corporate financing decision made by the firm.

[67] As Miller and Modigliani (1958) formulate their proposition I in a perfect capital market: 'The market value of any firm is independent of its capital structure and is given by capitalizing its expected return (i.e. cash flows) at the ρ_k (i.e. capitalization rate) appropriate to its class.' With as a result of the

take place. Investors will buy shares of the undervalued firm and sell shares of the overvalued firm in such a way that identical income streams are obtained. As investors exploit these arbitrage opportunities, the price of the overvalued shares will fall and that of the undervalued shares will rise, until both prices are equal.

When corporate taxes are introduced, proposition I changes dramatically. Miller and Modigliani (1958, 1963) show that in a world with corporate tax the value of firms is among others a function of leverage. When interest payments become tax deductible and payments to shareholders are not, the capital structure that maximizes firm value involves a hundred percent debt financing. By increasing leverage, the payments to the government are reduced with a higher cash flow for the providers of capital as a result. The difference between the present value of the taxes paid by an unlevered firm (G_u) and an identical levered firm (G_l) is the present value of tax shields (*PVTS*). Figure 1 depicts the total value of an unlevered and a levered firm. The higher leverage, the lower G_l, the higher G_u - G_l (= *PVTS*). [68]

Figure 1. Pre-tax value of the firm
This figure presents the expanded balance sheet of the unlevered and the levered firm with on the left hand side the pre-tax value of the firm and on the right hand side the present value of the tax payments to the government by the unlevered firm (G_u) and the levered firm (G_l), the market value of equity of the unlevered firm (E_u) and the levered firm (E_l) and the market value of debt of the levered firm (D).

Balance sheet of the unlevered firm

Pre-tax firm value	PV government's claim (G_u)
	PV residual claim equityholders (E_u)
Total value (TV)	Total value (TV)

Balance sheet of the levered firm

Pre-tax firm value	PV government's claim (G_l)
	PV residual claim equityholders (E_l)
	Debt (D)
Total value (TV)	Total value (TV)

former 'That is, the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class.' (Miller and Modigliani, 1958, p.268-269.)

[68] See Chapter 5 for a derivation of the cost of tax for the government. Figure 1 in this chapter is an exact copy of Figure 1 in Chapter 5.

In the traditional trade-off models of optimal capital structure it is assumed that firms balance the marginal present value of interest tax shields[69] against the marginal direct costs of financial distress or direct bankruptcy costs.[70] Additional factors can be included in this trade-off framework. Other costs than *direct* costs of financial distress are agency costs of debt (Jensen and Meckling, 1976). Often cited examples of agency costs of debt are the underinvestment problem (Myers, 1977)[71], the asset substitution problem (Jensen and Meckling, 1976 and Galai and Masulis, 1976), the 'play for time' game by managers, the 'unexpected increase of leverage (combined with an equivalent pay out to stockholders to make to increase the impact)', the 'refusal to contribute equity capital' and the 'cash in and run' game (Brealey et al., 2006). These problems are caused by the difference of interest between equity and debt holders and could be seen as part of the *indirect* costs of financial distress. Another benefit of debt—besides the PVTS—is the reduction of agency costs between managers and external holders of equity (Jensen and Meckling, 1976, and Jensen, 1986, 1989). Jensen and Meckling (1976) argue that debt, by allowing larger managerial residual claims because the need for external equity is reduced by the use of debt, increases managerial effort to work. In addition, Jensen (1986) argues that high leverage reduces free cash (flow) with less resources to waste on unprofitable investments as a result.[72] The agency costs between management and external equity are often left out

[69] Miller (1977) argued that under certain conditions, the corporate tax advantage of debt may be offset by tax disadvantages at the personal level, making leverage from a tax shield perspective irrelevant.

[70] Direct bankruptcy costs are the costs of the use of the legal mechanism allowing creditors to take over a firm when it defaults (Brealey et al., 2006). Direct bankruptcy costs consist of administrative costs and legal fees. Robicheck and Myers (1966) and Baxter (1967) suggest that the cost associated with bankruptcy might represent the missing element in the theory of Miller and Modigliani. However, Miller and Modigliani (1958) already remark that reorganization involves costs and might have unfavorable effects on earnings prospects, with a discount on the value of heavily indebted companies as a result, see Ibid. footnote 18.

[71] The underinvestment problem is sometimes referred to as the debt overhang problem (Grinblatt and Titman, 2002, p.563).

[72] Jensen predicts a positive relation between leverage and profitability if the market for corporate control is effective and forces firms to commit to paying out cash by levering up. However, if this market is ineffective, i.e. managers prefer to avoid the disciplining role of debt, a negative relation between profitability and leverage could be expected (Rajan and Zingales, 1995). The free cash flow theory of Jensen could then be presented as separate theory that assists the trade-off theory in

the trade-off theory since it assumes managers not acting on behalf of the shareholders (only) which is an assumption of the traditional trade-off theory.

In Myers' (1984) and Myers and Majluf's (1984) pecking order model there is no optimal capital structure.[73] Instead, because of asymmetric information and signaling problems associated with external financing, firm's financing policies follow a hierarchy, with a preference for internal over external finance, and for debt over equity.[74] A strict interpretation of this model suggests that firms do not aim at a target debt ratio. Instead, the debt ratio is just the cumulative result of hierarchical financing over time. (See Shyum-Sunder and Myers, 1999.) Original examples of signaling models are the models of Ross (1977) and Leland and Pyle (1977). Ross (1977) suggests that higher financial leverage can be used by managers to signal an optimistic future for the firm and that these signals cannot be mimicked by unsuccessful firms.[75] Leland and Pyle (1977) focus on owners instead of managers. They assume that entrepreneurs have better information on the expected cash flows than outsiders have. The inside information held by an entrepreneur can be transferred to suppliers of capital because it is in the owner's interest to invest a greater fraction of his wealth in successful projects. Thus the owner's willingness to invest in his own projects can serve as a signal of project quality. The value of the firm increases with the percentage of equity held by the entrepreneur relative to the percentage he would have held in case of a lower quality project. (See Copeland et al., 2005.)

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explaining why managers do not fully exploit the tax advantages of borrowing (as suggested by Myers, 2001, p.99).

[73] In 1984, the pecking order *story* was not new. Donaldson (1971, 1984) for example observed pecking order behavior in case studies. However, the pecking order until then was viewed as managerial behavior - possibly to avoid the discipline of capital markets.

[74] The pecking order theory assumes that managers know more about their companies' prospects, risks and values than do outside investors.

[75] Such unsuccessful firms do not have sufficient cash flow. This concept is easily applied to dividend policy as well. A firm that increases dividend payout is signalling that it has expected future cash flows that are sufficiently large to meet debt payments and dividend payments without increasing the probability of bankruptcy. (See Copeland et al., 2005.) Miller and Rock (1985) develop a financial signalling model founded on the concept of 'net dividends'. An unexpected increase in dividends will increase shareholders' wealth and an unexpected issue of new equity or debt will be indebted as bad news about the future prospects of the firm.

The stakeholder theory formulated by Grinblatt and Titman (2002) suggests that the way in which a firm and its *non-financial* stakeholders interact is an important determinant of the firm's optimal capital structure. Non-financial stakeholders are those parties other than the debt and equity holders.[76] Non-financial stakeholders include firm's customers, employees, suppliers and the overall community in which the firm operates. These stakeholders can be hurt by a firm's financial difficulties. For example customers may receive inferior products that are difficult to service, suppliers may lose business, employees may lose jobs and the economy can be disrupted. Because of the costs they potentially bear in the event of a firm's financial distress, non-financial stakeholders will be less interested ceteris paribus in doing business with a firm having a high(er) potential for financial difficulties. This understandable reluctance to do business with a distressed firm creates a cost that can deter a firm from undertaking excessive debt financing even when lenders are willing to provide it on favorable terms (Ibid., p.598). These considerations by non-financial stakeholders are the cause of their importance as determinant for the capital structure. This stakeholder theory could be seen as part of the trade-off theory (see Brealey et al., 2006, p.481, although the term 'stakeholder theory' is not mentioned) since these stakeholders influence the indirect costs of financial distress.[77]

As the trade-off theory (excluding agency costs between managers and shareholders) and the pecking order theory, the stakeholder theory of Grinblatt and Titman (2002) assumes shareholder wealth maximization as the single corporate objective.[78]

Based on these theories, a huge number of empirical studies have been produced. See e.g. Harris and Raviv (1991) for a systematic overview of this literature.[79] More

[76] The stakeholder theory is probably inspired by, among others, Baxter (1967) and Kim (1978) who discuss indirect costs of financial distress.

[77] The stakeholder theory could also explain observed pecking order behaviour in the market. See Grinblatt and Titman, 2002, p. 613.

[78] In the Modigliani and Miller world, where agency problems are absent, maximizing the value of the firm is identical to maximizing shareholder's wealth. When agency problems exist there are ways to increase shareholder wealth at the expense of other stakeholders. (See e.g., Cools, 1993, p.261.)

[79] Harris and Raviv divide the evidence into four categories: i) evidence of general capital structure trends; ii) event studies that measure the impact on share prices of an announcement of a capital structure change, iii) studies that relate firm/industry characteristics to capital structure, iv) studies that measure the relationship between capital structure and factors associated with corporate control.

recent studies are e.g. Shyum-Sunder and Myers (1999), testing the trade-off theory against the pecking order theory, Kemsley and Nissim (2002) estimating the present value of tax shields, Andrade and Kaplan (1998) estimating the costs of financial distress and Rajan and Zingales (1995) investigating the determinants of capital structure in the G-7 countries. Rajan and Zingales (1995)[80] explain differences in leverage of individual firms with firm characteristics. In their study leverage is a function of tangibility of assets, market-to-book ratio, firm size and profitability.[81] Barclay and Smith (1995) provide an empirical examination of the determinants of corporate debt maturity. Graham and Harvey (2001) survey 392 CFOs about among others capital structure. We come back to this Graham and Harvey study in Section 3.[82]

Cross sectional studies as by Titman and Wessels (1988), Rajan and Zingales (1995), Barclay and Smith (1995) and Wald (1999) model capital structure mainly in terms of leverage and then leverage as a function of different firm (and market) characteristics as suggested by capital structure theory.[83] We do the opposite. We do not analyse the effect of several firm characteristics on capital structure (c.q. leverage), but we analyse the effect of capital structure on variables that co-determine shareholder value. In several decisions, including capital structure decisions, these variables may get the role of decision criteria. Criteria which are related to the trade-off and pecking order theory are listed in Table 1. We will discuss these criteria using a simplified example in Section 4. Figure 2 illustrates the basic idea of our approach.

[80] Examples of other cross sectional studies before 1991 are: Bradley et al. (1984), Long and Malitz (1985) and Titman and Wessels (1988).

[81] See Lemmon et al. (2006) for empirical evidence against the explanatory power of determinants of capital structure such as size, market-to-book, profitability, and industry.

[82] For European firms Brounen et al. (2004) did a similar survey as Graham and Harvey did for U.S. firms.

[83] In cross-sectional research, capital structure theories are tested by analyzing the relation between leverage (as endogenous variable) and some firm (and or country/institutional) characteristics (as exogenous variables). For example the static trade-off theory predicts that firms with a high profitability have higher leverage. A positive cross-sectional relation between the determinant profitability and leverage will be analysed. Proxies are used to measure leverage on the one hand and profitability on the other. If proxies are perfect indicators for the determinants then econometric tests reveal whether a relation between the variables exists. See e.g. Cools (1993).

Figure 2. Example of the basic idea of assumed relations within the neoclassical view

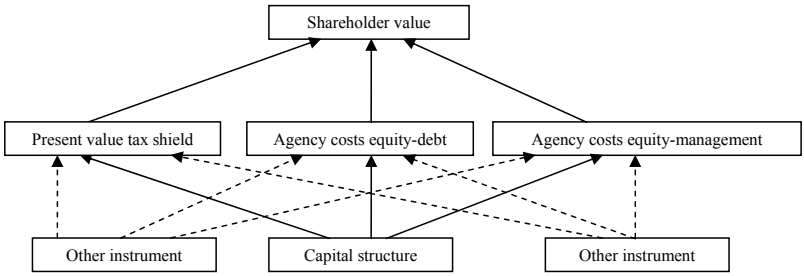

Figure 2 shows that shareholder value is related to the present value of tax shields and agency costs (both listed in Table 1 as determinants of shareholder value). The financing decision or 'capital structure choice' now is an instrument that influences the value of these determinants. For example, the higher the leverage, the higher the present value of the tax shield. However, besides the financing decision, 'other instruments' could have an influence (reflected with dotted arrows in Figure 2) on the value of these determinants as well. For example the decision to acquire assets that could be written of fast, influences the tax benefits of the interest deductibility. Of course, the financing decision influences the agency costs as well. For example, it could be argued that the agency costs between equity and debt increase with leverage. However, the tangibility of assets influences these agency costs as well. If a firm decides to invest in tangible assets this could have a negative impact on the magnitude of these agency costs. Put differently, agency costs are not minimized using one instrument only. Instead, a multiplicity of instruments is involved.

The financing problem—even in a neoclassical context—is complex, because i) relevant 'value determinants' are not influenced by capital structure only and ii) most if not all of these determinants cannot be translated into clearly quantifiable costs or benefits, even if we neglect the possible effect of other instruments on the selected determinants.

Table 1. Multiple Criteria or determinants of Capital Structure

Category	#	Multiple Criteria	References
Economic values	1	*Tax shield* - corporate level - personal level	 Miller & Modigliani (1958, 1963) Miller (1977)
	2a	*Direct costs of financial distress*	Miller & Modigliani (1958)
	2b	*Agency costs equity-debt* - underinvestment - asset substitution (risk shifting) - refusing to contribute equity capital - cash in and run - playing for time - bait and switch	 Myers (1977) Jensen & Meckling (1976), Galai & Masulis (1976), Brealey et al. (2006) Ibid. Ibid. Ibid. Ibid.
	2c	*Non-financial stakeholders* - customers - employees - suppliers - community	 Grinblatt & Titman (2002) Ibid. Ibid. Ibid.
	3	*Agency costs equity-management* - residual claim - reduction free cash flow (overinvestment); corporate control shareholders, corporate governance	 Jensen & Meckling (1976) Jensen (1986) Jensen & Ruback (1983) Shleifer & Vishney (1997)
	4	*Following hierarchy and flexibility* (real options)	Myers (1984), Myers & Mailuf (1984)
	5	*Signaling*	Ross (1977), Leland & Pyle (1977)
	6	*Subsidy*	Galai (1998)

3.3. Other objectives and considerations

A lot of evidence suggests that managers act not only in the interest of the shareholders (see Myers, 2001). Neither the static trade-off theory nor the pecking order theory can fully explain differences in capital structure. Myers (2001, p.82) states that 'Yet even 40 years after the Modigliani and Miller research, our understanding of these firms financing choices is limited.'[84] Results of several surveys (see Cools 1993, Graham and Harvey, 2001, Brounen et al., 2004) reveal that CFOs do not pay a lot of attention to variables relevant in these shareholder wealth maximizing theories. Given the results of empirical research, this does not come as a surprise.

[84] These firms are public, non-financial corporations with access to U.S. or international capital markets.

The survey by Graham and Harvey finds only moderate evidence for the trade-off theory. Around 70% have a flexible target or a somewhat tight target or range. Only 10% have a strict target ratio. Around 20% of the firms declare not to have an optimal or target debt-equity ratio at all.

In general, the corporate tax advantage seems only moderately important in capital structure decisions. The tax advantage of debt is most important for large regulated and dividend paying firms. Further, favorable foreign tax treatment relative to the U.S. is fairly important in issuing foreign debt decisions.[85] Little evidence is found that personal taxes influence the capital structure.[86] In general potential costs of financial distress seem *not* very important although credit ratings are. According to Graham and Harvey this last finding could be viewed as an (indirect) indication of concern with distress. Earnings volatility also seems to be a determinant of leverage, which is consistent with the prediction that firms reduce leverage when the probability of bankruptcy is high. Firms do not declare directly that (the present value of the expected) costs of financial distress are an important determinant of capital structure, although indirect evidence seems to exist. Graham and Harvey find little evidence that firms discipline managers by increasing leverage. Graham and Harvey (2001, p.227) explicitly note that '1) managers might be unwilling to admit to using debt in this manner, or 2) perhaps a low rating on this question reflects an unwillingness of firms to adopt Jensen's solution more than a weakness in Jensen's argument.'

The most important issue affecting corporate debt decisions is management's desire for financial flexibility (excess cash or preservation of debt capacity). Furthermore, managers are reluctant to issue common stock when they perceive the market is undervalued (most CFOs think their shares are undervalued). Because asymmetric information variables have no power to predict the issue of new debt or equity, Harvey and Graham conclude that the pecking order model is not the true model of the security choice.[87]

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[85] According to Graham and Harvey the most popular reason to issue foreign debt is that it provides a natural hedge against foreign currency devaluation.

[86] Graham (2000) argues that companies do not make full use of interest rate tax shields.

[87] For European firms Brounen et al. (2004, p.99) find moderate support for the static trade-off theory. The results of the pecking order theory, the desire for financial flexibility and pecking order behavior are important considerations but as Graham and Harvey (2001) conclude, asymmetric information is not the driving force behind this behavior.

The fact that neoclassical models do not (fully) explain financial behavior could be explained in several ways. First, it could be that managers do strive for creating shareholder value but at the same time also pay attention to variables other than the variables listed in Table 1. Variables of which managers think, that they are (justifiably or not) relevant for creating shareholder value. Second, it could be that managers do not (only) serve the interest of the shareholders but of other stakeholders as well.[88] As a result, managers integrate variables that are relevant for them and or other stakeholders in the process of managing the firm's capital structure. The impact of these variables on the financing decision is not per definition negative for shareholder value. For example if 'value of financial rewards for managers' is one of the goals that is maximized by managers—which may not be excluded—and if the rewards of managers consists of a large fraction of call options, managers could decide to increase leverage (in combination with the repurchase of shares) to lever the volatility of the shares with an increase in the value of the options as a result. The increase of leverage could have a positive effect on shareholder wealth (e.g. the agency costs between equity and management could be lower) but the criterion 'value of financial rewards' could (but does not have to) be leading. Third, shareholders themselves do possibly have other goals than shareholder wealth creation alone. Fourth, managers rely on certain (different) rules of thumb or heuristics that do not harm shareholder value but can not be explained by neoclassical models either.[89] Fifth, the neoclassical models are not complete or not tested correctly (see e.g. Shyum-Sunder and Myers, 1999).

Either way, we do expect that variables other than those founded in the neoclassical property rights view are or should be included explicitly in the financing decision framework. To determine which variables *should* be included we probably need other views or theories of the firm than the neoclassical alone. Zingales (2000)

[88] Block (2005) finds that on average 56% of his surveyed CFOs of Fortune 1,000 companies has stockholder wealth maximization as predominant goal. This percentage is much lower than 100% but higher than the results of Petty et al. (1975) and Stanley and Block (1984) where this percentage was only 11% (of their sample of Fortune 500 Companies) and 21% (of their sample of Fortune 1,000 companies) respectively.

[89] Miller (1977, p.272) states that …'harmful heuristics, like harmful mutations in nature die out. Neutral mutations that serve no function, but do no harm, can persist indefinitely.' Miller (1977, p.273) further argues that a pool of neutral mutations could be of value when the environment changes.

argues that '*...corporate finance theory, empirical research, practical implications, and policy recommendations are deeply rooted in an underlying theory of the firm.*' (Ibid., p.1623.) Examples of attempts of new theories are 'the stakeholder theory of the firm' (see e.g. Donaldson and Preston, 1995), 'the enlightened stakeholder theory' as a response (see Jensen, 2001), 'the organizational theory' (see Myers, 1993, 2000, 2001) and 'the stakeholder equity model' (see Soppe, 2006).

We introduce an organizational balance sheet which is based on the organizational theory of Myers (1993). The intention is to offer a framework to enhance a discussion about criteria that could be relevant for the different stakeholders of the firm. In Myers' organizational theory employees (including managers) are included as stakeholders; we integrate other stakeholders as suppliers, customers and the community as well. Figure 3 presents the adjusted organizational balance sheet.

Figure 3. Adjusted organizational balance sheet in market values

Balance sheet of the levered firm

Pre-tax value existing assets	(PTA)	PV residual claims equityholders	(E)
Pre-tax value growth opportunities	(PVGO)	Debt	(D)
		Employees' Surplus	(ES)
		Other stakeholders' Surplus	(OTS)
		PV government claims	(Gl)
Pre-tax value	(PTV)	Pre-tax value	(PTV)

Note that pre-tax value of the existing assets and the growth opportunities is the value of the firm including the present value of all stakeholders' surplus. The present value of the stakeholders' surplus (ES plus OTS) is the present value of future costs of perks, overstaffing, above market prices for inputs (including above market wages), above market services provided to customers and the community etc.[90] Depending on the theory of the firm, the pre-tax value can be distributed among the different stakeholders following certain 'rules'. Note that what we call 'surplus' in this framework is still based on the 'property rights' principle of the firm. Second, only

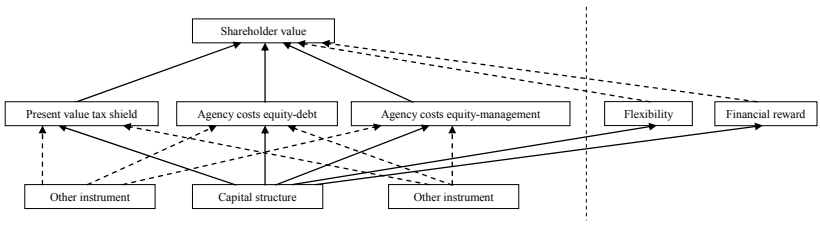
[90] To a certain extent - as long as debt is not risk free - the firm can expropriate wealth from the debt holders which would result in a broader definition.

distributions in market values are reflected in this balance sheet. Neutral mutations are not.[91]

Based on the results of Graham and Harvey (2001) and common sense we formulate a list of criteria or heuristics that could be integrated into the financing decision framework. Some criteria lead to neutral mutations others do not. We call these criteria 'quasi non-economic criteria'; non-economic because the criteria are not based on the neoclassical view. Quasi, because the relations with economic value are not always clear cut. We include criteria that lead to neutral mutations as well, because managers might have good reasons that we overlook or are relevant for other reasons than financial wealth.

The broadest decision framework we propose in this chapter is the one that includes both the economic and quasi non-economic variables. Figure 4 illustrates the idea. The additional quasi non-economic variables are listed in Table 2. This list is far from complete. Relevant variables to be included depend on i) the theory of the firm, ii) characteristics of the particular firm/industry/country and iii) judgment and the preferences of the manager(s).

Figure 4. Example of basic idea of possible relations



Financial flexibility (excess cash), the first variable in Table 2 is valued by managers because it increases their independence from the capital market. Managers may invest more often in projects that do not create shareholder value when they have excess cash or unused debt capacity. For this reason financial flexibility could be relevant for at least employees and the suppliers of resources needed for these projects. As long as managers only would invest in zero net present value projects this variable would have no value effect in the organizational balance sheet. But if it

[91] Myers (1984) defines - after Miller (1977) - neutral mutations as financing patterns or habits which have no material effect on firm value and makes managers feel better.

influences the value of the sum of the projects undertaken this will be reflected in this balance sheet. Of course, financial flexibility is also valued for economic reasons, see Section 2 and 4.

The probability of bankruptcy influences job security for employees and the duration of a 'profitable' relationship with the firm for suppliers, customers and possibly the community. For managers (and other stakeholders without diversified portfolios) the probability of default could be important. The cost of bankruptcy is for them possibly much higher than for shareholders with diversified portfolios. As with financial flexibility, the probability of default influences shareholder value as well. In Section 2 and 4 we discuss this variable in relation to shareholder value. Here the variable is relevant, because it has an effect on the wealth or other 'valued' variables of stakeholders other than the equity (and debt) holders.

We assume owner-managers dislike sharing control of their firms with others. For that reason, debt financing could possibly have non-economic advantages for these managers. After all, common stock carries voting rights while debt does not. Owner-managers might prefer debt over new equity to keep control over the firm. Control is relevant in the economic framework as well, see Section 2 and 4.

In practice, earnings dilution is an important variable effecting the financing decision.[92] Whether it is a neutral mutations variable or not, the effect of the financing decision on the earnings per share is often of some importance.[93] If a reduction in the earnings per share (EPS) is considered to be a bad signal, managers try to prevent such a reduction. Thus the effect on EPS becomes an economic variable. As long as it is a neutral mutation variable, or if it is relevant for other reasons, we treat EPS as a quasi non-economic variable.

The reward package could be relevant for employees. If the financing decision influences the value of this package this variable will be one of the relevant criteria for the manager. If it is possible to increase the value of this package, the influence on shareholder value is ceteris paribus negative. If the reward package motivates the

[92] E.g., Block (2005) finds that on average 28% of his surveyed CFOs of Fortune 1,000 companies have 'growth in earnings per share' defined as predominant goal of the firm, and Brav et al. (2005) state that three-fourth of their survey respondents (financial executives) indicate that increasing earnings per share is an important factor affecting their share repurchase decision.

[93] In perfect capital markets earnings dilution does not influence the value of equity. This is often misunderstood, see Brealey et al. (2006), Chapter 32.

manager to create extra shareholder value compared with the situation without the package, this would possibly more than offset this negative financing effect.

Other criteria that might be relevant are maturity matching, because of liquidity reasons, and the influence of the capital structure on the credit rating of debt.

Table 2. Multiple Criteria of Capital Structure

Category	#	Multiple Criteria
Quasi non-economic values	1	Flexibility (self sufficiency)
	2	Job security
	3	Control
	4	Earnings dilution
	5	Financial reward
	6	Maturity matching, Credit rating etc.

3.4. Capital structure as multiple criteria decision problem

Ideally, capital structure decisions are embedded in a capital structure management process, with 1) periodic planned evaluations (e.g. around reporting dates and connected with dividend decisions), 2) events or anticipated events concerning the assets of the company (large investments, mergers and acquisitions, unexpected results) or 3) concerning the liabilities side (changing financial market circumstances, new products offered by the financial industry, refinancing loans etc.). Given the multiplicity of considerations, the large variety of choices and the presence of many contingent claims, both real and financial, make many capital structure decisions unfit for being framed as an optimization problem. In such cases, it does make sense to solicit a variety of solutions by advisors, banks and other providers of capital, which can then be compared in terms of their impact on the criteria considered to be important for the firm concerned.

The factors considered to be important are determined by firm, industry, environmental, country or institutional characteristics. For example, profitability, risk, tangibility of assets, size, growth opportunities of the firm, the competition within and concentration of the industry, the legal system and corporate governance regulations are all more or less important in the selection and weighting of the appropriate criteria.

As an example of capital structure as a multiple criteria decision problem, consider the 100% equity financed firm 'OCS'. In the coming year OCS has to make an investment and financing decision.[94] Let:

x = new investment in millions of euros;

y = new issue of debt, in millions of euros;

z = new issue of equity, in millions of euros.

Assume the investment generates a perpetual free cash flow of €1 million. Assume for simplicity there are only two financing solutions: 100% debt (plan 1) and 100% equity financing (plan 2). OCS is a listed firm. Managers own 10% of total equity. Assume the unlevered cost of capital is 10% and x is € 10 million. The corporate tax rate is 30%. Taxes on a personal level are 0%. OCS has to decide whether she goes ahead with the project and if so, whether y = € 10 million or z = € 10 million. To support the financing decision OCS evaluates both financing solutions on the criteria listed in Table 1 and Table 2. If possible, the influence of the financing plans on the criteria is measured in euros. If this is not possible, we only make a qualitative statement. The scores on the economic and quasi non-economic criteria are given in Table 3. In this example we choose to score the quasi non-economic variables from the perspective of the manager.[95] The economic variables are scored from the perspective of the shareholders.

Tax shield. The main advantage of debt financing is the reduction of the present value of the government's claim. In general, the higher the proportion interest bearing debt, the higher the PVTS. However, the level of non-debt tax shields (DeAngelo and Masulis, 1980) and, among others a low level and high variability of earnings could have a negative impact on the PVTS of additional debt. If we assume the profits are high enough to realize the tax shields then the tax shield score on the corporate level of plan 1 is corporate tax rate times the amount of debt, i.e. 0.3 * € 10 million = € 3 million.[96] If on the personal level income tax for received interests is higher than for equity income, the advantage on the corporate level could be offset by the disadvantage on the personal level. For now, we assume there are no personal taxes. This implies there is no difference on the criterion 'Tax shield on a personal level'.

[94] The example is based on Myers and Pogue (1974).

[95] It is possible to score the criteria from the perspective of other stakeholders as well.

[96] We assume that the additional amount of debt is fixed and the assets of the project serve as collateral.

Table 3. Example scores simplified example 'OCS'

Category	#	Multiple Criteria	Scores plan 1 and 2		
Panel A: Economic values			Plan 1	Plan 2	Preference for plan
	1	*Tax shield* - corporate level - personal level	 € 3 million € 0	 € 0 € 0	 1 -
	2a	*Direct costs financial distress*	👎	👍	2
	2b	*Agency costs equity-debt*	👎	👍	2
	2c	*Non-financial stakeholders* - customers - employees - suppliers - community	 👎 👎 - -	 👍 👍 - -	 2 2 - -
	3	*Agency costs equity-management* - residual claim - free cash flow - control	 👍 👍 👎	 👎 👎 👍	 1 1 2
	4	*Following hierarchy* *Flexibility*	👍 👎	👎 👍	1 2
	5	*Signaling*	👍	👎	1
	6	*Subsidy*	-	-	-
Panel B: Quasi non-economic values		**Multiple Criteria**	**Scores plan 1 and 2**		
			Plan 1	Plan 2	Preference for plan
	1	*Flexibility*	👎	👍	2
	2	*Job security*	👎	👍	2
	3	*Control*	👍	👎	1
	4	*Earnings dilution*	👍	👎	1
	5	*Financial reward*	👍	👎	1

Direct costs of financial distress or the direct bankruptcy costs are the costs of the legal mechanism that allows creditors taking over the assets of a firm when a firm defaults (see Brealey et al., 2006). If a firm increases leverage, it increases the probability of default and the present value of the direct costs of bankruptcy. Lenders foresee these costs and foresee that they will pay them if default occurs. Therefore lenders will charge a higher interest rate which reduces both equity cash flows and equity value as a result. If we assume that the risk of the assets in place of OCS is low, and the size of the investment is small relative to the expected free cash flow, the expected probability of default is low. The impact of plan 1 on the direct costs of

financial distress then is limited. Of course, plan 2 scores better on this criterion than plan 1.

Agency costs equity-debt. If OCS is not in financial distress, the probability that OCS will play games with the debt holders is small. But if the FCFs are unexpectedly low, it could be that managers on behalf of the existing shareholders try to expropriate wealth from the debt holders. Therefore the agency costs equity-debt are low but positive. Of course the agency costs equity-debt are zero if the investment is financed with an issue of shares.

Non-financial stakeholders. If stakeholders foresee that—because of a higher leverage—the probability of default exceeds acceptable levels, stakeholders could e.g. charge higher prices or buy less products. If the products need a lot of services the value of the assets in place and the value of the new project could be reduced by using an excessive amount of debt. If OCS chooses plan 1 we assume customers will buy less products and employees will charge higher wages. We assume that neither suppliers nor the community is impacted by the financing decision.

Agency costs equity-management. Under plan 1 the residual claim managers hold remains the same. That means that the price of shirking for the managers remains the same as well. Under plan 2 this price decreases, which means the agency costs caused by a reduction in the residual claim for the managers increases. Under plan 1 free cash flows (FCFs) are reduced because of the promised interest payments. Under plan 2 these FCFs are not reduced. This means that plan 1 scores better on both criteria; residual claim and free cash flow. Given the stake managers have, under plan 1 they could prevent harder possible bidders to take-over the firm. If plan 2 is chosen the stake of the managers dilutes and -we assume- the power of the market for corporate control increases. Plan 2 scores better than plan 1 on the criterion control. The governance structure of the firm, e.g. the way the firm rewards their managers influences the importance of the FCF problem.

Following hierarchy / flexibility. If debt is issued instead of equity the negative impact of mispricing caused by information asymmetry is reduced. However, plan 1 also has a possible negative effect: plan 1 reduces the FCFs, which may negatively influence the future flexibility of the firm. Financial flexibility (excess cash or the preservation of debt capacity) is valued positively because it prevents firms from not investing in positive net present value projects. For example if the net present value of a new project is 1.5 million and the firm has—because of a lack of excess cash, i.e. a

lack of financial flexibility—to issue shares to collect 10 million but are really worth 12 million, the firm will not pursue. It only goes ahead if the net present value of the project is at least 2 million. (See Myers, 1984, p.584.) The score for plan 1 is relatively good for the aspect hierarchy and bad for expected flexibility.

Signaling. Given information asymmetry it could be argued that if managers have the incentive to always issue the correct signal (that is to tell the truth) an issue of debt could be interpreted as a positive signal about future cash flows (Ross, 1977). The score for plan 1 then is better than the score for plan 2.

Subsidy. There is no subsidy.

The first quasi non-economic variable flexibility is reduced if managers select plan 1. As under panel A FCF is reduced if debt is issued. If the new project generates positive FCFs then expected flexibility will increase due to an accumulation of free cash.

Job security increases inversely with the probability of default. If the new project contributes to stability of the firm's cash flows the new project could increase job security.

We assume that the managers do not like their stake to dilute. Managers prefer plan 1. This is also in accordance with the control score in Panel A of Table 3 where we assume that external shareholders prefer plan 2.[97]

Earnings dilution is higher if new shares are issued. If managers prefer higher earnings per share, plan 1 is favored by managers. Expected earnings increase due to the profitability of the new project, while the number of shares remains the same.

If the financial reward exists—besides the equity stake—of call options, plan 1 again is best. It increases the volatility of equity with a relative positive effect on call options as a result. If plan 2 is implemented the volatility remains the same.[98]

The next step is that the manager evaluates the relative scores on all the criteria and gives his/her own weighting factors to the relevant criteria and then decides which

[97] Management could prefer Plan 2 if for instance the power of certain active monitoring shareholders is reduced by a placement of new shares to minority shareholders.

[98] We assume the volatility of the assets remains the same.

plan is optimal.[99] If the perceived value of all the side effects under the favored plan is positive the manager will go ahead with this project.[100] This simplified 'numerical' example shows how complex capital structure problems can be. Even, if we only take the economic criteria into account.

3.5. Summary

The capital structure decision (or rather, the management of the capital structure over time) is never a goal on its own, but should be instrumental to the goal of the firm. In the traditional case of the firm that strives for the maximization of the value of the shares for the current shareholders, all choices concerning the capital structure should be evaluated in terms of their effect on the firm's market value. No wonder that so much research effort is devoted to the value effects of capital structure decisions. The capital structure decision is often pictured as an optimization problem in which a value function including all costs and benefits is to be maximized, possibly subject to some hard constraints.

We have shown that the management of the firm's capital structure is not that easy at all. The reason is that a number of considerations that enter the capital structure decision and have value implications, cannot be translated into clearly quantifiable costs or benefits that can be entered into the value function or be transformed into hard constraints. Examples discussed include agency costs between equity holders and management (including corporate control and corporate governance), costs of financial distress, benefits and costs for other financial stakeholders, flexibility and even the tax shield. Still these considerations cannot be ignored in the capital structure decision and its economic value implications. Therefore, we propose to translate some of these considerations as separate criteria, which can be traded off against the hard and quantifiable criterion of market value.

Many firms exist that explicitly choose for more objectives than value maximization alone. This may be because the shareholders adopt a multiple stakeholders approach or because of a different ownership structure than the usual corporate structure dominating finance literature. An example of the latter is the co-

[99] MCDA methods that allow the incorporation of quantitative and qualitative criteria could support this decision problem. See Zopounidis (1999) for arguments that could justify the use of MCDA methods in investment decisions and portfolio management decisions.

[100] We assume the present value without side effects equals €1 million / 0.1 = €10 million.

operation, a legal entity which can be found in, among others, many European countries. So in addition to the criteria that capture the value implications of capital structure decisions, this kind of firms may have other criteria as well. An example is bankruptcy risk and its implications for various stakeholders.

Ideally, capital structure decisions are embedded in a capital structure management process, with 1) periodic planned evaluations (e.g. around reporting dates and connected with dividend decisions), 2) events or anticipated events concerning the assets of the company (large investments, mergers and acquisitions, unexpected results) or 3) concerning the liabilities side (changing financial market circumstances, new products offered by the financial industry, refinancing loans). Given the multiplicity of considerations, the large variety of choices (e.g. all the specifications that can be connected with a loan or with a leasing contract) and the presence of many contingent claims, both real and financial, makes many capital structure decisions unfit for being framed as an optimization problem. In such cases, it does make sense to solicit a variety of solutions by banks and advisors, which can then be compared in terms of their impact on the criteria considered to be important for the firm concerned. The definition of the criteria and the study of the impact of the decision alternatives on these criteria is thus a sine qua non for financial structure decisions.

Chapter 4

Optimal capital structure decision in a multi-criteria framework; solutions for an M&A case as proposed by practicing financial experts[101]

Abstract

In this chapter, we analyse financing solutions as proposed by two consultants, one full service banker and one investment banker, for a merger and acquisition problem. We asked each specialist to construct three financing proposals: the first would focus on the interests of current shareholders; the second would center on the interests of management; and the third would examine how the specialist should advise the management of the bidder. We compare the resulting proposals using criteria described in Chapter 3, along with additional criteria mentioned by the specialists. We find that: i) the solutions differ between specialists; ii) the solutions and criteria applied by the specialists depend on the stakeholder (shareholders versus management) that the solution is tailored for; and iii) some economic criteria do not appear to be as relevant as suggested by theory.

4.1. Introduction

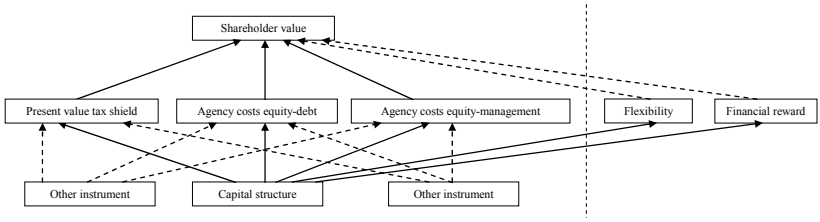
In Chapter 3 we formulate the capital structure decision within a multi-criteria framework. We make a distinction between capital structure decisions from the neoclassical perspective, where the ultimate goal is maximizing shareholder value, and a perspective in which other objectives and considerations are also relevant. Capital structure decisions influence shareholder value via various determinants or criteria, such as the present value of tax shields, and agency costs. We call these criteria 'economic criteria'.[102] Capital structure decisions influence other criteria that might be relevant for certain stakeholders as well. Examples include managerial flexibility and financial reward for management. We call these criteria 'quasi non-

[101] This chapter is based on Schauten and Spronk (2007) and is presented at the European Conference on Operational Research in Prague, July 2007.

[102] Economic criteria are criteria based on the neoclassical view and are relevant for the shareholder who aims for the maximization of shareholder wealth.

economic criteria'.[103] As shown in the preceding chapter, Figure 1 depicts possible relations between the capital structure and these criteria; on the left-hand side are criteria that influence shareholder value, and on the right-hand side are criteria that might be relevant for other reasons.[104]

Figure 1. Example of possible relations



What becomes clear is that the issue of financing is a complex, multi-criteria problem, where capital structure is not a goal in itself, but an instrument to achieve certain outcomes and/or to influence certain criteria values. As concluded in Chapter 3, the multiplicity of considerations and the large variety of choices (e.g., all the specifications that can be connected with a loan or with a leasing contract) makes the capital structure decision unfit for consideration as an optimization problem. Rather, it makes sense to solicit a variety of solutions from finance specialists that can be compared on criteria considered to be important.

In this chapter, we analyse various financing solutions generated by specialists for a merger and acquisition (M&A) financing problem. We sent out an M&A case study to two consultants, two 'full service' bankers, and one investment banker and processed the answers of four of them. We are interested in i) the financing solutions provided by the respondents for the bidding firm's financing problem, in order to compare them on selected criteria, ii) the criteria that specialists use in the evaluation of their solutions, in order to compare them with the criteria from Chapter 3, and iii) whether specialists acknowledge conflicts of interest between shareholders and management. We asked the specialists to draw up i) a financing proposal focused on

[103] Quasi non-economic criteria are criteria which might be relevant for the management. Quasi non-economic criteria are called non-economic, because the criteria are not based on the neoclassical view. Quasi, because the relations with economic value are not always clear cut.

[104] Figure 1 in this chapter is an exact copy of Figure 4 in Chapter 3, inserted here to easify the reading of this chapter.

the interests of the current shareholders of the bidder, ii) a financing proposal focused on the interests of the management of the bidder, and iii) a financing proposal such as would be recommended by the specialist to the management of the bidder.[105]

We find that i) solutions differ among specialists, ii) the differences between the specialists' preferred proposals are less than between the proposals for shareholders and management, respectively, iii) the criteria and solutions depend on the stakeholder the solution is made for (i.e., conflicts of interest between shareholders and management are acknowledged), iv) some economic criteria from the neoclassical view do not seem as relevant as would be suggested by theory, and v) the solutions can be compared using qualitative criteria only.

This chapter proceeds as follows. In Section 2, we introduce the M&A case in more detail. We introduce the bidder and the target firm, as well as the financing problem. In Section 3, we present all questions posed to the specialists and the expected solutions for this financing problem in general terms. These expected solutions are based primarily on Faccio and Masulis (2005), who study the M&A payment choices of European bidders for publicly and privately held targets. In Section 4 we present and explain the solutions offered by the various specialists, including their most important insights. In Section 5, we compare the criteria used by the specialists with the 'economic' criteria (relevant to shareholders who strive for wealth maximization) and the 'quasi non-economic criteria' (relevant to managers) from Chapter 3. As we will see, most of these criteria are explicitly or implicitly used by specialists, although some economic criteria from the neoclassical view do not seem as relevant as what would be suggested from theory. Further, we discuss additional criteria that the specialists consider relevant for shareholders. The specialists did not mention any additional criteria relevant to management. In Section 6, the ultimate proposals are evaluated from the perspectives of shareholders and of management. Section 7 summarizes our main findings and conclusions.

[105] We do not send out a questionnaire to CFOs as in Graham and Harvey (2001), Bancel and Mittoo (2004), Brounen et al. (2004, 2006), and De Jong and Van Dijk (2007) to determine which criteria or determinants are relevant in capital structure decisions in practice. Instead, we consult several finance specialists (non-CFOs) and present this question indirectly via an M&A case.

4.2. Case Vita: the bidder, the target, and the financing problem

This section gives a summary of the case. Case Vita—as it was sent to the specialists—is included in Appendix A. Vita (the bidder) is considering the acquisition of all the shares of competitor Duplo (the target) for €300 million. The business of both (virtual) firms is selling food to consumers via supermarkets.

Vita is a listed company with 400 supermarkets and total revenues of €1,613 million in the last fiscal year. Vita achieved an EBITDA of €93.5 million and had 4,100 FTE employed. All Vita stores are located in 'the green valley'. Vita differentiates itself from competitors by offering high quality fruit and vegetables at relatively low prices. In this market, low autonomous growth is realized mainly by elbowing out specialty stores that do not distinguish themselves from supermarkets with respect to their product offering and customer service. Substantial growth in this slow-growing market can be achieved only by taking over competitors. That is what Vita did successfully in the past—it acquired Shop & Carry, a chain with 190 supermarkets, five years ago— and Vita is now seeking additional acquisition targets.

Duplo is a player with 350 stores that essentially does not compete with Vita, because of the geographical location of Duplo's stores. As a result of Duplo's poor market positioning, it is experiencing a decrease in total revenues and relatively small margins. Within 2 years post-acquisition, nearly all Duplo stores will be repositioned as Vita stores. The investment required amounts to approximately €150,000 per store, a total of €52.5 million (350 x €150,000). The acquisition will increase Vita's buying power and will improve the company's ability to take advantage of economies of scale. See Appendix A for more details about the expected financial performance of Vita and Duplo as separate firms and Duplo as part of Vita (including synergies).

The management team of Duplo consists of its two founders, the Bakker brothers. Post-acquisition, they will leave the company as they have reached retirement age. The Bakker brothers each own 50% of Duplo's shares.

Vita's management is led by De Wit Jr., one of the sons of Jan de Wit, who founded Vita in the 1960s. De Wit Jr. (age 40) succeeded his father as CEO in 2001 and is successfully leading the company. Apart from De Wit Jr., the management team consists of De Bruin (age 48) and Van Ginkel (age 52). De Bruin is the CFO of Vita; Van Ginkel is the marketing manager. Each of De Bruin and Van Ginkel own a 2.5% interest in Vita. Each of De Wit Jr. and De Wit Sr. own a 20% interest in Vita.

All other shares are owned by third parties, of which one institutional investor holds a 10% interest.

The financing problem consists of €300 million for the acquisition of the shares from the Bakker family, and €52.5 million for the repositioning of the 350 Duplo stores. The required investment of €52.5 million will be financed through internally generated cash flow. The €300 million for the acquisition must be financed externally, although a fraction could be paid from excess cash (approximately €15 million). The De Wit family agreed upon the price of €300 million, but did not yet decide how to finance the acquisition.

4.3. Questions posed to the specialists and expected solutions

All the specialists (the respondents) work in actual companies: a consultancy firm, an investment bank, and a full service bank. These institutions are all well known in The Netherlands. For reasons of confidentiality, neither the names of the institutions nor the names of the specialists will be reported. To explain the purpose of the case study, the specialists were engaged in initial contact by telephone. After their commitment to participate in our research, we sent to them the (virtual) case by mail (electronic and a hard copy). We enclosed an answer sheet. After receiving the responses we interviewed the specialists in their office or by phone. The goal of this 'focused interview' (see Yin, 2003) was to prevent misunderstandings in the interpretation of their solutions.

The case included the following questions (see section PROBLEM in Appendix A).

We requested the following:

1) a financing proposal focused on the interests of the current shareholders (of Vita), excluding management;
2) a financing proposal focused on the interests of management (of Vita);
3) a financing proposal as you would advise it to the management of Vita.

We requested that specialists point out the possible consequences of their proposals on the interests of a) the shareholders (excluding management), b) management, and c) other stakeholders. Implicitly, we asked them to apply a single or multi-criteria framework to each of the stakeholders. For each question, we expected to receive differing solutions. First, this is because the specialists involved might have different views on what is good and bad for the various stakeholders. Second, it is possible that

each specialist's proposal is the solution that they have the most experience with, and experiences do differ. Third, conflicts of interest might influence the content of the proposal.[106] As a result of conflicts of interest between shareholders and management, we expect different answers from each specialist on each question as well. We received responses from four specialists. Unfortunately, one full service banker was not able to deliver his responses due to unforeseen circumstances.

We formulate some general expected solutions for questions 1 and 2 of the case (i.e. the first two requests explained above). These expected solutions are based primarily on Faccio and Masulis (2005), who study the M&A payment choices of 13 European bidders (excluding The Netherlands) for publicly and privately held targets.[107] We follow the reasoning spelled out in their hypotheses and empirical findings.

Corporate Control. From the perspective of the De Wit family, Vita should be reluctant to use public stock financing, because this financing method reduces family control. According to Faccio and Masulis (2005), a bidder with diffuse or highly concentrated ownership, is less likely to be concerned with corporate control issues. Since the De Wit family owns 40% of Vita, we expect them to prefer cash financing over equity financing.[108] An issue of new shares by Vita directly to the shareholders of the bidder—instead of to the public—is even more unlikely, because the target is held entirely by the Bakker family (and the relative deal size is high).[109] The Bakker

[106] See e.g. Loonen (2006) for a study in the Investment Consultancy Industry. Loonen (2006) finds that investment consultants do not give advice which is best for their private clients but which is best for the firm they work for.

[107] The sample of Faccio and Masulis (2005) include acquisitions announced over the years between January 1997 and December 2000 by listed bidders from Austria, Belgium, Finland, France, Germany, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland and U.K..

[108] Dutch bidders with a fraction of closely held shares that lies between 20% and 60% are more likely to use cash-financing because of loss of control as a result of stock-financing during 1996-2005 period. (See Swieringa and Schauten, 2007.)

[109] The relative deal size is computed by Faccio and Masulis (2005) as the ratio of offer size (excluding assumed liabilities) to the sum of a bidder's equity pre-offer capitalization plus the offer size. If we assume a WACC for Vita of 8% then the pre-offer capitalization is €342 million and the relative deal size for Vita 47% (= 300 / (342 + 300)). This is high compared to 10% (mean) and 4% (median) in Faccio and Masulis (2005) for 11 Continental European countries excluding The Netherlands during 1997-2000 period. Swieringa and Schauten (2007) report for The Netherlands during 1996-2005 period

family would then be a new block holder in the combined firm, with the possible risk to the De Wit family of losing control as a result. So, we expect that the De Wit family prefers financing with debt as much as possible, with the remainder financed by equity issued to the public.

From the perspective of the outside shareholders, the creation of a new large block holder in the combined firm could prove advantageous, since it could reduce agency costs between management and outside equity. Outside shareholders, including institutional investors, will probably prefer an equity issue directly to the Bakker family over a payment in cash. In 'case vita', we do not provide information about the preferred payment method of the Bakker family. However, it could be expected that the Bakker family prefers cash because the Bakker brothers will retire after completion of the deal.

Collateral, Financial Leverage and Debt Capacity. Faccio and Masulis (2005) use the fraction of fixed tangible assets (property, plant and equipment) as the primary measure of a bidder's ability to pay cash, financed from additional borrowings. Vita's *Collateral* is 69% (323/471). This is high compared to 27% (mean) and 23% (median) in Faccio and Masulis (2005) and 32% (mean) and 27% (median) in Swieringa and Schauten (2007). Given the high collateral of Vita, a payment in cash (financed with debt) can be expected. *Financial leverage* is, according to Faccio and Masulis (2005), the sum of a bidder's face value of the debt plus the deal value (including assumed liabilities), divided by the sum of the book value of the total assets at year-end prior to the bid, plus the deal value (including assumed liabilities). Financial leverage for Vita is 69% (= (210 debt Vita + 300 bid eq. + 78 debt Duplo) / (471 Vita + 300 bid eq. + 78 debt Duplo)). This ratio captures the bidder's post-deal leverage under the assumption that the transaction is completely debt financed (Faccio and Masulis (2005)).[110] Financial leverage for Vita is high compared to the 32% (mean) and 31%

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an average relative deal size of 11% and a median of 5%. A relative deal size of 47% for Vita in combination with 100% closely held shares by Duplo implies a control loss of 47% which again is high compared to Faccio and Masulis' results of 7% (mean) and 2% (median) for their Continental European countries and high compared to Swieringa and Schautens' mean of 8% (mean) and 3% (median) for The Netherlands.

[110] The pre-deal bidder leverage used by Martin (1996) adjusted for an industry mean is not significant related with method of payment. That is the reason why FM use the 'as if 100% debt financing' post deal leverage.

(median) in Faccio and Masulis (2005) and the 36% (mean) and 34% (median) in Swieringa and Schauten (2007). Given *this* outcome, an issue of equity is the most obvious conclusion. Faccio and Masulis (2005) further use *cross holdings with banks* and *interlocking directorships* as proxy for *accessibility* of debt financing. There are no cross holdings of stock between Vita and banks, and there are no interlocking directorships reported in this case. This means there is no extra mechanism that facilitates easier access to debt financing. *Asset size* of Vita is €471 million at the end of the year prior to the bid. This is small compared to the €68,505 million (mean) and the €2,467 million (median) in Faccio and Masulis (2005), and the €43,970 million (mean) and €1,513 million (median) in Swieringa and Schauten (2007). This would make debt financing less attractive because Faccio and Masulis (2005) assume that larger firms are more diversified, thus having proportionately lower expected bankruptcy costs and lower flotation costs. Vita is relatively small, which in this context makes debt less attractive.

Asymmetric information. The pecking order theory (Myers, 1984) predicts that Vita first uses internal funds to finance the acquisition, then external debt, and as last resort, external equity. Excess cash, the internal source, stands at around 15 million, which is not sufficient to finance the acquisition. From the perspective of the external shareholders, Vita should follow the pecking order; i.e., it should issue debt to finance the residual amount. However, the market timing theory of Baker and Wurgler (2002) states that bidding firms prefer stock offers when they perceive their stock to be overvalued, and they prefer cash offers financed with debt when they consider their stock undervalued by the market. Information about relative pricing error is not given in case Vita; if it were offered, this information could have too severe an impact on the financing solutions chosen by the specialists.[111] Given the pecking order theory, we expect shareholders (including the management of Vita) to prefer debt financing.

[111] If the specialists would have informed about market values or returns our response would have been that the market is efficient in the semi strong form (which is not often believed by practitioners). Faccio and Masulis (2005) use the buy and hold cumulative stock return over the year preceding the M&A announcement as proxy for bidder overvaluation. Note: if we assume WACC is 8% then Market to book of Vita in the year prior to the bid is (342+210)/(167+210) = 1.5 which is close to 1.9 (mean) and 1.3 (median) in Faccio and Masulis (2005) but low compared to 3.3 (mean) and 2.0 (median) in Swieringa and Schauten (2007).

To summarize, from the perspective of the outside shareholders, equity financing seems preferable, because it reduces the stake of management in Duplo. On the other hand, for shareholders, debt financing would be best according to the pecking order theory. From the perspective of management, debt financing is preferred, in order to retain as much control as possible. However, a 100% debt financing solution could result in a (too) highly levered firm compared with results from Faccio and Masulis (2005) and Schauten and Swieringa (2007).

4.4. The proposals

In this section, we describe the financing proposals in general terms highlighting specialists' most important considerations. Proposal 1 is the best proposal for shareholders (excluding the management of Vita), proposal 2 is best for the management of Vita, and proposal 3 is the one that specialists would recommend to the management of Vita. We discuss the proposals given by two consultants (C1 and C2), one investment bank (IB1), and one full service bank (FSB1). Consultant 1's first proposal is referred to as C11, Consultant 1's second proposal is referred to as C12, etc. The proposals are summarized in Table 1.

Appendix B contains a detailed description of the proposals including all criteria—as enumerated by the specialists—for each stakeholder. In Section 5, we compare these criteria with the 'economic' and 'quasi non-economic criteria' from Chapter 3.

Since FSB1's first answer to our questions was that 'an optimal capital structure does not exist' and 'in practice we are not asked to formulate an optimal financing solution for a specific stakeholder', we reformulated the questions for the banker as follows: 'is it possible to finance the acquisition completely with debt?'. The answer to this question was positive. FSB1 suggests financing on covenants ('cash flow based') instead of assets ('asset based') because 'in this market (the market that FSB1 is in) you only get the deal if you finance this proposition on covenants'. See Appendix B for a detailed description of the evaluation report by FSB1.

Proposal 1. C11 and C21 both contain solutions with 100% debt. IB11 comprises 50% debt and 50% equity as the optimal solution for shareholders. C11 contains a total recapitalization where the operational companies (Opcos) Vita and Duplo issue as much debt as possible. This amounts to €450 million, which makes it possible to pay a dividend of €150 million to the holding company (Holdco) of both firms. Holdco issues €150 million of mezzanine debt (we define mezzanine debt as

unsecured debt that represents a claim on a firm's assets that is senior only to shareholders) which, including the dividend from the Opcos totals €300 million. C21 proposes to create a new corporation (REneco) for the real estate of Duplo. Duplo sells the real estate to this highly levered SPV and pays, after a recapitalization, the net proceeds as a dividend to Holdco. Vita increases its leverage and pays a dividend to Holdco as well. If the solvency of the Opcos as a result of this increase in debt declines too much, Holdco will issue mezzanine debt instead. C1 and C2 both argue that 100% debt financing is preferred by shareholders since this prevents dilution. IB11 contains an issue of €150 million debt and an issue of €150 million equity, facilitated by an issue of tradable claims. The issue of claims gives the shareholders the right to participate in the issue of new equity and, in this way, prevents dilution. According to IB1, the size of the equity issue is limited, which means that for most shareholders (except management) it would be possible to exercise all allocated rights. The advantage of lower leverage is the lower financial risk profile for the shareholders.

Table 1. Summary proposals
This table presents a summary of the proposals from two consultants (C1 and C2), one investment banker (IB1), and one full service banker (FSB1). % reflects the percentage of the acquisition financed with the securities presented. Opcos means operating companies. Opcos involved are Vita (bidder) and Duplo (target). Amounts are in millions of euros and are rounded approximations. C11 refers to Consultant 1, proposal 1; C12 to Consultant 1, proposal 2 etc.

Proposal\specialist	C1	C2	IB1	FSB1
1	**100% debt (C11)** (recapitalization total) - Opcos debt issue of 450 - Opcos pay dividend of 150 to Holdco - Holdco issues mezzanine debt of 150 million	**100% debt (C21)** (recapitalization Duplo) - real estate Duplo in separate legal entity (REneco) - REneco debt issue of 134 - Opcos the residual - if necessary Holdco issues mezzanine Debt	**50% debt, 50% equity (IB11)** - debt issue of 150 - equity issue of 150, issue of equity via tradable claims	**100% debt (FSB11)**
2	**50% debt and 50% cumprefs (C12)** (recapitalization total) - Opcos debt issue of 450 - Opcos pay dividend of 150 to Holdco - Holdco issues cumprefs of 150	**50% debt and 50% equity (C22)** (recapitalization Duplo) - real estate Duplo in separate legal entity (REneco) - REneco debt issue of 134 - Opcos the residual - Holdco issues equity	**100% debt (IB12)** - debt issue of 300 If management can participate pro rata in new equity then lower amount of debt in favor of equity is possible	**100% debt (FSB12)**
3	**50% debt and 50% common stock, cumprefs, mezzanine (C13)** (recapitalization total) - Opcos debt issue of 450 - Opcos pay dividend of 150 to Holdco - Holdco issues cumprefs of 50 - Holdco issues common stock of 50 - Holdco issue mezzanine of 50	**As proposal 2 (C23)**	**33% debt and 67% equity (IB13)** - debt issue of 100 - equity issue of 200, issue of equity via tradable claims	**100% debt (FSB13)**

Proposal 2. C12 and C22 both contain solutions with approximately 50% debt and 50% equity. According to IB1, 100% debt is best for management. C12 is identical to C11 except for the issue of mezzanine debt by Holdco. Instead of an issue of €150 million mezzanine debt, Holdco issues €150 million 'cum prefs' with a fixed dividend and no voting rights.[112] According to IFRS, cumprefs are registered as debt.[113] For banks, cumprefs are seen as equity since bank claims are senior. The structure of C22 is the same as C21. However, the financial solution contains substantially less debt. C2 determines the amount of the 'debt base' on the expected 'worst case scenarios'. The leverage that will not bring Vita into financial difficulties would be the solution proposed. (This reasoning could be compared with the Recession Cash Flow Analysis of Donaldson, 1961.) The 'wild guess estimate' by C2 is an issue of €150 million equity by Holdco. C1 and C2 argue that less debt favors management since it reduces management's pressure to perform. The obligated interest payments give management less freedom. IB1 suggests 100% debt is best for management since their stake in the firm is not negatively influenced, and the probability that another major shareholder will claim (partial) control of the firm is limited. The negative impact on free cash flow is notable, but of minor importance. If management can participate pro rata in a new issue, an issue with less debt can be considered.

Proposal 3. C13 is quite similar to C12, and C2 makes no distinction between proposals 2 and 3 at all. C2 implicitly states that its ultimate proposal is whatever proposal is best for the management. IB13 comprises 33% debt and 67% equity. C13 contains, in contrast to the €150 million cumprefs in C12, €50 million common equity, €50 million cumprefs, and €50 million mezzanine debt. The reason for issuing common shares rather than cumprefs is that this lowers the published leverage. The issue in using mezzanine debt rather than cumprefs is that debt lowers the tax payment, since interest is tax deductible and dividends are not. The issue of equity suggested by IB1 is, as in IB11, facilitated by an issue of tradable claims. The amount of debt issued is lower than under IB11 and IB12. The advantage of less debt and more equity is the creation of an unused debt capacity for new (expansion) investment

[112] Cum prefs or cumulative preferred stock is stock that takes priority over common stock in regard to dividend payments. Dividends may not be paid on the common stock until all past dividends on the preferred stock have been paid.

[113] See De Jong et al. (2006) for the effect of IFRS regulation on the use of cumprefs in The Netherlands.

programs. IB is convinced that the magnitude of the acquisition justifies a major issue of equity. The use of a small amount of debt would decrease the negative pressure of the costs of an equity issue on earnings per share.

In summary, we conclude that i) solutions differ among specialists; ii) differences among specialists' preferred proposals is smaller than between proposals for shareholders and management, respectively, and iii) the criteria and solutions depend on which stakeholder the solution is made for; i.e., conflicts of interest between shareholders and management are acknowledged.

4.5. Comparison of specialists' criteria with 'economic' and 'quasi non-economic' criteria

In this section, we compare specialists' criteria with the 'economic' and 'quasi-non-economic' criteria from Chapter 3. The specialists' proposals we refer to are all included in Appendix B (and summarized in Table 1).

First, we compare the 'economic' criteria with those specialist criteria which are, in the opinion of specialists, relevant for shareholders. Table 2 shows which economic criteria are mentioned by financial specialists C1, C2, IB1 and FSB1 implicitly or explicitly (yes) and which are not (no). Variables which are, according to the specialists, relevant for shareholders but are not mentioned by us as economic criteria, are listed in Table 3.

Second, we compare the 'quasi non-economic criteria' with specialist criteria which are, according to the specialists, relevant to the management. Table 4 presents those 'quasi non-economic criteria' mentioned by the financial specialists implicitly or explicitly (yes) and those that are not (no).

The first criterion mentioned in Table 2 is *the tax shield of debt*. The positive effect of debt on the tax shield of debt is explicitly mentioned by one expert only (C1). The effect on personal taxes is ignored by all specialists.

Table 2. Economic criteria mentioned by Specialists
This table shows which economic criteria are mentioned by financial specialists C1, C2, IB1 and FSB1 implicitly or explicitly (*yes*) and which are not (*no*).

Category	#	Multiple Criteria	Mentioned by specialist			
			C1	C2	IB1	FSB1
Economic values (from Chapter 3, Table 1)	1	*Tax shield*				
		- corporate level	yes	no	no	no
		- personal level	no	no	no	no
	2a	*Direct costs financial distress*	no	no	no	yes
	2b	*Agency costs equity-debt*				
		- games	no	no	yes	no
		- covenants	yes	no	yes	yes
	2c	*Non-financial stakeholders*				
		- customers	no	no	no	no
		- employees	no	yes	yes	no
		- suppliers	yes	yes	yes	no
		- community	no	no	no	no
	3	*Agency costs equity-management*				
		- residual claim	no	no	no	no
		- free cash flow	yes	yes	yes	no
		- control	no	no	yes	no
	4	*Following hierarchy*	no	no	no	no
		Flexibility	no	no	yes	no
	5	*Signaling*	no	yes	no	no
	6	*Subsidy*	no	no	no	no

Direct costs are not mentioned; higher operational or business risk for the shareholder as a result of the acquisition (integration of riskier operations results in a higher risk profile of the assets of Vita, see C21) is seen as relevant though. Higher financial risk because of higher leverage is also seen as relevant (see Table 3). *Direct costs* of financial distress, however, were not mentioned. We can remark only that 'exit scenarios' (i.e., a sale and a sale and lease back of the stores) are mentioned in the report by FSB1 in the event that the firm does not meet its covenants. This could refer implicitly to costs to be incurred if financial difficulties occur.

Agency costs (equity-debt) are mentioned by IB1. IB1 states that by (unexpectedly) increasing leverage, the wealth of the existing debt holders could be expropriated (IB12). Other examples of agency costs are the negative effects of debt covenants. The existence of debt covenants could, for example, prevent firms from investing in valuable projects. Covenants that prohibit firms making risky but value-enhancing investments are an example of agency costs of equity-debt. Covenants are mentioned by almost all specialists (see e.g., C11, IB12 and FSB1).

Non-financial stakeholders play an important role; neither customers nor the community are mentioned, but *employees* and *suppliers* are. The risk for suppliers and employees could increase, with a possible positive or negative effect on the market value of equity as a result. The value of equity is positively influenced if the value of the stakeholder claim(s) decreases. On the other hand, if these stakeholders have the right to change their contracts with the firm to their own advantage, the effect on the value of equity could be less severe, or even negative.

Agency costs (equity-management) are mentioned by all specialists but never in explicit terms. All specialists claim a positive relation between leverage and *organizational efficiency* and the efficiency of *working capital management*. They implicitly state, the higher the leverage, the lower the free cash flow, and the higher the pressure on management to perform. IB1 mentions large shareholders who could enter the arena if the manager's stake dilutes. Managers would not appreciate the interference of a major shareholder in the operations of the firm; i.e., managers fear loss of control. From the perspective of external shareholders, the monitoring role of a large shareholder could benefit the shareholders (i.e., it could improve corporate governance/control). Agency costs that result from a reduction in the price of shirking (residual claim) as the stake of management decreases is not mentioned by the specialists.

Following hierarchy. Information asymmetry is not mentioned by practitioners as an argument favoring debt over equity. It seems that Myers' arguments for his pecking order (see Myers, 1984) are not recognized by practitioners.

Flexibility. Flexibility was mentioned by all specialists—often as a relevant criterion for management (see Table 4)—but recognized as relevant for shareholders as well (see e.g., IB13).[114] A disadvantage of high leverage is the inherent accompanying inflexibility in executing additional positive net present value investment programs. Management must enter the capital markets to source funds before it can invest. This can lead to underinvestment if the firm is not able to exercise

[114] IB13 formulates flexibility as advantage of a low leverage… 'the advantage of less debt and more equity is the creation of an unused debt capacity for new (expansion) investment programs', see Appendix B.

real options (if any) in time.[115] The existence of covenants could also prevent the firm from investing in valuable projects, or it could postpone the timing of investments.[116]

Signaling. Only C2 suggested that an issuance of equity can be interpreted as a positive signal to the market (see C22). This is in contrast with traditional signaling with debt, or the stake management has in the firm.

Subsidy was not mentioned by the specialists. This is not a surprise since subsidy was not included in the Vita case.

Table 3. Additional variables identified by the specialists that are relevant for shareholders. This table presents criteria that are mentioned by practitioners but that are not listed among the economic criteria in Chapter 3, Table 1.

		Multiple Criteria	**Mentioned by specialist**			
			C1	C2	IB1	FSB1
Additional criteria relevant for shareholders	1	*Dividends*	yes	yes	yes	yes
	2	*Dilution*	yes	yes	yes	no
	3	*Earnings per share*	no	no	yes	no
	4	*Financial risk*	yes	no	yes	no
		Absolute value lost	no	yes	no	no
		Structures/claims	yes	yes	no	yes
	5	*Cost of debt*	yes	no	no	no
	6	*Credit rating*	no	yes	no	no
	7	*Liquidity*	no	no	yes	no

A series of criteria not mentioned in Chapter 3, but relevant for shareholders, according to the specialists, are: *dividends*, *dilution, earnings per share, financial risk, absolute value lost, structures/claims, cost of debt, credit rating* and *liquidity* (see Table 3).

Dividends are reduced if the obligated payments to debt holders are higher. This is seen as a disadvantage by all practitioners. Dividends are restricted because of debt covenants or because the generated free cash flow is simply insufficient.[117]

[115] This criterion was called *elasticity* (offensive criterion) by Diepenhorst (1962). Diepenhorst (1962) distinguished further *guarantee capital* (defensive criterion) and *profitability* (pricing criterion) as criteria for the evaluation of a financing structure. See Smit and Trigeorgis (2004) for a problem solving approach that synthesizes ideas from game theory, real options, and strategy.

[116] We do not refer to the underinvestment problem of Myers (1977) here. The underinvestment problem of Myers is part of the agency problem between equity and debt. Specialists did not refer to this problem.

[117] Theoretically one could argue dividend policy is irrelevant, see Brealey et al. (2008).

Dilution is the most important factor mentioned by all specialists. Besides the fact that an issue of equity could influence the monitoring and control function exercised by existing shareholders (as discussed in Table 2 under Control), such issue also has an effect on the *earnings per share*. It seems that some specialists (IB1) assume existing shareholders also do not want their stake to be diluted for this latter reason. To prevent dilution, C1 and C2 propose 100% debt financing. IB1 proposes a different solution to prevent dilution. IB1 assumes that (external) equity holders do not prefer a very highly-leveraged firm because of the higher financial risk, in combination with more control by debt holders as a result of strict covenants. For this reason, IB11 contains new equity and only a small amount of new debt. To prevent dilution resulting from the issuance of equity, the firm gives the equity holders claims which give them the right to participate in any new issue of equity; the result of exercising these claims is that their stake does not dilute. Further, the financial risk for the shareholders remains roughly the same, because the extra use of debt is limited. Note that according to IB1, shareholders value *a higher earnings per share* more than the increase *in financial risk* as a consequence of higher leverage *so long as the increase is not extreme*. IB1 states further that although earnings per share is from a theoretical point of view not a good evaluation criterion, in practice, for listed firms, it is a leading criterion (as is the 'net debt/EBITDA ratio').

According to C1 and IB1, *financial risk* increases with leverage. C2 takes an alternative view, claiming that the risk to shareholders decreases if debt is used rather than new equity, since it limits the total amount of equity invested in the firm. If one invests more in equity, the possible loss is higher if the firm encounters financial difficulties; if one invests less by using (more) debt, the possible value lost is lower. This is a totally different kind of reasoning than Proposition II of Miller and Modigliani (1958). Further, *legal structures* are established and act to reduce the downside risk for shareholders and the *claims* owing to debt holders (see e.g., C21 and C22).

Cost of debt is relevant according to C1 (see C11); the lower, the better.[118]

The effect on *credit rating* can affect shareholder value via the investment guidelines of institutional investors (see C21).

[118] As long as the return is not in accordance with the risk borne by debt holders, this variable influences shareholder wealth.

Liquidity is positively related to the free float of shares (see IB11 and IB13) and benefits shareholders because liquidity is negatively related to the required rate of return.

Table 4. Quasi Non-Economic Criteria mentioned by Specialists
Quasi non-economic criteria mentioned by financial specialists C1, C2 and IB1 implicitly or explicitly (*yes*), and which are not (*no*).

Quasi non-economic values (see Chapter 3, Table 2)		**Multiple Criteria**	**Mentioned by specialist**			
			C1	C2	IB1	FSB1
	1	*Flexibility(self sufficiency)*	yes	yes	yes	no
	2	*Job security*	no	yes	yes	no
	3	*Control*	no	no	yes	no
	4	*Earnings dilution / per share*	no	no	yes	no
	5	*Financial reward*	no	no	no	no
	6	*Maturity matching,*	yes	yes	no	no
	7	*Credit rating etc*	no	no	no	no

Criteria that might be relevant for managers and that are not directly based on the neo-classical view are listed in Table 4 (see Chapter 3, Table 2).

Flexibility (self sufficiency) or freedom of action. The specialists did not express an assumption that managers would invest in self-enriching projects. However, advantages of low leverage for the manager were mentioned: higher internal cash flow for investment, 'peace' in operational activities (C12, C22 and IB12), and lower pressure for achieving organizational efficiencies. Flexibility, or freedom of action, is valued positively by management, but often negatively by shareholders (see 'agency problem' between equity and management in Table 2).

Job security is mentioned by C2 and IB1 and is negatively related to leverage.

Control. According to IB1, for management, control is an extremely relevant factor. Losing control to other major shareholders seems worse than losing control to debt holders (see IB12). More control for management could of course result in a negative effect on shareholder value if management pursues self-interested projects at the expense of shareholders.

Earnings dilution or earnings per share. According to IB1, earnings per share is relevant for management since it is an important factor in communicating with the capital markets.

Financial reward other than income from equity is not mentioned.

Maturity matching was mentioned by C1 and C2; it is used in asset-based financing solutions.

Credit rating was mentioned by C2 as a criterion relevant for to shareholders (see Table 3), but not to management. We encountered no other criteria we could add to the list of quasi non-economic variables.

4.6. Evaluation of specialists' preferred proposals

In this section we evaluate the ultimate proposals (four proposals 3) that specialists would actually present to the management of Vita. We include the proposal by FSB1 since it would give a positive response to a request by Vita for a 100%-debt financing solution to consummate the acquisition. The solutions will be compared on all criteria listed in Tables 2–4. We choose to score the variables listed in Table 2 and Table 3 from the perspective of the shareholders, and the quasi non-economic variables listed in Table 4 from the perspective of the Vita management. We incorporate, to the extent possible, the qualifications enumerated by the specialists themselves. If specialists did not apply a certain criterion in their evaluation, we made a qualitative statement ourselves. The relative scores were, of course, assigned by us. Since it is not possible to measure the influence of the financing plans in currency units, as became clear in the hypothetical 'OCS' example in Chapter 3, we make only qualitative statements. The symbol (👍) means good, (👎) means bad, and (👍👍👍👍) ≻ (👍👍👍), (👍👍👍) ≻ (👍👍), (👍👍) ≻ (👍), (👍) ≻ (👍👎), (👍👎) ≻ (👎), (👎)≻ (👎👎), (👎👎)≻ (👎👎👎), (👎👎👎)≻ (👎👎👎👎). The qualifications of the ultimate proposals are presented in Table 5.

The *present value of the tax shield* of debt (PVTS) is mentioned only by C1 and is highest for FSB13, since the amount of debt in FSB13 is highest, at €300 million. The amount of debt in C13 (see Table 1) totals €200 million—€150 million of debt in Opcos, plus €50 million of mezzanine debt in Holdco. The amount of debt in C23 is approximately €150 million, i.e., the sum of the debt in REneco, the Opcos, and if applicable, mezzanine debt in Holdco rather than debt in Opcos. The debt in IB13 is €100 million. If we assume that PVTS is positively related to the amount of interest-bearing debt, then the ranking of PVTS is, in decreasing order, FSB13, C13, C23 and IB23.

Direct costs of financial distress were not mentioned by the specialists, although FSB1 mentioned 'exit strategies', which could refer to costs triggered by a default. If we assume that the probability that financial difficulties occur is positively related to

leverage, then the negative influence on shareholder value is negatively related to leverage. The ranking is the same as for PVTS, although the sign is reversed.

Agency costs (equity-debt). As stated in Section 5, IB1 mentions the probability of wealth expropriation of debt as a result of an unexpected increase in leverage (at event date). IB1 and FSB1 both assume (or at least do not mention) that there is neither a recapitalization, nor an adjustment of covenants in existing debt contracts. This implies the possibility of wealth expropriation. An unexpected increase in debt is an unpleasant surprise for existing debt holders and a positive surprise for shareholders under IB13 and FSB13. C13 and C23 both assume old debt will be redeemed (i.e., a recapitalization is suggested). This implies no wealth transfer from existing debt holders to the shareholder under C13 and C23.

Now we focus on the agency costs placed on the shoulders of the shareholders by the new debt holders. New debt holders will try to protect themselves against the negative effects of possible manipulation by the shareholders after the acquisition. For simplicity, we assume agency costs to be higher i) the higher the leverage after the acquisition, and ii) the riskier the loan at issue date since we assume more (restricting) covenants if the loan is riskier or not asset based. Agency costs of debt are then highest for FSB13, followed by C13. C13 uses more debt than C23 and IB13. Besides this higher leverage, €50 million out of the €200 million is mezzanine debt. C23 contains more debt than IB13; however, a substantial amount of this debt is asset based (via REneco), which implies lower agency costs. That is why we assume that the agency costs of C23 are equal to the agency costs of IB13.

Non-financial stakeholders. We assume, as do the specialists, that neither the customer nor the community is impacted by the financing proposal; employees and suppliers, however, are indeed impacted. The claims these parties hold will (in favor of the shareholders) decrease in value with increasing leverage. However if, as a result of higher leverage, employees (middle management, etc.) charge higher wages, or suppliers adjust their terms of payment, the positive effect on shareholder value is reduced or even negatively related to leverage. We assume the total effect is neutral for IB13, and negative for the other solutions.

Agency costs (equity–management). The residual claim managers hold remains the same under FSB13, since the entire amount needed for the acquisition is borrowed. In other words, under FSB3, the management's stake does not dilute, resulting in a minimal effect on agency costs. If management's stake becomes diluted, then

management's price of shirking decreases; i.e., agency costs increase. If we assume that management has limited resources, dilution increases with the amount of equity issued. This implies C13 is the second best proposal, since the issuance of common equity is only €50 million. The other €50 million of equity is preferred equity with a fixed dividend without voting rights. Since holders of preferred equity do not benefit as do holders of common equity from value enhancing projects, they are not hurt as holders of common equity if management does not invest in these projects. C23 and IB13 comprise most equity.

Free cash flow (FCF) is negatively related to leverage. All specialists (except FSB1) point out the positive effects of low FCF—it increases organizational efficiency.

From a control perspective, external shareholders could benefit from monitoring activities by a (new) large shareholder. Under FSB13, this cannot be accomplished. The higher the issue of new common equity, the higher is the possible advantage of better governance by external shareholders. A claim issue reduces the possible appearance of a new large shareholder. This is the reason why we ranked IB13 equal to C13.

Hierarchy. If we follow Myers' pecking order, FSB13 is the best proposal, followed by C13, then by C23 and IB13.

Flexibility. High leverage with strict covenants limits new financing solutions. Firms that expect more profitable projects are hurt most by a multitude of restrictions. For simplicity, we assume that the higher the leverage, the lower the positively valued flexibility. The issue of €200 million in equity under IB13 is the solution that limits future borrowings least.

Signaling. If Vita issues debt, the market could interpret this as positive news. The firm informs the market about an anticipated prosperous future. As a result, share prices could rise. We expect this signal to strengthen the more debt the firm uses. The fact that the stake of the manager/entrepreneur does not dilute by using debt rather than equity further strengthens the signal. Note I: C2 stated that a successful issue of equity is a positive signal (see Section 5) which might be a reason to score C23 better than we do now. Note II: The issue of equity with tradable claims by IB13 could be interpreted as worse than an equity issue without the use of claims. It can be expected that the claims are issued, because the probability of a successful issue of common shares is otherwise low. With the use of claims, a successful issue may be enforced.

The announcement of an issue of claims could have a negative effect on shareholder value (this could also be explained by a possible wealth transfer from equity holders to old debt holders).

Table 5. Scores proposal 3
Table 5 shows the scores for the four proposals 3. 'Yes' means the criterion was used in the evaluation by the specialist, 'no' if the criterion was not applied. If 'yes', then the qualification good/bad is based on an evaluation by the specialist. The relative scores are made by us. The symbol (👍) means good, (👎) means bad and (👍👍👍👍) ≻ (👍👍👍), (👍👍👍) ≻ (👍👍), (👍👍) ≻ (👍), (👍) ≻ (👍👎), (👍👎) ≻ (👎), (👎)≻ (👎👎), (👎👎)≻ (👎👎👎), (👎👎👎)≻ (👎👎👎👎). Scores in Panel A1 and A2 are from the perspective of the shareholders; scores in Panel B are from the perspective of the management of Vita.

Category	#	Multiple Criteria	Scores			
			C13	C23	IB13	FSB13
Panel A1: Economic values (from Table 2)		*ΔDebt (x € 1 million)*	200	150	100	300
	1	*Tax shield* - corporate level	yes 👍👍👍	no 👍👍	no 👍	no 👍👍👍👍
		- personal level	no -	no -	no -	no -
	2a	*Direct costs financial distress*	no 👎👎👎	no 👎👎	no 👎	yes 👎👎👎👎
	2b	*Agency costs equity-debt* - wealth transfer effect at event date	no 👍👎	no 👍👎	yes 👍	no 👍👍
		- costs to prevent games after event date	yes 👎👎	no 👎	yes 👎	yes 👎👎👎
	2c	*Non-financial stakeholders* - customers	no -	no -	no -	no -
		- employees	no 👎👎	yes 👎	yes 👍👎	no 👎👎👎
		- suppliers	yes 👎👎	yes 👎	yes 👍👎	no 👎👎👎
		- community	no -	no -	no -	no -
	3	*Agency costs equity-management* - residual claim	no 👎	no 👎👎	no 👎👎👎	no 👍👎
		- free cash flow	yes 👍👍	yes 👍	yes 👍👎	no 👍👍👍
		- control	no 👍	no 👍👍	yes 👍	no 👍👎
	4	*Following hierarchy*	no 👎	no 👎👎	no 👎👎👎	no 👍👎
		Flexibility	no 👎👎	no 👎	yes 👍👎	no 👎👎👎
	5	*Signaling*	no 👍	yes 👍👎	no 👎	no 👍👍
	6	*Subsidy*	no -	no -	no -	no -

Table 5 *(Continued)*

		Multiple Criteria	**Scores**			
			C13	C23	IB13	FSB13
Panel A2: Economic values (from Table 3)	1	*Dividends*	yes 👍👎	yes 👍👎	yes 👍👎	yes 👎
	2	*Dilution*	yes 👎	yes 👎👎	yes 👎👎	no 👍👎
	3	*Earnings per share*	no 👍👍	no 👍	yes 👍👎	no 👍👍👍
	4	*Financial risk*	yes 👎👎	no 👎	yes 👍👎	no 👎👎👎
		Structures/claims	yes 👍	yes 👍👍	no 👍👎	yes 👍👎
		Absolute value lost	no 👎	yes 👎👎	no 👎👎👎	no 👍👎
	5	*Cost of debt*	yes 👎👎👎	no 👎	no 👍👎	no 👎👎
	6	*Credit rating*	no 👎👎	yes 👎	no 👍👎	no 👎👎👎
	7	*Liquidity*	no 👍	no 👍👍	yes 👍👍👍	no 👍👎
		Multiple Criteria	**Scores**			
			C13	C23	IB13	FSB13
Panel B: Quasi non-economic values (from Table 4)	1	*Flexibility (self sufficiency/FCF)*	yes 👎👎	yes 👎	yes 👍👎	no 👎👎👎
	2	*Job security*	no 👎👎	yes 👎	yes 👍👎	no 👎👎👎
	3	*Control*	no 👎	no 👎👎	yes 👎	no 👍👎
	4	*Earnings dilution / per share*	no 👍👍	no 👍	yes 👍👎	no 👍👍👍
	5	*Financial reward*	no -	no -	no -	no -
	6	*Maturity matching*	yes -	yes -	no -	no -
	7	*Credit rating*	no 👎👎	no 👎	no 👍👎	no 👎👎👎

Panel A2 of Table 5 contains the scores on the additional variables mentioned by the specialists.

The first variable is *dividends*. C1, C2 and IB1 indicate that a high level of debt might have repercussions for dividends. C1 and C2 value this result as negative for the shareholders. Propositions with a lot of debt score low on the criterion dividend because of the higher interest payments and redemptions. FSB13 with €300 million debt scores definitively the lowest. The other proposals have slight or no significant influence on dividend, according to the specialists.

Since C13 contains €50 million of common equity without claims, the problem of *dilution* exists but is limited. C23 contains a larger issue of equity, i.e., €150 million. This implies a larger dilution problem for C23. IB13 contains €200 million of common equity with claims, which could be exercised to prevent dilution. For simplicity, we score C23 and IB13 as equal. The 100% debt of FSB1 gives the shareholders no dilution problem at all.

If the return on total assets is higher than the cost of debt, then *earnings per share* is positively related to leverage. That would mean that FSB13 scores highest and IB13 the lowest.

The higher the leverage, the higher the fluctuation in the returns of equity; *financial risk* is high when leverage is high. Although IB1 states that the positive effect of leverage on earnings per share is of more value than the impact on risk, the impact on risk is positive.

To reduce the claims of debt holders if financial difficulties occur, C1's (two Opcos) and C2's (two Opcos and one REneco) *structures* might benefit shareholders more than the structure of IB1 and FSB1. We score C23 with REneco highest. As C2 mentioned, the *absolute value lost* by the equity holders is negatively related to leverage. From that perspective, FSB1 gets the highest score, and IB1 the lowest.

The cost of debt (marginal cost of debt as a percentage of marginal debt issued) is highest for mezzanine debt in Holdco. If we assume the amount of mezzanine debt is zero in C23, then the cost of debt score in a negative respect is highest for C13, followed by FSB13, C23 and IB13.

Higher leverage can have a negative impact on the *credit rating of debt*. A negative impact on the credit rating could be interpreted as a negative signal to the capital markets. For simplicity, we assume that the higher the total amount borrowed, the lower the credit rating of debt.

Liquidity is positively influenced by the free float of shares. We assume the positive effect is highest for IB13, followed by C23, C13 and FSB13.

Panel B of Table 5 contains the variables or heuristics that could be relevant for the management of the firm. All variables—except credit rating and financial reward—were implicitly or explicitly mentioned by at least one specialist (see Table 4). New variables were not added to this list.

Flexibility (self sufficiency). FCF is rewarded positively by managers. The higher the FCF, the less efficient the organization needs to be (in the short run). FCF is highest under IB13, because promised payments to debt holders under this alternative are lowest. The scores for flexibility for management are opposite to the scores for *agency costs equity-management* (FCF) in Panel A1 of Table 5.

Job security. If we assume job security within Vita is highest as the probability of financial distress is lowest, the same valuation applies as under flexibility.

Control. Management of Vita are shareholders and they do not wish to see their stake diluted and, above all, do not want a large shareholder to interfere with management decisions. The valuation of control is scored as in Panel A1, but with reversed signs.

Earnings dilution is already discussed as an item (earnings per share) that might be relevant for shareholders. See Panel A2 of Table 5.

Financial reward. Except for holdings of shares, no other relevant information is given in this case. If the reward is linked to earnings per share, then the preference of management for proposal FSB1 is clear. Since we did not give information about this variable, we cannot assign a ranking to the proposals.

C1 applied explicitly the *maturity matching* principle. The maturity of the loan with real estate as collateral is 25 years; the maturity for the fixed inventory is only 5 years. C2 uses real estate as collateral in a separate entity. Other proposals contained information about neither the maturity of assets nor of loans. The loans however, can be claimed if covenants are violated. We do not evaluate the proposals on this criterion. We state only that maturity matching is applied.

Credit rating is already discussed, as was earnings dilution. See Panel A2 of Table 5. We assume management does not like a downgrade of the status of their debt.

If we compare the financing proposals by simply summing the numbers of the proposals that score highest on the various criteria, we would conclude that the corner solutions, i.e., IB13 and FSB13, are the best solutions. FSB13 scores for example relatively well in Panel A on tax shield, free cash flow and earnings per share. IB13 scores highest on the flexibility-, and the job security criterion in panel B. This may suggest that IB3 is best from management's perspective, and that FSB13 is best from the shareholder's perspective.

Of course, the outcome of the evaluation of the proposals depends on the criteria used, the scores given, and the weighting factors applied. In our evaluation, we made simplifying assumptions in order to generate qualifications and comparisons. If we made other assumptions, the outcome would probably have differed.

Given the (soft) qualitative scores on the various criteria, management is able to compare the solutions. Management must decide which criteria are most relevant for them, and should collect more information (if necessary) to make more precise comparisons. Further, it could even be wise to collect additional financing proposals before making the 'final' financing decision.[119]

4.7. Summary

Several conclusions can be drawn from this M&A case. First, the optimal solution for shareholders is not, per se, the optimal solution for management. In other words, conflicts of interest are acknowledged.

Second, there is an optimal solution neither for the shareholders nor for the management. If there were just one optimal solution, one would expect that each specialist would present the same solution for each stakeholder. This is not the case, however.

Third, the relevance of the criteria based on the neoclassical view and summarized in Chapter 3 is more or less confirmed by the specialists, although there are notable differences. The criterion of a tax shield provided by debt is mentioned as important for shareholder value by only one specialist, while this is a major advantage according to financial theory. Those criteria that command no or almost no importance include taxes on the personal level, direct costs of financial distress, stakeholder customers, and the community, the influence of the magnitude of the 'residual claim' on agency costs between equity and management, and the pecking order (based on information a-symmetry).

Fourth, criteria that are relevant for shareholders according to the specialists, but that are not mentioned in our list with criteria based on the neoclassical view are:

[119] We received a solution from another investment banker (IB2), who was later informed about case Vita. We did not include IB2's solutions, since the solutions were made after the start of the credit-crisis and the others were not. The solution by this investment banker deviates from the proposals discussed and is as such interesting to analyse. The solution is available at http://people.few.eur.nl/schauten/Solution_Case_Vita_IB%202.pdf.

dividends, dilution, earnings per share, financial risk, structures/claims, absolute value lost, cost of debt, credit rating and liquidity.

Fifth, some criteria such as job security are relevant for management, but not directly for the shareholders. Other criteria such as flexibility and control are relevant for both stakeholders, but are evaluated with opposite signs.

Sixth, the financing proposals can be evaluated in qualitative terms. Since it is not possible to define the financing problem as an optimization problem, the collection of financing proposals and their comparison on relevant criteria seems (at minimum) a satisfying solution for an M&A financing problem.

Appendix A. Case 'Super-Vita'

INTRODUCTION

Super-Vita (Vita) is a listed company with approximately 400 supermarkets and total revenues of €1,613 million in the last fiscal year. Vita achieved an EBITDA of €93.5 million and had 4,100 FTE employed. All Vita stores are located in 'the green valley'. Vita differentiates itself from competitors by offering high quality fruit and vegetables at relatively low prices.

Vita is considering acquisition of the shares of an average-size chain for €300 million. This acquisition will further increase the buying power of Vita and will improve the company's ability to utilize economies of scale. The increased buying power will most likely lead to lower purchase prices. The economies of scale mainly pertain to the use of the distribution center and the marketing department. The acquisition candidate, company Duplo, is a player with stores that hardly compete with Vita, because of their geographical location. As a result of poor market positioning, company Duplo is dealing with a decrease in total revenues and relatively small margins. Furthermore, Duplo is struggling with management problems because of the unexpected departures of both the marketing manager and the financial director.

MARKET

The food market is characterized by low growth and heavy competition, especially in the prices of dry grocery goods (DGG). Autonomous growth, where possible, is primarily realized by elbowing out specialty stores that do not distinguish themselves from supermarkets with respect to their product offering and customer service. This trend is expected to continue in the coming years. The market leader in the green valley is Allied, which is also the market leader at the national level. Vita, with a regional market share of 20%, is the second largest player within the green valley and is positioned fourth on a national level.

MARKET STRATEGY

Vita's strategy is aimed at growth from acquisitions and from ousting inferior specialty stores from the market. Here, the competition is strongest in the fruit and vegetables segment. By acquiring Duplo, the number of stores will increase from 400 to 750 and total revenues will increase from €1,613 million to €3,009 million in year 1. Specialty stores in the vicinity will lose market share to Vita in the next few years. For the coming 3 years, we expect the total revenue growth of Vita, including Duplo, to be approximately 2% higher than the expected market growth of 0.5%. The expected revenue growth without the acquisition amounts to 1.5% more than the market growth.

MANAGEMENT AND ORGANIZATION

Vita's management is led by De Wit Jr. De Wit Jr. is one of the sons of Jan de Wit, who founded Vita in the 1960s. De Wit Jr. (age 40) succeeded his father as CEO in 2001 and is successfully leading the company. Under his leadership, Vita has been repositioned as a supermarket with fresh products at low prices. For the past 5 years, the increase in total revenues significantly exceeded market growth. Absenteeism is low compared to direct competitors, while the average age of the workforce is relatively high. The coming years will be tipped at introducing a younger workforce, which will lower personnel costs. This is necessary considering the price competition that is expected to continue into the future.

Apart from De Wit Jr, the management team consists of De Bruin (age 48) and Van Ginkel (age 52). De Bruin is the CFO of Vita, and both he and Van Ginkel, the marketing manager of Vita, consider the expansion as a challenge. De Bruin used to be the CFO of POVI, the number 2 in the industry, but he switched to Vita 6 years ago. Van Ginkel is responsible for the new store formula that was successfully implemented. Both De Bruin and Van Ginkel own a 2.5% interest in Vita. De Wit Jr., just like De Wit Sr., owns a 20% interest. All other shares are owned by third parties, of which one institutional investor holds a 10% interest.

Five years ago, Vita decided to make a public offering because of its acquisition of Shop & Carry. Vita financed this acquisition with a mix of debt and new equity. The management team has successfully incorporated the 190 stores of the acquired chain, and is ready for a new move. Considering the development of the market and the opportunity at hand, this is a logical next step.

The management team of Duplo consists of the 2 founders of the company, the Bakker brothers. After the acquisition, they will leave the company as they have reached retirement age. The Bakker brothers, each owning 50% of the shares, would like to sell their company to Vita. The Bakker family does not have successors. Also, the employees of Duplo are not interested in taking over the company. The Bakker brothers are of the opinion that selling the company to Vita will work out well for their employees. Nevertheless the price (of equity and debt at 1/1/year 1) equals the market value, namely approximately 7 x EBITDA (end of the year).

Vita has 400 stores of its own, each with an average surface area of 800 m^2 and total revenues per m^2 of approximately €5,000.

THE INVESTMENT

The acquisition of the shares of Duplo requires €300 million. Approximately €15 million of this amount could be financed by available liquid assets. For the remainder, external financing will be needed. External financing will most probably consist of issuing new equity and/or raising debt. Vita has not yet decided on this matter, and is seeking information and advice with respect to the possibilities.

Company Duplo owns 350 stores, each with an average surface area of 800 m^2. All buildings are suited for the store formula of Vita. The buildings are owned by Duplo. Within 2 years, nearly all of the Duplo stores will be repositioned as Vita stores. The required per store investment amounts to approximately €150,000, for a total of €52.5 million (350 x €150,000).

The repositioning and merger of Duplo with Vita will lead to an improvement in Duplo's gross margin from 20% last year, to 21.7% in year 3. Without the merger (and the increased buying power), margin would increase to only 20.5%. Both personnel and other costs will increase in the first three years as a result of the merger. The appendices contain the forecasted balance sheets and income statements for the proximate five years for Duplo, both as an independent entity and as a part of Vita. The appendices also contain the historical balance sheets and income statements of Vita for the past three years, and the forecasted balance sheets and income statements for the coming 5 years (without Duplo).

The appraised value of the Duplo and Vita store premises at direct sale amounts to €168 million and €240 million respectively.

Investment plan (amounts x €1 million):

Acquisition shares	€	300.00	at 1/ 1/ year 1
Repositioning	€	52.50	at 31/12/ year 1
Total	€	352.50	

Financing plan (amounts x €1 million):

External	€	300.00	at 1/ 1/year 1
Internal	€	52.50	at 31/12/year 1
Total	€	352.50	

The external financing could be reduced by using approximately €15 million of excess cash. The required investment of €52.50 will be financed through internally generated cash flow.

PROBLEM

Vita has decided to take over Duplo. The management of Vita has agreed to the price for the Duplo shares. However, the management has not yet decided upon the financing structure of the takeover.

We ask for the following information:

1) A financing proposal focused on the interests of the current shareholders of Vita, excluding management;
2) A financing proposal focused on the interests of the management of Vita;
3) A financing proposal as you would advise it to the management of Vita.

You can answer these questions on the enclosed answer sheet. Would you please also point out the possible consequences of your three proposals on the interests of: a) the shareholders (excluding the management), b) the management, and c) the other stakeholders.

Appendices:

1) Balance sheets, income statements and cash flow statements of Vita without Duplo.
2) Balance sheets, income statements and cash flow statements of Duplo as an independent entity.
3) Balance sheets, income statements and cash flow statements of Duplo as a part of Vita, including investments and synergies.
4) Answer sheet.

If desired, these appendices can also be downloaded from:

http://people.few.eur.nl/schauten/#research

Appendix A1

Balance sheets, income statements and cash flow statements of Vita without Duplo.

Vita

Statement of income (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Revenues	1550.0	1581.0	1612.6	1644.9	1677.8	1711.3	1745.6	1780.5
Cost of goods sold	1209.0	1230.0	1254.6	1279.7	1317.0	1340.0	1365.0	1392.3
Gross Profit	*341.0*	*351.0*	*358.0*	*365.2*	*360.7*	*371.4*	*380.5*	*388.1*
Personnel	186.0	189.7	195.1	197.4	199.7	201.9	204.2	208.3
Other expenses	77.5	71.1	69.3	69.1	70.5	71.9	73.3	74.8
Depreciation fixed assets	37.9	37.9	38.7	39.5	40.3	41.1	41.9	42.7
Operating income (EBIT)	*39.6*	*52.2*	*54.8*	*59.2*	*50.3*	*56.5*	*61.1*	*62.3*
Financial 2.0%	0.0	0.0	0.4	0.7	1.1	1.4	1.7	2.1
Financial costs 4.5%	6.0	9.2	9.2	9.4	9.6	9.8	10.0	10.2
Income before tax	*33.6*	*42.9*	*45.9*	*50.5*	*41.8*	*48.0*	*52.8*	*54.2*
Tax 30.0%	10.1	12.9	13.8	15.1	12.5	14.4	15.8	16.3
Net income	*23.5*	*30.1*	*32.2*	*35.3*	*29.2*	*33.6*	*37.0*	*37.9*
Dividend	*9.4*	*12.0*	*12.9*	*14.1*	*11.7*	*13.4*	*14.8*	*15.2*

Balance sheet (book (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Fixed assets	316.2	316.2	322.5	329.0	335.6	342.3	349.1	356.1
Inventories	93.0	94.9	96.8	98.7	100.7	102.7	104.7	106.8
Accounts receivable	7.8	7.9	8.1	8.2	8.4	8.6	8.7	8.9
Cash working capital	7.8	7.9	8.1	8.2	8.4	8.6	8.7	8.9
Goodwill								
Excess Cash	0.5	18.4	35.1	53.7	68.5	85.9	105.3	125.2
Total assets	*425.2*	*445.3*	*470.5*	*497.8*	*521.5*	*548.0*	*576.6*	*605.9*
Equity	130.0	148.0	167.3	188.5	206.1	226.3	248.4	271.2
Provisions	15.5	15.8	16.1	16.4	16.8	17.1	17.5	17.8
Debt long term	189.8	189.7	193.5	197.4	201.3	205.4	209.5	213.7
Debt short term	15.5	15.8	16.1	16.4	16.8	17.1	17.5	17.8
Accounts payable	74.4	75.9	77.4	79.0	80.5	82.1	83.8	85.5
Total Liabilities & Equity	*425.2*	*445.3*	*470.5*	*497.8*	*521.5*	*548.0*	*576.6*	*605.9*

Statement of Cash Flows (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Operating		52.2	54.8	59.2	50.3	56.5	61.1	62.3
Depreciation		37.9	38.7	39.5	40.3	41.1	41.9	42.7
Provisions		0.3	0.3	0.3	0.3	0.3	0.3	0.3
Operating Cash Flow before tax		*90.4*	*93.8*	*99.0*	*90.9*	*97.9*	*103.3*	*105.4*
Inventories		-1.9	-1.9	-1.9	-2.0	-2.0	-2.1	-2.1
Cash working		-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Accounts receivable		-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Accounts payable		1.5	1.5	1.5	1.6	1.6	1.6	1.7
Investment in working capital		*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.8*	*-0.8*
Investments in fixed assets (capex)		*-37.9*	*-45.0*	*-45.9*	*-46.8*	*-47.8*	*-48.7*	*-49.7*
Redemption		-41.1	-41.1	-41.9	-42.8	-43.6	-44.5	-45.4
Financial expenses		-9.2	-8.9	-8.7	-8.5	-8.4	-8.3	-8.1
Tax		-12.9	-13.8	-15.1	-12.5	-14.4	-15.8	-16.3
Dividend		-12.0	-12.9	-14.1	-11.7	-13.4	-14.8	-15.2
Cash used in financing activities		*-75.2*	*-76.6*	*-79.9*	*-75.6*	*-79.9*	*-83.4*	*-84.9*
Long-term debt		37.9	41.7	42.6	43.4	44.3	45.2	46.1
Short-term debt		3.4	3.5	3.5	3.6	3.7	3.8	3.8
Excess Cash		-17.9	-16.7	-18.6	-14.9	-17.4	-19.4	-19.9
Cash flow from financing activities		*23.4*	*28.5*	*27.6*	*32.2*	*30.6*	*29.6*	*30.0*

Appendix A2

Balance sheets, income statements and cash flow statements of Duplo as an independent entity.

Duplo

Statement of income (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Revenues	1360.0	1355.9	1350.5	1357.2	1370.8	1391.4	1419.2	1447.6
Cost of goods sold	1081.2	1082.0	1080.4	1083.1	1089.8	1106.1	1128.3	1150.8
Gross Profit	*278.8*	*273.9*	*270.1*	*274.2*	*281.0*	*285.2*	*290.9*	*296.8*
Personnel	163.2	162.7	158.0	156.1	157.6	160.0	163.2	166.5
Other expenses	61.2	61.0	64.8	61.1	61.7	62.6	63.9	65.1
Depreciation fixed assets	29.4	31.7	34.0	34.2	34.5	35.1	35.8	36.5
Operating income (EBIT)	*25.0*	*18.4*	*13.2*	*22.8*	*27.1*	*27.5*	*28.1*	*28.7*
Financial 2.0%	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial costs 5.0%	5.2	2.3	3.1	3.9	3.8	3.7	3.7	3.8
Income before tax	*20.1*	*16.2*	*10.2*	*18.9*	*23.3*	*23.8*	*24.4*	*24.8*
Tax 30.0%	6.0	4.8	3.0	5.7	7.0	7.1	7.3	7.4
Net income	*14.1*	*11.3*	*7.1*	*13.2*	*16.3*	*16.7*	*17.1*	*17.4*
Dividend	*9.9*	*7.9*	*5.0*	*9.3*	*11.4*	*11.7*	*11.9*	*12.2*

Balance sheet (book (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Fixed assets	244.8	264.4	283.6	285.0	287.9	292.2	298.0	304.0
Inventories	95.2	94.9	94.5	95.0	96.0	97.4	99.3	101.3
Accounts receivable	27.2	27.1	27.0	27.1	27.4	27.8	28.4	29.0
Cash working capital	13.6	13.6	13.5	13.6	13.7	13.9	14.2	14.5
Goodwill								
Excess Cash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total assets	*380.8*	*400.0*	*418.7*	*420.7*	*425.0*	*431.3*	*440.0*	*448.8*
Equity	255.0	258.4	260.5	264.5	269.4	274.4	279.5	284.7
Provisions	13.6	13.6	13.5	13.6	13.7	13.9	14.2	14.5
Debt long term	36.7	42.3	56.7	57.0	57.6	58.4	59.6	60.8
Debt short term	8.8	19.3	21.7	19.2	17.1	16.4	17.1	17.8
Accounts payable	66.6	66.4	66.2	66.5	67.2	68.2	69.5	70.9
Total Liabilities & Equity	*380.8*	*400.0*	*418.7*	*420.7*	*425.0*	*431.3*	*440.0*	*448.8*

Statement of Cash Flows (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Operating		18.4	13.2	22.8	27.1	27.5	28.1	28.7
Depreciation		31.7	34.0	34.2	34.5	35.1	35.8	36.5
Provisions		0.0	-0.1	0.1	0.1	0.2	0.3	0.3
Operating Cash Flow before tax		*50.1*	*47.2*	*57.1*	*61.8*	*62.8*	*64.1*	*65.4*
Inventories		0.3	0.4	-0.5	-1.0	-1.4	-1.9	-2.0
Cash working		0.0	0.1	-0.1	-0.1	-0.2	-0.3	-0.3
Accounts receivable		0.1	0.1	-0.1	-0.3	-0.4	-0.6	-0.6
Accounts payable		-0.2	-0.3	0.3	0.7	1.0	1.4	1.4
Investment in working capital		*0.2*	*0.3*	*-0.3*	*-0.7*	*-1.0*	*-1.4*	*-1.4*
Investments in fixed assets (capex)		*-51.3*	*-53.2*	*-35.6*	*-37.4*	*-39.4*	*-41.6*	*-42.4*
Redemption		-9.1	-12.3	-15.7	-15.2	-14.9	-15.0	-15.3
Financial expenses		-2.3	-3.1	-3.9	-3.8	-3.7	-3.7	-3.8
Tax		-4.8	-3.0	-5.7	-7.0	-7.1	-7.3	-7.4
Dividend		-7.9	-5.0	-9.3	-11.4	-11.7	-11.9	-12.2
Cash used in financing activities		*-24.2*	*-23.4*	*-34.5*	*-37.5*	*-37.5*	*-38.0*	*-38.8*
Long-term debt		12.9	22.9	11.6	12.0	12.4	12.9	13.1
Short-term debt		12.2	6.3	1.8	1.8	2.7	4.0	4.1
Excess Cash		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow from financing activities		*25.2*	*29.2*	*13.4*	*13.7*	*15.1*	*16.8*	*17.3*

Appendix A3

Balance sheets, income statements and cash flow statements of Duplo as a part of Vita, including investments and synergies.

Duplo

Statement of income (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Revenues	1360.0	1355.9	1350.5	1364.0	1404.9	1447.1	1483.2	1512.9
Cost of goods sold	1081.2	1082.0	1080.4	1061.2	1102.9	1133.1	1159.9	1183.1
Gross Profit	*278.8*	*273.9*	*270.1*	*302.8*	*302.1*	*314.0*	*323.3*	*329.8*
Personnel	163.2	162.7	158.0	191.0	196.7	188.1	185.4	177.0
Other expenses	61.2	61.0	64.8	81.8	84.3	86.8	74.2	63.5
Depreciation fixed assets	29.4	31.7	34.0	34.4	34.6	34.7	35.6	36.3
Depreciation repositioning					13.1	13.1	13.1	13.1
Operating income (EBIT)	*25.0*	*18.4*	*13.2*	*-4.4*	*-26.6*	*-8.8*	*15.1*	*39.8*
Financial 2.0%	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial costs 5.0%	5.2	2.3	3.1	3.9	6.3	6.1	5.7	5.0
Income before tax	*20.1*	*16.2*	*10.2*	*-8.3*	*-32.9*	*-14.9*	*9.4*	*34.8*
Tax 30.0%	6.0	4.8	3.0	-2.5	-9.9	-4.5	2.8	10.4
Net income	*14.1*	*11.3*	*7.1*	*-5.8*	*-23.0*	*-10.4*	*6.6*	*24.4*
Dividend	*9.9*	*7.9*	*5.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*

Balance sheet (book (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Fixed assets	244.8	264.4	283.6	286.4	288.0	289.4	296.6	302.6
Investment repositioning					52.5	39.4	26.3	13.1
Inventories	95.2	94.9	94.5	95.5	95.5	94.1	93.4	90.8
Accounts receivable	27.2	27.1	27.0	20.5	14.0	7.2	7.4	7.6
Cash working capital	13.6	13.6	13.5	10.9	7.0	7.2	7.4	7.6
Goodwill								
Excess Cash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total assets	*380.8*	*400.0*	*418.7*	*465.8*	*444.0*	*424.2*	*418.1*	*408.5*
Equity	255.0	258.4	260.5	254.7	231.7	221.3	227.9	252.2
Provisions	13.6	13.6	13.5	13.6	14.0	14.5	14.8	15.1
Debt long term	36.7	42.3	56.7	43.0	43.2	43.4	44.5	45.4
Debt short term	8.8	19.3	21.7	82.9	78.6	69.8	56.1	23.1
Accounts payable	66.6	66.6	66.4	66.2	71.6	76.4	75.2	74.8
Total Liabilities & Equity	*380.8*	*400.0*	*418.7*	*465.8*	*444.0*	*424.2*	*418.1*	*408.5*

Statement of Cash Flows (x € 1 mln)	Realised Year -3	Realised Year -2	Realised Year -1	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
Operating		18.4	13.2	-4.4	-26.6	-8.8	15.1	39.8
Depreciation		31.7	34.0	34.4	47.7	47.9	48.7	49.4
Provisions		0.0	-0.1	0.1	0.4	0.4	0.4	0.3
Operating Cash Flow before tax		*50.1*	*47.2*	*30.1*	*21.5*	*39.5*	*64.1*	*89.6*
Inventories		0.3	0.4	-0.9	-0.1	1.5	0.6	2.7
Cash working capital		0.0	0.1	2.6	3.9	-0.2	-0.2	-0.1
Accounts receivable		0.1	0.1	6.5	6.4	6.8	-0.2	-0.1
Accounts		-0.2	-0.3	5.4	4.8	-1.2	-0.5	-2.1
Investment in working capital		*0.2*	*0.3*	*13.6*	*15.1*	*6.9*	*-0.2*	*0.2*
Investments in fixed assets (capex)		*-51.3*	*-53.2*	*-89.7*	*-36.1*	*-36.1*	*-42.8*	*-42.2*
Redemption		-9.1	-12.3	-15.7	-25.2	-24.4	-22.6	-20.1
Financial expenses		-2.3	-3.1	-3.9	-6.3	-6.1	-5.7	-5.0
Tax		-4.8	-3.0	2.5	9.9	4.5	-2.8	-10.4
Dividend		-7.9	-5.0	0.0	0.0	0.0	0.0	0.0
Cash used in financing activities		*-24.2*	*-23.4*	*-17.1*	*-21.6*	*-26.0*	*-31.1*	*-35.6*
Long-term debt		12.9	22.9	-2.4	8.8	8.9	9.8	9.8
Short-term debt		12.2	6.3	65.5	12.3	6.9	0.3	-21.8
Excess Cash		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow from financing activities		*25.2*	*29.2*	*63.1*	*21.2*	*15.7*	*10.0*	*-12.0*

Appendix A4

Answer sheet

	Proposal 1	**Proposal 2**	**Proposal 3**
Contents proposal	1)	2)	3)
Consequences for the shareholders (excl. Vita's management)	4)	5)	6)
Consequences for Vita's management	7)	8)	9)
Consequences for other stakeholders (please specify)	10)	11)	12)

If you need more space to answer these questions, please add a separate sheet and refer to the numbers in the table above.

Appendix B. Solutions by specialists, including their evaluations

In this appendix, we describe the various solutions proposed by the various specialists, including relevant criteria mentioned per specialist per stakeholder. Proposal 1 is the best proposal for shareholders (excluding the management of Vita); proposal 2 is the best proposal for the management; and proposal 3 is the proposal the specialists would actually recommend to the management of Vita. We discuss the proposals given by two consultants (C1 and C2), one investment bank (IB1), and one full service bank (FSB1). Consultant 1's first proposal is referred to as C11, Consultant 1's second proposal is referred to as C12, etc. The proposals are evaluated from the perspective of the shareholders, managers, and other stakeholders on the criteria mentioned by the specialists. We follow the reasoning taken by the specialists. Note that FSB1 only evaluated whether the acquisition could be financed completely with debt. FSB1 did not construct alternative financing solutions.

CONSULTANT 1 (C1)

Proposal 1: best for current shareholders (of Vita), excluding the management (C11)

100% debt would be best for shareholders according to C1.[120] A total recapitalization of debt (by syndication), including 100% debt financing for the acquisition, is suggested. The proposed structure is as follows: a legal entity Newco (= Holdco) is created which holds the shares of Vita and Duplo. The operating companies (Opcos) Vita and Duplo remain legally separate. The *borrowing base* of both Opcos is 70% of the appraised value of the real estate, plus 50% of the book value of the fixed inventory (not stocks of goods), and 70% of the accounts receivable. The borrowing base for Vita and Duplo, then, is €215 million[121] and €220 million[122] respectively.[123]

[120] C1 was the only specialist who recommended not to acquire Duplo. According to this specialist, the investment outweighs the extra earnings / extra cash flows generated by the acquisition.

[121] The borrowing base for Vita (€215 million) is: 70% of €240 million (real estate) plus 50% of €82.5 million (total fixed assets minus €240 million) plus 70% of €8.1 million (accounts receivable).

[122] The borrowing base for Duplo after the acquisition (€220 million) is 70% of €168 million (real estate) plus 50% of €115.6 (total fixed assets, minus €168 million) million plus 50% of €52.5 (repositioning) plus 70% of €27 (accounts receivable).

[123] The amount borrowed by both Opcos was rounded by Consultant 1 to €450 million.

The maturity of the debt with real estate as collateral (€286 million) is 25 years; the debt with fixed inventory as collateral is 5 years (€125 million).

Vita will borrow €215 million, redeems the existing debt of €210 million (€193.5 million long term debt, plus €16.1 million short term debt), and will pay a dividend of €40 million (the residual €5 million, plus excess cash of €35 million) to Newco. Duplo borrows €220 million, pays off the existing debt of €78 million (€56.7 million long term debt and €21.7 million short term debt) and pays a dividend of €142 million (€220 million, minus €78 million) to Newco. The total amount paid to Newco then, is €182 million. Newco needs €300 million to buy the shares. That means Newco must issue another €118 million (€300 million minus €182 million) with the shares of Vita and Duplo as the only collateral.[124] This issue would be an issue of mezzanine debt (12% interest). The equity / total assets ratio of the Opcos Vita and Duplo decreases as a result from 36% to 29%, and from 62% to 25%, respectively. If this decrease is too high for suppliers, it could be appropriate to reduce the amount borrowed by the Opcos and to increase the amount borrowed (mezzanine debt) by Holdco.

Perspective: shareholders

The first positive effect for the shareholders mentioned by C1 is that there is no *dilution* if the acquisition is 100% debt financed. Second, management should follow a strict *working capital policy* and make available *financial reports* on a regular basis. A third advantage, a higher *gearing* with a higher *tax shield* as a result was mentioned (the value is estimated as the corporate tax rate multiplied by the additional amount borrowed). Disadvantages mentioned were the higher *risk profile* for shareholders because of debt holders' *claims on the assets* of the Opcos, the high *cost of debt*, and the *prohibition on dividends*.

Perspective: management

For management, only negative effects were mentioned. First, management must deal with many *covenants* enforced by the syndicate of banks and has to present *financial reports often* (each quarter). Second, management is *less flexible* in executing additional investment programs, i.e., management must *consult* the syndicate of banks

[124] The amount borrowed (mezzanine debt) by Holdco was rounded by Consultant 1 to €150 million.

first. Because of the high leverage, *free cash flow is low* with a need for new external financing for major investments as a result.

Perspective: other stakeholders

Suppliers were mentioned with demands for '*stricter terms on trade credit*' to compensate them for the increase in risk they perceive. C1 mentioned that some firms have contracts with suppliers that first must be renegotiated if the risk profile of the firm changes dramatically. If important suppliers do not agree with the new situation, proposal 1 (100% debt) could be non-executable or rather expensive.

Proposal 2: best for the management of Vita (C12)

Instead of issuing mezzanine debt of €118 million (rounded to €150 million in Table 1), Holdco issues 'cum prefs' with a fixed dividend and no voting rights. According to IFRS, cumprefs are registered as debt. For banks, cumprefs are seen as equity, since bank claims are senior, i.e., the higher the fraction of cumprefs and the lower the fraction of debt, the lower the risk for holders of debt.

Perspective: shareholders

Proposal 2 has the following advantages for shareholders. First, it would be possible to pay a limited amount of *dividends*. Second, the *cost of debt* would be lower compared with proposal 1. Third, equity's financial risk is lower. Disadvantages include a lower gearing with a *lower tax shield* as a result (dividends are not tax deductible), and a less strict *working capital management / less disciplined management*.

Perspective: management

Compared with proposal 1, management must deal with fewer *covenants* and *financial report requirements*. In other words, there is more peace within the operational activities. Second, management is more *flexible* in executing additional investment programs without the need for new external finance since the *internal cash flow* is relatively high.

Perspective: other stakeholders

No change in risk for the suppliers, which can be seen as advantageous for this stakeholder. They need not change the terms of their given *trade credit*.

Proposal 3: the ultimate proposal (C13)

Instead of the issue of cumprefs by Holdco for €150 million (see C12), Holdco will issue €50 million of common equity, €50 million cumprefs[125] / convertibles and €50 million mezzanine debt. The issue of common shares instead of cumprefs lowers the published leverage. The issue of mezzanine debt instead of cumprefs lowers tax payments since interest is tax deductible and dividends are not.

Perspective: shareholders

Proposal 3 has the following advantages for shareholders. First, management should follow a *strict working capital policy* and must issue *reports regularly*. Second, *the cost of debt* is lower compared with proposal 1. Third, the *gearing* is reasonably high as is the *tax shield* compared with proposal 2. Fourth, management is rather *disciplined* compared with proposal 2 because of the higher obligatory payments to the debt holders. This is good for *organizational efficiency*. The disadvantages are *higher financial risk* and a some *dilution*.

Perspective: management

The *covenants* by banks are reasonable; there is *moderate peace* within the Opcos and the number of *conferences* with banks is limited. Refinancing is (only) needed if *free cash flow* is too limited.

Perspective: other stakeholders

None, or just a moderate adjustment in the *term of payments* with suppliers.

[125] Again, cumprefs with a fixed dividend and no voting rights.

CONSULTANT 2 (C2)

Proposal 1: best for current shareholders (of Vita), excluding the management (C21)

Consultant 2 starts with the statement that Vita is a healthy firm without Duplo. If it acquires Duplo, the *risk of the assets* of Vita increases. From the perspective of the shareholders of Vita, this is undesirable. Consultant 2 suggests keeping Duplo in a *separate legal entity* in order to keep the risk to the shareholders of Vita as low as possible. In the basic *structure,* legal entity Holdco holds the shares of Vita and the shares of the legal separate entity Duplo. This is the same structure as in the proposals by C1.

Two financing solutions were discussed. Under each scenario, Vita pays the excess amount of cash to Holdco. That means that the external financing need is €352.5 million – €35 million (excess cash Vita) = €317.5 million.[126] Alternative 2 was preferred because the borrowing base of this alternative is a bit higher and the real estate of Duplo is relatively safe.

Alternative 1:

Duplo borrows approximately 6 x EBITDA (cash flow based), i.e., Duplo borrows €283 million (= 6 x €47 million). Subsequently, Duplo pays off the current amount of debt of €78 million and pays the residual of €205 million to Holdco.[127]

This means that €112.5 million (= €317.5 million – €205 million) should be borrowed by Vita or Holdco (mezzanine). Vita could increase its outstanding debt from €210 million to €322.5 million and pay out €112.5 to Holdco. This is a possible solution since the borrowing base of Vita is 6 x EBITDA, i.e., Vita could borrow €561 million (= 6 x €93.5 million) while the current amount of interest bearing debt is only €210 million. However, the equity of Vita is €167 million. If Vita pays €112.5 million (plus the excess amount of cash of €35 million) to Holdco, then the equity of Vita

[126] C2 adds the needed investment for the repositioning to the acquisition price. The fact that it could be financed with internally generated cash is explicitly ignored.

[127] This amount will probably be lower because €52.5 million is needed for the repositioning of the stores by Duplo. If so, the equity of Duplo does not decline by €205 million but by €152.5 million instead.

becomes rather low. To prevent this, an issue of mezzanine debt by Holdco could be considered.

Alternative 2:
Duplo sells the real estate to a new real estate vehicle (REneco). REneco borrows 80% of the direct sale value, i.e., 80% of €168 million = €134 million. Duplo redeems the current debt and pays the residual of €56 million (= €134 million – €78 million) to Holdco. Next, Duplo borrows the maximum amount based on expected cash flows. The cash flow (EBITDA) is lower now because Duplo pays rents for the use of the sold real estate to REneco. If we assume rents are €12 million (= 7% of €168 million), then the adjusted EBITDA of Duplo is €35 million (= €47 million – €12 million). For Duplo it is possible to borrow 4.5 x €35 million = €158 million. The total amount available from the 'old' Duplo is €214 million (= €158 million + €56 million). Equity of Duplo, which was €260 million, declines significantly if this amount is paid to Holdco.[128] Again, the residual will be borrowed by Vita or Holdco (mezzanine). The residual now is €103.5 million (= €317.5 million – €214 million). Vita could increase its current debt from €210 million to €313.5 million and pay out €103.5 to Holdco. To prevent an excessively extreme reduction in solvency, an issue of mezzanine debt by Holdco—as under alternative 1—could be a solution.

Perspective: shareholders
As stated under C11, the first positive effect is no *dilution* if the acquisition is 100% debt financed. Aside from that, shareholders need not invest more capital in the firm. In other words, the *extra value lost* if the firm encounters financial difficulties is nihil. Second, high leverage gives management an incentive to increase *organizational efficiency*. Management will do its utmost to prevent getting into financial difficulties. The disadvantages mentioned are no or lower *dividends* during the first years after the acquisition and a possible negative effect on the *credit rating of bonds*, which might have a *negative effect on share price*. (Certain institutional investors would not be allowed to invest in the firm's downgraded securities any longer.)

[128] This amount will probably be lower because €52.5 million is needed for the repositioning of the stores by Duplo. If so, the equity of Duplo does not reduce with €214 million but with €161.5 million instead.

Perspective: management

For the management of Vita, only one negative effect was mentioned: pressure to increase *organizational efficiency*. The advantage for the shareholder is seen as a disadvantage for management.

Perspective: other stakeholders

Other stakeholders mentioned are *suppliers*, *personnel*, *works committee*, *institutional investors* and *competition*. Suppliers see creditworthiness decrease and will probably respond with an adjustment of the *terms of payments*. Personnel suffer from increased leverage in the sense that the probability of getting into financial difficulties is higher. The works committee was mentioned since this committee often *plays a crucial role* in major changes within firms. If *credit ratings* are downgraded because of an increase in leverage, *institutional investors* could encounter difficulties with *investment guidelines* and sell their shares or bonds as a result. This could have a negative effect on securities prices. From the perspective of competitors, a high leverage is positive; by lowering their prices, they could hurt the financial situation of Vita.

Proposals 2 and 3: best for the management of Vita and the ultimate proposal (C22/C23)

Consultant 2 makes no distinction between proposals 2 and 3. Consultant 2 implicitly states that their ultimate proposal is that proposal which is best for management. The financial solution contains substantially less debt. The amount of debt will be determined by expected 'worst case scenarios'. For example, what happens if Vita is not able to increase the gross margin of Duplo. The leverage that will not bring Vita into financial difficulty would be the solution proposed. The 'wild guess estimate' by C2 is an issue of €150 million equity. In any case, to safeguard the real estate of Duplo, it will be placed in a separate legal entity.

Perspective: shareholders

The only disadvantage mentioned explicitly is *dilution*. If the old shareholders do not participate in the new equity stake, their share in the firm will decrease. This is seen as a disadvantage. And contrary to C21, the shareholders must implement an

additional financial investment under C22, which can be seen as a disadvantage, because this amount could be lost if difficulties occur.

Perspective: management

If the *buffer* (solvency) against losses is higher, management will experience more *freedom* (because of *higher free cash flows*) and need not visit their banks (monitoring / new loans) often.

Perspective: other stakeholders

Shareholders give their 'commitment' to the firm if the firm successfully issues new shares. This is perceived as a positive signal. The acquisition then is *perceived positively by the market*.

THE INVESTMENT BANKER (IB1)

Proposal 1: best for current shareholders (of Vita), excluding the management (IB11)

One of the main issues again is *dilution*. In contrast to the consultants, management, rather than the external shareholders, gains most if the acquisition is financed completely with debt. Proposal 1 does not contain a solution with 100% debt as with the consultants, but an issue of €150 million debt and €150 million equity. According to IB1, the issue of debt would lead to a net debt / EBITDA multiple of 2.9, which is, according to IB1, acceptable. Because of positive cash flows generated by the assets of the firm, this multiple could return to the current 1.8 of Vita. The issue of equity is facilitated by an issue of tradable claims. The guarantee of a successful issue of equity is, in this way, greatest.

Perspective shareholders

The first advantage of the proposal addresses the issue of tradable claims. The issuance of claims gives the shareholders *the right to participate in the issuance of new equity* and in this way prevents *dilution*. Because the size of the equity issue is limited, for most shareholders (except management) it would be possible to exercise all allocated rights. Shareholders who want to increase their stake in the firm can try to buy claims from shareholders who have no such intention. Another advantage is that if management cannot participate in the new issue, the *free float of shares* will

increase with a positive influence on share *liquidity*. Furthermore, as a result of partial debt financing, *earnings per share* will *increase* while the increase in *risk* remains within acceptable levels.

Perspective: management

If management is unable to participate in the new issue (e.g., for lack of funds) their *stake will dilute* with a loss of *control* as a result. A new *large shareholder* would mean more *interference*. These are the main disadvantages for management.

Perspective: other stakeholders

For employees, creditors, and the old holders of debt, the *creditworthiness* of the firm decreases and *the risk of their claims* increases.

Proposal 2: best for the management of Vita (IB12)

Instead of a mix of new equity and debt, a 100% debt financing solution is suggested. If management has sufficient capital, an issue of equity is given in consideration as well, so long as they can participate in it on a pro rata basis. However, as stated by IB1, it would be wise for management to diversify—in other words, not to put all its capital in the same basket.

Perspective: shareholders

First, the *financial risk* for shareholders is higher, which is seen as a *disadvantage*. Further, *holders of debt* have *more control* because of new *covenants*. The substantially *higher earnings per share* are seen as an advantage. However, if the firm encounters future difficulties, this could have a negative effect on *dividends*, which is seen as a disadvantage.

Perspective: management

There are *no negative dilution* effects for the managers, *no loss of control* to other (large) shareholders, and *the earnings per share* are higher. The disadvantage is the *reduction in free cash flow* to finance additional (expansion) investment programs.

Perspective: other stakeholders

For employees, creditors, and the old holders of debt, the *creditworthiness* of the firm decreases and the *risk of their claims* increases significantly more than under proposal 1.

Proposal 3: the ultimate proposal (IB13)

Proposal 3 contains an issue of €100 million of debt and €200 million of equity. According to IB3 the issuance of debt leads to a net debt / EBITDA ratio of 2.5, which can be reduced to 1.8 via generated cash flows. The issue of equity is again facilitated by an issuance of tradable claims. The amount of debt issued is lower than under proposals 2 and 1. *The advantage of less debt and more equity is the creation of an unused debt capacity for new (expansion) investment programs.* IB is convinced that the magnitude of the acquisition justifies a major issuance of equity. The use of a small amount of debt decreases the negative pressure of the costs of an equity issue on *the earnings per share.*

Perspective: shareholders

The same advantages and disadvantages are mentioned as under alternative 1. The only difference is the possible *higher free float* that could arise if some large shareholders do not exercise their rights, but sell them instead.

Perspective: management

The same advantages and disadvantages are mentioned as under alternative 1. The risk of *dilution* is a bit higher compared with proposal 1 because of the larger issuance of common equity.

Perspective: other stakeholders

The decrease in creditworthiness and the increase in risk of the claims of employees, creditors and the old holders of debt is limited compared with proposals 2 and 1.

FULL SERVICE BANKER (FSB1)

The banker wrote a 2 page report that contained the following sections: i) the credit base, ii) the request, iii) the financial position, performance, perspectives and operational risks, iv) pricing and return, and v) conclusion.

The credit base of Vita, with its 400 supermarkets, is substantial. The banker wants to know the number of franchise stores (if any) and calls this a 'condition precedent'. Also, more information is needed about the legal structure of the organization. The banker assumes none of the stores has 'joint and several liability', which implies structure risk is obvious. Total risk is perceived as acceptable, given centralized purchasing, marketing, and distribution. The banker assumes that after the acquisition, all stores are structured in one legal entity. De Wit Senior and De Wit Junior are part of the credit base, since they both own 20% of Vita and leave their mark on the healthiness of the firm.

The request consists of the financing of the acquisition (€300 million), plus the repositioning (€52.5 million), minus excess cash. The strategic rationale for the acquisition is valid: economies of scale, advantages on the purchase of goods, and the improvement of the market position of Duplo. FSB1 expects the firm could accomplish this strategy under normal business conditions. FSB1 suggests financing on covenants ('cash flow based') and not on assets ('asset based'). As FSB1 explained 'in this market (meaning the market FSB1 is in) you only get the deal if you finance this proposition on covenants'. The following covenants should be obtained: cross default[129], negative pledge[130], pari passu[131], interest coverage ratio (ICR) > 3, debt/ebitda < 3, and an effective cash sweep[132]. The acquisition price is perceived as not excessive. A possible *exit scenario* would include a sale or sale and leaseback of the stores.

In the opinion of FSB1, the solvency of Vita is good. Returns and cash flow are acceptable to good. The profitability of the firm did not suffer, or suffered only marginally, from the severe competition in the market. The most important risks are continuing competition ('price wars'), the changing nature of customer demand, and the turnaround and integration of Duplo. The forecasts seem realistic; the investment, however, is huge. The positive track record of management is seen as advantageous.

[129] A cross default means a default if the borrower defaults on any other obligation. If Vita defaults on another loan agreement, this gives our FS banker the right to demand the loan.

[130] A negative pledge is a clause which prevents the borrower from pledging greater security or collateral to other lenders *(http://glossary.reuters.com/index.php/Negative_pledge)*.

[131] Securities issued with a pari passu clause rank equally with existing securities of the same class. Ibid.

[132] All excess cash is used to finance the acquisition and for redemption.

Because of severe competition in the banking industry, the pricing should be sharp, that is, according to the bank, 150/175 basis points above Euribor. The pricing should be in accordance with the Net Raroc Hurdle rate, otherwise sufficient 'cross sell' should be realized.

The conclusion of the report represents positive advice (to the credit committee). The financing request is large for a well performing firm. The most significant risks revolve around the turnaround and integration of Duplo. Other strong points include the financial health of Vita, the good market position of the firm, and the positive track record of the management team.

Chapter 5

Cost of capital of government's claim
and the present value of tax shields[133]

Abstract

In this chapter we derive a general formula for the cost of capital of government's claim (r_g). Given our valuation framework that distinguishes three claimholders—equity holders, debt holders and government—we show for the models used in Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985), that the present value of tax shields is equal to the difference between the present value of the expected taxes paid by the unlevered firm and the levered firm, with each of the models' implied r_g as discount rate. We provide a numerical example of how to calculate r_g and we give a logic explanation for the low implied r_gs of Miles and Ezzell's and Harris and Pringle's model.

5.1. Introduction

This chapter is inspired by Fernández (2004). Although Fernández's derivations leading to his final results are disputable, his conclusion that the present value of tax shields (*PVTS*) is equal to the difference between the present value of expected taxes paid by the unlevered firm (G_u) and the present value of expected taxes paid by the levered firm (G_l) is valid.[134]

[133] This chapter is based on Schauten and Tans (2006) and was presented at the 3rd Corporate Finance Day K.U. Leuven, September 2005. We thank Martijn van den Assem, Ingolf Dittmann, Winfried Hallerbach, Thierry Post, Anoop Rai, Onno Steenbeek and Nicholas Wonder for their helpful comments. All remaining errors are our own.

[134] For a discussion of the validity of the final results of Fernández (2004), see Fieten et al. (2005), Fernández (2005), Arzac and Glosten (2005) and Cooper and Nyborg (2006). According to Fernández (2004), the *PVTS* for non-growing perpetuities is equal to τD, where τ is the tax rate and D is the market value of debt. *PVTS* for constant growth firms would be $\tau D r_u/(r_u-g)$, where r_u is the required return to unlevered equity and g is the constant growth rate.

In this chapter we introduce a general formula for r_g, 'the discount rate for expected tax payments' or 'the cost of capital of the government's claim'.[135] We establish a relation between r_g and the cost of equity of an unlevered and levered firm and the cost of debt.[136] Second, we derive the implied r_gs for traditional models such as Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985) and show that—given our assumption about the risk of the pre-tax cash flow—the implied r_g*s* for the models of Miles and Ezzell (1980) and Harris and Pringle (1985) are relatively low. Given our valuation framework that distinguishes three claimholders—equity holders, debt holders and government—we further prove that $PVTS = G_u - G_l$, where G_u and G_l are equal to the present value of the expected tax payments with each of the models' implied r_g as the discount rate.

This chapter is organized as follows. Section 2 presents a general discussion of the concept of the total value of firms. Section 3 introduces our valuation framework; we derive a formula for *PVTS* based on the difference between G_u and G_l, and derive a general formula for r_g. Section 4 compares the implied r_gs for the models used by Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985).[137] Section 5 contains a numerical example for a hypothetical firm. Section 6 concludes.

5.2. Total value of firms

The total value of the firm (*TV*) is calculated on a before-tax basis and is equal to the sum of the present values of equity (*E*), debt (*D*) and government's claim (*G*). Figure 1 presents the expanded balance sheets in market values of an unlevered and a levered firm.[138] The pre-tax asset value appears on the left and the value of the government's tax claim recognized as a liability on the right.

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[135] Galai (1998) internalizes the corporate tax claim in a one-period framework and analyses the tradeoffs between various policies available to the government to encourage investments to their socially optimal level.

[136] Fernández presented his results without deriving a discount rate for the expected tax payments. Fernández (2004) states 'we cannot establish a clear relation between the required return to taxes and the required return to assets', (p.150).

[137] Ruback (2002) makes the same assumption about the risk of the *PVTS* as Harris and Pringle (1985) do, and use the same implied implied r_g as a result.

[138] See Brealey et al. (2006), p.471.

Figure 1. Total value of the firm
This figure presents the expanded balance sheet of the unlevered and the levered firm with on the left hand side the pre-tax value of the firm and on the right hand side the present value of the tax payments to the government by the unlevered firm (G_u) and the levered firm (G_l), the market value of equity of the unlevered firm (E_u) and the levered firm (E_l) and the market value of debt of the levered firm (D).

Balance sheet of the unlevered firm

Pre-tax firm value	PV government's claim (G_u)
	PV residual claim equityholders (E_u)
Total value (TV)	Total value (TV)

Balance sheet of the levered firm

Pre-tax firm value	PV government's claim (G_l)
	PV residual claim equityholders (E_l)
	Debt (D)
Total value (TV)	Total value (TV)

We assume TV does not depend on leverage.[139] This implies that the TV of an unlevered firm is equal to the TV of an (except for leverage) identical levered firm. That is, we assume that the level and risk of the operating cash flows (*OCFs*) generated by the assets of both firms are the same.[140] The *OCF* of an *unlevered* firm is divided between the government (*GCF*) and the equity holders (*ECF*). The *OCF* of a *levered* firm can be split into a government cash flow (*GCF*), equity cash flow (*ECF*) and debt cash flow (*DCF*). In other words, the unlevered firm cuts the cake in two slices, the levered firm in three, but the size of the cake remains the same:

$$TV = G_u + E_u = G_l + E_l + D \tag{1}$$

Because we assume that the risk of the *OCF* is unaffected by leverage, the total cost of capital for the unlevered firm is equal to the total cost of capital of the levered firm:

$$r_{gu} G_u + r_u E_u = r_{gl} G_l + r_e E_l + r_d D \tag{2}$$

where r_{gu} is the cost of capital of government's claim of an unlevered firm, r_{gl} of a levered firm, r_u is the cost of equity of the unlevered firm, and r_e and r_d are the cost of equity and debt for the levered firm, respectively.

[139] This is in accordance with Proposition I of Miller and Modigliani (1958), see Brealey et al. (2006), p.471. We ignore costs / benefits related to leverage.

[140] Operating cash flow is earnings before interest and taxes (*EBIT*) minus net investments in fixed assets and working capital.

5.3. The present value of tax shields and the derivation of r_g

Before we derive the general formula for r_g, equation (14), we introduce our 'valuation framework' (which is based on Figure 1) in Table 1 and a general formula, equation (11), for the *PVTS*.

As shown in Table 1, *TV* at t = 0 of the unlevered, as well as the levered firm, is equal to the present value of the expected *OCFs*, where the *OCF* at t = 1 is equal to the earnings before interest and taxes (*EBIT*) minus *gZ*.[141] We assume *OCF* is a growing perpetuity. The discount rate for both streams of cash flows is the same since the risk of the *OCF* of the unlevered firm and the levered firm is equal.

For the unlevered firm, *E* at t = 0 (E_u) is the present value of the expected *ECFs*. The *ECF* at t = 1 is *EBIT* after tax at t = 1 minus *gZ*. The discount rate for the *ECFs* is r_u, the unlevered cost of equity. G_u is the present value at t = 0 of the expected *EBITs* times the corporate tax rate τ. We assume the risk of the *ECF* for the unlevered firm is equal to the risk of the *OCF*, since the only risk for both streams is the business risk of the assets. This implies the same cost of capital for the claim of the government as well. *TV* of the unlevered firm at t = 0 is G_u plus E_u. (If we add A1 and A2 from Table 1, we find A4.)

For the levered firm, *E* at t = 0 (E_l) is the present value of the expected *ECFs*, where the *ECF* at t = 1 is equal to the net earnings after tax minus *gZ* plus *gD* (*g* times the amount of debt at t = 0).[142] We further assume a constant leverage ratio,[143] a fixed cost of debt (r_d) and a dividend that is equal to the *ECF*. The discount rate for the *ECFs* (r_e) is higher than r_u because of the leverage effect. G_l at t = 0 is the present value of the expected earnings times τ. The discount rate for the tax payments, r_g, is not equal to r_u (as it was for the unlevered firm) nor is it equal to r_e of the levered firm. However, since r_u is the discount rate for *TV*, the weighted average of the discount rates of *E*, *D* and *G* must equal r_u:

$$r_g G_l + r_e E_l + r_d D = r_u \tag{3}$$

[141] *gZ* is the net investment at t = 1 in fixed assets and working capital to achieve growth (*g*). In our model, *Z* is the book value of the net fixed assets and working capital at t = 0.

[142] A net increase of debt at t = 1 is an outflow for the debt holders, but an inflow for the equity holders.

[143] The leverage ratio is expected to be constant in market values as well as book values over time, although both ratios could differ.

For the levered firm, *TV* at t = 0 is G_l plus E_l plus *D*. (If we add B1, B2 and B3 from Table 1, we find *TV* in B4.)

Table 1. Valuation Framework
This table presents the value at t = 0 of the claims hold by the government (*G*), equity holders (*E*) and debt holders (*D*) for an unlevered (column A) and levered (column B) firm. *EBIT* is the expected earnings before interest and tax at t = 1. *G* is the present value of the expected taxes at t = 0; G_u for an unlevered firm, G_l for a levered firm. *E* and *D* are the value at t = 0 of equity and debt, respectively; E_u is the value of equity at t = 0 for an unlevered firm, E_l is the value of equity for a levered firm at t = 0. *TV* is the total value of the firm at t = 0 and equals (*G*+*E*+*D*). τ is the corporate tax rate, *g* is the expected growth rate, *gZ* is the net investment in fixed assets and working capital at t = 1, r_u is the cost of capital of an unlevered firm and the total firm (*G*+*E*+*D*), r_g is the cost of capital for government's claims, r_e and r_d are the cost of equity and debt (for the levered firm), respectively.

		A Value Unlevered	B Value Levered
1)	*G*	$G_u = \frac{(EBIT)\tau}{r_u - g}$	$G_l = \frac{(EBIT - r_d D)\tau}{r_g - g}$
2)	*E*	$E_u = \frac{(EBIT)(1-\tau) - gZ}{r_u - g}$	$E_l = \frac{(EBIT - r_d D)(1-\tau) - gZ + gD}{r_e - g}$
3)	*D*	0	$D = \frac{r_d D - gD}{r_d - g}$
4)	*TV*	$\frac{(EBIT) - gZ}{r_u - g}$	$\frac{(EBIT) - gZ}{r_u - g}$

Given this framework we can derive the *PVTS*. In the traditional way, the *PVTS* could be derived directly by discounting the expected tax savings due to debt financing.[144] The approach we follow recognizes that the value of equity plus debt of a levered firm (V_l) is equal to the value of an unlevered firm (V_u) plus the *PVTS*:

$$E_l + D = V_u + PVTS \tag{4}$$

However, since we assume that *TV* of the unlevered firm is equal to *TV* of the levered firm, it follows that by substituting (4) where V_u is set to E_u into (1),

$$PVTS = G_u - G_l \tag{5}$$

Following this approach, the *PVTS* could be defined as (see A1 and B1 from Table 2):

$$PVTS = G_u - G_l = \frac{(EBIT)\tau}{r_u - g} - \frac{(EBIT - r_d D)\tau}{r_g - g} \tag{6}$$

Rewriting (6) yields:

[144] Note that the value of the firm in this traditional sense is only *E* plus *D* since it ignores the present value of the expected taxes for the government.

$$PVTS = \frac{(r_g - r_u)(EBIT)\tau + (r_u - g)r_d D\tau}{(r_g - g)(r_u - g)} \tag{7}$$

Equation (7) can be rewritten as:

$$PVTS = \frac{(r_g - r_u)(EBIT)\tau}{(r_g - g)(r_u - g)} + \frac{r_d D\tau}{r_g - g} \tag{8}$$

Recognizing that equation A1 from Table 1 is present in the first part on the right hand side, equation (8) becomes:

$$PVTS = \frac{(r_g - r_u)}{(r_g - g)} G_u + \frac{r_d}{r_g - g} D\tau \tag{9}$$

By inserting (5) into (9) we find:

$$PVTS = \frac{(r_g - r_u)}{(r_g - g)} (G_l + PVTS) + \frac{r_d}{r_g - g} D\tau \tag{10}$$

Rewriting:

$$VTS\left(1 - \frac{r_g - r_u}{r_g - g}\right) = \frac{r_g - r_u}{r_g - g} G_l + \frac{r_d}{r_g - g} D\tau$$

$$PVTS\left(\frac{r_u - g}{r_g - g}\right) = \frac{r_g - r_u}{r_g - g} G_l + \frac{r_d}{r_g - g} D\tau$$

$$PVTS = \frac{r_g - r_u}{r_u - g} G_l + \frac{r_d}{r_u - g} D\tau \tag{11}$$

Equation (9) and (11) both give the *PVTS* by taking the difference between G_u and G_l.

To derive the general formula for r_g, we make use of column B of Table 1:

$$G_l = TV - E_l - D = \frac{ECF + DCF + GCF}{r_u - g} - E_l - D \tag{12}$$

If we multiply each side by $(r_u - g)$ and substitute $E_l(r_e - g)$, $D(r_d - g)$ and $G_l(r_g - g)$ for *ECF*, *DCF* and *GCF,* respectively, we find:

$$G_l(r_u - g) = E_l(r_e - g) + D(r_d - g) + G_l(r_g - g) - E_l(r_u - g) - D(r_u - g) \tag{13}$$

Equation (13) can be rewritten as:

$$r_g = r_u + \frac{D}{G_l}(r_u - r_d) - \frac{E}{G_l}(r_e - r_u) \tag{14}$$

Equation (14) is the general formula for r_g.[145] If debt is zero, then $r_g = r_e = r_u$. If debt is higher than 0, we expect r_g to be higher than r_u. However, as will be shown in the next section, this is not always true.

5.4. A comparison of implied r_gs

To derive the implied $r_g s$ for the models used by Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985), we insert the equity functions as summarized in Table 2 into (14).[146] The implied $r_g s$ for the models are given in Table 3. If we insert the implied $r_g s$ from Table 3 into (11) we find for each of the models the *PVTS* as presented in Table 2 (see Appendix A).

Table 2. APV, WACC and r_e
This table presents the adjusted presents value (APV), weighted average cost of capital (WACC) and the cost of equity formulas for the models used by Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985). V_l is the value of a levered firm, V_u is the value of an unlevered firm, *PVTS* is the present value of the tax shield, τ is the corporate tax rate, D is the value of debt, E is the value of equity, $L = D/V$, r_d is the cost of debt, r_u is the cost of capital of an unlevered firm, r_a is the 'textbook' weighted average cost of capital (WACC), and r_e is cost of equity.

Model	Adjusted Present Value V_u plus PVTS	Weighted Average Cost of Capital	Cost of Equity
Myers (1974)	$V_l = V_u + \frac{r_d \tau D}{r_d - g}$	$r_a = r_u - \left(\frac{r_u - g}{r_d - g}\right) r_d \tau L$	$r_e = r_u + (r_u - r_d)\left(1 - \frac{r_d \tau}{r_d - g}\right)\left(\frac{D}{E}\right)$
Miles and Ezzell (1980)	$V_l = V_u + \left(\frac{1+r_u}{1+r_d}\right)\left(\frac{r_d}{r_u - g}\right)\tau D$	$r_a = r_u - \left(\frac{1+r_u}{1+r_d}\right) r_d \tau L$	$r_e = r_u + (r_u - r_d)\left(1 - \frac{r_d \tau}{1+r_d}\right)\left(\frac{D}{E}\right)$
Harris and Pringle (1985)	$V_l = V_u + \frac{r_d \tau D}{r_u - g}$	$r_a = r_u - r_d \tau L$	$r_e = r_u + (r_u - r_d)\left(\frac{D}{E}\right)$

If we compare the formulas in Table 3, we find that the implied r_g for Harris and Pringle's model is not and for Miles and Ezzell's model is almost not influenced by leverage. For both models (in contrast to that of Myers), it seems that the risk of the claim of the government is (and for Miles and Ezzell, almost) independent of leverage. At first, this finding may seem hard to explain. As we know, r_e increases

[145] Equation (14) is the general formula for r_g under the assumption that r_u is the discount rate for the pre-tax cash flows. If we do not make this restriction we find; $r_g = r_{tv} + (D/G_l)(r_{tv} - r_d) - (E/G_l)(r_e - r_{tv})$ where r_{tv} is the pre-tax discount rate. For the unlevered firm, the implied cost of capital of government's claim (r_{gu}) then is; $r_{tv} - (E_u/G_u)(r_u - r_{tv})$, and the $PVTS = (EBIT)\tau / (r_{gu} - g) - ((EBIT - r_d D)\tau)/(r_g - g)$.

[146] See Ehrhart and Daves (2002) for general formulas.

with leverage, because of the increase in financial risk. That is, equity holders hold a residual claim just like the government. Firms first pay interest, then tax and dividends. If leverage increases the variability in *ECFs*, it increases the variability in *GCFs* as well. However, under the assumptions we made, the low r_gs for Harris and Pringle's model and Miles and Ezzell's are a logic consequence which will be illustrated in the next section with a numerical example.

Table 3. Implied r_g
This table presents the cost of government's claim, r_g, for the models used by Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985). We derived r_g by inserting the cost of equity functions from Table 2 into equation (14). r_u is the cost of capital of an unlevered firm, r_d is the cost of debt, D is the market value of debt, G_l is the present value of the expected taxes levered firm, τ is the corporate tax rate and g the expected growth rate.

Model	Government Risk Rate
Myers (1974)	$r_g = r_u + \frac{D}{G_l}(r_u - r_d)\frac{r_d\tau}{r_d - g}$
Miles and Ezzell (1980)	$r_g = r_u + \frac{D}{G_l}(r_u - r_d)\frac{r_d\tau}{1 + r_d}$
Harris and Pringle (1985)	$r_g = r_u$

5.5. A numerical example: r_g and the *PVTS* for three classical models

In this section, we provide a numerical example of how to calculate r_g for the models of Myers, Harris and Pringle and Miles and Ezzell. We show that *PVTS* is equal to the present value of the expected tax shields *and* equal to G_u minus G_l. Further, we give a logical explanation for the low implied r_gs for Harris and Pringle's (and Miles and Ezzell's) model. We look at two scenarios. In scenario one, we assume the expected growth rate is zero, while in scenario two, we assume an expected growth rate of 2.5%.

The firm's balance sheets, profit and loss accounts, cash flows, valuation parameters and calculations for scenario one and two are presented in Table 4 and Table 5, respectively. The balance sheets at t = 0 and the profit and loss accounts at t = 1 are identical for both scenarios. However, the expected cash flows at t = 1, except for the government cash flow (*GCF*),[147] differ because of the investments that have to be made at t = 1. Under the no growth scenario, the firm must invest to maintain its fixed assets at a level that enables it to ensure constant cash flows. Under this

[147] The *GCFs are* identical because *GCF* is a percentage of earnings before tax at t = 1.

scenario, working capital remains constant. This implies that the yearly investment is equal to the depreciation of its fixed assets. Under the growth scenario, the firm has to invest more to achieve growth. This extra investment at the end of year t equals 2.5% of the book value of its assets at the beginning of year t. The firm starts to invest in growth at t = 1. The dividend under each scenario is equal to *ECF*.

The cost of capital for the government, r_g, is calculated as follows. First we calculate V_l using the APV method with the formulas from column 2 of Table 2. We calculate the market value of E by subtracting D from V_l. We then calculate TV by applying (12) and G_l by subtracting V_l from TV. We calculate r_e using the formulas from column 4 of Table 2. Finally, to find r_g for the three models, we insert the appropriate value for r_u, r_e, D, E, and G_l into (14).[148] Tables 4 and 5 present the alternative calculation for the *PVTS* following equation (5), as well as an alternative calculation for G_l. *PVTS* is equal to the present value of the expected tax shields but is also equal to the difference between G_u and G_l. In addition, G_l is the difference between TV and V_l, and is equal to the present value of the expected tax payments with r_g as discount rate.

Under both scenarios, the implied r_g for Miles and Ezzell's model as well as for Harris and Pringle's model is close to or equal to r_u. This low r_g can be explained as follows. For Miles and Ezzell's model, the weighted average of r_d and r_e is close to r_u, and for Harris and Pringle, it is equal to r_u. Since the total cost of capital of TV is r_u, the implied r_g is close to or equal to r_u. After all, the weighted average of r_d, r_e and r_g equals the cost of capital of TV, see (3).

The implied r_g for Myers' model is higher than the implied r_gs of the former models. The explanation follows the same line of arguments. Since the weighted average of r_d and r_e is lower than r_u (because the discount rate for *PVTS* is lower than r_u),[149] and the total cost of capital of TV is still r_u, r_g must be higher than r_u. The difference between r_g in the non-growth and growth scenario for Myers' model can be explained by the difference in the relative value of V_u and *PVTS*. Because the cash flows from operations and the cash flows from the tax shields are discounted at different rates, their respective values are affected differently non-proportionally by

[148] An alternative for this last step is to use the derived relations from Table 3.

[149] The weighted average of the required returns of the assets in the traditional sense, i.e., $V_u + PVTS$, equals the weighted average of the required returns of the providers of capital ($E + D$).

growth. Hence the weighted average of r_d and r_e becomes a function of growth (see Ehrhardt and Daves, 2002). If r_d is the discount rate for the tax shield, the weighted average of r_d and r_e decreases with growth. Since the cost of capital of TV remains r_u, and is equal to the weighted average of r_d, r_e and r_g, r_g increases with growth.[150]

[150] In the model used by Myers, r_e decreases from 11.88% to 10.47% because i) the risk of the assets (V_u + $PVTS$) decreased as a result of an increase in the $PVTS$ as percentage of V_l, and ii) leverage (D/E) decreased. Leverage decreased due to growth because debt at t = 0 is fixed and the value of this firm is positively related to growth (i.e., the return on new invested capital is higher than the cost of capital). Appendix B contains another numerical example. The example in Appendix B is based on an illustration from Harris and Pringle (1985) where V_l, D/V_l, r_e, r_d and τ are given.

Table 4. Example without Growth

This table presents the balance sheets, profit and loss accounts (P & L), cash flows and valuation for the scenario without growth. The balance sheets show net working capital (*NWC*), net fixed assets (*NFA*), and debt and the book value (*BV*) of equity. The P & L shows earnings before interest, taxes and depreciation (*EBITDA*), depreciation, interest, profit before tax (*PBT*), and tax and profit after tax (*PAT*). The column Cash presents the investment (*I*) in *NWC* and *NFA*, the operating cash flow (*OCF*), government cash flow (*GCF*), the increase of debt (*Δ Debt*), the debt cash flow (*DCF*), the equity cash flow (*ECF*), the capital cash flow (*CCF*) and the free cash flow (*FCF*). The valuations items are measured at t = 0: the unlevered value of the firm (V_u), the present value of tax shields (*PVTS*), the value of equity of the levered firm (E_l), the value of the government's claim for a levered firm (G_l) and an unlevered firm (G_u) and Total Value (*TV*).

Balance Sheet	t = 0	t = 1	t = 2	P & L	t = 1	t = 2	Cash Flows	t = 1	t = 2
NWC	100.0	100.0	100.0	*EBITDA*	270.0	270.0	*EBITDA*	270.0	270.0
NFA	1,000.0	1,000.0	1,000.0	Depreciation	50.0	50.0	*I* in *NWC*	0.0	0.0
Total Assets	1,100.0	1,100.0	1,100.0	*EBIT*	220.0	220.0	*I* in *NFA*	-50.0	-50.0
				Interest	30.0	30.0	*OCF*	220.0	220.0
Debt	600.0	600.0	600.0	*PBT*	190.0	190.0	*GCF*	76.0	76.0
Equity (*BV*)	500.0	500.0	500.0	Tax	76.0	76.0	*Δ Debt*	0.0	0.0
Total Liabilities	1,100.0	1,100.0	1,100.0	*PAT*	114.0	114.0	*DCF*	30.0	30.0
							ECF	114.0	114.0
							CCF	144.0	144.0
							FCF	132.0	132.0

Valuation parameters

g = growth rate = 0%; r_d = cost of debt = 5%;

r_u = cost of unlevered firm = 10%; τ = corporate tax rate = 40%

Application APV to find V_l

$V_l = E + D = V_u + PVTS$

$V_u = FCF_1/(r_u) = 132 / (0.1) = 1{,}320$

PVTS Myers (1974) = (0.05 x 0.4 x 600) / 0.05 = 240

V_l = 1,320 + 240 = 1,560. E = 1,560 - 600 = 960

PVTS Miles and Ezzell (1980) = ((1 + 0.1) / (1 + 0.05)) x (0.05/0.1) 0.4 x 600 = 125.71

V_l = 1,320 + 125.71 = 1,445.71. E = 1,445.71 - 600 = 845.71

PVTS Harris and Pringle (1985) = (0.05 x 0.4 x 600) / 0.1 = 120

V_l = 1,320 + 120 = 1,440. E = 1,440 - 600 = 840

Present value of government's claim (G_l)

$G_l = TV - V_l$

$TV = E + D + G = (ECF_1 + DFC_1 + GFC_1) / r_u$ = (114 + 30 + 76) / 0.1 = 2,200

G_l Myers (1974) = 2,200 - 1,560 = 640

G_l Miles and Ezzell (1980) = 2,200 - 1,445.71 = 754.29

G_l Harris and Pringle (1985) = 2,200 - 1,440 = 760

Required return on equity (r_e)

r_e Myers (1974) = 0.1 + (0.1 - 0.05) x (1 - (0.05 x 0.4) / 0.05)) x (600 / 960) = 11.88%

r_e Miles and Ezzell (1980) = 0.1 + (0.1 - 0.05) x (1 - (0.05 x 0.4) / (1+ 0.05)) x (600 / 845.71) = 13.48%

r_e Harris and Pringle (1985) = 0.1 + (0.1 - 0.05) x (600 / 840) = 13.57%

Table 4 *(Continued)*

Cost of government's claim (r_g)
r_g Myers (1974) = 0.1 + (600 / 640) x (0.1 - 0.05) - (960 / 640) x (0.1188 - 0.1) = 11.88%
r_g Miles and Ezzell (1980) = 0.1 + (600 / 754.29) x (0.1 - 0.05) - (845.71 / 754.29) x (0.1348 - 0.1) = 10.08%
r_g Harris and Pringle (1985) = 0.1 + (600 / 760) x (0.1 - 0.05) - (840 / 760) x (0.1357 - 0.1) = 10%

Alternative valuation method for PVTS
$PVTS = G_u - G_l$
$G_u = TV - Vu$ = 2,200 - 1,320 = 880
PVTS Myers (1974) = $G_u - G_l$ Myers (1974) = 880 - 640 = 240
PVTS Miles and Ezzell (1980) = $G_u - G_l$ Miles and Ezzell (1980) = 880 - 754.29 = 125.71
PVTS Harris and Pringle (1985) = $G_u - G_l$ Harris and Pringle (1985) = 880 - 760 = 120

Alternative valuation method for present value of government's claim (G_l)
$G_l = GCF_l / r_g$
G_l Myers (1974) = 76 / 0.1188 = 640
G_l Miles and Ezzell (1980) = 76 / 0.1008 = 754.29
G_l Harris and Pringle (1985) = 76 / 0.10 = 760

5.6. Summary

The total value of a firm comprises the present value of equity cash flows, debt cash flows and government cash flows. The value of the claim the government is equal to the present value of the expected tax payments, with its own discount rate r_g. In this chapter we derive a general formula for this particular 'cost of capital'. We show that for the models used in Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985), the *PVTS* is equal to the difference between the present value of the expected taxes paid by the unlevered firm and the levered firm with each model's implied r_g as discount rate. Given our valuation framework where we assume that r_u is the discount for the pre-tax cash flow, we show in contrast to Myers' mode, low implied $r_g s$ for both Miles and Ezzell's model and Harris and Pringle's model. This result is a logic consequence of the assumption we made about the risk of the pre-tax cash flow.

Table 5. Example with Growth

This table presents the balance sheets, profit and loss accounts (P & L), cash flows and valuations for the scenario with growth. The balance sheets show net working capital (*NWC*), net fixed assets (*NFA*), and debt and the book value (*BV*) of equity. The P & L shows earnings before interest, taxes and depreciation (*EBITDA*), depreciation, interest, profit before tax (*PBT*), and tax and profit after tax (*PAT*). The column Cash presents the investment (*I*) in *NWC* and *NFA*, the operating cash flow (*OCF*), government cash flow (*GCF*), the increase of debt (*Δ Debt*), the debt cash flow (*DCF*), the equity cash flow (*ECF*), the capital cash flow (*CCF*) and the free cash flow (*FCF*). The valuations items are measured at t = 0: the unlevered value of the firm (V_u), the present value of tax shields (*PVTS*), the value of equity of the levered firm (E_l), the value of the government's claim for a levered firm (G_l) and an unlevered firm (G_u) and Total Value (*TV*).

Balance Sheet	t = 0	t = 1	t = 2	P & L	t = 1	t = 2	Cash Flows	t = 1	t = 2
NWC	100.0	102.5	105.1	*EBITDA*	270.0	276.8	*EBITDA*	270.0	276.8
NFA	1,000.0	1,025.0	1050.6	Depreciation	50.0	51.3	*I* in *NWC*	-2.5	-2.6
Total Assets	1,100.0	1,127.5	1,155.7	*EBIT*	220.0	225.5	*I* in *NFA*	-75.0	-76.9
				Interest	30.0	30.8	*OCF*	192.5	197.3
Debt	600.0	615.0	630.4	*PBT*	190.0	194.8	*GCF*	76.0	77.9
Equity (*BV*)	500.0	512.5	525.3	Tax	76.0	77.9	*Δ Debt*	15.0	15.4
Total Liabilities	1,100.0	1,127.5	1,155.7	*PAT*	114.0	116.9	*DCF*	15.0	15.4
							ECF	101.5	104.0
							CCF	116.5	119.4
							FCF	104.5	107.1

Valuation parameters

g = growth rate = 2.5%; r_d = cost of debt = 5%;

r_u = cost of unlevered firm = 10%; τ = corporate tax rate = 40%

Application APV to find V_l

$V_l = E + D = V_u + PVTS$

$V_u = FCF_1/(r_u - g)$ = 104.5 / (0.1-0.025) = 1,393.33

PVTS Myers (1974) = (0.05 x 0.4 x 600) / (0.05 - 0.025) = 480

V_l = 1,393.33 + 480 = 1,873.33. E = 1,873.33 - 600 = 1,273.33

PVTS Miles and Ezzell (1980) = ((1 + 0.1) / (1 + 0.05)) x (0.05/(0.1-0.025)) 0.4 x 600 = 167.62

V_l = 1,393.33 + 167.62 = 1,560.95. E = 1,560.95 - 600 = 960.95

PVTS Harris and Pringle (1985) = (0.05 x 0.4 x 600) / (0.1-0.025) = 160

V_l = 1,393.33 + 160 = 1,553.33. E = 1,553.33 - 600 = 953.33

Present value of government's claim (G_l)

$G_l = TV - V_l$

$TV = E + D + G = (ECF_1 + DFC_1 + GFC_1) / (r_u - g)$ = (114 + 30 + 76) / (0.1- 0.025) = 2,566.67

G_l Myers (1974) = 2,566.67 - 1,873.33 = 693.33

G_l Miles and Ezzell (1980) = 2,566.67 - 1,560.95 = 1,005.71

G_l Harris and Pringle (1985) = 2,566.67 - 1,553.33 = 1,013.33

Required return on equity (r_e)

r_e Myers (1974) = 0.1 + (0.1 - 0.05) x (1 - (0.05 x 0.4) / (0.05 - 0.025)) x (600 / 1,273.33) = 10.47%

r_e Miles and Ezzell (1980) = 0.1 + (0.1 - 0.05) x (1 - (0.05 x 0.4) / (1+ 0.05)) x (600 / 960.95) = 13.06%

r_e Harris and Pringle (1985) = 0.1 + (0.1 - 0.05) x (600 / 953.33) = 13.15%

Table 5 *(Continued)*

Cost of government's claim (r_g)

r_g Myers (1974) = 0.1 + (600 / 693.33) x (0.1 - 0.05) - (1,273.33 / 693.33) x (0.1047 - 0.1) = 13.46%

r_g Miles and Ezzell (1980) = 0.1 + (600 / 1,005.71) x (0.1 - 0.05) - (960.95 / 1,005.71) x (0.1306 - 0.1) = 10.06%

r_g Harris and Pringle (1985) = 0.1 + (600 / 1,013.33) x (0.1 - 0.05) - (953.33 / 1,013.33) x (0.1315 - 0.1) = 10.00%

Alternative valuation method for PVTS

$PVTS = G_u - G_l$

$G_u = TV - V_u$ = 2,566.67 - 1,393.33 = 1,173.33

PVTS Myers (1974) = $G_u - G_l$ Myers (1974) = 1,173.33 - 693.33 = 480

PVTS Miles and Ezzell (1980) = $G_u - G_l$ Miles and Ezzell (1980) = 1,173.33 - 1,005.71 = 167.62

PVTS Harris and Pringle (1985) = $G_u - G_l$ Harris and Pringle (1985) = 1,173.33 - 1,013.33 = 160

Alternative valuation method for present value of government's claim (G_l)

$G_l = GCF_l / (r_g - g)$

G_l Myers (1974) = 76 / (0.1346 - 0.025) = 693.33

G_l Miles and Ezzell (1980) = 76 / (0.1006 - 0.025) = 1,005.71

G_l Harris and Pringle (1985) = 76 / (0.10 - 0.025) = 1,013.33

Appendix A. Proof: $PVTS = G_u - G_l$

To prove that *PVTS* is equal to the expressions for *PVTS* given in Table 2, we insert the implied r_g from Table 3 into (11) for each model.

Derivation of PVTS based on Myers (1974)

If we insert Myers' government risk rate function from Table 3 into (11), we find:

$$PVTS = \frac{r_u + \frac{D}{G_l}(r_u - r_d)\frac{r_d\tau}{r_d - g} - r_u}{r_u - g} G_l + \frac{r_d}{r_u - g} D\tau \tag{15}$$

Rewriting:

$$PVTS = \frac{D(r_u - r_d)\frac{r_d\tau}{r_d - g}}{r_u - g} + \frac{r_d}{r_u - g} D\tau$$

$$PVTS = \frac{D(r_u - r_d)r_d\tau}{(r_u - g)(r_d - g)} + \frac{r_d D\tau(r_d - g)}{(r_u - g)(r_d - g)}$$

$$PVTS = \frac{r_d D\tau(r_u - r_d) + r_d D\tau(r_d - g)}{(r_u - g)(r_d - g)}$$

$$PVTS = \frac{r_d}{r_d - g} D\tau \tag{16}$$

Q.E.D.

Derivation of PVTS based on Miles and Ezzell (1980)

If we insert Miles and Ezzells' government risk rate function from Table 3 into (11) we find:

$$PVTS = \frac{r_u + \frac{D}{G_l}(r_u - r_d)\frac{r_d\tau}{1 + r_d} - r_u}{r_u - g} G_l + \frac{r_d}{r_u - g} D\tau \tag{17}$$

Rewriting:

$$PVTS = \frac{D(r_u - r_d)\frac{r_d\tau}{1 + r_d}}{r_u - g} + \frac{r_d}{r_u - g} D\tau$$

$$PVTS = \frac{r_d\tau D(r_u - r_d)}{(r_u - g)(1 + r_d)} + \frac{r_d D\tau(1 + r_d)}{(r_u - g)(1 + r_d)}$$

$$PVTS = \frac{r_d \tau D\left[(r_u - r_d) + (1 + r_d)\right]}{(r_u - g)(1 + r_d)}$$

$$PVTS = \frac{r_d \tau D\left[(r_u + 1)\right]}{(r_u - g)(1 + r_d)}$$

$$PVTS = \left(\frac{1 + r_u}{1 + r_d}\right)\left(\frac{r_d}{r_u - g}\right)\tau D \tag{18}$$

Q.E.D.

Derivation of PVTS based on Harris and Pringle (1985)

If we insert Harris and Pringle's government risk rate function from Table 3 into (11) we find:

$$PVTS = \frac{r_u - r_u}{r_u - g} G_l + \frac{r_d}{r_u - g} D\tau \tag{19}$$

Equation (19) can be rewritten as:

$$PVTS = \frac{r_d}{r_u - g} D\tau \tag{20}$$

Q.E.D.

Appendix B. Example Based on an Illustration of Harris and Pringle (1985)

Instead of using a fixed amount of debt at t = 0 and an unlevered cost of capital as given, this example (see Table B1 on the next page) starts with an observed leverage ratio, and an 'observed' cost of equity and cost of debt.[151] Because r_e and r_d are given, r_u differs under each model with different TVs as a result (since the G_ts (and G_us) differ). Using equation (14), we find r_g for each of the models: 17.00%, 15.35% and 15.20% for the models used by Myers, Miles and Ezzell and Harris and Pringle, respectively. Again, the r_g of Myers model is highest and the r_g of Harris and Pringle is the lowest. Of course, in this example, part of the differences between the implied $r_g s$ can be explained by different $r_u s$.

[151] We use the valuation parameters of an illustration from Harris and Pringle (1985), p. 241-242.

Table B.1 Example - Harris and Pringle (1985, p. 241)
This table presents the observed market value of a levered firm (V_l), the inferred cost of capital of an unlevered firm (r_u), the inferred total value of the levered firm (TV), the inferred value of an unlevered firm (V_u), the inferred present value of the claim of the government of an unlevered (G_u) and levered firm (G_l) and the present value of the tax shields ($PVTS$). All values are values at t = 0. Expected cash flows are cash flows at t = 1.

Model	Observed Value of Levered Firm, V_l				Inferred					
	V_l	=	Equity	+ Debt	r_u	$TV = V_u + G_u$	V_u	G_u	$G_l = TV - V_l$	$PVTS = V_l - V_u = G_u - G_l$
Myers (1974)	7.31	=	5.12	2.19	15.87%	11.67	6.30	5.37	4.36	1.01
Miles and Ezzell (1980)	7.31	=	5.12	2.19	15.26%	12.14	6.55	5.58	4.83	0.76
Harris and Pringle (1985)	7.31	=	5.12	2.19	15.20%	12.18	6.58	5.60	4.87	0.73

Valuation parameters

g = growth rate = 0%; r_d = cost of debt = 11%; r_e = cost of equity = 17%; L = leverage ratio = Debt / (Equity + Debt) = 30%; τ = corporate tax rate = 46%; *OCF after tax* = operating cash flow as if 100% equity financed = 1 in perpetuity; $OCF\ before\ tax = OCF\ after\ tax\ /\ (1 - \tau) = 1\ /\ (1 - \tau) = 1.8519$; r_u depends, given r_e and r_d, on the assumptions of the risk of the $PVTS$; the lower this risk, the higher the r_u. See Harris and Pringle (1985).

$V_u = OCF\ after\ tax\ /\ r_u$

V_u Myers (1974) = 1 / 0.1587 = 6.30; V_u Miles and Ezzell (1980) = 1 / 0.1526 = 6.55; V_u Harris and Pringle (1985) = 1 / 0.1520 = 6.58

G_u = government cash flow of unlevered firm / r_u; government cash flow of unlevered firm = $\tau\ x\ EBIT$ = 0.46 x 1.8519 = 0.8519

G_u Myers (1974) = 0.8519 / 0.1587 = 5.37; G_u Miles and Ezzell (1980) = 0.8519 / 0.1526 = 5.58; G_u Harris and Pringle (1985) = 0.8519 / 0.1520 = 5.60

Cost of government's claim (r_g)

r_g Myers (1974) = 0.1587 + (2.19 / 4.36) x (0.1587 - 0.11) - (5.12 / 4.36) x (0.17 - 0.1587) = 17.00%

r_g Miles and Ezzell (1980) = 0.1526 + (2.19 / 4.83) x (0.1526 - 0.11) - (5.12 / 4.83) x (0.17 - 0.1526) = 15.35%

r_g Harris and Pringle (1985) = 0.1520 + (2.19 / 4.87) x (0.1520 - 0.11) - (5.12 / 4.87) x (0.17 - 0.1520) = 15.20%

Alternative valuation method for present value of government's claim (G_l)

$G_l = GCF_l / (r_g - g)$

G_l Myers (1974) = (1.8519 - 0.11 x 2.19)(0.46) / (0.17 - 0.025) = 4.36

G_l Miles and Ezzell (1980) = (1.8519 - 0.11 x 2.19)(0.46) / (0.1535) = 4.83

G_l Harris and Pringle (1985) = (1.8519 - 0.11 x 2.19)(0.46) / (0.1520 - 0.025) = 4.87

Chapter 6

The discount rate for discounted cash flow valuations of intangible assets[152]

Abstract

To an increasing degree, companies are interested in the separate value of intangible assets. The need for separate valuation partly arises from new international accounting standards of the International Accounting Standards Board. Under certain conditions, these accounting standards allow the value of intangible assets to be determined using the discounted cash flow method, which requires the determination of the cost of capital of the relevant intangible assets. In this chapter, the required return of intangible assets for 8 different business sectors is determined by means of an empirical study of companies from the US Standard & Poor's 500 Index. The resulting required return is subsequently compared with proxies for the required return on intangible assets used in practice, such as the weighted average cost of capital. As anticipated, the average required return for intangible assets was higher than the WACC. The cost of equity appears to best approximate the cost of capital of intangible assets.

6.1. Introduction

This chapter focuses on the discount rate used for discounting cash flows generated by intangible assets. Intangible assets include e.g. business relations, software, trademarks, trade secrets or patents. To an increasing degree, companies are interested in the separate value of intangible assets. This knowledge is often essential for important commercial decisions, such as assessing brand portfolios, for purchase and sale transactions of intellectual properties and for valuations arising from international accounting standards. In the international accounting rules of the International Accounting Standards Board, under a number of different circumstances the value of an asset should be determined using the discounted cash flow (DCF) method. In

[152] This chapter is based on Stegink, Schauten and De Graaff (2006). We are grateful to Arjan Vos and Jeroen Weimer for their valuable contribution. Any remaining errors are our own.

particular this is the case if it is not possible to determine the fair value[153] of an asset based on a price in an active market,[154] which often is the relevant situation for intangible assets.

Although a range of methods is available to determine the value of intangible assets (some of which will be discussed below), both in the literature (Smith and Parr, 2005; Reilly and Schweihs, 1998; Mard et al., 2002) and in practice there is a distinct preference for the DCF approach. The literature also explains how to determine the cash flows resulting from the ownership of intangible assets. However, suggestions for determining the appropriate discount rate are limited. This chapter aims to fill this gap by providing more insight into the discount rate of individual intangible assets in relation to the cost of equity as well as the cost of debt and the cost of capital of the company as a whole.[155]

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[153] Fair value is the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction.

[154] Upon an acquisition, the acquiring company should value the identifiable assets and liabilities of the acquired company that satisfy the recognition criteria (IAS 38.21) at fair value (IFRS 3.36). An intangible asset can only be identified and recognised separately (of the acquired goodwill) on the balance sheet of the acquiring company if the fair value can be measured reliably (IFRS 3.37c and 45). IAS 38 (paragraphs 35-41) deals with measuring the fair value of an intangible asset which was obtained by the acquisition of another company. If the fair value cannot be measured on the basis of market prices on an active market, the fair value can be measured on the basis of the market prices of similar assets or by using indirect estimation methods (including the calculation of the present value of future cash flows). In certain circumstances, the DFC method can also be used for so-called impairment tests (IAS 36): if the value of an asset at balance sheet date exceeds its recoverable amount, the asset is deemed to be impaired. In this case, the company should depreciate the value on the balance sheet to the recoverable amount and recognise the impairment loss. The recoverable amount is the highest of an asset's fair value less costs to sell and its value in use (IAS 36.18). The value in use is based on the cash flow projections (IAS 36 paragraphs 30-57).

[155] It is common within the field of corporate finance to determine the value of a company/division/ project as a whole. It is unusual to award a value to a separate balance sheet item. Apart from that, there is usually no need to do this. We demonstrate that it is possible to use corporate finance theory to determine a discount rate for intangible assets. This deduction is based on a number of assumptions: i) the non-intangible assets generate a certain return as separate item (without interaction with the intangible assets); and ii) the company as a whole generates a certain return with the aid of all the assets (including intangible assets). Using the derived discount rate for intangible assets, it is subsequently possible to measure the value of intangible assets using the DCF method. The cash flows generated by the intangible assets are equal to the difference between the cash flows generated by the

The approach we put forward is based on the WARA (Weighted Average Return on Assets) method of Smith and Parr (2005).[156] According to the WARA method, the company's weighted average cost of capital (WACC) is equal to the weighted average return on the various assets (WARA) within the company. Using this method, it is fairly straightforward to derive the required return (the discount rate) on intangible assets.

The potential of the WARA approach is demonstrated by means of an empirical application involving the constituents of the S&P500 index over the year 2004.[157] Using the WARA method we obtain the required return on intangible assets for eight different business sectors. The calculated required returns on intangible assets are subsequently compared to the most common proxies for the required return on intangible assets. The purpose of this comparison is to determine the best proxy for the discount rate of intangible assets. The proxies are: the company's WACC (weighted average cost of capital), the unlevered cost of equity[158] and the levered cost of equity.[159] As expected we show empirically that the required return on intangible assets is higher than the company's WACC as well as the unlevered cost of equity. We also show that the levered cost of equity underestimates the required return on intangible assets. However, of the three proxies, the discount rate for intangible assets is best approximated by the levered cost of equity.

The chapter is structured as follows. Section 2 contains a brief background of the methods that are currently available for valuing intangible assets and examines the methods and proxies used to calculate the discount rate for a DCF analysis in practice. Section 3 describes the method and data of the empirical study, as well as the hypotheses that were tested. In Section 4, the results of the empirical study are presented. Finally, Section 5 summarises our conclusions.

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company/division/project as a whole, including intangible assets, and the same cash flows, but excluding intangible assets. This chapter does not deal with how to determine these cash flows.

[156] Ibid. p.764-766.

[157] For 2002 and 2003 we find similar results. In this chapter we report the results for 2004 only.

[158] The unlevered cost of equity is the required return of the company as a whole as if the company were fully funded by equity.

[159] The levered cost of equity is the return that the providers of equity demand for the business risk and the financial risk they run. The business risk is determined by the systematic risk of the assets of the company as a whole; the financial risk is determined by the relative size of the debt in relation to equity. The higher this ratio (also known as leverage), the higher the required return.

6.2. Methods of intangible asset valuation and the discount rate

6.2.1. Methods for the valuation of intangible assets

Valuation methods for intangible assets can be divided into four categories[160]: the costs approach, the market approach, the residual approach and the DCF approach. According to the costs approach, the value of an intangible asset is equal to the costs that would be incurred at the moment of valuation in order to replace or reproduce the intangible asset. The market approach measures an intangible asset using the market prices for similar intangible assets. The residual approach is indirect and sets the value of the total of all intangible assets equal to the difference between the total firm value and the net value of all other assets. Finally, the DCF approach analyses the future incremental free cash flows that are generated by the intangible asset. By discounting these free cash flows to their present value, we obtain an estimate of the value of the intangible asset.[161] The DCF approach is preferable to the other methods in most cases, because the user is prompted to analyse the characteristics and market circumstances of the intangible asset to be valued. Moreover, the risks that accompany the free cash flows are taken into account.

6.2.2. Methods for determining the discount rate

The DCF method raises the question of which discount rate should be used to discount the future cash flows back to the present. In other words, how risky are these cash flows? The discount rate of an asset is also called the minimum return requirement for investors and is equal to the minimum return required on the asset. The model most used in practice to determine the required return on an asset is the capital asset pricing model (CAPM).[162] The CAPM assumes a one-to-one (positive) relation between systematic risk (beta)[163] and required return. The beta of an asset that

[160] Real options and the technology factor method (for measuring technologies) can be seen as hybrid variations of the identified methods (Smith and Parr, 2005), but will not be dealt with in view of the restricted scope of this chapter.

[161] For a summary of the methods that can be used to determine these cash flows, see Smith and Parr (2005) and Reilly and Schweihs (1998).

[162] For alternative pricing methods, please refer to Brealey et al. (2006) or Levy and Post (2005).

[163] Beta of object i is equal to the co-variance of the returns on object i with the returns on the market portfolio divided by the variance of the returns on the market portfolio. Since the market portfolio is

is publicly traded can be estimated by means of regressing the returns of the asset against the returns of the relevant market index.[164] Intangible assets, however, are not publicly traded, so no return data are available and the beta cannot be estimated directly.

The literature suggests several solutions for estimating betas of such non-traded assets,[165] for example, accounting betas, the pure-play approach and full-information approach. With accounting betas, a regression analysis is performed on changes in the yearly or quarterly profit of a company in comparison to relative changes in profits for the entire market. The pure-play approach tries to estimate the beta of a division of a company by means of comparable listed companies. Since the beta of a division is not measurable using information on returns, a proxy beta is derived from one or more betas of listed companies with activities similar to the division in question. This proxy for the beta will then be used as a yardstick of the systematic risk of the division or enterprise (Fuller and Kerr, 1981). The full-information method was developed by Ehrhardt and Bhagwat (1991) and Boquist and Moore (1983). This approach is based on the assumption that one can consider a company as a portfolio of business components. The beta of the enterprise is the weighted average of the betas of the various types of business components within the enterprise. First, the betas of the companies and the weights of the various business components in the companies are determined. Secondly, a cross-section regression analysis is conducted to obtain estimates of the betas of the various groups of business components (Chua et al., 2003).

6.2.3. Determining the discount rate of intangible assets

The methods discussed up to this point are, according to the literature, suitable for determining the betas of non-traded assets. Using CAPM, the required return on the asset can be determined. In this section, the most commonly used methods will be discussed, which, according to the literature, are used in practice for determining the required return on intangible assets. In line with CAPM, the required return on

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not observable, a market index is used instead. Strict application of the CAPM in practice is not possible.

[164] The assumption is that beta is stationary through time.

[165] These methods are primarily aimed at measuring the betas of projects and divisions. See Damodaran (1999), Ehrhard and Bhagwat (1991) and Patterson (1995).

intangible assets is the required return that reflects the systematic business risk of intangible assets.

Reilly and Schweihs (1998) argue that the WACC of the enterprise can be used as a proxy for the required return on the intangible asset. The use of the WACC, however, is not always correct. If the risk of the intangible asset is higher (lower) than the risk of the enterprise as a whole, the WACC gives an underestimate (overestimate) of the required return. Moreover, the WACC gives an underestimate of the business risk if the tax benefit of debt is included in the calculation of the WACC.[166]

Smith and Parr (2005) discuss a different commonly used proxy for the required return on intangible assets. Smith and Parr suggest that the unlevered cost of equity is a reasonable approximation of the actual required return, because—as they assume—intangible assets in most cases are funded with equity. This reasoning does not appear to be correct in all cases. The unlevered cost of capital of the enterprise reflects the business risk of the enterprise as a whole. If the risk of the intangible assets is different from the risk of the enterprise as a whole, which is likely to occur in practice, the unlevered cost of capital gives a biased estimate of the required return on intangible assets. Hence, even if we assume that intangible assets can very rarely be funded with debt, it cannot be concluded that the unlevered cost of capital of the enterprise is a good proxy for the required return on the intangible assets.

On the other hand, when the *levered* cost of equity is used as proxy, the additional risk arising from debt funding by the company is also charged on to the intangible assets. This appears to be inappropriate. We are, after all, only interested in the required return as compensation for the systematic business risk of the intangible asset. Nevertheless, it is imaginable that the levered cost of capital of the company provides a better approximation of the required return on the intangible asset. By including the compensation for incurring financial risk in the levered cost of equity, the levered cost of equity is higher than the WACC and higher than the unlevered cost of equity. If the risk of intangible assets is indeed higher than the assets of the

[166] The tax benefit of debt (deductible interest charges) results in a lower WACC than the unlevered cost of equity when the discount rate of the tax shield is lower than the unlevered cost of equity. If the WACC is calculated as the weighted average of the cost of equity and the cost of debt after tax, the WACC is even lower. We calculate the WACC as the weighted average of the cost of equity and debt before corporate tax (see equation (3)).

company as a whole, the levered cost of equity may give a better approximation of the cost of capital of the intangible assets.

The build-up method provides a summary of all the types of risks that are relevant for the intangible assets to be valued. Each risk is subsequently awarded a return value to compensate for that risk (Smith, 1997). The required return thus comprises the components that add up to the total systematic risk.

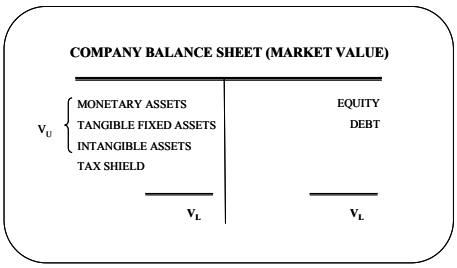
In our opinion, the WARA method is the theoretically most sound approach for determining the required rate of return on assets, and hence is the preferable approach for obtaining the appropriate discount rate of intangible assets.[167] The WARA method will be discussed in detail in the next section.

6.3. Method, data and hypotheses

6.3.1. Method

The assets of a company can be divided into different categories. For the purpose of this study, the company consists of a portfolio of monetary assets (net working capital), tangible fixed assets and intangible assets. If the company is funded by both equity and debt we distinguish the present value of tax shields (*PVTS*) as a separate asset category. The value of the company is then composed as illustrated in Figure 1. This figure represents the market value of the monetary assets, tangible fixed assets, and intangible assets. The tax shield is stated as a separate item. The value of the other assets (V_U) excludes the value of the tax shield; in other words, the value of the company as if it were entirely funded by equity.

Figure 1. Company balance sheet in market values



[167] In line with Smith and Parr (2005), we assume that the weighted average return on the different assets within the company equals the WACC.

In the absence of market information about the value of the intangible assets held by companies in the dataset, the empirical study uses the residual method to calculate the value of the intangible assets. In this context, we assume an efficient capital market, that is, the market values the company correctly and determines the value of all the assets together. The method or discount rate used by the company itself to measure intangible assets is not directly relevant. The value of the total of all the intangible assets is equal to the difference between the enterprise value and the value of the other assets. This can be formulated as follows:

$$V_L = E + D = V_U + PVTS = MA + TFA + IA + PVTS \quad (1)$$

where V_L is the market value of the levered company, E is the market value of the equity, D is the market value of the debt, V_U is the market value of the unlevered company, $PVTS$ is the present value of the tax shield, MA is the market value of the monetary assets, TFA is the market value of tangible fixed assets, and finally IA is the market value of the intangible assets. The identity in (1) can be rewritten to obtain an expression for the market value of the intangible assets in terms of the value of other components of the firm:

$$IA = V_L - MA - TFA - PVTS \quad (2)$$

In order to determine the discount rate of the intangible assets we apply the WARA method. The WARA method that we apply is an adjusted version of the WARA method of Smith and Parr. Our model distinguishes itself from that of Smith and Parr by the addition of the value of the tax shield as a separate asset as well as the application of the WACC before corporate tax instead of after corporate tax. Ignoring the tax shield as a separate item leads to an underestimate of the discount rate of the intangible assets.[168] Applying the WACC after tax leads to an underestimate of the discount rate of all the assets (including the intangible assets) of the company. In other words, the return required by capital providers (WACC) is equated with the weighted

[168] If the tax shield is not stated as a separate item, it is considered to be part of the intangible assets when the residual method is applied. Since we assume that the risk of the tax shield is the same as the risk of debt, the calculated discount rate of the intangible assets (including the tax shield) would be lower.

average of the required returns on all the company's individual or groups of assets (WARA):

$$WACC = R_e \frac{E}{E+D} + R_d \frac{D}{E+D} = WARA = R_{MA} \frac{MA}{V_L} + R_{TFA} \frac{TFA}{V_L} + R_{IA} \frac{IA}{V_L} + R_{PVTS} \frac{PVTS}{V_L} \quad (3)$$

where $WACC$ is the weighted average cost of capital of the company before tax, R_e is the levered cost of equity, R_d is the cost of capital of the debt, and where R_{MA}, R_{TFA}, R_{IA}, and R_{PVTS} are the required returns on monetary assets, tangible fixed assets, intangible assets (including goodwill), and the tax shield, respectively.

The required return on intangible assets can be derived from equation (3) and is given by:

$$R_{IA} = \frac{WACC - R_{MA} \frac{MA}{V_L} - R_{TFA} \frac{TFA}{V_L} - R_{PVTS} \frac{PVTS}{V_L}}{\frac{IA}{V_L}} \quad (4)$$

The required return on intangible assets is the required return as if the intangible assets are financed with equity only.

6.3.2. Dataset

The dataset comprises companies from the S&P 500 index for the year 2004. We decided to use companies from the S&P 500 index because of the possibility to collect data from a large group of comparable companies spread over numerous sectors.[169] Financial institutions were excluded, however, because they have a different equity and asset structure.[170] Companies of which the proportion of intangible assets is less than 15% of the total enterprise value were also removed from the dataset.[171] Ultimately, our sample contains data for 318 companies for the year 2004.

[169] The S&P 500 index includes 500 US companies that all represent major sectors.

[170] This is consistent with the majority of the empirical studies referred to in the existing literature (including Rajan and Zingales, 1995).

[171] We removed observations where IA/V_L is less than 15% because possible inaccuracies in RT_{MA}, R_{TFA}, R_{PVTS} and the $WACC$ could have too great an influence on the results.

The *WACC* is the weighted average cost of capital of the company before tax. The levered cost of equity (R_e) is calculated using the CAPM. Since the dataset consists of companies from the US S&P 500, the risk-free interest rate (R_f) is equated with the 'yield-to-maturity' on 10-year U.S. government bonds, i.e. 3.7%. The market risk premium (MRP) is set at 5%.[172] The estimated betas (β) as well as the costs of debt (R_d), are obtained from the financial database of Bloomberg.

The required returns on the different components of monetary assets (cash and cash equivalents, transferable securities, receivables, inventories and other monetary assets) are assumed to be the same for all the companies involved in the study. The required return on the whole group of monetary assets (R_{MA}) is the weighted average of the required returns on the different components. The required return on the Bloomberg Real Estate Investment Trust Index (BBREIT) was used as proxy estimating the required return on tangible fixed assets (R_{TFA}). This results in a required return of 6.03% for the year 2004. This variable is assumed to be the same for every company.

The present value of the tax shield is the same as the marginal tax rate (40%) multiplied by the value of the debt.[173] We assume that the company adheres to a previously agreed funding plan, with the value of the debt and the ensuing tax shield being fixed for each moment in the future. This implies that the cost of capital of the tax shield is the same as the cost of debt (Brealey, Myers and Allen, 2006).

Initially, the group of companies will be studied as a whole. Subsequently, this group is divided into eight sectors (raw materials, communication, cyclic consumer products, non-cyclic consumer products, energy, industry, technology and utilities).

6.3.3. Hypotheses

The hypotheses to be tested are based on the literature referred to in section 6.3. The hypotheses are tested using a paired t-test[174]. The 'cost of capital of intangible assets' is the R_{IA} value we calculate using the adjusted WARA method.

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[172] This MRP is used by KPMG Corporate Finance for North American companies, as well as for European companies in industrialised countries.

[173] See Kemsley and Nissim (2002) e.g. for empirical evidence.

[174] The paired t-test is used to test the null hypothesis that states that the average of the population of paired differences of the two samples equals zero. It is assumed that the paired differences are

Hypothesis 1

H_0: The cost of capital of the intangible assets is equal to the WACC.

H_1: The cost of capital of the intangible assets is not equal to the WACC.

The above hypothesis is used to ascertain whether intangible assets carry the same risk as the company as a whole. Put differently, we test whether the WACC of the company is a fair proxy for the required return on intangible assets.

Hypothesis 2

H_0: The cost of capital of the intangible assets is equal to the unlevered cost of equity[175].

H_1: The cost of capital of the intangible assets is not equal to the unlevered cost of equity.

The above hypothesis is used to test whether the unlevered cost of equity is a fair proxy for the required return on intangible assets.

Hypothesis 3

H_0: The cost of capital of the intangible assets is equal to the levered cost of equity.

H_1: The cost of capital of the intangible assets is not equal to the levered cost of equity.

The above hypothesis is used to test whether the levered cost of equity is a fair proxy for the required return on intangible assets.

Hypothesis 4

H_0: The difference between the cost of capital of intangible fixed assets and the unlevered cost of equity is equal to the difference between the cost of capital of the intangible assets and the levered cost of equity.

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distributed independently and normally. The two samples must be related to each other so that they form pairs together.

[175] The unlevered cost of equity is calculated by using unlevered beta in the CAPM. In the calculation of the unlevered beta, we assume that the cash flows are perpetual and that the level of debt is constant. The unlevered beta was calculated as follows (Koller, Goedhart and Wessels, 2005):

$$\beta_U = \frac{\beta_E + \beta_D (1 - t_c) \frac{D}{E}}{1 + (1 - t_c) \frac{D}{E}}$$

H_1: The difference between the cost of capital of intangible fixed assets and the unlevered cost of equity is not equal to the difference between the cost of capital of the intangible assets and the levered cost of equity.

The above hypothesis is used to test whether the unlevered cost of equity is a better approximation of the required return on the intangible assets than the levered cost of equity.

6.4. Results

In the empirical study, the required return on intangible assets was calculated by means of the adjusted WARA method. The results for the entire dataset are shown in Table 1. This table also shows the results applying the Smith and Parr method. The estimated cost of capital of intangible assets (R_{IA}) using the adjusted WARA method is higher than the R_{IA} following the Smith and Parr method (10.67% vs. 9.12%), because of the different treatment of tax. Smith and Parr do not include the tax shield as a separate item in their model, as we do, and they assume that WARA equals WACC after corporate tax, while we use the WACC before corporate tax (see section 6.3.1.).

Average ratios for the asset structure as well as the capital structure per industry are presented in Table 2. Figure 2 presents the weighted average cost of capital (WACC), the unlevered cost of capital ($R_{e,u}$), the levered cost of capital ($R_{e,l}$) and the cost of capital of the intangible assets (R_{IA}) per industry

Table 1. Average required return for the full sample
This table presents the weighted average cost of capital (*WACC*), the unlevered cost of capital ($R_{e,u}$), the levered cost of capital ($R_{e,l}$) and the cost of capital of the intangible assets (R_{IA}). The adjusted method distinguishes itself from that of Smith and Parr by the addition of the value of the tax shield as a separate asset and the application of the *WACC* before corporate tax.

Applied method	#	*WACC*	$R_{e,u}$	$R_{e,l}$	R_{IA}
Adjusted WARA method (full sample)	318	8.25%	8.56%	9.17%	10.67%
WARA method Smith & Parr (full sample)	318	8.05%	8.56%	9.17%	9.12%

Table 2. Average assets and liabilities ratio per industry
Average ratios are given for monetary assets (*MA*), fixed tangible assets (*FTA*), intangible assets (*IA*) and the present value of the tax shield (*PVTS*). Average liability ratios are for debt (*D*) and equity (*E*). All ratios are calculated as the equally weighted average of the individual ratios per industry.

Industry	Assets				Liabilities	
	% MA	*% FTA*	*% IA*	*% PVTS*	*% D*	*% E*
Raw materials	10%	41%	39%	10%	24%	76%
Communication	8%	20%	65%	7%	15%	85%
Cyclic consumer products	13%	27%	53%	7%	18%	82%
Non-cyclic consumer products	7%	18%	69%	6%	14%	86%
Energy	5%	51%	38%	6%	16%	84%
Industry	11%	24%	58%	7%	18%	82%
Technology	13%	10%	75%	2%	6%	94%
Utility	-3%	68%	14%	21%	52%	48%
Total	10%	23%	61%	6%	16%	84%

Figure 2. Resturns per industry
This figure presents the weighted average cost of capital (*WACC*), the unlevered cost of capital ($R_{e,u}$), the levered cost of capital ($R_{e,l}$) and the cost of capital of the intangible assets (R_{IA}) per industry.

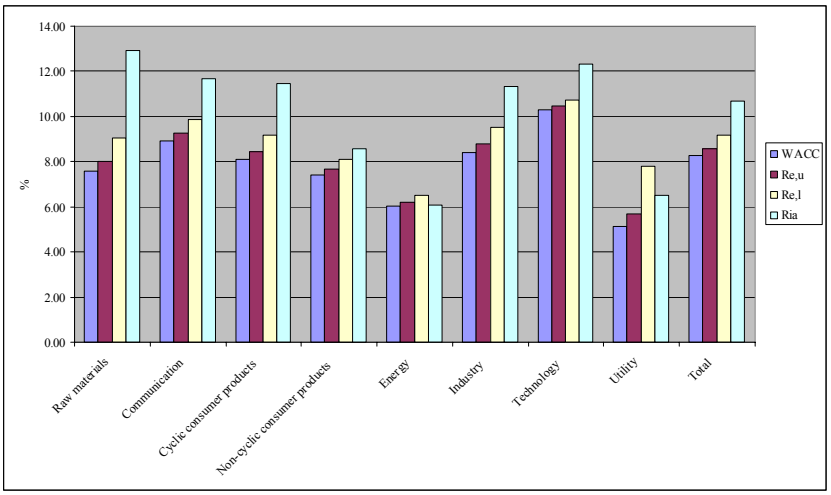

Table 3 presents per industry i) the average difference between the return on intangible assets and the weighted average cost of capital (R_{IA} minus *WACC*); ii) the average difference between the return on intangible assets and the unlevered cost of equity (R_{IA} minus $R_{e,u}$); iii) the average difference between the return on intangible assets and the levered cost of equity (R_{IA} minus $R_{e,l}$) and iv) the average difference between the deviation of the unlevered cost of equity and the levered cost of equity from the return on intangible assets (R_{IA} minus $R_{e,u}$)-(R_{IA} minus $R_{e,l}$).

Table 3. Results hypotheses

This table presents per industry i) the average difference between the return on intangible assets and the weighted average cost of capital (R_{IA} minus $WACC$); ii) the average difference between the return on intangible assets and the unlevered cost of equity (R_{IA} minus $R_{e,u}$); iii) the average difference between the return on intangible assets and the levered cost of equity (R_{IA} minus $R_{e,l}$) and iv) the average difference between the deviation of the unlevered cost of equity and the levered cost of equity from the return on intangible assets (R_{IA} minus $R_{e,u}$)-(R_{IA} minus $R_{e,l}$). If the differences are significantly different from zero the corresponding null hypothesis is rejected. Differences that are significant at the 1% level are marked with ***.

Hypothesis		$R_{IA} = WACC$		$R_{IA} = R_{e,u}$		$R_{IA} = R_{e,l}$		$(R_{IA} - R_{e,u}) - (R_{IA} - R_{e,l}) = 0$	
Industry	#	average	t-stat.	average	t-stat.	average	t-stat.	average	t-stat.
Raw materials	21	5.35***	4.48	4.92***	4.22	3.86***	3.31	1.06***	3.92
Communication	38	2.74***	4.36	2.40***	3.89	1.79***	2.94	0.61***	7.53
Cyclic consumer products	54	3.37***	5.40	3.02***	4.97	2.26***	3.82	0.76***	5.80
Non-cyclic consumer products	79	1.19***	6.91	0.93***	5.79	0.47***	3.29	0.46***	8.96
Energy	13	0.05	0.12	-0.13	-0.32	-0.42	-0.98	0.29***	4.59
Industry	56	2.93***	4.01	2.56***	3.56	1.82	2.59	0.75***	7.73
Technology	51	2.02***	7.19	1.84***	6.78	1.59***	6.04	0.25***	3.76
Utility	6	1.38	0.69	0.82	0.42	-1.30	-1.00	2.12	2.84
Total	318	2.42***	10.95	2.11***	9.81	1.50***	7.25	0.61***	13.93

The following conclusions can be drawn from the results of the hypotheses tested:

Hypothesis 1

The null hypothesis stating that the required return on intangible assets is equal to the *WACC* is rejected. One can therefore conclude that intangible fixed assets are not equally risky as the company as a whole. Only with respect to the two smallest sectors, energy and utility companies, the null hypothesis cannot be rejected. Generally, however, one can conclude that intangible assets carry a greater risk than the company as a whole.

Hypothesis 2

In almost all sectors, the null hypothesis that the unlevered cost of equity is a fair proxy for the required return on intangible assets is rejected. Again, the null hypothesis cannot be rejected for the energy and utility sectors. In general, however, the required return on intangible assets is significantly higher than the unlevered cost of equity. Consequently, the unlevered cost of equity does not appear to be a fair proxy for the required return on intangible assets.

Hypothesis 3

The levered cost of equity does not appear to be a fair proxy either. The null hypothesis is rejected in almost all sectors. In these sectors, the required return on intangible fixed assets is significantly higher than the levered cost of equity. Only in the energy, industry and utility sectors the difference in not significant.

Hypothesis 4

This hypothesis tests whether the unlevered cost of equity is as good an approximation of the required return on the intangible assets as the levered cost of equity. Table 3 clearly demonstrates that the null hypothesis is rejected in all sectors except the utility sector. However, it is possible to conclude from the positive average difference that in six of the eight sectors the levered cost of equity is a better approximation of the required return on intangible fixed assets than the unlevered cost of equity. The cost of capital of levered equity is higher than the cost of capital of unlevered equity. Since in six of the eight sectors, the required return on intangible

assets is higher than the levered and unlevered cost of equity, the levered cost of equity is the better proxy (for these six industries).

6.5. Summary

If it is not possible to determine the value of intangible assets on the basis of a price on an active market, international accounting standards allow the application of the discounted cash flow method under certain conditions. This involves expected cash flows being discounted at a discount rate, which should accurately reflect the risk of the asset in question.

In this chapter, the discount rate was calculated using the adjusted WARA method. This method is based on the WARA method of Smith and Parr. In contrast to Smith and Parr, the tax shield is included as a separate asset in the model. In our opinion, if the tax shield is not included in the model, it leads to an underestimate of the required return on intangible assets. Consequently, the WACC before tax is used instead of the WACC after tax. The use of the WACC after tax also leads to an underestimate of the discount rate.

In addition to these adjustments to the model, we have also demonstrated empirically that the proxies used in the literature do not produce a fair estimate of the discount rate for intangible assets. The study shows that for all the identified sectors, the required return on intangible assets is higher than the WACC. It also shows that the return is higher than the levered or unlevered cost of equity of the company as a whole. The expected differences between the calculated required return on intangible assets and the proposed proxies are confirmed by the results of the empirical study. In six of the eight sectors, the levered cost of equity appears to be the best proxy for the required return on intangible assets.

Summary

This dissertation consists of six chapters that each discusses issues in Corporate Finance.

In Chapter 1 we examine the relation between the quality of corporate governance and the value of excess cash for large European firms. We use the Deminor ratings for Shareholder rights, range of Takeover defences, Disclosure and Board structure, as proxies for the quality of corporate governance. Following the method of Dittmar and Mahrt-Smith (2007) we first estimate a cash model to determine the level of normal cash holdings and subsequently the level of excess cash. Then we analyse the influence of governance on the value of excess cash. We find that the *level* of excess cash as well as the *value* of excess cash is positively related to the governance Takeover defences score. We find that spending firms with excess cash and a low quality of corporate governance spend more than firms with a high quality of corporate governance. This finding might explain the positive relation between the level of excess cash and governance. We further find that, governance positively influences the ROA in the years after the year of spending. If we assume that projects of poorly governed firms—with relatively lower ROAs—are negative NPV projects, then the 'value destructive investing behaviour' of poorly governed firms could explain the value differential of excess cash between well and poorly governed firms. Firms that (potentially) invest in negative NPV projects, and cannot be corrected by being taken over, are valued lower accordingly. We find no relation between the level nor the value of excess cash and the quality of firms' corporate governance categories Shareholder rights, Disclosure or Board. Given our empirical results, only the market for corporate control seems strong enough to prevent managers from wasting excess cash.

In Chapter 2 we examine the relation between the quality of corporate governance and the cost of debt. We use the Deminor ratings for the years 2000-2004 as proxies for the quality of corporate governance. As proxy for the cost of debt we use the yield and yield spread of 319 bonds issued in the years 2001-2005. After adjusting for issuer characteristics, issue characteristics and market characteristics, we find a negative relation between the governance component Disclosure and the cost of debt. This relation is negatively influenced by the quality of the corporate governance

measure Shareholder rights. If the quality of Shareholder rights is high, the relevance of Disclosure is low. However, if the quality of Shareholder rights is low, Disclosure seems to be statistically and economically significant. The negative influence of Disclosure on the cost of debt is in accordance with empirical literature; the interaction with Shareholder rights is new. For convenience, we refer to this interaction between Shareholder rights and Disclosure as the '*share rights or disclose*' hypothesis. Management that does not share rights with shareholders i.e., firms that do not score high on Shareholder rights, have higher costs of debt if their score for disclosure is low. Firms that do not share rights but communicate relatively well are rewarded with a lower cost of debt. We do not find evidence for any relation between the cost of debt and the governance measures Takeover defences nor Board structure and functioning.

In Chapter 3 we show that despite a vast literature on the capital structure of the firm, there still is a big gap between theory and practice. Starting with the seminal work by Modigliani and Miller, much attention has been paid to the optimality of capital structure from the shareholders' point of view. Over the last few decades studies have been produced on the effect of other stakeholders' interests on capital structure. Well-known examples are the interests of customers who receive product or service guarantees from the company. Another area that has received considerable attention is the relation between managerial incentives and capital structure. Furthermore, the issue of corporate control and, related, the issue of corporate governance, receive a lion's part of the more recent academic attention for capital structure decisions. From all these studies, one thing is clear: The capital structure decision (or rather, the management of the capital structure over time) has to deal with more issues than the maximization of the firm's market value alone. In this chapter, we give an overview of the different objectives and considerations that have been proposed in the literature. We distinguish 'economic criteria' and 'quasi non-economic criteria'. Economic criteria are criteria based on the neoclassical view and are relevant for the shareholder who aims for the maximization of shareholder wealth. Quasi non-economic criteria are criteria which might be relevant for the management. Quasi non-economic criteria are called non-economic, because the criteria are not based on the neoclassical view; and quasi, because the relations with economic value are not always clear cut. We show that capital structure decisions can be framed as

multiple criteria decision problems, where capital structure is not a goal in itself, but an instrument to achieve certain outcomes and/or to influence certain criteria values.

Chapter 4 discusses a merger and acquisition case as illustration of the multi-criteria framework developed in Chapter 3. We analyse financing solutions as proposed by two consultants, one full service banker and one investment banker, for a merger and acquisition problem. We ask each specialist to construct three financing proposals: the first would focus on the interests of current shareholders; the second would center on the interests of management; and the third would examine how the specialist should advise the management of the bidder. We compare the resulting proposals using criteria described in Chapter 3, along with additional criteria mentioned by the specialists. We find that: i) the solutions differ between specialists; ii) the solutions and criteria applied by the specialists depend on the stakeholder (shareholders versus management) that the solution is tailored for; and iii) some economic criteria do not appear to be as relevant as suggested by theory. The different financing solutions that the financial experts should actually advise management (their third proposals) are scored by us—in qualitative terms only—on criteria which are relevant for the shareholders (from a neo classical perspective and the perspective of the experts) and the management.

Chapter 5 deals with the valuation of debt tax shields. We discuss a valuation framework of the total firm which aims to improve the understanding of the 'tax shield valuation discussion'. In this chapter we derive a general formula for the cost of capital of government's claim (r_g). Given our valuation framework that distinguishes three claimholders—equity holders, debt holders and government—we show for the models used in Myers (1974), Miles and Ezzell (1980) and Harris and Pringle (1985), that the present value of tax shields is equal to the difference between the present value of the expected taxes paid by the unlevered firm and the levered firm, with each of the models' implied r_g as discount rate. In contrast to Myer's model we show low implied $r_g s$ for both Miles and Ezzell's model and Harris and Pringle's model. We provide a numerical example of how to calculate r_g for each of the models and give a logical explanation for the low implied $r_g s$ for the last two mentioned models.

Chapter 6 deals with the determination of the unlevered cost of capital for the separate valuation of intangible assets. In this chapter, the required return of intangible assets for 8 different business sectors is determined by means of an empirical study of companies from the U.S. Standard & Poor's 500 Index. The

method we apply is the Weighted Average Return on Assets or WARA method. Our WARA method is an adjusted version of the WARA method of Smith and Parr (2005). Our model distinguishes itself from that of Smith and Parr by the addition of the value of the tax shield as a separate asset as well as the application of the WACC before corporate tax instead of after corporate tax. Ignoring the tax shield as a separate item could lead to an underestimate of the discount rate of the intangible assets. Applying the WACC after tax leads to an underestimate of the discount rate of all the assets (including the intangible assets) of the company. To determine the required return for intangible assets, the return required by capital providers (the before tax WACC) is equated with the weighted average of the required returns on all the company's individual or groups of assets (WARA). The resulting required return is subsequently compared with proxies for the required return on intangible assets used in practice, such as the weighted average cost of capital. As anticipated, the average required return for intangible assets is higher than the WACC. For most industries, the cost of equity appears to best approximate the cost of capital of intangible assets.

Samenvatting (Dutch summary)

Dit proefschrift richt zich op het vakgebied van de Corporate Finance. Centraal staan de begrippen 'valuation' of waardering, 'capital structure decisions' of beslissingen ten aanzien van de vermogensstructuur en 'the cost of capital' of de kostenvoet van het vermogen.

In hoofdstuk 1 onderzoeken wij voor grote Europese beursgenoteerde ondernemingen of er een verband bestaat tussen de kwaliteit van de corporate governance en de waarde van de overtollige hoeveelheid liquide middelen (excess cash). Als maatstaf voor de kwaliteit van corporate governance maken wij gebruik van governance scores die zijn samengesteld door Deminor. Deminor geeft scores voor de volgende vier governance onderdelen: aandeelhoudersrechten (shareholder rights), aanwezigheid van beschermingsconstructies (range of takeover defences), transparantie (disclosure), en het functioneren en de kwaliteit van de board (board structure & functioning). In navolging van Dittmar en Mahrt-Smith (2007) schatten wij eerst een zogenaamd 'normal cash' model. Met behulp van de uitkomsten van dit model bepalen wij het niveau van de overtollige hoeveelheid liquide middelen, per onderneming, per jaar, voor de periode 2000-2004. Wij tonen aan dat de waarde van excess cash positief beïnvloed wordt door de kwaliteit van de governance maatstaf takeover defences. De overige maatstaven hebben geen invloed op de waarde van excess cash. Wij vinden verder dat ondernemingen met een hoge score voor takeover defences meer excess cash aanhouden dan ondernemingen met een lage score. Dit wordt verklaard doordat ondernemingen met een lage score excess cash sneller uitgeven. De invloed van de uitgaven op de return on assets is voor laatst genoemde groep ondernemingen relatief ongunstig. Onze bevindingen zijn in overeenstemming met die van Dittmar en Mahrt-Smith (2007) en bevestigen dat takeover defences het meest relevante governance mechanisme is voor de waardering van excess cash.

In hoofdstuk 2 analyseren wij voor grote Europese beursgenoteerde ondernemingen het verband tussen de kwaliteit van corporate governance en de kosten van vreemd vermogen. Als maatstaf voor de kwaliteit van corporate governance maken wij weer gebruik van de governance scores die zijn samengesteld door Deminor. Als proxy voor de kosten van vreemd vermogen gebruiken wij de spread en de yield spread van de door betreffende ondernemingen uitgegeven

obligaties. Na controle voor ondernemings-, emissie- en marktkenmerken, vinden wij een negatief verband tussen de kosten van vreemd vermogen en de mate van transparantie van de onderneming. Hoe transparanter de onderneming, des te lager de kosten van vreemd vermogen. Dit verband wordt beïnvloed door de kwaliteit van de aandeelhoudersrechten. Hoe hoger deze kwaliteit is, des te minder sterk is het verband tussen de kwaliteit van de transparantie en de kosten van vreemd vermogen. Het negatieve verband tussen de transparantie en de kosten van vreemd vermogen is in overeenstemming met eerder uitgevoerd onderzoek. De invloed van aandeelhoudersrechten op dit verband is nieuw. Wij veronderstellen dat indien de aandeelhoudersrechten beperkt zijn, het belang van transparantie toeneemt. Door lagere aandeelhoudersrechten zijn agency-conflicten tussen het management en de vermogensverschaffers hoger met als gevolg een hogere mate van informatierisico. Hieronder wordt verstaan dat managers informatie kunnen achterhouden die ongunstig kan zijn voor de verschaffers van vreemd vermogen. Vandaar dat de kwaliteit van 'disclosure' er meer toe doet bij ondernemingen met een lage score voor aandeelhoudersrechten. Wij noemen dit verband de '*share rights or disclose*' hypothese.

In hoofdstuk 3 gaan wij in op het vraagstuk van de vermogensstructuur. Wij onderscheiden de neoklassieke benadering waarin het maximaliseren van aandeelhouderswaarde centraal staat bij het nemen van beslissingen ten aanzien van de vermogensstructuur en de door ons genoemde quasi non-economic benadering. Uit een literatuurstudie blijkt dat de neoklassieke benadering niet in staat is alle verschillen tussen vermogensstructuren te verklaren. Bij het nemen van vermogensstructuurbeslissingen houden managers niet alleen rekening met determinanten die aandeelhouderswaarde beïnvloeden, maar zijn ook andere variabelen in meer of mindere mate van belang. Deze variabelen noemen wij quasi non-economic variabelen. Non-economic vanwege het feit dat de variabelen niet direct gebaseerd zijn op de neoklassieke benadering. Quasi, omdat verbanden met aandeelhouderswaarde desondanks kunnen bestaan. Wij concluderen dat vermogensstructuurvraagstukken—door hun complexiteit—niet geschikt zijn als optimalisatievraagstuk. Een vermogensstructuurvraagstuk kan het beste worden opgelost door een aantal door financieel specialisten opgestelde financieringsvoorstellen met elkaar te vergelijken op criteria, die voor de onderneming relevant worden geacht.

Hoofdstuk 4 is een vervolg op hoofdstuk 3 en geeft een illustratie van een vermogensstructuurvraagstuk, waarbij verschillende financieringsoplossingen met elkaar worden vergeleken. Wij analyseren de oplossingen voor een fictieve overname. De oplossingen zijn opgesteld door twee consultants, een investment banker en een zogenaamde full service bank. Wij hebben elk van de specialisten gevraagd drie financieringsvoorstellen samen te stellen. Een voorstel dat in het bijzonder de belangen behartigt van de aandeelhouders, een voorstel dat vooral rekening houdt met de belangen van het management en tenslotte het voorstel dat de financieel expert werkelijk aan de biedende onderneming zou doen. Wij hebben de experts tevens verzocht aan te geven welke criteria bij elk van de voorstellen door hen relevant worden geacht. Uit de analyse blijkt dat de opgestelde voorstellen voor elk van de drie categorieën sterk van elkaar afwijken; de gehanteerde criteria afhankelijk zijn van de partij waar het voorstel voor is opgesteld; en dat sommige criteria vanuit de neoklassieke theorie van minder belang worden geacht. Een voorbeeld hiervan is de contante waarde van de belastingbesparingen door het gebruik van vreemd vermogen. De voorstellen die de financieel experts werkelijk zouden uitbrengen, hebben wij vervolgens met elkaar vergeleken vanuit het perspectief van de aandeelhouders en het management.

In hoofdstuk 5 gaan wij in op de berekening van de contante waarde van de belastingbesparingen door het gebruik van vreemd vermogen (present value of tax shields of PVTS). Wij bespreken een raamwerk waarin de totale waarde van de onderneming gelijk is aan de som van de waarde van het eigen vermogen, het vreemd vermogen en de contante waarde van de verwachte vennootschapsbelastingbetalingen aan de overheid. Niet alleen de vermogensverschaffers hebben een claim op de kasstromen die door de onderneming worden gegenereerd, ook de fiscus heeft die. De PVTS is gelijk aan het verschil tussen de waarde van de claim die de overheid heeft op een onderneming zonder schuldfinanciering en de waarde van de claim op een identieke onderneming maar dan met schuldfinanciering. In dit hoofdstuk formuleren wij een algemene vergelijking ter bepaling van de afgeleide vermogenskosten voor de overheid. Hiermee wordt de disconteringsvoet bedoeld die gebruikt wordt om de verwachte belastingbetalingen contant te maken. Voor een aantal traditionele waarderingsmodellen leiden wij deze disconteringsvoet af. De consistentie van het model illustreren wij onder andere met behulp van enige numerieke voorbeelden.

Hoofdstuk 6 gaat in op de bepaling van de vermogenskosten van immateriële activa (R_{IA}). De vraag uit de praktijk naar een dergelijke kostenvoet lag aan de basis van dit hoofdstuk. Voor acht verschillende industrieën die kunnen worden onderscheiden onder S&P 500 ondernemingen, bepalen wij de R_{IA}. Wij hebben deze kostenvoet afgeleid met behulp van de zogenaamde weighted average cost of assets of 'wara methode'. Het gewogen gemiddelde van de geëiste rendementen op de bezittingen van de onderneming, inclusief de contante waarde van de belastingbesparingen, is volgens deze methode gelijk aan het gewogen gemiddelde van het door de vermogensverschaffers geëiste rendement (de 'wacc'). Het geëiste rendement op de immateriële activa hebben wij vervolgens vergeleken met proxies die in de praktijk voor deze kostenvoet worden gebruikt. Voor de meeste industrieën blijkt dat het geëiste rendement door de verschaffers van eigen vermogen de R_{IA} het best benadert.

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VALUATION, CAPITAL STRUCTURE DECISIONS AND THE COST OF CAPITAL

This thesis consists of six essays in Corporate Finance. In Chapter 1 we examine the relation between the quality of corporate governance and the value of excess cash for large European firms. We use ratings for Shareholder rights, Takeover defenses, Disclosure and Board structure as proxies for the quality of corporate governance. We find that the value of excess cash is negatively related to anti-takeover provisions only. Chapter 2 discusses the relation between corporate governance and the cost of debt. We find a negative relation between Disclosure and the cost of debt and uncover that this relation depends on the quality of Shareholder rights. This novel interaction effect is explained by our share rights or disclose hypothesis. In Chapter 3 and 4 we formulate the capital structure decision within a multi-criteria framework. We conclude that the capital structure decision is unfit for consideration as an optimization problem. Rather, it makes sense to solicit a variety of solutions from finance specialists that can be compared on criteria considered to be important. In Chapter 4 we discuss a merger and acquisition case as illustration. We compare different solutions generated by mutually independent financial experts on criteria which are relevant for the shareholders and for the management. In Chapter 5 we derive a general formula for the cost of government's claim. We show that the present value of tax shields is equal to the difference between the present value of the expected taxes paid by the unlevered firm and those paid by the levered firm. In Chapter 6 the required return of intangible assets is determined for a variety of business sectors. The required returns are subsequently compared to several proxies used in practice. For most sectors, the levered cost of equity seems to be the best proxy.

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Design & layout: B&T Ontwerp en advies (www.b-en-t.nl) Print: Haveka (www.haveka.nl)