The design of basic and supplementary health care financing schemes: Implications for efficiency and affordability

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The design of basic and supplementary health care financing schemes:
Implications for efficiency and affordability

De vormgeving van basis- en aanvullende zorgverzekeringen:
implicaties voor doelmatigheid en betaalbaarheid

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To Adelina,
to my sister and to my parents

CONTENTS

1.

General Introduction

1.1. INTRODUCTION

Since 1960 the medical care expenditures have more than doubled worldwide as a share of GDP (Kotlikoff and Hagist, 2005; Cutler, 2002). OECD countries have experienced an average annual increase in per capita health care costs of 3.5 percent during the period 1990-2001, outpacing the average annual economic growth during the same period by about 50 percent.[1] The major driving forces behind the continuing rise in health care costs are medical technology,[2] health care services price-inflation,[3] and the aging of the population.[4] Policymakers have expressed the view that continued increases in health care spending may be "unsustainable", particularly in light of government budget deficits.[5]

For decades, governments have been seeking suitable solutions to finance the rising health care costs, given the increasingly constrained collective resources. Suitable refers to the maintenance of affordable and universal access to basic health care services, the containment of aggregate spending and the improvement of technical, allocative and dynamic efficiency of health care delivery (Schut, 1995). In the attempt to find a balance between affordability and efficiency goals, a great variety of mixes of different sources of health care financing have emerged across countries combining out-of-pocket spending, supplementary health insurance, and collective funding (tax-based financing or social health insurance).

Throughout this thesis, the term affordability indicates the extent to which a socially acceptable level of insurance coverage is affordable for everybody.[6] Depending on the context, the terms cross-subsidisation or solidarity may be used instead of affordability. By efficiency, we refer to dynamic efficiency, which is defined as quality-improving and cost-reducing innovations in the organisation and delivery of care (van Barneveld *et al.*, 2001; Schut, 1995).

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1. See www.oecd.org – Health Data 2002 - and www.oecdobserver.org – graph "Healthy Growth", accessed on March 2, 2006.

2. Newhouse (1992) roughly estimates that about half – and perhaps even more – of the 50-year (from 1940 to 1990) increase in medical care expenditure in the US is attributable to technological change (including new types of physical capital and new diagnostic and therapeutic procedure). See also Baker *et al.* (2003).

3. Smith *et al.,* (2006).

4. See Population ageing and health care expenditure – www.ageing.ox.ac.uk, accessed February 11, 2006.

5. Aaron (2003).

6. Our definition of affordability is partly based on the 'normative definition' proposed by Bundorf and Pauly, (2006).

1.1.1. Many definitions of health care financing schemes

The diversity of financing arrangements in different countries is reflected in the great variety of definitions adopted in the literature and by governments to describe the various sources of health care funding (Foubister *et al.*, 2006; Colombo and Tapay, 2004; Mossialos and Thomson, 2004; Mossialos and Thomson, 2002). Traditionally, health care financing schemes are classified along two dimensions: "public" and "private". Yet the meanings attributed to public or private financing schemes are not uniformly defined. There are several ways to distinguish between public and private health care financing schemes. These distinctions can be based on factors such as the degree of cross-subsidisation inherent in the scheme, the intensity of regulation, the ownership and management of the scheme, the level of compulsion in participation, the extent to which an insurance entity actually bears financial risks, and the sources of funding (OECD, 2004; Mossialos and Thomson, 2002). Due to the use of different distinguishing factors, the boundaries between private and public health care financing schemes appear quite blurred.

Dror (2000) noticed that there has been a convergence between public and private health care financing arrangements in terms of the degree of cross-subsidisation and intensity of regulation. For instance, several countries (including Australia, France, Ireland, the Netherlands, Switzerland, and the United States) reduced cross-subsidies and increased cost-sharing in public financing schemes and, conversely, introduced regulations to enhance the degree of cross-subsidisation in private insurance arrangements.

The distinction between public and private financing schemes based on the (public or private) nature of insurers is also problematic. Social security schemes can be administered and managed by private institutions, such as mutual companies in Belgium or private insurers in the Netherlands. On the other hand, government-owned insurers can also provide private insurance. VHI Healthcare (formerly the Voluntary Health Insurance Board) is a state-backed entity providing private voluntary insurance in Ireland. Medibank Private is the largest non-profit state-backed fund providing private voluntary insurance in Australia. In some cases, the same insurance entity may offer different types of cover (eg. in Belgium, the Netherlands and Switzerland).

In some countries (eg. the Netherlands and Switzerland), individuals are required to purchase mandatory health insurance from private competing risk-bearing insurers. Nevertheless, this insurance is regulated in a manner similar to public schemes in other OECD countries, since the benefits package is standardised, premiums are community-rated, and enrolment is open (Colombo, 2001; van de Ven *et al.*, 2006). In most OECD countries, supplementary insurance is purchased on a voluntary basis from private for-profit companies, while coverage for basic services is mandatory for at least some groups in the population. However, there are also cases in which

the law mandates participation to private supplementary health insurance (eg. Belgium and Germany). In addition, there are cases of public basic health care financing schemes for which participation is voluntary (eg. Germany).

1.1.2. Classifying health care financing schemes

A classification of health care financing schemes based on the dichotomy public-private can not provide a clear and uniform definition of health care financing schemes. Therefore, a uniform and coherent conceptual framework that clearly distinguishes between different health care financing schemes is needed in order to analyse the features and the interactions between different financing schemes.

We envisage two essential dimensions for defining different health care financing arrangements: 1) the type of services and 2) the type of coverage they provide. By services we mean health care goods and services,[7] and by coverage we refer to the level of compensation of the costs of a set of predefined health care services. Coverage may be either in-kind or in-cash.

In this thesis, we distinguish between basic and supplementary services, and between mandatory and voluntary coverage. Historically in most countries the crucial element of distinction between basic and supplementary services has been cross-subsidisation. Therefore, **basic services** are defined as the set of health care services for which the government enforces a system of mandatory cross-subsidies from low- to high- risk groups or from high- to low- income groups. **Supplementary services** are defined as the set of health services that do not fulfil the conditions for being considered as basic. We define **mandatory coverage** if the government imposes on consumers a legal obligation to obtain coverage. By contrast, we refer to **voluntary coverage** when people are free to decide which services to cover. Restrictions on choice of coverage as a result of employment-based group contracts do not fall under the scope of our definition of mandatory coverage, since these restrictions are not the result of government regulation. Then, the term basic coverage (BC) refers to schemes that provide access to (the coverage of) basic health care services within a certain society, and supplementary coverage (SC) to schemes providing access to (the coverage of) supplementary services, which are by definition excluded from BC. Mandatory coverage (MC) refers to schemes that provide mandatory coverage for either basic or supplementary services. In case these services are basic we refer to mandatory basic coverage (MBC), if they are supplementary we refer to mandatory supplementary coverage (MSC). In case there is no legal obligation set by the govern-

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7. In the insurance literature the term benefits is widely adopted to refer to health care services and goods. Throughout this thesis the term benefits is sometimes used, particularly when referring to services provided by insurance schemes or contracts.

Figure 1. Classifying health care financing schemes

Coverage \ Services	Mandatory	Voluntary		
Basic	Mandatory Basic Health Coverage (MBC)	Voluntary Basic Health Coverage (VBC)	⇒	Basic Health Coverage (BC)
Supplementary	Mandatory Supplementary Health Coverage (MSC)	Voluntary Supplementary Health Coverage (VSC)	⇒	Supplementary Health Coverage (SC)
	⇓	⇓		
	Mandatory Health Coverage (MC)	Voluntary Health Coverage (VC)		
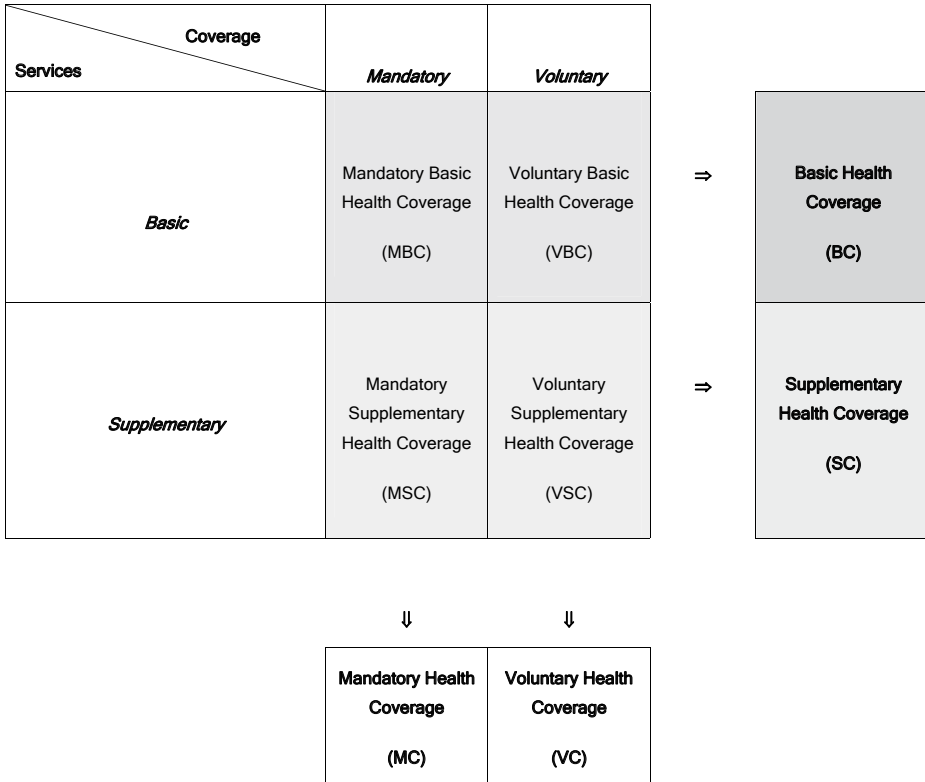
ment limiting consumers' choice of coverage, we are in presence of voluntary coverage (VC), which may provide coverage for either basic (VBC) or supplementary (VSC) services (see Figure 1). Apart from countries where the distinction between MBC and VBC or between MSC and VSC is necessary, we use BC and SC to refer to MBC and to VSC schemes, respectively. If the basic or the supplementary coverage (BC or SC) are offered by an insurer, we also adopt the terms basic health insurance (BI) and supplementary health insurance (SI) schemes.

According to our classification, National Health Service (NHS) and social health insurance schemes can be categorised as schemes providing mandatory basic health care coverage (MBC), given that the coverage is mandatory and the system of cross-subsidies finances directly basic services' provision or the coverage for these services. In National Health Insurance (NHI) or Service (NHS) countries, such as Australia, Canada, France, Ireland, Italy and the United Kingdom, every resident is to some extent mandated by the law to contribute to health care financing (eg. via taxes) and is entitled to access a uniformly predefined set of services from specific providers. In

social health insurance countries such as Belgium, Germany, Israel, the Netherlands and Switzerland, the government has introduced a legal mandate for the majority of the population to purchase coverage for a uniform set of basic (ie. subsidised) entitlements from competing health insurers or sickness funds.

Examples of voluntary basic coverage (VBC) can be found in several countries. In general, VBC pursues one or more of the following three different functions:

a) It duplicates the financial coverage for services already fully covered by MBC, but with increased choice over providers and reduced waiting times; or
b) It provides a substitute for individuals not eligible for MBC;
c) It complements the coverage of services for which individuals are not or only partly covered (ie. co-payments) by MBC.

Duplicate VBC is typical of countries with so-called Beveridge-style tax-funded health care systems (ie. National Health Service (NHS)), eg. Australia, Ireland, Mediterranean countries, New Zealand, Nordic countries, United Kingdom. In these countries VBC provides insured access to care that duplicates many of the basic services provided by the NHS, to which VBC's subscribers retain full access. The key VBC's attractions in these countries are faster access to basic services, a more comfortable care environment, a wider choice of providers and better (perceived) quality of care. Among this group, Australia and Ireland are the most significant cases of duplicate VBC. They both have a large population segment (over 40 percent) with VBC and a similar share of total health expenditures (over 7 percent). In both countries the government has introduced several institutional (ie. a risk-equalisation scheme) and regulatory (ie. community-rating) arrangements to guarantee the financial access of high-risk individuals to VBC. In Ireland, VBC also provides substitutive coverage for services (eg. GP) for which certain groups (eg. high-income people) are not covered by MBC. VBC is present also in Germany for about 10 percent of the population (ie. high-income groups) who are not eligible for MBC. In France, 90 percent of the population buys subsidised-VBC to insure for services (eg. hospital care, prescription drugs) not fully covered (eg. co-payments) by the MBC scheme. Although in most countries the voluntary coverage of services (eg. medical devices) that are completely excluded from MBC is not subsidised, in some countries (eg. Australia, France and Ireland) individuals may benefit from cross-subsidies (VBC).

For goods or services completely excluded from collective financing, individuals are allowed to purchase VSC in all OECD countries. However, in Belgium and Germany, the governments have enforced the mandate for sickness funds' enrolees to purchase coverage for some services that are excluded from the basic benefits package. More specifically, in Belgium the law prescribes that all insured are obliged to enrol with the same insurer for both basic and (some) supplementary services. In Germany, BC providers may choose whether or not to provide coverage for (some) supplementary

services, and all of them do so. If BC providers choose to provide coverage for (some) legally determined supplementary services, they must offer it to all their BC enrolees, who must buy it unless they change BC provider.

1.1.3. Trends

Over the past decades two trends can be observed in most OECD countries. On the one hand, policymakers focused on achieving universal access to health care services by establishing and gradually expanding mandatory coverage for a uniformly pre-defined set of services to the entire population (Cutler, 2002; Hurst, 1990). On the other hand, along with the gradual expansion of mandatory coverage, health care reforms in most OECD countries aimed at containing the collective financing of health care by increasing the share of individual financial responsibility and participation to the financing of health care spending (Colombo and Tapay, 2004; Cutler, 2002). Shifting (parts of) the costs of health care away from collective to individual responsibility led to an increase in the demand for voluntary and supplementary health insurance, and thereby to a proliferation of several intertwined health care financing schemes. In particular, most OECD countries have limited the comprehensiveness of schemes providing universal mandatory basic health care coverage by allowing individuals to increasingly rely on voluntary basic or supplementary health care financing schemes.

In most of the following OECD countries, voluntary basic or supplementary health care financing schemes have been playing an important role in the last decades:
–   Australia (Colombo and Tapay, 2003; Bloom, 2000);
–   Belgium (Schokkaert and Van de Voorde, 2003);
–   Canada (Finkelstein, 2002; Flood and Archibald, 2001);
–   France (Buchmueller and Couffinhal, 2004);
–   Germany (Wasem *et al.*, 2004);
–   Ireland (Nolan, 2006);
–   Israel (Brammli-Greenberg and Gross, 2003);
–   the Netherlands (Schut *et al.*, 2004);
–   Switzerland (Beck *et al.*, 2003; Colombo, 2001);
–   the United States (Docteur *et al.*, 2003; Eppig and Chulis, 1997).

Since the beginning of the 1990s, the role of supplementary health care financing in terms of share of total health care financing or in terms of percentage of insured has increased in several OECD countries (see Table 1). In terms of share of MBC-spending, SC-expenditures increased in Canada (from 11 to 16 percent), Germany (from 2 to 3 percent), Israel (from 3 to 5 percent) and the Netherlands (from 5 to 7 percent),

TABLE 1. Trends indicating an increasing role of VBC & SC [a]

	Australia	Belgium	Canada	France	Germany	Ireland	Israel	The Netherlands	Switzerland	United States
Exp SC/Exp MBC % Or Exp VBC/Exp BC %	1985: 13.2% - 1991: 24% 1993: 24.3 % 1997: 25% 1999: 21% 2000: 18% 2001: 18.2%	2%	1990: 11% 2000: 16.1%	1990: 14.4% 2000: 16.8%	1997: 2.1% 2003: 2.2 % 2005: 3%	1990: 12.6% 1991: 14.5% 1993: 18.3% 1997: 16.1% 2000: 18% 2001: 14.1%	1999: 3.3% 2000: 4.1% 2003: 5.3%	1997: 5.4% 2000: 6.3% 2003: 6.5%	1996/7: 37% 2000: 28% 2003: 23%	1990: 8.6% [b] 2000: 7.9%
Share of individuals buying VBC/SC	1987: 47.2% 1993: 39.9% 1997: 31.3 % 1999: 30.1% 2000: 42.1% 2001: 44.9%	95%	65%	92%	1993: 8% [c] 2003: 11% [c]	1957: 15% 1980: 26% 1987: 30% 1993: 35% 1999: 42% 2003: 47% 2006: 50% [d]	1999: 45.8% 2000: 56.0% 2003: 66.0%	1997: 94.5% 2000: 92.9% 2003: 92.1%	1997: 62% 2003: 71%	1997: 60% [e] 1999: 59% 2000: 57.4% 2001: 60%
Relevance of VBC/SC in healthcare financing	Moderate	Low	Moderate	High	Low	Moderate	Moderate	Moderate	High	Moderate

[a] The references of all the data presented in the tables are listed per country in the above text.

[b] These figures refer to total public and private spending.

[c] These figures refer only to VSC-enrolees, since 100% MBC-enrolees has MSC.

[d] 43.0% are non-medical card holders.

[e] These figures refer to the share of Medicare beneficiaries buying Supplemental Insurance.

mainly because of government policies that focused on reducing collective health care financing and increasing coverage of services previously paid for out-of-pocket. While representing only a small share of total health care financing, on average SC covers 60 percent or more of the population in OECD countries. The share of individuals purchasing VSC has increased particularly in Germany (from 8 to 11 percent), Israel (from 46 to 66 percent) and Switzerland (from 62 to 71 percent) and it is steadily high in Canada (65 percent) and the Netherlands (92 percent).

Table 1 shows also that other countries (eg. Australia, France and Ireland,) in the attempt of containing collective financing relied on VBC rather than on SC. The share of VBC-expenditures as a percentage of MBC-spending has been fluctuating (eg. Australia and Ireland) and, in some cases, has increased over time (eg. France). The percentage of the population buying VBC has increased in Australia (from 40 to 45 percent) and Ireland (from 35 to 50 percent) and is remarkably high in France (92 percent). The fluctuations in the shares of both VBC and SC in some countries are mainly related to the introduction of universal mandatory basic health care coverage (such as Medicare in Australia (1983) and social health insurance in Switzerland (1996)).

1.1.4. Implications for efficiency and affordability

In this thesis, we focus mainly on the design of the different health care financing schemes and on the consequences for efficiency and affordability of shifting (parts of) the costs of health care from mandatory basic health care financing schemes (hereafter simply basic health insurance, ie. BI) to supplementary health care financing schemes (ie. SI).

The trend towards an increasing role of supplementary health insurance may cause concern. Most countries encourage competition in supplementary health insurance markets as a means of increasing flexibility, efficiency and enhancing consumer choice. The absence of detailed government regulations in competitive markets for supplementary health insurance may enhance cost-effective substitution of care (technical efficiency), provision of 'tailor-made' care to consumers (allocative efficiency) and quality-improving and cost-reducing innovations in the organisation and delivery of care (dynamic efficiency). On the other hand, a continuous decrease of collective spending accompanied by an increasing reliance on competitive and unregulated markets for supplementary health insurance is likely to prompt an increasing conflict with society's goal of affordable access to coverage (van de Ven *et al.*, 2003; van de Ven *et al.*, 2000). Besides, reducing collective financing may also result in a welfare loss to society if individuals' (altruistic) preferences cannot be met (Schut, 1995).

In an unregulated competitive market for health insurance, the premium per contract will be based on expected costs (equivalence principle). For individual insur-

ance, this implies that premiums would be differentiated according to risk factors such as age, gender, health status, etc. (ie. risk-rating). For example, the premium of an old or chronically ill person would be much higher than the premium of a young or healthy person. Furthermore, insurers might refuse to cover high-risk individuals for whom an appropriate premium cannot be calculated and/or they might exclude pre-existing medical conditions from coverage (ie. risk-selection).

In some countries (ie. Belgium, Germany, Israel, the Netherlands and Switzerland) SI covers services excluded from a legally determined basic package of services offered by competing insurers or sickness funds. If supplementary insurance is combined with basic insurance or is offered by the same entities or their affiliates, it may be used as a tool for risk-selection in a competitive BI market. In sum, the expansion of supplementary health insurance may have serious consequences for both the efficiency and affordability of basic health care services.

1.2. AIM AND CONTRIBUTION OF THIS STUDY

In this thesis, we propose a typology of health care financing schemes that is based on the dimensions of basic/supplementary (services) and mandatory/voluntary (coverage). The proposed classification serves to analyse the design of different funding schemes and the interactions between basic and supplementary health care financing schemes. As far as we know, an in-depth analysis of the implications of an increasing share of supplementary health care financing on affordability and efficiency has not yet been performed.

Given this background this manuscript focuses on the design of basic and supplementary health care financing schemes. The main purpose of this study is to investigate the consequences of an increasing share of supplementary health care financing on efficiency and affordability of basic services.

The main contributions of this study are the development of a theoretical framework for the analysis of the design of health care financing schemes, and an empirical and institutional analysis of the interactions between basic and supplementary sources of financing. This study provides a better understanding of the strength and weaknesses of the financial and organisational structures of different countries' health care financing schemes. In particular, it focuses on countries with a competitive market for mandatory basic health insurance and on competitive markets for supplementary health insurance regardless of whether coverage is mandatory or voluntary.

1.3. RESEARCH QUESTIONS

Based on the proposed classification of health care financing schemes, this study focuses on the design of basic and supplementary health care financing schemes and, in particular, on the implications of an increasing reliance on supplementary health care financing schemes on the efficiency and affordability of basic health care services.

Chapter *two* provides a theoretical framework that investigates the economic rationales for the design of health care financing schemes. We distinguish between the arguments for governments to implement a system of mandatory cross-subsidies that aims at achieving an affordable access to care for vulnerable groups (ie. low-income or high-risk people); and the arguments to enforce mandatory coverage for a predefined set of health care services. Based on this distinction, we investigate whether and to what extent the introduction of universal mandatory coverage for a uniform set of services is necessary and proportionate to achieve an affordable access to care for vulnerable groups. We also consider the economic rationales for alternative strategies. In particular, the following research question is addressed:

1. What can be the economic arguments for governments to enforce a system of mandatory cross-subsidies and to implement a legal mandate to obtain coverage for a set of predefined services?

In the *third* chapter, we apply the conceptual analysis developed in chapter 2 to the following OECD countries: Australia, Belgium, France, Germany, Ireland, Israel, The Netherlands, Switzerland, and the United States. The focus of this chapter is to discern whether the actual design of different countries' health care financing schemes is consistent with the economic rationales for mandatory cross-subsidies and for mandatory coverage. Specifically the following question is addressed:

2. Is the design of health care financing schemes in the selected countries in conformity with the economic rationales for organising a system of mandatory cross-subsidies, and for imposing mandatory coverage?

Chapter *four* investigates the potential for risk-rating in supplementary health insurance markets. An empirical analysis is developed to determine the reduction of cross-subsidies caused by the transfer of benefits from mandatory basic health insurance with community-rated premiums to voluntary supplementary health insurance with risk-rated premiums. The central questions of this chapter are the following:

3. Why and to what extent do insurers risk-rate premiums in supplementary health insurance markets?
4. What is the potential for risk-rating caused by transferring services from basic to supplementary health insurance?

In chapter *five,* we evaluate the prospects for solidarity (ie. affordability) in competitive markets for both basic and supplementary health insurance and discuss the relevance and potential effects for national policies of supranational regulations. In particular, this chapter proposes an economic analysis of the several intervention strategies that can be adopted by governments to regulate competition in health insurance markets with the aim of achieving solidarity. The analysis relates to both basic and supplementary health insurance markets. The purpose is to determine the first-best regulatory intervention strategy to achieve solidarity in competitive health insurance markets, from a theoretical perspective. Furthermore, the chapter evaluates the potential impact of supranational law (ie. European Community (EC) law) on national regulations sustaining solidarity in competitive basic and supplementary health insurance markets. Specifically the following questions are addressed:

5. What is the best strategy that governments can adopt to achieve an "acceptable level of solidarity" in competitive health insurance markets from an economic perspective?
6. Do the different intervention strategies conform to the EC legal framework?

In the *sixth* chapter, the focus is on how the design and operation of supplementary health insurance markets can affect the behaviour of insurers offering basic health insurance. In particular, an international comparison is made with the aim of assessing whether supplementary health insurance is likely to be used as a tool for risk-selection in the following five countries with competitive markets for basic health insurance: Belgium, Germany, Israel, the Netherlands and Switzerland. The questions guiding this chapter are:

7. What are the conditions under which supplementary health insurance can be used as a selection device in competitive markets for mandatory basic health insurance?
8. To what extent are these conditions fulfilled in the competitive mandatory basic health insurance markets of the five countries considered?

Finally the main findings are summarised in Chapter *seven*.

For the convenience of the reader the following remark is made. Because (versions of) the chapters have been submitted, accepted or published as independent articles in scholarly journals,[8] they can be read independently.

8. Versions of chapter 2, 3 and 4 have been submitted for publication to international (health) economics journals. Chapters 5 and 6 have been published in *Health Economics Policy and Law* (Paolucci *et al.*, 2006-2007).

2.

Economic rationales for the design of health care financing schemes

SUMMARY In this chapter we investigate the economic rationales for the design of health care financing schemes. We make an explicit distinction between the arguments for governments to implement a system of mandatory cross-subsidies to achieve affordability in the financial access to basic services for high-risk or low-income individuals, and the arguments to mandate the coverage for predefined health care services.

We argue that the most important economic arguments to enforce a system of cross-subsidies are related to: the presence of externalities in health care services consumption; the individuals' risk of becoming bad risks; and the moral hazard effects induced by cross-subsidisation.

The rationale for mandatory coverage is based on considerations of free riding behaviour, individuals' lack of foresight and too high transaction costs of alternative ways to organise cross-subsidies.

Finally, we discuss the implications of our analysis for the design of health care financing arrangements. We argue that imposing a universal mandate to obtain uniform coverage for predefined services is not a necessary and proportionate measure to increase the affordability of health care for vulnerable groups. To achieve affordability it is sufficient if governments impose mandatory cross-subsidies. By allowing variations over income groups in the composition of the mandatory benefits packages and/or on the level of deductibles moral hazard can be reduced as compared to a universal mandate for a uniform coverage.

2.1. INTRODUCTION

In most countries governments decide about the introduction of mandatory coverage and mandatory cross-subsidies on the basis of a number of underlying arguments. These arguments can be manifold eg. ethical, historical (ie. path dependency), political (ie. pressure groups), economic etc. In this chapter, the focus is on the set of economic rationales for the design of health care financing schemes. For this purpose, a general framework is developed that analyses the main economic rationales underlying the political choice of enforcing a system of mandatory cross-subsidies and introducing a mandatory coverage provision. In particular, the following question is addressed:

• What can be the economic arguments for governments to enforce a system of mandatory cross-subsidies and to implement a legal mandate to purchase coverage for a set of predefined services?

This chapter is organised as follows. In the next sections, we make a distinction between a system of *mandatory cross-subsidies* (section 2.2.) imposed to achieve affordability in the financial access to basic services, and *mandatory coverage* (section 2.3.) introduced to guarantee that certain groups of individuals are covered and protected against the financial risk of needing certain medical services. This distinction is based on the divergence between the arguments for the enforcement of a system of mandatory cross-subsidies and the arguments to mandate the coverage for predefined health care services. The main implications for the design of health care financing schemes are summarised (section 2.4.).

2.2. MANDATORY CROSS-SUBSIDIES

Although universal mandatory coverage for a uniform set of services may guarantee an affordable access to care, it may not be a necessary and proportionate tool from an economic perspective. In order to achieve an affordable access to basic health care services for vulnerable groups (eg. low-income or high-risks individuals), it is sufficient for governments to introduce a system of cross-subsidies, in which low-risk and/or high-income individuals contribute to the financing of health care services needed by high-risk and/or low-income individuals.[1] Although in most societies indi-

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1. In this thesis, cross-subsidisation may apply to both services and insurance coverage. There are several intervention strategies to increase the financial accessibility to care or to health insurance.

viduals appear to be willing to support such a system of cross-subsidies, government intervention may be required in order to assure its existence and functioning. Theoretically, government intervention would not be necessary if the individuals' willingness to cross-subsidise overwhelms the incentives for free riding. In particular, if the contributions are not given voluntarily (eg. by external donors) governments may have to impose a system of mandatory income- or risk- related cross-subsidies.[2] The broader the minimum set of health services considered as basic,[3] the higher are the mandatory cross-subsidies' contributions.

In the following subsections, we discern the main economic arguments related to the enforcement of a system of mandatory cross-subsidies that aims at achieving affordable financial access to health care services for the high-risk and/or the low-income groups. In particular, we distinguish and discuss the following economic arguments: the presence of externalities in the demand for some health care services (section 2.2.1.), the individual's risk of becoming a high-risk (section 2.2.2.), and the moral hazard effect induced by cross-subsidisation (section 2.2.3.).

2.2.1. Externalities

For some goods and services, including many forms of medical treatment, consumers may be willing to pay for the consumption by others. A reason for this is that the consumption of health care services produces external effects. Externalities arise when a consumption (production) activity of one set of individuals affects the utility functions of other individuals, while this effect is not included in the individuals' utility functions (Rosen, 2005). Externalities can be both positive and negative. *Positive (negative) externalities* occur when actions of one set of individuals make other individuals better (worse) off, yet the first set neither bear the costs nor receive the benefits of doing so (Gruber, 2005). The external effects generated by an individual's (non-) consumption of health care services' are mainly the consequence of two types of interpersonal preferences: altruistic and egoistic preferences. The literature tracks down a third type of interpersonal preferences so-called paternalistic preferences (van Doorslaer and Schut, 1999; Culyer and Simpson, 1980). Since the only difference between paternalistic and altruistic preferences is in the extent and the focus of an individual's concern about others, we simply distinguish between two types of altruistic preferences. We refer to **type-1** altruistic preferences if an individual's concern is

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For a more in depth analysis of two of the strategies (ie. explicit premium-subsidies and implicit premium-subsidies) we refer to chapter 5 in this thesis.

2. Empirical evidence concerning the importance of the free rider problem in public good provision is not conclusive (see Brunner, 1998; Palfrey and Prisbrey, 1997).

3. Basic services are the totality of cross-subsidised services.

about others' *general wellbeing* and to **type-2** altruistic preferences if an individual concerns specifically about others' *health status*.[4]

2.2.1.1. Altruistic preferences[5]

A first important consumption externality in health care is the presence of type-1 altruistic preferences that is an individual's concern about the wellbeing of others. Thus, an individual's concern about others' well being generates an altruistic externality that calls for subsidisation. Type-1 altruistic preferences may undertake a very general form of interpersonal dependencies. For instance, the interpersonal utility function for individual B may look like the following:

$$U_B = U_B (H_B, U_A[H_A (M_A), C_A], C_B)$$

The utility of B is in this case a direct function of the utility of individual A and therefore of A's health status (H_A) and non-medical consumption (C_A). An important implication of this model is that B respects the preferences of A. For example, if A prefers other goods (C_A) over health or health care, than B may also be willing to pay for A's consumption of these other goods (C_A). Therefore, A freely chooses, based on his/her own preferences, whether to consume medical care (M_A) or other goods (C_A). A financial transfer of income (lump sum) from B to A would appear to be the simplest transaction in order to increase A's utility.[6] Alternatively, an individual's concern about others may not be focused on others' general wellbeing but specifically on their health status (type-2 altruistic preferences). In other words, an individual may prefer to contribute to improvements in others' health status rather than others' general welfare (Reinhardt, 1998; Arrow, 1963). In this case, type-2 altruistic preferences may be expressed by the following interpersonal utility function for individual B:

$$U_B = U_B (H_B, H_A(M_A), C_B)$$

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4. The social concern for the distribution of the use of health care services may be based on viewing medical care as involving good-specific altruism (Diamond, 1992) or commodity-egalitarianism (Evans, 1978).

5. In this chapter, we do not deal with the question: what determines altruism? This question has given rise to an entire field of study of social capital, the value of altruistic and communal behaviour in society. A central finding of this field is that individuals are likely to be more altruistic when they are more "trusting" others. Anderson *et al.* (2003) found that most of the attitudinal and behavioural measures of trust were positively correlated with high contributions to merit or public goods.

6. The problem with this "lump-sum solution" is the virtual impossibility of establishing lump-sum taxes and subsidies that do not affect incentives of either the payer of the tax or the recipient of the subsidy (Graaff, 1971; Nath, 1969; Samuelson, 1947).

The utility of B is a direct function of A's health status (H_A), therefore B's willingness to subsidise limits itself to A's medical consumption, in so far that it positively contributes to A's health status. Possible interpersonal transactions, which could increase the utilities of both individuals, would have to be income- or risk- related subsidies earmarked to the consumption of specific services that positively contribute to health. Most people seem to be unwilling to deny effective care to other members of society.[7] Presumably, an individual's concern toward others' health status does not only depend on the effectiveness of treatments, but also on the costs and the severity of the illness. For instance, in case of lifesaving interventions individuals may be willing to cross-subsidise the financial access of high-risk or low-income individuals to services or treatments, even if they are not particularly cost-effective. Thus, altruistic preferences may be stronger for some health care services than for others.

Given the presence of altruistic preferences, an individual's utility of supporting a system of cross-subsidies may depend on the following factors: the cost-effectiveness of services, the initial health status of the beneficiary, the expected cost of services per consumer, and the consumers' responsibility for the incidence of the disease. Each of these factors will be discussed below.

Cost-effectiveness of services
Cost-effectiveness analyses (CEA) are usually indicated as the primary tools policy-makers adopt in deciding whether to include (or exclude) a service in the basket (Drummond *et al.*, 1997).[8] The results of a CEA are summarised by the cost-effectiveness (CE) ratio.[9] The CE ratio compares the incremental cost of an intervention with

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7. Van den Berg *et al.* (1986) found evidence of the presence of strong altruistic preferences for medical care consumption in the Netherlands. From data of the 1985 Health Interview Survey by the Netherlands Central Bureau of Statistics (CBS) they conclude that 78 percent of the representative sample population fully disagreed with the statement that 'people with a less favourable health status should pay more for health care than people in good health' (9 percent partially agreed, only 3 percent fully agreed and 10 percent had no opinion).

8. An extensive literature review about CEA methodology may be found elsewhere (Hauck *et al.*, 2003). Key problems include choice of a summary measure to capture other benefits important to patients and the public; non-comparability of the values elicited with different health state value elicitation instruments; generalisability of studies beyond the study setting or country; choice of target population receiving the intervention; accounting for uncertainty in measuring costs and outcomes; inability to account for the opportunity costs of the cost-increasing element of new interventions; and the requirement to consider portfolios of programmes, rather than individual technologies.

9. Let the subscripts 1 and 0 denote the intervention under study and the alternative to which it is compared, respectively. If C_1 and C_0 are the net present values of costs that result when the intervention and alternatives are used, and E_1 and E_0 their respective health outcomes, the incremental CE ratio is simply: CE ratio = $(C_1 - C_0)/(E_1 - E_0)$. This ratio, which is a cost per unit incremental health effect, is often used as a measure of value.

the incremental health improvement attributable to the intervention. The health improvements of using the intervention are typically measured in quality-adjusted life-years (QALYs) gained. Therefore, the CE ratio is usually expressed as a cost per QALY gained.[10] The intervention with the relatively lower CE ratio is considered the most cost-effective. In other words, CE ratios indicate which health care services will provide health improvements most efficiently (ie. at a lower cost) (Garber, 2000).

The information provided by CE ratios may affect an individual's utility of contributing to a system of cross-subsidies, since they allow comparisons among different services in terms of costs and effects (ie. measured in QALYs). Economically rational individuals with altruistic preferences maximise their utility by maximising the effect of cross-subsidies on others' health status. In particular, the effect of cross-subsidisation on others' health status increases the lower the CE ratio of the treatment. The lower the CE ratios of services are, the more effective cross-subsidisation on others' health status is, and thereby the more the altruistic preferences of rational individuals are satisfied. All in all, the lower the CE ratio of an intervention for a specified diagnosis, the higher an individual's utility of contributing to a system of cross-subsidies that guarantees the financial access to the intervention by others.

Initial health status of the beneficiary
Cost-effectiveness information is not the only grounds on which individuals' altruistic preferences are based, and thereby for governments to decide whether a certain service should be cross-subsidised. For instance, in the case of lung- or heart-transplants, a relatively high cost-effectiveness ratio does not appear to constitute a sufficient motivation to exclude these services from cross-subsidisation in most countries. A parallel argument can be made for Viagra, which is not included in the basic basket of most countries despite its low cost-effectiveness ratio.

Apparently, when it comes to assess whether and to what extent specific health care services generate altruistic externalities, other factors, besides cost-effectiveness, such as the individuals' initial health status have to be considered.[11] Our proposition is that an increase in an individual's utility produced by an improvement of a

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10. In many respects QALYs are analogous to life expectancy, but include interventions that improve quality of life even when they do not affect survival. Each year that an individual lives longer contributes an additional year to the life expectancy calculation. The amount that each additional year of life adds to QALYs, in contrast, is a preference weight or utility that takes a value between 0 (death) and 1 (best health imaginable).

11. Although related to the argument of individuals' initial health status, the concepts of severity of illness (Nord *et al.*, 1999), fair inning (Williams, 1997) and proportional shortfall (Stolk, 2004; Johannesson, 2001) will not be discussed, since they do not explicitly refer to the variation in an individual's utility of supporting a system of cross-subsidies generated by an improvement in others' health status or quality of life.

given size in others' health status is likely to be greater the lower the patient's initial health status.

From the "law of diminishing marginal return" it follows that an improvement on an individual's "own" health status increases his or her "own" utility more the lower his "own" health status. This is also likely to hold for the marginal utility of "other's" health. The assumption of decreasing marginal utility of "other's" health implies that for equal improvements on A's health status ($H_{A1} - H_{Ao} = H'_{A1} - H'_{Ao}$), the difference in B's utility decreases the higher is A's initial health status ($U'_{B1} - U'_{Bo} < U_{B1} - U_{Bo}$). More precisely:

$$\delta\, U_B\, (H_A)\, /\, \delta\, H_A < 0$$

Therefore, the plausible assumption of decreasing marginal utility of "other's" health implies that an individual's marginal utility of supporting a system of cross-subsidies that guarantees the financial access to specific services is greater the lower others' initial health status. Everything equal, the poorer the initial health status (measured in QALYs) of a patient, the more the effect of cross-subsidies satisfies an individual's altruistic preferences.

In current CEA, health improvements (ie. gains in QALYs) produced by consumption of health care services are weighted equally regardless the initial health status of patients. Thus, only the number of QALYs gained determines priority, while in a decision-making process of a rational altruistic individual QALYs that are gained by people with a lower initial health status may be given more weight. For instance, patients eligible for a lung transplant normally are in such poor health states (in Figure 2, closer to 0 on the X axis, ie. H_{Ao}), which altruistic individuals may find it acceptable to cross-subsidise the high cost per QALY in order to provide patients with a 'last resort medicine'. This phenomenon may be especially pronounced for lifesaving interventions. In contrast, erectile dysfunction is generally considered not to be life-threatening. Since it generally occurs to people with good health status (in Figure 2, H'_{Ao}, ie. high initial health status), the QALY gains produced by Viagra, which is a cost-effective treatment, would receive a relatively low weight.[12] In deciding whether (and for which diagnoses) the financial access to a service should be cross-subsidised, weights that consider the cost-effectiveness of services and the initial health status of patients could be used to reflect the individuals' altruistic preferences.

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12. Note that in specific patient groups such as patients with erectile dysfunction due to spinal cord injuries, this argument does not hold, since these patients' initial health status is low. Therefore, a rational altruistic individual may be willing to cross-subsidise the low cost per QALY of Viagra to patients with a diagnosed erectile dysfunction due to spinal cord injuries.

Figure 2. Decreasing marginal utility of other's health

The diagram shows $U_B(H_A)$ on the vertical axis with marked values U'_{B_1}, U'_{B_0}, U_{B_1}, U_{B_0}, and a concave increasing curve. The horizontal axis is labelled with H_{A_0}, H_{A_1}, H'_{A_0}, H'_{A_1}, origin at 0.
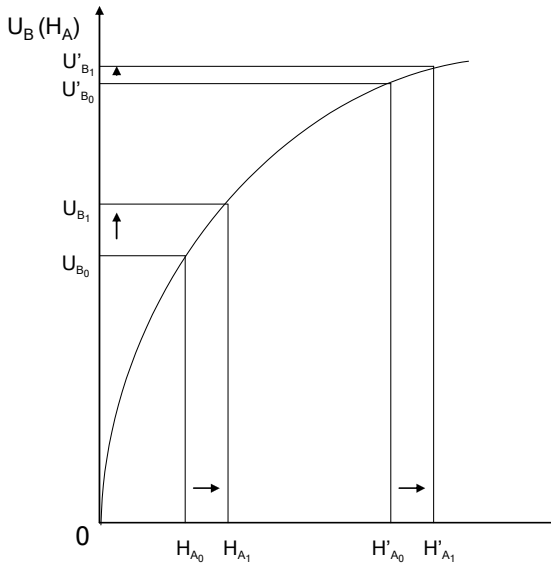
The expected cost of services per consumer
A rational and altruistic individual's utility of supporting a system of cross-subsidies may also be affected by the expected costs of health care services faced by others. All other things equal, the lower the expected cost of services per consumer the weaker the effect of cross-subsidies is likely to be in satisfying individuals' altruistic preferences. In general, a system of cross-subsidies particularly satisfies altruistic preferences, and thereby produces a welfare gain, if it increases financial access to otherwise unaffordable care (Nyman, 2003). Whether and to what extent health care is unaffordable may vary across individuals, and it depends in particular on their available income (or total wealth). For instance, if services involve low utilisation rate and are relatively cheap (ie. Paracetamol), an individual may not be willing to cross-subsidise people who need them, given that these services may be easily accessed without constituting an excessive financial burden on each consumer. Nevertheless, there always are individual consumers for whom even low prices or volumes are hard to afford, and the absence of subsidies may cause differences in health care use. These differences may generate altruistic externalities for some health care services used by some individuals, and thus call for subsidies.

Ceteris paribus, the higher the expected price and volume of medical care per consumer, the greater an individual's utility of contributing to a system of cross-subsidies, and thereby the stronger governments' arguments to enforce it.

Consumer's responsibility for the incidence of the disease
Another factor that may influence an individual's willingness to support a system of cross-subsidies can be derived from a consumer's responsibility in originating the condition for which services are demanded. Consider the case of health care expenditures that are clearly caused by the individuals' behaviour, such as smoking or skiing accidents. All in all, the greater a consumer's responsibility in originating a condition is, the less would the use of services satisfy altruistic preferences, and thereby the lower an individual's utility to support cross-subsidisation for the consumption of the services. In practice, however, it may be difficult to establish a clear connection between someone's responsibility and health care consumption. And, even if so, it may be practically unfeasible to set-up a system of cross-subsidies that corrects for it.

2.2.1.2. Egoistic preferences
Externalities generated by the individual's (non-) consumption of health care services may also be the consequence of egoistic preferences. For instance, individual B may be concerned about the use of medical care by individual A simply for egoistic reasons in the case of communicable diseases. The interpersonal utility function for B looks like the following:

$$U_B = U_B\ (H_B\ [M_B, H_A\ (M_A)],\ C_B)$$

The medical consumption of A (M_A), for example in the form of vaccination, reduces the chances that A gets a communicable disease and improves, in that way, the health of A (H_A). However, because of the existence of a chance that B will also be infected by A (external effect), this has an influence on the (expected) health of B (H_B), and thereby on B's utility U_B. In general, immunisation for communicable diseases yields a positive utility for all non-immunised individuals.[13] This externality limits itself to the use of the few health care services for which there is a divergence between collective and individual benefits or costs of consumption (Schut, 1995; Schut and Lapre', 1988). If the full cost of immunisation is borne by each consumer then the risk of under-consumption is likely to occur, that is individuals may purchase less of these services than the socially optimal level.[14] In fact, rational consumers would purchase goods

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13. Similarly, effective preventive care may generate positive externalities. The consumption of effective preventive care may constitute a net gain for society as a whole, since it may reduce the chance of using more costly curative services in the future. This holds true if society pays for the future costs of curative services.

14. The demand for preventive care is likely to be less than socially optimal because of the fact that moral hazard results in a substitution away from preventive care toward curative care (Pauly, 1974).

until the ratio of the marginal utility of each to its price is equal across all goods. Therefore, when there is a positive consumption externality, the collective marginal utility is greater than that of the individual, so that (some) consumers, acting on their own and relying on their own resources, will not buy a large enough quantity of such goods (Rice, 2003). The risk of underconsumption is higher for low-income individuals, because high-income people have higher opportunity costs of sickness (higher time price) and lower marginal utility of money. In the case of a positive externality, a straightforward way to overcome underconsumption is to introduce subsidies.[15] If a large number of people benefits from the subsidies, as it appears to be the case for immunisations, it is very likely that most individuals would also be willing to participate in a system of cross-subsidies.

Another consumption externality in health care is the presence of individuals' concern about their own treatment opportunities relative to others. Therefore, individuals' utility depends not so much on what care they have access to in absolute terms but relative to others (Rice, 2003). Most plausible, perhaps, would be that people want those who have less access than they have to have more (altruistic preferences) and, at the same time, want to have as much access to services as those who have more (concern about status or rank). Although economists usually assume that utility is a function of an individual's endowment, independent of his relative position, the importance of relative standing, or positional externalities, has a long history in economic theoretical (Galbraith, 1958; Duesenberry, 1949; Veblen, 1899) and empirical analysis (Easterlin, 1995; Neumark and Postlewaite, 1993; Kapteyn and Wansbeek, 1985; Duncan, 1976). Positional externalities occur when "one person's action alters an important frame of reference for others' " (Frank, 1991). People care about their relative position in society for many reasons. One of these reasons might be that people feel envy when others have things that they themselves do not possess. Envy may change individuals' utility functions and its presence raises important policy questions (Choi, 1993; Elster, 1991; Bannerjee, 1990; Frank, 1985).[16] For example, the

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The gains from preventive care are uncertain and occur in the future, while the costs (in terms of money and time) have to be made in advance. By contrast, curative care often offers a short-term and more certain gain. Therefore, the stronger the individual's asymmetry with respect to uncertainty surrounding gains and losses, the less likely the person will demand preventive care (Fuchs, 1982).

15. For instance, governments may enforce a system of earmarked income-related (from high to low income groups) cross-subsidies, or subsidise the provision of immunisations, even providing them free of charge.

16. The term 'positional' has not been applied uniformly in the literature. For instance, positional goods were initially defined by Hirsch (1976) as those that are in fixed supply or subject to congestion with increased use. Solnick *et al.* (1998) attempt to identify what things create positional externalities and when people may find themselves on a positional treadmill. In other words, they try to answer the question: to what extent are positional externalities imposed when I have eg. cosmetic

use of cosmetic treatments such as facelift by some individuals may result in a reduction of the utility for the others since their look may be no longer as appealing. Then society's marginal utility from the consumption of cosmetic treatments will be lower than the individual marginal utility of the facelift users. Society's marginal utility may be realigned with the marginal utility of individuals consuming cosmetic services either by introducing cross-subsidies or taxation. A system of cross-subsidies may be introduced with the purpose of increasing the financial accessibility to cosmetic care for those individuals who are willing but not able to pay for it. Moreover, the concern for great relative physical attractiveness can lead everyone to expand resources simply to remain in the same relative position (Wolf, 1991). On the other hand, cross-subsidising cosmetic surgery (or similar services) lowers the costs borne by individuals, and thereby it may increase the quantity of services consumed (ie. moral hazard) and the deadweight loss. In order to increase social welfare and correct for this moral hazard, governments could introduce taxation on the consumption of these services or leave these benefits out of the basic basket (Frank, 1999). So, to the extent that positional externalities are present in the consumption of health care services the introduction of cross-subsidisation leads to a trade-off between the satisfaction of this type of egoistic preferences, on the one hand, and moral hazard, on the other hand.

2.2.2. The financial risk of becoming a high-risk

The individuals' risk of incurring high medical costs for future health problems may constitute a second main argument for governments to establish a system of cross-subsidies. In particular, the occurrence of catastrophic risks or chronic illnesses, such as AIDS, cancer, senile dementia, heart disease, or organ failure may cause dramatic increases in health expenditures, which are likely to be unbearable by most individuals. The problem faced by consumers, in particular low-income individuals, is that of obtaining lifetime insurance for this type of risks/illnesses (Cochrane, 1995; Pauly, 1992; Diamond, 1992; Newhouse, 1984). From a dynamic perspective, there is a missing market problem. If contracts covered the whole lifecycle, the individual probability of being sick in each period would be low, and premiums per-period would be low as well. However, insurance contracts are not signed once and for all, and individuals are exposed to the risk of incurring in events that increase their future expected expenditures. In this case, when the contract is renewed, insurers will adjust premiums to the new risk category, and access to coverage may become problematic. This happens because in real-world markets insurance against the financial risk of becoming

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surgery? They found that positional concerns are extremely important for physical attractiveness and stronger for goods than for bads.

a high-risk is incomplete. Therefore, individuals lose welfare *ex ante*, since they want insurance against the risk of falling into a worse risk class but they cannot obtain it. More precisely, the welfare loss derives from a missing market for insurance against the chance of being discovered to be high-risk. This problem has been termed the problem of renewable insurance or the problem of inter-temporal insurance (Cutler and Zeckhauser, 2000).

In order to correct for this market failure, government intervention may be required.[17] In particular, by establishing a system of cross-subsidies that increases the financial access for high-risk and/or low-income groups to health care services, governments guarantee that risk-averse consumers are insured against long-term health risks (ie. dramatic and unforeseen future changes in health status).[18] In this sense a cross-subsidy system also provides insurance against the financial risk of becoming a high-risk in the future (van de Ven *et al.*, 2000).

2.2.3. Moral Hazard

Moral hazard may arise along several dimensions.[19] In general, moral hazard problems refer to adverse behaviours encouraged by the guarantee of financial protection (ie. subsidies) against losses caused by the occurrence of adverse events (Gruber, 2005). Since subsidies may reduce the marginal cost of health care services borne by the individual, they may result in excessive consumption of these services ('consumer-initiated moral hazard').[20] Providers may also be inclined to induce additional demand for services for which they know that the costs are covered by subsidies ('supplier-induced moral hazard').

The problem of moral hazard or subsidies-induced overconsumption is not uniform across health care services. In particular, the extent to which cross-subsidies

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17. In theory, markets might develop to deal with the problem posed by lifetime insurance. For a careful review of the main reasons suggesting that market solutions (eg. long-term insurance, time-consistent insurance contracts) may be poor vehicles for insuring long-term health risks, we refer to Cutler *et al.*, 2000.

18. After all, the traditional function of insurance is to protect against an adverse event that has not yet occurred (Arrow, 1963).

19. Moral hazard problems are particularly relevant to the health care sector as contrasted with other sectors, because they emerge from the unequal distribution of information between the parties involved. Insurers and governments have highly imperfect information about the appropriateness of medical diagnoses and treatments. Hence, it is very difficult for them to value the damage caused by a disease and to appraise the costs of treatment. Moreover, they cannot judge whether or not subscribers have taken action to prevent diseases from occurring, which make it hard to relate premiums and subsidies to subscribers' preventive activities (Schut, 1995).

20. Moreover, individuals may reduce preventive activities to protect health status if they are (to some extent) financially protected against adverse events.

induce moral hazard depends on the service's demand price-elasticity and on the interactions between subsidised and non-subsidised services. The higher is a service's demand price-elasticity the greater is the subsidies-induced overconsumption. For instance, the moral hazard effect of cross-subsidising lung-transplants may be much smaller than that of cross-subsidising Viagra, because the demand price-elasticity of lung-transplants is likely to be smaller than Viagra's. *Ceteris paribus,* the smaller the moral hazard effect of cross-subsidising a specific service, the stronger may be the governments' arguments to enforce a system of cross-subsidies that guarantees the financial access to that service.

An important interaction between subsidised and non-subsidised services may occur if cheap substitutes (ie. OTC drugs) of subsidised services are not cross-subsidised. Depending on the type of service, the choice of not subsidising relatively cheap substitutes may induce a substitution effect towards the remaining more expensive subsidised services. If the total cost (including the cross-subsidy) of services would exceed the cost of these substitutes, this substitution effect may imply a welfare loss for society. On the other hand, subsidising cheaper substitutes, which may be accessed by most individuals without excessive financial burden, may increase moral hazard. So, the substitution effect induced by a system of cross-subsidisation leads to a trade-off between cost-effective substitution and moral hazard.

All in all, cross-subsidisation may induce moral hazard problems, which consist of excessive, and thereby suboptimal, consumption of subsidised services. Moral hazard may also lead to health care cost inflation.[21] So, to the extent that a system of cross-subsidies increases the incentives for excessive consumption of health care services, there is a trade-off between access to care and moral hazard. Therefore, when deciding whether to cross-subsidise specific services policymakers have to be aware of the financial consequences of subsidies-induced overconsumption.

2.2.4. Summary

The following summary Table 2a presents an overview in which each economic argument is related to its positive or negative effect on the decision to organise cross-subsidies between risk/income groups.

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21. In particular, subsidies-induced overconsumption by increasing the costs of a specific service may negatively affect the cost-effectiveness ratio of that service. In many countries (eg. France, The Netherlands, Norway, United Kingdom, etc.), policy-makers have in some circumstances taken into account the *ex-post* cost-effectiveness ratio in deciding whether or not to subsidise a service. For instance, cost-effective treatments with a high *ex-post* cost-effective ratio (eg. selective serotonin reuptake (SSRIs), sildenafil (Viagra) ect.) were (partially) removed from the basic basket. On the other end, treatments not considered cost-effective ex-ante (eg. ultra-orphan drugs) were subsidised because of their low *ex-post* impact on the budget available for cross-subsidies (Hughes *et al.*, 2005; Kooijman, 2003; Harris *et al.*, 2001).

Table 2a. Economic arguments for mandatory cross-subsidies

		Effect on the decision to organise cross-subsidies between risk/income groups
Economic Arguments		
Altruistic Externalities	CE ratio	-
	Initial Health Status of beneficiaries	-
	Expected cost per consumer	+
	Consumers' responsibility for the incidence of the disease	-
Egoistic Externalities	Positive	+
	Negative	-
Individual risk of becoming a bad risk		+
Moral Hazard	Demand price-elasticity	-
	Cheap substitutes	+

2.3. MANDATORY COVERAGE

Coverage, that provides financial access to predefined health care services, may be particularly beneficial for those at the lower end of the income distribution (Nyman, 2003). However, it is those at the lower end of the income distribution who are most likely not to take out coverage voluntarily (Feldstein, 1999). Governments may stimulate the voluntary purchase of coverage by subsidising it. In addition or in alternative, governments may impose on consumers a legal obligation to obtain coverage. In section 2.3.1., the following economic rationales for governments to enforce mandatory coverage are discussed: free riding (section 2.3.1.1.), lack of foresight (section 2.3.1.2.) and transaction costs of organising otherwise a system of cross-subsidies (section 2.3.1.3.).[22] In section 2.3.2., we propose two alternatives for the fine-tuning of mandatory coverage.

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22. In the literature, adverse selection is often advocated as another argument for governments to introduce mandatory coverage (Nyman, 2003). The government can avoid the adverse selection induced welfare loss from inadequate protection by making coverage compulsory. In the presence of mandatory coverage low-risk individuals are prevented from opting out of a pooling equilibrium. But compulsion may generate other welfare losses, ie. moral hazard. Alternative and less invasive measures can deal with adverse selection while maintaining adequate risk protection for all risk groups. The central idea is to require insurers to offer adequate coverage to all applicants, irrespective of risk, while keeping premiums affordable by means of some system to redistribute purchasing power for medical care (Schut, 1995). For instance, governments may introduce a system of (risk-related) cross-

2.3.1. Economic rationales for mandatory coverage

2.3.1.1. Free riding

The first alleged argument to enforce mandatory coverage is free riding. People may have incentives to hide their true preferences for some goods or services (eg. public or merit goods) and let other people pay while enjoying the benefits themselves. This phenomenon is known as free riding and its presence may lead to inefficient allocations of resources. In general, any investment in goods or services that has a personal cost but a common benefit may provide incentives for individuals to underinvest, or to invest less than is socially optimal (free rider problem) (Gruber, 2005).[23]

In the context of health care financing, free riders are individuals who purposely do not purchase coverage for their own health care entitlements because they expect not to be denied access to medical treatments in case of need or others in society are willing to pay for them if they really need health care. Empirical studies show that the presence of last resort safety nets, such as charity, reduces the demand for coverage, because they remove the health and the financial consequences (ie. disutility) of being uncovered (Johnson and Crystal, 2000; Dubay *et al.*, 1997; Holahan, 1997; Cutler and Gruber, 1996; Thomas, 1994).

An individual's incentives and opportunities to free ride may change in relation to the type of health care services and across different income groups. In general, an economically rational individual has incentives to abuse others' altruistic preferences if the average expected costs of different health care services exceed his or her own available income. Without a mandatory coverage provision, the risk that an individual does not cover for certain services and prefers to free ride is greater the higher the average expected costs of care are. In addition, incentives to free ride are smaller the higher an individual's available income, because the higher the income the lower the marginal utility of money (Nyman, 2003). Hence, low-income individuals could purposely not cover for health care services because others in society are willing to pay for them if they really need health care. For high-income people this argument is less relevant because they can (and therefore will have to) pay most health care services themselves.

For services or treatments with very high average expected costs (eg. liver failure requiring a liver transplant or routine dialysis, diabetes, asthma, or other chronic diseases that would require periodic physician visits and regular use of pharma-

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subsidies financed via mandatory solidarity contributions that may increase the affordability and sustainability of coverage for high risks.

23. See Rosen (2005) for a comprehensive analysis of the consequences for efficiency of free riding, and for a review of the literature that investigates the empirical relevance of the free rider problem.

ceuticals etc.) mandatory coverage may be necessary to prevent free riding even for high-income groups, excluding those individuals belonging to the high end of that distribution. For those at the very low end of the income distribution, the coverage of (most) health care services, including those with a low average expected cost, would represent a relatively high financial burden, and thereby increase the incentives and the opportunities for free riding. Therefore, for low-income groups a mandatory coverage provision for a broad set of services may be necessary to prevent free riding and thereby increase welfare. For middle/high income groups mandatory coverage may be limited to services with high average expected costs.

Ceteris paribus, the effectiveness of a mandatory coverage provision to prevent individuals from free riding, and thereby to increase welfare, diminishes as the average expected costs of care decrease and increases as an individual's available income decreases.

2.3.1.2. Lack of foresight

Governments may also enforce mandatory coverage in the presence of individuals' myopic behaviour (ie. lack of foresight), implying that individuals do not appropriately cover themselves against health risks. In other words, individuals may fail to maximise their (life-time) utility (Rosen, 2005). For instance, this may mean that consumers feel healthy and underestimate health risks, ie. young and healthy individuals do not always know what is in their best interest. Individuals' lack of foresight may have serious consequences for individuals and society. In fact, the immediate financial advantage of not paying for coverage may lead to high future expenses, which may be nearly or totally impossible to afford by individuals. In order to prevent individuals from becoming uninsurable and having unaffordable high health expenditures, government intervention may be required in the form of mandatory coverage.

Individuals' lack of foresight is not homogeneous across income groups and types of health risks. Firstly, different income groups may have heterogeneous preferences towards health care coverage, since the marginal value of money is different across income groups. An important difference between different income groups is that particularly for those at the low end of the distribution the voluntary purchase of coverage represents a loss of income that would otherwise be used to purchase necessities, like shelter, food and clothing. Thus, at the low end of the income distribution, the utility cost of purchasing coverage is greater *vis à vis* the value of the other goods and services forgone, compared to those at the high range of the distribution. Forgoing these necessities could have consequences for health similar to those of forgoing medical care when ill (Nyman, 2003). Another important difference across income groups is that on average high-income individuals are better educated than

low-income people and may afford high health care costs. Therefore, the lack of fore-sight argument for governments to introduce mandatory coverage is less relevant (although not irrelevant for catastrophic health risks) for high-income than for low-income groups.

Secondly, myopic behaviour is not uniform across different types of health risks. Individuals' forecasting ability may be weaker for health risks that may occur in a 'far future' than for health risks that may occur 'at any time'. In addition, individuals may not correctly appreciate how much certain health care services may contribute to their own health or for the health status of their dependents in the future. We refer, for example, to psycho-geriatric care, to long-term psychiatric care, to the use of den-tal care by children, to the contraceptive pill for girls under 18 years old, to obstetric care, to long-term nursing home care and to care for persons addicted to alcohol and drugs (van de Ven, 1995). A theoretical explanation to this phenomenon is that indi-viduals' aversion towards risk is not symmetric, since they appear to prefer certain to uncertain gains but prefer uncertain to certain losses (Kahneman and Tversky, 1979). Therefore, the stronger the individual's asymmetry with respect to uncertainty, the less likely the person will voluntarily demand for insurance coverage. Moreover, the more catastrophic health risks are, the greater the impact of an individual's lack of foresight may be on future health care expenditures, and thereby the stronger the rationale for governments to introduce a mandatory coverage provision. For other types of health risks, variations in an individual's available income may affect his or her willingness to voluntary demand for coverage. Low-income people are more ex-posed to the financial consequences of short-sightedness than high-income groups, due to a relatively lower ability to pay. A mandatory coverage provision for a broad set of services, including those with low future costs, may be necessary for low-income groups to prevent (the consequences of) myopic behaviour and thereby increase welfare. Extending the mandatory coverage provision for non-catastrophic risks to high-income groups may not be necessary to prevent that high-income groups be-have myopically.

Ceteris paribus, the more serious health risks are, the greater the impact of indi-viduals' lack of foresight may be on health expenditures, and thereby the stronger the rationale for governments to introduce a mandatory coverage provision.

2.3.1.3. Transaction costs of organising otherwise a system of cross-subsidies

A third economic rationale to introduce mandatory coverage can be the transaction costs of organising otherwise a system of mandatory cross-subsidies. If without universal mandatory coverage these costs are much higher than with universal man-datory coverage, governments may make the coverage for cross-subsidised services mandatory for everyone (ie. including high-income people). On the other hand, uni-

versal mandatory coverage may induce moral hazard and increase total health care costs, and thereby constitute a welfare loss for society as a whole. So to the extent that the organisation of an alternative system of cross-subsidies generates high transaction costs, Society may face a trade-off between moral hazard and transaction costs of organising cross-subsidies.

2.3.1.4. Summary

Tables 2b summarises the main economic arguments for governments to introduce mandatory coverage and their positive or negative impact on the choice to enforce a mandatory coverage provision.

Table 2b. Economic arguments for mandatory coverage

		Effect on the decision to enforce mandatory coverage
Economic Arguments		
Free Riding	Income	-
	Cost of illness	+
Lack of Foresight	Income	-
	Cost of illness	+
Transaction costs of alternative ways to organise cross-subsidies		+

The introduction of mandatory coverage may be an effective welfare increasing provision so far as it prevents free riding and myopic behaviour. However, these economic arguments are not equally relevant for *different groups of individuals* and for *different types of services* or *health risks.* Therefore, the introduction of *universal* mandatory coverage for a *uniform* comprehensive package of services (eg. including the coverage of services with low average expected costs) may be **unnecessary** to prevent free riding and lack of foresight. *Universal* mandatory coverage for a *uniform* set of services may also be **disproportionate** because it may reduce the responsiveness to consumers' preferences, induce moral hazard and increase total health care costs, and thereby constitute a welfare loss for society.

2.3.2. Fine-tuning mandatory coverage

In order to avoid the welfare decreasing consequences of moral hazard, mandatory coverage could be fine-tuned according to the individuals' available income and the type of service. An important precondition for fine-tuning mandatory coverage to different income groups is to maintain the desired level of cross-subsidies between

risk groups. Therefore, the fine-tuning of mandatory coverage should be accompanied with a (not too costly) system of cross-subsidies between risk groups.

The fine-tuning of mandatory coverage for different income groups may occur in two ways: by transferring *in toto* certain services from mandatory to voluntary coverage; or by increasing the extent of cost sharing (eg. deductibles). Hence, consumers may opt-out from mandatory coverage and voluntarily pay out-of-pocket (or seek for coverage) for certain services; or they may opt for a deductible, which means that they can choose to pay the costs up to a certain amount themselves. In both cases they receive a premium rebate.

High-income groups may be allowed to opt-out from mandatory coverage for a wider range of services (eg. GP, prescription drugs etc.) or to take a higher deductible than low-income groups, for which a mandatory coverage provision is necessary also for services with low average expected costs and for non-catastrophic health risks. Therefore, fine-tuning mandatory coverage according to the individuals' available income and to the type of service effectively prevents free riding and myopic behaviour, and it also reduces moral hazard and thereby increases welfare compared to *universal* mandatory health insurance for a *uniform* set of services, provided that organising cross-subsidies is not too costly.

The drawback of fine-tuning mandatory coverage is that it may imply high transaction costs. In particular, the more mandatory coverage is fine-tuned to the individuals' available income the higher are the consumers' search costs and the transaction costs of fine-tuning involved in the definition of the several mandatory packages of services, in adjusting the packages to variations in individuals' incomes (eg. due to changes in employment status, promotion etc.) or to health care services' technological innovations.

So, the fine-tuning of mandatory coverage by type of service and income groups confronts governments with a trade-off between moral hazard, on the one hand, and the transaction costs of fine-tuning coverage and organising cross–subsidies, on the other hand. In the next subsections we discuss two types of schemes that aim at smoothing this trade-off by limiting the extent to which mandatory coverage can be fine-tuned: the two-option scheme (section 2.3.2.1.) and the single-option scheme with income-related deductibles (section 2.3.2.2.). Both schemes may be relevant for both NHS-countries and for countries with a competitive (social) health insurance market.

2.3.2.1. *High and low option schemes*
Governments may make a clear distinction between two schemes, a **low-option scheme** for the high-income groups and a **high-option scheme** for the low-income groups, rather than having a large variety of mandatory packages of services fine-

tuned according to the individuals' income.[24] The low-option scheme primarily includes health care services with high expected costs for which mandatory coverage is necessary also for high-income groups (eg. to prevent myopic behaviour). The high-option scheme envisages a mandatory coverage provision for a comprehensive package of services (eg. including low-cost care) for low-income groups. By choosing the low-option scheme (high-income) individuals may reduce the mandatory package and benefit from a reduction of the mandatory contribution (ie. premium rebate). In order to guarantee an affordable access to the (broader) high-option scheme for high-risk or low-income individuals, the premium rebate should not affect the viability of the system of mandatory cross-subsidies.[25] In case of an unregulated competitive health insurance market the premium reduction should be risk-rated. In other words, the premium rebate for the low-option scheme is higher for the high-risk individuals than for the low-risk individuals. If the difference in contribution per risk group between the two schemes would reflect the difference in expected costs of the two schemes per risk group, then cross-subsidies are maintained. Moreover, if the premium rebate does not affect the system of cross-subsidies, the financial access to the high-option scheme for the high-risk or low-income people is subsidised by the low-risk or high-income individuals. In addition to the high-option there might be all kind of voluntary supplementary health insurance, ie. not-subsidised.

Compared with allowing consumers to choose from several levels of mandatory coverage, the distinction between a high-option and a low-option scheme is more effective in containing the consumers' search costs and the transaction costs of fine-tuning mandatory coverage. On the other hand, it is less responsive to consumers' preferences (ie. consumers' choice of coverage is limited to two schemes) and also less effective in reducing moral hazard (but more effective than universal mandatory coverage).

2.3.2.2. Single-option scheme with income-related deductibles

An alternative to the two-option scheme is to have mandatory coverage for a uniform package of services with the option for consumers to choose an income-related

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24. Contours of the Basic Health Care Benefit Package, Publication no. 2003/021; downloadable from: http://www.gezondheidsraad.nl/.

25. Although in theory the arguments for mandatory coverage differ from the arguments for mandatory cross-subsidies, in most countries the package of cross-subsidised services coincides with, or contains, the package of services for which a mandatory coverage provision is enforced. For example, there are packages of cross-subsidised services for which there is no mandate to purchase coverage (eg. GP care for the high-income people in Ireland) but not *vice versa*. This is true for health care but not for other types of insurance (eg. car). In car insurance often the purchase of insurance is compulsory but not subsidised. Therefore, we plausibly assume that high-option plans coincide with the package of cross-subsidised services.

deductible with a premium rebate. On average, the higher the income the higher the maximum deductible level. The **no-deductible scheme** can then be considered as the high-option scheme and the **high-deductible scheme** as the low-option scheme. By taking a deductible, high-income individuals may reduce the mandatory package. The costs on which the mandatory cross-subsidies can be based on are the costs of the no-deductible scheme (ie. high-option scheme). The premium reduction in case consumers choose to take a deductible could be unregulated and it would most likely be risk-rated in a competitive market, ie. a low premium reduction for low-risks and a high premium reduction for high-risk individuals. If the premium reduction is equal to the expected out of pocket expenditures (ie. it does not reduce the cross-subsidies) solidarity is maintained.

The single-option scheme with voluntary income-related deductibles effectively prevents free riding and myopic behaviour; it avoids the transaction costs of fine-tuning mandatory coverage by type of service and income group and it enhances the responsiveness to consumers' preferences and it reduces moral hazard and total health care expenditures compared to universal mandatory health insurance for a uniform package of services.

2.4. SUMMARY AND CONCLUSIONS

This chapter investigates the economic rationales for the design of health care financing arrangements. It proposes a categorisation of financing schemes based on a distinction between mandatory cross-subsidies and mandatory coverage. The most important economic arguments for governments to enforce a system of mandatory cross-subsidies that guarantees the financial access to a predefined set of basic services to high-risk or low-income individuals are related to: the presence of externalities in health care services consumption; the individuals' risk of becoming bad risks; and the moral hazard effects induced by cross-subsidisation. Conversely, the rationales for mandatory coverage are based on considerations of free riding behaviour, individuals' lack of foresight and too high transaction costs of alternative ways to organise cross-subsidies.

From our analysis we also conclude that the introduction of *universal* mandatory coverage for a *uniform* set of services is unnecessary to prevent free riding and myopic behaviour and also disproportionate because it induces moral hazard. In line with the objective of preventing free riding and myopic behaviour, mandatory coverage could be fine-tuned according to the individuals' available income. In particular, the choice between enforcing *universal* mandatory coverage for a *uniform* package of basic services and fine-tuning mandatory coverage confronts governments with a

trade-off between moral hazard, on the one hand, and the transaction costs of fine-tuning and of organising otherwise a system of mandatory cross-subsidies, on the other hand.

To smooth this trade-off, the following two types of schemes can be considered as pragmatic alternatives: the two-option scheme and the single-option scheme with voluntary income-related deductibles.

Although they both represent potentially attractive alternatives to *universal* mandatory coverage, the single-option scheme with income-related deductibles is preferable on several grounds. Firstly, the distinction between two packages (ie. two-option scheme) may result practically unfeasible, because it may generate difficulties in the identification of the criteria to find the services that clearly make the difference between the two packages. Secondly, under the two-option scheme the transaction costs of fine-tuning are likely to be higher compared to the single-option scheme with income-related deductibles. Thirdly, the single-option scheme with voluntary income-related deductibles provides a wider choice than the two-option scheme, and thereby it increases the responsiveness to consumers' preferences.

3.

The design of health care financing schemes in different countries

SUMMARY In this chapter, the conceptual analysis developed in the previous chapter is applied to the following countries: Australia, Belgium, France, Germany, Ireland, Israel, the Netherlands, Switzerland and the United States. In particular, we discuss the conformity of the actual design of these OECD countries' health care financing schemes with the economic arguments for mandatory cross-subsidies and for mandatory coverage. We observe that several countries (eg. Australia, Belgium, France and Israel) opted for the introduction of universal mandatory coverage for a comprehensive and uniform package of services. As discussed in chapter 2, this measure is not per se necessary and proportionate to achieve an affordable access to (the coverage of) health care services for vulnerable groups. Alternatively, governments could rely either on the two-option scheme or the single-option scheme with voluntary income-related deductibles. Although the latter scheme is likely to be preferable from an economic perspective, it is not implemented in any of the considered countries. Only the Netherlands and Switzerland come close to this scheme given that they have implemented a single-option scheme with traditional deductibles (fixed amounts) for curative health care services. However, the fixed deductible levels may be too high for low-income people and too low for high-income individuals. In addition, long-term care services are covered by a universal single-option scheme with mandatory income-related copayments in the Netherlands (AWBZ). As far as the two-option scheme is concerned, it is implemented in Germany and Ireland. Nevertheless, the high-option scheme for low-income people seems to be too broad in Germany and too small in Ireland.

3.1. INTRODUCTION

In this chapter the conceptual analysis developed in chapter 2 is applied to the following OECD countries: Australia, Belgium, France, Germany, Ireland, Israel, The Netherlands, Switzerland and the United States.

There are several important differences in the way different countries design and structure their health care financing schemes. For instance, there are differences in the regulation of financial access (eg. yes/no mandatory cross-subsidies for specific services); in the institutional setting (eg. yes/no competition); in the types of carriers (yes/no commercial insurers); in the type of coverage (voluntary or mandatory); and in the set of entitlements (ie. services, choice of providers, quality of care and waiting time) provided. In particular, the political decisions about whether to introduce mandatory cross-subsidies and whether to enforce mandatory coverage are not uniform across services and population groups in different countries. Many different explanations can be offered for the diversity in the design of different countries health care financing schemes (eg. path dependency, pressure groups etc.). In this chapter, however, we focus on whether the actual design of health care financing schemes of the selected countries is coherent with the economic rationales for mandatory cross-subsidies and mandatory coverage. In particular, we address the following research question:

• Is the design of health care financing schemes in the selected countries in conformity with the economic rationales for organising a system of mandatory cross-subsidies, and for imposing mandatory coverage?

This chapter is structured as follows. First, we investigate whether and to what extent the design of health care financing schemes in the different OECD countries is organised in line with the economic arguments for introducing a system of mandatory cross-subsidies (section 3.2.). Then, we analyse the conformity of different countries' health financing schemes with the economic arguments for enforcing a mandatory coverage provision (section 3.3.). In section 3.4., we conclude by summarising our findings and by discussing the main policy implications.

3.2. MANDATORY CROSS-SUBSIDIES IN DIFFERENT COUNTRIES

Mandatory cross-subsidies are present in all the countries considered. The main purpose of cross-subsidies is to achieve affordable access to health care services or to health insurance.

In general, countries with a so-called social health insurance scheme (eg. Belgium, Germany, Israel, the Netherlands and Switzerland) implement mandatory cross-subsidies with the aim to increase the affordability of insurance coverage for most health care services. Mandatory cross-subsidies for the purchase of insurance coverage can be of two types:

- Explicit cross-subsidies, eg. risk-equalisation schemes;
- Implicit cross-subsidies, eg. premium rate restrictions like community-rating, income-related contributions.

In Belgium, Germany, Israel, the Netherlands and Switzerland, the government has introduced a combination of explicit (risk-equalisation) and implicit (community-rating and/or income-related contributions) cross-subsidies for the coverage of a broad set of services ranging from long-term care and hospital care to ambulatory care and rehabilitative physiotherapy. In Germany, these subsidies do not automatically apply for the upper 10 percent high-income groups unless they decide to opt-in. In Belgium and Germany mandatory cross-subsidies apply to dental care. In Belgium there are no cross-subsidies for home care (see Table 3a).

In so-called National Health Insurance or National Health Service systems (NHS) (eg. Australia, France and Ireland), mandatory cross-subsidies are usually raised via income-related contributions or taxation to finance the provision of most health care services.

In Australia, every citizen is entitled to access a broad package of services financed by the tax-based NHS scheme (ie. Medicare), ranging from public health care, long-term care (apart from home care), and hospital care to ambulatory care and prescription drugs. In Ireland, apart from long-term care and hospital care, the access to other subsidised NHS-services differs across income groups. The NHS provides access to services such as ambulatory care, prescription drugs, medical devices and dental care only for the low-income and high-risk groups (ie. medical card holders). In these two countries individuals may buy voluntary health insurance for the coverage of services (partly) uncovered by the NHS, but also for services for which they retain full access under the NHS (duplicate coverage). Interestingly, voluntary health insurance is subsidised in both countries via a combination of explicit (risk-equalisation) and implicit (community-rating) cross-subsidies.

In France the National Health Insurance (NHI) scheme (*Sécurité Sociale)* is financed by taxation and income-related contributions and it provides coverage for a broad benefits package (see Table 3a). For services (eg. dental care, medical devices, spa) that are only partly covered (copayments) by or completely excluded from the NHI, individuals may purchase voluntary insurance, which is fully subsidised only for the unemployed and the low-income groups.

Apart from the United States, the access to public health services, such as the vaccination of communicable diseases, is subsidised in all other countries mainly via taxation. The primary economic argument for the introduction of subsidies for the immunisation of transmissible illnesses is the presence of positive externalities in the demand for this type of services. In particular, the fact that vaccines yield a direct positive externality to all individuals, including the non-immunised people, may increase the risk of underconsumption particularly among the low-income groups. An effective way to prevent underconsumption is to subsidise vaccines, as most countries do. Similarly, other types of preventive care that effectively reduce the probability of using expensive (subsidised) curative care in the future may yield positive externalities. Although this provides an economic justification for subsidisation, apart from vaccinations not many countries actually subsidise the access to effective preventive care, eg. interventions lowering systolic blood pressure and thereby preventing the occurrence of cardiovascular-diseases (Murray *et al.*, 2003).

The access to (the coverage of) long-term care services (eg. home care, nursing home care, dialysis care, palliative care, psychiatric care etc.) is subsidised in almost all the countries considered. An economic argument for implementing a system of cross-subsidies may be the presence of altruistic externalities in the consumption of long-term care. In order to assess the extent to which the presence of altruistic preferences justifies a system of cross-subsidies several factors have to be taken into account, such as the cost-effectiveness of long-term care, the individuals' initial health status, the expected cost of long-term care services per consumer and the consumer's responsibility for the incidence of the illness (see chapter 2). Long-term care may require the use of expensive machineries (eg. dialysis care), drugs (eg. insulin for diabetic patients), or personnel (eg. skilled-nursing) or it may yield limited QALY gains because it is needed by aged people (eg. home care) or terminal patients (eg. palliative care). Although long-term care may not be cost-effective, the introduction of a system of cross-subsidies may be economically justified for those services (eg. home care and nursing home care) for which the average initial health status of the consumers is poor (eg. old people), the expected costs per consumer is very high and the consumer's behaviour is not likely to be related with the incidence of the illness. Another economic argument for the introduction of cross-subsidies for costly long-term care is the financial risk of becoming a high-risk in the future. A system of cross-subsidies that guarantees affordable access to (the coverage of) long-term care services can in fact be seen as an insurance against health risks with catastrophic financial consequences. According to the arguments of altruistic externalities and the absence of adequate private insurance for the financial risk of becoming a bad risk, mandatory cross-subsidisation of long-term care (coverage) such as home care,

nursing home care, psychiatric care etc. may be required to assure affordable access to these services to everyone.

The design of most countries' financing schemes appears to be consistent with the economic rationales for cross-subsidising long-term care services apart from Australia (ie. home care), Belgium (ie. home care) and the United States (ie. home care and psychiatric care for individuals aged 65 or older).

Almost all the countries considered have implemented a system of mandatory cross-subsidies with the aim of achieving affordable access to (the coverage of) hospital care, prescription drugs and ambulatory care (ie. GP and specialist) for everyone. In general, for most hospital care and prescription drugs the introduction of a system of cross-subsidies appears to be consistent with the economic rationale provided by altruistic externalities and the financial risk of becoming a high-risk. Most hospital care and prescription drugs appear to be relatively cost-effective, assuming the appropriateness of the diagnosis. Considering that the costs per consumer for most hospital care and prescription drugs are relatively high, cross-subsidies may improve the affordability of these benefits for everyone. In addition, cross-subsidies may act as an insurance against the risk of needing expensive hospital services or drugs in the future. An argument for not cross-subsidising hospital care and prescription drugs may be subsidies-induced overconsumption (ie. moral hazard). As estimated by van Vliet (2004) for the Dutch private health insurance market the price-elasticities of hospital care (-0.04) and prescription drugs (-0.08) are quite small in absolute terms and much smaller than for other services such as GP care (-0.4), non-rehabilitative physiotherapy (-0.3), specialist care (-0.12) and other care (e. dental care, medical devices etc.) (-0.21).[1] The lower price-sensitivity of specialist care, prescription drugs and hospital care may be in part due to a lower impact of price-variations for higher need of health care. The still rather high elasticity for non-rehabilitative physiotherapy may be explained by the often doubtful necessity and effectiveness of such care. In principle, supplier- or consumer-induced moral hazard is less likely to occur for services with low price-elasticities than for services with high price-elasticities. Nevertheless, the results of the RAND experiment show that even for services with a low price-elasticity (eg. hospital care and prescription drugs) high levels of coinsurance result in substantial reduction of moral hazard.[2] An argument against subsidisation

1. These studies are consistent with the literature (Newhouse, 1993). It has to be acknowledged that the overall price-elasticity, which equals -0.14 for the six types of care in van Vliet (2004), is in the middle of the range reported by the RAND study. This indicates that according to the RAND experiment individuals are on average more sensitive to price-variations for the different types of care than the Dutch privately insured.

2. However, the RAND study used high copayments rates that seem unthinkable in the context of most countries considered here.

may be that individuals' lifestyles (eg. high-fat diet, smoking, drinking, unsafe sex etc.) can be responsible for the incidence of some illnesses (eg. heart diseases, lung cancer, HIV etc.) that require certain hospital care or prescription drugs (for example acute surgery such as heart or lung transplant, chemotherapy, antiretroviral drugs etc.). Given that the relationship between behavioural factors and incidence of certain conditions is often controversial, cross-subsidies for hospital care, prescription drugs and specialist visits may be justified on the basis of the other determinants of altruistic externalities (in particular cost-effectiveness and costs of services per consumer) and the financial risk of becoming a bad risk; or on non-economic (eg. ethical) arguments.

The rank order of price-elasticities presented above indicates that patients are particularly sensitive to GP care price-variations. Therefore, cross-subsidies are likely to induce moral hazard for GP care, ie. a reduction in the out-of-pocket payments by consumers for (the coverage of) GP visits may result in an increased number of consultations. On the other hand, if GP care is not subsidised, supplier-induced moral hazard towards more expensive (substitutive) hospital care may occur. In addition, the cost-effectiveness of ambulatory care may be relatively high particularly if GPs function as gatekeepers. Considering that the costs per consumer of GP are relatively low and do not constitute a financial burden for most individuals, cross-subsidisation for GP care can be justified especially for low-income and high-risk people.

Ireland and the United States are the only two countries in which the access to GP care is subsidised only for low-income and high-risk groups. Interestingly, in Ireland individuals may purchase cross-subsidised voluntary health insurance for the coverage of GP care. Therefore, the reduction of moral hazard that (potentially) results from limiting cross-subsidisation in the access to GP care may be offset by the welfare loss of increased moral hazard of cross-subsidising the voluntary coverage of GP care. In Ireland, prescription drugs are subsidised only for 30 percent of the population (ie. low-income and high-risk groups). In the United States, these services are subsidised only for Medicare beneficiaries (see Table 3a). The limited extent of mandatory cross-subsidies for prescription drugs in these countries may threaten the affordability of these services for low-income or high-risk individuals whose income (age) is slightly above (below) the subsidy threshold.

The only type of physiotherapy that is subsidised in all countries apart from the United States is rehabilitative care (eg. musculoskeletal, cardiothoracic and neurological). In terms of the economic rationales for mandatory cross-subsidies, the fact that rehabilitative physiotherapy is the sole type of physical therapy to be subsidised in most countries is probably due to its relatively high cost-effectiveness, its high costs per consumer and the poor individuals' initial health status on average.

Moreover, given that the probability of subsidies-induced moral hazard for rehabilitative physiotherapy is lower than for other types of physiotherapy (eg. therapeutic massage), the introduction of a mandatory cross-subsidies system for rehabilitative physiotherapy is sound from an economic perspective.

For benefits such as dental care, medical devices, spa, hospital amenities and alternative care most countries do not organise mandatory cross-subsidies. In Australia and Ireland people may benefit from subsidies for these benefits if they purchase voluntary health insurance. In France only low-income people are subsidised for services such as dental care, medical devices and spa. In Belgium and Germany dental care is subsidised for everyone excluding the self-employed and high-income people. The main economic argument for not subsidising these services is subsidies-induced overconsumption. The relatively high price-elasticity of services such as dental care, medical devices, alternative care, etc. (ie. "other care" in van Vliet, 2004) suggests that cross-subsidies may induce moral hazard for these types of care. The absence of cross-subsidisation for these services may be also justified by the often unproven necessity and effectiveness of some of these services (for example alternative care or spa).

Table 3a. The beneficiaries of cross-subsidisation by types of care in different countries

	Public health services	Home care	Nursing home care	Other long-term care	Ambulatory care (GP and Specialist)	Hospital care	Prescription drugs	Physiotherapy	Dental care	Medical devices	Spa	Hospital amenities	Alternative care
AUS	Everyone[1]	People purchasing voluntary insurance coverage (for this service)[2]			Everyone[1]	People purchasing voluntary insurance coverage (for these services)							
BE	Everyone[1]	Nobody			Everyone[1, 3]			Everyone[1] (only rehabilitative)	Everyone[1,3]			Nobody	
FR				Everyone[1]				Everyone[1] (only rehabilitative)	Low-income or under 18 people[4]				Nobody
GER	Everyone[1]		Everyone[1] (restricted to specific services)		Everyone (excluding the 10% high-income groups)							Nobody	
IRL		Everyone[1]			Low-income or people above 70 (ie. medical card holders) & Everyone with voluntary insurance coverage[5]	Everyone[1]	Low-income or people above 70 (ie. medical card holders)[5]			People purchasing voluntary insurance coverage			
ISR				Everyone[1]				Everyone[1] (only rehabilitative)			Nobody		

NL	Everyone[1,6]		Nobody above 18	Everyone[1] (only rehabilitative for chronically ill)		Nobody
CH	Everyone[1]					Nobody
USA	Low-income people[7]	Low-income & high-risk people[7]	Low-income people between 21-65years[8]	Low-income & high-risk people	High-risk people[8]	Nobody[7]

[1] Everybody indicates that all citizens may benefit from (some) cross-subsidisation to access or cover for the indicated services. Although in general the individuals that are more likely to benefit from cross-subsidies are low-income or high-risk people, there may be differences across countries in the way the systems of cross-subsidies are organised for the different population groups.

[2] For all individuals who purchase voluntary health insurance in Australia, the government has introduced several types of mandatory cross-subsidies, such as community-rating, risk-equalisation, a 30 per cent rebate on premiums, a 2 per cent surcharge for individuals buy coverage after age 30 and a 1 per cent medical levy surcharge for individuals without coverage. Apart from ambulatory care (GP and specialist), voluntary health insurance may cover a wide variety of services. About 75 per cent of the voluntarily insured subscribed comprehensive policies including home care, hospital care, dental care, and other ancillary services (PHIAC, 2001; Colombo and Tapay, 2004).

[3] In Belgium some categories of the self-employed and their dependants (10 per cent of the population) have to purchase coverage voluntary to benefit from risk-adjusted cross-subsidies for some minor risks (eg. ambulatory care, medicines and dental care). This voluntary insurance is taken by about two thirds of the self-employed concerned and it covers 75 per cent of the population at risk, including their dependants) (Schokkaert and Van de Voorde, 2003).

[4] In France the subsidies for the people with a low-income or with age less than 18 years cover 35 per cent of total dental care costs and 25 per cent of spa costs (Sandier and Ulmann, 2001).

[5] In Ireland, medical card holders' (30 per cent of the population) free access to care is subsidised by the government (eg. earmarked taxation). The regulator has also implemented a system of mandatory cross-subsidies (eg. risk-equalisation, community-rating) in the competitive market for voluntary health insurance.

[6] In the Netherlands, public health services (eg. vaccines), catastrophic risks and long-term care are subsidised by the government (eg. taxation). A mixed system of mandatory income- and risk-related cross-subsidies aims at financing the access to ambulatory care, hospital care and prescription drugs.

[7] By low-income and high-risk people we mean individuals that are eligible for (both) Medicaid and Medicare, which are the two main state-backed programs (ie. subsidised by taxation) in the United States. In particular, Medicare beneficiaries are people (and their families) age 65 or older; under age 65 with certain disabilities; and of all ages with End-Stage Renal Disease (permanent kidney failure requiring dialysis or a kidney transplant).

[8] Access to certain services, such as psychiatric care for people age between 21 and 65, prescription drugs, physical therapy and dental care via Medicaid is not uniformly subsidised across different states.

3.3. MANDATORY COVERAGE IN DIFFERENT COUNTRIES

Although universal mandatory coverage for a uniform set of services is very popular in OECD countries, it is not *per se* optimal from an economic perspective (as discussed in chapter 2). In particular, apart from the coverage of care with high average expected costs per capita, a universal mandate may be unnecessary to prevent free riding and myopic behaviour or may be disproportionate because it may induce moral hazard and an increase in health care expenditures. For services with high average expected costs such as hospital care, long-term care, expensive prescription drugs and rehabilitative physiotherapy, mandatory coverage may be necessary also for high-income or low-risk people particularly to prevent myopic behaviour. Moreover, mandatory coverage may be proportionate because for these services moral hazard is not very likely to occur. For other services such as ambulatory care and medical devices, physiotherapy, dental care, spa, alternative care and hospital upgrades, mandatory coverage may be restricted to low-income or high-risk groups. In fact the incentives to free ride and to behave myopically are stronger for low-income or high-risk than for high-income or low-risk individuals, given that for these services the average expected cost per individual is relatively low. Moreover, universal mandatory coverage is likely to induce moral hazard for these services.

In most countries with a National Health Insurance (NHI) or Service (NHS) system, coverage is mandatory for everyone and uniform for a comprehensive package of services including long-term care, ambulatory and hospital care and prescription drugs (see Table 3b). In France universal mandatory coverage extends to all types of physiotherapy. Although free riding and lack of foresight are effectively prevented by universal mandatory coverage, the generosity of the mandatory package of services is likely to induce moral hazard (particularly for GP visits and non-rehabilitative physiotherapy). Apart from long-term care, all services in the mandatory package are subject to fixed copayments schemes. In order to limit the exposure to out-of-pocket payments, individuals may purchase voluntary insurance to cover for the copayments and for services not included in the mandatory benefits package (eg. dental care etc.) (see Table 3b). For the purchase of voluntary insurance the unemployed and the low-income individuals are fully subsidised by the *Couverture Maladie Universelle* (CMU) (ie. general taxation). Although copayments may be an effective tool to reduce moral hazard, allowing individuals to purchase voluntary coverage (fully subsidised for low-income groups) may offset the effectiveness of these copayments in mitigating moral hazard and lead to excessive demand of care and thereby to an increase in health care costs.

In Ireland, apart from long-term care and hospital care, the coverage of other services (eg. ambulatory care, prescription drugs, physiotherapy and dental care) is man-

datory only for medical card holders (ie. low-income or high-risk people). In principle the option of a broader mandatory package of services for low-income groups than for high-income groups is consistent with the objective of preventing free riding and myopic behaviour (as discussed in chapter 2). In Ireland individuals may purchase voluntary health insurance for most health care services and benefit from cross-subsidies (such as community-rating and risk-equalisation). Although cross-subsidisation may increase the affordability of coverage, it may not appropriately address the problems of free riding and myopic behaviour inherent to the voluntary coverage of high-cost services (eg. prescription drugs, rehabilitative physiotherapy) for individuals who are not eligible for medical cards (ie. 70 percent of the Irish population). Therefore, for high-cost care mandatory coverage should be extended to everyone. Moreover the combination of explicit (risk-equalisation) and implicit (community-rating) cross-subsidiation in the Irish voluntary health insurance market is likely to create incentives for risk-selection, especially considering the rather poor quality of the risk-equalisation scheme.

In Australia there is no mandatory coverage for home care and rehabilitative physiotherapy. Although the voluntary coverage for these services is subsidised, subsidisation may not be sufficient to offset the incentives for free riding and lack of foresight particularly for low-income and high-risk individuals. To prevent free riding and myopic behaviour in the decision to buy voluntary coverage for high-cost care (eg. home care) the introduction of a mandatory coverage provision may be necessary especially for low-income people (see chapter 2).

In some countries such as Belgium, Israel, the Netherlands and Switzerland, the government has introduced a legal mandate for all inhabitants to purchase coverage from competing health insurers or sickness funds for a uniform set of services, comprising ambulatory and hospital care, prescription drugs and rehabilitative physiotherapy. In Belgium and Switzerland the mandatory package of services offered by sickness funds includes also long-term care services. In Israel and the Netherlands, the coverage for long-term care is mandatory and uniform for everyone but provided by regional or nation-wide monopolistic insurers (van de Ven *et al.*, 2007).

The Netherlands and Switzerland are the only two attempts towards the single-option scheme with voluntary income-related deductibles. After the enforcement of the New Insurance Act (2006), the Netherlands switched from a German-like two-option scheme to a Swiss-like universal single-option scheme with voluntary fixed-deductibles in exchange for a premium rebate, but only for curative health care services.[3] In principle, the fine-tuning of mandatory coverage via voluntary deductibles

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3. For long-term care (eg. nursing home care), the Netherlands implemented a universal single-option scheme (ie. AWBZ) with mandatory income-related copayments.

Table 3b. The eligibility to mandatory coverage of different population groups by types of care in different countries

	Public health services	Home care	Nursing home care	Other long-term care	Ambulatory care (GP and Specialist)	Hospital care	Prescription drugs	Physiotherapy	Dental care	Medical devices	Spa	Hospital upgrade	Alternative care
AUS	Everyone	Nobody			Everyone & Copayments[1]					Nobody			
BE			Everyone		Everyone apart some categories of self-employed & Copayments[2]	Everyone	Everyone apart some categories of self-employed	Everyone apart some categories of self-employed (only rehabilitative)	Everyone apart some categories of self-employed		Nobody		Everyone apart some categories of self-employed
FR			Everyone		Everyone & Copayments[3]						Nobody		
GER	Everyone	Everyone & Copayments[4]	Everyone & Copayments		Everyone (no 10% high-income groups)		Everyone (no 10% high-income) & Copayments[4]		Nobody		Everyone (no 10% high-income)	Nobody	
IRL			Everyone		Low-income or above 70 people (ie. 30% medical card holders)	Everyone	Low-income or above 70 people (ie. 30% medical card holders)					Nobody	
ISR			Everyonce		Everyone & Copayments (exemption for low-income people)[5]	Everyone	Everyone & Copayments (ceiling for chronically ill people)[5]	Everyone (only rehabilitative)			Nobody		
NL	Everyone		Everyone & Income-related copayments		Everyone & Deductibles[6]			Everyone[1] (only rehabilitative for chronically ill)	Nobody older than 18years		Nobody		

CH	Everyone			Everyone & Deductibles[7]		Nobody
	Low-income people	Low-income & high-risk people[8]	Low-income people between 21-65years	Low-income & high-risk people[8]	Low-income people	Nobody[8]
USA						

[1] In Australia, Medicare covers for 85 per cent of the reference price established for ambulatory care the rest is at the expense of consumers who may not buy voluntary insurance for this type of service. For hospital care Medicare provides full coverage only for public patients hospitalised in state-owned facilities. If individuals want an increased choice of hospitals (public and private) Medicare covers only 75 per cent of the established reference price. High-risk groups (eg. chronically ill) pay a lower copayment or are exempted (PHIAC, 2001; Colombo and Tapay, 2004).

[2] In Belgium copayments for ambulatory care amounted to about 11 per cent of total reimbursements (Schokkaert and Van de Voorde, 2003).

[3] In France the share of copayments on total reimbursements per type of services amounted to 25 per cent for ambulatory care (22.5 per cent covered by voluntary insurance; and 3.5 per cent by out-of-pocket payments), 9 per cent for hospital care (4 per cent; 5 per cent) and 37 per cent for drugs (19 per cent; 18 per cent). There are no exemptions for copayments, but people eligible for CMU (eg. low-income people) receive subsidies to pay out-of-pocket for the copayments amounts or to purchase insurance coverage (Sandier and Ulmann, 2001; Colombo and Tapay, 2004).

[4] In Germany the share of out-of-pocket payments is about 17 per cent of the total costs for long-term care, which includes home care and nursing home care. The copayments for hospital care and rehabilitative care are 9 euros per day for the first 14 days, for prescription drugs amount to 5 euros per box and for dental care are between the 35 per cent and the 50 per cent of total costs (Busse, 2002). For these services the different forms of copayments sum up to 9 per cent of insurers' expenditures. Spa treatment is the only service together with hospice and palliative care for which low-income people have to take out non-subsidised mandatory coverage if their insurance carrier is providing it (Buchner and Wasem, 2003).

[5] In Israel all insurers collect between 3-5 euros for the first visit to specialists and 6 euros for outpatient and diagnostic visits. Moreover, there is a ceiling of 25-45 euros that limits the total out-of-pocket payments. Copayments on drugs are proportional (about 10 per cent) (Shmueli et al., 2003).

[6] In the Netherlands, individuals may choose a deductible of euros 0, 100, 200, 300, 400 or 500 per person per year (van Kleef et al., 2006-7).

[7] There are copayments in the form of individual deductibles starting from a mandatory minimum deductible (CHF 230) and the voluntary deductibles on top of the mandatory (CHF 170, 370, 970 and 1.270 per person per year). Children are exempted for deductibles and their voluntary deductible options are all lower than the options for adults and are rarely chosen. In addition to these deductibles there is a coinsurance of 10 per cent up to a maximum of CHF 600 per person per year for all medical costs on top of the deductibles (van Kleef et al., 2006-7).

[8] Individuals eligible for Medicare are not covered for all health care costs. The program contains premiums, deductibles and co-pays, for which the covered individual must pay out-of-pocket. Some people who may qualify to have other governmental programs (such as Medicaid) pay premiums and some or all of the costs associated with Medicare. Most people do not pay a monthly premium for nursing-home care, because they (or a spouse) have had 40 or more quarters where they paid taxes. A beneficiary will pay also a deductible of $992 for a hospital stay of 1-60 days; a $248 per day co-pay for days 61-90 of a hospital stay; a $496 per day co-pay for days 91-150 of a hospital stay. Everyone pays an insurance premium for ambulatory and hospital care; the standard premium is $93.50 per month. After a beneficiary meets the yearly deductible of $131.00, they will be required to pay a co-insurance of 20 per cent of the Medicare-approved amount for all ambulatory and hospital services. For prescription drugs Medicare plans may or may not charge a premium at their discretion. The deductibles and coinsurance charges for prescription drugs vary substantially from plan to plan (see Desmond et al., 2006 for all relevant references).

is effective in preventing free riding and lack of foresight. Nevertheless, given that in both countries voluntary deductibles are not income-related, the maximum fixed-deductible may be too low for the high-income and too high for the low-income people. A single-option scheme with voluntary income-related deductibles for both curative and long-term health care services would therefore be more responsive to consumers' preferences, and reduce moral hazard and total health care costs compared to universal mandatory coverage.

Germany is the only Bismarkian-country with a two-option scheme. In fact, the mandate to purchase coverage from competing insurers is universal only for long-term care and restricted to low- and middle- income groups for a broad range of services including palliative care and spa (see Table 3b). The German two-option scheme effectively prevents free riding and lack of foresight; increases the responsiveness to consumers' preferences and it reduces moral hazard compared to universal mandatory health insurance for a uniform set of basic services; and it does not affect the affordability of health care coverage for low-income and high-risk groups given that they are cross-subsidised by the high-income (apart from the top 10 percent high-income groups) and low-risk groups (ie. income-related contributions and risk-related subsidies).

In other countries such as the United States, mandatory coverage for most services is quite fragmented across income and risk groups. For instance, mandatory coverage for long-term care, rehabilitative physiotherapy and prescription drugs applies only to certain income groups and differs by State (ie. Medicaid beneficiaries). Therefore, high-risk individuals (ie. people above 65 years eligible for Medicare), who are not eligible for Medicaid, have to rely on voluntary coverage for these services if they can afford it. Since the likelihood that low-risk individuals would buy voluntary coverage for long-term care and prescription drugs in a competitive insurance market is low, an adverse selection spiral is likely to occur (Desmon *et al.*, 2006; Ettner, 1997; Wolfe and Goddeeris, 1991). For these services, policymakers are considering introducing a universal mandatory coverage provision for a uniform package of services (Steinbrook, 2006).

3.4. CONCLUSIONS

This chapter discusses the conformity of the actual design of nine OECD countries' health care financing schemes with the economic arguments for mandatory cross-subsidies and for mandatory coverage.

Many countries (eg. Australia, Belgium, France and Isreal) opted for the introduction of universal mandatory coverage for a comprehensive and uniform package

of services. As discussed in chapter 2, this measure is not *per se* necessary and proportionate to achieve affordable access to (the coverage of) health care services for vulnerable groups. In conformity with the economic rationales, mandatory coverage could be fine-tuned according to the individuals' available income. Governments may consider the following alternatives to universal mandatory coverage: the two-option scheme and the single-option scheme with voluntary income-related deductibles. Although the latter scheme may be preferable from an economic perspective, it is not implemented in any of the considered countries. Only the Netherlands and Switzerland come close to this type of scheme given that they have implemented a single-option scheme with traditional deductibles (fixed amounts), and with income-related copayments for long-term care in the Netherlands. As far as the two-option scheme is concerned, it is implemented in Germany and Ireland. The high-option scheme (ie. for low-income people) appears to be too broad in the Germany and too small in Ireland. In Germany, it includes services like spa for which the arguments for mandatory coverage are particularly weak (eg. moral hazard). Moreover, for services such as ambulatory care the percentage of individuals who may opt-out from the high-option scheme is only 10 percent (ie. the highest income groups). Given the relatively low costs of GP care and its relatively high price-elasticity, the government may consider to lower the income threshold or to introduce income-related copayments/deductibles for ambulatory care as for hospital care, prescription drugs and rehabilitative physiotherapy. In Ireland, the mandatory coverage provision for ambulatory care and prescription drugs applies only to 30 percent of the population. Considering that the price-elasticity of prescription drugs is relatively low and their costs high, the mandatory coverage provision for expensive drugs could be extended to everyone.

Apart from Australia and Belgium, in all other countries the coverage or the access to long-term care is subsidised and mandatory for everyone. In Australia the only way for individuals to benefit from cross-subsidisation for home care is to purchase voluntary health insurance. In the Australian voluntary health insurance market there is a combination of explicit (risk-equalisation) and implicit (community-rating, 30 percent premium rebate and lifetime cover) cross-subsidies. Although the market is extensively regulated and subsidised, the combination of explicit and implicit cross-subsidies does not seem to have tackled appropriately the adverse selection problems (Butler, 2007; Connelly *et al.*, 2006). In the long-run the combination of a poor quality risk-equalisation scheme (ie. two age-bands) with community-rating is likely to create incentives for risk-selection in the Australia voluntary health insurance market (van de Ven *et al.*, 2000). In Australia alternative care and home care are considered equally with respect to cross-subsidies, ie. individuals who want to benefit from subsidisation for the coverage of these services have to buy voluntary

insurance. Given that the effectiveness of alternative care is not scientifically proven, its costs relatively low and subsidies-induced moral hazard high compared to home care services, the economic rationale for mandatory cross-subsidies is stronger for home care than for alternative care.

Home care in Belgium is excluded from the system of mandatory cross-subsidies although coverage is mandatory for everyone. In presence of mandatory coverage for home care, the absence of cross-subsidies may be related to the fact that the level of price-competition in the Belgian health insurance market is moderately low. In fact, a mandatory coverage provision may be sufficient to guarantee subsidisation for home care between low-risk (ie. young) and high-risk (ie. old) individuals if the level of price-competition in the insurance market is low. Although organising cross-subsidies implicitly via a mandate to purchase coverage might be effective in the short term, it may not be a stable solution, particularly in the context of an ageing society (ie. the percentage of old people increasing faster then birth-rates). If the level of price-competition increases in the market, the premium for home care for low-risk (ie. young) individuals would approach zero and insurers would no longer be able to implicitly subsidise high-risk (ie. old) people. An effective long-term solution might be to introduce explicit risk-adjusted subsidies for home care in Belgium.

Interestingly in these countries the financial access to ambulatory care is subsidised for those people for who home care is not subsidised. Given that the costs per consumer of ambulatory care are lower than home care, the introduction of a system of cross-subsidies for home care is likely to satisfy altruistic preferences more effectively than for ambulatory care.

4.

The potential for risk-rating in competitive markets for supplementary health insurance: an empirical analysis

SUMMARY Many countries are considering the option of reducing the share of mandatory basic health insurance (BI) and to increasingly rely on voluntary supplementary health insurance (SI) schemes to cover health care expenditures. In theory, competitive markets for SI tend to risk-rated premiums. After discussing the determinants of risk-rating in competitive SI markets, we estimate the potential for risk-rating due to the transfer of benefits from BI to SI coverage. For this purpose, we simulate several scenarios in which benefits covered by BI are transferred to competitive markets for SI. We use a dataset from one of the largest insurers in the Netherlands, to calculate the potential premium range for SI resulting from this transfer. Our findings show that, by adding risk-factors, the minimum SI premium decreases while the maximum increases. Moreover, we observe that risk-rating primarily affects the maximum premium. The magnitude of the premium range is especially substantial for benefits such as medical devices and drugs. For these services the potential consequences of risk-rating in terms of access to affordable insurance coverage may be considered not "socially acceptable", since they result in high SI-premiums for certain risk/income groups. Therefore, when transferring benefits from BI to SI policy makers should be aware of the implications for the affordability of insurance coverage.

CHAPTER 4

4.1. INTRODUCTION

In the previous chapter, we argued that most OECD countries implement mandatory cross-subsidisation either implicitly (eg. through community-rating) or explicitly (eg. through risk-adjusted premium subsidies and/or taxation) with the purpose of providing (the coverage for) a wide range of benefits to most individuals at an affordable price (ie. solidarity). For instance, countries with a National Health Service (NHS) system finance health care mainly via taxation and open access to health care facilities to all nationals (Colombo and Tapay, 2004). Countries with a competitive market for mandatory basic health insurance (BI) adopt a risk-equalisation scheme with premium rate restrictions (eg. community-rating) and open enrolment (van de Ven *et al.*, 2003).

Conversely, in most voluntary supplementary health insurance (SI) markets these institutional and regulatory arrangements are formally absent. In the long run, the absence of these legal constraints may induce insurers to risk-rate premiums and thereby increase their competitiveness and profits in competitive SI markets. In this chapter, we address the following questions:

- Why and to what extent do insurers risk-rate premiums in SI markets?
- What is the potential for risk-rating caused by transferring benefits from BI to SI coverage?

In order to answer these questions, we provide an empirical illustration of the transition from community-rated to risk-rated premiums in SI markets. We hypothesise that this transition would naturally occur in competitive SI markets without premium rate restrictions.

This chapter is organised as follows. First we discuss the equivalence principle and the rationale for risk-rating in competitive SI markets. Then the methodology and the data used in the econometric analysis are briefly described. In particular, we simulate several scenarios in which benefits covered by BI (community-rating) are transferred to SI (risk-rating). And we calculate the potential premium range resulting from this transfer in order to quantify the potential gains of risk-rating for insurers relative to community-rating. Finally, we discuss the conclusions and the policy implications.

4.2. THE SOLIDARITY AND EQUIVALENCE PRINCIPLES

A major problem of competitive markets for SI, although they may stimulate insurers to be more efficient and more responsive to consumer preferences, is the "apparent

incompatibility" between the solidarity and equivalence principles. The solidarity principle implies that low-risk or high-income individuals subsidise high-risk or low-income individuals with the aim of achieving an affordable access to health insurance coverage. The equivalence principle refers to the fact that, without external interventions, a competitive health insurance market may tend to risk-adjusted premiums. It might be argued that solidarity could be achieved by a system of implicit cross-subsidies where insurers would accept predictable losses on the contracts of high-risk individuals and compensate these losses with predictable profits made on the contracts of low-risk individuals. However, implicit cross-subsidisation cannot be financially sustainable in a competitive insurance market (van de Ven *et al.,* 2000). Since competition minimises the predictable profits per contract, insurers have to break even on each contract and therefore apply the equivalence principle, either by adjusting the premium to the consumer's risk (premium differentiation) or by adjusting the accepted risks to the premiums (risk-selection). While for automobile, burglary and fire insurance these consequences appear to be "socially acceptable", for health insurance this may not be the case (Schokkaert and Van de Voorde, 2004).

For instance, consider the case of unregulated competitive health insurance markets dominated by insurers that community-rate their premiums (eg. private health insurance in the Netherlands before 2006). In this context, those insurers that introduce risk-rating (with easily available risk factors such as age and gender)[1] would immediately gain a competitive advantage *vis à vis* insurers that adopt community-rated premiums. The competitive advantage of risk-rating insurers consists of their increased attractiveness for low-risks. In fact, low-risks would crowd the cheaper risk-rating insurers. As a result, in the absence of compensation schemes for high-risk individuals community-rating insurers would be forced either to follow risk-rating insurers or to increase their community-rated premiums. In the latter case, they most likely will be faced with an adverse selection spiral, which will force them to exit the market.

1. Throughout this chapter, we consider gender as a potential risk factor given that insurers may use it to risk-rate premiums in several countries' private voluntary health insurance markets. In accordance with EC-law, the Council Directive 2004/113/EC of December 2004, adopted to implement the principle of equal treatment between men and women in the access to and supply of goods and services (Article 13 of the EC-Treaty), establishes that Member States may decide "to permit proportionate differences in individuals' premiums and benefits where the use of sex is a determining factor in the assessment of risk based on relevant and accurate actuarial and statistical data", which must be regularly updated and made public (Article 5(2), Directive 2004/113/EC). An example of gender-based premium differentiation outside the EU is South Africa (Armstrong *et al.*, 2004). In any case, forbidding the use of gender as a risk factor would not affect significantly the premium range relative to the other risk factors, ie. age and health status.

In this chapter, we mainly focus on risk-rating and, in particular, on its determinants and its effects on the affordability of insurance coverage.

4.3. THE DETERMINANTS OF THE LEVEL OF RISK-RATING

In this section we discuss a conceptual framework in order to discern the determinants of the insurers' incentives for risk-rating in competitive SI markets. Insurers' choice regarding whether and to what extent to adopt risk-rated premiums in these markets is influenced by several factors, which may be distinguished in two main categories: 1) exogenous factors, that cannot be influenced by insurers' actions such as the level of competition, the consumers' willingness to switch and the regulatory framework; and 2) endogenous factors, that can (to some extent) be affected by insurers' behaviour such as transaction costs of risk-rating, self-regulation and the choice of risk-adjusters in SI markets.

4.3.1. Level of competition
The degree of competition and contestability in SI markets is a crucial element in order to assess whether there are incentives for risk-rating. The most common indicators used to measure the degree of competition and contestability in the marketplace are the price-sensitivity, the market share of the (potential) insurers,[2] and the consumers' switching rate. In general, highly competitive and contestable markets increase the incentives for insurers to risk-rate premiums. If insurers (partially or completely) bear the financial risk, the greater the degree of competition in the market the less likely it is for insurers to survive without risk-rating premiums. In fact, insurers choosing not to compete with risk-rated premiums may lose market share to insurers who actually risk-rate, and thereby worsen the average risk profile of the individuals in their pool. This may lead to excessive and unsustainable expected costs mainly due to the low-risk individuals' crowding-out effect, and thereby it may force insurers to exit the market.

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2. If available, the preferable indicator of firms' market power is the relevant price-sensitivity, since it directly provides information about the shift in the (incumbent or new entrant) firms' market shares due to price-variations. Market shares as such are more crude proxies of firms' market power (often adopted by Antitrust Authorities as indirect indicators, when data on price-sensitivities lacks). They can be measured at the level of the individual firms on the "relevant market" in order to establish the market dominance of each firm. Alternatively, concentration ratio's (CR8, CR4 and the Hirschman-Herfindahl index) report the aggregated market share of the largest firms in the market. If market shares are not decisive, the competitive advantage of the dominant firm should be taken into account including entry barriers. Entry barriers are particularly important to determine the degree of contestability of the market.

4.3.2. Consumers' willingness to switch

Whether risk-rating in SI markets is effective for insurers to increase their market share and/or profits depends also on the consumers' willingness to switch SI-provider. In fact, by offering lower premiums insurers would gain market share if and only if consumers were sufficiently sensitive to the price-variation (price-sensitivity) and willing to switch. Some empirical studies (Strombom *et al.,* 2002; Buchmueller and Feldstein, 1997) indicate substantial variation in price-sensitivity related to expected health care costs. For instance younger, healthier individuals are between two and four times more price-sensitive than individuals who are older and who have been recently hospitalised or diagnosed with cancer. Moreover, premium sensitivity is significantly higher for new enrolees (eg. probably younger), suggesting that habit reduces price-sensitivity. The consumers' willingness to switch SI-carrier depend on other factors, which determine the magnitude of the price-sensitivity, such as habit, convenience and the strength of the link between SI and BI providers.[3] These factors should also be taken into account when considering the potential increase in the percentage of low-risk individuals in the insurers' portfolios due to a premium decrease. For instance, if the link between SI and BI carriers is strong, low switching rates in BI markets may lead to low switching rates in SI markets. This is due to the role of SI in health care financing which is relatively less important than BI's and to the fact that a strong link between BI and SI providers may strengthen the consumers' preferences for one stop shopping (ie. joint purchase of BI and SI). In some countries (eg. The Netherlands), low switching rates in BI markets may well explain low switching rates and, in turn, the prevalence of community-rated premiums in SI markets.[4]

4.3.3. Regulatory framework

The level of risk-rating also depends on the regulatory framework. Many countries adopt premium rate restrictions such as community-rating, a ban on certain rating factors, or rate-banding (by class), with the scope of reducing the adverse effects of risk-rating (van de Ven and Ellis, 2000).

Despite the legal obligation of insurers to adopt, for example community-rated premiums within their pool, risk-rating among insurers may still occur indirectly. To the extent that some insurers are successful in attracting the low-risk persons, these selection activities (eg. product differentiation) result in market segmentation, such that the low-risk individuals pay a low premium and the high-risk individuals

3. See chapter 6 for more details on the strength of the links between SI and BI carriers.

4. Switching rates in the Dutch BI market increased by 18 percent after the introduction of the new Dutch national health insurance scheme in January 2006. In the coming years, this may lead to an increase in the SI's switching rates, given that BI and SI are linked (see chapter 6).

pay a very high premium - if they are able and willing to do so. That is, market segmentation leads to premium differentiation among insurers (not within the same insurer). An example of market segmentation caused by legally mandatory open enrolment and community-rating per insurer, is South Africa's private health insurance market. Given that age profiles differ considerably among insurers, the maximum community-rated age-related per capita expected costs per insurer are four times the minimum (Armstrong *et al.*, 2004). In sum, premium rate restrictions (and open enrolment) create incentives for selection, which may threaten access to affordable health insurance coverage.

4.3.4. Transaction costs

In a competitive market for SI, transaction costs may inhibit risk-bearing insurers from adjusting their premiums to an individual's expected costs (Newhouse, 1996). Transaction costs refer for example to the overall administrative and marketing expenses incurred by SI providers, or they may simply refer to the costs involved in the risk-rating process, such as the elaboration, distribution, collection and processing of health questionnaires. Questionnaires are useful tools for gaining specific and detailed information on individuals' health status, which is an accurate predictor of individuals' expected costs (van de Ven *et al.*, 2004). The widespread utilisation of health questionnaires suggest that in unregulated competitive SI markets the level of transaction costs does not preclude insurers from using questionnaires to risk-rate premiums (or to risk-select).

4.3.5. Self-regulation

Another reason for insurers not to risk-rate premiums in the short-term and to maintain premiums at an acceptable level for Society (ie. community-rated premiums) may be to avoid government intervention in SI markets. In response to insurers' risk-rating, governments may decide to introduce regulatory constraints on premium setting in SI markets or to transfer benefits from SI to BI coverage. In order to avoid government intervention, insurers may prefer to self-regulate in the short-term, ie. not to engage in price-competition. Nevertheless, in the medium/long term incentives to undercut (raise) the premiums of low-risk (high-risk) individuals may increase, given the potential profits (losses) insurers may make by attracting them.

4.3.6. Choice of risk-adjusters

Insurers' decision concerning whether to implement risk-rated premiums in SI markets depends considerably on the choice of risk-adjusters that effectively represent good predictors of individuals' future health care expenditures. There are a number of factors that influence the choice of risk-adjusters.

First, an essential pre-condition to risk-rating is that the relevant information about individuals' risk profiles can be collected routinely at reasonable costs. The data necessary to construct risk-adjusters usually can be obtained by requiring applicants to fill in health questionnaires. Contrary to regulated BI markets where the law usually forbids or imposes severe restrictions to the use of health questionnaires, in most countries' SI markets insurers are relatively free in adopting them (as discussed in chapter 6).[5] Insurers may use this information to predict new applicants' and existing enrolees' future health expenditures.[6]

A *second* element is the stability of a potential risk factor. Insurers may tend to give priority to the use of risk factors that are stable in time. Using very volatile risk-adjusters may cause dramatic and unstable differences in the premiums, which may be very difficult for consumers to accept.[7] For instance, the use of 1-year DCGs (ie. Diagnostic Cost Groups) as a risk factor results in premiums which depend on whether one has been hospitalised in the previous year. Therefore, the premium in period t would increase dramatically in case of hospitalisation in period t-1. Whereas, at t+1 the premium would decrease to the t-1 level assuming that no hospitalisation occurred in period t. The use of 3-year or 5-year DCGs mitigates the volatility of this health status indicator and increases the predictability of the models (Lamers and van Vliet, 1996). Nevertheless, the use of this adjuster may be very costly since it may require frequent repetitions of the risk classification process. All in all, the use of risk-adjusters that reflect chronic conditions (such as PCGs, Pharmaceuticals Cost Groups) may be preferable for insurers given that their effect on the premium variation is in principle less volatile, at least in the short-term.

A *third* important factor is the profitability of (further) risk-rating. In order to establish whether or not a risk-adjuster produces financial gains, rational insurers consider two elements: 1) the specific risk-adjuster's contribution to the variation in the premium range; 2) the variation in the percentages of individuals (frequency) in

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5. The choice of risk-adjusters is considered as an endogenous determinant of the level of risk-rating, since health questionnaires are designed by the insurers. Consequently, insurers may influence, at least to a certain extent, the quality of the questions proposed and thereby the quality, in terms of predictive power, of the resulting risk-adjusters.

6. Under the regulatory constraints currently present in the Dutch (and most other countries') SI market, most information about relevant risk-factors may be collected by insurers via health questionnaires. The fact that most risk-factors are observable decreases the possibility (and the consequences) of adverse selection, which in fact appears not to be an issue at least in the Netherlands given that 90% of the population holds SI.

7. In unregulated competitive insurance markets the use of health status indicators as risk-adjusters by insurers is very likely to happen in the long run. Nonetheless, large and sudden fluctuations in the premiums may be difficult to accept for enrolees if these variations are due to a change in health status.

each risk group produced by the introduction of new risk-adjusters. The more substantial the risk-adjuster's contribution to the variation of the premium range and to the variation in the percentage of individuals' identified in each risk cell, the greater would be the effect of risk-rating on insurers' potential profits.

Frequent and large variations in the premiums and in the cells' composition may also cause problems in terms of insurers' reputation *vis à vis* consumers, competitors and governments. Therefore, insurers have to weigh the profitability of risk-adjusters with a *fourth* factor that is the returns/losses of risk-rating in terms of reputation. Particularly for countries with a competitive BI market where a wide variety of benefits are provided by sickness funds or *mutualités*, solidarity in terms of affordability and accessibility of insurance coverage is a very sensitive issue. Moreover, not-for profit entities operating in the BI market are often linked to SI providers, which increases the (potential) spillover effects in terms of reputation. BI providers linked to a SI provider may deteriorate their reputation *vis à vis* the government, consumers and other insurers, which may lead to important losses both in terms of volumes and finances. On the other hand, BI/SI providers may exploit risk-rating in SI markets also as a tool for risk-selection in the BI market (with community-rated premiums) (see chapter 6). Whether the losses in terms of reputation for BI providers due to risk-rating by the linked SI entities outweigh the profits produced by both risk-rating (in the SI market) and by induced risk-selection (in the BI market) is crucial to predict insurers' behaviour. So to the extent that risk-adjusters can be collected at a reasonable cost, insurers (BI and SI providers) face a trade-off between the profitability of risk-rating and its potential losses in terms of reputation.

4.4. METHODS

Consistent with the observed trend that benefits of the mandatory basic health insurance (BI) are transferred to voluntary supplementary health insurance (SI),[8] we simulate a scenario in which certain benefits, covered by BI, are transferred to SI coverage. Since in BI markets premiums are community-rated by legislation, the transfer of benefits to an unregulated competitive SI market may lead insurers to risk-rate premiums. In order to calculate the expected risk-rated premiums, we apply ordinary least squares (OLS) to individual's annual health care expenditures (Y) relative to different benefits packages:

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8. Since January 2004, BI in the Netherlands no longer covers for the costs of physiotherapists and dentists for adults; of the first in-vitro fertilisation treatments (IVF); of the contraceptive pill for women older than 21 years; and of taxi transport of sick people to the doctor. Psychotherapy was limited to 30 treatments (Van Kolfschooten, 2003).

$$Y = \beta X + \varepsilon.$$

Where Y can be:

1. Y_1 = the total health care expenditures of the "2002 SI benefits package";
2. Y_2 = the total expenditures (=SI+BI expenditures) for dental care;
3. Y_3 = the total expenditures (=SI+BI expenditures) for paramedic care;
4. Y_4 = the total expenditures (=SI+BI expenditures) for medical devices;
5. Y_5 = the total expenditures (=SI+BI expenditures) for pharmaceuticals;
6. Y_6 = the total expenditures for the "complete SI benefits package" (=$Y_2+Y_3+Y_4+Y_5$).

The expected premiums can be calculated for all subgroups that follow from the different risk factors (X) included in the estimated regression equation above.

In the simulations, we calculate the community-rated premium (average premium), and the maximum and the minimum expected premium [E(Y)=$\hat{\beta}$X] that insurers would obtain by adjusting the benefits' costs to different risk factors (Xs) such as age, gender, diagnostic cost groups (DCGs) and pharmaceutical cost groups (PCGs) for each of the benefits (packages). The obtained premium range, that is the absolute difference between the maximum and the minimum risk-based premiums, is confronted with the community-rated premium. This allows us to quantify the potential gains of risk-rating and discuss the potential implications for solidarity. The main reason for applying OLS instead of two-part models to compare, for each benefits package, the premium range with the community-rated premium across different models is that it corresponds to a realistic simulation of health insurers' practice. To all dependent variables we apply a simple demographic model (Model 1) characterised by 16 age*gender dummies (independent variables), a demographic model plus a dummy for DCGs (Model 2), a demographic model plus a dummy for PCGs (Model 3) and a demographic model plus two dummies for DCGs and PCGs (Model 4). We consider different models with the purpose of evaluating whether the gradual introduction of risk factors affects the premium range, and thereby the affordability of health insurance coverage. The community-rated premium, the minimum and the maximum expected premiums are the result of a multiple regression analysis, not of cell-based averages.

We considered these benefits since in several countries policy-makers have already excluded (some of) them from the basic package covered by mandatory health insurance. This is particularly the case for dental and paramedic care and medical devices, whereas pharmaceuticals are (still) covered by BI in most countries. Since prescription drugs are partly covered by Medigap (the Medicare supplemental insurance) in

the US (Uccello and Bertko, 2003; Laschober *et al.*, 2003),[9] we decided to include them in the analysis to show the potential implications of risk-rating.

4.5. DATA

The empirical analysis in this study is based on a dataset issued by one of the largest insurers in the Netherlands (AGIS), concerning about 1.5 million Dutch insured. We concentrate our analysis on a sub-sample of about 0.5 million individuals holding identical coverage for both BI and SI. Table 4a presents the dependent and independent variables along with means and standard deviations used in our regressions.

The dataset contains demographic information on the enrolled members, such as sex, date of birth, zip code, and eligibility. For each enrolee the dataset comprises administrative information on hospitalisations, prescription drugs' consumption and health care expenditures. The annual per person health care expenditures include the costs (2002) paramedic care, dental care, medical devices, pharmaceuticals and other care (ie. inpatient and outpatient specialist care, general practitioner (GP) care, ambulatory care etc.). All cost data refer to actual charges.

For each hospital admission in 2001, the diagnosis is known in the form of the relevant code from the International Classification of Diseases, ninth edition, Clinical Modification (ICD-9-CM). According to these diagnoses, individuals are classified in a Diagnostic Cost Group (DCG) on an annual basis, which are based on inpatient hospital information for certain chronic diseases. Patients were assigned, analogous to the DCG model by Pope *et al.* (2000), to a DCG according to inpatient diagnostic information. Thus, based on clinical similarities and the amount of hospitalisations, the ICD-9-CM codes (about 15.000) were clustered in 172 groups of diagnosis (DxG) as specified in Pope *et al.* (1999). In order to adjust the model to the Dutch Healthcare System a team of medical experts reviewed the diagnosis groups and excluded 105 of the 172 groups. About 25 percent of the people that were hospitalised are assigned to a DCG. Pharmacy Cost Groups (PCGs) are based on outpatient pharmacy information for certain chronic diseases. Patients were assigned to a PCG, when more than 180 daily drug dosages (DDD) were prescribed for one year. Only about 12 percent of the prescribed drugs are used for the PCGs. Patients are assigned only to 1 PCG or 1 DCG, ie. the most expensive. DCGs and PCGs may not be the sole information insurers

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9. No Medigap policies sold after January 1, 2006 include drug coverage. People can only buy prescription drug coverage through the new Medicare Part D prescription drug plans. If people did not join a drug plan during the initial enrolment period (November 15, 2005 and May 15, 2006), they can join during the annual enrolment period between November 15th and December 31st of each year, and they will have to pay a penalty (see www.calmedicare.org/drugs/mpdc/guide/medigap.html).

Table 4a. Descriptive Statistics

Variables	Mean*	Standard Deviation (SD)*
*Cost in year 2002 (in €)**		
2002 SI BP [a]	75	248
Dental (SI+BI)	83	188
Paramedic (SI+BI)	70	226
Medical devices (SI+BI)	76	468
Pharmaceuticals (SI+BI)	309	972
Other care (SI+BI)	284	1073
SI BP [b]	538	1248
Independent variables		
Age (years)	40	23
Female (%)	56	0.5
In a PCG group year 2001 (%)	8.5	0.3
In a DCG group year 2001 (%)	2	0.5
Number of individuals 545366		

* All the cost variables, including the means and the standard deviations, reported in this table represent the sum of BI and SI health care expenditures per SI benefit or benefits package in year 2002, ie. SI BP.
[a] The "2002 SI Benefits Package (2002 SI BP)" includes dental care (36 per cent of the total dental care expenditures), paramedic care (10 per cent), medical devices needed for disability (5 per cent), pharmaceuticals (4 per cent), home care for pregnant and elderly people (10 per cent), alternative care (100 per cent), and cross-boarder care obtained for temporary stay (max 60-90 days) (100 per cent). We did not consider home, alternative and cross-boarder care in our estimations given that they are not frequently used on average.
[b] In the "complete SI Benefits Package (SI BP)" we included the total expenditures (BI+SI) of dental care, paramedic care, medical devices and pharmaceuticals.

actually use in risk-rating premiums, they may for instance use DBCs (ie. *Diagnose Behandeling Combinatie* which means Diagnosis Treatment Combination) instead of DCGs or other variables such as region of residence, ethnicity etc.

4.6. RESULTS

4.6.1. The potential gains of risk-rating in competitive supplementary health insurance markets

This section presents the estimations results' providing an indication of the potential gains of risk-rating for insurers in SI markets. In general, we found that for most

benefits (packages) the implementation of a "simple" demographic risk-rating model has an important impact on the premium range. The potential gains of risk-rating are particularly substantial for the "complete SI benefits package", where the risk-rated premium range from 146 euros (minimum) to 1276 (maximum) euros and the community-rated premium is only 538 euros. That is the highest risk group pays 700 euros extra per year. The benefits that primarily contribute to this result are pharmaceuticals and medical devices (see Table 4b). If insurers gradually add risk-adjusters in the calculation of SI premiums, the premium range increases for all benefits (packages),[10] and thereby the potential reduction of solidarity becomes more serious. Particularly for the "complete SI benefits package", where the maximum (minimum) premiums for the risk-rating Models 2-3-4 are respectively 2581 (138), 2302 (132) and 3239 (127) euros, the implementation of additional risk factors substantially increases the potential gains of risk-rating. For instance, in case insurers risk-rate using the demographic plus the DCGs and PCGs dummies (that is the model with all available risk factors), the highest risks pay 2701 euros per year more than under community-rating, while the lowest risks save 411 euros. Again, the benefits that primarily contribute to these results are medical devices and pharmaceuticals (see Table 4b & 4c).

Considering only medical devices, the premium range of the demographic plus DCGs model (16; 608 euros) doubles the premiums range resulting from the demographic model (17; 299 euros). Also the premium range resulting from the demographic plus PCGs model (12; 483) increases in comparison to that of the less sophisticated demographic model but the effect of DCGs appears to be greater. In case insurers risk-rate by using the complete set of risk factors (Model 4), the premium range further widens (12; 723), that is the highest risk groups would have to pay about 640 euros more than in case of community-rating (76 euros).

For pharmaceuticals the estimation results suggest that the potential gains of risk-rating may be even more substantial. The premium range for the demographic plus DCGs (51; 1690) and the demographic plus PCGs (40; 1560) models is double that of the demographic model (57; 813). The use of the complete set of risk-adjusters produces a further growth in the premium range (38; 2175), which means that the highest-risk groups would have to pay 1900 euros more than in case of community-rating.

Compared to other benefits (packages), the potential gains of risk-rating for dental care and paramedic care are quite limited. The premium range resulting from the use of the demographic model is 108 euros for dental care and 158 euros for paramedic

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10. For all benefits (packages), the more insurers risk-rate the higher (lower) is the maximum (minimum) premium paid by the highest (lowest) risk-groups. Moreover, the increase in the maximum premium produced by the use of additional risk-adjusters is much larger than the decrease in the minimum premium.

care. Considering that the community-rated premium is 83 and 70 euros respectively, the increase in premium resulting from demographic risk-rating is at most 50 euros for dental care and 106 euros for paramedic care. Moreover, if insurers add risk-adjusters in the calculation of SI-premiums, the variation in the premium range for dental care is minimal: from 108 euros if insurers use demographic risk-rating (Model 1) to 116 euros if they use the complete set of risk-adjusters (Model 4). For paramedic care the potential gains of further risk-rating are slightly more substantial than for dental care but smaller than for other benefits. The premium range varies from 158 euros if insurers use Model 1 to 299 euros if they adopt Model 4 (see Table 4b & 4c).

4.6.2. Will insurers risk-rate in practice?

In competitive and unregulated SI markets, where consumers are sensitive to price-variations and transaction costs are relatively low, the insurers' choice regarding whether and to what extent to risk-rate premiums, depends on the predictive power of the risk-adjusters. In particular, insurers may decide whether or not to (further)

Table 4b. Community-rated premiums (CRP) vs Risk-rated premiums (RRP)

Risk-factors	Benefits					
	2002 SI BP	Dental Care	Paramedic Care	Medical devices	Pharmaceuticals	Complete SI BP
	CRP=75*	CRP=83	CRP=70	CRP=76	CRP=309	CRP=538
Model 1 (Demographic)	Min RRP= 6	Min RRP= 35	Min RRP= 18	Min RRP= 17	Min RRP= 57	Min RRP= 146
	Max RRP= 125	Max RRP= 143	Max RRP= 176	Max RRP= 299	Max RRP= 813	Max RRP= 1276
	SD = 30	SD = 29	SD = 41	SD = 84	SD = 238	SD = 341
Model 2 (Demographic / DCGs)	Min RRP= 6	Min RRP= 29	Min RRP= 18	Min RRP= 16	Min RRP= 51	Min RRP= 138
	Max RRP= 135	Max RRP= 143	Max RRP= 281	Max RRP= 608	Max RRP= 1690	Max RRP=2581
	SD = 30	SD = 29	SD = 44	SD = 95	SD = 273	SD = 392
Model 3 (Demographic / PCGs)	Min RRP= 6	Min RRP= 31	Min RRP= 17	Min RRP= 12	Min RRP= 40	Min RRP= 132
	Max RRP= 130	Max RRP= 143	Max RRP= 231	Max RRP= 483	Max RRP= 1560	Max RRP= 2302
	SD = 30	SD = 29	SD = 45	SD = 104	SD = 357	SD = 484
Model 4 (Demographic / DCGs / PCGs)	Min RRP= 6	Min RRP= 27	Min RRP= 13	Min RRP= 12	Min RRP= 38	Min RRP= 127
	Max RRP= 138	Max RRP= 143	Max RRP= 314	Max RRP= 723	Max RRP= 2175	Max RRP= 3239
	SD = 30	SD = 29	SD = 47	SD = 110	SD = 369	SD = 506

* Units are in euros per year.

Table 4c. Complete SI BP

Variables	Model 1 (Demographic)			Model 2 (Demographic/DCGs)			Model 3 (Demographic/PCGs)			Model 4 (Demographic/PCGs/DCGs)		
	Parameter Estimate	Standard Error	Pr > |t|	Parameter Estimate	Standard Error	Pr > |t|	Parameter Estimate	Standard Error	Pr > |t|	Parameter Estimate	Standard Error	Pr > |t|
Intercept	174,43	7,44	<,0001	163,70	7,34	<,0001	154,08	7,11	<,0001	147,10	7,05	<,0001
male 10-19	50,15	10,38	<,0001	56,18	10,24	<,0001	46,54	9,92	<,0001	51,37	9,83	<,0001
male 20-29	15,54	9,38	0,0975	21,63	9,25	0,0194	9,57	8,96	0,2855	14,58	8,88	0,1005
male 30-39	124,78	9,39	<,0001	128,17	9,26	<,0001	102,13	8,97	<,0001	106,09	8,89	<,0001
male 40-49	310,10	10,20	<,0001	303,66	10,06	<,0001	255,16	9,75	<,0001	253,56	9,66	<,0001
male 50-59	514,44	10,62	<,0001	482,61	10,47	<,0001	400,95	10,15	<,0001	383,46	10,07	<,0001
male 60-69	681,32	10,82	<,0001	617,85	10,69	<,0001	473,84	10,38	<,0001	437,83	10,29	<,0001
male 70+	997,13	10,63	<,0001	886,83	10,52	<,0001	612,40	10,29	<,0001	551,28	10,22	<,0001
female 0-9	-28,03	10,64	0,0084	-25,35	10,49	0,0157	-21,33	10,16	0,0358	-19,69	10,08	0,0506
female 0-19	99,85	10,50	<,0001	107,24	10,35	<,0001	101,61	10,03	<,0001	107,17	9,94	<,0001
female 20-29	123,59	9,24	<,0001	129,52	9,12	<,0001	114,97	8,83	<,0001	120,03	8,75	<,0001
female 30-39	224,84	9,05	<,0001	227,87	8,93	<,0001	200,50	8,65	<,0001	204,29	8,57	<,0001
female 40-49	380,57	9,50	<,0001	374,21	9,37	<,0001	322,72	9,08	<,0001	321,35	9,00	<,0001
female 50-59	551,77	9,71	<,0001	530,70	9,58	<,0001	452,49	9,29	<,0001	442,38	9,21	<,0001
female 60-69	712,65	9,99	<,0001	666,91	9,86	<,0001	543,43	9,57	<,0001	518,67	9,49	<,0001
female 70+	1101,70	9,25	<,0001	1019,04	9,15	<,0001	774,37	8,95	<,0001	730,92	8,88	<,0001
DCGs				1398,31	11,22	<,0001				1069,63	10,88	<,0001
PCGs							1374,00	6,00	<,0001	1290,94	6,01	<,0001

risk-rate premiums on the basis of the potential financial gains produced by the introduction of different (new) risk factors. *Ceteris paribus*, the profitability of (further) risk-rating depends on the specific risk-adjusters' contribution to the variation in the premium range and on the percentage of individuals (frequency) in each risk group produced by the introduction of (new) risk-adjusters.[11] The more substantial the risk-adjusters' contribution is to the variation of the premium range and to the variation in the percentage of individuals' identified in each risk cell, the greater the insurers' propensity to risk-rate SI premiums is in practice. For instance, the rather small effect of different models on the variation in the premiums range relative to the "2002 SI benefits package", which is mainly due to the limited benefits covered, may generate a small incentive for risk-rating. This is also reflected by the widespread use of community-rated premiums in countries' unregulated competitive SI markets where SI coverage is limited to few (luxury) benefits (eg. the Netherlands) (Schut *et al.*, 2004). The prevalence of community-rated premiums in the Dutch SI market may be also justified by the long tradition of social health insurers (sickness funds) dominating the market and the low consumer mobility in the BI market (until 2005) combined with a strong link between SI and BI (Laske-Aldershof and Schut, 2005; Laske-Aldershof *et al.*, 2004). Insurers' propensity towards risk-rating may change due to the introduction of the new Health Insurance Act in January 2006. In particular, the Health Insurance Act abolished the distinction between sickness funds and private health insurers and transferred several benefits from BI to SI coverage. Therefore, in the coming years the presence of commercial-oriented insurers, the higher degree of competition in the market, the substantially increased mobility in the BI market (from 3 percent in 2005 to 18 percent in 2006), which is likely to increase the mobility in the SI market due to strong links between SI and BI carriers, and the increased broadness of the SI benefits package may induce insurers to risk-rate SI premiums.

In this section, we focus on the "complete SI benefits package" since it shows the largest premium range variations for the four models simulated. For this particular benefits package we present the variations in the percentages of individuals in each risk cell produced by the introduction of (additional) risk-adjusters. The purpose is to discern whether and to what extent insurers would have incentives to risk-rate in a competitive unregulated SI market, characterised by price-sensitive consumers and by low transaction costs (eg. risk-adjusters are available routinely at reasonable costs).

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11. In order to provide a "prediction" of the profitability of risk-rating, the difference between expected expenditures in each risk-cell and the community-rated premiums may be considered. Simulation techniques that take into account also the differences in price-sensitivity may be adopted to predict the number of individuals moving (ie. switchers). We thank a referee for bringing up this point.

As shown in Table 4d, insurers risk-rating premiums according to a "simple" demographic model may gain a substantial competitive advantage towards insurers adopting community-rated premiums (538 euros). In fact, the percentage of low-risk consumers attracted by the lower risk-rated premiums is around 55 percent,[12] whereas consumers with higher than average risk profiles (about 45 percent) may prefer the lower community-rated premiums. In the long run, the (potentially) substantial crowding-out of low-risks from community-rating insurers may seriously endanger their financial sustainability. The high proportion of high-risks due to the 'departure' of low-risks reduces the implicit cross-subsidisation realised by community-rated premiums (equivalence principle). Therefore, community-rating insurers may be forced 'sooner or later' to risk-rate premiums in order to survive in the market. All in all, the substantial variations in the premium range and in the percentage of (new) low-risk individuals attracted by the lower premiums increase the insurers incentives to shift from community-rating to risk-rating SI premiums according to age and gender dummies. Risk factors such as age and gender are easily available at reasonably low costs and forbidding the collection or the use of this type of information by insurers can be potentially very onerous for the regulator. Therefore, risk-rating premiums by means of age and gender dummies appear to be quite feasible.

Insurers may decide to further risk-rate premiums in order to attract new members by adding to the demographical model risk-adjusters such as DCGs and/or PCGs (models 2, 3, 4). From Table 4d, we observe that by adding the DCGs dummy the percentage of (new) low-risk individuals (55 percent) does not vary from that of the demographic model. That is, insurers do not gain any competitive advantage towards insurers that risk-rate adopting only age and gender dummies. Whereas, the introduction of either the demographic plus PCGs model or the demographic plus DCGs and PCGs makes insurers' premiums more attractive for an extra 5-10% low-risk consumers. Whether the relatively marginal increase in the percentage of new (low-risk) potential costumers is considered sufficient for adopting Models 3 and/or 4 depends in practice also on the premium variation relative to community-rated premiums and the effects of risk-rating on the insurers' reputation.

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12. This represents the percentage of individuals that would pay less than 538 euros (community-rated premium) if they switched to insurers adopting a demographic model to risk-rate premiums. In particular, more than the 15% (25%) of enrolees would have a substantial reduction of 338 (238) euros in their premium contribution.

Table 4d. Percentages of individuals (Frequency) in each risk group for the 4 Models

Risk-rated Premiums	Model 1 (Demographic)	Model 2 (Demographic / DCGs)	Model 3 (Demographic / PCGs)	Model 4 (Demographic / DCGs / PCGs)
0-100	0	0	0	0
100-200	17%	17%	17%	22%
200-300	26%	26%	26%	21%
300-400	10%	10%	9%	9%
400-500	5%	5%	11%	11%
500-600	8%	8%	4%	12%
600-700	4%	10%	14%	7%
700-800	7%	4%	2%	0
800-900	10%	5%	0	6%
900-1000	0	0	6%	0
1000-1100	0	4%	0	0.1%
1100-1200	4%	7%	0	0.2%
1200-1300	9%	0	0	0.1%
1300-1400	0	0	0	0.3%
1400-1500	0	0.2%	0	0.6%
1500-1600	0	0.2%	0.4%	0.6%
1600-1700	0	0.3%	0.6%	1%
1700-1800	0	0.3%	0.6%	0.9%
1800-1900	0	0	0.4%	2%
1900-2000	0	0.4%	2%	2%
2000-2100	0	0.4%	2%	0
2100-2200	0	0.3%	2%	2%
2200-2300	0	0	0	0
2300-2400	0	0.2%	3%	0
2400-2500	0	0.7%	0	0
2500-2600	0	1%	0	0
2600-2700	0	0	0	0.1%
2700-2800	0	0	0	0.3%
2800-2900	0	0	0	0.1%
2900-3000	0	0	0	0.3%
3000-3100	0	0	0	0.4%
3100-3200	0	0	0	0
3200-3300	0	0	0	1%
>3300	0	0	0	0

4.7. CONCLUSIONS

The limited level of risk-rating in most SI markets may be attributed to the absence of a strong price-competition, to insurers' strategic choice of abstaining from risk-rating to avoid government intervention, to consumers' limited price-sensitivity and willingness to switch, and to insurers' fear of a loss of reputation. In the short term, in countries where the size of total SI expenditures (compared to BI) and the variation in individual expenditures for SI benefits are small it may not be advantageous for insurers to risk-rate premiums. For instance, Dutch health insurers conceded to the government to provide SI policies at community-rated premiums and to abstain from underwriting for the first 6 months of 2006. This type of commitments may strengthen insurers' reputation and convince the regulator to (further) transfer benefits from BI to SI, given the unchanged premium regime. Therefore, it is likely that refraining from risk-rating could induce governments to transfer benefits from BI to SI coverage. This in turn may result in an increase in the insurers' potential gain of risk-rating. Policy makers, when transferring benefits from BI to SI, should be aware of the potential long-run implications for solidarity because a larger role of unregulated competitive SI markets provides stronger incentives for insurers to risk-rate premiums. Moreover, the ongoing debate in several countries (eg. the Netherlands) on whether to apply premium rate restrictions in competitive SI markets seems to reflect the notion that if competing risk-bearing insurers are free to set their premiums, the premium for high-risks may end up to be so high as to jeopardise their access to supplementary health insurance coverage. A transfer of benefits from BI to SI and the transition from community-rated to risk-rated premiums inherent to competitive SI markets imply in the long run a potential reduction of risk-solidarity (in terms of access to insurance coverage), as shown by the variation of the premium range for the different benefits (packages). For some of the transferred benefits (eg. medical devices and drugs) the premium range of risk-rating may be considered too large and thereby not "socially acceptable", since it implies a substantial reduction of solidarity for certain risk/income groups. For other services (eg. dental care), the premium range is likely to be considered acceptable, given that the reduction of risk-solidarity is quite small. Governments when transferring benefits from BI (community-rated premiums) to SI (risk-rated premiums), have to carefully decide for which benefits (packages) and to what extent (in terms of "allowable" premium variation) solidarity is desired. For services such as medical devices and drugs for which the risk-rated premiums variations are substantial, policy-makers may decide not to transfer these benefits from BI (community-rated premiums) to SI (risk-rated premiums) markets. Although cross-subsidising benefits by keeping them in BI (community-rated premiums) increases solidarity, it may also induce moral hazard (ie. subsidies-induced

overconsumption). So when transferring benefits from BI to SI, governments may face a trade-off between subsidies-induced moral hazard and the reduction of risk-solidarity induced by risk-rating in SI markets. For instance, the (potential) high pre-mium range due to risk-rating may be a reason for Society to consider which specific drugs or medical devices, if any, to transfer to SI coverage and whether to fine-tune BI-coverage with some form of co-insurance (eg. deductibles or co-payments), which is actually already the case in many countries. As discussed in chapter 2, the preferred alternative for the fine-tuning of BI-coverage is the implementation of the single-option scheme with voluntary income-related deductibles.

5.

Solidarity in competitive health insurance markets: analysing the relevant EC legal framework

SUMMARY In this chapter we perform an economic analysis of different regulatory frameworks that aim at achieving solidarity in competitive markets for basic health insurance. Thereafter, we analyse the legal conformity of these intervention strategies with European Community (EC) law. We find that risk-compensation schemes are the first-best intervention strategy because they guarantee an "acceptable level of solidarity" without hindering free trade and competition and without reducing efficiency. Second-best options are premium- and excess-loss- compensation schemes, which guarantee solidarity at the expense of some efficiency. Premium rate restrictions and open enrolment should be avoided because they reduce efficiency and are unnecessary, not proportional and undesirable to the pursuit of the general good. These conclusions are relevant for European Union (EU) countries that adopt premium rate restrictions and open enrolment in combination with a risk-compensation scheme, such as Ireland and the Netherlands. In these countries policy-makers should design the health insurance schemes in conformity with EC-law, eg. by replacing premium rate restrictions and open enrolment with premium- and/or excess-loss- compensation schemes.

CHAPTER 5

5.1. INTRODUCTION

In the previous chapter the apparent incompatibility between the solidarity and equivalence principles was discussed. In particular, we argued that without government regulatory intervention, (implicit) cross-subsidisation cannot be financially sustainable in competitive health insurance markets.

In most European Union (EU) countries with a competitive health insurance market, such as Belgium, the Czech Republic, Germany, Ireland, and the Netherlands, governments or employers have been taking actions to increase solidarity, resulting in a reduction of the level of competition. Since a restriction of competition may reduce efficiency, an increasing number of countries are looking for ways to combine competition and solidarity.

In this chapter, we address the following questions:

- What is the best strategy that governments can adopt to guarantee an "acceptable level of solidarity" in competitive basic health insurance markets from an economic perspective?
- Do the different intervention strategies conform to the European Community (EC) legal framework?

This chapter is organised as follows. First we present an economic analysis of four regulatory interventions aimed at guaranteeing solidarity in competitive basic health insurance markets. Then we describe a legal analysis of the EC legal framework relevant for these markets. Finally we discuss the conclusions and the policy implications.

5.2. GUARANTEEING SOLIDARITY IN COMPETITIVE BASIC HEALTH INSURANCE MARKETS

Four strategies can be discerned to achieve solidarity in competitive basic health insurance markets:

(a) Legal restrictions on competition;
(b) Risk-compensation schemes;[1]

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1. Consistently with the literature, in other chapters of this thesis we used the terms risk-adjustment or risk-equalisation schemes, when referring to mechanisms introduced to equalise the difference in risk profiles among competing insurers via a system of risk-adjusted subsidies. In this chapter, we mainly adopt the term risk-compensation schemes to be consistent with Article 54 of the Insurance Directives (see section 5.3.3.).

(c) Premium-compensation schemes;

(d) Excess-loss-compensation schemes.

These intervention strategies can be applied independently or in combination. In the following subsections, we consider each strategy independently in order to compare them with each other and identify which is the preferred strategy from an economic perspective.

5.2.1. Strategy (a): legal restrictions to free trade and competition

One strategy to achieve an "acceptable level of risk-solidarity" is to regulate competition by introducing premium rate restrictions and open enrolment often together.[2]

Premium rate restrictions can take several forms: community-rating per insurer, a ban on certain rating factors, or rate-banding (by class). In this chapter, we mainly refer to community-rating per insurer, which implies that an insurer quotes the same premium for everyone in its pool, independent of the individual's risk characteristics. The rate restrictions are assumed to apply to specified health insurance coverage. To prevent insurers from refusing to contract (or renew a contract) with high-risk individuals, governments may complement premium rate restrictions with an open enrolment requirement. In order to ensure that low-risk individuals also contribute to solidarity, the government can introduce a mandatory health insurance scheme.

Although these regulations aim at solidarity by realising a system of implicit cross-subsidies, they are not effective in guaranteeing it. Premium rate restrictions and open enrolment imply predictable profits and losses for identifiable subgroups of consumers. Despite the open enrolment requirement insurers can use many subtle forms of risk-selection, which may have various adverse effects (van de Ven *et al.*, 2000). First, in the case of large predictable profits resulting from risk-selection, insurers may provide poor services to the chronically ill and choose not to contract with providers who have the best reputation for treating chronic illnesses. Therefore, risk-selection may threaten good *quality care* for the chronically ill. Second, to the extent that some insurers are successful in attracting the low-risk persons, these selection activities result in market segmentation, such that good quality care for high-risk individuals is not cross-subsidised. All in all, risk-selection may threaten *solidarity* in terms of the coverage of good quality care for high-risk people.

Third, in case of large predictable profits resulting from selection, selection may be more profitable than improving efficiency in health care production; particularly in the short run, when insurers have limited resources available to invest in cost-reducing activities. Efficient insurers may lose market shares to inefficient insurers

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2. A weaker form of open enrolment is "guaranteed renewal", which implies that once insurers have accepted an enrolee they cannot cancel the policy.

that prefer to invest in selection rather than in efficiency, resulting in a welfare loss for Society as a whole. Therefore, risk-selection may threaten *efficiency*.

In sum, premium rate restrictions and open enrolment, whose aim is guaranteeing solidarity, create incentives for selection that may threaten solidarity, efficiency, quality of care and consumer satisfaction. Because of these adverse effects of risk-selection, premium rate restrictions and open enrolment are *undesirable*. Illustrative empirical evidence supporting our conclusions about the effect of various interventions in competitive health insurance markets can be found in Hall (2000) for the US, in Beck *et al.* (2003) for Switzerland and in Buchner *et al.* (2003) for Germany. In addition, in the pursuit of the general good, it is not advisable to forbid insurers to differentiate premiums according to risk factors for which solidarity is not desired such as providers' inefficiency, oversupply, consumer propensity to consume, lifestyle factors, etc. (van de Ven and Ellis, 2000).

5.2.2. Strategy (b): risk-compensation schemes

An alternative way to achieve risk-solidarity is through risk-compensation schemes. According to this strategy, insurers are completely free to apply risk-rated premiums and to refuse or accept high-risk consumers. Risk-compensation schemes correspond to a system of explicit cross-subsidies, such that the high-risk individuals receive a risk-adjusted premium subsidy from a solidarity fund, which is filled with mandatory solidarity contributions from the low-risk individuals. In order to determine the amount of the subsidy, several relevant risk groups are discerned. The subsidy for each risk group is based on the average expenses of all insurers within the relevant risk group. In addition, the subsidy is earmarked for the purchase of health insurance with a specified benefits package and is not transferable. "Maximum-risk-solidarity" is achieved when the risk factors used by the solidarity fund to calculate the risk-adjusted subsidy correspond to the risk factors used by the insurers to calculate the premium. If the solidarity fund uses fewer risk factors, then the high-risk consumers are not compensated for the higher premium as far as these risk factors are concerned. Moreover, insurers may also refuse applicants, given the absence of an open enrolment requirement. In practice a "perfect risk-equalisation" system does not (yet) exist. Therefore, the level of risk-solidarity achieved in the presence of an "imperfect risk-equalisation" system might not be acceptable for Society. For instance, if the risk-compensation scheme is only based on age and gender (as it is in most countries), insurers that are specialised in Disease Management Programs for treating patients with diseases such as asthma, heart disease, diabetes or cancer, are confronted with predictable losses on their target groups ranging from 30 to 65 percent of the actual expenses for these patients (see Table 5). In order to increase solidarity there

Table 5. Predictable losses in case of premium rate restrictions (ie. community-rating per insurer) and open enrolment

SOURCE	SUBGROUP	% Of population	Predictable Loss as % of Actual Expenses MODEL				
			No RE	A/G	A/G +DCG	A/G +PCG	A/G +DCG +PCG
	SUBGROUP BASED ON INFORMATION FROM <u>PRIOR YEAR</u>						
(1)	Poor perceived health	20.7%	54%	29%	23%	.	.
(1)	>= 3 Chronic conditions	18.0%	55%	35%	28%	.	.
(1)	Functional disabilities	9.9%	67%	33%	27%	.	.
(1)	Visiting GP >= 4 times in 2 months	4.2%	62%	43%	33%	.	.
(1)	Use of home nursing (prior year)	2.4%	70%	51%	46%	.	.
(1)	Use of prescribed drugs >= 5 in 2 weeks	3.3%	73%	49%	40%	.	.
(2)	Asthma	5.0%	49%	36%	.	.	.
(2)	Heart Disease	1.8%	76%	53%	.	.	.
(2)	Diabetes	1.7%	70%	44%	.	.	.
(2)	Cancer	1.2%	78%	64%	.	.	.
(3)	Highest expenses (prior year)	10%	75%	61%	40%	43%	30%
	SUBGROUP BASED ON INFORMATION FROM <u>4 YEARS AGO</u>						
(4)	Highest expenses	9.2%	57%	44%	.	.	.
(4)	Highest prescription drug expenditures	9.7%	67%	47%	.	.	.
(4)	Highest number of days of illness	5.2%	.	51%	.	.	.
(4)	Change in relative health status	14.1%	.	32%	.	.	.
(4)	>3 physician consultation (6 months)	20.5%	.	34%	.	.	.
(5)	Highest expenses	9.5%	64%	47%	38%	.	.

SOURCES:
(1)   Lamers, HSR, 1999, Table 2
(2)   Van Barneveld *et al.*, JHE, 2001, Table 5
(3)   Van de Ven *et al.*, HA, 2004, Exhibit 1
(4)   Van Vliet & Van de Ven, SSM, 1992, Table 4 & 7
(5)   Lamers & Van Vliet, MedCare, 1996, Table 8
RE = Risk-Equalisation; A/G = Age/Gender; DCG = Diagnostic Cost Group; PCG = Pharmaceutical Cost Group.

are complementary measures for which two different situations can be discerned, depending on the cause of the imperfectness:[3]

i.Insurers have, for whatever reason, more risk factors available (for use in premium differentiation) than the ones used for calculating the risk-adjusted premium subsidies. In this case, complementary measures that achieve risk-solidarity are: premium-compensation schemes that give subsidies related to the "premium minus risk-adjusted subsidy" (premium-related subsidies); and/or excess-loss-compensation schemes that compensate insurers for all expenses in excess of some fixed amount (see below: strategy (c) and (d)). They both reduce the range of the "premium minus risk-adjusted subsidy" and thereby increase risk-solidarity.

ii. Insurers know that there are high-risk and low-risk individuals within the 'risk-adjusted premium subsidy's risk groups', but they prefer to refuse high-risk clients rather than further differentiate their premiums. Reasons to do this would include the high transaction costs of further premium differentiation. In this case, premium rate restrictions (by definition) are unnecessary and an alternative to open enrolment may be an excess-loss-compensation scheme, which reduces the insurers' incentives for risk-selection.

There are at least three modes to organise the subsidy payment flows (see Figure 5):
1. Direct-Consumer-Subsidy;
2. Indirect-Consumer-Subsidy;
3. Risk-Equalisation.

According to Mode (1), equalisation occurs among consumers. The low-risk consumers pay a mandatory solidarity contribution to the solidarity fund and the high-risk consumers receive a risk-adjusted premium subsidy from the solidarity fund. An alternative is that the subsidy goes to the insurer, and the consumer pays the premium minus the subsidy to the insurer (Mode (2)). Another alternative is that the consumer pays the "premium minus subsidy plus solidarity contribution" to the insurer, while the insurer and the solidarity fund clear the net difference of all the solidarity contributions and subsidies of the relevant clients (Mode (3)). Although at first glance these modalities may seem to be quite different, they primarily differ in the way that payment flows are organised. Since the solidarity contributions and the subsidies can be calculated in the same way. Therefore the effects on incentives are also equal.

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3. Throughout this chapter, we consider the most realistic scenario of imperfect risk-equalisation.
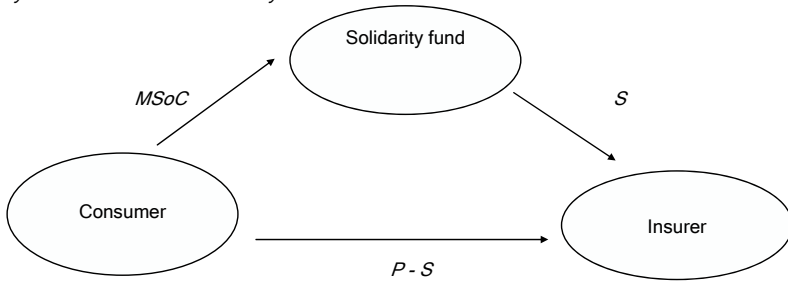
Figure 5. Three modes of a subsidy system
MSoC= mandatory solidarity contribution; S= subsidy (these could be risk-adjusted or premium-related); P= risk-rated premium.
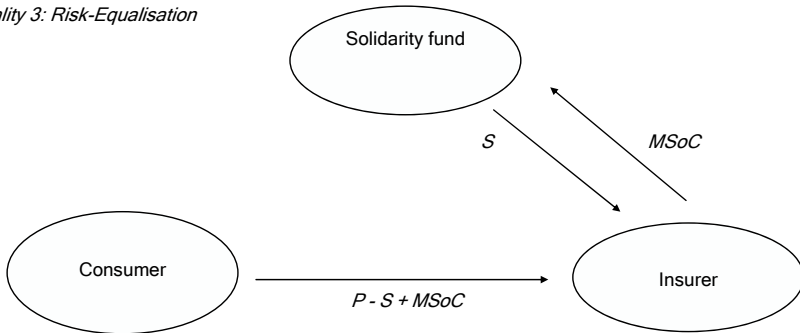
Modality 1: Direct-Consumer-Subsidy
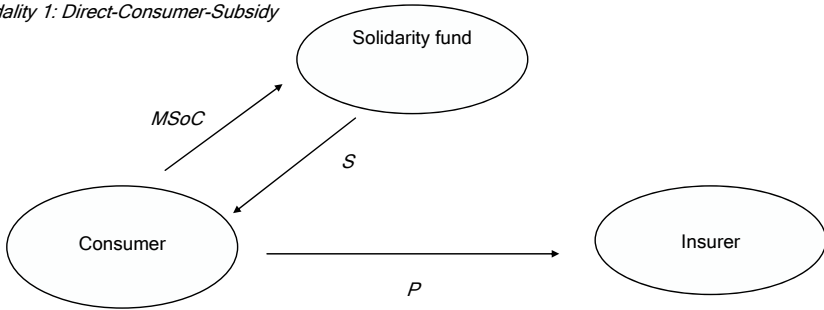
Modality 2: Indirect-Consumer-Subsidy

Modality 3: Risk-Equalisation

5.2.3. Strategy (c): premium-compensation schemes

Premium-compensation schemes correspond to premium-related subsidies. Normally, these subsidies are granted directly to consumers (Mode (1)), eg. via tax-deductible premiums. Under this strategy insurers are completely free to ask risk-rated premiums and to refuse or accept high-risk consumers. Premium-compensation schemes are effective in achieving solidarity to whatever extent Society wants. In case insurers still selectively underwrite, given the absence of an open enrolment requirement, it may be necessary to introduce an excess-loss-compensation scheme.

In general, premium-related subsidies diminish the consumers' incentives to shop around for the lowest premium and thereby insurers' incentives for efficiency. They would also stimulate consumers to buy more complete insurance, resulting in more moral hazard, than they would have done in case of no subsidy at the margin. In addition, premium-compensation schemes reduce the competitive advantage of the most efficient insurers and thereby overall price-competition. This may lead to premium inflation. In sum, premium-compensation schemes are effective in guaranteeing solidarity but only at the expense of some efficiency.

5.2.4. Strategy (d): excess-loss-compensation schemes

Another solution to increase risk-solidarity is to introduce cost-compensation schemes, eg. excess-loss-compensation schemes (for several forms of ex-post cost-compensation arrangements see Van Barneveld *et al*, 2001; Van Vliet, 2000; Van de Ven and Ellis, 2000). Under an excess-loss-compensation scheme insurers are compensated by the solidarity fund for all expenditures above a certain threshold (eg. 20,000 euros per year) for each individual insured. These compensations reduce the range of the risk-adjusted premiums. Since the solidarity fund is filled in by contributions from low-risk individuals, excess-loss-compensation schemes increase risk-solidarity. If the threshold amount is not too high, excess-loss-compensation schemes may avoid selection activities such as the exclusion of pre-existing medical conditions and the rejection of applicants. Because excess-loss-compensation schemes reduce the insurers' financial risks, solidarity is achieved at the expense of price-competition. Moreover, these schemes may cause inflation in insurance premiums, so Society has to weigh the solidarity-gains with the efficiency-losses caused by its adoption. An extreme example of excess-loss-compensation schemes was provided by the Act on Access to Private Health Insurance (WTZ) in the Netherlands, which guaranteed full compensation of all losses above the maximum premium set by the government. In January 2006, WTZ was abolished because of the introduction of the new Health Insurance Act.

5.2.5. The preferred intervention strategy

Although politicians may prefer premium rate restrictions and open enrolment because of their supposed direct effects on achieving the goal of solidarity, we conclude that risk-compensation schemes are preferable. In particular, perfect risk-compensation schemes are the first-best intervention strategy to achieve an acceptable level of solidarity in competitive health insurance markets without compromising effective price-competition and without endangering the financial sustainability of the scheme. In presence of an imperfect risk-compensation scheme the level of risk-solidarity might not be acceptable for Society.

In order to increase solidarity, excess-loss- and premium- compensation schemes may be implemented as complementary measures to the best available risk-compensation scheme. Premium- and excess-loss- compensation schemes are both effective in achieving solidarity to whatever extent Society wants, but only at the expense of efficiency (trade-off solidarity-efficiency).

Premium rate restrictions and open enrolment are not advisable strategies *per se* or as complements of imperfect risk-compensation scheme to achieve solidarity in competitive insurance markets because they create predictable losses (profits) for insurers on high-risk (low-risk) individuals. In the long run, this induces insurers to avoid individuals with predictable losses and to select profitable consumers, despite an open enrolment requirement. This selection can have adverse effects in terms of the quality of care for chronically ill individuals, solidarity for the good quality care for high-risk people and efficiency in the production of care.

All in all, we suggest risk-compensation schemes as the intervention strategy to start from when regulating competitive health insurance markets that aim at guaranteeing solidarity.

5.3. THE EC LEGAL FRAMEWORK RELEVANT FOR COMPETITIVE HEALTH INSURANCE MARKETS

This section presents the EC legal framework relevant for competitive health insurance markets, which focuses on the Competition rules and the Insurance Directives as part of the Free Movement of Services principles.

5.3.1. Competition law: Are social health insurers 'undertakings'?

The introduction of market forces in health care raises the question of whether EC Competition principles are applicable in traditional public law activities (in particular Article 81 and 82 of the EC-Treaty). If applicable, Competition rules may forbid national measures and/or agreements between undertakings 'which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition' (Article 81), within the context of social health insurance. In order to assess whether Competition principles apply to social health insurers, eg. sickness funds, the concept of 'undertaking' is central. Based on the Court's jurisprudence, an 'undertaking' encompasses every entity engaged in an economic activity, irrespective of the legal status of the entity and the way in which it is financed.[4] In Cases 159 & 160/91 *Poucet and Pistre* (1993) ECR I-637, para 17, the Court made clear that the concept did not encompass organisations with a social objective and charged with the management of certain compulsory social security schemes, based on the principle of solidarity. The Court enforced the centrality of the solidarity principle by ruling that a social security entity, offering an optional old-age scheme that operates on a capitalisation basis[5] with limited elements of solidarity, was engaged in an economic activity (Case C-244/94 *Fédération Francaise des Société d'Assurance,* FFSA (1995) ECR I-4013, para 17-19). The principles established in the FFSA Case were confirmed in three parallel judgments in which the pension fund providing supplementary old-age pensions to medical specialist was classified as an undertaking.[6] The Court emphasised the fact that the funds operated in accordance with the capitalisation principle, under which the amount of the individuals' contributions and benefits depended on the financial results of the investments made. These rulings indicate that when elements of the capitalisation principle are added to solidarity-based health insurance schemes and premiums are set in relation to the degree of risk, the activity's character (economic or social) of the scheme becomes less clear. In the Case C-218/00 *Cisal* [2002] ECR I-691, para 37, the Court concluded that there is solidarity between better and less well paid workers if there is no direct link between the contributions paid and the benefits granted.[7] Compulsory member-

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4. See, in particular, Case C-41/90 *Höfner and Elser* [1991] ECR I-1979, para 21; Cases 159 & 160/91 *Poucet and Pistre* [1993] ECR I-637, para 17; and Case C-244/94 *Fédération Francaise des Société d'Assurance* (FFSA) [1995] ECR I-4013, para 17-19.

5. According to the Court this is the case when the entitlements depend solely on the amount of contributions paid by the recipients and the financial results of the investments made by the managing organisation rather than on a redistributive basis where contributions solely depend on income.

6. Joined Cases C-115/97 to C-117/97, *Albany, Drijvende Bokken and Brentjens* [1999] ECR I-6025 and in the joined Cases C-180/98 to C-184/98 *Pavlov* [2000] ECR I-6451.

7. C-218/00 para 42.

ship in the plan is also required for solidarity to exist. Moreover, solidarity exists when social security activities are subject to supervision by the State and the nature and level of benefits and the amount of contributions are, in the last resort, fixed by the State.[8] Although statutory supervision is important, the solidarity element seems to be decisive in determining whether an insurer is an undertaking. An insurance entity that transfers risk between members regardless of the level of contribution fulfils an exclusive social function, and therefore does not carry out an economic activity (Case C-355/00 *Freskot* [2003] ECR 2003, I-5263, para 78-79).

In the jointed Cases C-263/01, C-306/01, C-354/01 and C-355/01 *AOK Bundesverband* (2004), ECJ, para 53, the Court held that the solidarity principle was fulfilled by an equalisation of costs and risks between the German sickness funds. Because of risk-equalisation, sickness funds are not in competition with each other or with private institutions with respect to providing statutory pharmaceutical benefits. Even the latitude that the sickness funds have when setting premiums and their freedom to compete with each other to attract members, does not call the non-economic nature of their activity into question.[9]

5.3.2. Health insurers entrusted with a task of "general economic interest"

An important exception to EC Competition law is found in Article 86, section 2 EC, which provides an exclusion from the general Competition rules for certain undertakings that perform a task of "general economic interest". This exception represents an escape from the general Competition rules regarding certain undertakings, where the application of Competition law would 'obstruct the performance' of their assigned tasks. Since the Case C-475/99 *Ambulanz Glöckner* (2001), ECR I-5751, para 65, it is clear that this exception may also be applicable to the health care sector.[10] In this Case, the Court ruled that the general economic interest task of transporting patients that was entrusted to these organisations by law could justify the existing restriction (or exclusion) of competition if necessary in order to make the activity economically feasible. All in all, the Court recognises that exceptions to Competition rules are allowed in those instances where these exceptions are necessary for the general economic interest. Therefore, for Article 86 (2) EC to apply, it has to be shown that the restrictive measures or even the exclusion of competition in health insurance markets is necessary to ensure the performance of the particular tasks assigned

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8. Ibid, para 43.

9. *AOK*, para 56.

10. The European Commission presented a Green paper on services of general interest (COM (2003)270) in order to clarify the concept of services of general interest and the relevant Community legal regime.

to sickness funds (Case C-320/91 *Carbeau* [1993] ECR 1993, I-2533, para 14). It should be clear that without such restrictive measures, sickness funds cannot perform their entrusted task under economically acceptable conditions or under conditions of financial stability. In addition, Article 86 (2) is subject to the principle of proportionality. If the restrictive measures go further than is necessary to perform the assigned tasks under the same conditions, the restrictive measures cannot be precluded as necessary and proportionate.

5.3.3. The Insurance Directives

The EC-Treaty provides that restrictions on the freedom to provide (insurance) services across borders within the EU shall be prohibited (Article 49 EC-Treaty: 'Services' are 'normally for remuneration'). This provision is supplemented by secondary legislation (eg. Directives), including that covering insurance services.

The Insurance Directives[11] introduced a single system for the authorisation and financial supervision of insurance undertakings by the Member State where their head office is located. Such authorisation issued by the home Member State enables insurance undertakings to carry out their insurance business anywhere in the EU. The Directives also required Member States to abolish controls on premium prices and prior notification of policy conditions, and allowed individuals and businesses to buy insurance in another Member State. As such, the Insurance Directives intend to encourage and enhance competition in EU countries' insurance markets.[12] In several Member States, private health insurance serves as a partial or complete alternative to the health coverage provided by the social security system and falls within the scope of the Insurance Directives. Article 2(1) clearly excludes social health insurance schemes from the scope of the Directives.[13] This is relevant not merely for social security organisations but also for the types of insurance and operations which they provide in that capacity. However, if insurance funds operate a social security scheme (ie. work-related accidents) at their own risk, then this scheme does not fall under Article 2's exception. This is the consequence of the Case C-206/98 *Belgium* ECR [2000] I-3509, in which the Court concluded that where this insurance is offered by undertakings operating at their own risk, it falls within the scope of the Directives. This means that the applicability of the Directives is determined by whether or not

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11. Officially Council Directive 92/49/EEC of 18 June 1992 on the co-ordination of laws, regulations and administrative provisions related to direct insurance other than life assurance and amending Directives 73/239/EEC and 88/357/EEC (OJ 1992 No. L 228, 11/8/1992, p. 1).

12. Commission Interpretative Communication Freedom to Provide Services and the General Good in the Insurance sector. European Commission Brussels, 2/2/2000 C (1999) 5046:1.

13. Article 2(1): 'This Directive shall apply to the types of insurance and undertakings referred to in Article 1 of Directive 73/239/EEC'.

the insurance is offered at the organisation's own risk and the scheme in question pursues an economic activity.[14] If the Directives apply, governments are essentially not allowed to control the prices and conditions of insurance products. However, there are several exceptions to this rule, such as the Article 54 exception.[15] According to that provision, the introduction of legal restrictions can be justified by reason of general good,[16] in case private health insurance schemes "wholly or partially" replace the social security system. These measures may include: open enrolment, rating on a uniform basis and lifetime cover; offering standard policies in line with social security schemes in combination with participating in loss compensation schemes.[17] In the context of a competitive health insurance market, the general good can be defined as the guarantee of an "acceptable level of risk-solidarity". As suggested by the European Commission,[18] private health insurance schemes could be in line with Article 54 only if the Court considers the disputed measures (eg. premium rating and open enrolment) as objectively necessary and proportionate to the general good. The necessity and proportionality criterion is crucial when assessing the legal sustainability of different strategies, as it will appear hereafter.

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14. On the interpretation of own risk element see (Drijber and de Groot, 2002) or (van de Gronden, 2003).

15. Article 54(1): "Notwithstanding any provision to the contrary, a Member State in which contracts covering the risks in class 2 of point A of the Annex to Directive 73/239/EEC may serve as a partial or complete alternative to health cover provided by the statutory social security system may require that those contracts comply with the specific legal provisions adopted by that Member State to protect the general good in that class of insurance, and that the general and special conditions of that insurance be communicated to the competent authorities of that Member State before use".

16. The concept of the general good is based on both the Treaty (Article 28 EC) and the Court's Case law. The Court requires that a national provision must be applied in a non-discriminatory manner; they must be justified by imperative requirements in the general interest; they must be suitable for securing the attainment of the objective which they pursue; and they must not go beyond what is necessary in order to attain it. Case 55/94 *Gebhard* ECH I-4165. In its interpretative communication, the Commission has applied these principles to the insurance sector. Commission Interpretative Communication. Freedom to Provide Services and the General Good in the Insurance Sector. C (1999) 5046 Brussels, 2.2.2000, pp. 22 and 27-28.

17. According to the 24th recital in the Directive's preamble.

18. See the famous "Bolkestein-letter", Brussels 25 November 2003. CAB/PvB/D (03) 0848, page 2; the Landsadvocaat, p.16; Steyger, 2002; and Van de Gronden, J.W., 2003.

5.4. CONFORMITY OF DIFFERENT INTERVENTION STRATEGIES WITH THE EC LEGAL FRAMEWORK

In this section, we assess whether the four intervention strategies previously analysed conform with EC legal principles, or if not, can be justified in terms of the general good principle in order to achieve solidarity in competitive health insurance markets. The general good exception is primarily based on European Court of Justice (ECJ) Case-law concerning the Free Movement of Services, but has also been accepted in the Competition law setting (Mortelmans, 2001).[19] Under the Court-developed exemptions, any measure that hinders free movement and competition is justified as long as it is both objectively necessary and proportionate to the achievement of the general good (Case C-120/78, *Cassis du Dijon* doctrine (1979) ECR 649).

5.4.1. Are legal restrictions of free trade and competition in conformity with EC-law?

Premium rate restrictions in combination with open enrolment are inadequate tools to guarantee risk-solidarity in competitive basic health insurance markets. Therefore, the Court's general good exception may not provide a justifiable hindrance to free trade and competition, since these measures are not effective in realising the objective and because less invasive alternatives are available. All in all, legal restrictions to competition fail both the necessity and the proportionality tests, as part of the general good exception.

According to Article 54 of the Insurance Directives, legal restrictions (such as premium rate restriction and open enrolment) in combination with a loss compensation scheme can be justified as a barrier to free trade and competition. Nevertheless, such a combination, as applied in the Dutch private WTZ health insurance scheme, may not be suitable from an economic perspective since it leaves the insurers without any financial risk, and therefore without any incentive for efficiency and without any price-competition.

5.4.2. Are risk-compensation schemes in conformity with EC-law?

Risk-compensation schemes do not hinder competition or free trade since insurers are free to set their premium conditions and select low-risk individuals. At the least, this holds true for Modes (1) and (2). Since there is no hindrance to competition or free movement, assessment of the general good exception is not necessary. However, this is different with Mode (3), where insurers are forced to participate in the com-

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19. See also the Communication made pursuant to Article 19 (3) of Council Regulation No 17, OJ 1999, C-363/2, N (10).

pensation scheme. One may question whether this measure constitutes a hindrance to the Free Movement of Services or Competition rules, or falls under the scope of State Aid when private insurers are forced to participate in a risk-compensation scheme. Participation in such a scheme can be justified for reasons of general good (ie. the 'solidarity principle'). Nonetheless, Mode (3) has to fulfil the necessity and proportionality test. Although necessary in order to compensate bad risks ('solidarity objective'), Mode (3) does not fulfil the proportionality test, because it has a more invasive impact than Modes (1) and (2) due to the forced participation in the compensation scheme.

If one assumes that sickness funds for providing social health insurance are not (considered) undertakings in terms of Competition law,[20] the State Aid argument will be relevant only to private insurance undertakings operating the social health insurance scheme. Particularly, when insurers participate in a compensation scheme supervised by law, the rules on State Aid are relevant (Article 87(1) EC). This is relevant for Modes (2) and (3) of the risk-compensation scheme. Mode (1) falls outside the scope of this Article, since consumers instead of insurers receive the compensation; consequently, State Aid is not applicable in this case. However even in the case of Modes (2) and (3), the compensation does not necessarily constitute State Aid, since it may be viewed as a compensation for bad risks, which exceeds the additional costs the insurers bear in operating their public obligation. This can be derived from the Case C-280/00 *Altmark* 24 July 2003, para. 95. Therefore, State Aid rules are not applicable.

To conclude, while Modes (1) and (2) of the risk-compensation scheme do not hinder free trade and competition, Mode (3) does.

5.4.3. Are premium- and excess-loss- compensation schemes in conformity with EC-law?

Premium- and excess-loss- compensation schemes are partially effective in achieving solidarity at the expense of price-competition. Consequently, these strategies may constitute a hindrance to free trade and competition. Moreover, excess-loss- and premium- compensation schemes are less proportionate than risk-compensation schemes (Mode (1) and (2)), since the latter constitute a more effective alternative to achieve solidarity without hindering free trade and competition. Therefore, excess-loss- and premium- compensation schemes are *per se* unjustifiable from an EC legal perspective. However, they are justifiable as effective complementary alternatives to the best available risk-compensation scheme because there are no other less invasive and more effective options.

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20. See also, the "Bolkestein-letter", ibid, p. 3.

5.5. CONCLUSIONS

Both from an economic and legal perspective, risk-compensation schemes represent, in principle, the first-best intervention strategy to achieve an "acceptable level of risk-solidarity" in EU Member States' competitive basic health insurance markets. In principle, they are effective in guaranteeing solidarity, particularly if complemented with premium- and/or excess-loss- compensation schemes (see below). In addition, risk-compensation schemes do not hinder free trade and competition and do not reduce efficiency (at least, Modes (1) and (2)).

Premium- and excess-loss- compensation schemes are partially effective in achieving solidarity. Because they reduce price-competition and thereby are less proportionate than risk-compensation schemes (Mode (1) and (2)), they are *per se* unjustifiable from an EC legal perspective. However, as a complement to the best available risk-compensation scheme, they are justifiable, because there are no other less invasive and more effective complementary alternatives available. In particular, premium rate restrictions and open enrolment are equally invasive, since they reduce price-competition and efficiency, but in the long run they create incentives for risk-selection and thereby threaten the quality of care for high-risk individuals.

In sum, risk-compensation schemes (Mode (1) and (2)) are the first-best strategy and should be the regulatory starting point when Society's goal is to achieve solidarity in competitive basic health insurance markets. If Society considers the level of solidarity achieved by the most sophisticated risk-equalisation system as insufficient, it should combine risk-compensation schemes with second-best strategies such as premium- and excess-loss- compensation schemes. Such combinations constitute a justifiable hindrance to free trade and competition.

5.6. POLICY IMPLICATIONS FOR EU COUNTRIES

Several EU Member States aim to combine competition and solidarity. However, the strategies they apply to achieve solidarity in competitive markets for basic health insurance may conflict with EC legal principles on free trade and competition. In this respect, it is crucial to know whether the insurance scheme in place is exempted from the Insurance Directives by Article 2 (social security exception). Therefore, the scheme should fulfil the 'social security' definition, which is related to elements such as social objective, income- and risk- solidarity, compulsory contributions, state supervision and legal status. Although these elements are crucial, the absence of one or more elements does not necessarily mean that the exception is not applicable. Apart from being exempted from the Directive, it is also important to remain outside

the scope of the Directive. When the solidarity element in social insurance schemes becomes blurred, there is still the danger that the Directive might apply. Nonetheless, a dominant solidarity-based scheme with compulsory solidarity contributions instead of a capitalisation-based scheme is a pivotal element of social security. When operated by a private undertaking, the insurance activity should not be operated at the insurer's own risk and should not perform an economic activity; otherwise, the Directives are applicable.

Assuming that there is a convergence among the criteria of both Free Movement of Services (including the Insurance Directives) and Competition rules, the 'economic activity' criterion is decisive for defining a scheme as 'social security'. This assumption has been based on several Court rulings on convergence, such as *Dassonville* Case 8/74, 1974 ECR 837; *Leclerc* Case 229/83, 1985 ECR 1, and *Banchero* Case 387/93, 1995 ECR I-4666. The relevance to Member States can be described as follows. In the *AOK* Case, the Court ruled that German sickness funds do not perform an economic activity when determining maximum amounts for pharmaceuticals. Therefore, they are assumed to fulfil the social security exception of the Directives. A similar conclusion with respect to the current Belgian and Czech sickness funds might not be unlikely, since they operate in a more or less similar way when providing social health insurance. However, the Dutch situation might be different if the Court would consider the Dutch private insurers as undertakings, (as the Dutch Competition Authority NMa currently does (NMa, 2000)), or consider the insurance risk they bear as "own risk" (as decided in the "Belgium Case"). In that case, EC Competition law and the Insurance Directives would be applicable. In Ireland, the voluntary scheme for supplementary health insurance is managed by competing private insurance undertakings which provide financial coverage for basic health care services' costs at their own risk, which means that the Directives are applicable.

It has been argued before that if Article 2's exception is not applicable; an insurance scheme can be still exempted from the Directives by Article 54 for reasons of general good. In order to achieve solidarity in competitive markets for basic health insurance, Member States may adopt intervention strategies that are justifiable under the general good provision of Article 54. Assuming that countries wish to adopt legal restrictions, they are left (from an EC legal perspective) with the unique alternative of combining premium rate restrictions and open enrolment with an excess-loss-compensation scheme that fully compensates the insurers for all losses above

the maximum premium. However, from an economic perspective, this option is not attractive.

One may question the consequences for intervention strategies that Member States have chosen within competitive insurance markets and whether they are economically suitable and "Europe-proof". In January 2006, the Dutch government introduced a mandatory basic health insurance scheme for the all population managed by private insurers operating at their own risk, which combines premium rate restrictions and open enrolment with a risk-compensation scheme (Mode (2)) and premium-compensation schemes ("zorgtoeslag", for low-income individuals and tax-deductions for the chronically ill). Based on our analysis, this proposed scheme is not justifiable under Article 54's general good exception requirements, because these proposed legal restrictions to free trade and competition do not fulfil the necessity and the proportionality tests. In the Irish case, the voluntary health insurance scheme combines premium rate restrictions, open enrolment and a standardised benefit package with a risk-compensation scheme. This combination was found to be unnecessary and disproportionate, since the alternative of combining risk-compensation schemes with a premium- and/or an excess-loss- compensation scheme is both more effective and less invasive to competition. Therefore, the current premium rate restrictions and open enrolment adopted in Ireland is not in conformity with Article 54's general good exception criteria. This conclusion for Ireland is based on the consideration that premium rate restrictions and open enrolment are tools for guaranteeing solidarity and not the general good itself. Although EU Member States do have some discretionary authority to define the "general good", it is inappropriate to define a "tool that is ineffective in guaranteeing solidarity" as the general good, as the Irish government does.[21]

In sum, the premium rate restrictions and open enrolment that are currently applied in Ireland and the Netherlands (implemented since January 2006) do not satisfy the necessary legal conditions in terms of the Insurance Directives. Therefore, we advise policy makers in these countries to consider the following alternatives, which in our view reconcile the equivalence and the solidarity principles in competitive health insurance markets in an "Europe-proof way": 1) replace the premium rate restrictions and open enrolment with premium- and/or excess-loss- compensation schemes; or 2) change the health insurance schemes' institutional character in such a way that it falls outside the scope of the EC Competition law and the Insurance Directives.

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21. Currently in Ireland's open enrolment, community-rating and lifetime cover are considered as expressions of the principle of solidarity not as tools for its fulfilment (White Paper, Department of Health and Children 1999, page. 21; European Commission, State Aid N46/2003 – Ireland, *'Risk equalization scheme in the Irish health insurance market'*).

6

Supplementary health insurance as a tool for risk-selection in mandatory basic health insurance markets: a five-country comparison

SUMMARY As the share of supplementary health insurance (SI) in health care finance is likely to grow, SI may become an increasingly attractive tool for risk-selection in basic health insurance (BI). In this chapter, we develop a conceptual framework to assess the probability that insurers use SI for favourable risk-selection in BI. We apply our framework to five countries in which risk-selection via SI is feasible: Belgium, Germany, Israel, the Netherlands and Switzerland. For each country we review the available evidence of SI being used as selection device. We find that the probability that SI is and will be used for risk-selection substantially varies across countries. Finally, we discuss several strategies for policy makers to reduce the chance that SI will be used for risk-selection in BI-markets.

CHAPTER 6

6.1. INTRODUCTION

In chapter 4 we found that a transfer of benefits from mandatory basic health insurance (BI) to supplementary health insurance (SI) may reduce the affordability of health insurance coverage for the transferred benefits, since SI-premiums may be risk-rated and health insurers may not be willing to accept all applicants (in particular high-risk individuals). In addition, the expansion of SI may also reduce access to basic health services, since it may increase the opportunities for risk-selection in basic health insurance (BI) markets (van de Ven *et al.*, 2003). For unfavourable risk groups, risk-selection may imply less choice because of limited switching opportunities and higher premiums due to lower cross-subsidies from favourable risk groups.

In this chapter, we examine the conditions where SI is likely to be used as a tool for risk-selection in BI-markets. In particular, we develop a conceptual framework that identifies the preconditions for the use of SI as a tool for risk-selection in BI-markets, and the determinants of the probability that SI is used for this scope. Then, we investigate to what extent risk-selection via SI is likely to occur in five countries where the preconditions are met: Belgium, Germany, Israel, the Netherlands and Switzerland. For each of these countries, we review the available evidence of the use of SI as a risk-selection device and we assess whether SI is likely to be used as a tool for risk-selection. Finally, we discuss the main policy implications of our findings.

6.2. CONCEPTUAL FRAMEWORK

In this section, we develop a conceptual framework to assess the probability that SI is or will be used for risk-selection in BI. First, we identify two necessary preconditions and then the crucial determinants for the use of SI as a selection device in BI.

6.2.1. Preconditions for risk-selection via supplementary health insurance

The first precondition is that insurers have to have *incentives* to perform risk-selection in BI. This implies that health insurers must bear financial risk for the provision of BI and some risk types must be more attractive than others. Traditionally, BI was provided by non-competing administrative-carriers that were fully compensated for the medical costs of their enrolees (Cutler, 2002). However, during the nineties these BI-carriers in several countries were exposed to competition and financial risk. In order to preserve universal financial access, these changes were typically accompanied by premium rate restrictions, open enrolment and risk-adjusted compensation payments. As far as the risk-adjusted compensation payments are not sufficient to

compensate for predictable losses on high-risk individuals, health insurers in these countries face incentives to select risks (van de Ven *et al.*, 2003).

The second precondition for the use of SI as a selection device in BI is the presence of a *link* between the purchasing decisions for the two types of insurance. This link must exist in order for health insurers to be able to use SI to influence the consumers' decision to buy BI. For instance, if consumers are legally obliged - or have a strong preference - to obtain SI from the same carrier that provides BI, selective underwriting by insurers of applicants for SI may undermine open enrolment requirements in BI.

6.2.2. Determinants of risk-selection via supplementary health insurance

If both preconditions are present, the probability that SI is used for risk-selection in BI critically depends on the *strength* of the *incentives* for risk-selection in BI and the *strength* of the *links* between SI and BI.

We distinguish the following determinants of the strength of the incentives for risk-selection in BI. The first crucial determinant is the quality of the risk-equalisation scheme. The more accurately insurers are compensated for each risk type, the weaker the incentives for risk-selection are. A second determinant is the level of financial risk for the health insurer. The more the insurer is at risk for the financial results of selling BI, the stronger the incentives for risk-selection. A third determining factor for the incentives faced by insurers is the level of price-competition. Strong price-competition will force insurers to exploit the available opportunities for risk-selection. By contrast, weak competition leaves room for cross-subsidisation, which may reduce incentives for risk-selection, particularly if BI is carried out by non-profit insurers pursuing social goals (Douven and Schut, 2006).

Next, we discern the following determinants of the strength of the links between SI and BI. First, the strength depends on the type of link. In practice three types can be observed: (1) regulatory or formal links, (2) insurer-established links or tying provisions, and (3) consumer-preferred links.

The strongest link is constituted by a legal requirement that SI and BI have to be sold as a joint product by the same health insurer. Next, insurers may be able to enforce joint purchase by means of tie-in sale provisions in SI-policies. For instance, SI-contracts may include provisions that the contract will be terminated or a surcharge will be required if the subscriber switches to another BI-carrier. Since these tie-in provisions are not legally required they are likely to constitute a weaker link than a formally enforced one. If the government forbids tie-in provisions or even requires that BI and SI must be sold by different legal entities, insurers may still be able to establish a link between the two. For instance, insurers could establish such a link by joining the same holding company and using the same brand name for SI

and BI products. Finally, even in the absence of any formally or insurer-established link, consumers may have strong preferences for a joint purchase of SI and BI. One-stop shopping may be attractive because it lowers search and transaction costs and because it may facilitate the coordination of basic and supplementary benefits.

A second determinant of the strength of the link between SI and BI is the extent to which health insurers are free to set the terms of the contract, the enrolment rules and the types of benefits covered by SI. Health insurers can effectively use SI for risk-selection in BI by means of selective underwriting, by premium discounts and by benefits design targeted at favourable risk groups (with respect to BI).

Selective underwriting can be based on health history questionnaires to SI-applicants. By including questions that are particularly relevant to assess the applicant's risk for BI, insurers can subsequently decide to deny SI-coverage or calculate a high surcharge to compensate for the expected loss on BI. If allowed, insurers may also decide not to renew the SI-contract of enrolees who are unfavourable risks in BI (selective disenrolment).

The design of specific SI-packages is another strategy that insurers may adopt to differentiate between low-risks and high-risks (eg. early cancer diagnosis is more likely to be demanded by healthy individuals whereas cancer therapy by sick people). In the same way, insurers may advertise SI to certain (profitable) risk categories, eg. by using specific distribution channels (internet, fitness clubs etc.), offering high rebates for deductibles, informing unprofitable enrolees about their right to change insurer and providing bonuses to agents who are successful in getting rid of the most expensive cases by shunting them off to competitors.

Insurers may also attract favourable risks by offering SI-premiums below actuarially fair levels. By using health history questionnaires, insurers can determine which applicants are likely to be profitable in BI and they may use these expected profits to offer these applicants a premium discount. Cross-subsidising SI-contracts by profits on BI-contracts may be more attractive than lowering the community-rated BI-premium, particularly for new entrants who do not have to recover the losses of unfavourable risk groups in the BI-market (Kifman, 2005).

Finally, the strength of the link between SI and BI is also determined by the importance of SI for consumers. If SI comprises only a small fraction of individuals' health care expenses or if only a small proportion of the population purchases SI, then the link between both types of insurance is likely to be weak. Hence, both the share of SI in total health care expenditure and the share of the population covered by SI are likely to be positively related to the probability that SI will be used for risk-selection in BI.

6.3. SUPPLEMENTARY HEALTH INSURANCE AS A TOOL FOR RISK-SELECTION IN MANDATORY BASIC HEALTH INSURANCE MARKETS IN FIVE COUNTRIES

In this section, we investigate to what extent SI is likely to be used as a tool for risk-selection in the BI-market in five countries: Belgium, Germany, Israel, the Netherlands and Switzerland. These countries were selected because each country fulfils

Table 6a. Main features of SI in the 5 countries*

	Belgium		Germany		Israel	The Netherlands	Switzerland
	MSI	VSI	MSI	VSI	VSI	VSI	VSI
Expenditure ratio SI/BI (%)	2%		< 5%	2%	< 5%	6%	23%
Share of BI-insured buying SI (%)	95%	n.a.	95%	11%	66%	92%	71%
Market share of largest 4 SI-insurers at national level (%)	19%	-	-	45%	91%	52%	40%
Regulation of premium, coverage and enrollment	No exclusion by age/health status	No exclusion by age/health status	Coverage restrictions, open enrolment	None	Open enrolment, age-related premiums	None	None
Share of group-contracts	No group-contracts	No group-contracts	Negligible	Negligible	No group-contracts	Negligible 11.3%	Negligible
Premium setting	Risk-rated	Risk-rated	Income-related	Risk-rated	Age-related to be approved by the government	Community-rated (some insurers use few age classes)	Risk-rated
Premium variation	Small	Small	Substantial	Substantial	Small	Substantial	Substantial
Product differentiation	Moderate	Moderate	Large	Large	Small	Large	Large

* Most figures relate to 2002 or 2003. *Sources*: Beck *et al.* (2003), Beck (2004, 2006), Berghman & Meerbergen (2005), Brammli-Greenberg & Gross (2003), Bruijn *et al.* (2005, 2006), Buchner & Wasem (2003), Christian Mutualities (2003), Colombo (2001), Controledienst (2004), Douven & Schut (2006), Laske-Aldershof *et al.* (2004), Nuscheler & Knaus (2005), NZa i.o. (2006), Prinsze *et al.* (2005), Schokkaert & Van de Voorde (2003), Schut *et al.* (2004), Shmueli *et al.* (2003), Tamm *et al.* (2006), Wasem *et al.* (2004).

the preconditions for risk-selection via SI: insurers face incentives for risk-selection in BI and there are links between the decisions to purchase BI and SI. For each of the five countries we assess whether SI is likely to be used as a tool for risk-selection in BI by examining to which extent the determinants of the conceptual framework are relevant in these countries. In addition, we review the available evidence of the actual use of SI as a risk-selection device. Table 6a summarises the main features of SI in each of the five countries.

6.3.1. Belgium

6.3.1.1. Main features of SI
In Belgium, three types of SI can be distinguished, two of which can be used as a tool for risk-selection in the BI-market. First, almost all local BI-providers offer mandatory supplementary coverage (MSI). It is stipulated in the statutes of these local insurers that SI is mandatory for all their members. Moreover, according to the law all insured are legally obliged to enrol with the same local insurer for both BI and MSI. Second, BI-providers offer voluntary supplementary coverage (VSI) on top of BI and MSI (primarily extra hospital services). Again, insured who want to buy VSI are obliged to enrol with the same BI/MSI provider. From 1994 until 2002, SI-expenditures as a share of BI-expenditures remained constant at 2 percent (Table 6a), indicating that SI and BI expenditures grew at the same rate. Currently, MSI covers costs related mainly to hospitalisation, health care abroad, transportation of the sick, logopaedics, orthodontics, alternative medicine and home care. VSI expands the coverage of hospital costs. The benefits package is regulated by the law, which obliges every BI-provider to offer at least one item in the MSI. In reality, all insurers offer dozens of additional benefits ranging from health promotion to all kinds of advantages such as birth premiums, cheap holidays for children and pre-marriage savings. The level of concentration of the SI-market is low, the market share of the four largest insurers being only about 19.4 percent. Premium rate restrictions (eg. community-rated premiums) are absent in both SI-markets. In case of financial problems, the Control Office can oblige them to take some measures. There is no formal open enrolment in the MSI-market. Nevertheless, insurers do not deny access in practice. VSI-providers can only exclude new enrolees because of their age or health status. SI-contracts can be terminated yearly subject to three months' notice by the insured.

6.3.1.2. Incentives for risk-selection
The risk-equalisation scheme in Belgium is based on demographic and socio-economic information. There are also some morbidity-related risk-adjusters, but they are not based on diagnostic information, meaning that BI-providers can easily identify highly

profitable risk groups (Schokkaert and Van de Voorde, 2003). Despite the rather poor risk-equalisation scheme, incentives for risk-selection are substantially mitigated by the limited financial risk for BI-providers (7.5 percent of gains and losses). In addition, the out-of-pocket BI-premium is almost negligible, so price-competition is hardly feasible. Finally, in absence of competition, BI-carriers have no strong drive to select risks, since they are non-profit entities pursuing social goals.

Due to the limited financial risk and the absence of price-competition, BI-providers have relatively weak incentives for risk-selection (Table 6b).

6.3.1.3. Usefulness of SI as selection device

The law stipulates that the insured must obtain BI and MSI from different entities of the same insurer. These entities must be financially independent and cannot cross-subsidise each other. In practice, however, it is difficult to attribute marketing and administrative costs to the different entities, since the same insurer offers SI and BI. Typically, BI and SI are marketed as joint products. For insurers, the strong formal links make SI a potentially important tool to attract customers.

For Belgian insurers the most straightforward strategies to select favourable risks in SI-markets are product and premium differentiation. Premiums are differentiated according to risk categories, mainly age, family composition and employee/self-employed status. The benefits package is regulated but the freedom to differentiate is sufficiently large to attract specific risk groups. Under the Belgian law comparative or misleading advertising is forbidden. In addition, the law forbids that benefits are granted with the purpose of inciting switching. In practice, these regulatory restrictions on selective marketing and benefits design are not very effective (see below).

Finally, selective underwriting, particularly in the forms of waiting times and exclusion of pre-existing medical conditions, is allowed and used in the VSI-market.

Despite the fact that SI offers insurers a potentially effective tool for risk-selection, the usefulness of SI for this purpose is restricted due to the limited role of SI in total health care financing. This together with the weak incentives for risk-selection makes it unlikely that SI is a frequently used tool for risk-selection in BI.

6.3.1.4. Evidence of risk-selection via SI

Nevertheless, there are indications that SI is increasingly used for favourable risk-selection. Although evidence is largely anecdotal, selective advertising has increased during the last years. Certain insurers selectively promote new insurance products related to sports (such as a reduction of registration fee for the sports club or discounts for children participating in a sports camp). In the leading Belgian newspaper *"De Standaard"* (September 28, 2005), three CEOs of large insurers' associations wrote an article entitled "War amongst insurers". In particular, they accused other

BI-carriers' sales representatives of attracting healthy enrolees by offering them advantageous SI-contracts. Since 2000, the number of items included in the SI has steadily increased, with substantial differences between the different funds. According to the three CEOs this risk-selection undermines access, and they appealed to the government to make these selection activities impossible.

Evidence from a survey among VSI-members of the Christian insurers showed that specific benefits are particularly attractive to specific risk groups (Christian Mutualities, 2003). Not only enrolment in VSI substantially differed between various age and socio-economic groups, but an analysis of the survey data also revealed a positive relation between characteristics such as education, income and marital status and the probability of having hospital insurance.

6.3.2. Germany

6.3.2.1. Main features of SI
Two types of supplementary insurance can be distinguished in Germany: MSI and VSI.

MSI is exclusively offered by (most) BI-providers. On top of the standardized mandatory basic benefits package (MBI), German insurers are allowed to offer extra benefits, up to a maximum of 5 percent of total expenses covered (Buchner and Wasem, 2003). MSI-benefits include services such as spa treatments and hospice treatment. Supplementary benefits are determined in the by-laws of the individual insurer and are mandatory for all subscribers of that insurer (no opting-out). Open enrolment for BI also applies to MSI. Moreover, insurers must charge a single contribution rate for both basic and supplementary benefits. However, in contrast to BI, expenses for MSI are not included in the risk-equalisation scheme.

German citizens can also buy supplementary insurance from competing for-profit carriers on a voluntary basis (Wasem *et al.*, 2004). VSI mainly covers costs regarding upgraded hospital accommodation, dental care, alternative medicine, glasses and co-payments. The VSI-market is unregulated: no premium rate restrictions (eg. community-rated premiums), no open enrolment requirements and no standardized benefits. VSI-providers are allowed to calculate risk-rated premiums and to exclude pre-existing conditions from coverage. Usually, applicants 55 years or older receive no contract at all. BI-carriers are not allowed to offer VSI. VSI comprises only 2 percent of total health care expenditure and 11 percent of the German population. The market share of the four largest VSI-insurers is about 45 percent (Table 6a).

6.3.2.2. Incentives for risk-selection

The risk-equalisation scheme in Germany does not effectively neutralise incentives for risk-selection (Buchner and Wasem, 2003). This and the high level of financial risk for health insurers, accountable for 97 percent of gains and losses, create strong incentives for risk-selection. In addition, the high level of competition due to the presence of about 250 BI-carriers, and the absence of entry barriers further reinforce the incentives for risk-selection (Table 6b). For instance, new BI-carriers (eg. Betriebskrankenkassen, BKKs) grew rapidly after entering the market because they were successful in attracting favourable risks by offering low contribution rates (Tamm *et al.,* 2006).

6.3.2.3. Usefulness of SI as a selection device

BI and MSI are tightly linked, since they are offered and marketed as joint products by a single provider at a single price. If subscribers want to opt out, they can only switch to another BI-provider that offers a different package of supplementary benefits. The strong link between MSI and BI makes MSI a potentially useful tool to attract favourable risks. Despite this, the usefulness of MSI for risk-selection in BI is restricted by the open enrolment requirement, the absence of a separate premium and the limited scope of the supplementary benefits that can be included. In fact, the only way that MSI can be used for risk-selection is by the design of the benefits package.

Until 2004 VSI and BI were completely separated by law. Then, the government decided to allow BI-providers to act as agents for VSI-providers. Most BI-providers now cooperate with one VSI-provider and offer premium discounts to their subscribers. Moreover, as part of this cooperation, some VSI-providers waive their right to reject applicants. However, none of them has waived its right to calculate risk-related premiums. If subscribers switch to another BI-provider, in most cases they lose their VSI-discount. Opportunities for BI-providers to use this link as a tool for risk-selection are rather limited, since BI and VSI providers are also not allowed to cross-subsidise each other and must be financially independent from each other.

6.3.2.4. Evidence of risk-selection via SI

Nevertheless, there is some evidence that BI-carriers use the composition of MSI-benefits to attract low-risks. A comparison of supplementary benefits for the three main types of BI-providers shows substantial differences (Nuscheler and Knaus, 2005). Whereas most of the traditional regional BI-carriers (AOKs) offer benefits that are attractive to the high-risks – such as chiro therapy (91 percent), cancer therapy (64 percent), homeopathic medicine (70 percent) – only a small minority of the fast growing and lower-priced BKK-funds offer these benefits (14 percent offers cancer therapy, 26 percent homeopathic medicine and 33 percent chiro therapy). By contrast, BKKs more

often than AOKs offer benefits that are attractive to favourable risk groups, such as health checkups (25 vs. 9 percent) and cancer screening (25 vs. 0 percent).

Given the weak and only recently established link between BI and VSI providers, risk-selection via VSI does not seem to be an issue yet. However, many of VSI-contracts offer rebates that may be lost if enrolees switch BI-carrier. Andersen and Grabka (2006) conclude that attractive SI-packages had an impact on switching. However, the risk profiles of switchers are unknown.

MSI and VSI may become a more important tool for risk-selection in the near future if the basic benefit package is further reduced. However, in contrast to the trend of a gradual expansion of the role of SI in health care financing, the 2006 German health care reform plan includes a transfer of a number MSI-benefits (palliative care and some spa treatments) and some VSI-benefits (acupuncture) to the basic health insurance package.

6.3.3. Israel

6.3.3.1. Main features of SI
In Israel, SI can be bought voluntarily and on an individual basis from the same insurer providing BI, a commercial insurer, or both. During the period 1995-2002, the share in the population buying SI from a BI-provider rapidly increased from 35 to 66 percent, while the share buying SI from a commercial insurer increased from 16 to 24 percent (the share buying both types of SI grew from 5 to 20 percent). Since only SI provided by BI-carriers can be used as a tool for risk-selection in BI, we focus our analysis on this type of SI. Currently, SI covers costs of some surgical interventions in Israel and abroad, dental care, preventive screening, alternative medicine, co-payments in BI (especially for drugs), and IVF. In the period 1999-2002, SI-expenditures as a share of BI-expenditures grew from 3.3 percent to 5.3 percent (Table 6a).

In Israel the four largest BI/SI providers together hold 91 percent of the SI-market share. There is an open enrolment requirement and insurers may charge age-related premiums for SI-coverage after government approval. Law does not determine the composition of benefits package and the contractual conditions. Nevertheless, the extent of product differentiation is still moderate (Brammli-Greenberg and Gross, 2003).

6.3.3.2. Incentives for risk-selection
The quality of the risk-equalisation scheme in Israel is quite poor (only age-related subsidies), therefore BI-providers can easily identify risk groups that are highly unprofitable, such as chronically ill people (Shmueli *et al.*, 2003). Since BI-suppliers are fully at risk and are not allowed to charge a premium for BI, the incentives for

risk-selection are strong. These incentives are mitigated, however, by the weakly competitive structure of the BI-market. Traditionally the BI-market is dominated by a few non-profit insurers, while legal entry barriers effectively prohibit any potential competition. Switching rates are low (about 1 percent per year) (Laske-Aldershof *et al.*, 2004).

6.3.3.3. Usefulness of SI as a selection device

BI-providers are allowed to offer SI only to their own enrolees. Alternatively, BI-insured may choose to buy SI-coverage from commercial insurers, but they cannot obtain SI from another BI-provider. BI-providers exercise the double function of SI and BI suppliers in a regulated context. The law requires that BI/SI providers keep a separate financial administration for SI and BI. Cross-subsidisation between BI and SI is forbidden and providers are not allowed to sell other types of insurance.

Despite the strong link between BI and SI, the usefulness of SI as a selection device is restricted by open enrolment and by the limited freedom for insurers to differentiate premiums. The limited role of SI in health care financing and the low switching rates also reduce the usefulness of SI as a selection device.

6.3.3.4. Evidence of risk-selection via SI

Currently, there is no evidence of insurers using SI for risk-selection in BI. Although the share of SI in total health care financing is still small (5 percent), it steadily increased during the last decade. If this trend continues, SI is likely to become a more useful tool for risk-selection, particularly if the risk-equalisation scheme will not be improved.

6.3.4. The Netherlands

6.3.4.1. Main features of SI

In the Netherlands, SI is exclusively voluntary. More than 90 percent of BI-insured buy SI. SI can be bought on an individual basis or via group contracts (Table 6b). Currently, SI covers almost all dental care for adults, alternative medicine, maternal home care, physical therapy, psychotherapy, anticonceptives and IVF. In the last decade, the number of services excluded from the basic benefits package and covered by SI has steadily increased. The same applies to SI-expenditures as a share of BI-expenditures, which grew from 2 percent in 1994 to 6.5 percent in 2003 (Table 6a).

The Dutch SI-market is not regulated by the government. There is no open enrolment requirement and there are no restrictions on premium rate setting and benefits package. Although risk-rating is allowed, insurers still charge predominantly community-rated premiums (Schut *et al.*, 2004). The most likely explanation for this

is that SI is traditionally offered as a by-product of BI. Since almost all insured buy SI and BI from the same insurer and switching rates were low until 2006, there was hardly any competitive pressure to differentiate SI-premiums (Laske-Aldershof *et al.*, 2004; Douven and Schut, 2006).

6.3.4.2. Incentives for risk-selection

The risk-equalisation scheme in the Netherlands is the most sophisticated among the five countries. Nevertheless, BI-providers can still easily identify risk groups that are highly unprofitable relative to the community-rated premium that BI-providers have to charge (Prinsze *et al.*, 2005). Since BI-carriers are accountable for about 50 percent of gains and losses, insurers can substantially benefit from risk-selection. Prior to 2006, incentives for risk-selection were mitigated by the weak competition among non-profit BI-providers due to the limited propensity of consumers to switch to another insurer (Laske-Aldershof *et al.*, 2004; Douven and Schut, 2006). Since the 1st of January 2006, the Dutch health insurance system has been profoundly reformed by the introduction of a new BI-scheme. The former distinction between social health insurance (MBI) for low/middle income groups and private health insurance (VBI) for high-income groups has been abolished. Under the new BI-scheme all enrolees can switch plans at annual open enrolment periods (two months). BI-premiums have to be community-rated and a risk-equalisation scheme applies as before. Dutch citizens had to choose a new contract for BI and SI. Anticipating that many customers would consider switching, insurers engaged in a price war (Douven and Schut 2006). Indeed, the switching rate increased dramatically, from about 3 to 18 percent (NZa i.o., 2006). Although switching rates in 2006 are likely to have been high because of the radical change in choice setting, price-competition is expected to remain strong in the future. Strong price-competition substantially increases the incentives for risk-selection in the new BI-scheme.

6.3.4.3. Usefulness of SI as a selection device

Since the introduction of the New Health Insurance Act in January 2006, there is no legal separation between SI and BI providers in the Netherlands. Before 2006 both types of insurance were offered by different juridical entities. Cross-subsidisation between BI and SI providers was forbidden and both providers had to be financially independent. Despite the separation of providers, SI and BI were always sold as a joint product under the same brand name (Schut *et al.*, 2004). SI and BI providers typically belonged to the same holding company, making marketing and administrative costs difficult to ascribe to the different entities. Prior to 2006, most SI-contracts had a clause that the contract would be automatically terminated once the insured would switch to another BI-provider. Although termination clauses are forbidden

under the new BI-scheme, this prohibition does not effectively preclude tie-in sales. For instance, several insurers made clear that they would charge higher SI-premiums to enrolees choosing other BI-providers and some insurers offer SI only to applicants that obtain BI from the same company. In practice, almost all consumers still buy SI and BI from the same company (NZa i.o., 2006).

Since SI-providers are free to set premiums, determine the benefits package and apply medical underwriting; SI can be effectively used for risk-selection in BI. If consumer mobility remains high after 2006, this would make SI a particularly powerful tool to discriminate between different risk groups.

Other straightforward strategies would be to use health questionnaires to identify favourable and unfavourable risk groups that apply for SI. Such strategies, however, are effective only if a substantial proportion of the insured is willing to switch (Schut and Hassink, 2002).

Given the links between BI and SI and the absence of legal restrictions on underwriting, product differentiation and premium setting, SI is a moderately useful tool for risk-selection.

6.3.4.4. *Evidence of risk-selection via SI*

Before 2006, both the incentives for risk-selection and the usefulness of SI as a selection device were limited. Survey results indicate that less than 1 percent of the applicants were refused, despite the fact that insurers used health questionnaires for SI-applicants (Bruijn *et al.*, 2005; Laske-Aldershof and Schut, 2005).

Since 2006, price-competition and consumer mobility increased, which made SI a powerful selection device. However, to accommodate the transfer to the new BI-scheme, all insurers promised to accept all applicants for SI without medical underwriting. Recent investigations show that in 2006 only a few insurers used health questionnaires for SI-applicants and, except for extensive dental coverage, no applicants were refused (Bruijn and Schut, 2006; NZa i.o., 2006). Since the promise to accept all SI-applicants only holds for 2006 and 2007, the probability that SI will be used as selection device is likely to increase in the future. A possible counteracting factor may be the damaging effect of such behaviour on an insurer's reputation. For several years already, the national patient federation (NPCF), the Ministry of Health and the Dutch Health Authority (NZa) monitor the underwriting practices of SI-providers and publish the results of their investigations (NZa i.o, 2006; Bruijn *et al.*, 2005-6; Laske-Aldershof and Schut, 2005).

6.3.5. Switzerland

6.3.5.1. Main features of SI
In Switzerland, SI is exclusively voluntary and covers dental care, sick-leave payments, alternative medicine, upgraded hospital accommodation, access to all physicians and hospitals all over the country, cross-border care, and transportation costs for accidents in the mountains. Prior to the health care reform of 1996, SI accounted for almost 30 percent of total health care expenditures. Due to the introduction of a comprehensive BI-scheme, however, the share of SI in health care financing decreased to about 20 percent (Table 6a). Nevertheless, the popularity of SI has grown, with the share of BI-insured holding SI-coverage increasing from 62 percent in 1997 to 71 percent in 2003.

Government intervention in the SI-market is limited. There are no open enrolment requirements, standardised benefits and premium rate restrictions. Three types of SI-carriers can be distinguished: independent SI-providers, daughter companies of BI-carriers, and integrated BI/SI providers. Consumers are free to choose among these three SI-carriers. The regulatory regimes that apply to daughter companies and integrated providers are quite different. Integrated insurers are restricted to the exclusive provision of health coverage by law, while daughter companies may offer all kinds of insurance coverage besides health insurance. Combined with the more liberal supervisory regime, this explains the growing popularity of daughter companies at the expense of integrated ones.

6.3.5.2. Incentives for risk-selection
The risk-equalisation scheme in Switzerland is based only on age, gender and region, implying that BI-providers can easily identify risk groups that are highly (un)profitable. Moreover, BI-carriers are fully at risk and there is no reinsurance or state aid in case of losses. Therefore, insurers have to charge sufficiently high premiums to survive. Since insurers face substantial competition, the incentives for risk-selection are strong (Table 6c).

6.3.5.3. Usefulness of SI as a selection device
Formally, basic and supplementary benefits are strictly separated. It is legally forbidden to link rebates in SI to BI, ie. SI-carriers are not allowed to cover the medical expenses that fall under voluntary deductibles in BI. In terms of accounting requirements, SI-providers are obliged to keep their financial administration separated from BI-providers. Cross-subsidisation between BI and SI providers and tie-in sale provisions in SI-contracts are also forbidden.

Despite the legal separation between BI and SI carriers, most SI-carriers are daughter companies of or integrated with BI-carriers, which makes it difficult to establish whether marketing and administration costs refer either to BI or SI carriers. Moreover, despite the fact that tying-in is forbidden, when people switch BI-provider they usually terminate their contract with the related SI-carrier. This likely reflects a consumer preference for a joint purchase of BI and SI. Since BI and SI benefits overlap to some extent, consumers may not want to figure out which plan is responsible to cover the costs of care once they fall ill. Moreover, insurers try to prevent consumers from a separate purchase of BI and SI "by all kind of tricks, for instance by taking away the premium discount for families or by surcharges on the premium or for extra administrative expenses" (*"Beobachter Kompakt"*, 2006). Beck (2004) also found that having SI significantly reduces the probability to switch.

Hence, despite the separation between BI and SI, most consumers purchase both products from the same company. Given the important role of SI in health care financing and the possibility of selective underwriting, selective advertising, and product and premium differentiation, the joint purchase of SI and BI makes SI a potentially useful tool for risk-selection in the BI-market (Table 6b).

6.3.5.4. Evidence of risk-selection via SI
Beck (2006) shows that the impact of risk-selection on premiums increased from 1997 to 2006 by a factor of 12 and can explain a substantial part of the variation in premiums. Although empirical research is hampered by the fact that risk-selection is a hidden activity by insurers, there is substantial evidence suggesting that risk-selection via SI in the BI-market is becoming more and more important (Beck, 2004; Colombo, 2001). Each year several insurers launch new SI-products that are particularly attractive to healthy customers. In addition, SI-premiums are increasingly risk-rated, new SI-products for upgraded hospital accommodation targeted at specific age groups (eg. SI-policies were launched under the label "Hospital 20" and "Hospital 30"). These new SI-products are attractive for young people as long as they pass the mandatory health check.

6.4. CONCLUSIONS OF THE FIVE-COUNTRY COMPARISON

In this chapter we developed a conceptual framework to assess the probability that insurers use supplementary insurance as a tool for risk-selection in basic insurance markets. We identified two preconditions for using SI as a selection device: (1) the presence of incentives for risk-selection in BI, and (2) the presence of links between SI and BI. Next, we identified which factors determine the strength of the incentives for

risk-selection in BI and the usefulness of SI as a tool for risk-selection. We applied our framework to five countries in which the preconditions are met, and conclude that the probability that SI is or will be used for risk-selection substantially varies across countries.

The main findings of our five country comparison are summarised in Tables 6b, 6c and 6d.

Table 6b concludes that incentives for risk-selection in BI-markets are particularly strong in Switzerland and Germany, moderate in Israel and the Netherlands (since 2006) and relatively weak in Belgium.

Table 6c concludes that the usefulness of SI as a tool for risk-selection in BI is highest in Switzerland, followed by the Netherlands, Belgium and Israel. In contrast, SI is not a particularly useful selection device in Germany.

Table 6d combines the findings of Table 6b and 6c to assess the probability that SI is or will be used for risk-selection in each of the five countries. In Switzerland, SI is most likely to be used for risk-selection in BI. Although insurers typically try to hide risk-selection activities, there is substantial evidence that SI is increasingly used for risk-selection in Swiss BI-market. In the Netherlands the probability that SI will be used for risk-selection in BI has been substantially increased since the introduction of the new BI-scheme in 2006. During the first two years of the reform, health insurers agreed to accept all applicants for SI without selection. For subsequent years this agreement will no longer hold, however, and the intensified competition may prompt insurers to use SI as an effective strategy for risk-selection. Despite the strong incentives for risk-selection in Germany, SI is not a very useful tool for risk-selection. Nevertheless, there is some evidence of BI-carriers using SI-benefits as a way to attract favourable risk groups or to deter unfavourable ones. As compared to Germany, Belgium presents the opposite case, where SI could be effectively used for risk-selection in BI but the incentives to do so are weak. Despite these limited incentives, SI also appears to be increasingly used in Belgium to attract favourable risk groups. In Israel, insurers are faced with moderate incentives for risk-selection. Although SI and BI are closely linked, the room to use SI for risk-selection is limited by regulation. At present, there is no evidence that SI is used in Israel for risk-selection in BI.

Table 6b. Strength of incentives for risk-selection in BI

	Belgium	Germany	Israel	The Netherlands	Switzerland
Quality of the risk-equalisation scheme	Moderate	Moderate	Low	High	Low
Financial risk for insurers	Low 7.5%	High 97%	High >90%	Moderate 54%	High 100%
Competition among insurers	Weak	Strong	Weak	Weak (until 2006) Strong (since 2006)	Strong
Incentives for risk-selection	**Weak**	**Strong**	**Moderate**	**Moderate**	**Strong**

Table 6c. Usefulness of SI for risk-selection in BI

	Belgium	Germany		Israel	The Netherlands	Switzerland
		MSI	VSI			
Type of link	Strong	Strong	Weak	Strong	Moderate (until 2006) / Strong (since 2006)	Moderate
Freedom to use SI as tool for risk-selection	High	Low	High	Low	High	High
Importance of SI	Moderate	Low	Low	Moderate	Moderate	High
Usefulness of SI for risk-selection in BI	**Moderate/ High**	**Low**	**Very low**	**Moderate**	**Moderate/ High**	**High**

Table 6d. Probability and evidence of risk-selection in BI via SI

	Belgium	Germany		Israel	The Netherlands	Switzerland
		MSI	VSI			
Incentives for risk-selection	Weak	Strong	Strong	Moderate	Moderate	Strong
Usefulness of SI for risk-selection in BI	Moderate/High	Low	Very low	Moderate	Moderate/High	High
Probability of risk-selection in BI via SI	Low	Moderate	Low	Moderate	Moderate/High	High
Evidence of different strategies adopted to use SI as a tool for risk-selection	**Yes**	**Yes**	**No**	**No**	**Limited**	**Yes**

6.5. POLICY IMPLICATIONS

For policymakers, expanding supplementary health insurance may be an attractive policy option to alleviate the mounting pressure to contain public spending. For insurers, however, the expansion of SI may offer opportunities for risk-selection in BI-markets. Policymakers may want to avoid this spillover effect, since risk-selection is likely to reduce both access (due to lower cross-subsidies) and choice (due to lower switching opportunities) for specific risk groups.

Policymakers can pursue two main strategies to reduce the probability that SI is or will be used for risk-selection in BI-markets. The first strategy is to reduce the incentives for risk-selection in BI. The most effective way to accomplish this is by improving the risk-equalisation scheme. Particularly in Germany, Israel and Switzerland, where the quality of the current risk-equalisation scheme is quite poor, the risk-equalisation formula needs to be improved to neutralise the strong incentives for selection. Alternative ways to reduce the incentives for risk-selection are to limit insurers' financial risk (as in Belgium), and to restrict competition among insurers (as in Israel). Both alternatives have the important drawback, however, that they also reduce the incentives for efficiency.

The second strategy is to reduce the usefulness of SI as a selection device. The most effective way to do this would be to enforce a strict separation of SI and BI providers (as was the case in the VSI-market in Germany prior to 2004). However, a strict separation would raise consumers' search costs and inhibit an effective coordination of services covered by BI and SI. A less radical measure would be to forbid tie-in sales provisions in SI-contracts; although the Swiss experience shows that such a measure can be easily circumvented. The usefulness of SI as a selection device can also be limited by imposing regulatory restrictions to SI-providers such as open enrolment, standardised benefits and premium rate restrictions (as in Israel). A disadvantage of these regulations may be that they hamper an efficient functioning of the SI-market. For instance, premium rate restrictions and standardised benefits may result in adverse selection and could expose insurers to a premium death spiral (Cutler and Reber, 1998). Moreover, for EU countries like Belgium, Germany, and the Netherlands, regulating SI may not be a feasible option, since it is likely to be in conflict with the prevailing EU regulation (as argued in chapter 5). An alternative strategy to counteract the use of SI as a tool for risk-selection is to make this hidden strategy transparent. In the Netherlands, for instance, the national patient federation (NPCF) and the Dutch Health Authority (NZa) periodically monitor insurers' behaviour. By investigating and exposing the use of health questionnaires for applicants of SI, the use of tying-in strategies and the underwriting practices, the fear of a loss of reputation may prevent insurers from using SI for risk-selection purposes. Hence, bringing the

'reputation mechanism' into play might be an effective complement to the first-best strategy of improving the quality of the risk-equalisation scheme.

7.

Conclusions and discussion

7.1. INTRODUCTION

Since the beginning of the 1990s, the role of supplementary health insurance in different countries' health care financing has received considerable attention from policy-makers and analysts. In an increasing number of OECD countries, health care reforms have been proposed in the direction of increasing the role of supplementary health insurance markets in the financing of health care. The major reasons behind the increasing reliance on supplementary health insurance markets are the alleged inefficiencies of collectively financed schemes, and the increasing constraints upon collective spending caused by the rising health care expenditures. The simplest government strategy to face the worldwide growth in health care expenditures, in the presence of constrained public resources, is to increase the share of individuals' contributions to health care financing by an increasing reliance on supplementary health care financing schemes.

In this thesis, the focus is on the design of basic and supplementary health care financing schemes and on the implications of an increasing reliance on supplementary health care financing schemes on efficiency and affordability of basic health care services. For this purpose, we envisaged two elements to characterize health care financing schemes: 1) the implementation of a system of mandatory cross-subsidies that guarantees the financial access to care for vulnerable groups (ie. low-income or high-risk people); and 2) the enforcement of a legal obligation for individuals to purchase coverage for a predefined set of services. The presence of a system of cross-subsidies is crucial to distinguish basic from supplementary services. The enforcement of a legal obligation to purchase coverage is essential to discern mandatory from voluntary coverage. Based on a distinction between basic and supplementary services and between mandatory and voluntary coverage, a classification of different countries' health care financing schemes was proposed with the purpose of answering the central question of this thesis:

- *What are the consequences of an increasing share of supplementary health insurance for the efficiency and affordability of basic health care services?*

The present study is relevant since supplementary health insurance is viewed as an alternative to collective financing that effectively enhances efficiency and increases consumer choice. In particular, competition in supplementary health insurance markets is considered as a vehicle to achieve these goals. However, an increasing reliance on competitive and unregulated markets for supplementary insurance may also reduce access to health insurance for high-risk groups. This happens because competition induces insurers to differentiate premiums according to individuals' risk

profiles (risk-rating) or exclude some risks from coverage (risk-selection). These strategies may result in high premiums and partial or even absent coverage for high-risk groups. Consequently, the potential social welfare gain from risk protection cannot be fully realized. Depending on the way supplementary health insurance markets are intertwined with basic health care financing schemes, an increasing reliance on supplementary health insurance may also affect the financial access to affordable basic health care services and the efficiency of basic health care financing schemes.

The study is organised as follows. First, we present a theoretical analysis for the design of health care financing arrangements and its application to different OECD countries. Then, we perform empirical and institutional investigations of the implications of an increasing share of supplementary health care financing on the efficiency and affordability of basic health care services.

7.2. THE DESIGN OF BASIC AND SUPPLEMENTARY HEALTH CARE FINANCING SCHEMES

The proposed typology of health care financing schemes, which classifies health care financing schemes along the dimensions of basic/supplementary (services) and mandatory/voluntary (coverage), is based on the distinction between mandatory cross-subsidies and mandatory coverage. Therefore, it becomes fundamental to answer the following research question:

- *What can be the economic arguments for governments to enforce a system of mandatory cross-subsidies and to implement a legal mandate to purchase coverage for a set of predefined services?*

The conclusion of our analysis is that the main economic arguments for governments to enforce a system of mandatory cross-subsidies that guarantees the financial access to predefined basic services to high-risk or low-income individuals are the presence of externalities in health services consumption and the lack of private insurance against the financial risk of becoming a high-risk in the future. In particular, the larger are the externalities in the demand for health care services and the less feasible is insurance against the risk of becoming a high-risk in the future, the more a system of cross-subsidies is justifiable on economic grounds. A system of cross-subsidies may induce moral hazard and lead to an increase in total medical care costs. *Ceteris paribus,* this may be an argument for governments not to cross-subsidize the financial access to services with a high price-elasticity of demand.

From our analysis, we identified three main economic arguments for governments to enforce mandatory coverage: free riding, lack of foresight, and the transaction costs of organising otherwise a system of mandatory cross-subsidies. In many OECD countries, the introduction of mandatory coverage is intended to enhance the financial accessibility to health care services for low-income and high-risk individuals. Nevertheless, mandatory coverage is not *per se necessary* to achieve the goal of affordability, given that the implementation of a system of mandatory cross-subsidies is a *sufficient* measure to guarantee the financial access to basic services for low-income and high-risk individuals. The extent to which a mandatory coverage provision is *necessary* for the prevention of free riding and myopic behaviour is not equal for different income groups and for different types of services and health risks. In particular, the higher the income the less necessary is a legal obligation to obtain coverage for a broad set of services (eg. including the coverage for non-catastrophic risks or of services with low average expected costs). Moreover, a *universal* mandate to pay for a *uniform* and broad set of services may not be *proportionate* because it may unnecessarily reduce the responsiveness to consumers' preferences, induce moral hazard and increase health care costs, and thereby lead to a welfare loss for society. Consistent with the free riding and the lack of foresight arguments mandatory coverage could be fine-tuned according to the individuals' available income. Although the fine-tuning of mandatory coverage may limit the extent of moral hazard compared to universal mandatory coverage, it may involve transaction costs. Therefore, when introducing universal mandatory coverage for a uniform package of services, governments face a trade-off between moral hazard, on the one hand, and the transaction costs of fine-tuning and of organising otherwise a system of cross-subsidies. The following two strategies were proposed to smooth this trade-off: a two-option scheme and a single-option scheme with voluntary income-related deductibles. These strategies are both suitable alternatives to *universal* mandatory coverage. For the following reasons the single-option scheme with income-related deductibles is preferable: the distinction between two options may be problematic in terms of the identification of the criteria to differentiate the services between the two packages; the transaction costs of fine-tuning are higher and the possibilities for fine-tuning are smaller for the two-option scheme than for the single-option scheme with income-related deductibles.

Based on our theoretical analysis, we examined the economic rationales of the health care financing schemes of several OECD countries (eg. Australia, Belgium, France, Germany, Ireland, Israel, the Netherlands, Switzerland and the United States). In particular, we addressed the following question:

- *Is the design of health care financing schemes in the selected countries in conformity with the economic rationales for organising a system of mandatory cross-subsidies, and for imposing mandatory coverage?*

The tendency in most of the selected countries is to have *universal* mandatory coverage for a *uniform* and broad set of services. Only Germany and Ireland have introduced the two-option scheme. In Germany, the high-option scheme (ie. for low-income people) appears to be too broad, because it applies to 90 percent of the population and it provides coverage for services such as spa, ambulatory care etc. for which the arguments for mandatory coverage are weak and incentives for moral hazard particularly strong. For these services the government may consider to lower the income threshold or to introduce income-related copayments/deductibles. Albeit there is no two-option scheme in France, high fixed-copayments apply to the coverage of most basic services. Nevertheless, the fact that in France individuals may purchase voluntary subsidised health insurance for the coverage of copayments may offset the effectiveness of this tool to limit moral hazard and thereby health care expenditures. In Ireland the mandatory coverage provision for ambulatory care and prescription drugs applies to only 30 percent of the population. The low price-elasticity and high costs of prescription drugs provides economic arguments for extending the mandatory coverage provision for expensive drugs to the majority of the population.

Although the single-option scheme with voluntary income-related deductibles is the preferred alternative to *universal* coverage from an economic perspective, it is partly implemented only in few countries. In Switzerland, a single-option scheme with traditional deductibles (fixed amounts) is implemented for all services considered as basic. In the Netherlands there are two distinct single-option schemes. One provides coverage for long-term care services and is combined with income-related copayments (ie. AWBZ). The other provides coverage for other basic services and resembles the Swiss single-option scheme with voluntary fixed-deductibles. Fixed deductibles do not address appropriately the problems of free riding and myopic behaviour given that they may be too high for low-income people and too low for high-income people. For the same reason they are less effective than income-related deductibles in tackling moral hazard.

Some inferences were made also about the effectiveness of the systems of mandatory cross-subsidies in relation to the services subsidised in different countries. In conformity with the economic arguments for mandatory cross-subsidies, in most countries everyone may benefit from cross-subsidies for the coverage or the access to long-term care. Australia and Belgium are rather exceptional. In Australia a combination of explicit (eg. risk-equalisation) and implicit (eg. community-rating) cross-subsidies exists only for individuals purchasing voluntary health insurance. In the

past decades, the peculiar combination of a poor quality risk-equalisation scheme (ie. two age-bands) with community-rating per insurer has induced an adverse selection spiral and has created incentives for risk-selection in the Australian voluntary health insurance market.

In Belgium the coverage of home care is mandatory for everyone but not cross-subsidised. Substituting an explicit system of mandatory cross-subsidies with an implicit one (ie. universal mandatory coverage) might be effective in the short run, but it is not a stable solution because in the long run insurers have incentives for risk-selection. An effective long-term solution might be to introduce explicit risk-adjusted subsidies for home care in Belgium.

7.3. IMPLICATIONS FOR EFFICIENCY AND AFFORDABILITY

Based on the proposed classification, the thesis focuses on the consequences on affordability and efficiency of a shift from basic towards supplementary health insurance schemes. First, we answer the following research questions:

- *Why and to what extent do insurers risk-rate premiums in supplementary health insurance markets?*
- *What is the potential for risk-rating caused by transferring services from basic to supplementary health insurance?*

In competitive markets for voluntary supplementary health insurance, insurers are more likely to risk-rate premiums:
- The greater the freedom in setting premiums (ie. absence of premium rate restrictions) and the degree of competition in the voluntary supplementary health insurance market.
- The more consumers are sensitive to price-variations and willing to switch.
- The lower the transaction costs involved in the risk-rating process.
- The greater the availability, the stability and the profitability of risk-adjusters that effectively represent good predictors of future individuals' health care expenditures.
- The lower the loss of reputation produced by risk-rating.

In most countries, supplementary health insurance markets are far less regulated than basic health insurance markets or tax-funded schemes. Apart from few exceptions (such as Belgium and Germany), the purchase of supplementary health insurance is usually voluntary. Cross-subsidisation between low and high risk/income groups and legal restrictions on the premiums setting (eg. community-rating) are

practically absent. Nevertheless, risk-rating is limited. This can be explained by the absence of strong price-competition, the consumers' low price-sensitivity or propensity to switch due to the linkage with basic insurance, insurers' social reputation and as a strategy to avoid government intervention. In the long run, however, the expansion of competitive markets for voluntary supplementary health insurance may increase price-competition, which may induce insurers to risk-rate premiums.

An empirical analysis was developed to investigate the potential for risk-rating due to the transfer of benefits from basic to supplementary coverage in the long run. For this analysis, we considered competitive and unregulated markets for voluntary supplementary health insurance, where consumers are sensitive to price-variations, transaction costs are minimal and risk-adjusters available at a reasonable cost. A dataset issued by one of the largest insurers in the Netherlands was used to simulate different scenarios in which several benefits, eg. dental care, paramedic care, prescription drugs and medical devices, were transferred from basic to supplementary insurance coverage. We chose these benefits because most OECD countries consider them as supplementary services, ie. the access to (the coverage of) these services is not cross-subsidised. The results of the study indicate that a shift away from basic to supplementary health insurance is likely to lead to a substantial premium variation for most benefits. We found that risk-rating primarily affects the maximum premium. For services such as dental care, the potential gains of risk-rating for insurers are likely to be acceptable for society given that the difference between the community-rated premium and the risk-rated premiums is quite small in absolute terms and does not change if insurers use sophisticated risk-rating models. Particularly for prescription drugs and medical devices, the potential gains of risk-rating for insurers are already substantial if insurers use a simple demographic model and increase if insurers use additional risk-factors (eg. Diagnostic Cost Groups (DCGs) and Pharmaceuticals Cost Groups (PCGs). For these benefits the potential consequences of risk-rating in terms of access to affordable insurance coverage may be considered not "socially acceptable", since they result in high premiums for certain risk/income groups. Besides, this may also result in a welfare loss to society if individuals' (altruistic) preferences cannot be met.

Therefore, when transferring benefits from basic (community-rated premiums) to supplementary (risk-rated premiums) health insurance schemes a careful consideration of the consequences on efficiency and affordability of this transfer is required. For services for which the risk-rated premium variations are substantial, policy makers may decide not to transfer these benefits from basic (ie. subsidised) to supplementary (ie. non-subsidised) health insurance schemes.

Furthermore, governments have to consider whether the different intervention strategies available are effective in achieving an affordable access to health care in basic health insurance schemes. Therefore, the following questions were addressed:

- *What is the best strategy that governments can adopt to achieve an "acceptable level of solidarity" in competitive health insurance markets from an economic perspective?*
- *Do the different intervention strategies conform to the European Community (EC) legal framework?*

Without external intervention competitive health insurance markets tend to risk-rated premiums or may induce insurers to select favourable risks. By observing different countries, we identified several intervention strategies that governments may adopt to achieve affordable insurance premiums in competitive basic health insurance markets. The most common strategies, which can be adopted alone or in combination, are the following four: premium rate restrictions (eg. community-rating) and open enrolment, risk-equalisation schemes, premium-compensation schemes and excess-loss-compensation schemes. From an economic perspective, the preferred strategy is to introduce a system of risk-equalisation. A system of risk-equalisation corresponds to a scheme of explicit cross-subsidies, such that the high-risks receive a risk-adjusted premium subsidy from a solidarity fund, which is filled with (mandatory) solidarity contributions from the low-risks. To the extent that the risk-equalisation scheme is not capable to sufficiently compensate health insurers for predictable losses, the other three strategies may additionally be required to achieve an affordable access to health insurance coverage. Without an adequate risk-equalisation scheme, premium rate restrictions and open enrolment are not effective in guaranteeing an "acceptable level of risk-solidarity", because they create incentives for selection that may threaten the quality of care for high-risk people, efficiency and consumer satisfaction. Premium- and excess-loss- compensation schemes are effective in achieving risk- and income- solidarity to whatever extent society wants. On the other hand, they reduce the competitive advantage of the most efficient insurers and thereby overall price-competition. Moreover, these strategies increase the consumers' incentives to overinsure (ie. moral hazard) and diminish the consumers' incentives to shop around for the lowest premium, and thereby insurers' incentive for efficiency. Therefore society has to weigh the solidarity-gains with the efficiency-losses caused by the introduction of premium- and excess-loss-compensation schemes.

For European Union (EU) countries, any potential restriction of free trade and competition of national policies has to be compatible with supranational regulations (ie. EC-law). Therefore, the different intervention strategies proposed to guarantee the

access to affordable health insurance have to be in conformity with EC competition rules and with the Insurance Directives. In order to assess the conformity with EC-law, the necessity and proportionality tests were applied to verify whether the four alleged intervention strategies satisfied them. We found that also from an EC legal perspective, risk-equalisation schemes represent the first-best intervention strategy to achieve an "acceptable level of risk-solidarity" in EU Member States' competitive markets for basic health insurance. As explained, perfect risk-equalisation schemes guarantee risk-solidarity without hindering free trade or competition and do not re-duce efficiency. Therefore, risk-equalisation schemes are necessary and proportionate measures to realize the goal of affordability. Premium rate restrictions and open en-rolment may be considered as "justifiable hindrances" to free trade and competition under the EC legal framework only if combined with an excess-loss-compensation scheme (Article 54 of the Insurance Directives). Premium- and excess-loss- compen-sation schemes were found less proportionate than risk-equalisation schemes, and therefore *per se* unjustifiable hindrances of free trade and competition from an EC legal perspective. But in case the level of risk-solidarity achieved by an "imperfect risk-equalisation system" is not considered as "socially acceptable", in terms of the "allowable" premium variation, the regulator may adopt premium- and excess-loss-compensation schemes as complementary to the best available risk-equalisation scheme. Such combinations constitute a justifiable hindrance to free trade and com-petition from an EC-law perspective.

Finally the extent to which supplementary health insurance can be used as a tool for risk-selection in competitive markets for basic health insurance was analysed for the following five countries: Belgium, Germany, Israel, the Netherlands and Switzerland. The following research questions were addressed:

- *What are the conditions under which supplementary health insurance can be used as a selection device in competitive markets for mandatory basic health insur-ance?*
- *To what extent are these conditions fulfilled in the competitive mandatory basic health insurance markets of the five countries considered?*

Under certain conditions basic health insurance carriers are likely to use supplemen-tary health insurance as a selection device in competitive markets for basic health insurance. Risk-selection in basic health insurance markets may reduce access to affordable health insurance due to a reduction of cross-subsidies from low- to high-risk groups, may reduce quality of care for unprofitable risk groups and may reduce

efficiency, since the resources invested in risk-selection produce no welfare gain for society.

We identified and examined two necessary preconditions and several determinants to assess the chance that basic insurance carriers adopt supplementary health insurance as a selection tool. The first precondition is that insurers have to have *incentives* for risk-selection in basic health insurance markets, which depends on the quality of the risk-equalisation scheme, on whether insurers bear the financial risk for their insurance activities, and on the level of competition. The second precondition is the presence of a *link* between supplementary and basic health insurance providers or products. The 'strength' of the links between supplementary and basic health insurance depends on the following three determinants:

1. The type of link between basic and supplementary insurances;
2. The freedom insurers have in setting the terms of the insurance contracts, the enrolment rules and the types of benefits covered; and
3. The importance of supplementary health insurance in terms of total health care financing and of the percentage of individuals purchasing it.

After having identified and examined these conditions, we investigated to what extent they are fulfilled in five countries where the preconditions are met and risk-selection in basic health insurance markets is a potential problem: Belgium, Germany, Israel, the Netherlands and Switzerland. Given the quality of the risk-equalisation formula, the extent of competition and the insurers' financial risk in the five countries' basic health insurance markets, incentives for risk-selection are particularly strong in Germany and Switzerland, moderately pronounced in the Netherlands and Israel, and relatively weak in Belgium. In all countries, except for voluntary supplementary health insurance in Germany, basic and supplementary health insurance are linked either formally or informally (or both). This implies that supplementary health insurance is a potential selection tool in basic health insurance markets. In Switzerland, the availability of various strategies to use supplementary health insurance as a selection device combined with the strong incentives for risk-selection makes supplementary health insurance a very powerful tool to select favourable risks in the basic health insurance markets. This is confirmed by the available evidence regarding the use of supplementary insurance as a selection tool. In Germany, there is also some evidence that mandatory supplementary health insurance is used as selection device. However, since the importance of mandatory supplementary health insurance is limited and diminishing, its usefulness as a selection device is limited. In the Netherlands, the sophisticated risk-equalisation scheme limits but does not eliminate the incentives for risk-selection in the basic health insurance market. Furthermore, the existence of informal links and unrestricted opportunities to risk-select in the supplementary insurance market make supplementary health insurance an attrac-

tive tool for risk-selection, especially after the 2006 reform, which allows new commercial insurers to enter the basic health insurance market. Despite the incentives for risk-selection in the Israelis' basic health insurance market and the strong formal links between basic and supplementary insurers, the probability that supplementary health insurance is used as a selection device is substantially reduced by legal restrictions. Finally, in Belgium supplementary health insurance is a useful selection device. On the other hand, due to the weak incentives for risk-selection, the probability that supplementary insurance is adopted as a selection device is quite low. Nevertheless, there is growing anecdotal evidence showing that an increasing number of basic insurers use supplementary health insurance as a tool to select favourable risks in basic health insurance markets.

7.4. EPILOGUE

The central question addressed in this thesis is the following:

• *What are the consequences of an increasing share of supplementary health insurance for the efficiency and affordability of basic health care services?*

Based on our theoretical and empirical findings, the answer to the central question can be summarized as follows. Supplementary health insurance can play a useful role in containing public health care financing, and in improving the efficiency of resource allocation in health services and health insurance markets. But the effects of an increasing reliance on supplementary health insurance strongly depend on the complex interaction between basic and supplementary health care financing schemes.

In the long run, a transfer of benefits from basic to supplementary health care financing schemes reduces the affordability of health insurance coverage. The absence of government regulation (eg. community-rating) and of cross-subsidies in most countries' competitive markets for supplementary health insurance can induce insurers to risk-rate premiums. As indicated by the variation of the premium range for the different benefits, the potential for risk-rating in supplementary health insurance markets is particularly large for services such as drugs and medical devices and small for dental care and paramedic care. For drugs the premium may range from a minimum of about 40 euros to a maximum of about 2200 euros per year, and for medical devices from a minimum of 12 euros to a maximum of 723 euros per year. For dental care the premium may range from 27 euros (minimum) to 143 euros (maximum) per year, and for paramedic care from 13 euros (minimum) to 314

euros (maximum) per year. Both for affordability and efficiency reasons policymakers when expanding supplementary health insurance by transferring benefits from basic health care financing schemes should consciously decide for which benefits (packages) and to what extent (in terms of "allowable" premium variation) cross-subsidisation is desired. The (potential) high premium range due to risk-rating for drugs and medical devices may be a reason for governments to consider which specific drugs or medical devices, if any, to transfer from basic to supplementary health care financing schemes and whether to fine-tune the coverage of basic services with some form of co-insurance (eg. deductibles or co-payments).

The expansion of supplementary health care financing schemes has repercussions also on the efficiency and affordability of basic health care financing schemes. In Bismarkian countries (eg. Belgium, Germany, Israel, the Netherlands and Switzerland) the close intertwining between the competitive markets for basic and supplementary health insurance offers the opportunities to use supplementary health insurance as a selection device in competitive markets for basic health insurance. Without adequate government intervention, risk-selection is likely to reduce both access (due to lower cross-subsidies) and choice (due to lower switching opportunities) for specific risk groups. From an economic perspective, the most effective strategy to reduce the probability that supplementary health insurance is or will be used for risk-selection in basic health insurance markets is to improve the risk-equalisation scheme. Other strategies such as limiting the insurers' financial risk, restricting competition among insurers, enforcing a strict separation between supplementary and basic health insurance providers, forbidding tie-in sales provisions in supplementary insurance contracts, may result in an inefficient functioning of both basic and supplementary health care financing schemes. For EU countries the adoption and improvement of the risk-equalisation scheme is the first-best intervention strategy also from a legal perspective. In particular, the introduction of legal restrictions of competition such as community-rating and open enrolment may not be in conformity with EC-law unless it is in combination with a full loss compensation scheme.

Nederlandse samenvatting

DE VORMGEVING VAN BASIS- EN AANVULLENDE ZORGVERZEKERINGEN: IMPLICATIES VOOR DOELMATIGHEID EN BETAALBAARHEID

Dit onderzoek richt zich op de vormgeving van basis- en aanvullende zorgverzekeringen. Het belangrijkste doel van deze studie is te onderzoeken wat de gevolgen zijn van een toenemend aandeel van aanvullende verzekeringen in de financiering van gezondheidszorg voor de doelmatigheid en betaalbaarheid van zorg.

De belangrijkste onderzoeksresultaten worden hieronder opgesomd.

Hoofdstuk twee bespreekt de economische motieven die een rol spelen bij de vormgeving van het financieringsysteem. Hierbij wordt expliciet een onderscheid gemaakt tussen de motieven voor verplichte kruissubsidies en de motieven voor een verzekeringsplicht. De belangrijkste motieven voor verplichte kruissubsidies zijn de externe effecten van zorggebruik en de kans voor een individu om in de toekomst een hoog risico te worden. Een argument tégen verplichte kruissubsidies voor zorgverzekeringen is dat dit kan leiden tot een toename van het moreel risico (dat wil zeggen: het 'gebruikmaken of verschaffen van meer of duurdere medische diensten, veroorzaakt door het feit dat de verzekering de kosten vergoedt'). De motieven voor een verplichte verzekeringsdekking zijn gerelateerd aan de mogelijkheden tot liftersgedrag bij afwezigheid van een verzekeringsplicht, de neiging van individuen om toekomstige risico's te laag in te schatten, en de hoge transactiekosten die zijn verbonden aan het op een andere manier organiseren van kruissubsidies. Geconcludeerd wordt dat verplichte kruissubsidies voldoende zijn voor het realiseren van een betaalbare zorgpremie voor kwetsbare groepen. Een voor iedereen verplichte verzekering met een uniform pakket is hiervoor in beginsel niet nodig. Indien de financiële toegankelijkheid via verplichte kruissubsidies is gegarandeerd, kan voor hogere inkomensgroepen de omvang van het verplichte verzekeringspakket worden verkleind en/of de hoogte van het eigen risico voor de basisverzekering worden verhoogd. Het voordeel hiervan is een vermindering van moreel risico.

In hoofdstuk drie wordt het theoretisch kader uit hoofdstuk twee toegepast op de volgende landen: Australië, België, Frankrijk, Duitsland, Ierland, Israel, Nederland, Zwitserland en de Verenigde Staten. Landen als Australië, België, Frankrijk, Nederland en Israel kennen een voor iedereen verplichte verzekering met een uitgebreid, uniform pakket. Zoals beargumenteerd in hoofdstuk 2, is deze maatregel niet noodzakelijk en niet proportioneel voor het bereiken van een betaalbare gezondheidszorg

voor kwetsbare groepen. Teneinde het moreel risico niet onnodig te vergroten zou de overheid als alternatief een beperkt pakket voor hoge inkomens en een uitgebreid pakket voor lage inkomens kunnen hanteren of een uniform pakket met een inkomensafhankelijk eigen risico dat laag is voor lage inkomens en hoog is voor hoge inkomens. Hoewel een uniform pakket met een inkomensafhankelijk eigen risico vanuit economisch perspectief de voorkeur verdient, is het in geen van de genoemde landen terug te vinden. Alleen Nederland en Zwitserland komen in de buurt van dit systeem gegeven het feit dat zij voor de curatieve zorg een uniform pakket hebben met traditionele (d.w.z. niet inkomensafhankelijke) eigen risico's. Daarnaast is in Nederland de langdurige zorg opgenomen in een verplichte verzekering met een uniform pakket en inkomensafhankelijke eigen bijdragen. Een verplichte verzekering met een beperkt pakket voor hoge inkomens en een uitgebreid pakket voor lage inkomens vinden we in Duitsland en Ierland.

De markt van aanvullende verzekeringen kenmerkt zich door sterke concurrentie tussen verzekeraars. Dit kan leiden tot meer doelmatigheid en een toename van keuzemogelijkheden voor de consument. Sterke concurrentie kan verzekeraars ook aanzetten tot premiedifferentiatie en risicoselectie. Deze strategieën leiden tot hogere premies en minder verzekeringsdekking voor verzekerden met een hoog risico. Hoofdstuk vier beschouwt mogelijke vormen van premiedifferentiatie die kunnen optreden bij een eventuele overheveling van zorg uit de basisverzekering naar de aanvullende verzekering. Voor verschillende zorgvormen wordt gesimuleerd hoe groot de premiebandbreedte bij premiedifferentiatie zou kunnen zijn. Deze simulatie laat zien dat de premiebandbreedte groot is voor medicijnen en hulpmiddelen en klein is voor tandheelkundige hulp en paramedische zorg. Voor medicijnen kan de premie variëren van 40 euro tot 2200 euro per jaar, voor hulpmiddelen van 12 euro tot 723 euro per jaar; voor tandheelkundige hulp van 27 euro tot 143 euro per jaar en voor paramedische hulp van 13 euro tot 314 euro per jaar. Gegeven zulke potentiële premieverschillen dienen beleidsmakers bij een eventuele overheveling van zorg van de basisverzekering naar aanvullende verzekeringen een bewuste keuze te maken voor welke zorgvormen kruissubsidiëring wenselijk is en in welke mate.

In hoofdstuk vijf wordt een economische analyse uitgevoerd van verschillende reguleringsmechanismen voor het bereiken van solidariteit op een concurrerende zorgverzekeringsmarkt. Vervolgens wordt getoetst of deze mechanismen in overeenstemming zijn met het EG-recht. De belangrijkste bevinding van deze analyse is dat een systeem van risicoafhankelijke premiesubsidies vanuit economische overwegingen de beste manier is om solidariteit te realiseren en niet in strijd is met het EG-recht. Dit systeem kan leiden tot een acceptabel solidariteitsniveau zonder belemmer-

ing van het vrije verkeer en concurrentie, en doet geen afbreuk aan doelmatigheid. Second-best alternatieven voor het bereiken van solidariteit zijn premieafhankelijke subsidies en het achteraf compenseren van hoge kosten (hetgeen tot lagere premies zal leiden voor de verzekerden met een hoog risico). Deze alternatieven gaan echter ten koste van de doelmatigheid. Een ander alternatief is premieregulering en een acceptatieplicht voor verzekeraars. Deze maatregelen geven verzekeraars prikkels tot risicoselectie en kunnen zodoende leiden tot verminderde toegankelijkheid tot goede zorg van chronisch zieken en tot verminderde doelmatigheid. Voorts zijn genoemde maatregelen in strijd met het EG-recht omdat zij niet noodzakelijk en niet proportioneel zijn. Dit is een relevante uitkomst voor de EU landen die premie-regulering en acceptatieplicht hanteren naast een systeem van risicoafhankelijke premiesubsidies, zoals bijvoorbeeld Ierland en Nederland. Teneinde hun regulering in overeenstemming brengen met het EG-recht zouden deze landen de premiereg-ulering en acceptatieplicht kunnen vervangen door premieafhankelijke subsidies (of zorgtoeslagen) of het achteraf compenseren van hoge kosten.

Naarmate aanvullende verzekeringen belangrijker worden in de financiering van gezondheidszorg, worden zij een aantrekkelijker instrument voor risicoselectie in de basisverzekering. Hoofdstuk zes bespreekt een conceptueel model voor het vaststellen van de kans dat verzekeraars aanvullende verzekeringen gebruiken voor gunstige-risicoselectie in de basisverzekering. Dit model wordt vervolgens toegepast op vijf landen waarin risicoselectie via de aanvullende verzekering mogelijk is: Bel-gië, Duitsland, Israel, Nederland en Zwitserland. Daaruit blijkt dat de risico's op het gebruik van aanvullende verzekeringen als selectie-instrument in de basisverzeker-ing het grootst zijn in Zwitserland en het kleinst in België. In Nederland is het risico toegenomen door invoering van de Zorgverzekeringswet in 2006. Ten slotte worden verschillende strategieën besproken die beleidsmakers kunnen gebruiken om de kans op risicoselectie via de aanvullende verzekeringen te verkleinen. Vanuit economisch perspectief is het verbeteren van de risicoverevening de meest effectieve strategie. Andere strategieën zoals het beperken van het financiële risico van verzekeraars, het beperken van concurrentie tussen verzekeraars, het afdwingen van een strikte scheiding tussen basisverzekering en aanvullende verzekering en het verbieden van koppelverkoop kunnen leiden tot doelmatigheidsverliezen.

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Curriculum vitae

Francesco Paolucci (1977) is a health economist and Research Fellow at ACERH (ANU). He graduated in Economics at University of Bologna in March 2002 with a thesis on the "Protection of the general interest and competition in health care services" supervised by Prof. G. Fiorentini. Prior to taking up his current post in 2007, he worked for 5 years as a researcher at the Institute of Health Policy and Management, Erasmus University of Rotterdam, where he wrote his PhD thesis entitled "The design of basic and supplementary health care financing schemes: implications for efficiency and affordability", under the supervision of Prof. W.P.M.M. van de Ven and Prof. F.T. Schut. After focusing on the economic analysis of EC-law in health care (insurance) markets, he developed a particular interest in the conceptual and empirical analysis of the interactions between basic and supplementary health care financing schemes in different countries. His teaching and research interests include health insurance, regulated competition, risk-equalisation, risk-selection and international comparison of health care systems. His previous appointments include Assistant-Director of the European Master in Law and Economics at University of Bologna and Assistant-Director of the Master in Health Economics, Policy and Law at Erasmus University Rotterdam. He is currently the Coordinator of the course in "Competition policy in the health care sector" at Erasmus University Rotterdam and Member of the iHEA Scientific Committee.