Reform of the public pension system in Germany*

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Abstract

This paper highlights that reform of pension systems is mainly a matter of redistribution between the currently retired generation, the current workforce, and their children, between high income earners and low income earners, between those currently paying into the system and those who do not, and between families with many children and families with few children. Political economy aspects will be essential in predicting and understanding the reform outcome. The paper also highlighted a fundamental trade-off as regards regulation in a funded pension system. Regulation will not be able to effectively address the Samaritan's dilemma, regardless whether this regulation will impose mandatory contributions to a funded pension system and stringent portfolio regulation, or whether the government may try to solve the problem by tax incentives.

1 A brief history

Entering the new millennium, Germany can look back on more than 100 years of a public pension system. The system originated in 1889 as part of Bismarck's policy of establishing a public social security system which was

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an answer to the pressing social and political situation. He tried to cool down the political conflict and to satisfy to some extent the demand for protection from risks that emerged with the arrival of a large working class that has not developed institutions to cope with these risks. The pension system was initially designed mainly as disability insurance, with the major share of contributions used for work disability pensions. The system was available to and mandatory for a limited group of the work force, the replacement rate provided by the system for those who reached the (at that time rarely observed) age of seventy years was rather low, and the system was partially funded (see, e.g., Lampert, 1996).

The history of reform of the system during the last 100 years was smooth and, for most parts, unidirectional. First, the types of workers required to participate in the system systematically expanded with time. Today (end of 1999) mandatory participation in the public pension system encompasses almost all groups of earners with the exception of some groups of self-employed professionals and civil servants[1], without provisions to opt out even for higher income groups.[2] Reforms established in 1999 continued and finally completed this process: criteria have been tightened by which activities are considered self-employed, forcing some further groups of self-employed individuals into the public pension system. This latest reform was intended as a reaction to the current trend of individuals in several professions to opt out of the public pension system by ending their employment relationship with a firm and, instead, working for this firm on a free-lance "self-employed" basis, without actually changing their job characteristics as regards their actual responsibilities.

Second, the contribution rate and the replacement rate have both risen during most periods since the system has been established. Important steps were the reduction in the retirement age from initially 70 to 63 and 60 for men and women, respectively[3], and adjustment rules for pensions that tied

[1] Civil servants' pensions are calculated according to different rules and are paid from current tax revenue. In other words, there is a second, smaller scale pay-as-you-go system that finances civil servants' pensions.

[2] The system has a cap. The earnings exceeding a certain limit ("Beitragsbemessungsgrenze") are not included in the insurance system. Workers do not pay contributions on this share of their earnings. In 1999 this limit was DM 8500, and DM 7200 in the area of the former East-Germany.

[3] The rules that applied at the end of 1999 were complicated. For instance, the regular retirement age for men was 63 for male individuals who were in the system for at least 35 years, and 65 for others. Long term unemployment and disability also has an impact on individuals' possibility to retire earlier. Apart from this, earlier or later retirement was possible and had an impact on the replacement rate. Rules for individuals retiring after 2000 are less generous (see, e.g., Sozialgesetzbuch, 1999, §§ 35-41).

the pension benefits to the growth of wages. It is only in recent years, as it has become more and more transparent that the future financial viability of the system requires reform, that some of these reforms have been reversed. For instance, the reform in 1992 made pension increases a function of net wages instead of gross wages, and the reform that was to be implemented in 1999 aimed at adjusting retirement age in several steps back to 65 in the first decade of the new millennium.[4]

Third, when the German pension system was established, it was meant as a (partially) funded system. The funded part of the system rapidly vanished. A hyperinflation in the twenties and a currency reform after World War II would have eliminated any funds in any case. Today, the system is fully pay-as-you-go, with an annual budget of 427 b. DM in 1998[5] (Rentenversicherungsbericht 1999) financed by contributions as a percentage of labor income (19,5 percent of the insured earnings in 1999) and federal transfers paid from the general tax revenue of about DM 96.1 b., or 22.5 percent in 1998, and about 26.5 percent, or DM 104.4 b. in 1999 (Finanzbericht 1999, p.16).

It is well-known that the introduction of a pay-as-you-go financed public pensions system benefits the "first generation": those who are old and close to retirement when the system is introduced pay little or no contributions but receive pensions for the rest of their life. This "first-generation benefit" accrues not only if a pension system is introduced, but also whenever the existing system is expanded.

For instance, persons who have already completed a major part of their working life gain if the replacement rate of the system is increased: these persons paid only little contributions up to that point. They then pay higher contributions for the rest of their working life, but will receive higher old-age pensions during their whole retirement.

Similarly, persons who are in their working stage benefit if, for a given replacement rate, the group of contributors increases. The amount needed to finance the currently retired is paid for by a larger working population. Hence, these workers' contribution rate is reduced. But at the same time, for a given replacement rate, the present value of their receipts in terms of

[4]The change in political power in 1998 makes it doubtful whether this policy will be sustained. Currently, a heated public debate is going on about special retirement schemes, strongly advocated by the unions, to reduce the retirement age to 60. Of course, even with present rules, due to rules of early retirement (e.g., for long term unemployed), the current average retirement age was as low as about age 59.5 in 1998 (Börsch-Supan and Winter, 1999).

[5]Including 27.5 b. DM of the mining fund (Knappschaftliche Rentenversicherung).

future pensions remains unchanged.[6]

The continuing reforms that increased the group of participants in the social security system, increased the replacement rate, and reduced the retirement age can be seen as a process that granted each generation some "first-generation advantage", and this effect was probably important for generating a political climate of broad acceptance for this system. The "first-generation gift" makes current generations vote in favor of an introduction or expansion of an unfunded pension system if they believe that the expansion is indeed permanent, especially if the growth rate of the wage bill exceeds the interest rate.

The political economy of the "first-generation gift" effect makes it surprising that it took about one hundred years until the system had managed to grow to its present maximum size. The process of granting first-generation gifts must come to an end if the growth rate of the sum of wages falls short of the interest rate. In the case of a stationary pay-as-you-go pension system the internal rate of return of the pay-as-you-go system equals the growth rate of the sum of wages. The internal rate of return of the system is smaller than the capital market interest rate, implying that workers who make contributions to this system get less than if they save in the capital market or buy an (almost perfect) old-age and disability insurance contract. The difference between these returns implies that generations in the mature state of the pension system receive a present value of pensions that is smaller than the present value of their contributions. The difference is an implicit tax, which serves to finance the interest on the "first-generation gift". As is well-known, such implicit taxes have substitution effects, and induce workers to generate less income in the official labor market. Indeed, there is a maximum size of the pension system, given that the system is pay-as-you-go financed. As with any tax, a Laffer curve argument can explain why the system has a maximum size.[7]

[6]This is strictly true only if the system has a replacement rate that follows gross wages. If, as is the case in Germany, the replacement rate follows net wages, there is a countervailing effect, because the replacement rate of the pensioneers increases due to lower contribution rates for the employed.

[7]Breyer (1994) has made this Laffer curve argument in a simple full information model with exogenously assumed proportional contributions. But of course, the thrust of the argument also applies in an incomplete information context with a government that chooses the optimal mechanism to elicit contributions. In this context, Konrad (1995a) has considered the role of public investment for the maximum size of the public pension system, and Konrad (1995b) has analysed the impact of international social security tax competition with mobile workers. He shows that worker mobility increases the incentives for public infrastructure investment and reduces the incentives for public education investment.

2 Why is there a crisis?

The crisis of the social security pension system is an almost universal problem in OECD countries and social security reform is discussed in all industrialized countries. Its dominant reason is demographics. The size of the problem differs from country to country, depending on the country's demography, the replacement rate, retirement age, and the financing method. A survey for European countries is, for instance, provided by Boldrin, Dolado, Jimeno and Peracchi (1999).

The German situation has been described in more detail and with greater precision by several authors. For a comprehensive and comparative analysis see, e.g., Sinn (1999a, 1999b). The German population is shrinking rapidly, life expectancy is increasing, and the unemployment rate is high. For a given pay-as-you-go system with given retirement age this implies that there are fewer workers per pensioner at each time, and for a given replacement rate, this increases contribution rates.

Due to these demographic developments, the internal rate of return that a married male earns by participating in the mandatory pay-as-you-go pension system in Germany was about 3.5 percent for those born in 1930 and continuously drops to 1.2 percent, 0.6 percent and 0.3 percent for those born in 1960, 1970 and 1980, respectively (see Schnabel 1998), if the labor market characteristics are unchanged. This low internal rate of return of the pension system would not be a problem if the pay-as-you-go system were a minor budget share. However, the total annual budget of the German public pension system is about the same size as the annual budget of the federal government. (Note that the German pension system is not part of the federal government activities and is organized seperately.)

The financial burden that is imposed by the pay-as-you-go system can be visualized by the time paths of contribution rates without reform (See, e.g., Sinn and Thum 1999). The most recent and most sophisticated version of estimates is the computational general equilibrium model by Hans Fehr (1999). Figure 1 illustrates the various estimates of contribution paths for the present system. The most notable facts are the sharp increase in contribution rates from currently 19.5 percent to about 31 percent of gross labor income in 2040.

These contribution rates do not include the huge transfers from the general federal budget to the pension system that amount to about one quarter of total social security old age pensions. A large share of the contribution rate is similar to an implicit tax on labor income, because the internal rates of return for the current working generation and their children are much lower than the capital market rate of return, and because the current system

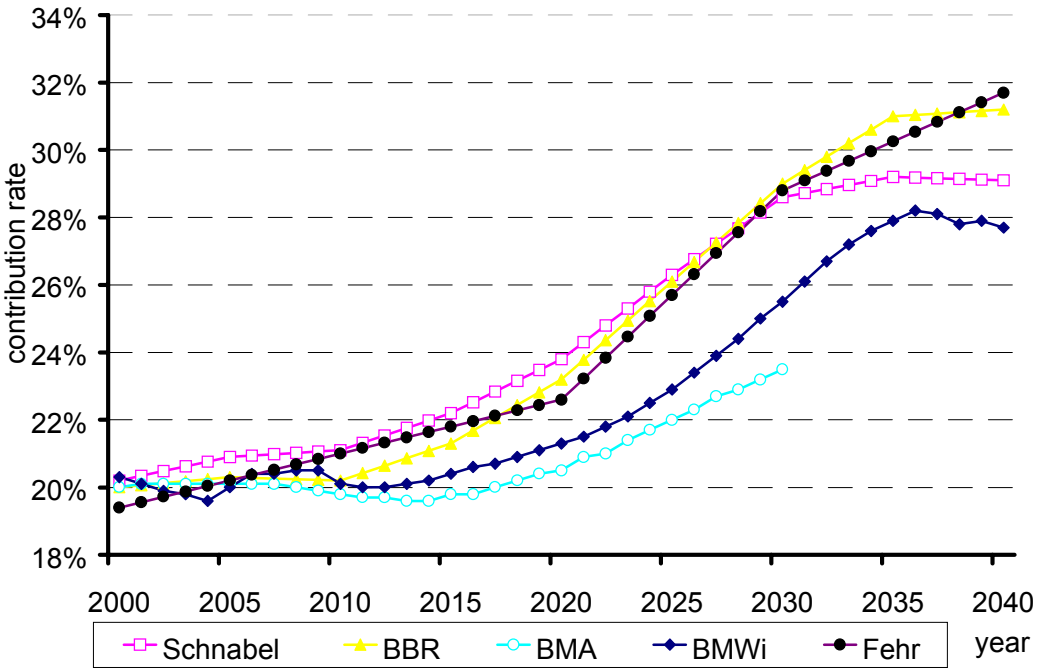

Figure 1: Schnabel: Schnabel (1998), medium scenario; BBR: Besendorfer, Borgmann and Raffelhüschen (1998); BMA: Sozialbeirat (1998); BMWi: Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft (1998), (scenario 2); Fehr: Fehr (1999). Sources: Sinn and Thum (1999) and Fehr (1999).

also redistributes between different types of workers within each generation. The rate of this implicit tax has been calculated for a 'representative' worker for Germany by Thum and von Weizsäcker (1999). They find that with the current system the implicit income tax is about 8 percent for the representative worker born in 1940, and rises to 19 percent for the representative worker born in the year 2000. From a theoretical point of view, these calculations most likely underestimate the true effects as they are not based on a general equilibrium model that takes into account the effects of extremely high tax rates on official labor income and tax evasion. Indeed, adding to these implicit taxes the substantial marginal labor income tax rates and other components of social security payments that are similar to an implicit tax (e.g., public health insurance[8]) the disincentives could be massive, and, depending on the elasticity of the tax base, the system may simply become unsustainable.

Summarizing, the demographic trend of shrinking population size in Germany reduces the internal rate of return of the pay-as-you-go pension system far below the market rate of interest. At the same time the system has grown to a size at which contributions become a major share of workers' budgets. Accordingly, there will be growing labor market disincentives of the implicit tax which make a reform of the system inevitable.

3 Reform proposals

Consider the various parameters that influence a pay-as-you-go financed pension system.

(i) As has been discussed by many researchers, technological progress and economic growth are beneficial but do not help to reduce the contribution rate if the replacement rate is fixed.

(ii) An increase in population growth (induced, for instance, by an aggressive family policy) could raise the internal rate of return in the long run. However, such a policy is unlikely, and given that the system faces major problems in the next 40 years, the effects of this policy arrive too late to solve this problem.

(iii) A considerable increase in female labor participation would reduce the contribution rate, but only temporarily. The impact would be similar to

[8] At present, German mandatory public health insurance is highly redistributive. While most benefits of public health insurance are independent of income, health insurance is proportional to income, up to an upper limit. Currently it is about 13 percent of gross labor income, and an increasing trend is apparent. Accordingly, from the perspective of individuals, this amounts to an implicit marginal income tax of about 13 percent.

an expansion of the system, just like adding a further group of the working force that starts paying contributions now and earns pensions only later. However, an increase of the female labor force participation could help to manage the problems of the next 40 years.

(iv) The effects of temporary immigration are similar. Only a permanent inflow of immigrants and the induced growth of the work force would increase the attractiveness of the system permanently, just like a permanent increase in the birth rate. However, the size of such immigration inflow had to be large in order to have a considerable impact on the contribution rate. Börsch-Supan and Winter (1999) report that an inflow of about 800,000 immigrants per year would be needed to fully compensate for population aging, which would be about 2.5 times the current net immigration which is already very high by European standards.

(v) With respect to the contribution rate, an increase of the retirement age (which reduces the number of recipients and increases the number of contributors) would be more effective than lowering the replacement rate. However, an increase in the retirement age is most difficult because one cannot set the effective age of retirement by law. Effective retirement depends on the labor market conditions, and a disability pension is an alternative pathway into effective retirement.

(vi) Given the problems of increasing the retirement age, the most obvious way to reduce the contribution rates is to reduce the replacement rate of current and future pensioners. Of course, this is not without problems, because the currently old expected to receive the present replacement rate, and adjusted their private savings accordingly. It is too late for them to revise their intertemporal allocation of income. However, a reduction in pensions of the current generation is one of the few ways to make this generation share the burden of pension reform and should therefore be considered as a reasonable goal. Current governmental plans to deviate for two years from the standard rules of annual pension adjustment and to grant only an increase that compensates for inflation are one way to reduce the replacement rate.

(vii) An extensive academic discussion took place about the possibility of an efficiency enhancing transformation from a pay-as-you-go financed system to a fully (or partially) funded system. This intellectual debate started with a paper by Breyer (1989) who showed that, essentially, the transition from an unfunded pension system to a fully funded system cannot be achieved as a Pareto improvement. Breyer's insight is the same as in Mats Persson (2000) who points out that unfunded systems make a gift to the first generation, and, when returning to a funded system, this gift must be repaid by someone.

Some authors (e.g., Homburg 1990, Raffelhüschen 1993, and Breyer and Straub 1993) argued, however, that, due to endogenous labor supply, pro-

portional contribution rates to an unfunded social security system involve an excess burden which is absent in a funded system. If these welfare losses could be avoided, the welfare gains could be used to compensate the generations for paying the gift to the first generation. These approaches assume that the welfare losses incurred in the present system by making the contribution rate proportional to income is a necessary element of a pay-as-you-go financed pension system that would disappear in a funded system.

The proportionality of contributions to a pay-as-you-go system with flat pensions and the involved welfare losses in these models is not an intrinsic element in pay-as-you-go systems. It is a result of intragenerational redistribution. Fenge (1995) pointed out this fallacy, showing that a welfare improving transition from pay-as-you-go to a funded system is not viable in a system that avoids intragenerational redistribution, by making pensions a function of contributions.

This was not the end of the discussion. For instance, Belan, Michel and Pestieau (1998) consider an endogenous growth model in which macroeconomic spillovers from capital investment is the "growth engine". They argue that the economy is undercapitalized in this case, and transition from an unfunded to a funded system could be welfare improving because it increases capital accumulation. Fenge and von Weizsäcker (1999) argue that partial transition to an at least partially funded compulsory system could be more powerful than a fully unfunded system in addressing Coate's (1995) Samaritan dilemma problem that arises in economies in which individuals receive a governmentally guaranteed minimum income. A last example of this type of results is Demmel und Keuschnigg (1999) who consider an economy in which a monopoly union pursues an inefficient wage policy that leads to unemployment. He argues that proportional (or progressive) labor income taxation aggravates the inefficiency, and this inefficiency would be reduced in a funded system.

All these proposals rest on the assumption that there is a given inefficiency in the economy and claim that a transition from pay-as-you-go to a funded system reduces or eliminates this inefficiency. While the arguments here are more indirect than with the original contribution by Homburg (1990), we have to ask whether the inefficiency is generically linked to the pay-as-you-go financing of the pension system. In the few contributions we briefly discussed above, it seems to be straightforward to correct the inefficiency without making a transition from a pay-as-you-go system to a funded system. A more extensive review of this discussion can be found in Bach and Wiegard (1999).

This discussion suggests that there is no Pareto-improving transition from a pay-as-you-go system to a funded system. Accordingly, the discussion

about transition and about the appropriate transition path is mainly a discussion that is about intragenerational and intergenerational redistribution. This observation may explain the heat in the public debate.

(vii) At present, several policy proposals are being discussed in Germany. But, first of all, the government as well as the unions seem to believe in the positive effects of a significant decrease of open unemployment. Low unemployment rates (like in the U.S. or the Scandinavian countries) will increase the contributions which are paid to the pension system, will increase labor force participation of women, will attract immigrants, and will increase the effective retirement age. Nevertheless there will be an unavoidable increase in the contribution rate which is considered as not acceptable (see Wagner 1999).

The most radical reform proposal (advocated by many economists and the prime minister of Saxony, Kurt Biedenkopf, see, e.g., Biedenkopf and Miegel (1997)) is to cut down the public pension system to a flat-rate pension ("basic pension"). Individuals could then decide on whether they would like to increase private savings on a voluntary basis. Many other reform proposals are similar to the proposal made by the scientific advisors of the Ministery of Economics who advocated essentially to keep a pay-as-you-go system, but, in order to smoothen the contribution rate over the next 25 years, to build up reserves in the next few years by raising the contribution rate above what is needed to finance the current pensions. This view has been supported also by Sinn (1999a) and Fenge and von Weizsäcker (1999) as well as by the Council of Economic Advisors (Sachverständigenrat zur Begutachtung der wirtschaftlichen Lage).

These reform proposals differ somewhat in their assumptions regarding some structural parameters, e.g., the adjustment of retirement age, the growth rate of wages, immigration, and, in particular, the path of repayment of the gift that was received by the 'first generation'. The conservative government which was in power until 1998 intended to reduce the replacement rate in a slow adjustment process that would have taken more than 10 years, in line with the interests of the current elderly voters who are more inclined to vote conservative. The current government which draws more strongly on younger voters will cut down the replacement rate instantly in the years 2000 and 2001 by an adjustment of pensions that, for some time period, proceeds slower than net wage increases.[9]

It may be a surprise that the new government which is more in favor of progressive taxation than the old government will not achive its goal of

[9]For voter shares in recent elections, see, e.g., http://www.statistik-bund.de/wahlen/eutabalt/eutab19.html

lowering the replacement rate by a change in the income tax treatment of pensions. At present, the treatment of pensions for income taxation is complicated in Germany. Only about 25 - 30 percent of the amount of each individual public pension is considered taxable income. Given that the German marginal income tax is zero in the range between DM 0 and about DM 13,000 for singles and between DM 0 and about DM 26,000 for married couples, if pensioners have no other major source of income, they do not pay income taxes on their pensions if they do not exceed DM 42,000 per year. This is puzzling, because a major share of contributions to social security is essentially tax free. Compared to conventional aims of income redistribution, a regular tax treatment of pensions may be more appealing than a general downward adjustment of the replacement rate. Still, a drastic increase in the tax burden on social security pensions is unlikely to happen.[10]

The current working population is most heavily burdened by all reform proposals. A move towards a funded system that takes place within the next 20 to 30 years imposes a double burden on the current working generation, having to pay contributions to the pensions paid to the retired, without receiving a transfer from their children themselves. The size of the burden of the children of the current working generation depends on the different types of reform. For instance, the speed of transition to a funded system determines which generation is burdened more heavily.

In addition to these intergenerational issues, the reform proposals differ with respect to their intragenerational redistributional impact. For instance, the German pay-as-you-go system has always been financed by contributions proportional to wage income plus governmental transfers from general tax revenue. Recent reforms in Germany have increased the share of transfers from general tax revenue considerably in order to reduce the contribution rate. This reform was meant to redistribute the burden of financing old-age pensions from employed workers to other groups in society (self-employed, civil servants, unemployed, retired). However, the extent to which such a transition could occur is limited. At present, more than 25 percent of the federal budget is used for such transfers to the pension system and accounts for about the same percentage of the pension bill there.

Another element of intragenerational redistribution in social security has been highlighted in a paper by Breyer and von der Schulenburg (1987). They consider parents who care about the utility level of their children, but unlike Barro (1974), consider heterogenous families. Consider two types of families. Let the parents be about 45 years old in both families. Suppose one family

[10] One reason could be government's concerns about the opposition of the elderly voters against a regular tax treatment.

has one child, whereas the other family has more children, and suppose both parents care about the utility of their children. Independent of whether Barro's bequest motive is operative or not, the fathers of the two types of families care quite differently about possible reforms of the social security system, since the effects differ for the two types of families if they have different numbers of children.

4 Guidelines for partially funded systems

Current reform proposals mainly differ with respect to the allocation of the burden of financing the gift that has been made to the first generation when introducing the pay-as-you-go system, or to subsequent generations, when expanding the system. Whether and how a (partially) funded pension system is introduced is mainly a matter of intergenerational redistribution, and economics does not give clear cut advice on such matters. However, if such a system is introduced, this needs to take care of a number of design issues.

We will only discuss the problems of partially funded old-age retirement payments because this reform feature is the most challenging one. It is important to note, however, that measures for increasing the effective age of retirement, restructuring widows' payments and other kinds of redistribution elements, and last but not least, the rules for paying contributions are most important keystones of a reform package as well (see Wagner 1999). We will also abstain from a discussion of potential macroeconomic problems with funded systems (see Wagner et al. 1999).

4.1 Political economy risks

An important consideration is the political economy risk. As is well-known, the political decision about introducing a pay-as-you-go system is strongly biased in favor for such a system, as many voters would belong to the "first generation" that wins from such an introduction. Accordingly, if a funded system exists, there is a strong political pressure to divert the accumulated funds and use it directly or indirectly on the current generations and to re-introduce a pay-as-you-go system.

In order to reduce such political risks, it can be useful to accumulate funds in a privately organized system (Sinn 1999b). Also, privatized funds may operate more efficiently than funds managed by a governmental bureau, and we would like to subscribe to this view.

There are certainly some design questions of how to organize such a private system. For instance, similar to existing regulation in insurance mar-

kets and banking, some consumer protection may be discussed. Much can be learned from insurance markets, in particular about the dangers of regulatory capture. But on the other hand, one needs to think about the problems of fraud and gambling by funds managers, and some experience with pension funds regulation in other countries can be usefully applied.

4.2 Design of a private system

The introduction of a funded system with privately managed funds raises a number of design questions. For instance, should the pension system be mandatory, or should the system be voluntary? If the system is voluntary, should the government subsidize individual savings? Should it be possible to borrow against the future pensions? Should participants be able to allocate their savings freely between different types of assets? Should funded pension savings be paid out when individuals enter their retirement period, or should transformation of accumulated savings into annuities be mandatory when the retirement age is reached? Many of these questions are related to a simple fundamental trade-off in a modern welfare state that makes the answer to most of these questions ambiguous, and we consider this trade-off somewhat closer.

4.2.1 Flexibility and the Samaritan's dilemma

Individuals will always be entitled to have some means tested basic income or basic consumption level which they either earn for themselves, or receive as a transfer from the rest of society. Individuals may pursue strategies by which they end up with little or no wealth when being old. For instance, individuals who do not have much income anyway may decide not to save for old-age consumption. If they consume the present value of their lifetime-income before they enter the retirement age, they receive social subsistence benefits from society. This may be advantageous even if it leads to a very uneven consumption pattern over lifetime, because the elicited subsidy yields an increase in expected lifetime income.

For similar reasons, individuals who know that they receive subsistence payments if they have no income when old have an incentive to gamble, even if the gamble is not actuarially fair. Suppose some individuals have wealth x when entering the retirement period, and assume that this wealth is higher than the guaranteed minimum subsistence consumption level y. The individuals can simply consume x and have utility $u(x)$ in the retirement period. Alternatively, they can buy highly risky assets that yield either 0 or $10x$ with probabilities 90 % and 10 %, respectively. Hence, this gamble is

fair, and risk averse individuals would not accept it. However, individuals who can rely on a guaranteed minimum subsistence consumption level $y > 0$ may still choose the gamble, even if they are risk averse. They will, if $0.9u(y) + 0.1u(10x) > u(x)$ which is always the case for x sufficiently close to y. Hence, individuals may put all their retirement savings at risk, and modern capital markets would provide the means to do this most elegantly and with almost no transaction cost. Of course, this behavior is inefficient. The transfer to these individuals must be paid by other individuals. In a symmetric world, all individuals contribute in financing these transfers, and all individuals will lose from such behavioral incentives. Welfare losses are generated because the individuals' expected income is unchanged but their consumption allocation becomes risky. Welfare losses in this allocation are equal to the individuals' risk bearing cost in this example.

These are two variants of Buchanan's (1975) Samaritan's dilemma, that has been re-emphasized in Coate (1995), and is the main efficiency argument for compulsory retirement plans and compulsory insurance. Similarly, to avoid the second type of Samaritan's dilemma, individuals must be kept from gambling. To do this, individuals' portfolio choices must be controlled and tightly regulated.[11]

Of course, such stringent regulation regarding the size of savings, and the portfolio composition have their costs. One type is monitoring cost. A second type of cost is the welfare loss from distortions that a regulatory regime is likely to generate. Individuals' preferences and their future earnings expectations are typically private information. Hence, it will typically be difficult to devise a mandatory regime in a way that does not impose binding restrictions on some individuals and constrains the individuals to some consumption plan which differs from their first-best choice. Someone who anticipates that he will have access to major income flows when he will have passed the average retirement age should not be forced into mandatory savings. Persons also differ with respect to their risk aversion and with respect to their information as regards investment alternatives. Accordingly, a uniform mandatory portfolio composition will force individuals into allocations that are suboptimal.

However, the trade-off does not end here. Individuals and the market are ingenious in bypassing any regulatory constraint. For instance, if individuals can borrow against their pension entitlements, any mandatory savings plan

[11] In a recent paper, Homburg (1999) shows that forced savings as a share in labor income may be a poor instrument to cope with the Samaritan's dilemma if one takes into account that labor income itself is endogenous. Forced savings may then drive some individuals into a poverty trap even during the working stage of their life, because they are able to earn enough to make ends meet, but their incentives to earn are not strong enough to make them earners if they also have to contribute to a social security system.

could simply be compensated by an appropriate reduction in other savings, or appropriate borrowing. Hence, to escape from the Samaritan's dilemma, borrowing against accumulated pension funds must be ruled out. Of course, this will be difficult and costly. Suppose this borrowing would be illegal. An illegal market could emerge that caters to this demand, most likely causing the usual additional cost which characterize illegal markets[12].

With modern capital markets and access to fancy derivative instruments, it is even more difficult to rule out gambling. Any regulatory regime that has some 'bite' will have high enforcement cost, high indirect cost from making individually desired transactions illegal, and high cost from constraining individuals far away from their first best consumption. It seems not unlikely to us that extremely tight regulation generates welfare losses that outweigh the benefits from solving the Samaritan's dilemma.

4.2.2 Governmentally subsidized savings

Alternatively, the government may try to induce voluntary savings and a 'reasonable' portfolio composition. What comes to mind here are governmental subsidies to voluntary savings plans that provide an appropriate portfolio management. Indeed, such instruments seem to be quite popular in the U.S. (for some discussion see Mitchell 2000). The following example can explain why such savings plans are popular and, at the same time, why such a policy may seriously reduce welfare.

Consider first a situation in which the Samaritan's dilemma is absent. Suppose a person lives for two periods, the working period 1, and the retirement period 2, and has utility of private consumption

$$U(x_1, x_2) = u(x_1) + u(x_2)$$

with x_i consumption in period i. Let the capital market rate of interest be zero, for simplicity. Suppose the individual has income m that accrues in period 1. It can allocate this income between consumption x_1 and x_2, and, in a laissez-faire situation, it would allocate equal shares between the periods: $x_i = m/2$. We denote savings by k. If all saving k is subsidized, with s the constant subsidy rate, this will typically increase savings, such that $u'(m-k) = (1+s)u'(k(1+s))$. Of course, this intertemporal allocation is distorted.

[12]Some of these costs are expected punishment cost on the demand side and on the supply side, increased transaction cost from the lack of public protection, reduced market transparency, and inefficient enforcement of contracts in these markets.

If there is an upper limit as regards the amount of z that is subsidized, and if the individual has access to perfect capital markets, the budget constraint becomes $m + sz = x_1 + x_2$. The intertemporal distortion disappears. However, such a (lump-sum) transfer from the government to the individual is expensive in a world in which tax revenue cannot be collected without an excess burden.

If only a certain type of saving is subsidized (e.g., stock market investment, but not housing), and if there is no cap for the maximum amount of savings that is subsidized, this will lead to distorted investment incentives. It will distort the intertemporal allocation and will crowd out non-subsidized forms of private saving, even if they have a higher gross return than the subsidized savings instruments. Hence, restricting subsidies to a subset of assets generates further distortions. Again, if there is a sufficiently low upper limit for subsidized savings, the intertemporal distortion vanishes. However, two types of welfare cost remain: the excess burden of collecting the taxes needed to make the transfers, and the distortions in savings composition.

Consider now whether governmental subsidies can alleviate the Samaritan's dilemma problem. Suppose again that there is a governmentally guaranteed minimum income y in each period. Instead of allocating m equally between periods, the person may spend all income in period 1 and rely on welfare, receiving a transfer equal to y in period 2. This choice is made if

$$u(m) + u(y) > u(m/2) + u(m/2).$$

For y sufficiently close to m, this condition is fulfilled, even if u is strictly concave.[13] This outcome describes the Samaritan's dilemma situation.

Assume now that the government subsidizes a particular retirement plan, such that each USD put into this plan receives some governmental subsidy equal to s, up to a maximum saving, say,$\frac{m}{2} \geq z$. The individual could save now and obtain utility $u(\frac{m}{2} + \frac{sz}{2})$ in both periods, by appropriate transactions in the capital markets. Indeed, it may be true that $2u(\frac{m}{2} + \frac{sz}{2}) \geq u(m) + u(y)$. However, if the individual has access to a perfect capital market, whether the Samaritan's dilemma applies depends on whether $2u(\frac{m}{2} + \frac{sz}{2}) \geq u(m + sz) + u(y)$. The individual can achieve utility $2u(\frac{m}{2} + \frac{sz}{2})$ by borrowing $(1 + s)z$ on the private capital market, spending all income in the first period, using the payments $(1 + s)z$ to pay back the loan, and rely on welfare in period 2. This possibility arises especially if the contribution plan is not automatically annuitized and paid out at the beginning of retirement age.

The example makes clear that saving through savings plans can be crowded

[13] This minimum income of an n-person household in Germany is approximately 45 percent of such households' average net income.

out by borrowing, and that individuals may have a strong incentive to do this. In particular, without introducing capital market restrictions and if pension plans are not automatically annuitized, they may be of rather limited help for overcoming the Samaritan's dilemma. But, on the other hand, any general restriction on portfolio choice constrains other groups of individuals and also generates welfare losses. Summarizing, governmentally subsidized savings plans are not a straightforward instrument to deal with the Samaritan's dilemma.

5 Conclusions

This paper highlights that reform of pension systems is mainly a matter of redistribution between the currently retired generation, the current workforce, and their children, between high income earners and low income earners, between those currently paying into the system and those who do not, and between families with many children and families with few children. Political economy aspects will be essential in predicting and understanding the reform outcome.

Apart from this, the paper has highlighted a fundamental trade-off as regards regulation in a funded pension system and discussed why we think regulation will not be able to effectively address the Samaritan's dilemma in its various guises, regardless whether this regulation will impose mandatory contributions to a funded pension system and stringent portfolio regulation, or whether the government may try to solve the problem by tax incentives.

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