A Blue Print For Germany's Pension Reform

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ABSTRACT

Germany relies almost exclusively on a public pay-as-you-go pension system for old-age income provision. This mandatory "retirement insurance" has become under severe pressure, mainly from population aging and from incentive effects that have reduced labor supply.

This paper argues Germany needs a pension reform with three main elements:

(1) A reformed pay-as-you-go pillar which is actuarially fair, features a transparent notional account set-up, and freezes contribution rates at the current level;

(2) A second funded pillar which is based on US 401(k)-style grouped accounts that finance the impending aging burden;

(3) Augmented by redistributive features that guarantee a minimum pension and strengthen human capital formation.

The paper briefly discusses the sources of the current problems, details the reform proposal, in particular the cohort- and time-varying transition burden which turns out to be rather moderate, and sheds light on the side effects of such a transition on the German macro economy which are more subtle than is often claimed.

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Introduction

The German pension system has been very successful in providing a high and reliable level of retirement income in the past. It was the first formal pension system in the world, designed by Bismarck almost 120 years ago, and it was a model for many social security systems around the world. It has been praised as one of the causes for social and political stability in Germany, has survived two major wars, the Great Depression, and more recently, unification.

However, times have changed, and a flurry of reforms since 1992 has not succeeded in stabilizing contribution rates , public support, and system enrolment. Almost all projections show contribution rates one generation ahead that appear to be simply unsustainable.[1]

This paper argues that Germany needs a much more significant pension reform than is currently debated among the political parties. Parametric reform of the current pay-as-you-go (PAYG) system is likely to fail. We argue that two main steps are needed: First, the pay-as-you-go part of the system needs to be made more transparent and more fair. More transparency is required to break the political economy blockade; more fairness is required in the sense of neutralizing the current incentives to retire very early. Second, Germany needs a more balanced mix of pay-as-you-go and funded old-age provision. A higher degree of prefunding diffuses much of the demographic burden, reduces the negative incentive effects on labor supply, and has positive side effects on the German macro economy. We also argue that these two steps need to be augmented by a minimum pension and a more decisive support of human capital formation.

Many of these arguments have been made for other countries.[2] The case is particularly strong in Germany because of the extent of population aging and the size of the PAYG system. To this end, we propose a concrete transition model from the current PAYG system to a more balanced division of labor between public and private old-age income provision. Main point is to show that the transition burden can be shouldered with relative ease, and that it is not at all a

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[1] A summary of opinion polls can be found in DIA (1999); Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft (1998) reviews projections of contribution rates.

[2] The articles in DIA (1999), among many other studies, survey current reform proposals in six OECD countries.

"double burden" in the literal sense. The transition can therefore dispense of debt financing which would be difficult for economic, political and legal reasons due to the treaty of Maastricht.

The paper proceeds as follows. Section 1 presents the sources of the current problems and argues that parametric reforms within the current system will not be able to prevent unsustainable contribution rates. Section 2 briefly provides the theoretical underpinnings of a reform that introduces a significant extent of prefunding. Section 3 presents the first part of our reform proposal: a more transparent pay-as-you-go pillar. Section 4 simulates the transition to a higher share of funded pensions in total retirement income. Section 5 discusses the role of redistribution in a pension system. We conclude with some caveats on pension policy.

1. Where We Stand

The German public pension system is very monolithical. It covers almost all workers and provides almost all retirement income within a single public PAYG system with relatively transparent rules. A detailed description of the system is provided by Börsch-Supan and Schnabel (1999), and a critical evaluation of the micro- and macroeconomic features of the German public pension system can be found in Börsch-Supan (1999a).

In a nutshell: The system is financed by contributions (19.3% of gross income) and general revenues (about 9% of gross income), thus a comprehensive contribution rate of about 28% of gross income. It provides a pension that is approximately proportional to life-time earnings. Hence, the system is much less redistributive than the US Social Security system and most other European pension systems. The current average pension is about 70% of average earnings (US Social Security: about 50%). Average retirement age is 59.5 years. In addition to old-age pensions, the system provides a generous disability pension and survivor benefits. Although the German system is only average among European systems with respect to the average replacement level of a pensioner at the statutory normal retirement age of 65, it is very generous for the average early retiree at age 59.5. Public pensions account for almost 12% of GDP, a share two-and-a-half times larger than in the US.

There are two main reasons for the increasing difficulties of the German public pension system: Population aging and early retirement. We will discuss each in turn. We also discuss in how far these problems can be dealt with within the current system, i.e., by a "parametric reform" of the predominant PAYG system.

Population aging

Population aging is particularly severe in Germany. According to Bos et al. (1994), the proportion of German elderly will increase from 21 percent in 1995 to 36 percent in the year 2035, the highest share among the industrialized countries at that time. While the OECD projects an increase from 20.6 percent in 1990 to 39.2 percent in 2030 for its European member countries, the German demographic old age dependency ratio will far more than double from 21.7 percent in 1990 to 49.2 percent in 2030.[3] As in most other industrialized countries, the aging process has two causes. The reduction in the fertility rate was particularly quick and pronounced in Germany. It fell within 10 years from 2.4 to 1.5, from baby boom to baby bust. In addition, life expectancy has risen by almost 10 years from 1950 to 1990. This trend has not stalled.

Figure 1: Economic Dependency Ratio, 1995-2050
(Number of Pensioners as Percent of Number of Workers)
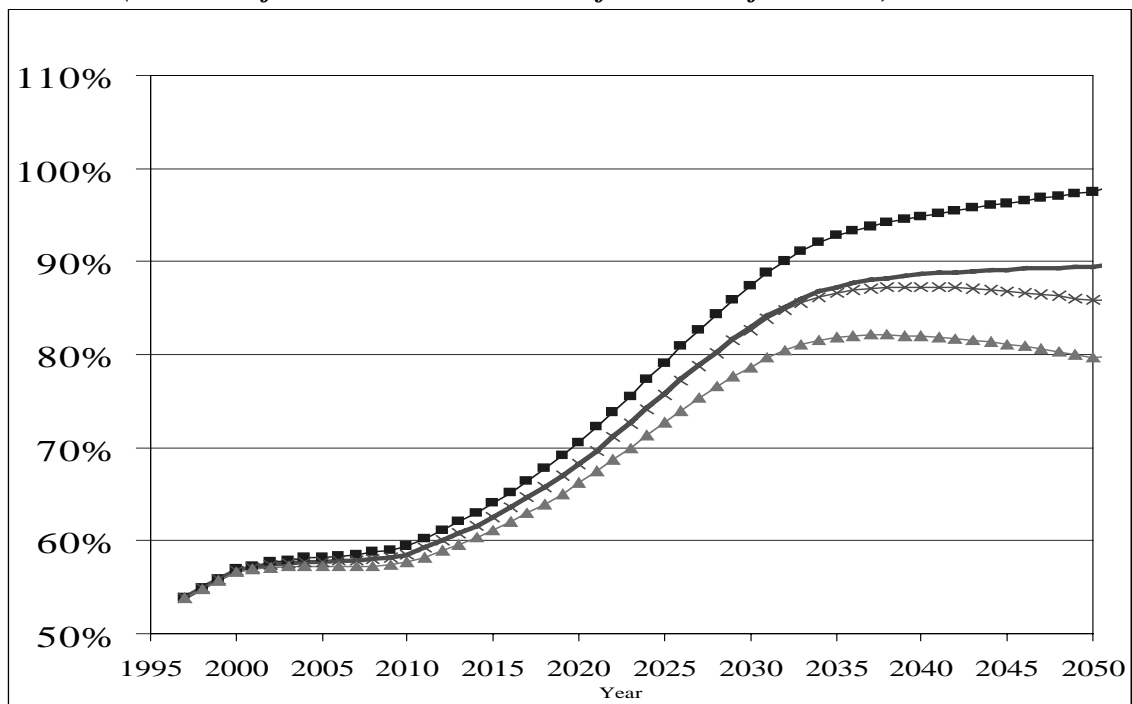
Note: Figure displays four scenarios (from top to bottom): Strong aging and constant fertility, medium aging and constant fertility, medium aging and increasing fertility, weak aging and increasing fertility.
Source: Birg and Börsch-Supan (1999).

As a consequence, the ratio of pensioners to workers will increase accordingly, only slightly dampened by an increase in labor force participation. This is shown in Figure 1. Given

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[3] OECD, based on World Bank projection by Bos et al. (1994). The OECD dependency ratio relates persons age 65 and older to persons between ages 15 and 64. Very similar projections for Germany in Bundesministerium des Innern (1996). Birg and Börsch-Supan (1999) assume a higher life expectancy, implying higher dependency ratios.

the current benefits, we can convert this increase in the economic dependency rate in an increase in the contribution rate of the PAYG system. Based on a recent government projection which is close to the medium projection in Figure 1, the German social security comprehensive contribution rate, about 28 percent of gross income in 2000, would reach about 40 percent of gross income at the peak of population aging in 2035 if the current replacement rate is maintained and age-specific labor force participation rates remain as they are (Börsch-Supan, 1998a). Using the governments projected adaptations of labor force participation and a slightly reduced replacement rate, the projected comprehensive contribution rate is 37%. This appears to be unsustainable, and particularly so, because contributions to health insurance and general taxes are also expected to rise in the wake of population aging.

Population aging is therefore a serious threat to the stability of the German public pension system, particularly so because the share of social contributions in total labor compensation is already about 50 percent. Because most workers view the PAYG contributions as taxes, they exacerbate the negative incentive effects on participation that are already plaguing the German labor market.

We do have evidence on such incentive effects. While participation in the German public retirement insurance is mandatory for dependent employees, it is not for the self-employed who can choose between joining the public system, buying life-insurance or pension fund shares, and self-insuring. Thus, this group is a good indicator of the acceptance of the public retirement insurance. In 1985, 62% of all self-employed had chosen to join the public system. In 1995, only 23% did so. In addition, also the number of self-employed increased. In many cases, these were workers who switched to self-employment but kept their former employer as their main client, thereby escaping social security taxation. The losses to the public pension budget between 1985 and 1995 amount to about 6%. These experiences are in line with the evidence of "opting out" rules such as in the UK or in Hungary. In addition to such revealed preferences, opinion polls show that most younger dependently employed workers would like to leave the mandatory system if they only could.[4]

Early retirement

Another very costly negative incentive effect is created by the lack of an "actuarially fair" adjustment of pensions to retirement age in the German PAYG pension system. The German social security system tilts the retirement decision towards the earliest retirement age ap-

plicable because the failure to adjust benefits in an actuarially fair manner creates a loss in the expected value of social security benefits when a worker postpones retirement. This mechanism has been described in detail by Börsch-Supan and Schnabel (1999). This loss is large relative to the labor income that could be earned when working longer and currently exceeds 50 percent of labor income.[5] It will still be between 20 and 30 percent in 2004 when the 1992 pension reform will have been phased in. It is even larger when a worker is eligible for disability benefits.

The resulting effect on early retirement has been estimated by several formal econometric analyses (Börsch-Supan, 1992; Schmidt, 1995; Siddiqui, 1997; Börsch-Supan, 1998b). Estimates of the reduction in the average retirement age range from 2.5 to 3.5 years. Since average life expectancy of a worker at age 60 is about 18 years, the earlier retirement age amounts to an increase in pension expenditures of about 20 percent. In combination with the generous disability rules, it has produced the rather early average retirement age that is currently about 59.5 years, earlier than the earliest legal possibility to receive an old-age pension, which is age 60, and more than five years ahead of the normal retirement age of 65 years.

Can parametric changes of the PAYG system stabilize the contribution rate?

One might argue that a parametric reform suffices to fix the early retirement incentives and that there is no natural link between the lack of actuarial fairness and a pension system being of the public PAYG type. The US Social Security system, for instance, is roughly actuarially fair in the age 62-65 window. However, the US appear to be the exception. Incentive effects similar to Germany exist in almost all other PAYG systems in the industrialized countries, see Gruber and Wise (1999) and are often even stronger in developing countries (Börsch-Supan, Palacios and Tumbarello, 1999).

A potential reason lies in the political economy process akin to PAYG systems. Actuarial fairness is not easy to achieve because it requires adaptation, e.g. to changing life expectancy. In a public defined benefit system, as almost all PAYG systems are, adjustments to the relation between benefits and contributions are subject to the political process, and many studies have shown that this process is typically dominated by the beneficiaries at the expense of the contributors (Browning, 1975; Verbon, 1988). This makes actuarial fairness hard to

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[4] Boeri, Börsch-Supan, and Tabellini (2000).

[5] More precisely: The change in present discounted value of expected future pension benefits net of taxes when postponing retirement by one year, divided by the net earnings during this year.

achieve in practice. Note that prefunded pensions pull the adaptation to actuarial fairness out of the political process into the realm of actuaries, cutting through the political economy problems.

We are also skeptical that changes in the parameters of the PAYG system can make the PAYG system immune to population aging. This skepticism is based on the sheer size of the population aging problem which will more than double the old-age burden per worker.

An increase in the retirement age is the most powerful route to simultaneously increasing the number of contributors and decreasing the number of beneficiaries. In light of a prolonged life span, increasing the active part of it appears to be a rather natural option, particularly, when the rather low retirement age in Germany, about age 59.5 as mentioned before, is considered. Several changes in the law and its implementing statutes in the wake of the 1992 pension reform are attempting to change the retirement age. Official estimates put the induced change in retirement age at about 3 years.[6]

However, there are important caveats. First, it is not clear that legislative changes translate in actual behavior. Although the reaction to a decrease in the legal early retirement age has been impressively quick (see Börsch-Supan and Schnabel, 1998), the elasticity with respect to easing a system does not need to be symmetric to the one when the system is tightened. Prognos (1998) assumes that a third of the workers will escape to disability. This may well be an underestimate as disability has over and again proved to be a door that is hard to close, e.g. in the Netherlands and the United States. The high uptake of disability before flexible retirement was introduced in 1972 points out that this may happen again also in Germany. Second, a shift in the average retirement age by a few years will not suffice to stabilize the contribution rate. In order to fully compensate for the effects of population aging, the average retirement age has to increase by about 9.5 years to age 69.[7] This is a huge shift into ages in which morbidity is increasing and productivity decreasing, and a shift that presupposes a sufficiently flexible labor market in order to absorb the additional labor supply.

An increase in female labor force participation is another frequently mentioned mechanism that might help to reduce the retirement burden. Again, there are several drawbacks. First, increasing female labor force participation is not a trivial policy exercise and requires structural changes in German daily life. Second, the effect is small and temporary. Even if fe-

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[6] Implicit in Prognos (1998) and Hain and Müller (1998).

[7] Börsch-Supan (1998a), based on simulations with a detailed demographic and employment projection model.

male labor force participation reached the level of male labor force participation within the next decade, the social security contribution rate in 2035 would be reduced by only about a third, and the effect would only be temporary because the additional female workers will eventually claim pensions.

Having younger migrants substitute for the lack of native children can obviously alleviate the effects of population aging. However, the numbers have to work out. To fully compensate the German population aging process, about 800,000 persons (workers and family) have to immigrate annually into Germany from now on through the year 2035, assuming the current age structure of immigrants. This would be 2.5 times the current net immigration which is already three times higher than in the US on a per capita base -- a rate which is currently simply unthinkable.

Because no single step can stabilize the contribution rate to the German PAYG system, current policy in Germany is to add many patches to the current system in a piecemeal approach that is exemplified by the 1992 and 1999 reforms and the many small modifications in between. These fixes include downsizing the system by decreasing benefits, increasing the retirement age, tightening the eligibility for disability pensions, and hoping for an increase in female labor force participation and some help from migration. These fixes require considerable additional absorption in the labor market and nevertheless include a partial default on benefit promises. Lowering benefits and at the same time increasing contributions will make the PAYG system less attractive. The implicit rates of return of the PAYG system are projected to become negative starting from about the cohort born in 1985. This will increase the incentives to evade from the system. Thus, the stabilizing patches in itself are potentially destabilizing by decreasing the contribution base.

2. What About Pareto-Improvements?

Where we stand does not appear to be particularly attractive. However, is there any way to transit to a more attractive situation? Stronger: Can we design a pareto-improving reform? While there is little disagreement among economists on the necessity to neutralize incentives to retire early and to make a pension system transparent in order to strengthen the link between benefits and contributions, the core of the theoretical debate is on the pros and cons of prefunding. Whether a transition to a funded system is pareto-improving is not an easy

question, and while a detailed discussion is not the focus of this paper, it is appropriate to sketch the main theoretical arguments before proceeding to concrete reform proposals.[8]

The debate is characterized by two extreme positions which are clearly wrong. On the one hand, it is claimed, are high capital market returns during the last two decades relative to a low or even negative implicit rate of return of the PAYG system proof of the superiority of a prefunded system. This argument and its most simple form is flawed because it ignores risk, administrative and insurance costs. Even if these are properly taken into account and a positive return differential remains due to the dynamic efficiency of the economy, the argument ignores the transition burden. While a funded system may be more efficient than PAYG pensions under dynamic efficiency, paying back the initial debt of the PAYG system undoes at least some of the transition gains because this necessarily incurs new distortions.

Yet, at this stage the discussion often succumbs to another flawed position. Breyer (1989), Brunner (1994), and Fenge (1995) take an extreme position and claim equivalence of maintaining the PAYG system and a transition to a fully funded system. This position has been repeated by Sinn (2000). However, their arguments only hold in very simple economies that work frictionless (e.g., perfect capital markets) and have a fixed technology. Moreover, pensions must be fair in the sense that contributions and benefits are perceived as strictly proportional within each generation. If contributions are perceived as pure taxes (which appears to be the case according to most polls), or if there are liquidity or diversification constraints (Pestieau and Possen, 2000), or if the technology changes because productivity is affected by changes in the pension system (Corsetti, 1994; Corsetti und Schmidt-Hebbel, 1995; Holzmann, 1997; Börsch-Supan, 1999b), these results do not hold and provide room for a genuine pareto-improvement. Even if such side effects of a transition are small, they change the growth path of an economy and therefore have large effects in the long run.

We have little empirical guidance about these "second order" effects in Germany. A companion paper explores capital market inefficiencies in the German system of corporate governance that are amplified by the lack of institutional investors in Germany.[9] Capital productivity is relatively low, even taking the high capital intensity into consideration, pointing to X-inefficiencies in the usage of physical capital which appear to be related to lack of corporate

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[8] See Börsch-Supan (1999) for an extended discussion.

[9] Börsch-Supan and Winter (2000).

governance.[10] A transition to more prefunding might strengthen the role of institutional investors, increase competition on the capital market, and thus provide higher capital productivity while maintaining (or increasing) labor productivity.

In any case: The balance of the debate on the pros and cons of a pareto-improving transition is somewhere between indeterminate and pro, hence argues in favor of a step in direction of more prefunding than it is currently the case in Germany. While the German public debate stresses many reasons to be conservative in the degree of prefunding, there is little that supports the current monolithity. Indeed, more funding increases the capital market risk, and PAYG systems have a built-in insurance against secular capital market failures. Since Germany has experienced the disastrous effects of hyperinflation and stock market crashes in a rather dramatic way, Germans appear to be particularly averse against capital market risks. However, prefunding also reduces the political risks that have characterized public PAYG systems and which appear to be underestimated. Social security benefits have been changed up and down as political constellations shifted in the recent years in all major EU countries as can be studied in the many institutional comparisons available.[11] Political risks are particularly apparent in the discretionary adjustments to inflation each time subject to pork-barrel politics. Note that a mixed system has a lower risk than either a purely funded and a purely PAYG system as long as capital market and political risks are not perfectly correlated. Since Germans appear to be willing to pay a high premium for an insurance against secular capital market failures, i.e. relatively low rates of return of a large remaining PAYG component, we propose a mixed strategy with a reformed PAYG system frozen at its current size, augmented by a funded pillar that increases in strength as population aging proceeds. We present each element in turn under pure insurance considerations, and then discuss some aspects of redistribution.

3. A Frozen, Fair and Transparent PAYG Pillar

The current PAYG pillar suffers from three main problems. The deadweight losses will become very large when population aging accelerates and contribution rates skyrocket. Hence, we propose freezing the PAYG rate at the current level of the contribution rate. Second, the PAYG system has strong incentive effects towards early retirement, amplifying the financing problem in times of increased longevity. Hence, we propose increasing the adjustments to re-

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[10] McKinsey Global Institute (1996, 1997).

[11] Gruber and Wise (1999), DIA (1999).

tirement age to the actuarial level. Third, the system is subject to political tinkering that destroys the link between benefits and contributions, contributing to the tax character of contributions. Hence we propose a so called "notional accounts" system which clearly lists past contributions and expected benefits.

Freezing the PAYG system

Population aging in Germany will develop its main force not before the next decade, see Figure 1. This still yields some room for building up funds that can alleviate the contribution burden when the population aging will accelerate. The main idea behind the freezing proposal is to have a natural and reasonably tinkerproof and transparent mechanism for a transition schedule.

Freezing the contribution rate implies a smaller PAYG budget per retiree when the dependency ratio increases. For a given aspiration level of pension income, we can express this as a "pension gap" that needs to filled with the new funded pillar that will be discussed below. The size of this gap depends on the actual demographic changes and eventual labor force adjustments. It defines the future mix of the system between the PAYG and the perfunded pillar. Figure 2 shows the expected path under the current government projections. Variations are relatively small until about age 2030 but of course increase as new cohorts enter.

Figure 2: Mix Between PAYG and Prefunded Pillar, by Birth Cohort
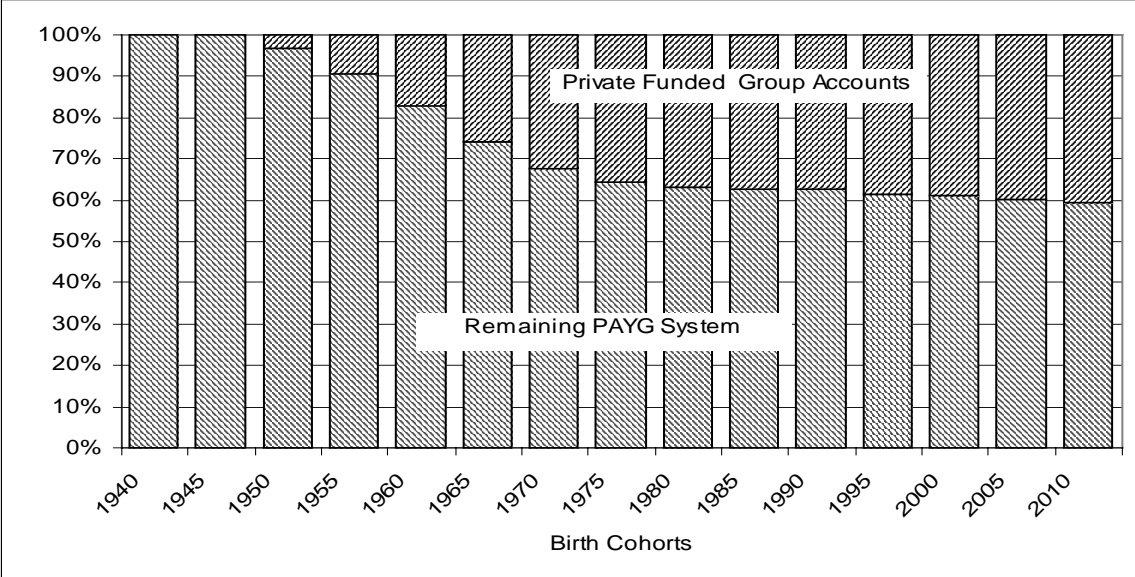
Actuarial adjustments to retirement age

Second step is to make the adjustment factors that relate the level of pension benefits to retirement age actuarially fair in the sense that the present value of future benefits is independ-

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ent of retirement age. Until 1992, benefits were proportional to years of service, hence, post-poning retirement by one year after 40 years of service implies an increase of 2.5%, well below an actuarial adjustment which is between 7 and 8 percent at age 65 and a 3% discount rate. The 1992 pension reform has introduced an actuarial adjustment of 3.6%, to be phased in by the year 2004, still below the required level.

Although the incentive effects of actuarial unfair adjustments are relatively undisputed (see the volume by Gruber and Wise, 1999), increasing the adjustments is politically controversial because of the widespread belief that reducing retirement age will also reduce unemployment. This paper is not the place to discuss the underlying lump-of-labor fallacy. The work initiated by Layard, Nickell and Jackman (1991) show ample evidence of a *negative* correlation between retirement age and unemployment.

Transparent accounts

The third major reform step is to set up the PAYG system as a system of so called "notional accounts". While this only changes the presentation of the system, not its underlying economics directly, it is an important step because it tightens the link between contributions and benefits, and because it makes it harder to tinker with the system.

A notional account system is also a device which makes the actuarial readjustment to retirement age more transparent, thus accelerating a change in the retirement age. It decreases the tax nature of contributions the closer these accounts resemble to, say, whole life insurance accounts. The accounts also clearly show the effects of freezing the contribution rate and thereby define the amount that has to be contributed to the funded pillar. Therefore, introducing a notional account set up is crucial for this reform proposal.

"Tinkering" with the system has become more frequent in Germany in recent years. For example, the replacement rate was reduced more or less silently through a redefinition of service years. Such "administrative adjustments" become public eventually and have lowered the public trust in the system even further. If workers receive quarterly accounts, changes in the projected pensions will be scrutinized more closely, increasing the accountability of the pension policy.

4. Transition to a Partially-Funded Pension System

The main aim of this section is to show that the transition costs to a degree of pre-funding that might be palatable to the German public are rather modest even if they are levied

onto a single generation. This scheme does not resort to recognition bonds or similar devices that stretch the transition costs over several generations as, e.g., proposed by Feldstein and Samwick (1998). The transition costs turn out to be in the order of 3 percent of gross income, thus much smaller than the expected increase in the contribution rate if the PAYG system were maintained, as we have seen in Section 2. Benefits from the transition accrue for cohorts born after 1961 who will then face a much reduced contribution rate.

An important factor in the design of transition models is the intertemporal allocation of the transitional burden. A simple shift of the high burden that would occur around 2035 under the PAYG system to earlier years is as unattractive as a long drawn out allocation of the burden over several generations because this would incur costly debt services.[12] In addition, when a large capital stock must be accumulated in a short period of time, the transitional burden is especially heavy. This suggests designing a transition burden which varies both over time and between cohorts and leaves a lag period between announcing the reform and beginning it. We use the freezing mechanism proposed in the previous section to achieve this, and start freezing the PAYG system only 7 years from the date of announcement.

We assume that the pension gap is completely filled, i.e., the sum of future reduced PAYG pensions and new funded pensions is equal to current PAYG pensions with a net replacement rate of 70.5%. Figure 2 has already displayed the transition path. The funded pension will provide eventually about a third of formal pension income, while the remaining two thirds are financed PAYG. Adding the existing other sources of retirement income, the balance between PAYG and other sources will create a mix similar to what it is now in the Netherlands and Switzerland.

The private funded system is designed in a similar fashion as a group life insurance.[13] This group insurance covers all three biometric risks (longevity, disability and survivorship) and is paid out on retirement as an annuity. For the sake of simplicity we will consider a standardized life course, in which gainful employment begins at age twenty and ends at age sixty, only slightly modified by a gradual increase in retirement age of 3 years through the year 2050. We apply the life expectancy projections by Birg, also used by the most recent governemnt computations. Early disability occurs between age 45 and 60 with an increasing probably averaging 15 percent, the current frequency. Survivor benefits are paid in accordance to the aver-

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[12] The Maastricht and Amsterdam treaties may also set legal bounds on the indebtedness, although it is not fully clear whether the debt limits apply to making implicit debts explicit.

age current probabilities which is likely to be an overestimate because an increasing share of women will have their own pensions such that the partial offset rule applies.

The pension or insurance company is investing the accumulated capital in the market using a broad portfolio of stocks, bonds, direct placement and real estate, generating an average gross rate of return of 6.5%. This is the average return between 1980 and 1995 in the industry. We subtract administrative costs of 6% of contributions, the average for group insurance policies.[14] Here enters the significance of the group policy: past experience has shown that individual accounts tend to have higher administrative costs. Group policies and a universal spread of prefunding "enforced" by the notional account mechanism also minimizes the costs of adverse selection in the annuity market. We do not propose additional incentives or mandatory contributions but a consistent taxation of all retirement benefits together with tax deductibility of all pension contributions.

The resulting net rate of return to the customer is 4.5% in real terms. We assume that this rate will decline in the wake of population aging to 4.2% in 2035, and then remain constant. This estimate is based on an overlapping generations model that simulates the effect of population aging and the feedback of a partially funded pension system on capital intensity and rate of return.[15] We also present simulations with a slightly higher (5.5%) and a substantially lower real rate of return (3.0%).

Figure 3 shows the path of total contributions under the proposed mixed and under the current pure PAYG system. For each birth cohort, it compares the total contributions in the transition scenario (contributions to remaining PAYG system plus contributions to private pension accounts) with the contributions in a continued PAYG system. It is important to note that we are comparing situations with equal utility of consumption and leisure in the retirement phase because both scenarios rest on identical retirement incomes and identical retirement ages.

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[13] Details of this and related transition models can be found in Birg and Börsch-Supan (1999).

[14] Administrating individual policies is more expensive. This is why we choose group policies that can be bundled by employers, as is done in the Netherlands or, in a slightly modified form, through the US 401(k) plans.

[15] See Birg and Börsch-Supan (1999) and Börsch-Supan, Heiß and Winter (2000).

Figure 3: Total Contributions in Transition Model and in Continued PAYG System
*(DM/month at the average wage)*
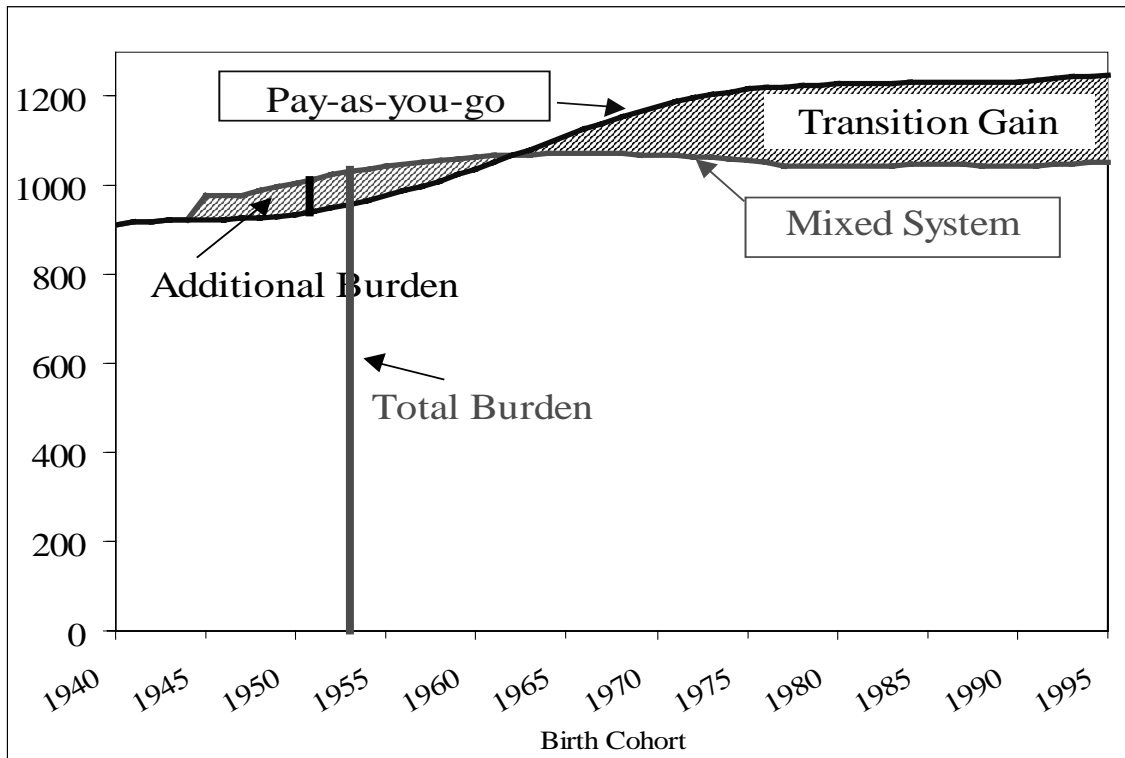
Note: 1000 DM are approximately 500 US-$ at PPP. *Source*: Birg and Börsch-Supan (1999).

The transition smoothens the increase of the total contribution rate relative to the PAYG system, and prevents the total contribution rate from reaching the peak burden of the PAYG system after the year 2035 without changing pension benefits. For cohorts born after about 1970, the transition results in substantially lower total contributions than under the PAYG system.

Figure 4 shows the temporary transition burden and the long-run relief by cohort in more detail. It depicts three rates of return.

Figure 4: Transition Burden and Long-Term Relief
(DM/month at the average wage)
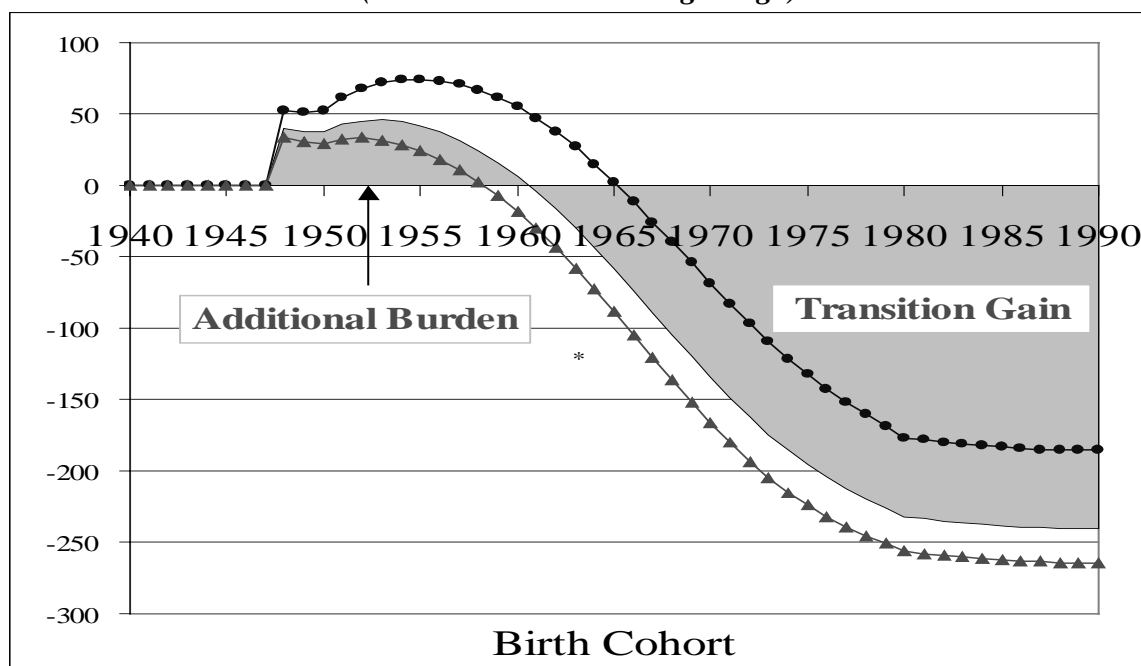
Note: 100 DM are approximately 50 US-$ at PPP. The Figure shows three rates of return (shaded area: 4.5%, blue dots: 3.0%, green triangles: 5.5%). *Source*: Birg and Börsch-Supan (1999).

The transition entails average transition costs of about DM 45 (Euro 25) for cohorts born between 1950 and 1955, standardized for a worker with average earnings. This corresponds to about 1.1% of gross income. Long-term gains accrue from the cohort 1961 on and reach the order of DM 250 (Euro 130). This saving corresponds to more than a quarter of current total contributions which average DM 950 (Euro 500) in 2000.

A transition burden of 1.1% of gross income (or about 2.2% of net income) is significant. However, it is far from being a "double burden" in the literal sense. Figure 3 makes this visible most graphically. Moreover, recent tax changes, partially due to unification, also obtained this order of magnitude. We conclude that a transition to an equal division of labor between public PAYG and private funded old-age provision is doable within the limits of the historical tax variation.

These simulations are of course very sensitive with respect to the assumed rate of return. Figure 4 shows the variation. A reduction in the real rate of return from 4.5% to 3.0% increases the maximum transition burden from DM 45 to DM 75, shifts the break-even point by about 4 years to the cohort born in 1965, and reduces the long-term relief from about DM 240 to DM 180. Note that is still a very significant reduction in the contribution rate relative to

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maintaining the current PAYG system. A higher real rate of return, here 5.5%, will increase this gain and reduce the transition burden.

Figure 5 shows the cohort dependency of the transition path of savings. Unlike to current government proposals or the Swedish model, the freezing model implies a higher savings rate for the cohorts born around 1965 than earlier or later cohorts. The earlier cohorts need to fill a smaller gap, while the later cohorts have longer time to exploit the force of compound interest.

Figure 5: Transition Burden and Long-Term Relief
### (DM/month at the average wage)
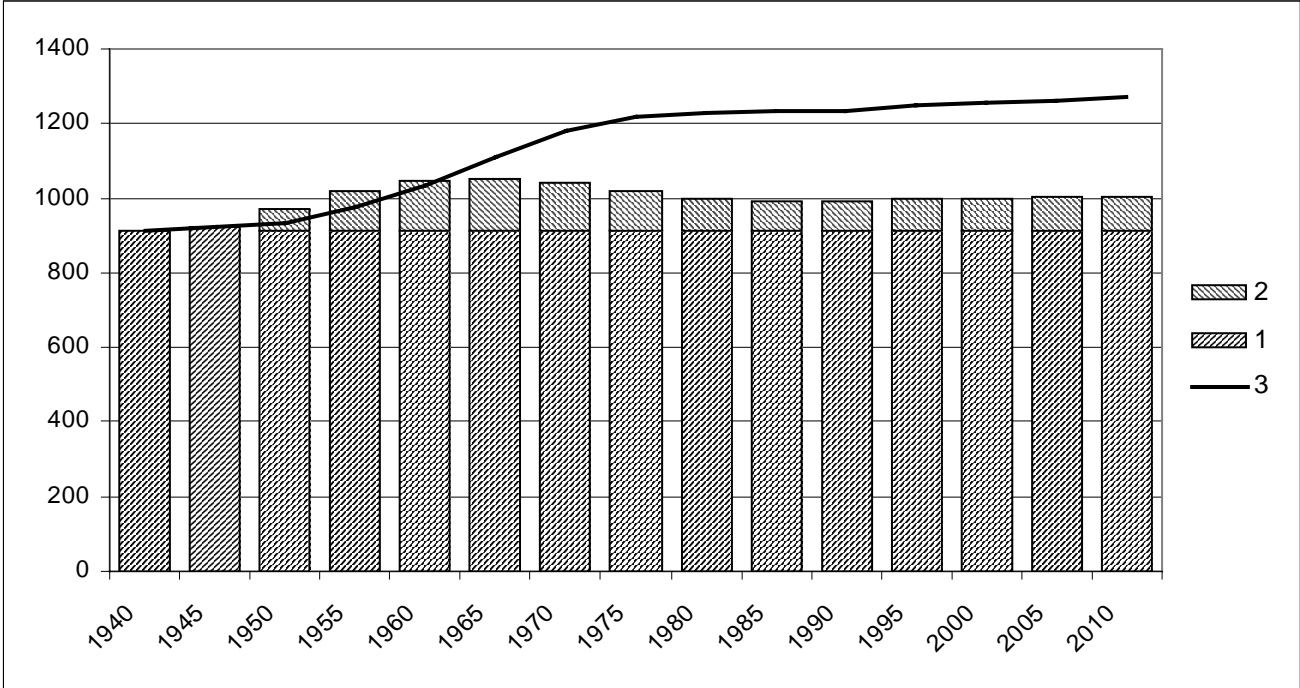
Note: 1000 DM are approximately 500 US-$ at PPP. The Figure shows PAYG (1) and savings (2) contributions to the mixed system and the PAYG contribution to the old pure PAYG system (3). Replacement rate fixed at 70.5%. Real rate of return is 4.5%. *Source*: Birg and Börsch-Supan (1999).

The implied saving rate (i.e., contributions to new pension accounts) for the 1965 cohort is about 3.2%. If rates of return are lower, this rate has to increase. It will reach 4.7% at a 3% real rate of return, but is only 2.5% at a 5.5% rate of return.

The transition to more funding will generate substantial savings in order to provide for income in old-age. Figure 6 shows the accumulated contributions to private pension accounts in the transition model at an assumed rate of return of 4.5%.

Figure 6: Accumulated Contributions to Private Pension Accounts, 2000-2050
(Billion DM, real)
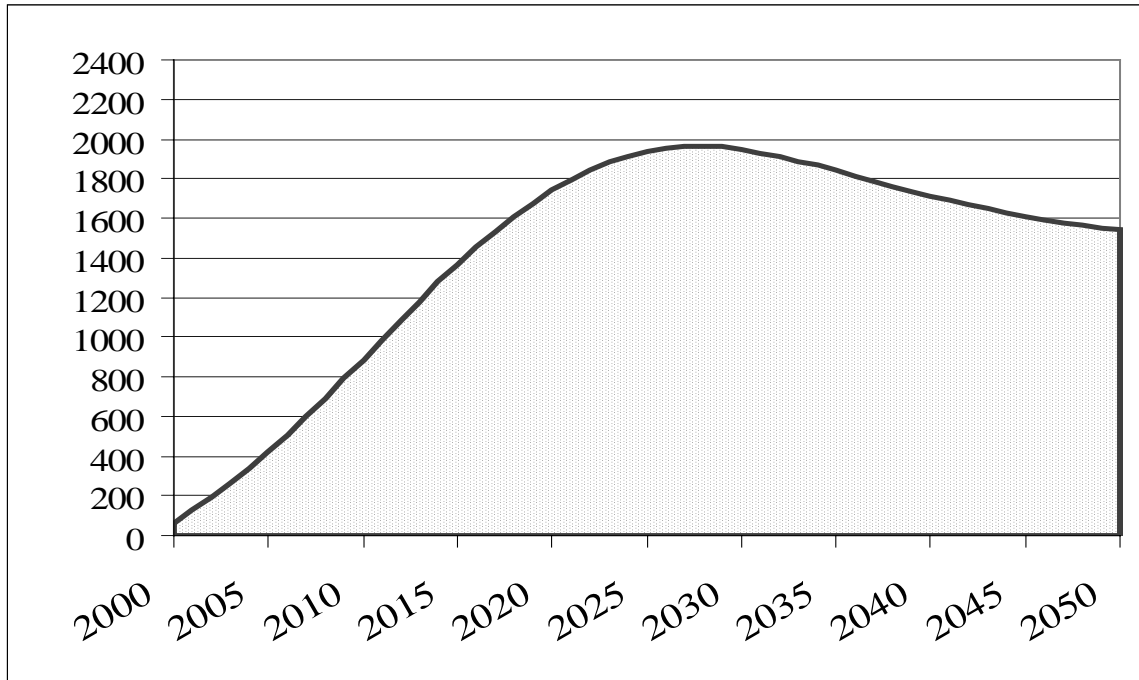
Note: 1000 DM are approximately 500 US-$ at PPP. The 1998 GDP in Germany was about 3750 billion DM.
Source: Birg and Börsch-Supan (1999) and Börsch-Supan, Heiß and Winter (2000).

However, not all of these savings will be new savings since some crowding out of other savings is likely. Birg and Börsch-Supan (1999) have estimated the extent of this substitution based on the same overlapping generations model that was used to predict the reaction of the rate of return to population aging and capital accumulation. These estimates indicate a substitution of about one third, leaving two thirds new saving. Thus, applied to the 1965 cohort, the total household saving rate will increase from some 12.1% (1998) to 14.2%, well in the realm of the historical variation in German household saving rates.

The path in Figure 6 has several implications. First, the magnitude of accumulated new savings is manageable relative to the current capital stock. The long run value (year 2050) represents about 10% of current gross fixed capital, and about 16% of gross fixed capital in the production sector. It is about equal to today's value of life insurance savings and occupational pensions.

Second, the accumulation takes place slowly, echoing the freezing scenario. More significantly, there is no sudden decline in the capital stock around the year 2030 when the baby boomers retire. Main reason is that the baby boom retirement entry stretches about 10 years, during which the new pillar has not yet matured. The increase in new accounts therefore com-

pensates for a substantial portion of dissaving among the retired baby boomers. This also explains part of the small reaction of returns with respect to demographics that was mentioned earlier.

5. Redistribution

The discussion in Sections 3 and 4 has concentrated on the retirement "insurance" of an average worker. It has ignored two important aspects of distribution. First, reducing the PAYG component to two-thirds of the current level will drive the retirement income below the poverty line, if workers have less than 85% of the average life-time earnings and fail to contribute to private accounts. Second, all pension systems suffer from a free-rider system, independent of their PAYG or funded financing mechanism. Families with children "produce: human capital that enable future wage payments that can be taxed for the PAYG system and future capital income that can be used to finance funded pensions. Since pensioners receive the same PAYG or funded pensions, free riding – not bearing the costs of producing human capital – is profitable. We discuss each consideration briefly in turn.

It is debatable whether income redistribution should be part of the pension system. Germany has a social assistance system which essentially delivers a base income also in old age. A close link between contributions and benefits, reducing the tax character of contributions, speaks in favor of separating a base pension from retirement insurance. The stigma effect of social assistance speaks for the opposite. So do fiscal federalism aspects: Social assistance in Germany is paid by the local community, while pensions are paid by a federal agency.

Redistribution between families with and without children is also a debatable issue within the pension system, since the free rider issue is not confined to the pension system. However, it has particularly strong effects on pensions. One might argue that modern societies have lost the wisdom that children are needed, in particular for old age. Introducing a compensating mechanism into the pension system then helps to reduce at least the distributive effects of the choice of having children. A mixed pension system is a helpful device in this respect. If the PAYG replacement is effectively a function of the number of children, say, by crediting a substantial part of the children's education phase as years of service to one or both parents, the pension gap will be smaller for families with than without children.[16] Thus, families without children will invest more in real capital while families with children invest in human capital, a

sensible division of labor of a society that needs more human and more real capital in order to sustain the current level of consumption in a future German economy that will have a substantially lower absolute number of workers.[17]

Conclusions

The pension reform discussion in Germany focuses on fixing the current PAYG system and still hides then true extent of population aging. Polls show that most people are aware of a pending crisis, but substantially underestimate its magnitude. The proposed introduction of a small funded pillar will have little effect because most households already have existing occupational pensions and/or life-insurance contracts. The crucial reform step is an open presentation of the future path of the PAYG system under a stable contribution rate, precipitating new savings with little crowding out. This is why this paper, as a first step, recommends the introduction of a notional account set-up of the current PAYG system.

This paper then demonstrates that a more fundamental reform, namely a gradual transition from PAYG to a partially funded system, is quite possible. Our simulation analysis focused on the level of the transition burden and showed that the additional burden can be kept rather low because the return differential between PAYG and a funded system is relatively large. Our proposed transition model holds the replacement rate and the retirement age (i.e., utility from consumption and leisure) constant relative to the PAYG system, and maintains the currently generous survivor and invalidity benefits. It also keeps the administrative cots low relative to a free-for-all approach with UK-type individual accounts. This is done by using an augmented grouped whole life insurance as savings instrument that provides an annuity in case of retirement, disability and survivorship.

A gradual transition to a partially funded system opens two dimensions of additional flexibility. The first permits more inter-temporal flexibility through the savings mechanism, reducing the peak burden around the year 2035 and substantially reducing the long-term contribution rate. The second permits international flexibility through the capital market, moderating the impact of population aging on the German capital market.

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[16] The current system credits three years of education for a single child. Actual breaks in the job career of women are much longer. These years are also valued at the average wage, not at the mother's actual wage.

[17] Sinn (2000).

The side effects of a more fundamental reform are potentially large, although they are more subtle than often claimed. Transition costs take much of the seemingly large return differential between the PAYG system and a *de novo* funded system. Genuine macroeconomic effects are induced by changes in labor and capital productivity. As stressed in Section 2, these effects are indirect but small changes in the rate of growth have large long-term effects.

We end this paper by a remark on the timing of reform. There is, indeed, only a small window of opportunity. Figure 7 shows total contributions under three scenarios: Continuing PAYG, a transition to 50% funding, and the same transition postponed by 10 years. The message is clear: Pension reform must take place soon such that the benefits of the reform accrue before the peak of population aging. If it is postponed, the peak of population aging coincides with the maximum transition burden, an unpalatable situation.

Figure 7: The Timing of Reform
(Total contributions for the average worker, DM/Month)
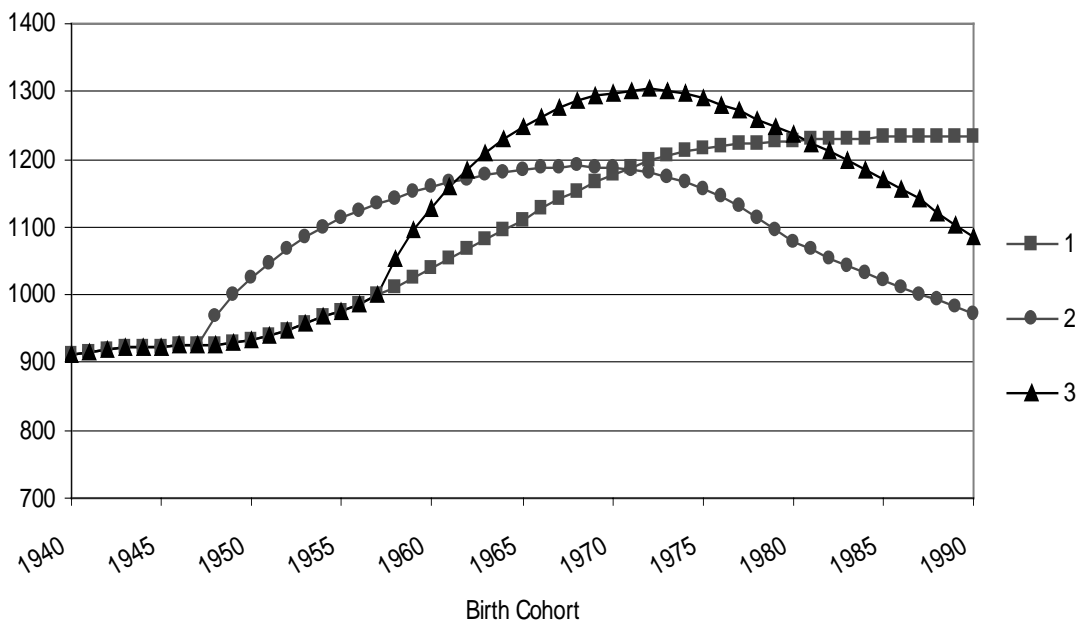
Notes: 1=Continued PAYG System, 2=Transition to 50% Funding in 2007, 3=Transition in 2017.
Source: Birg and Börsch-Supan (1999).

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