Political sustainability and the design of social insurance

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Abstract

This paper examines how the issue of political support affects the design of social insurance. It distinguishes between redistributive character and size of social protection. Three main results emerge. First, it may be appropriate to adopt a system which is less redistributive than otherwise optimal, in order to ensure political support for an adequate level of coverage in the second (voting) stage. Second, supplementary private insurance may increase the welfare of the poor, even if it is effectively bought only by the rich. Third, the case for prohibiting (supplementary) private insurance may become stronger when the efficiency of private insurance markets increases. © 2000 Elsevier Science S.A. All rights reserved.

Keywords: Social insurance; Political support

\textit{JEL classification:} H23; D72; H50

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1. Introduction

This paper is inspired by the current debate about the future of social protection. On the one hand, there appears to be some consensus that social insurance per se plays an important and overall positive role in modern societies. On the other hand, there appears to be the concern that the current systems may be ill designed and not be sustainable (both financially and politically) in the long run. Consequently, one of the major problems that arises is to know how the current systems ought to be reformed to ensure their viability and their ability to provide appropriate coverage in the future. This is the issue we are considering in this paper, though in an admittedly stylized way.

The role and design of social insurance has traditionally been studied within a welfare economics framework. From that perspective, social insurance can play two roles. First, it may correct market failures when informational problems (such as adverse selection) prevent private markets from offering an appropriate level of coverage. Second, it can play a redistributive role, complementing other tax/transfer policies (see Rochet (1991) and Cremer and Pestieau (1996)). The optimally designed social insurance system then strikes a balance between these positive effects and the welfare cost (distortions) associated with its financing.

Though insightful, this approach does not, however, appear to account for all the dimensions of the current debate. Political economy considerations constitute one of the omissions and a potentially serious one! To illustrate this point, let us consider one of the prominent issues, namely the choice between a minimal program, solely intended to relieve poverty, or a more ambitious and generous system which reduces the uncertainty faced by all individuals. It is often argued that the appropriate choice between these two approaches involves a tradeoff between efficiency cost (distortions) and political sustainability. The main argument in favor of the minimal view is that such a social insurance costs less, and thus requires lower payroll taxes, inducing smaller distortions. The main argument in favor of the more generous view, on the other hand, is that such a social insurance in the Bismarckian tradition concerns everyone in society, thus attracts more political support and resists better to its rolling back.

The latter of these arguments goes beyond the scope of traditional welfare economics by raising the potentially important issue of political support. This is one of the features on which political scientists have traditionally focused when dealing with social protection. More recently, the economics literature has also...
addressed this issue. However, all the existing contributions are very much in line with the minimal (and means-tested) vs. generous (and universal) controversy mentioned above. Consequently, they appear to neglect one of the crucial features of social protection: in reality, social insurance systems do not just differ in their size (extent of coverage) but also in their more or less redistributive character. Furthermore, each of these dimensions can be expected to affect the political support drawn by a given system. For instance, when the system provides actuarially fair benefits, political support may well increase with the extent of coverage (in particular when private alternatives are limited). With flat benefits, on the other hand, a large system may not be sustainable because a significant fraction of the population effectively pays its coverage at a price which exceed the actuarially fair “premium”.

This paper examines the issue of political support for social insurance by explicitly recognizing the distinction between size and redistributive character. Our approach is normative in the sense that we study the appropriate design of social insurance. From that perspective, it resembles traditional second-best studies. It differs, however, in the constraints that affect the policy design. In our setting these constraints reflect the fact that some of the features of social protection are determined through a political process. Further, to concentrate on this issue, we assume away labor market distortions. Consequently, if all relevant variables were set by a welfare maximizing authority, a first-best outcome could be achieved. When the political process is accounted for, this may, however, no longer be true. The politically determined variables may then not be set at their optimal levels. Furthermore, this inefficiency may affect the determination of the remaining characteristics of social insurance.

Social insurance, such as defined here, is financed by a proportional payroll tax. It provides benefits that consist of two parts: a flat part and a variable part that is a fraction of individuals’ contributions. This fraction, which we call the Bismarckian factor, defines the type of social insurance that may range from a flat-rate benefits type (which we refer to as Beveridgean) to a pure Bismarckian scheme in which

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3Moenë and Wallerstein (1996), adopting a Rawlsian viewpoint to choose between uniform benefits and means-tested benefits conclude: “the conservative ideal of a limited welfare state that pays benefits only to the very poor is politically unsustainable in the absence of altruistic voting” (p. 20). De Donder and Hindricks (1998) use an alternative approach wherein both parameters, the tax rate and the means-test factor, are chosen simultaneously by majority voting. They expectedly face serious problems of indeterminacy and multiplicity of equilibria.

The size of social protection can be measured for instance by the share of social spending in GDP: in 1993 it ranges from 38.3% in Sweden to 19.9% in Ireland. Assessing the redistributive character is more difficult. An interesting attempt by Esping-Andersen (1990) relies on the combination of several redistribution indicators, summarized by the so-called “decommodification” score ranging from 23.3 for Ireland to 39.1 for Sweden.
all benefits are proportional to individuals’ contributions. The compensation is paid in the bad state of nature, in which an individual loses his earning capacity and is without resources. Such a scheme is rather close to unemployment and disability insurance and to a lesser extent to health insurance.

Our approach is based on the recognition that while the redistributive character of a system (i.e., its more or less Bismarckian or Beveridgean design) and its size are both essential features of social protection, they are not exactly symmetric. Its redistributive character is to a large extent an integral part of the very definition of the system in itself. Bismarckian systems on the one hand and Beveridgean systems on the other hand, imply specific institutional and administrative arrangements which cannot be overturned in the short run. This is reflected by the fact that the more or less redistributive character of its social insurance system is by now often solidly anchored in a country’s traditions. For some countries, like Germany and France, this tradition is obviously Bismarkian, while it is Beveridgean for others, like the UK and most Scandinavian countries.

The size of the system (i.e., the extent of coverage), on the other hand, is essentially determined by the rate of payroll taxes (through the public sector budget constraint). These variables are typically subject to more frequent adaptations (e.g., on an annual basis) and their adjustments are likely candidates to reflect political support (or the lack of it) for the social protection system.

To account for the different status of the two relevant decisions, we adopt a two-stage approach. In the first, constitutional, stage the Bismarckian factor, defining the type of social insurance is chosen by a welfare-maximizing authority. In the second stage, the payroll tax rate, determining the size of the system is chosen through majority voting.

While the above argument pleads for a constitutional choice of the type of system, it is not in itself sufficient to explain why the determination of tax rates is left to the political process. Why not instead fix them constitutionally in order to bypass the potentially inefficient political process? What underlies our approach is the idea that there is some (aggregate) uncertainty which is resolved between the two stages and which makes the constitutional choice of tax rates an inadequate arrangement. This issue of constitutional vs. political choice has been addressed for instance by Laffont (1996) and Boyer and Laffont (1998). Constitutional decisions are viewed as benevolent, but confined to “rigid” rules. Political decisions, on the other hand, are more flexible but may reflect the interest of some...
groups rather than those of society as a whole. Unlike these authors, we do not explicitly model this uncertainty and, consequently, we do not address the issue of constitutional vs. political choice. Instead, our purpose is to study the implications of a given type of institutional arrangement.\footnote{Our model could easily be adapted to accommodate aggregate uncertainty and to endogenize the political nature of the decisions on tax rates. This would give rise to a more general setting yielding our formulation as a special case.}

Returning to our own setting, it will be shown that the political process in the second stage may have a crucial impact on the constitutional decision pertaining to the social protection system. If the tax rate could be directly controlled, our setting would call for a system with flat benefits (i.e., a Bismarckian factor set at zero). With majority voting in the second stage, on the other hand, the equilibrium tax rate is contingent on the Bismarckian factor, but this allows only for an indirect control. As a consequence, it may be appropriate to adopt a system which is less redistributive than otherwise optimal, in order to ensure political support and thus an adequate level of coverage in the second stage. The key parameters determining the equilibrium outcome are the earnings distribution and the concavity of the utility functions.

Whether or not private insurance is available has an important impact on the outcome. We first consider both cases separately (Sections 3 and 4) and then proceed with a comparison to assess if it may be adequate to prohibit private insurance at the constitutional stage (Sections 5 and 6). Private insurance is assumed to be costlier than public insurance but tends to be more attractive for anyone with above-average earnings. We shall show that the (un)availability of private insurance crucially affects the nature of the voting equilibrium in the second stage. Without private insurance, the individual with the median income is necessarily pivotal, while other individuals may be pivotal when private insurance is available.\footnote{From that perspective, our paper is also related to the literature which studies the equilibrium supply of publicly provided private goods with or without private supplements (and/or the possibility of \textquotedblleft opting out"). Epple and Romano (1996), for instance, show that a system of public provision along with private supplements is majority preferred to either a market-only or a government-only regime. Anderberg (1999) extends their model to an insurance setting with adverse selection.} Rather surprisingly, it also turns out that supplementary private insurance may increase the welfare of the poor, even if it is effectively bought only by the rich. Finally, it also appears that the case for prohibiting (supplementary) private insurance may become stronger when the efficiency of private insurance markets increases.

2. The model

The society consists of an identical number of three types of individuals. An
individual of type \( i \) is characterized by his (exogenous) income level \( w_i \), with \( w_1 < w_2 < w_3 \). In order to focus on redistributive social insurance, we do not explicitly consider the possibility of redistributing income through an income tax.\(^6\) However, one can interpret the \( w_i \)'s as income levels after income taxation.

Individuals can be in two states of the world. In the first, they earn \( w_i \) and in the second, they have no income and must rely on insurance benefits. To keep the notation simple, we assume that they all face the probability \( 1/2 \) to be in either state. Assuming further that they have identical preferences over disposable income \( c_i \) and insurance benefits \( b_i \), their utility function is given by

\[
U(c_i, b_i) = u(c_i) + u(b_i),
\]

where \( u \) is strictly concave (and increasing). Further, we assume that the coefficient of relative risk aversion \( R(x) = -xu''(x)/u'(x) \) is non-decreasing and larger than one.\(^11\) Benefits \( b_i = b^p_i + b^s_i \) represent the sum of private and social insurance benefits. Private benefits \( b^p_i \) are determined by an individual’s contribution. Specifically, one has

\[
b^p_i = \rho^p \theta_i w_i,
\]

where \( \theta_i \geq 0 \) is the proportion of income invested in private insurance, while \( \rho^p \) is the rate of return of such insurance. Social insurance is financed by a proportional payroll tax at rate \( t \geq 0 \) and benefits are given by

\[
b^s_i = t[(1 - \alpha)\bar{w} + \alpha w_i],
\]

where \( \bar{w} = (w_1 + w_2 + w_3)/3 \) is the mean income while \( \alpha \in [0,1] \) is the Bismarckian factor. Observe that (3) takes into account the budget constraints of the public sector (requiring that average contributions equal average benefits).\(^12\) With \( \alpha = 0 \), social insurance is fully redistributive and everyone receives the same benefits \( \bar{w} \) (which equal the average contribution). On the other hand when \( \alpha = 1 \), individual benefits are equal to individual contributions and there is no redistribution of income. In reality, there is no country with \( \alpha = 1 \) or 0; what prevails is a mixture of these two canonical types of social insurance. This is why we study the possibility of \( \alpha \) being between 0 and 1. Social benefits are then a convex

\(^6\)Our analysis can easily be extended to the case of a continuous distribution of incomes. This does not affect the results but makes their derivation more technical and less intuitive.

\(^10\)This would call for endogenous labor supply and would complicate the analysis.

\(^11\)Both of these assumptions are standard and generally considered as “realistic”.

\(^12\)Our model is a stylized representation of a more complex setting in which each type \( i \) is characterized by \( w_i \) and \( p_i \), the probability of losing his earning capacity. The utility function of type \( i \) is then given by:

\[
U(c_i, b_i) = (1 - p_i)u(c_i) + p_i u(b_i).
\]
combination of average and individual contributions and a higher value of $\alpha$ represents a less redistributive social insurance system.

Observe that the rate of return of private insurance is the same for all types (income levels), while social insurance implies a rate of return which is type-specific and given by:

$$\rho_i^s = \left[ \frac{w_i}{w_i (1 - \alpha) + \alpha} \right].$$  \hspace{1cm} (4)

Not surprisingly, $\rho_i^s$ is a decreasing function of $w_i$, unless $\alpha = 1$ ("pure" Bismarckian system). Further, one can easily verify that the "average return" of social insurance equals one (government's budget constraint).\(^{13}\)

Throughout the paper we shall assume that $\rho^p < 1$: private insurance is costlier than public insurance. This assumption may, at first, appear somewhat surprising. Many economists believe that the public sector tends to be less efficient than the private sector. This belief is one of the main rationales for privatization. However, in the case of financial intermediation, insurance and banking, one often observes that the public sector is cheaper than the private sector for two main reasons. First, social insurance is generally managed through a single administration, as opposed to private insurance which is provided by a number of companies. Consequently, social insurance benefits from sizeable scale economies. Second, the private insurance market devotes a lot of resources to advertisement, which is not the case for social insurance. These arguments are confirmed by a number of empirical studies. It is important to realize that the key efficiency enhancing feature here is the collective and "monopolistic" nature of social insurance.\(^{14}\)

The arguments of the utility function can now be expressed in the following way:

Private and social insurance benefits are now respectively determined by:

$$b_i^p = \rho^p w_i \frac{1 - p_i}{p_i},$$

$$b_i^s = \left[ \frac{1 - \alpha}{\alpha} \left( \sum_i w_i (1 - p_i) \right) + \alpha w_i \frac{1 - p_i}{p_i} \right].$$

These expressions reduce to (1)–(3) when $p_i = 1/2$. They show that the correlation between $w$ and $p$ is now a crucial parameter. For sickness, disability and unemployment, this is likely to be negative. In this case, one can show that the median income earner can oppose redistribution even when his income is below average income. Consequently the results we derive below for the case where $w_i > \bar{w}$ may also apply to the (empirically more relevant) case where $w_i < \bar{w}$.

\(^{13}\)Using (4) one can easily show that $\sum_i w_i \rho_i^s / 3\bar{w} = 1$.

\(^{14}\)This issue of the excess cost associated with a privately managed insurance system has been particularly studied for social security and health care. Diamond (1992) argues that these excess costs are not negligible. Mitchell (1998) in her survey shows that they vary greatly across countries and institutional settings; see also Gouyette and Pestieau (1999).
\[ c_i = w_i (1 - \theta - t) \quad \text{and} \quad b_i = w_i (\rho^{p} t + \rho^{s} \theta). \] (5)

Consider an individual of wage \( w \) and assume for the time being that he can choose both the level of social protection (by setting \( t \), for a given value of \( \alpha \)) and his private insurance contribution, \( \theta \). This problem provides a useful benchmark for the study of voting behavior below. The linearity of expression (5) implies that he will, in general, only choose one type of insurance. Specifically, he will choose private insurance (\( \theta > 0 \) and \( t = 0 \)) if \( \rho^{p} > \rho^{s} \), while he prefers social protection (\( t > 0 \) and \( \theta = 0 \)) in the opposite case. Recall that \( \rho^{s} \) (defined by (4)) decreases with \( w \); not surprisingly, low income individuals are thus more likely to favor social protection. Furthermore, the comparison between the two rates of return depends on the value of \( \alpha \). In particular, when \( \bar{w}/w < \rho^{p} < 1 \), there exists an interior value of \( \alpha \) for which \( \rho^{p} = \rho^{s} \); it is easily determined from (4) and given by

\[ \alpha(w) = \frac{\rho^{p} w - \bar{w}}{w - \bar{w}}. \] (6)

Consequently, if \( \alpha = \alpha(w) \) individuals of income \( w \) are indifferent between the two types of protection, while all those with lower (resp. higher) income levels strictly prefer social (resp. private) insurance.

For future reference note that:

\[ \frac{d\alpha}{dw} = \frac{\bar{w}(1 - \rho^{p})}{(w - \bar{w})^{2}} > 0 \]

as long as \( \rho^{p} < 1 \).

3. Private insurance prohibited

We first analyze the case where private insurance is not available. The objective of this exercise is twofold. First, there are countries where social insurance, notably in the field of health care, is not allowed. Second, if the availability of private insurance decreases ex ante social welfare, its prohibition might be

\[ ^{15} \text{The problem we consider here is relevant at the voting stage only. Once} \ t \text{has been set, all individuals (except for the median voter) will face a tax rate which differs from their preferred level. They may then well find it optimal to supplement social protection by private insurance (if available). This problem is studied in Section 4; see (22) for its formal statement.} \]
desirable. To deal with this issue it is of course necessary to separately analyze both cases.

3.1. Voting stage: the choice of \( t \) given \( \alpha \)

Given \( \alpha \), the tax rate is chosen by majority voting. We must then identify the median voter and determine his preferred tax rate.

The preferred payroll tax rate of an individual with earnings \( w \) is given by:

\[
\* t(w, \alpha) = \arg \max_t u[w(1 - t)] + u[t(\bar{w} + \alpha(\bar{w} - w))].
\] (7)

For simplicity we shall often use the notation \( t_i^*(\alpha) = t^*(w_i, \alpha), \ i = 1, 2, 3 \) to refer to the preferred tax rates of the different types.

The first- and second-order conditions are:

\[- u'(c)w + u'(b)(\bar{w} - \alpha(\bar{w} - w)) = 0 \] (8)

\[ D = u''(c)w^2 + u''(b)(\bar{w} - \alpha(\bar{w} - w))^2 < 0 \] (9)

where (9) holds for all \( t \in [0,1] \). Consequently, the objective function is concave (preferences are single-peaked) so that a majority voting equilibrium exists and is determined by the preferred tax rate of the median (pivotal) voter.

Before proceeding, two remarks about the properties of \( t^* \) are in order. First, it follows directly from (8) that

\[ t^*(w, 1) = \frac{1}{2} \quad \forall w. \] (10)

In words, when \( \alpha = 1 \) (pure Bismarckian system with no redistribution) all types have the same preferred tax rate, namely \( t = 1/2 \) which allows for perfect consumption smoothing across states of nature \((c = b)\).

Second, differentiation of (8) yields:

\[
\frac{\partial t^*}{\partial \alpha} = \frac{\bar{w} - w)u'(b)(1 - R_c(b))}{D}. \] (11)

Given our assumption on relative risk aversion \((R_c > 1)\), this expression has the
same sign as $\bar{w} - w$. Consequently, the preferred tax rate is a decreasing (resp. increasing) function of the Bismarckian factor for individuals with above-average (resp. below-average) incomes.\footnote{One can easily verify that a change in $\alpha$ creates conflicting income and substitution effects. With $R, > 1$, the income effect dominates and this explains the relationship between $\alpha$ and $t^*$.}

We can now turn to the determination of the voting equilibrium. When $t^*$ is a monotonic (increasing or decreasing) function of $w$, the median voter is simply the individual with median income (namely $w_2$). To check if this (sufficient) condition holds, we use the following expression, derived from (8):

$$\frac{\partial t^*}{\partial w} = \frac{\alpha u'(b)(1 - R_c(b)) - u'(c)(1 - R_c(c))}{-D}. \tag{12}$$

With $D < 0$ (expression (9)), it immediately follows that (12) is positive if

$$\frac{\alpha u'(b)}{u'(c)} \frac{1 - R_c(c)}{1 - R_c(b)} < 1 \tag{13}$$

One can easily show that this condition is necessarily satisfied when $w > \bar{w}$. This property, along with (10) and (11) then implies that when $w > \bar{w}$ one necessarily has $t^*_a(\alpha) < t^*_b(\alpha) < t^*_c(\alpha)$ for any $\alpha < 1$. When $w < \bar{w}$, (13) continues to hold (without any further restrictions required) when $\alpha$ is sufficiently close to 0 or 1. However, some additional technical assumptions are now required to ensure an unambiguous ranking of the different types’ preferred tax rates for any value of $\alpha$. These assumptions are satisfied, in particular, for the class of (exponential) utility functions we consider in the illustrations below.\footnote{Utility functions with constant relative risk aversion provide another example.}

In what follows, we shall concentrate on the case where a median income individual is effectively the median voter so that the voting equilibrium is given by $t^*_2(\alpha)$, the preferred tax rate of type 2.

To set the grounds for the analysis of the constitutional stage, note that $t^*_2(\alpha)$ is increasing or decreasing depending on whether $w_2 < \bar{w}$ or $w_2 > \bar{w}$ (see expression (11)). In words, an increase in the Bismarckian factor yields a higher (resp. lower) equilibrium tax rate when the median income is smaller (resp. larger) than the mean income. Empirically observed income distributions typically suggest that the median income is lower than the average income. However, as noted above, when the probability of income loss is negatively correlated with income, $t^*_2(\alpha)$ can be decreasing even when $w_2 < \bar{w}$.\footnote{See footnote 12.} Furthermore, when dealing with voting, abstention can imply that the median income of those voting effectively be higher than the average income. Consequently, the results that emerge when the pivotal voter has above-average income may be of some relevance and we shall continue to consider both cases.
Figs. 1 and 2 summarize the main results of this section; they depict the profiles of preferred tax rates for both of the considered cases. It might appear surprising to find that higher income people prefer higher tax rates. However, one has to keep in mind that social insurance is here the only source of income in the bad state of nature. If the utility function is sufficiently concave, high income individuals will then prefer a higher value of $b$ than poor individuals, even though they pay a higher price for this coverage.$^{21}$

3.2. Constitutional stage: Rawlsian objective

We now turn to the constitutional stage at which $\alpha$ is determined. Utility levels are evaluated at the second-stage voting equilibrium induced by the considered value of $\alpha$. Some additional notation is needed. First, define

$$V^*_i(\alpha, t) = u[w_i(1 - t)] + u[t(\bar{w} + \alpha(w_i - \bar{w}))], \quad i = 1, 2, 3,$$

which specifies the utility of a type $i$ individual as a function of $\alpha$ and $t$. The index $n$ is used to point out that there is no private insurance. The relevant utility level to be considered at the constitutional stage is obtained by evaluating (14) at $t^*_i(\alpha)$

$^{21}$The “sufficient degree of concavity” is ensured by the assumption that relative risk aversion is larger than one.
(the voting equilibrium given by the preferred tax rate of the median voter).

Fig. 2. Profile of preferred tax rates for \( w_1 > \bar{w} \).

With a Rawlsian objective, the constitutional problem then consists in maximizing the utility of the worst-off individual (namely 1) with respect to \( \alpha \). Formally, the solution \( \alpha_R^* \) is defined as

\[
\alpha_R^* = \arg \max_{\alpha} \{ v_1^*(\alpha); \text{s.t. } 0 \leq \alpha \leq 1 \}.
\]

Differentiating \( v_1^* \) yields

\[
\frac{dv_1^*}{d\alpha} = \frac{\partial V_1^*}{\partial \alpha} + \frac{\partial V_1^*}{\partial t} \frac{dt^*_2}{d\alpha}.
\]  

Using (14) one easily shows that

\[
\frac{\partial V_1^*}{\partial \alpha} = u'(b_1)(w_1 - \bar{w})t^*_2(\alpha) < 0.
\]

This first term on the RHS of (15) term measures the direct impact on the utility of 1 of an increase in \( \alpha \). It is negative because an increase in \( \alpha \) implies a less redistributive system which, not surprisingly, decreases the utility of the poorest individuals.

Observe in passing that if \( t \) were set directly (rather than determined through voting) only this term would be relevant so that a Beveridgean system (\( \alpha = 0 \)) would necessarily be optimal. Now, when \( t \) is determined by voting, the indirect
impact through the payroll tax (and the level of coverage) has to be accounted for; it is captured by the second term on the RHS of (15).

To interpret and sign this term, observe first that \( \frac{\partial V_1^\theta(\alpha, t_1^\theta(\alpha))}{\partial t} < 0 \); this follows from \( t_1^\theta(\alpha) < t_2^\theta(\alpha) \) along with the concavity of the individual’s objective function (7) in the voting problem (see Section 3.1). As to \( \frac{dR^\theta}{d\alpha} \), we know from (11) that it has the same sign as \((\bar{w} - w_2)\). Consequently, the following two cases have to be distinguished:

- \( w_2 \leq \bar{w} \)

In this case, both terms on the RHS of (15) are negative (for any \( \alpha \)) so that the optimal solution is given by \( \alpha^\theta = 0 \). This result is not surprising. As mentioned above, the direct impact of an increase of \( \alpha \) on the utility of type 1 is always negative. Setting a strictly positive Bismarckian factor can only be desirable if it brings the (voting equilibrium) tax rate closer to type 1’s preferred rate. Now, when \( w_2 < \bar{w} \) an increase in \( \alpha \) has exactly the opposite effect. It brings about a further increase of an already “too high” tax rate (from type 1’s perspective).

To sum up, a Beveridgean system is optimal. Furthermore, the type of social protection that emerges from our two stage process is exactly the same as when \( t \) is under direct control of the (Rawlsian) public authority.

- \( w_2 > \bar{w} \)

In this case, the two terms on the RHS of (15) are of opposite signs. In particular, one can easily check that \( \frac{dV_1^\theta(0)}{d\alpha} \) now has an ambiguous sign. Consequently, it is no longer necessarily optimal to set \( \alpha = 0 \); an interior solution is potentially possible though, of course, not guaranteed.22

Analytically, a precise characterization of the type of solution (interior or corner) is extremely difficult (and not very insightful), even for specific utility functions. The only straightforward result is that a corner solution will prevail when \( w_2 \) is sufficiently close to \( \bar{w} \).23 However, to make our main point, namely that \( \alpha^\theta > 0 \) is effectively possible, it is sufficient to provide numerical examples, and this will be done in Section 6 below.

Anticipating on this, observe that the possibility of an interior solution confirms one of the points made in the introduction. When \( \alpha^\theta > 0 \) the political process makes it desirable to adopt a social insurance system which is less redistributive than otherwise optimal. The level of \( \alpha \) is then used as a device to induce a voting equilibrium tax rate (and level of coverage) which is more suitable to the poor.

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22A corner solution at \( \alpha = 1 \), on the other hand can easily be ruled out.
23This follows from a simple continuity argument, using the fact that (15) is strictly negative when \( w_2 = \bar{w} \).
3.3. Constitutional stage: utilitarian objective

Let us now reexamine the constitutional choice of \( \alpha \) for a utilitarian (rather than Rawlsian) social welfare function. Using the notation introduced in the previous subsection, social welfare is now given by

\[
SW^n_{U}(\alpha) = \sum_{i=1}^{n} V^n_i(\alpha) = \sum_{i=1}^{n} V^n_i(\alpha, t^n_2(\alpha)).
\] (16)

The constitutional problem consists in determining \( \alpha^*_U \) that maximizes \( SW^n_{U}(\alpha) \) subject to \( 0 \leq \alpha \leq 1 \).

Differentiating (16) and rearranging yields:

\[
\frac{dSW^n_{U}}{d\alpha} = \left( \frac{\partial V^n_1}{\partial \alpha} + \frac{\partial V^n_2}{\partial \alpha} + \frac{\partial V^n_3}{\partial \alpha} \right) + \left( \frac{\partial V^n_1}{\partial t} + \frac{\partial V^n_2}{\partial t} + \frac{\partial V^n_3}{\partial t} \right) \frac{dr^n_2}{d\alpha}.
\] (17)

The first term on the RHS measures the direct impact of a variation of \( \alpha \) on welfare, while the second term measures the indirect impact, through the induced variation in the voting equilibrium. Using expression (14), the definition of \( V^n_i \), the first term can be expressed as follows:

\[
\left( \frac{\partial V^n_1}{\partial \alpha} + \frac{\partial V^n_2}{\partial \alpha} + \frac{\partial V^n_3}{\partial \alpha} \right) = t^n_2 \left[ (w_1 - w) u'(b_1) + (w_2 - w) u'(b_2) \right] + (w_3 - w) u'(b_3) = t^n_2 \text{cov}(w, u'(b)),
\] (18)

where \( \text{cov} \) denotes the covariance. Now, when \( \alpha > 0 \) one has \( b_3 > b_2 > b_1 \), so that (from the strict concavity of \( u \)) \( \text{cov}(w, u'(b)) < 0 \). On the other hand, \( \alpha = 0 \) implies \( b_3 = b_2 = b_1 \) so that \( \text{cov}(w, u'(b)) = 0 \). Not surprisingly, the direct impact of an increase in \( \alpha \) (making the system less redistributive) on utilitarian welfare is thus negative. Consequently, if the tax rate were directly set by the utilitarian authority, the optimum would, once again, imply \( \alpha = 0 \). Like in the Rawlsian case, \( \alpha > 0 \) can only be desirable if it induces a more “adequate” tax rate in the second stage.

The fact that the first term on the RHS of (17) vanishes at \( \alpha = 0 \) has another interesting implication. It implies that the derivative at \( \alpha = 0 \) of social welfare reduces to:

\[
\frac{dSW^n_{U}(0)}{d\alpha} = \left( \frac{\partial V^n_1}{\partial t} + \frac{\partial V^n_2}{\partial t} \right) \frac{dr^n_2}{d\alpha},
\] (19)

where we have also used \( \frac{\partial V^n_3(\alpha, t^n_2(\alpha))}{\partial t} = 0 \) (which follows directly from the definition of \( t^n_2 \)). Keeping in mind that \( dSW^n_{U}(0)/d\alpha > 0 \) is a sufficient condition for \( \alpha^*_U > 0 \), expressions (17), (18) and (19) can be used to show that with a
utilitarian objective it may be optimal to set $\alpha > 0$ even if $w_2 < \bar{w}$.\footnote{Consider, for instance, the case where $\bar{w} > w_2$. Then one has $t^*_2 \rightarrow t^*_1$ and, at the limit, $\alpha^*_2 \rightarrow \alpha^*_1$. One then has $\partial V^*_2/\partial \alpha > 0$ (from (12)) and $\partial t^*_2/\partial \alpha > 0$ (from (11)). Consequently, $\partial S^*_2/\partial \alpha > 0$ which implies $\alpha^*_0 > 0$.} Contrast this with the result in the Rawlsian case (where $w_2 < \bar{w}$ necessarily implied $\alpha^*_n = 0$). Consequently, a positive $\alpha$ decreases the utility of the poorest type, but it nevertheless increases expected utility of the representative individual at the constitutional stage.

A more precise characterization of the conditions under which a positive $\alpha$ is appropriate does not appear to be possible with general utility functions. Once again, the numerical example in Section 6 will provide some further insights.

4. Private insurance authorized

We now reintroduce the possibility for individuals to buy additional private insurance if the level of public insurance chosen by the pivotal voter is too low for them. Recall that private insurance coverage must be positive ($\theta \equiv 0$); individuals are not allowed to sell back part of their public insurance if they feel overinsured. Further, observe that supplementing social insurance by a private one is not the same as “opting out”: buying private insurance has no impact on an individual’s payroll tax bill. In other words, individuals cannot replace social insurance by private insurance.

4.1. Voting stage: the choice of $t$ given $\alpha$

As explained in Section 2, individuals with incomes $w < \bar{w}$ prefer social insurance over private insurance regardless of the value of $\alpha$. Consequently, type 1 individuals always prefer social insurance. When $w_2 < \bar{w}$, the same holds for type 2 individuals.

Consider now an individual with income $w > \bar{w}$. For $\bar{\alpha} = (\rho^w(w - \bar{w})/(w - \bar{w})$, he is indifferent between social and private insurance; see (6). For $\alpha < \bar{\alpha}$, he prefers private insurance; in other words, his preferred payroll tax is $t^* \equiv 0$. On the other hand, for $\alpha \geq \bar{\alpha}$, his preferred payroll tax is given by (7); put differently, once $\theta = 0$, individual preferences over payroll tax rates are the same as when private insurance is prohibited. Denote $\bar{\alpha}_i = \bar{\alpha}(w_i)$, $i = 2, 3$ for the type 2 and type 3 individuals respectively.

We are now in a position to determine the median voter and hence the tax rate chosen at the political equilibrium stage for the two cases.

\begin{itemize}
  \item $w_2 < \bar{w}$
\end{itemize}
Individual 2 always prefers social insurance because he benefits from the redistribution ($\rho_2^s > 1$). For low values of $\alpha$ ($\alpha < \bar{\alpha}_2$), type 3 individual prefers private insurance and for $\alpha \geq \bar{\alpha}_2$, he has a preferred tax rate $t^p_3(\alpha)$; see Fig. 3.\(^\text{23}\) For $\alpha < \bar{\alpha}_3$, type 1 individual is the median voter and the tax rate chosen by majority vote is $t^p_1(\alpha)$. For $\alpha \geq \bar{\alpha}_3$, the situation is the same as when private insurance is prohibited, and the median voter is of type 2.

To sum up, the voting equilibrium, denoted by $t^*(\alpha)$ is thus given by

\[
t^*(\alpha) = \begin{cases} 
  t^p_1(\alpha) & \text{if } 0 \leq \alpha < \bar{\alpha}_3 \\
  t^p_3(\alpha) & \text{if } \bar{\alpha}_3 \leq \alpha \leq 1 
\end{cases}
\]  

(20)

It is interesting to note that the availability of private insurance can favor individual 1 (even though he does not effectively buy such insurance). Specifically, for low values of $\alpha$, type 1 individual becomes the median voter and can choose his preferred tax rate.

- $w_2 > \bar{w}$

The situation is now more complex; see Fig. 4. For $\alpha < \bar{\alpha}_2$, types 2 and 3 individuals prefer private insurance. Consequently, a majority of voters is in favor

\(^{23}\)As a tie breaking rule, we assume that an individual who is indifferent between private and social insurance votes for his preferred social insurance protection (as defined by (7)).
of a zero tax rate. For $\alpha_2 \leq \alpha < \alpha_3$, type 1 individual is the median voter and for $\alpha \geq \alpha_3$, type 2 individual is the median voter.

In contrast with the previous case, too low values of $\alpha$ can lead to the abandonment of social insurance by a coalition of $2/3$. To sum up, the voting equilibrium is now given by:

$$t^*(\alpha) = \begin{cases} 
0 & \text{if } 0 \leq \alpha < \alpha_2 \\
\bar{t}_1^\theta(\alpha) & \text{if } \alpha_2 \leq \alpha < \alpha_3 \\
\bar{t}_2^\theta(\alpha) & \text{if } \alpha_3 \leq \alpha \leq 1
\end{cases} \quad \text{(21)}$$

Before proceeding, it is interesting to point out that both (20) and (21) imply $t^*(\alpha) \leq \bar{t}_2^\theta(\alpha)$. In words, for any given level of $\alpha$ the tax rate with private insurance is less than or equal to the tax rate that obtains when only social insurance is available. Consequently, it appears that the availability of private insurance may effectively undermine political support for a given social protection system.

4.2. Constitutional stage: Rawlsian objective

The analysis of the constitutional stage proceeds along the same lines as in Sections 3.2 and 3.3. However, the type-specific utility levels achieved in the second stage have to be redefined to account for the availability of private insurance. Formally, we define
\[ V_i^p(\alpha, t) = \max_{\theta \in [0, 1]} u[w_i(1 - t - \theta)] + u[t(\bar{w} + \alpha(w_i - \bar{w})) + \rho^i \theta v_i], \]

\[ i = 1, 2, 3, \] (22)

and \( v^p_i(\alpha) = V_i^p(\alpha, t^*(\alpha)) \).

In the Rawlsian case, the constitutional problem then amounts to determine \( 0 \leq \alpha_R^p \leq 1 \) which maximizes \( v^p_1(\alpha) \). We have to distinguish two cases, but in each instance, the solution is rather straightforward.

- \( w_2 \leq \bar{w} \).

Recall that in this case \( t^*(0) = t^p_R(0) \): for \( \alpha = 0 \), the poorest individual is also the median voter in the second stage. Consequently, nothing can be gained from setting a positive level \( \alpha \) and it immediately follows that \( \alpha_R^p = 0^2 \).

- \( w_2 > \bar{w} \)

Only two candidate solutions need to be considered, namely \( \alpha = 0 \) and \( \alpha = \bar{\alpha}_2 \). An argument exactly similar to the one used in the previous case indeed shows that \( \alpha > \bar{\alpha}_2 \) is dominated by \( \bar{\alpha}_2 \). Similarly, one easily shows that \( 0 < \alpha < \bar{\alpha}_2 \) is dominated by \( \alpha = 0 \).

To compare the utility levels implied by \( 0 \) and \( \bar{\alpha}_2 \), note that in both cases type 1 effectively chooses his preferred level of insurance: private for \( \alpha = 0 \) and social for \( \alpha = \bar{\alpha}_2 \). But then \( \rho^1 > 1 > \rho^p \) (obtained from (4)) immediately implies that the utility level is higher for \( \bar{\alpha}_2 \). In words, whatever \( \alpha \) social insurance always has a higher rate of return for the low income type. If \( \alpha \) is set “too low”, the second stage voting will imply no social insurance; consequently, type 1 is left with private insurance. On the other hand, \( \alpha = \bar{\alpha}_2 \) ensures a positive level of social protection which, moreover, is precisely type 1’s preferred level.

To sum up, when \( w_2 > \bar{w} \) one has \( \alpha_R^p = \bar{\alpha}_2 > 0 \): it is always optimal to set a positive level of \( \alpha \) at the constitutional stage.

4.3. Constitutional stage: utilitarian objective

Welfare is now given by

\[ SW^p_u(\alpha) = \sum_{i=1}^{3} v^p_i(\alpha) = \sum_{i=1}^{3} V_i^p(\alpha, t^*(\alpha)), \] (23)

and the solution is denoted by \( \alpha_R^p \). Observe that this expression differs in two respects from (16), its counterpart in the absence of private insurance. First, unlike \( V_i^p \), \( V_i^p \) accounts for the individual’s maximization with respect to private

\[^2\text{Formally, } (0, t^p_R(0)) \text{ maximizes } V_i^p(\alpha, t). \text{ Consequently, one has } v^p_i(0) = V_i^p(0, t^p_R(0)) > V_i^p(\alpha, t^*(\alpha)) = v^p_i(\alpha), \text{ for all } \alpha > 0.\]
coverage; see (22). Second, with private insurance the median voter is not necessarily an individual of type 2.

Differentiating (23) with respect to \( a \) yields:

\[
\frac{dSW^P}{d\alpha} = \left( \frac{\partial V_1^P}{\partial \alpha} + \frac{\partial V_2^P}{\partial \alpha} + \frac{\partial V_3^P}{\partial \alpha} \right) + \left( \frac{\partial V_1^P}{\partial t} + \frac{\partial V_2^P}{\partial t} + \frac{\partial V_3^P}{\partial t} \right) \frac{dt}{d\alpha}.
\]  

(24)

The first term on the RHS of this expression can be rearranged exactly like in (18), provided that \( b \)'s are properly redefined (to account for private insurance). Observe that while the covariance term was zero at \( \alpha = 0 \) in the absence of private insurance, it is now negative for all \( 0 \leq \alpha \leq 1 \).

As in the previous case, \( \alpha = 0 \) would be optimal if \( t \) were set by the welfare-maximizing authority. To examine if the political process implies a different result (namely \( \alpha > 0 \)), we have to distinguish the usual two cases.

- \( w_2 < \overline{w} \).

A straightforward (but somewhat tedious) inspection of (24) (making use of (20)) makes it clear that no general result can be obtained for this case; both \( \alpha^U_1 = 0 \) and \( \alpha^U_1 > 0 \) are possible. However, compared to the setting without private insurance (Section 3.3) the result \( \alpha^U_1 = 0 \) appears to be much “more robust”. Put differently, somewhat extreme assumptions appear to be needed to generate a positive Bismarckian factor.

- \( w_2 > \overline{w} \).

Now, \( \alpha = 0 \) implies \( t^e = 0 \): a Beveridgean system induces a voting equilibrium which implies no social insurance at all. Unlike in the Rawlsian case, it is however not always the case that \( \alpha = \overline{\alpha} \), dominates \( \alpha = 0 \). Nevertheless, it is easy to show that the optimal \( \alpha \) continues to be (strictly) positive. To establish this, we shall now show that \( \alpha = 1 \) necessarily yields a higher welfare than \( \alpha = 0 \).

First, observe that combining (21) and (10) yields \( t^e(1) = 1/2 \). Second, it is easily shown from (22) that \( V_1^P(0,0) < V_1^P(1,1/2) \), \( i = 1,2,3 \). Consequently, one has \( \nu^P_i(1) > \nu^P_i(0) \), \( i = 1,2,3 \) which immediately implies that \( \alpha = 1 \) yields a higher level of welfare than \( \alpha = 0 \).

Intuitively, this result can be understood as follows. With a purely Bismarckian system, there is no redistribution, but the tax rate corresponds to the preferred level

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27One has to keep in mind though that \( t^e(\alpha) \) may be discontinuous at \( \overline{\alpha} \) and \( \overline{\alpha} \); consequently, (24) does not apply for these values.

28It can be easily shown that \( \theta_1 > \theta_2 \geq \theta_3 \) (except if \( \rho^e \) is so low that \( \theta_3 = 0 \)). Consequently, \( \mu_1 > \mu_2 > \mu_3 \) now holds even when \( \alpha = 0 \) (that is when social insurance benefits are the same for all).

29Recall that the first term on the RHS of (24) is negative at \( \alpha = 0 \). In addition, one has \( \partial V_1^P/\partial t < 0 \) (while \( \partial V_1^P/\partial t > 0 \)).

30Provided that \( \overline{\alpha} > 0 \), which we assume for simplicity.

31The strict inequality rests on \( \rho^e < 1 \).
of all types (perfect consumption smoothing). With a Beveridgean system, on the other hand, there will effectively be no redistribution either (for the tax rate is zero) and all individuals are then left with the (less efficient) private system.

Observe that while this property implies $\alpha_U^p > 0$ it does not imply that $\alpha_U^p = 1$. The optimum can well be at a lower level, and specifically at $\alpha_c$; the numerical example in Section 6 illustrates this point.

To sum up, when $\tilde{w}_2 > \tilde{w}$ both utilitarian and Rawlsian objectives imply that it is never optimal to adopt a Beveridgean system. In both case the adoption of a less redistributive system appears to be the “price to pay” to ensure the viability of social protection in the voting stage.

5. The welfare impact of private insurance

The previous sections have shown that the availability of private insurance has a significant impact on both the voting and the constitutional stages. In particular, it has been shown that private insurance tends to reduce the voting equilibrium tax rate and, hence, the generosity of a given social protection system. On the other hand, the availability of private insurance may increase the welfare of the poor (even though they do not effectively buy such insurance). Finally, it is clear that private insurance in itself tends to increase welfare by giving individuals an additional option. Consequently, if payroll taxes were set along with $\alpha$ at the constitutional stage, the availability of private insurance (even when “inefficient”) would necessarily bring about a welfare-improvement. We shall now examine to what extent this remains true if the political process is accounted for.

Analytically, this is rather difficult, and precise results can only be derived for the Rawlsian objective:

- $w_2 < \tilde{w}$: with or without private insurance, the Rawlsian criterion implies that a Beveridgean system is chosen ($\alpha_R^n = \alpha_R^p = 0$). However, the utility of type 1 individuals is higher with private insurance because he is then the median voter; see Sections 3.2 and 4.2. Consequently, in this case, it is never optimal to prohibit private insurance.

- $w_2 > \tilde{w}$: the result now depends on $\rho^p$, the rate of return of private insurance. When $\rho^p$ is large (so that $\bar{\alpha}_2$ tends to 1), it is always optimal to prohibit private insurance. To see this recall that with private insurance, a positive level of public insurance arises only if $\alpha \geq \bar{\alpha}_2$. When $\bar{\alpha}_2 = 1$, one must then set $\alpha = 1$ (implying $t = 1/2$), but this outcome is also achievable (though of course not optimal) when private insurance is prohibited. When $\rho^p$ is small ($\bar{\alpha}_2$ tending to 0), on the other hand, the availability of private insurance is necessarily welfare enhancing; the argument here is exactly similar to the one used above for the case $w_2 < \tilde{w}$. To sum up, private insurance becomes socially undesirable when it is rather efficient. In that case it becomes more attractive for type 2 individuals
and social insurance with a significant degree of redistribution cannot be sustained.

For the utilitarian objective, on the other hand, the comparisons appear to be ambiguous. The numerical illustration, to which we now turn, confirms that different patterns of results are effectively possible.

6. Numerical examples

A numerical illustration is useful for several reasons. First, it illustrates the results obtained in the previous sections. Second, it provides some additional insight regarding the determination of $\alpha$ at the constitutional stage, specifically in those cases where the analytical results appear to be ambiguous. Third, it yields some answers to the question of whether or not (and when) supplementary private insurance ought to be allowed.

Our benchmark example is as follows:

- $u(x) = -e^{-\delta x}$ with $\delta = 1$;
- $\rho^p = 0.9$
- two wage distributions: $(w_1, w_2, w_3)$ is either $(5, 6, 15)$, implying that $w_2 < \bar{w} = 8.66$ or $(5, 14, 15)$ implying that $w_2 > \bar{w} = 11.33$.

The results are summarized in Table 1. It appears that when $w_2 < \bar{w}$ the $\alpha$ chosen at the constitutional stage is always zero (fully redistributive social insurance scheme) except for the utilitarian criterion when private insurance is prohibited (Section 3.3). When $w_2 > \bar{w}$, on the other hand, the Bismarckian factor is always strictly positive and bigger with than without private insurance.

Furthermore, it is always optimal to allow private insurance. For the cases where $w_2 < \bar{w}$ this does not come as a surprise and merely confirms the analytical results of Section 5. For the remaining cases, no analytical results were obtained.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Benchmark scenario</th>
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<tbody>
<tr>
<td></td>
<td>$w_2 &lt; \bar{w}$</td>
</tr>
<tr>
<td></td>
<td>without</td>
</tr>
<tr>
<td>Rawls</td>
<td>$\alpha = 0$</td>
</tr>
<tr>
<td></td>
<td>$t = 0.434$</td>
</tr>
<tr>
<td></td>
<td>$v_1 = -0.082$</td>
</tr>
<tr>
<td>Utilitarian</td>
<td>$\alpha = 0.021$</td>
</tr>
<tr>
<td></td>
<td>$t = 0.435$</td>
</tr>
<tr>
<td></td>
<td>$sw = -0.054$</td>
</tr>
</tbody>
</table>
and the examples show that private insurance may effectively be welfare improving in these settings.

To complete the picture, it is now interesting to provide an illustration of the opposite result, namely that the prohibition of private insurance may be appropriate. To achieve this, just change one parameter of the model, namely the degree of efficiency of private insurance $\rho$ which is set to 0.95 instead of 0.9. Table 2 summarizes the results for the relevant case, namely $w_t > \tilde{w}$.

We now obtain the result that a more efficient private insurance system becomes socially undesirable. This comes from the fact that private insurance is now very attractive for type 2 individuals and some substantial redistribution is only possible when this private insurance is prohibited.

This example documents the importance of the political process in a particularly striking way. If the tax rate were set directly by the (welfare maximizing) public authorities, the availability of private insurance could only be welfare improving. Furthermore, a more efficient private system can only result in a more significant welfare improvement. When tax rates are determined through majority voting, on the other hand, both of these results may be reversed. Private insurance is no longer necessarily desirable — the fact that its availability undermines political support for social insurance may dominate its positive effects on welfare. Furthermore, a more efficient private system may now prove to be worse for it exacerbates the negative impact on political support.

### 7. Concluding comments

This paper has examined the issue of political support for social insurance by explicitly recognizing the distinction between size and redistributive character. In our two-stage procedure, the Bismarckian factor is chosen at the constitutional level on the basis of either a Rawlsian or a utilitarian social welfare function. The tax rate is then chosen at the second stage by majority voting.

The main results regarding the optimal level of the Bismarckian factor in the

<table>
<thead>
<tr>
<th></th>
<th>without</th>
<th>with priv. insur.</th>
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<tbody>
<tr>
<td><strong>Rawls</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$</td>
<td>0.261</td>
<td>$\alpha = \bar{\alpha} = 0.737$</td>
</tr>
<tr>
<td>$t$</td>
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<td>$t = 0.453$</td>
</tr>
<tr>
<td>$v_1$</td>
<td>$-0.102$</td>
<td>$v_1 = -0.114$</td>
</tr>
<tr>
<td><strong>Utilitarian</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$</td>
<td>0.31</td>
<td>$\alpha = \bar{\alpha} = 0.737$</td>
</tr>
<tr>
<td>$t$</td>
<td>0.530</td>
<td>$t = 0.453$</td>
</tr>
<tr>
<td>$sv$</td>
<td>$-0.036$</td>
<td>$sv = -0.039$</td>
</tr>
</tbody>
</table>
Table 3
The optimal level $\alpha$ in the different cases

<table>
<thead>
<tr>
<th></th>
<th>$w_2 &lt; \bar{w}$</th>
<th>$w_2 &gt; \bar{w}$</th>
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<tbody>
<tr>
<td></td>
<td>without</td>
<td>with priv. ins.</td>
</tr>
<tr>
<td>Rawls</td>
<td>$\alpha = 0$</td>
<td>$\alpha = 0$</td>
</tr>
<tr>
<td>Utilitarian</td>
<td>$\alpha \geq 0$</td>
<td>$\alpha \geq 0$</td>
</tr>
</tbody>
</table>

different cases are summarized in Table 3. The main conclusions that have emerged are the following. First, it may be appropriate to adopt a system which is less redistributive than otherwise optimal, in order to ensure political support for an adequate level of coverage in the second stage. Second, as expected, private insurance does undermine the political support for social insurance. Third, supplementary private insurance may nevertheless increase the welfare of the poor, even if it is effectively bought only by the rich. Fourth, and last, the case for prohibiting (supplementary) private insurance may become stronger when the efficiency of private insurance markets increases.

Finally, let us return to one of our main assumptions, namely the fact that $\alpha$ has been restricted to be nonnegative. This hypothesis has permitted us to concentrate on the choice between Bismarckian and Beveridgean systems, while allowing for “intermediate” programs. However, our analysis could easily be extended to the case where negative values of $\alpha$ are permitted, which effectively would amount to considering “targeted” benefits.\(^{32}\) This possibility would be especially relevant when private insurance is available so that the rich can carry income between states of nature. Formally this extension can easily be dealt with and our main results would remain valid. In particular, the finding that the political process may make it desirable to set $\alpha$ at a higher than otherwise level would effectively be reinforced (and arise in a larger number of situation).\(^{33}\) As far as the interpretation (and relevance) of the results is concerned, the application of our setting to the problem of targeting would, however, have to be considered with great care. In particular, it neglects some aspects, such as labor market distortions and/or discontinuities in the effective benefits, which are likely to be crucial for the assessment of targeted policies.

References


\(^{32}\)We thank the referee for bringing this interpretation to our attention.

\(^{33}\)In some of the cases we consider, the level of $\alpha$ which is adopted coincides with the optimal level only because both are restricted to be nonnegative.


