



# Premium subsidies and social health insurance: Substitutes or complements?☆

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## ABSTRACT

Premium subsidies have been advocated as an alternative to social health insurance. These subsidies are paid if expenditure on health insurance exceeds a given share of income. In this paper, we examine whether this approach is superior to social health insurance from a welfare perspective. We show that the results crucially depend on the correlation of health and productivity. For a positive correlation, we find that combining premium subsidies with social health insurance is the optimal policy.

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## 1. Introduction

Private health insurance markets discriminate according to risk of illness. Those with a higher risk of illness usually have to pay higher premiums than those with a lower risk. In many countries, this price discrimination is regarded as unjust, violating equity principles such as ‘equal access’ or ‘solidarity’. A common solution are social health insurance schemes which establish transfers from low risks to high risks by forcing all citizens into one health insurance contract with a uniform premium.

In a recent paper, Zweifel and Breuer (2006a) fundamentally question this equity argument in favor of social health insurance. They maintain that being a high risk does not necessarily imply that a person should receive transfers:

“[Uniform premiums] result in a cross-subsidization of high-risk by low-risk, low-income individuals. This can result in counter-productive effects. For example, a healthy young worker subsidizes a wealthy older manager who is a heavy

user of medical services. Equity considerations seem to call for redistribution from everyone else to the double disadvantaged, viz. the high-risk, low-income individuals.” (Zweifel and Breuer, 2006a, p. 172)

Based on the above argument Zweifel and Breuer propose to substitute social health insurance by “premiums subsidies”. These subsidies are targeted to individuals whose expenditure on health insurance exceeds a given share of income. By this policy, they want to focus transfers on high-risk, low-income individuals.

Zweifel and Breuer also advance efficiency arguments for risk-based premiums, stating that these allow cost sharing to be tailored to the individual risk type, thereby dealing better with moral hazard. In addition, they point out that risk-based premiums avoid possible costs due to risk selection induced by uniform premiums. This applies if social health insurance is provided by competing insurers.

The case for social health insurance also depends on the severity of risk discrimination in private health insurance markets. For the individual health insurance market in the US, Pauly and Herring (1999, 2007) find that premiums are not proportional to risk, pointing to a substantial amount of risk pooling. However, risk pooling is only partial because higher health risk is significantly related to higher premiums overall and to lower coverage rates in unregulated states (Pauly and Herring, 2007, pp. 775–776).

Social health insurance is also defended by its effect on the income distribution. Empirical studies show that poverty and

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ill-health are positively correlated.<sup>1</sup> For this reason, McGuire (2006) argues that social health insurance may well be optimal from a second-best perspective. It redistributes not only to those with higher health risks but also tends to make the poor better off. Formally, this line of reasoning has been analyzed by Cremer and Pestieau (1996) who show that a positive correlation of health and income provides a strong argument for social health insurance.

van de Ven (2006) criticizes the concept of premium subsidies advocated by Zweifel and Breuer. He points out that high-risk, low-income consumers have little incentive to shop around for a well-priced health plan if their premiums are subsidized. Furthermore, the fact that they receive a subsidy at the margin creates a moral hazard problem. These individuals will tend to over-insure.<sup>2</sup> Zweifel and Breuer (2006b) also mention a negative incentive effect of their proposal. Low-income individuals who receive a premium subsidy effectively face a higher marginal tax rate as the subsidy is decreasing in income.

Whether premium subsidies in combination with risk-based premiums are an alternative to social health insurance is therefore an open issue. The fact that in Switzerland premium subsidies go along with social health insurance raises the general question whether premium subsidies are substitutes or complements to social health insurance.

Overall, an assessment of the ZB proposal calls for an analysis of optimal government interference in health insurance markets to advance equity objectives. In the following, we develop a theoretical framework for this purpose which considers social health insurance as well as premium subsidies. We allow for heterogeneity in productivity and risk types. The government maximizes a social welfare function and uses a linear income tax to redistribute between high and low-productivity individuals. To support high-risk individuals, it can pay premium subsidies if expenditure for health insurance exceeds a given share of pre-tax income or introduce social health insurance. Since Zweifel and Breuer want to target transfers to the worst-off in society, we pay particular attention to the solutions for a maximin social welfare function. In addition, we present results for the utilitarian welfare function.

We examine three schemes in detail. The benchmark is social health insurance combined with optimal linear taxation, a scheme which has been analyzed in detail by Cremer and Pestieau (1996).<sup>3</sup> The second is the proposal by Zweifel and Breuer with risk-based premiums and premium subsidies. The third scheme combines premium subsidies with social health insurance, an approach which is taken in Switzerland. Building on these results, we extend the analysis and examine whether different combinations of social health insurance and premium subsidies can increase welfare.

Our model takes explicitly into consideration the incentive effects on labor supply, in particular, those due to changes in the marginal tax rate induced by premium subsidies. Furthermore, we allow for different degrees of correlation of health and productivity. To keep the analysis tractable, we abstract from further moral

hazard problems. For private health insurance markets, we assume that premiums are actuarially fair given an individual's risk type. We do not consider partial risk-pooling in the private health insurance market.

The paper is structured as follows. In Section 2 we present the model. Section 3 introduces premium subsidies and examines when these will be claimed by individuals. In Section 4 we present the general problem of choosing premium subsidies and social health insurance and analyze different solutions. Section 5 concludes.

## 2. The model

We consider an economy in which individuals supply labor and consume one numeraire good. Labor supply is denoted by  $l$  and consumption of the numeraire by  $c$ . Earnings ability of an individual is  $w$ , implying labor income  $wl$ . Individuals become ill with probability  $\pi$ . If ill, they require treatment leading to medical expenditure  $L$ . Medical treatment fully restores health in a short period of time and therefore has no effect on labor supply. The utility function  $u(c, l)$  is increasing in consumption, decreasing in labor supply, and strictly quasi-concave. Furthermore,  $\partial^2 u / \partial c^2 < 0$  which implies that individuals are risk averse in consumption. Individuals maximize expected utility.

Individuals differ in their earnings ability  $w_i$  ( $w_1 < w_2$ ) and in their probability of falling ill  $\pi_j$  ( $\pi_l < \pi_h$ ). This gives rise to  $2 \times 2$ -types, where  $\theta_{ij}$  is the fraction of  $ij$ -types. The share of productivity type  $i$  is given by  $\theta_i$  and the share of high risks among each productivity type is denoted by  $\kappa_i$ . Hence, the proportions of the four types in the population can be written as

$$\theta_{1h} = \theta_1 \kappa_1, \quad \theta_{1l} = \theta_1 (1 - \kappa_1), \quad \theta_{2h} = \theta_2 \kappa_2, \quad \theta_{2l} = \theta_2 (1 - \kappa_2). \quad (1)$$

If  $\kappa_1 > \kappa_2$ , i.e., if there are relatively more high risks among low-productivity individuals, then productivity and health are positively correlated.

The government maximizes a social welfare function. As Cremer and Pestieau (1996) and Zweifel and Breuer (2006a), we suppose that the government cannot make transfers contingent on  $\pi$ . We also make the standard assumption in problems of income taxation that the government can observe labor income  $y = wl$  but neither productivity  $w$  nor hours worked  $l$ . However, the government knows the joint distribution of both characteristics,  $\pi$  and  $w$ . An income tax is available for redistributive purposes. The tax schedule  $T(y)$  is assumed to be linear, consisting of a marginal tax rate  $t$  and a uniform lump-sum transfer  $\tau$ :

$$T(wl) = twl - \tau.$$

In addition, the government can introduce social health insurance which covers a share  $s$  of the possible medical expenditures at a uniform premium. A uniform contribution  $s\bar{\pi}L$  by each individual guarantees that social health insurance has a balanced budget in expectation. Here  $\bar{\pi}$  is the average probability of illness,

$$\bar{\pi} \equiv (\theta_{1h} + \theta_{2h})\pi_h + (\theta_{1l} + \theta_{2l})\pi_l. \quad (2)$$

On the private health insurance market individuals can buy insurance coverage  $I$  at an actuarially fair premium  $\pi_j I$ . Without premium subsidies, we can apply Mossin's theorem (Mossin, 1968), which states that individuals will fully insure: individuals solve the problem

$$\max_{l, I} E[u] = (1 - \pi)u((1 - t)wl + \tau - s\bar{\pi}L - \pi I, l) + \pi u((1 - t)wl + \tau - s\bar{\pi}L - \pi I - L + sL + I, l).$$

<sup>1</sup> See, e.g., van Doorslaer et al. (1997), Gerdtham and Johannesson (2000) and Breyer et al. (2003).

<sup>2</sup> van de Ven (2006) also advocates an alternative consisting of risk-based and non-means-tested subsidies which is explained in detail in van de Ven et al. (2000). A similar proposal has been made by Pauly et al. (1992) who want to introduce refundable tax credits which reflect a household's risk category and are inversely related to household income.

<sup>3</sup> A similar analysis can be found in Blomqvist and Horn (1984). Boadway et al. (2003, 2006) extend the analysis by Cremer and Pestieau (1996) to include moral hazard and adverse selection. They show that with moral hazard, the case for public intervention in insurance markets remains. The introduction of adverse selection has the effect of fostering social insurance. Netzer and Scheuer (2007) find that more social insurance can be counterproductive in the presence of adverse selection if individuals have a precautionary labor motive.

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