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**Income Redistribution and the Political  
Economy of Social Health Insurance:  
Comparing Germany and Switzerland**

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# **Income Redistribution and the Political Economy of Social Health Insurance: Comparing Germany and Switzerland**

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## **Abstract**

In many countries, collectively financed health insurance systems or health services delivery systems (such as the NHS) exist. Typically, these institutions are financed via general taxes or specific contributions levied on earnings. As benefits are not dependent upon income, this implies a redistribution from high to low earners. An exception can be found in Switzerland, where equal per-capita contributions are used.

From a public-choice perspective it is natural to ask whether the combination of health insurance and income redistribution leads to an expansion or a contraction of the size of a public health care system, a question that is particularly relevant in view of the projected rapid increase of health care costs in the next decades due to population ageing and medical progress.

Building upon the work of Gouveia (1997) and an earlier paper by the author (Breyer 1995) I use a simple model of direct democracy to analyze under what circumstances income redistribution tends to expand the size of a public health insurance system. The predictions of the model are confronted with existing evidence from Germany and Switzerland and are used to develop hypotheses on the future development of the systems.

*JEL codes:* H42, H51

## 1. Introduction

Switzerland and Germany represent interesting objects of comparison for different fields of applied economic research because of the difference of their institutions. This is especially true for Public Choice, because here the effects of direct and representative democracy can be studied. This also holds for social policy research, because the social security systems differ tremendously in their basic concepts among the two countries.

First of all, in Switzerland we literally find a *national* health insurance: there are almost no exceptions from compulsory membership. Secondly, the components of redistribution are arranged very different: while the *statutory* pension scheme in Germany is constructed principally as an equivalence-system, the first pillar of the old age and survivors insurance (AHV) in Switzerland redistributes income in the vertical direction through the income-proportional levying of contributions without a ceiling, combined with pension payments within tight upper and lower bounds. In the national health insurance the complete opposite is true: there are unique per-capita contributions in Switzerland, while in Germany a vertical redistribution takes place through contributions which depend on earnings.

Comparing the two health insurance systems from a public-choice perspective, the question arises whether the connection with income redistribution leads to an expansion or a limitation of the scope of services of the compulsory insurance - a question which is of tremendous relevance in a dynamic perspective, considering the expected rapid medical progress.

In the theory of finance the illustrated problem is described under the title "public provision of private goods". From a public-choice view, the most important contributions to this literature are Besley/Coate (1991), Epple/Romano (1996), Gouveia (1997) and Blomquist/Christiansen (1999), while the author of the present paper presented a model in Breyer (1995), which has anticipated essential results of Gouveia. It is the aim of this contribution to apply the general model of Gouveia to the special institutional frameworks of Switzerland and Germany and to analyze comparatively how the existence or the lack of redistributive components will affect the extent of coverage in a compulsory insurance system.

Through this, the question can be answered whether the separation of the income redistribution from the national health system and the shift to the tax transfer system means a Pareto-improvement. It should be emphasized that the differences in the political systems are not taken into account in our analysis. Our model can be interpreted alternatively as a direct democracy or as a representative two-party system with majority voting.

In Section 2 the assumptions of the model of Gouveia are presented and applied to the specific way of contribution-levying in Germany and Switzerland. For simplification some specificities of the German system such as the existence of an income ceiling and other categorical exemptions from compulsory membership will be disregarded. Section 3 analyses the political decision on the level of insurance coverage in the compulsory insurance under the assumption that private supplementary insurance is allowed and available in the market at fair prices. Section 4 introduces adverse selection into the model. In Section 5 testable hypotheses about the extent of each scope of services will be developed from the comparison of the model results and first empirical evidences will be presented. Section 6 deals with the normative question whether the two institutional frameworks are Pareto-comparable, and Section 6 contains final remarks.

## **2. The model**

Gouveia (1997) considers a continuum of individuals who can differ in two characteristics: their market income  $y$  and their probability of falling ill,  $p$ . Both characteristics are exogenous and observable, i.e. incentive effects of taxation on earnings as well as moral hazard and adverse selection in insurance are all ignored. The common (continuous) distribution function of both parameters,  $F$ , is defined on the Cartesian product of the income-interval  $Y$  and the (unit)-interval of the probability of falling ill,  $P$ .

There are only two homogeneous goods, medical care and (general) consumption, whose consumed quantities are labelled  $h$  and  $c$ , respectively. The quantity  $h$  additively consists of the state provided quantity  $g$ , and the private additional purchase  $m$ . Both goods are traded in the world-market, and therefore

their price-ratio (quantity of consumption goods per unit of medical care) is exogenous and will be denoted by the symbol  $\gamma$ .

The utility of each consumer consists additively of the partial utility function  $u(c)$ , which is increasing and concave in consumption, and the partial utility function  $v(h)$ , which is increasing and concave in the quantity of medical care, where the latter is only relevant in the state of illness. His expected utility therefore is  $u(c) + p \cdot v(h)$ .

Private health insurance contracts provide a lump-sum payment in the case of illness for an actuarially fair premium, i.e. the individual can secure itself the insurance benefit  $I$  for an insurance premium of  $p \cdot I$ . The national health insurance in contrast shall be identified as an in-kind benefit system: each patient gets the same quantity of medical care,  $g$ . It is financed by an income tax with a tax schedule  $\tau(y)$ , while a risk rating does not take place. As special cases of the general tax schedule  $\tau(y)$  we obtain for the two polar cases Switzerland (superscript  $s$ ) and Germany ( $d$ ):

$$(1) \quad \tau^s(y) = \alpha; \quad \tau^d(y) = \beta \cdot y,$$

furthermore the ratio between the individual contribution and the contribution on average of the population shall amount to:

$$(2) \quad t^s(y) = 1; \quad t^d(y) = y/\bar{y}$$

If  $\bar{p}$  denotes the mean of the risk of illness and  $\bar{y}$  denotes average income of the population, it follows from the two alternative budget constraints of the state:

$$(3) \quad \alpha = g \cdot \bar{p} \cdot \gamma = \beta \cdot \bar{y}$$

The relative (tax-) price of an individual with characteristics  $(p, y)$  for one unit of social health insurance coverage amounts to

$$(4) \quad T^j(p, y) = t^j(y) \cdot \bar{p}/p \quad (j = s, d).$$

### 3. The political equilibrium

In the following we consider the case that markets for private additional insurances are allowed. This case is realistic, because the individuals could override a possible prohibition, e.g. through purchasing an insurance contract in a foreign country. We follow Gouveia (1997, S. 226) and first determine the demand for private insurance as well as for medical care in case of illness for the case that the state provided service quantity is zero. As the insurance is available at fair conditions, full insurance is demanded and in case of illness the treatment quantity  $h$  is bought, which satisfies the marginal condition

$$(5) \quad v'(h) = \gamma \cdot u'(y - p \cdot \gamma \cdot h).$$

The solution of (5) defines the demand function  $H(\gamma; y, p)$ .

In the next step Gouveia solves for the optimal size of state provision of services from the perspective of an individual with characteristics  $(y, p)$  and he shows that this can be calculated as follows:

$$(6) \quad g^*(y, p) = \begin{cases} H[T^j(p, y) \cdot \gamma; y, p] & \text{if } T^j(p, y) \leq 1 \\ 0 & \text{otherwise.} \end{cases}$$

The economic intuition of (6) is straightforward: Individuals with a tax-price greater than 1 receive private insurance coverage more cheaply than the public one and therefore vote against state provision. Individuals with a tax price smaller than 1 profit from the implicit redistribution connected with the state provision and therefore vote for the extent of the state system which they would buy in the private market, if there was no state provision, but they were confronted with the implicit price  $T^j(p, y) \cdot \gamma$  of the state system for each unit of medical care.

Equation (6) defines a distribution of the public provision levels desired by the voters, which of course depends on the distribution of the characteristics and the distribution of the tax-prices. If we assume a direct democracy, the political equilibrium is defined by the median of the distribution of the  $g^*$ -values. In the following, it has to be analysed for each of the two institutional settings if propositions

about the position of the median are possible. In particular it has to be asked whether a majority of the voters demands a positive level of state provision of health services.

### 3.1 Income-proportional contributions

Taking into account equations (2) and (4), the relative tax-price of an individual with characteristics  $(y, p)$  in the German system of contribution assessment can be transformed to

$$(7) \quad T^d(p, y) = t^d(y) \cdot \bar{p}/p = \frac{y/\bar{y}}{p/\bar{p}},$$

i.e. the relative tax-price is the ratio of the relative income and the relative illness-risk (each with respect to the average value). General propositions on the distribution of the relative prices are only possible if we know the joint distribution of the characteristics.

In the special case of identical probability of illness, the denominator of (7) is equal to 1, and the tax price is identical to the relative income. This is typically smaller than 1 for a broad majority of the population, from which would follow that a majority favours a provision of state services.

In the opposite case of heterogeneous risks of illness, general propositions on the preferences of the median voter are difficult to obtain because in this case the covariance between the variables  $p$  and  $y$  becomes important.

### 3.2 Lump sum contributions

In the Swiss system of contribution assessment for the relative tax price holds:

$$(8) \quad T^s(p, y) = t^s(y) \cdot \bar{p}/p = \frac{1}{p/\bar{p}}$$

i.e. the tax price is smaller than 1 for those whose risk of illness is greater than the population average; in other words for the above-average risks.

If we consider the distribution of the illness-risks in the population and measure them not only by the probability of falling ill at all, but by the expected costs of illness, it is therefore plausible, that those – similar to income – are distributed with positive skewness. In any event, empirical observations on the distribution of



premiums in private health insurance show that regularly only a minority of not more than 30 per cent of all applicants have to pay a surcharge on the standard premium.

Such a distribution of illness-risks means that a majority of voters is confronted with a relative tax-price higher than 1 and therefore refuses a state provision of health services. The political equilibrium of the Swiss system of contribution levying would therefore be characterised by a non-existence of a national health insurance.

#### 4. Introducing adverse selection into the model

So far, the result of the analysis of the model is quite amazing: if the contributions to the financing of the state provided health services are levied in terms of a linear income tax, a positive level of state provision will be chosen in political equilibrium. In contrast, if the contributions have the shape of a uniform per-capita tax, the equilibrium quantity is zero.

This is essentially due to the fact that Gouveia assumes the absence of asymmetric information. The result changes when we take into account the existence of adverse selection. This already becomes clear in a simple model with only two values of probability of illness,  $p_h$  and  $p_l$  ( $p_h > p_l$ ): if the membership to a risk-group can not be observed by an insurer, in absence of a state compulsory insurance a pooling equilibrium does not exist in the market for private insurance contracts of the price-quantity-type because of the single-crossing-property (cf. Rothschild/Stiglitz 1976). A separating equilibrium only exists if the share of the high risks is not too small. If it exists, the low risks receive only such a thin insurance coverage that it is not worth-while for a high risk to pretend to be a low risk and demand the corresponding contract despite the relatively small premium, and they obtain a full-insurance contract with conditions that imply zero profits for the insurer.

These circumstances are presented in Figure 1, which is adapted from Eckstein et al. (1985). Here, point  $P$  denotes the consumption vector of the individual in both states of nature (superscript  $k$ =sick,  $g$ =healthy), provided that he has no insurance coverage. The straight line  $PQ$  symbolises the set of all consumption vectors  $(c_h^g, c_h^k)$  which can be reached through contracts which are actuarially fair for high risks and the line  $PT$  has an analogous interpretation for low

risks (subscript  $l$ ). The indifference curves of both types of individuals are labelled  $EU_h$  and  $EU_l$  respectively.

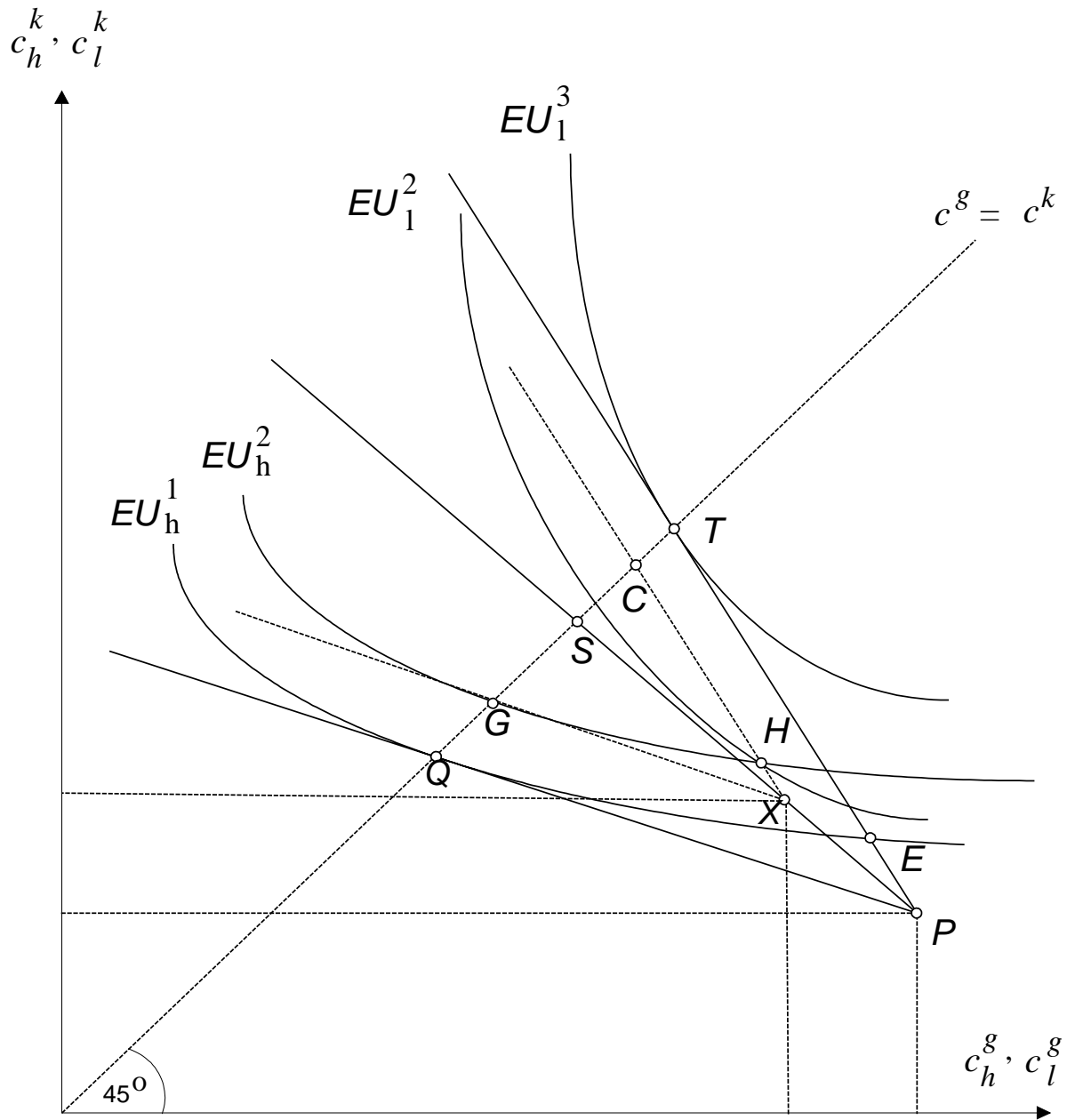


Figure 1: Pareto-improvement through mandatory insurance

As an insurer can not observe the membership of an individual in one group, each contract has to be offered to both types of demanders and has to satisfy the condition of a non-negative profit for the actual composition of the demanders. In this sense, all contracts which satisfy the condition of zero-profitability must lie on line  $PS$ , if they are bought by all citizens.

Eckstein et al. (1985) show that in such a situation only a separating equilibrium exists, in which all high risks buy full insurance coverage (point  $Q$ ) and all low risks are offered a contract on their zero-profitability-line, which is just not interesting for the high risks (point  $E$ ).

On the basis of Figure 1 it can now be analysed under what conditions a Pareto-improvement is possible through introduction of a compulsory public insurance, compared to this separating equilibrium. Because of the compulsory character a budget-balancing public insurance has to fulfil the actuarial equivalence condition for the whole population and therefore has to be characterized by a point on the line  $PS$ , e.g. point  $X$ .

If purchase of private supplementary insurances is allowed, point  $X$  represents the new endowment for both risk types, from which the budget constraints for actuarially equivalent contracts start, that are parallel to the lines  $PQ$  and  $PT$  respectively. High risks reach point  $G$  through such a private supplementary insurance.

For the same reason as above (absence of a state compulsory insurance) a private complementary insurance on the line  $XC$  only below and to the right of point  $H$ , which lies on the same indifference curve for high risks as point  $G$ , is now valid for low risks. If point  $H$ , as drawn in Figure 1, lies on a higher indifference curve for low risks than point  $E$ , state compulsion brings about a Pareto-improvement.

The economic intuition underlying the Pareto-improvement is the following: high risks benefit from the fact that for the compulsory part of the insurance – symbolised by the distance  $PX$  – a uniform rate is calculated so that they are subsidized by the low risks. Low risks now pay a higher premium for the compulsory part of the insurance than the equivalent one; but on the other hand they can now buy the additional amount  $XH$  privately, without the conditions being spoiled through the sale of the same insurance to the high risks. The total extent of their insurance

coverage therefore rises from  $PE$  to  $PH$ . This effect can compensate for the deterioration of the total price if they are sufficiently risk averse.

## 5. Empirical examination of the results of the model

A comparison of the health insurance systems in Switzerland and Germany seems to confirm the theoretical results derived above: in 1998, the expenditures of the “Compulsory Health Care Insurance” (OKPV) in Switzerland amounted to 11.9 billion CHF, to which 5.9 bio. CHF (1996) of the national hospital-financing have to be added. Altogether 17.8 billion CHF or 4.7 per cent of the GDP of Switzerland account for the collectively financed health services.<sup>1</sup>

The corresponding figures for the “Statutory Sickness Funds” (GKV) in Germany are in the same year: expenditures of 234.1 bio. DEM or 6.2 per cent of GDP. There it is not taken into account that the German GKV only insures about 90 per cent of the resident population. According to the OECD definition, the GDP-share of the social expenditures for health amounted 1995 to 6.6 per cent in Switzerland and 8.1 per cent in Germany, which leads to the same conclusions with respect to the difference between both countries.

We can find similar results, if we do not compare the total expenditure – which can be biased through different relative prices – but the scope of insurance coverage. Here it is obvious that in Switzerland the scope of services is much less encompassing than in Germany: dental treatments are not covered except in connection with a severe general illness and for all other services higher copayments are required than in Germany: while in Germany only pharmaceuticals and similar services fall in the category of compulsory copayments, in Switzerland there exists a yearly deductible of 230 CHF for adults as well as a linear coinsurance of 10 per cent up to 600 CHF per year, for all insured.

Furthermore one third of the insured make use of the possibility to reduce the insurance premium by up to 40 per cent through opting for a higher yearly deductible of up to 1.500 CHF (cf. Bezzola/Martinsson 1997). Because these individuals will be

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<sup>1</sup> see the website of the “Bundesamt für die Sozialversicherung”: [www.bsv.admin.ch/statistik](http://www.bsv.admin.ch/statistik) for data for Switzerland and for Germany: BMA, (2000)

the lower risks, this leads to an additional element of limiting the redistribution from the low to the high illness-risks.

Beside this examination of past or present empirical observations, testable hypotheses on the future development of the systems can be deduced. Just in the health insurance a high growth-potential for expenditures exists because of the rapid medical progress and the aging of the population ( cf. to the prognoses for Germany: Breyer/Ulrich 2000). The question arises how the political systems can cope with this development: to which extent will they tolerate a growth of the contribution rates, and how far will limitations of the scope of services occur? The politico-economic model of Sections 2 and 3 suggests that Switzerland will make use of the possibility to cut the scope of services to a higher degree than Germany, where the income-redistribution connected with the levying of contributions helps stabilizing the system on the political level.

## **6. Transition problems**

Tax-financed health-insurance-systems are sometimes criticised with the argument that the redistributive procedures linked with the financing nurtured financial illusions and led to less rational decisions on the extent of services. In a vote about the introduction of coinsurance regulations e.g., the better off would have a biased incentive to vote for coinsurance, because they would profit from the spending cuts to a disproportional extent. Conversely members with below-average income would have a biased incentive to vote against coinsurance, because they would participate in the savings to a lesser extent.<sup>2</sup> Thus it is argued that a shifting of the pure income redistribution component to the tax-transfer-system would strengthen the rationality of the decision about the scope of services in the health insurance and could therefore lead to a Pareto-improvement.

In the light of the theoretical results of the model of Section 3 this proposition must now be questioned: the separation of income redistribution from the social health insurance system shifts also the political weights towards a decrease of the scope of services of the national health insurance. Therefore the implicit redistribution between high and low illness risks will necessarily be reduced and high

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<sup>2</sup> Like the author of the present contribution in Breyer/Haufler (2000)

risks will be worse off. Moreover the presumption that in such a system the individuals would vote on coinsurance features only according to efficiency considerations is misguided because there is still a redistributive effect (namely the one between the different risk groups), which biases the decision.

## **7. Concluding Remarks**

Switzerland and Germany generate an extremely suitable pair of countries for studying the effects of different political and institutional systems on the formation and extent of contribution-financed compulsory social insurance schemes. For the case of social health insurance it turns out that in absence of pure income-redistribution through the system (i.e. in Switzerland), only the presence of adverse selection is suitable to explain that this branch of the social insurance system found political acceptance in the first place. What it is less surprising is that the extent of the insurance benefits is significantly smaller than in the German national health insurance. With regard to the future technological and demographic developments we predict a widening of the disparities between the two health-insurance-systems, concerning their share of the Gross Domestic Product.

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