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Health care reform: Separating insurance from income redistribution

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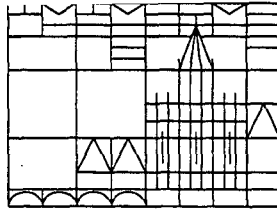
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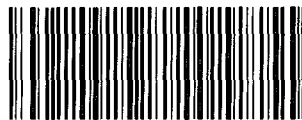
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**Health Care Reform:
Separating Insurance
from Income Redistribution**

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Diskussionsbeiträge

Health Care Reform: Separating Insurance from Income Redistribution

Friedrich Breyer and Andreas Haufler

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Health Care Reform: Separating Insurance from Income Redistribution *

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Abstract

Most systems of health care financing in EU member states currently include elements of income redistribution. The paper analyzes the effects of shifting income redistribution entirely to the tax system, while confining public health systems to their insurance role. We argue that this reform could create two types of efficiency gains. On the expenditure side, it would allow to offer insured persons an improved menu of choices – for example through co-payment schemes – that would help to reduce the gap between the social costs of health care and the perceived private costs. On the revenue side, social security contributions represent a specific type of wage taxation that may imply a shadow price of public funds above that of the general tax system.

JEL classification: H51, I18

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1 Introduction

The health care systems of many developed countries combine the provision of compulsory insurance with redistributive features. Redistribution through the health care system generally occurs not only from good to bad risks, but also from high-income to low-income households. In most EU member states, health care contributions are related to the gross wage income of the insured person whereas medical services received are independent of the contributions made. Hence health care financing is inextricably linked to equity issues in most current welfare systems, even though the extent of redistribution varies considerably across individual countries (see Wagstaff et al. 1999).¹

In recent years this type of income redistribution through the social security system has come under increasing pressure. On the one hand, the parallel development of private insurance schemes has offered a growing number of high-income individuals the possibility to opt out of the redistributive health care system. On the other hand, the rapidly increasing costs of health care have intensified the search for mechanisms that increase the incentives for a more economical use of medical goods and services, mitigating the fundamental free riding problem inherent in any full insurance scheme. However, attempts to offer individuals an improved menu of choices in the market for health care are severely constrained by the requirement not to impinge on the level of redistribution that is currently carried out through health care insurance.

One obvious possibility to free health care systems from their redistributive task without reducing the overall level of income assistance to poor households is to increase the effective redistribution of the tax system. In this perspective, taxes and social security contributions are thus regarded as a single, integrated system. This viewpoint – which we adopt in the present paper – is not an obvious one in countries which have a long independent history of social security systems and where ‘public finance’ and ‘social policy’ have, in large parts, developed as two separate fields. Even in these countries, however, the strict separation of taxes and social security contributions seems to be slowly eroding. In Germany, for example, two tax reforms in 1997 and 1999 raised the standard value-added tax rate and introduced a general

¹An example for a non-redistributive system is Switzerland, where contributions to social health insurance are the same for every adult.

tax on energy consumption, using the additional proceeds from these taxes to reduce the contribution rate for old-age insurance.

In this paper we try to combine the expenditure-related arguments for a more efficient consumption of health services with a conventional optimal taxation analysis that aims at minimizing the social costs of income redistribution. Recent policy-related proposals for reforming the financing of health care (e.g. Pauly et. al. 1991, Hoffmeyer and McCarthy 1994, Advisory Council for the Concerted Action in Health Care 1995, 1997) have largely focused on the first aspect of improving the efficiency in the market for health services. Some of these proposals continue to rely on income-dependent insurance contributions, whereas others favour a switch to income-independent premia. Our analysis will show that both of these approaches can, in principle, be compatible with more efficient choices in the market for health services. They differ, however, with respect to the deadweight loss incurred in financing income redistribution.

The plan of the paper is as follows. In Section 2 we give an overview of existing systems of financing health care in the European Union and comment on the redistributive features present in the different national contribution schemes. In Section 3 we analyze two aspects of reforming existing schemes of financing health care: Section 3.1 demonstrates in a simple framework that a health care system freed of its distributional role would facilitate the adoption of more incentive-compatible insurance contracts and thus generate efficiency gains on the expenditure side. In Section 3.2 we show that redistribution through the health care system may well imply a higher shadow price to the society than redistribution financed exclusively through an optimally designed general tax system. Hence there are further potential efficiency gains on the revenue side of reforming health care financing. Section 4 sums up our argument.

2 Redistributive features of European health financing systems

To prepare the ground for the theoretical analysis in Section 3 it is useful to first take stock of the extent of income redistribution involved in the systems of health care financing in the 15 EU member states. We explicitly limit the following overview to

income redistribution as opposed to redistribution among different types of health risks. Every health insurance plan with compulsory membership which does not allow risk-related premiums redistributes from low-risk to high-risk members, and this is one of the main reasons for having mandatory health insurance (cf. Zweifel and Breyer, 1997, Chap. 5). But over and above this sharing of the burden of health risks, many European health care systems including all EU 15 countries shift money from high-income to low-income earners - quite independent of health risks, and this shall be the matter of concern in the following.²

Historically, most of this redistribution can be explained by the following development. A typical public health care scheme provides its members with two types of benefits:

- (a) compensation for lost earnings in case of sickness,
- (b) reimbursement for the costs (or direct provision) of medical care.

In Germany, for example, when Bismarck introduced the sickness fund system in 1883 earnings compensation constituted a major part (around 50 per cent) of total sickness fund expenditures. Since the amount of compensation was roughly proportional to the level of earnings, the system of earnings-related contributions met the criterion of equivalence between contributions and benefits, at least for the corresponding share of contributions. Moreover, since before the introduction of the sickness fund law, physicians had been used to charge fees according to the incomes of their patients, the monetary value of part (b) of health insurance initially also increased with the income of the insured. Over time, however, the consumption of medical care increased enormously, reflecting the massive technological progress in medicine. At the same time, the duty to provide earnings compensation was shifted to employers, so that the mix of benefits provided has changed more and more towards type (b).³ This has changed the character of the health care financing system away from the principle of equivalence and towards a redistributive scheme.

²Income-related contributions also imply a redistribution from small families and double income earners to large families with only one income earner. We do not attempt to isolate this additional redistributive effect in our analysis here.

³Since 1970 German employers, for example, have to pay 80-100 per cent of regular earnings during the first six weeks of sickness, so that the corresponding share of sickness fund expenditures has gone down to about 5 per cent.

Two further remarks can be made. First, the official policy language distinguishes between two types of sources through which health care systems are financed: contributions and taxes. In the traditional public finance literature, two criteria are used to discriminate between these two types of financing schemes:

1. contributions are earmarked, whereas taxes are not,
2. from the point of view of the payer, contributions generate a claim to benefits, whereas taxes do not.

While the first distinction makes sense in the field of health care, the second does so only in a very restricted way. In principle, only those people are insured who pay contributions, but the level of benefits (except earnings compensation) does not vary with the level of contributions. Secondly, in some countries (Belgium, Ireland, Portugal, Spain, U.K), a comprehensive social security contribution is levied which can not easily be separated into different branches. This is one of the reasons why it is impossible to compare the 15 EU member states with respect to the contribution rates to the public health care systems – in some cases they simply are not available.⁴

Correspondingly, the following comparison is more focussed on the structure than on the quantitative extent of income redistribution in the EU 15. Table 1 provides an overview, which is based on two data sources with some differences in their answers to specific questions, viz., the annual report of the European Commission (MISSOC 1998) and the paper by Wagstaff et al. (1999), which covers 11 of the 15 EU countries. In the first column, the source(s) of financing are stated, and when there are two (contributions and taxes), the dominant source is stated first.

Despite some ambiguities, the following general statements seem to be warranted:

1. Only Germany and the Netherlands have earnings ceilings by which compulsory membership is limited. Persons with earnings above these ceilings (and their families) can become voluntary members in Germany, but not in the Netherlands. Also the ceiling is much lower in the Netherlands. Financing systems are *less redistributive* the lower the ceiling. On the other hand, voluntary membership allows high-income earners to enter the system if they find this

⁴A further complication is that blue-collar and white-collar workers have to pay different contribution rates in three countries (Austria, Italy and Luxemburg).

Table 1: Financing of health care in EU member states (1998)

	contri- butions (C) vs. taxes (T)	annual earnings ceiling for contri- butions (ECU)	earnings ceiling for compulsory membership (ECU)	other exemp- tions (e.g. self-employed)
Austria	C, T	36,252	none	yes
Belgium	C, T	none	none	yes
Denmark	T	n.a.	n.a.	n.a.
Finland	T, C	none	none	no
France	C, T	none	none	yes
Germany	C, T	38,253 ^a	38,253	yes
Greece	C, T	20,160	none	yes
Ireland	T, C	30,053	none	no
Italy	C, T	20,597 ^b	none	no
Luxembourg	C, T	68,105	none	yes
Netherlands	C, T	27,934	27,934 ^c	yes
Portugal	T, C	none	none	no
Spain	T, C	28,153	none	yes
Sweden	T, C	none	none	no
U. K.	T, C	none	none	no

^a West Germany (former FRG)

^b no earnings ceiling for white-collar workers

^c additional insurance for "large risks" with lump-sum contribution compulsory for all

Source: European Commission (1998), Tables II, III; Wagstaff et al. (1999), Fig. 1.

in their own interest. This may either occur when they face high health risks or when they have large families and non-working spouses.

2. Categorical exemptions from mandatory membership, which refer to the self-employed or civil servants, can be found in 8 countries (Austria, Belgium, Germany, Greece, France, Luxemburg, Netherlands and Spain). To the extent that these are high-income groups, the exemptions may be interpreted as lowering the extent of redistribution. On the other hand, as non-labour income is not burdened with contributions, including the self-employed without changing the financing rules would lead to a massive redistribution from the poor workers to the “rich” people with little labour income.⁵
3. Contributions are levied on total earnings without a ceiling in six countries (Belgium, Finland, France, Portugal, Sweden, U.K.). In Italy, a ceiling applies only to the earnings of blue-collar workers. Again, the higher the ceiling, the more redistributive is the system.
4. In no country are contributions the only source of financing. In Denmark there is exclusive tax financing and in six countries (Finland, Ireland, Portugal, Spain, Sweden and the U.K.) taxes are the dominant financing source. Tax financing clearly makes the system more redistributive, at least insofar as the main tax basis is income: the tax system covers all income sources, has no ceiling and is typically progressive.
5. In addition, there can be implicit transfers from the insured in the private health insurance sector to the members of public health plans if the former have to pay higher prices for identical services than the latter (as e.g. in Germany).

It is easy to see that the extent of redistribution inherent in public health care financing is a multidimensional matter so that it is not easy to rank the countries with respect to this criterion. Yet, it appears that those systems can be called “least redistributive” in which parts of the population are exempted, the dominant financing source are contributions and earnings are included only up to a (low) ceiling. Thus obvious candidates for the bottom places are Germany and the Netherlands,

⁵There are, however, some cases where non-earnings income is subject to sickness fund contributions. In Germany this applies, for example, to voluntarily insured pensioners.

whereas the label “most redistributive” seems to belong to the all-tax-financed Denmark followed by Finland, Portugal, Sweden and the U.K. with heavy tax financing, no ceilings and no exemptions.

These findings are in general confirmed by the progressivity indices calculated in Wagstaff et al. (1999, Table 6) for the publicly financed health expenditures: Netherlands and Germany have a negative index, whereas the values are positive for all five countries mentioned above which rely heavily on tax financing. The ranking of index values derived from this quantitative analysis is, however, different from our broad categorization. For example, according to Wagstaff et al. (1999, p. 284) the Danish system of health care financing is less progressive (redistributive) than that of Portugal, Spain or the U.K. because a major source of funding is a near-proportional local income tax.

3 Theoretical analysis of reforming health care finance

3.1 The expenditure side

In this section we first analyze to what extent alternative schemes of financing health care allow to incorporate incentive-compatible mechanisms that avoid the over-use of health care typical for a full-insurance system. For this purpose we adapt a simplified version of the model of redistributive health care insurance in Breyer (1991), where the insured can choose a proportional co-payment on all their health expenditures in case of illness. In contrast to Breyer (1991), the focus here will be on income redistribution, rather than redistribution between different health risks.

There are two types of households, A and B, where household A is ‘rich’ while household B is ‘poor’. The poor household has no own income and its entire expenditure must be financed by the rich household, either through taxes or through social security contributions. For each individual, there are two possible states of the world $j \in \{s, h\}$. Both household types will be sick (superscript s) with the exogenous probability π and healthy (superscript h) with probability $(1 - \pi)$. There are two goods, a general consumption good y , which is taken to be the numeraire, and a composite health good x . For simplicity we assume that household B does not

make any choices. It has a fixed subsistence income \bar{y}_B and consumes a fixed amount of health expenditures \bar{x}_B in case of illness. Finally the poor household is always fully insured.⁶ Hence the poor household's utility level is also fixed in both states of the world and the focus of the analysis is on the decisions of the rich household A (i) which amount of health goods to consume in case of illness, and (ii) which rate of co-payment to choose in the insurance plan.

We make the following assumptions on the expected utility function $E(U_A)$ of the rich household. In case of good health, utility depends only on general consumption y_A whereas in case of illness utility depends on general consumption and the consumption of health goods x_A . We assume that utility is additively composed of the subutility function $u(y_A)$ for general consumption goods and a subutility function $v(x_A) < 0$, which describes the disutility from being sick. By consuming health goods, this disutility can be reduced, but marginal utility gains are decreasing as x_A rises. Furthermore, utility from general consumption is also strictly concave in y_A , implying risk aversion. The properties of the two subutility functions can thus be summarized as follows:

$$u(y^j) > 0, u' > 0, u'' < 0; \quad v(x) < 0, v' > 0, v'' < 0. \quad (1)$$

We assume that the purchasing decisions by the rich household type do not affect the relative price between goods x and y . We can then set the price of x equal to unity for notational convenience, implying that the marginal rate of transformation (MRT) between x and y is also equal to one. The expected utility function of the rich household A is then given by

$$\begin{aligned} E(U_A) &= \pi [u(w - P_A - T_A - cx_A) + v(x_A)] + (1 - \pi) u(w - P - T) \\ &= \pi [u(y_A^s) + v(x_A)] + (1 - \pi) u(y_A^h), \end{aligned} \quad (2)$$

where w is the exogenous gross income, P_A is the insurance premium, T_A are lump-sum taxes, both to be paid by the rich household (and specified below), c is the

⁶It is a common result in the insurance literature that 'bad risks' will always choose full coverage. This will be true even in a 'separating equilibrium' where no redistribution occurs, and incentives for full coverage are increased in a 'pooling equilibrium' with redistribution (even though this equilibrium may not always exist; see Rothschild and Stiglitz 1976). The last argument also carries over to the present setting since the poor household will always prefer full coverage, given that the premium is paid by the rich individual.

co-payment rate chosen in the proportional coinsurance plan and y_A^j is general consumption in health status $j \in \{s, h\}$.

In the second stage of the game, in case of illness, the rich household chooses the amount of health goods x_A , given the co-payment rate decided on in the first stage (before the resolution of uncertainty). Differentiating (2) with respect to x_A gives the first-order condition

$$\frac{v'(x)}{u'(y)} = c. \quad (3)$$

Household A equates the marginal rate of substitution between x and y to the relative price that she faces. Given that the marginal rate of transformation between x and y is unity, private and social prices of the health good thus coincide only for $c = 1$. For any $c < 1$ the private costs of health care, as perceived by the insured person, are below their true social cost. Differentiating (3) with respect to x_A and c and using the properties (1) shows that the demand for health goods by household A is unambiguously falling in the co-payment rate c :

$$\frac{dx_A}{dc} \equiv x' = \frac{u' - c u'' x_A}{v'' + c^2 u''} < 0. \quad (4)$$

In the first stage of the game the rich individual chooses the proportional co-payment rate c . To determine the optimal value of c , the insurance premium P_A and the tax T_A have to be specified. We assume that the insurance market is perfectly competitive. Hence given the exogenous probability π of the poor household of being sick and the fixed level of health goods \bar{x}_B consumed in this case, the insurance premium for the poor household is always $\pi \bar{x}_B$. In addition the rich household has to finance the poor individual's subsistence level of general consumption \bar{y}_B ; this will always occur through the tax system.

We consider two main cases, depending on whether the poor person's (fixed) health care premium is paid through the tax system or through household A's health care contribution. The latter case is further subdivided according to whether or not the choice of a proportional co-payment also affects the redistributive part of individual A's overall health care contribution.

Case 1: The poor person's health care premium is paid through the tax system (as a lump sum) and P_A reflects only the expected health expenditures of household A. Hence we get

$$P_A^1(c) = \pi (1 - c) x_A(c) \quad \text{and} \quad T_A = \bar{y}_B + \pi \bar{x}_B. \quad (5)$$

Case 2a: The poor person's premium is paid through the health care system and proportional co-payments also extend to the redistributive part of the rich household's overall premium P_A . In this case we have

$$P_A^2(c) = \pi (1 - c) [x_A(c) + \bar{x}_B] \quad \text{and} \quad T_A = \bar{y}_B. \quad (6)$$

Case 2b: The poor person's premium is paid through the health care system, but proportional co-payments reduce only individual A's own risk premium. Hence

$$P_A^3(c) = \pi [(1 - c)x_A + \bar{x}_B] \quad \text{and} \quad T_A = \bar{y}_B. \quad (7)$$

We first turn to Case 1. Differentiating P_A^1 in (5) with respect to c gives

$$\frac{\partial P_A^1}{\partial c} = \pi [(1 - c) x'_A - x_A] < 0. \quad (8)$$

This result shows that in a competitive insurance market with zero profits, the premium of household A must fall *more than proportionally* as c increases, because the insurance company anticipates the reduced health expenditures of household A under a co-payment scheme [cf. eq. (4)].

Substituting (5) in (2), differentiating with respect to c and using the optimality condition (3) gives

$$\begin{aligned} \frac{\partial E(U_A)}{\partial c} = & -\pi (1 - c) x'_A [\pi u'(y_A^s) + (1 - \pi) u'(y_A^h)] \\ & + \pi x_A (1 - \pi) [u'(y_A^h) - u'(y_A^s)] = 0. \end{aligned} \quad (9)$$

The first term in (9) is an efficiency effect, deriving from the difference between the private and the social costs of health goods for any $c < 1$. By choosing a positive co-payment the (representative) rich household reduces its own inefficiently high consumption of health goods, and all efficiency gains are returned to her in the form of a lower insurance premium P . The second effect reflects the insurance motive, which aims at equalizing net incomes in the two states of the world. It is then easy to show that a positive co-payment $0 < c < 1$, with strict inequalities, will be optimal. To see this, we evaluate (9) at the two boundaries for the co-payment variable c .

For $c = 0$ we get

$$\left. \frac{\partial E(U_A)}{\partial c} \right|_{c=0} = -\pi x'_A [\pi u'(y_A^s) + (1 - \pi) u'(y_A^h)] > 0,$$

since the second term in (9) disappears when the co-payment is zero and hence $y_A^s = y_A^h$. Hence there is no insurance motive in this case and only the efficiency effect is operating.

Similarly, we get for $c = 1$

$$\left. \frac{\partial E(U_A)}{\partial c} \right|_{c=1} = \pi x_A (1 - \pi) [u'(y_A^h) - u'(y_A^h - x_A)] < 0$$

since the first term in (9) disappears for $c = 1$ and risk aversion implies $u'(y_A^h) < u'(y_A^h - x_A)$. Here there are no efficiency losses from a *marginal* reduction in c , but the insurance motive is clearly operating. Assuming that the second-order conditions for a maximum are fulfilled and $E(U_A)$ is concave in c , we can then conclude that $c = 0$ is ‘too small’ a co-payment whereas $c = 1$ is ‘too large’.

Consider now Case 2a. Differentiating P_A^2 in (6) with respect to c gives

$$\frac{\partial P_A^2}{\partial c} = \pi [(1 - c) x'_A - x_A - \bar{x}_B] < 0. \quad (10)$$

In comparison to Case 1 [eq. (8)] the reduction in the insurance premium is even larger here when c increases, because the rise in the co-payment also reduces the redistributive part of individual A’s insurance premium.

Substituting (6) in (2), differentiating with respect to c and using (3) gives:

$$\begin{aligned} \frac{\partial E(U_A)}{\partial c} = & -\pi [(1 - c) x'_A + \bar{x}_B] [\pi u'(y_A^s) + (1 - \pi) u'(y_A^h)] \\ & + \pi x_A (1 - \pi) [u'(y_A^h) - u'(y_A^s)] = 0. \end{aligned} \quad (11)$$

Comparing (11) with (9), the first (efficiency) term is larger now for any given value of c . Hence, in the optimum, $(1 - c)$ must be smaller to compensate for this additional effect, implying a higher co-payment c . Intuitively, in this case there is an incentive for household A to expand the co-payment beyond the level that would be chosen under a fair insurance premium, because co-payments are a way to reduce the redistributive payment to household B.

Case 2a implies, however, a reduced level of income support to the poor household. If the insurance premium of household B is to be fully paid by the rich person, then only $c = 0$ is a permissible solution in this case. This, of course, is the reason why redistributive insurance schemes often do not allow for positive co-insurance rates. The efficiency costs of such a restriction then follow from our previous result

that the optimal level of c is strictly positive. Hence the rich individual is forced to choose an inefficiently low level of the co-payment and thus will be unambiguously worse off as compared to the case of tax-financed redistribution.

Finally, in Case 2b redistribution occurs within the health care system, but co-payments do not reduce the level of redistribution. Different variants of this scheme have been proposed in the literature. The ‘health care prototype’ proposed by Hoffmeyer and McCarthy (1994, pp. 26-37) combines income-related premiums paid to a central, redistributive fund with risk-related premiums paid to a private insurance company chosen by the individual. Under an alternative scheme, which has long been advocated in Germany (see Männer, 1989; Advisory Council for the Concerted Action in Health Care 1995), insurance contributions are analytically decomposed into a “risk-equivalent” and a redistributive component. In both cases co-payments will thus lead to a proportional reduction in the pure risk premium only.

In our setting of pure income redistribution, it is easy to see that this case is analytically equivalent to Case 1 and thus is indeed compatible with efficient insurance contracts. Since the premium is split between a ‘fair’ insurance component and a purely redistributive component it is possible to calculate competitive risk premia for household A in the same way as in Case 1, without changing the redistributive part ($\pi \bar{x}_B$) of household A’s overall insurance payment. The latter will thus act like an additional tax on household A. In the setting of this section both the redistributive payment via health care insurance premia and via explicit taxes represent lump-sum payments made by household A. In the following section 3.2 we will see, however, that the equivalence between Cases 1 and 2b breaks down when the financing decision is modelled in more detail.

Finally, note that our discussion here has abstracted from the simultaneous redistribution between different health risks that occurs in actual health care systems. Hence, under the proposal to split insurance contributions into a pure risk premium and a redistributive component, the latter consists of two parts, a redistributive payment due to income differences across households and one that is due to differences in health risks. For any individual household, each of the two redistributive components can be either positive or negative. This allows to introduce incentive-compatible co-payment schemes while maintaining not only existing levels of income redistribution, but also existing levels of redistribution between different health risks. The difficulty

that arises under such a scheme is that the redistributive payment that each individual makes (or receives) must be calculated from a two-dimensional matrix with income on one axis and health status on the other (see Männer 1989).

In this extended setting, shifting the role of pure income redistribution to the tax system (Case 1) is thus no full substitute for the analytical decomposition of insurance premia (Case 2b) because it does not incorporate the effects of differences in health risks. Tax-financed income redistribution is, however, fully compatible with this more ambitious proposal because it will simplify the decomposition of insurance premia by eliminating one of the two different sources of redistribution.⁷

3.2 The revenue side

We now focus on the financing of redistribution via the health care system vs. the general tax system. For this purpose, we simplify the expenditure side by fixing the level of health services consumed by each individual in case of sickness and neglect any co-payment choices. The competitive insurance premia are then $\bar{P}_i = \pi_i \bar{x}_i$ ($i \in \{A, B\}$), where different levels of health good consumption and different possibilities for the rich and the poor person to get sick can be permitted.

On the other hand, we now model the revenue side of the health care system and the tax system in more detail. Again, the poor household has no income and her health expenditures (or, equivalently, the premium of the competitive insurance company) must be exclusively financed by the rich household. In addition, the poor household's subsistence level of general consumption (\bar{y}_B) must again be tax-financed by the rich person. The rich household endogenously supplies labour l_A . In addition, it has a fixed amount of non-labour income, denoted by Π_A . This income can alternatively be interpreted as pure economic rent from a fixed factor (e.g. land), or as pure profits derived from entrepreneurial activity.

Corresponding to general practice in most countries, insurance contributions are

⁷Another proposal to increase the efficiency of health care insurance systems while maintaining redistribution between different risk groups has been made by Pauly et. al. (1991). The authors argue in favour of lump-sum transfers from the government to high-risk individuals, compensating them for the extra costs of chronic or severe diseases. One problem with this plan is, however, that the long-term costs of a given health status may be very difficult to anticipate (see also Cochrane, 1995).

financed by a proportional wage tax.⁸ With respect to the tax system, our benchmark case considers a comprehensive income tax that is levied at a uniform and proportional rate t on all income sources. In the simple setting assumed here this comprehensive income tax is equivalent to a general and proportional tax on consumption (an idealized value-added tax). The rate of the social security contribution is denoted by s and the general tax rate is given by t . However, given that deviations from the principle of comprehensive income taxation are becoming visible in some countries (in particular in Scandinavia) we will also consider a ‘dual income tax’ where wage income and profit income can be levied at different rates (denoted by t_w and t_r , respectively). Finally, we can ignore here the (fixed) fair premium that the rich household pays for its own health insurance, since this will be financed by health insurance under any of the cases considered here. This implies that both s and t can be interpreted as tax rates levied for redistributive purposes only.

We consider again the two main cases where household B’s insurance premium ($\bar{P}_B \equiv \pi \bar{x}_B$) is financed through the general tax system (Case 1) or through household A’s health care contribution (Case 2). The subdivision differs, however, from the cases discussed in the previous section. We now consider two different possibilities under tax financing, depending on whether all income sources are taxed under a uniform tax schedule, or under a dual income tax where different tax rates can be levied on different income sources.

Case 1a: The poor person’s insurance premium is paid through the tax system and the same tax rate applies to all sources of income. We then get

$$\begin{aligned} s &= 0, \\ t[w l_A + \Pi_A] &= \bar{y}_B + \bar{P}_B. \end{aligned} \tag{12}$$

Case 1b: The poor person’s insurance premium is paid through the tax system and different tax rates can be levied on wage vs. rent income. In this case we have

$$\begin{aligned} s &= 0, \\ t_w w l_A + t_r \Pi_A &= \bar{y}_B + \bar{P}_B. \end{aligned} \tag{13}$$

⁸We initially abstract from income ceilings in assessing the contributions to the health care system. This feature of existing financing schemes will be discussed at the end of the section.

Case 2: The poor person's insurance premium is paid through the health care system. This gives, allowing for different tax rates on wage and profit income

$$\begin{aligned} s w l_A &= \bar{P}_B, \\ t_w w l_A + t_r \Pi_A &= \bar{y}_B. \end{aligned} \quad (14)$$

To see which of the two ways of financing P_B is more efficient, we set up a Lagrange problem that maximizes the indirect utility of the rich household, subject to the redistribution constraint, and endogenize the levels of all tax variables s, t_w, t_r . Of course, this also covers the case of a general income tax when we impose the additional constraint $t_w = t_r = t$. Furthermore, we incorporate Kuhn-Tucker multipliers $\mu \geq 0$, $\rho_w \geq 0$, $\rho_r \geq 0$ which allow for the possibility that one of the two tax rates on wages is zero in the optimum, and that rent income may be fully taxed away. The Lagrangian is

$$\begin{aligned} \mathcal{L} = V_A [w (1 - s - t_w), \Pi_A (1 - t_r)] &+ \lambda \{ (t_w + s) w l_A(\omega) + t_r \Pi_A - (\bar{P}_B + \bar{y}_B) \} \\ &+ \mu s + \rho_w t_w + \rho_r (1 - t_r), \end{aligned}$$

where ω is the net wage after taxes and social security payments. Differentiating with respect to the three tax parameters, normalizing the marginal utility of private income to unity and using Roy's theorem yields:

$$\frac{\partial \mathcal{L}}{\partial s} = (\lambda - 1) w l_A - \lambda (t_w + s) w^2 \frac{\partial l_A}{\partial \omega} + \mu = 0, \quad (15)$$

$$\frac{\partial \mathcal{L}}{\partial t_w} = (\lambda - 1) w l_A - \lambda (t_w + s) w^2 \frac{\partial l_A}{\partial \omega} + \rho_w = 0, \quad (16)$$

$$\frac{\partial \mathcal{L}}{\partial t_r} = (\lambda - 1) \Pi_A - \rho_r = 0, \quad (17)$$

$$(t_w + s) w l_A(\omega) + t_r \Pi_A - (\bar{P}_B + \bar{y}_B) = 0, \quad (18)$$

$$\mu s = 0, \quad (19)$$

$$\rho_w t_w = 0, \quad (20)$$

$$\rho_r (1 - t_r) = 0. \quad (21)$$

We consider first the case of a comprehensive income tax, or alternatively a value-added tax (Case 1a). The first-order condition for this instrument is obtained by combining (16) and (17) and adding the constraint $t_w = t_r = t$. This gives

$$\frac{\partial \mathcal{L}}{\partial t} = \frac{\partial \mathcal{L}}{\partial t_w} + \frac{\partial \mathcal{L}}{\partial t_r} = (\lambda - 1)[w l_A + \Pi_A] - \lambda (t + s) w^2 \frac{\partial l_A}{\partial \omega} + \rho = 0. \quad (22)$$

We can then subtract the first-order conditions (15) from (22) to get

$$\mu = (\lambda - 1) \Pi_A + \rho.$$

Note that μ and ρ are non-negative and $\lambda > 1$ must hold under distortive tax financing where the shadow price of tax revenue exceeds the private marginal utility of income. Furthermore, from the revenue constraint (18), either s or t must be positive and hence either μ or ρ must be zero. From these constraints, it is then immediately clear that $\rho = 0$ and $\mu > 0$. This implies from (19) that $s = 0$ in the optimum. To understand this result, note that the excess burden terms [the second terms in (15) and (22)] are identical for both taxes. However, the positive first term in (22) is larger than in (15) because of the higher tax base. Hence the shadow price of public funds for redistribution is smaller under general tax financing than if redistribution is financed through the social security contribution s .

This result implies that tax-financed redistribution dominates redistribution by health care contributions if a comprehensive income tax (or a value-added tax) is levied on all income sources. This is clearly an intuitive result in the present framework because the general tax system contains a lump-sum element (the tax on exogenous rent income) which is absent under social security financing. Since the tax system cannot differentiate between the taxation of wage income and rent income, using a high tax rate t – and accordingly choosing a zero contribution rate s – ensures that exogenous rent income is taxed as much as possible, given the constraints on the tax instruments.

Consider now Case 1b, where different tax rates can be levied on wage income on the one hand and rent income on the other. From the first-order condition for the tax on rents [eq. (17)] we can see immediately that either $\lambda = 1$, implying that the marginal financing source is a lump-sum tax, or $\rho_r > 0$, implying from eq. (21) that the tax rate on rent income is 100 per cent. The first case will arise when the revenue requirement is sufficiently small, so that the proceeds from the tax on rent income are sufficient to cover all expenditures. Since $\lambda = 1$ in this case, it follows from (15) and (16) that *both* μ and ρ_r must be positive; hence, from (19) and (20) both s and t_w are zero in the optimum. Alternatively, if the revenue requirement exceeds household A's total rent income Π_A then this income will be fully taxed in the optimum, and the remaining revenue needs are met either by social security contributions or by a positive tax on wages.

The important point is, however, that in this case the social security contribution (s) is a perfect substitute for the isolated tax on wage income (t_w) [cf. eqs. (15) and (16)]. Therefore, there is one degree of freedom in choosing either s or t_w exogenously, and adjusting the remaining tax rate on wages in order to meet the corresponding optimality condition. If some redistribution is carried out through the health care system, the first line in (14) effectively fixes the level of s that is required to finance the health care system. However, this constraint on s is not welfare-reducing because any wedge between the optimal aggregate burden on wage income and the social security rate s can be eliminated by an optimal adjustment of t_w .

To summarize this discussion, financing redistribution through the general tax system rather than through social security contributions will reduce the shadow price of income redistribution, and hence increase welfare, when both of the following conditions are fulfilled: (i) the marginal excess burden of taxing labour both explicitly and through social security contributions must be higher than the marginal excess burden on other tax bases; (ii) there must be some rigidities in the tax system which do not permit to impose independently optimized tax rates on wage income and other income sources.

Condition (i) has been incorporated here in the simplest possible way, by introducing an exogenous rent/income. However, several recent contributions have shown that when unemployment is incorporated as an important real-world feature (in particular in continental Europe), then tax reforms that reduce the overall burden on wage income are welfare-improving in more general models with capital mobility (Koskela and Schöb 1998). We would argue that Condition (ii) is also likely to be met because the presence of significant tax differentials for different income sources gives an incentive to transform income from sources that are heavily taxed to those that are taxed more lightly. This acts as a constraint on the independent setting of wage vs. capital income tax rates in those countries which have introduced dual income tax systems.⁹ Furthermore, a shift from income to value-added taxation has already been observed in some countries, and is contemplated in others. To the extent that tax-financed redistribution occurs not through income but through

⁹One specific problem, sometimes called the 'Achilles heel' of the dual income tax, is to divide the income of the self-employed into capital and wage income. For an overview of the Nordic tax reforms which stresses this problem, see Sørensen (1994).

consumption taxes it is immediately clear that the indirect taxation of all income sources occurs at the same rate.

We would argue, therefore, that with tax-financed redistribution our Case 1a above is the more relevant one in practice. We emphasize that in this case tax financing is welfare superior to any scheme that finances redistribution partly through social security contributions. Note in particular that this also applies to the case where insurance premia are decomposed into a risk component and a redistributive component (Case 2b of the previous section). Therefore, we can strengthen our argument made at the end of Section 3.1: if one favours this decomposition of insurance contributions in order to maintain current levels of redistribution between different *risk groups*, then shifting pure *income redistribution* to the tax system will not only simplify the decomposition of insurance contributions but it will also lead to efficiency gains from the perspective of revenue collection.

Up to now, we have treated social security contributions as a proportional tax on wages. In practice, however, many contribution schemes for the financing of health care systems in the EU include annual income ceilings above which the marginal tax rate is zero (see Table 1). Clearly, if income redistribution were purely financed through the general tax system, this “regressive” feature of current health care financing would be eliminated. Integrating the social security contribution with the general income tax system – even if this were linear – is equivalent to raising the income ceiling. If the reform is to be revenue-neutral, then the effective tax rate on labour income can be reduced accordingly (leaving non-labour income aside for now). Income earners below the income ceiling would thus pay a lower tax rate without a change in their tax base. In contrast, income earners above the ceiling experience both a tax rate and a tax base effect but the latter must dominate under revenue neutrality, implying a higher effective tax (contribution) rate.

These redistributive effects would even be reinforced under a progressive income tax schedule. Hence the efficiency gains discussed above would be accompanied by presumably significant redistributive effects that would generally favour low income earners while imposing an extra burden on high income earners. To the extent that these effects are considered as undesirable they would have to be compensated by an adjustment of the income tax schedule.¹⁰

¹⁰In some countries (such as Germany) the taxation of high-income individuals is at the upper bound of what is constitutionally allowed. Furthermore, it is well known from the theory of optimal

4 Conclusions

In this paper we have analyzed the effects of eliminating the redistribution of income which currently occurs in many systems of health care financing in EU member states, and shifting it to the general tax system. We have argued that this reform could lead to two types of efficiency gains. On the one hand, it would facilitate the adoption of health insurance contracts – for example co-payment schemes – that reduce the incentives for individuals to ‘overconsume’ health services. On the other hand, financing income redistribution through the general tax system is also likely to reduce the excess burden of taxation associated with a given redistributive policy.

By combining both sets of arguments, it is possible to rank alternative solutions to health care financing which are equivalent in more narrow settings. For example, the Danish system of financing the entire health budget through taxes is potentially efficient on the revenue side, but does not allow for cost-cutting incentives on the expenditure side. Similarly, proposals to extend the base on which health care contributions are calculated and incorporate non-labour income may reduce the excess burden of taxation relative to the current system, but they do not facilitate the introduction of more flexible insurance contracts. Conversely, the proposals to split up existing health care premia into a risk equivalent and a redistributive element are aimed at improving the efficiency of the expenditure side of the health care system, but redistribution would likely still be financed in an inefficient way.

In the political debate the idea of shifting pure income redistribution to the tax system is often not clearly separated from the proposal to eliminate the redistributive component of social health insurance completely by calculating actuarial premia (cf. Sachverständigenrat, 1996, p. 250). It needs to be stressed that the latter position is not taken here. While we have not modelled differences in health risks in this paper, our analysis is nevertheless based on the presumption that redistribution between different health risks may be explicitly desired by society, and impossible to achieve via lump-sum transfers. Therefore, redistribution between different health risks would remain in the social health insurance system, implying identical per-capita contributions for full coverage.¹¹ Adjustments of the contribution rate in case

income taxation that steeply progressive income tax systems are not optimal, even under rather egalitarian social welfare functions (see Atkinson and Stiglitz, 1980, Ch. 13 for an overview).

¹¹This proposal was discussed in one of the latest reports by the German Advisory Council for

of co-payment options could then be calculated on an actuarial basis, using one of the alternative methods of decomposing insurance contributions into a pure risk premium and a redistributive component.

Finally, we emphasize that we have not questioned the extent of income redistribution inherent in the current combined tax and social security system. In fact, our entire analysis has been explicitly based on the constraint that the total level of income redistribution is kept constant. The equity and efficiency effects that would arise from a *reduction* in current levels of income distribution in EU member states – caused, for example, by increased international mobility of factors of production – are thus a separate issue that is beyond the scope of the present paper (see, e.g., Sinn, 1996, for a detailed analysis).

the Concerted Action in Health Care (1997), but dismissed as “too unrealistic”.

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