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# **A Social Security Fallacy**

Stefan Homburg

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## 1. Introduction

Today, all industrialised countries have comprehensive public pension systems. The size of these systems is impressive: A typical European country spends between 10 and 20 per cent of total wage income on public pensions. For an American worker, FICA contributions amount to roughly 12 per cent of gross wage income. Since social security taxes are levied without exemptions or provisions, they often exceed the payroll tax; this holds especially for families and low income workers. Social security systems are also costly in the sense that they require special laws, special bureaucracies, perhaps special courts.

Considering the significance and costs of public pension systems, it is natural to ask for an economic justification. As yet, mainly two justifications have been discussed in the literature. Following Diamond's (1977) taxonomy, they may be subsumed under "paternalism" and "market failure", respectively. The first argument (Feldstein 1985) rests on the assumption that consumers are myopic and would not make appropriate provision for retirement. Instead of maximising their "true" intertemporal utility function, people discount the utility of future consumption. It is clear that with such irrational behaviour a compulsory social security system may be beneficial. But this line of reasoning is difficult to put into an individualistic framework because a third party has to determine the "true" utility function. Moreover, if the argument were valid, it would suggest interfering generally with private intertemporal decision making – but equally important long-term decisions such as choice of profession or marriage are almost unregulated. Additional complications arise in a public choice framework because one must explain why myopic citizens should vote in favour of non-myopic politicians – knowing that the latter will force them to provide for retirement as soon as they have entered the government offices. Therefore, the myopia argument, which goes back at least to Eugen von Böhm-Bawerk and his allegation that people discount future utilities excessively, seems unconvincing.

Whereas the myopia argument assumes that people are stupid, the second strand rests precisely on the opposite premise, i.e. on rationality and strategic behaviour. Suppose there exists a final safety net in the sense that the government grants a certain minimum income to everybody. If someone has not made appropriate provision for retirement, society will bail him out which implies, in turn, that it may be optimal *ex ante* not to make such provision. According to this view, social security systems are justified because of a fiscal externality: They solve, or at least alleviate, a free rider problem that is just a special case of Buchanan's famous *Samaritan's Dilemma* (Buchanan 1977, Coate 1995).

This market failure argument for compulsory pension systems is unanimously accepted in the literature. According to Kotlikoff, Spivak and Summers (1982, p. 1057), "forcing individuals to save eliminates the ability of a few to 'free ride' on the generosity of many". Similar statements have been made by Atkinson (1987, p. 809), Rosen (1988, p. 196), Barr (1987, p. 191) and many other authors who are often brief because they seem to consider the point as more

or less trivial. The perhaps most comprehensive evaluation of compulsory savings can be found in Hayek's *Constitution of Liberty* and it seems apt to quote a longer passage from this famous book because Hayek is perfectly unsuspicious for presenting false arguments in favour of government intervention.

“Once it becomes the recognized duty of the public to provide for the extreme needs of old age ... etc., irrespective of whether the individuals could and ought to have made provision themselves, and particularly once help is assured to such an extent that it is apt to reduce individuals' efforts, it seems an obvious corollary to compel them to insure (or otherwise provide) against those common hazards of life. The justification in this case is not that people should be coerced to do what is in their individual interest but that, by neglecting to make provision, they would become a charge to the public. ... Up to this point the justification for the whole apparatus of ‘social security’ can probably be accepted by the most consistent defenders of liberty.” (Hayek, 1960, p. 286).

This paper demonstrates that Hayek is wrong. Modelling a simple welfare state with a final safety net, a payroll tax and a free rider problem, we show that *nothing* can be gained by making old age provisions mandatory. Within an optimal taxation framework, Hayek's argument rests on an illusion which may be referred to as a *social security fallacy*. Put briefly, this fallacy says that a compulsory pension system allows circumventing an important free rider problem which cannot be solved otherwise. But we will show that with an optimally chosen tax transfer system there is no room for further improvements by means of compulsion.

In order to avoid any misunderstanding, it should be emphasised at the outset that the paper is *not* concerned with the mechanics of pay-as-you-go pension systems, with uncertain life expectancy or with the innumerable forms of income redistribution that take place in actual pension schemes. Our theoretical question is whether or not compulsory old age insurance as such – similar to motor car insurance – may enhance overall welfare. The precise notion of welfare in this context is spelled out below.

## 2. Individual savings in the welfare state

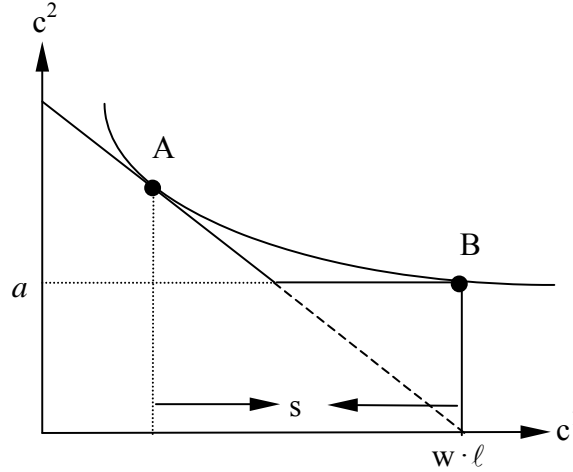
Consider a consumer with a well behaved utility function  $u(c^1, c^2, \ell)$ , where  $c^1$  denotes consumption when young,  $c^2$  denotes consumption when old, and  $\ell$  represents labour supply. In a small open market economy with an exogenous interest factor  $R = 1 + r$  and an exogenous wage rate  $w$  the consumer's two budget constraints read  $c^1 + s = w \cdot \ell$  and  $c^2 = R \cdot s$ , and the consumer maximises intertemporal utility subject to these budget constraints by choosing labour supply  $\ell$  and savings  $s$ .

Now let us introduce a welfare state that grants a certain minimum income in form of a basic allowance,  $a$ , to every consumer in need. The existence of such a final safety net is taken as a brute fact. Young consumers are subjected to an *earnings test* which means that they obtain the difference between the allowance and their wage income. Old consumers are subjected to

a *wealth test* so that they obtain the difference between the allowance and their accumulated savings, including interest. Transfer payments are financed by a (possibly non-linear) payroll tax  $T(w \cdot \ell)$  which is zero for wage incomes less than  $a$  and zero, positive or negative for wage incomes greater than  $a$ . A capital income tax could also be introduced, but this would not change our results<sup>1</sup>. Given the two instruments  $a$  and  $T(w \cdot \ell)$ , the consumer now solves

$$(1) \quad \begin{aligned} & \max_{c^1, c^2, s, \ell \geq 0} u(c^1, c^2, \ell) \\ \text{s.t.} \quad & \text{i) } c^1 + s = \max \{w \cdot \ell - T(w \cdot \ell); a\}, \\ & \text{ii) } c^2 = \max \{R \cdot s; a\}. \end{aligned}$$

The introduction of a final safety net gives rise to a moral hazard problem, as depicted in fig. 1 where the payroll tax has been omitted for convenience. Without the basic allowance, the consumer would choose point A and the provision for retirement,  $s$ , is strictly positive. Due to the guaranteed minimum income, the budget line becomes kinked, and the consumer under consideration is indifferent between points A and B. The budget set is no longer convex which implies that optima are not unique generally and that the individual market excess demand correspondence need not be continuous. The possibility of discontinuities becomes immediately clear from the figure: For any basic allowance  $a + \varepsilon$  ( $\varepsilon > 0$ ), the consumer will choose a point near B, and for any basic allowance  $a - \varepsilon$ , he or she will choose point A. Therefore, an arbitrarily small policy change may induce a given finite change in savings.



**Fig. 1:** Savings moral hazard.

Fig. 1 also makes clear that points along the horizontal part of the budget line, except corner points like B, are never optimal: If second period consumption equals  $a$ , the consumer will not at all provide for retirement because this would require diminishing first period consumption. Therefore,  $R \cdot s > a$  is a necessary condition for  $s > 0$  to be optimal. An analogous argu-

<sup>1</sup> In a companion paper (Homburg, 2000) we have analysed the case of *linear* payroll taxes. With a linear tax function, compulsion may yield an efficiency gain or a Pareto deterioration, depending on various parameters. The present paper shows that in the more general case of non-linear tax functions, *nothing* can be gained by introducing a compulsory pension system.

ment applies to labour supply and thus three types of behaviour can emerge from the above optimisation problem:

*Case I (no moral hazard):* The consumer chooses  $\ell > 0$  and  $s > 0$  which implies that he or she will not obtain any transfer payment from the government.

*Case II (savings moral hazard):* The consumer chooses  $\ell > 0$  and  $s = 0$ . This is precisely the behaviour which Hayek seems to have in mind. The existence of a final safety net induces the consumer not to provide for retirement but to spend net wage income  $w \cdot \ell - T(w \cdot \ell)$  entirely on first period consumption.

*Case III (unemployment):* The consumer chooses  $\ell = 0$  and becomes unemployed. In this case one would expect the consumption pattern  $c^1 = c^2 = a$  which is indeed the only solution if the transfer payment  $a$  corresponds to the physical subsistence level. However, if the transfer payment is large and if the consumer has a strong preference for second period consumption,  $c^1 = a - s$  and  $c^2 = R \cdot s$  may also be optimal in principle. We rule out this exceptional behaviour because its consideration would not change the following results.

To summarise, the existence of a final safety net induces various moral hazard problems. Some people who are in a position to provide for their old age may find it optimal not to do so but to speculate on assistance from the government. Others may even find it optimal to become unemployed. Both problems are due to the government's inability to observe potential incomes<sup>2</sup>. As has been pointed out first by Mirrlees (1971), *asymmetric information* about individual abilities is the central premise of optimal taxation theory. In the next section, we will develop its implications for compulsory pension systems.

### 3. Compulsory savings

Let us enlarge the set of government instruments by introducing compulsory savings. In order to separate compulsion from other aspects of public pension systems (like intragenerational or intergenerational redistribution), we assume the compulsory pension system to be *actuarially fair* which means that a consumer who has paid \$ 1 in the first period will obtain \$  $R$  in the second period. The system is characterised by a non-negative number  $b$ , the *contribution rate*. Contributions are levied on wage income so that a consumer with wage income  $w \cdot \ell$  will pay the amount  $b \cdot w \cdot \ell$  when young and will obtain the amount  $R \cdot b \cdot w \cdot \ell$  when old. In order to make the system effective, the law must forbid pledging public pensions, of course.

It is clear that the introduction of such a pension system does not change the budget set of non-free riders. A non-free rider will simply reduce voluntary savings correspondingly and will stick to the original consumption plan<sup>3</sup>. But a free rider, and this point is very important,

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2 If the government were able to measure potential incomes, it could relate taxes and transfers to these potential incomes rather than to market incomes. Under this unrealistic assumption, cheating would be impossible for the individuals, and the resulting tax-transfer-system would be first best.

3 With high contribution rates, some consumers may become rationed in the capital market. In this case, which we neglect for simplicity, the public pension system induces a welfare loss even for non-free riders.

will consider the contribution as an additional payroll tax even if the public pension plan is actuarially fair: Due to the wealth test, a consumer who has not provided voluntarily for retirement ( $s = 0$ ) only obtains the transfer  $a - R \cdot b \cdot w \cdot \ell$  when old. In present value terms, the wealth test reduces a free rider's lifetime income by  $b \cdot w \cdot \ell$ . The consumer's optimisation problem now reads:

$$(2) \quad \begin{aligned} & \max_{c^1, c^2, s, \ell \geq 0} u(c^1, c^2, \ell) \\ \text{s.t.} \quad & \text{i) } c^1 + s = \max \{w \cdot \ell - T(w \cdot \ell) - b \cdot w \cdot \ell; a\}, \\ & \text{ii) } c^2 = \max \{R \cdot s + R \cdot b \cdot w \cdot \ell; a\}. \end{aligned}$$

Gradual increases in the contribution rate may have a paradox impact on aggregate savings in this model. For, assume that at the outset there exists a consumer who finds it optimal not to provide for retirement. Increasing the contribution rate from zero to, say, 10 per cent makes the free rider feel uncomfortable because the compulsory contribution is perceived as an additional payroll tax. In the last section's terminology, it may well become optimal for the consumer to switch from case II behaviour (savings moral hazard) to case I behaviour (no moral hazard) which involves an *increase* in voluntary savings.

#### 4. Optimal policies in a general equilibrium model

In order to derive our main result, we consider an economy inhabited by a continuum of consumers who have identical preferences but different skills<sup>4</sup>. A consumer's *skill level*, defined as labour output per working hour, equals the real wage rate so that skills are directly denoted by  $w$ . The distribution of skills is given by a probability distribution function  $F(w)$  with support  $[0; 1]$ .

Given an arbitrary *policy*  $(a, b, T(\cdot))$ , a consumer with skill level  $w$  solves the optimisation problem (2) and adopts one of the three types of behaviour outlined in section 2. This self-selection process defines three subsets of the interval  $[0; 1]$ . Set I contains consumers who work and save, set II contains consumers who work but do not save, and set III contains the unemployed. Assuming that consumers who are indifferent between two or more solutions decide for the set with the lowest number, the sets are uniquely defined, pairwise disjoint, and their intersection equals the interval  $[0; 1]$ . Denoting the maximal utility a consumer can achieve by  $u^*(\cdot)$ , the government's formal objective is to maximise social welfare  $W$  which is defined in the usual manner as the sum (or average) of individual utility levels:<sup>5</sup>

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4 A continuum of consumers makes it easier to construct numerical examples because the above-mentioned discontinuities vanish at the aggregate level. The assumption of identical utility functions could be relaxed without changes in the results.

5 Those who dislike utilitarianism can re-interpret  $W$  as an expected utility representation of choices from behind a Rawlsian veil of ignorance. They may also take  $W$  as a mere device that helps detecting necessary conditions for constrained Pareto-optima. Our results would also hold in a setting with altruistic rich individuals who aim at maximising the poor's welfare by choosing an appropriate policy.

$$(3) \quad W(a, b, T(.)) = \int_0^1 u^*(a, b, T(.), R; w) dF(w).$$

The choice of policies is restricted by the government's budget constraint which reads

$$(4) \quad \int_{III} a dF(w) + \int_{II \cup III} \frac{a}{R} dF(w) - \int_{II} b \cdot w \cdot \ell(.) dF(w) = \int_{I \cup II} T(.) dF(w).$$

The budget constraint stipulates that transfers to the unemployed (first integral) plus the present value of transfers to the old (second integral), reduced by compulsory savings if applicable (third integral), must be financed by tax revenue (fourth integral). The policies considered are purely redistributive but introducing a separate revenue requirement would not change the following results. A policy is *optimal* if it maximises (3) subject to the budget constraint (4) and the implicit self-selection process.

**Proposition:** Assume that the policy  $(a, b > 0, T(.))$  is optimal. Then there exists a policy  $(a, b = 0, T^*(.))$  which is also optimal.

Because the latter policy is one without compulsory savings, the proposition says that any compulsory pension system can be abolished without welfare loss, provided that the tax function is adjusted appropriately. The proof is extremely simple. Consider the tax formula

$$(5) \quad T^*(w \cdot \ell, s) = T(w \cdot \ell) + b \cdot w \cdot \ell - \min\{b \cdot w \cdot \ell; s\}.$$

The new tax schedule has a marginal rate that exceeds the marginal rate of the original tax schedule by  $b$ . Moreover, the new schedule allows a limited offset of private savings against tax liability. We check the impact of the policy change on the different groups, starting from a state with a compulsory pension system and moving to a state without one:

- By construction, set I consumers save  $s \geq b \cdot w \cdot \ell$  when the compulsory pension system becomes abolished. Their payroll tax amounts to  $T^*(w \cdot \ell, s) = T(w \cdot \ell)$  so that their utilities remain unchanged.
- Set II consumers, i.e. people who do not provide for retirement even in the presence of a pension system, will continue not to do so after the system has been abolished<sup>6</sup>. The payroll tax of these consumers increases to  $T^*(w \cdot \ell, 0) = T(w \cdot \ell) + b \cdot w \cdot \ell$  but this effect is accompanied by the cessation of compulsory contributions which, remember, are perceived as taxes by these free riders. Before and after the reform, utility levels of free riders come to  $u(w \cdot \ell - T(w \cdot \ell) - b \cdot w \cdot \ell, a, \ell)$ .
- Set III consumers, whose utilities do not depend on taxes and contributions but only on the basic allowance  $a$  are perfectly unaffected by the reform.

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<sup>6</sup> The reader may wonder why set II is non-empty in the presence of a compulsory pension system. This may occur if the contribution rate is relatively low. If set II happens to be empty, the proof is even simpler because one only has to check the welfare effects on set I and set III consumers.



Since all consumers' utilities remain the same, so does the separation of the population into the three sets, and a glance at the budget constraint (4) shows that it is still satisfied. Therefore, the original optimum can also be reached without a compulsory pension system.

As an example, consider an unsophisticated policy without compulsory pensions, with a linear tax schedule  $T(w \cdot \ell) = \tau \cdot (w \cdot \ell - a)$  for wage incomes greater than  $a$  and with a basic allowance  $a > 0$ . The sets I, II and III may all have strictly positive measure so that a savings moral hazard problem does exist. Assume that set II becomes empty when a compulsory pension system with  $b = 10$  per cent happens to be introduced and that this policy change increases overall welfare. Our proposition says that the same welfare gain can be obtained from a simple tax reform which involves

- increasing the marginal tax rate by 10 per cent and
- introducing a tax credit which equals the minimum of taxpayer's savings and 10 per cent of gross wage income<sup>7</sup>.

The two policies are analytically equivalent. This equivalence holds for proportional or progressive tax schedules, and also holds independent of the government's objective. From a practical point of view, the tax policy is cheaper because it does not require a separate bureaucracy. Of course, a Leviathan government prefers the compulsory pension system for the very reason that it is costly and that it offers innumerable jobs for "specialists".

## 5. Conclusion

Contemporary public pension systems serve many purposes. They are used for intragenerational as well as for intergenerational redistribution. But it is well known that the former purpose could also be pursued by use of the general tax transfer system whereas for the latter government debt is an alternative instrument. Hence the literature often argues that the *genuine* function of public pension systems is to solve the savings moral hazard problem. Compulsory pension systems are seen as an *additional instrument* which facilitates preventing consumers from living on the generosity of others. "Protecting the prudent" (Holler 1996, 58) is considered as the basic function of compulsion – as a function so important that it justifies the erection of costly public pension systems.

In this paper we have shown that such a view is mistaken. Modelling compulsory contributions as lump-sum payments would surely entail efficiency gains but would circumvent the real problem. The real problem is that owing to asymmetric information the welfare state cannot detect innate abilities but can only observe market transactions. Once this is granted, it follows that compulsory contributions must be conditioned on observable variables like wage income – and exactly this is done in reality. From the perspective of a would-be free rider, a contribution that depends on wage income is equivalent to a payroll tax even if the pension is

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<sup>7</sup> It may be noted that most countries do grant tax deductions at least for qualified savings accounts. The above proposition, however, suggests the use of tax credits.

actuarially fair. Therefore, such a contribution causes the *same* distortions as the payroll tax, and compulsion turns out to be analytically equivalent to an appropriately modified tax code. This point, once stated, is analytically simple but practically important because it questions the common wisdom about public pension systems and shows that the main justification for such systems is simply erroneous. Because compulsory contributions do not serve a purpose which cannot equally be served by an appropriate change in the tax code, the usual defense of social security breaks down – at least when contributions depend on market incomes – and the public pension systems could be abolished without any welfare loss. In view of their enormous administrative costs, this seems to be a promising strategy for social reform.

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## Abstract

The article investigates whether compulsory old age provisions are justified from an economic point of view. According to a standard argument, some people would not provide suffi-

ciently for their old age in the absence of a compulsory pension system – they would become a charge to the public. This free rider problem can be solved by mandatory lump sum contributions. However, if contributions depend on labour income, as they do in reality, potential free riders consider them as payroll taxes – even if the pension system is fully funded and actuarially fair. Therefore, compulsory contributions which are related to earned income do not solve an economic problem which cannot be tackled by the tax system as well. Put differently, there exists no economic justification for compulsory contributions, the standard argument is simply false.

### **Zusammenfassung**

Es wird die Frage untersucht, ob der Zwang zur Altersvorsorge ökonomisch gerechtfertigt ist. Nach einem Standardargument würden manche Personen ohne einen solchen Vorsorgezwang nicht für ihr Alter vorsorgen, sondern der Allgemeinheit zur Last fallen. Dieses Problem wird scheinbar durch pauschale Zwangsbeiträge gelöst. Sind die Zwangsbeiträge aber einkommensabhängig, wie in der Realität, werden sie von potentiellen Trittbrettfahrern als Lohnsteuern wahrgenommen, und zwar sogar dann, wenn das Alterssicherungssystem voll kapitalgedeckt und aktuarisch fair ist. Einkommensabhängige Zwangsbeiträge lösen deshalb kein Problem, das nicht auch innerhalb des Steuersystems gelöst werden könnte. Anders ausgedrückt gibt es keine ökonomische Rechtfertigung für den Versicherungszwang; das Standardargument ist nicht haltbar.