



SONDERFORSCHUNGSBEREICH 504

Rationalitätskonzepte,
Entscheidungsverhalten und
ökonomische Modellierung

No. 07-09

**How an Unfunded Pension System looks like
Defined Benefits but works like Defined
Contributions: The German Pension Reform**

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May 2007

Financial support from the Deutsche Forschungsgemeinschaft, SFB 504, at the University of Mannheim, is gratefully acknowledged.

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Paper written for the Fundacion Carolina

31 May 2007

Abstract:

This paper describes the German pension reform process 1992-2007 with a stress on a remarkable development: the public pay-as-you-go-financed pension system has almost silently moved from a traditional defined benefit system to a system which works in many respects like a defined contribution system. The paper combines economic with political considerations, hopefully offering a few lessons that are useful also for other countries.

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We are grateful to Juan F. Jimeno for his thoughtful discussion at the Conference "Welfare and Competitiveness" and many helpful comments by participants of several conference in Europe and the US. Financial support was provided by the National Institute on Aging (NIA) through the NBER, the German Science Foundation (DFG), the State of Baden-Württemberg, and the German Insurers Association (GDV). All remaining errors are ours.

How an Unfunded Pension System looks like Defined Benefits but works like Defined Contributions: The German Pension Reform

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1. Introduction

This paper describes the German pension reform process since 1992 with a stress on a remarkable development: the public pay-as-you-go-financed pension system has almost silently moved from a traditional defined benefit system to a system which works in many respects like a defined contribution system.

Defined benefit systems have been an important achievement of social policy during the emergence of modern welfare states. They provide workers with a reliable perspective on their retirement income. They are, however, unsustainable if the balance between young contributors and older benefit recipients changes, e.g., due to earlier retirement ages, as they emerged since the 1970s in almost all industrialized countries, or due to population aging, which will double the number of beneficiaries per contributor during the next three decades.

Defined contribution systems automatically react to these changes. In funded defined contribution systems, the rates of return and the conditions for annuitization are results of demand and supply on the capital markets. They are thus sustainable by design. However, they expose workers to types of risk modern societies have not yet adapted to. Capital markets are still volatile, and the risk of being underfunded at retirement – e.g., if a worker starts saving late or interrupts contributions due to unemployment or family events – is not a risk which we are well equipped to calculate.

Pension reform is the art of finding a compromise between sustainability with respect to secular changes and stability of retirement income for the individual worker. There is a painful tension between these two goals as the preceding discussion of defined benefit and defined contribution systems has shown. Any country embarking on pension reform, be it in Europe or in

Latin-America, has to make painful choices between these two basic principles.¹ This paper describes the compromise that has been reached in Germany after a reform process that lasted 15 years, hopefully with a few lessons that are useful also for other countries.

Since pension systems reflect the social fabric of a country, the paper begins with a brief summary of the history of the German pension system (Section 2). Sections 3 through 7 describe the strategic steps in the reform process, marked by law changes and commission reports. Section 8 shows a bit more formally the similarity between the new German system and the Swedish national defined contribution system. Section 9 concludes.

2. The evolution of the German system in a nutshell

The German pension system, designed by Bismarck almost 120 years ago, was the first formal pension system in the world. It has been very successful in providing a high and reliable level of retirement income in the past at reasonable contribution rates, and it became a model for many social security systems around the world.

As opposed to other countries such as the United Kingdom and the Netherlands, which originally adopted a Beveridgian social security system that provided only a base pension, public pensions in Germany were from the start designed to extend the standard of living that was achieved during work life also to the time after retirement. Thus, public pensions are roughly proportional to labor income averaged over the entire life course and feature only few redistributive properties. The German pension system is therefore called “retirement insurance” rather than “social security” as in the United States, and workers used to understand their contributions as “insurance premia” rather than “taxes.”

The insurance character is strengthened by institutional separation and the point system. The German retirement insurance system is not part of the government budget but a separate entity. This entity is subsidized by the federal government. Rationale for this subsidy—which comes to about 30 percent of expenditures—are noninsurance benefits, such as benefits paid to German immigrants after opening the iron curtain. Any surplus, however, remains in the system. It

¹ See e.g. Schmidt-Hebbel (1999) or Valdés-Prieto (1998) for the Latin American experience, Fox and Palmer (1999) for the Latvian experience.

is not transferable into a “unified budget” as in the United States.² The point system, similar to the French system, relates benefits to the number of years contributed and the relative earnings position in each of these years. Workers who contribute longer to the public system receive a proportionally higher pension. Moreover, pensions are proportional to the amount contributed. This feature is important because it represents a crucial element of a defined contribution system.³

The German retirement insurance started as a fully funded system with a mandatory retirement age of 70 years when male life expectancy at birth was less than 45 years. Today, life expectancy for men is more than 75 years but average retirement age is about 61 years. The system converted to a de facto pay-as-you-go system when most funds were invested in government bonds between the two world wars. After a long and arduous debate, the German Bundestag decided in 1957 to convert the system gradually to a pay-as-you-go scheme. The remainder of the capital stock was spent about 10 years later. Since then, the German system is purely pay-as-you-go with a very small reserve fund lasting less than 14 days of expenditures in Spring 2004.

A second historical reform took place in 1972. It made the German pension system one of the most generous of the world. The retirement behavior visible in current data is mainly influenced by the reform. The 1972 system is generous in two respects. First, the system has a high replacement rate, generating net retirement incomes that are currently about 70 percent of pre-retirement net earnings for a worker with a 45-year earnings history and average lifetime earnings.⁴ This is substantially higher than, for example, the corresponding U.S. net replacement rate of about 53 percent.⁵ The high initial level of public pensions was exacerbated by indexation to gross wages. Second, the 1972 reform abolished the mandatory retirement age of 65 years for those with a long service life⁶ in favor of a flexible choice during a “window of re-

² See Gruber and Wise (2004).

³ See Bäcker et al. (2000)

⁴ This replacement rate is defined as the current pension of a retiree with a 45-year average earnings history divided by the current average earnings of all dependently employed workers. It is different from the replacement rate relative to the most recent earnings of a retiring worker, which are usually higher than the life-time average.

⁵ This figure is arrived at using the same replacement rate concept as in endnote 2.

⁶ At least 35 years.

tirement” between age 63 and 65, with no actuarial adjustments. Adding to these very generous early retirement provisions were easy ways to claim disability benefits and low mandatory retirement ages for women and unemployed persons, further increasing the number of beneficiaries and extending the “window of retirement” to between 60 and 65.

It is no surprise that the German public pension system is the single largest item in the German social budget. In the year 2001, public pension expenditures amounted to some 200 billion euros, representing 21 percent of public spending and 11.8 percent of GDP. It is the second largest pension budget in the OECD, surpassed only by Italy (at 14.2 percent of GDP). It is more than 2.5 times as expensive as the U.S. social security system (which is 4.4 percent of GDP).⁷

The generosity of the German public pension system is considered a great social achievement, but negative incentive effects and population aging are threatening its very core.⁸ Although incentive effects are still arcane in the eyes of politicians and the electorate, population aging has become a “megatrend” in the popular debate. All industrialized countries are aging, but Germany—together with Italy and Japan—will experience a particularly dramatic change in the age structure of the population. The severity of the demographic transition has two causes: a quicker increase in life expectancy than elsewhere, partly because of the still relatively low level in the 1970s, and a more incisive baby boom/baby bust transition (than the United States, for example) to a very low fertility rate of 1.3 children per woman, only a bit higher than the rock-bottom fertility rate of 1.2 in Italy and Spain. Consequently, the ratio of elderly to working-age persons—the old-age dependency ratio—will increase steeply. According to the latest OECD projections, the share of elderly (aged 65 and above) will exceed a quarter of the population in 2030, and the German old-age dependency ratio will almost double, from 24.0 percent in 2000 to 43.3 percent in 2030⁹.

The increase in the dependency ratio has immediate consequences for a pay-as-you-go social insurance system because fewer workers have to finance the benefits of more recipients. The German social security contribution rate, which in 2003 was 19.5 percent of gross income, was

⁷ See OECD (2001).

⁸ See Börsch-Supan (2000).

⁹ See OECD (2001). The OECD dependency ratio relates persons age 65 and older to persons between ages 15 and 64.

projected at the end of the 1980s to exceed 40 percent of gross income at the peak of population aging in 2035 if the accustomed replacement rates and the indication of pensions to gross income were maintained.¹⁰ This led to a 15-year-lasting pension reform process, starting with the 1992 reform, culminating in the reform agenda of the “Sustainability Commission” in 2003, and ending – at least for the time being – in 2007, when the last proposal of this agenda was made to law.

The reform process transformed the German public pay-as-you-go pillar in a system that works very much like the Swedish notional defined contribution (NDC) system, but is still in the form of a defined benefit system. The following sections describe these reforms and their strategic steps. It should be noted that these reforms were not master-minded; just the opposite, some “happened” due to budget crises and new political constellations. From hindsight, however, the strategic steps follow, maybe astoundingly, a rather consistent red thread.

3. The 1992 Reform

The first main change of the 1992 reform was to anchor benefits to net rather than to gross wages. This implicitly has reduced benefits since taxes and social security contributions have increased, reducing net relative to gross wages. While this mechanism was modified several times between 1998 and 2001 and today no longer includes taxes, the important link to social security contributions has been preserved. It will become particularly important when population aging speeds up, since it implies an implicit mechanism of burden sharing between generations.¹¹

The second important element in the 1992 reform was the introduction of “actuarial” adjustments to benefits to retirement age. These changes will reduce incentives to retire early and are an important first strategic steps towards making the system more alike a defined contribution system since benefits now depend on the date of retirement in an actuarial fashion.

The introduction of benefit adjustments to retirement age in Germany mimics the automatic benefit adjustments within an NDC system approach, where benefits are adjusted to retirement age by the annuity formula. However, in contrast to an NDC system, the adjustments in the

¹⁰ See Prognos (1987).

¹¹ See Schnabel (1998).

German system have been set discretionarily and are not directly linked to changes in life expectancy. They are about 1.5 percentage points lower than current life tables and a 3 percent discount rate would imply.¹²

4. The 1999 Reform

It became quickly clear that the 1992 reform was too little and too late to put the German system on a stable and sustainable path. In 1999, a new pension reform attempt was supposed to lower the replacement rate according to a prespecified “demographic factor”—a function of life expectancy plus several correction factors. However, the reform was revoked after the conservative government lost elections in 1998, and the new social-democratic government, strongly supported by the unions, fulfilled its election promises not to touch pension benefits.

A side effect of this reform, which was not revoked, was a gradual change of eligibility ages for pensions for women and unemployed persons from age 60 to age 65. This change will be fully implemented by 2017 and effectively leaves a “window of retirement” for healthy workers only if they have at least 35 years of service. Moreover, there will be no distinction between men and women (after the year 2015); unemployment-retirement will be abolished (after the year 2007); and part-time retirement (which was largely taken in two “blocks” of full-work and subsequent full-retirement) will be impossible (after the year 2007). These changes were largely unnoticed by the population. They will change the effective retirement age by around 2 years from about age 60 to age 62.¹³

5. The Riester Reform in 2001

Not touching pension benefits was easier said than done. The financial situation of the pension system worsened rather quickly after the 1998 elections that brought the social democrats to power in Germany. As a remarkable irony in politics, the former union leader then secretary of labor Walter Riester successfully passed a major reform bill through parliament in 2001.

The 2001 reform is popularly referred to as the Riester reform. It is a major change in the system. It will change the monolithic German system of old-age provision to a genuine multipillar

¹² Actuarial computations depend on a discount or interest rate which makes payments made or received at different points in time commensurable. Usually, a rate of 3 percent is assumed, sometimes 4 or 5 percent. The German computations rest on a discount rate of about 1 percent.

system. The most important aspect of the reform, which came into effect on January 1, 2002, is a partial substitution of pay-as-you-go financed pensions by funded pensions.¹⁴ The reform aimed to achieve three main objectives:

- **Sustainable contribution rates.** The key objective of the Riester reform was to stabilize contribution rates and thus (1) to limit further increases in nonwage labor costs and (2) to achieve a fairer balance of intergenerational burdens. The law actually states that contribution rates to the public retirement insurance scheme must stay below 20 percent until 2020 and below 22 percent until 2030 while the net replacement rate must stay above 67 percent. Failure must precipitate government action.
- **Secure the long-term stability of pension levels.** Pensions will be gradually reduced from the current level of 70 percent of average net earnings to around 67–68 percent by the year 2030. At the same time, however, the Riester reform changed the computational procedure for the reference earnings, now subtracting a fictitious 4 percent of gross earning to be invested into the new funded supplementary private pensions. This differs from the definition of net earnings that applied prior to the reform, as it means that actual PAYG pension levels will fall by a larger margin (by some 10 percent to about 63.5 percent) than suggested by the new definition.
- **Spread of supplementary private pension savings.** The decline in public pensions is expected to be offset by supplementary (occupational and private) pensions. In order to achieve this aim, supplementary pensions are subsidized, either by tax deferral and tax deduction, or by direct subsidies to individual and occupational pension plans. These supplementary pensions are, however, not mandated.

Table 1 gives an overview over the main changes:

¹³ See the projections on the change of retirement age by Berkel and Börsch-Supan (2004).

¹⁴ See Bonin (2001).

Table 1. Key Elements of the Riester Reform

Introduction of a needs-oriented basic income	Minimum social security guarantee for old age; reduction in earning capacity secured by means of needs-oriented basic income
New adjustment formula	Reduction in pension level by about 10 percent
Abolition of occupational incapacity pensions	Discontinuation of occupational incapacity pensions; replacement by two-tier general invalidity pension
Reform of women's and survivors' pensions	Modification of income rules for survivors' pensions; introduction of "pension splitting for married couples"
Reformed framework for occupational pensions	Introduction of a legal right to convert salary into pension contributions; relaxation of investing rules; introduction of pension funds; DC plans permitted
Establishment of funded (voluntary) supplementary pension provision	Introduction of individual retirement accounts; rules for the recognition of financial services products eligible for state subsidies (Retirement Pension Contracts Certification Act); provision of state subsidy; introduction of deferred taxation

Source: Authors compilation.

Since the Riester reform is a crucial step in the 15-year reform process, we will explain these reform elements in more detail in the following four subsections, and the provide a brief assessment of the Riester reform.

5.1 The PAYG Pillar: Reducing the Replacement Rate

The calculation of the current monthly pension value for a specific year takes account of the development of the earnings of all workers. This procedure is intended to guarantee that the "standard pension replacement rate" remains stable and does not fall behind the development of current average earnings.¹⁵ Before the 2001 reform, the objective of safeguarding standards of living in old age was considered to be met if pensions were worth 70 percent of average net earnings. Thus the pension level more than maintained the purchasing power of the level of pension entitlements acquired when a person retires. Until the 2001 reform, the German pension system was essentially run by adapting the contribution rate to this 70 percent standard replacement rate.

¹⁵ The reader is reminded that the term *replacement rate* may be misleading. In the German context, it does NOT refer to last earnings before retirement. Rather, the "standard replacement rate" refers to the pension of a worker, who had 45 earnings points, divided by the average net earnings off all current workers.

The Riester reform introduced a rather complex new adjustment formula, which relates changes in the pension value (PV_t) to lagged changes in gross income (AGI_t), modified by the actual contribution rate to public pensions (τ_t) and a fictitious contribution rate to the new private pension accounts (AVA_t), gradually increasing from 0.5 percent in 2003 to 4 percent in 2009. In addition, a somewhat awkward “sensitivity factor” d_t was introduced. It is 100 until 2010, then decreases to 90, which effectively increases the sensitivity of PV to increases in τ after 2010. It thus simply reduces the replacement rate after 2010:

$$PV_t = PV_{t-1} \frac{AGI_{t-1} \frac{d_t}{100} - AVA_{t-1} - \tau_{t-1}}{AGI_{t-2} \frac{d_t}{100} - AVA_{t-2} - \tau_{t-2}}.$$

The complex design of the formula reflects the balance between the two opposing aims of the reform: to keep the contribution rate below a fixed level (20 percent until 2020, 22 percent until 2030), and to keep the redefined standard replacement level above 67 percent until 2030. Both conflicting aims are part of the German pension law. If any of these aims are violated, the law precipitates government action, such as the introduction of the reform commission in 2003. The awkward jump in the sensitivity factor d_t reflects the aim to mimic the speed of demographic change: the system dependency ratio will stay relatively flat until 2010 and will then quickly rise.

5.2 The New Funded Pillar: Introducing Supplementary Funded Pensions

A crucial component of the Riester reform was the introduction and significant promotion of supplementary funded private pensions to fill the pension gap created by the reduction of the replacement rate. The objective is to offer incentives for people to take out supplementary private pension cover that, in the long term, should compensate for the future cuts in public pensions. However, there will be no legal mandate for people to invest in additional private schemes. These so-called Riester pensions can be occupational or individual pensions.

On the one hand, Riester pensions are heavily subsidized to incentivate households to build up retirement savings. The incentives provided by the state can take two forms: direct savings subsidies and tax-deductible special allowances if they give an additional advantage.

On the other hand, Riester pensions have been heavily regulated. The main restriction on the demand side is on payment plans. Since additional private pension schemes are intended to supplement or replace benefits from the public pension scheme, the government decided that incentives will be available only for investment vehicles that guarantee payment of a life annuity payable from the date of retirement. Investment vehicles that provide for lump-sum disbursements are not subject to state subsidies.¹⁶ This restriction has already met with considerable criticism in the public debate as it excludes other forms of provision for old age (such as investments in old-age or nursing homes).

The initial regulation of suppliers was also stringent, although it has been dramatically loosened after the Sustainability Commission's proposals, see below. Individual retirement accounts qualify for state promotion only if they meet criteria laid down in the new Certification of Retirement Pension Contracts Act (AltZertG). Qualifying pension plans require certification by the Federal Financial Markets Authority (Bundesanstalt für Finanzdienstleistungs- und Finanzmarktaufsicht), which will be granted automatically if they fulfill the following preconditions:

1. Pension benefits may be paid out only when the beneficiary reaches the age of 60 at the earliest or upon reaching retirement age, unisex rates have to ensure equal treatment of men and women and the possibility to extend benefits to survivor and invalidity benefits must be provided.
2. At the beginning of the disbursement phase, the accrued pension contributions (inclusive of subsidies) must be guaranteed (that is, the nominal rate of return must be nonnegative).
3. Pension payments must be in the form of a life annuity or a disbursement plan linked to lifelong periodic installments with an initial lump-sum payment (up to 30% of the accumulated capital).
4. Initial commission and administrative charges must be spread equally over a period of at least 5 years.

¹⁶ If a lump-sum payment is chosen, all subsidies have to be reimbursed to the tax authorities.

5. The investor must have the right to suspend contributions during the saving phase, to allow the policy to continue running without making additional contributions, to switch policies, to withdraw capital in order to finance privately owned housing or to terminate the policy.

Products eligible for subsidy support and into which old-age pension contributions and the proceeds on such contributions may be invested include pension insurance and capitalization products, bank accounts with accumulated interest, and shares in growth and distributing investment funds. These products are offered by life insurance companies, banks, capital investment companies, financial services institutions, and securities services companies.

Contributions to Riester pensions are tax exempt during the saving phase, pension payments during the benefit phase, however, will be taxed in full as normal income. This applies to all benefits regardless of whether these accrue from contributions, subsidies, or capital gains. One may regard this as another form of subsidy, since taxes occur later in life (hence, an implicit tax credit) and usually at a lower rate due to progressivity.¹⁷

5.3 State Promotion of Occupational Pension Schemes

The Riester reform remained largely inexplicit on the role of occupational pensions versus individual accounts. Occupational pensions have traditionally played a minor role in Germany, particularly in comparison with other countries. Demand for participation in occupational pension schemes has also been falling in recent years.¹⁸ On the other hand, occupational pensions may provide a psychological substitute for mandated private pensions. In order to strengthen occupational pensions, additional (implicit and explicit) subsidies were introduced with the Riester reform.

The most important change in occupational pensions resulting from the Riester reform is the general right of workers to convert part of their salary directly into contributions to pension plans. This applies regardless of whether the contributions are paid by the employer or the employee. Arrangements may be based both on gross and net pay. If they are based on net pay, there is a large implicit subsidy since the so-converted salary may not only be subject to deferred taxation but can also be exempt from social security contributions, at least until 2008. If

¹⁷ See Börsch-Supan and Lührmann (2000). The “tax credit” feature depends on the an income or consumption tax point of view.

¹⁸ See Ruppert (2000).

they are based on gross pay, contributions may enjoy the same direct subsidies or tax relief as contributions to individual accounts, as long as the occupational pensions meet certain criteria that are less restrictive than the criteria for individual pension plans. Which contribution rules apply depends on the chosen investment vehicle and the incentives they attract. Collective bargaining agreements, however, have precedence over the right to convert salary. This means that an employee covered by a binding collective agreement is entitled to convert his or her pay into pension only if this is explicitly provided for in the terms of the collective agreement. This rule ensures that employers and unions can impose their own rules on occupational pension plans.

5.4 The Minimum Pension

An important element of the Riester reform was a minimum social security guarantee for old age and those, whose earning capacity is reduced. This is effectively a means-tested minimum pension, 15 percent higher than the German basic income (social assistance). It effectively shields workers in the lowest income deciles from the benefit cuts by the Riester reform. Riester pensions, however, will be counted in the means-testing procedure which creates negative incentives to participate in spite of very high subsidies to these savings for low wage earners.

5.5 An Assessment of the Riester Reform

The Riester reform, heralded in 2002 as “pension reform of the century”, was certainly a major reform of the German pension system. Its success, however, rests on whether the new voluntary supplementary private pensions, the “Riester pensions,” will be accepted by the German workers who were used to the all-caring public pay-as-you-go system. It is important to realize that this takes time. It took about 5 years to popularize a general subsidized dedicated savings program (*Vermögenswirksame Leistungen*, directly deducted from payroll), which now enjoys almost universal participation. In the United States, individual retirement accounts (IRAs) needed at least as long to be accepted by a large share of households. In this subsection, we look at the Riester pension’s design and the incentives in order to understand who is likely to take it up and who is not, and then compare it to the actual uptake.

The depth of Riester incentives. Two aspects need to be considered when assessing the benefits offered by Riester incentives: the subsidies/tax exemptions during the contribution phase and any tax-related advantages or disadvantages that arise during the disbursement phase. The direct subsidies during the contribution phase are very deep for those who have relatively low

incomes and those who have children. The reverse is the case for the tax-deductible special allowances, due to the progressive tax system. Here, households with higher incomes benefit more. This results in a U-shaped relation between subsidies and income.¹⁹ For lowest-income households, the subsidy is almost as large as the contribution itself. Even for the well-to-do, subsidy rates are high: around 40–50 percent. Given these deep subsidies, uptake is likely to be high. This U-shaped curve is flattened out during the disbursement phase when pension benefits will be taxed. This flattening effect is due to the impact of progressive taxation. Taxation will not affect pensioners in the lower half of the income distribution because their pension income is below a generous exemption for retired households. It will, however, considerably reduce the effective lifetime subsidy to households with incomes above average.

The form of the Riester incentives. Although the depth of the Riester incentives makes the Riester pensions rather attractive, the Riester pension is less flexible than other retirement investment products. One of the main drawbacks is that most of the capital has to be annuitized and can therefore not be used as collateral or bequeathed. The argument lacks a certain logic since the very objective of the Riester pensions is to provide annuity income in order to fill the pension gap emerging from the reduced PAYG pillar. In our opinion, the widely voiced argument is a clear indication that most workers have not yet realized that they will depend on the Riester pensions for a reasonable retirement income.

The extensive certification requirements that severely restrict the scope of private providers to develop new private insurance products and that lead to higher costs is also disadvantageous. Certain cost items can result in total costs of up to 20 percent, compared with around 10 percent for a normal capital sum life insurance policy.²⁰

What is more, the certification rules serve merely to create a formal product standard without creating the transparency needed to compare different investment vehicles and the relative rates of return they offer. As a result, customers are often not in a position to make truly informed private investment decisions. The guarantee of the nominal value of contributions does ensure that, on retirement, at the very least the nominal capital saved is available as pension capital. However, there are no rules that prescribe the sort of pension dynamization that is needed to

¹⁹ We use the word *subsidy* for both the direct subsidy and the tax-deductible special allowance.

²⁰ See Stiftung Warentest (2002).

ensure that the value of pension benefits paid out from the saved capital can be maintained over the long term. Nondynamized Riester benefits will very quickly lose their value, even at very modest rates of inflation.

Preliminary evidence on take-up rates. First survey results showed that the demand for Riester products was very sluggish: only around 9 percent had actually taken out a policy by mid 2002, and not much changed until 2004. This led to some disillusion among policy makers. Recent figures, however, show a very steep increase in uptake rates. Börsch-Supan, Reil-Held und Schunk (2006), using the SAVE panel data on German households' saving behaviour, show that demand for Riester products doubled in 2004 and again in 2005. The uptake rate end of 2005 exceeded 20 percent of all employees who also belong to the first pillar of the German pension system, the primary target population of the Riester reform. 2006 appears to be another year of a steep increase.

In addition, there is a growing trend for workers to enroll in supplementary pension plans. Only around half of those planning to enroll in such plans are considering doing so in the framework of a Riester policy. The other half prefer other savings and insurance products, and/or occupational pensions.²¹

Extrapolating the above dynamics and using the coverage reported in Börsch-Supan, Essig und Wilke (2005), about 80 percent of all households, in which at least one person is enrolled in the first pillar public pension system, are covered by a second and/or third pillar pension.

On average and even at the median, the accumulated funds are sufficiently large to offset the cuts in the first pillar. For the less well to do, however, this is not the case.

Moreover, many households, especially in the higher income brackets, may merely restructure their existing pension plans in order to reap Riester subsidies. At this point we do not have much hard evidence on such substitution. Should these households have a fixed pension target, financing state subsidies via general taxation can actually have perverse effects that lead to a lower savings rate.²²

²¹ See Leinert (2003).

²² See Börsch-Supan and Lüthmann (2000).

Given successful take-up, as indicated by the recent evidence, the future composition of retirement income will be quite different from the current monolithic one. While the German PAYG system will remain the dominant pillar for old-age provision, Riester pensions will make up about 35 percent of state organized retirement income. Should other income sources (currently about 15 percent of total retirement income) stay as they are, this would yield a share of PAYG pensions in total retirement income at about 55 to 60 percent. Some crowding out of existing occupational pensions and other private pensions by the new Riester pensions is likely, however, as mentioned earlier.

6. New Efforts: The 2003 Proposals by the Sustainability-Commission

When it became obvious that the Riester reform measures would not suffice to meet the contribution rate and pension level targets, a new reform commission, the “Commission for Sustainability in Financing the German Social Insurance Systems”, popularly referred to as the Rürup commission after its chairman, Bert Rürup, was established in November 2002.²³ Its twin objectives are those of the Riester reform: to stabilize contribution rates while at the same time ensuring appropriate future pension levels.

The Rürup commission met in 2003 very different circumstances than Riester faced in 2001. Unexpectedly high unemployment rates and the poor performance of the German economy with extremely low growth rates precipitated a short-run financial crisis of the pension system and created a sense of urgency for reform. Moreover, the electorate became increasingly aware that stabilizing social security contributions in total labor compensation is essential for enhancing future growth. This paradigm shift away from thinking in pension claims toward thinking in financing possibilities had a noticeable impact on the commission’s reform proposals.

In addition, the commission profited from the fact that the Riester reform had already paved the way for a more forceful shift from pay-as-you-go financed first-pillar pensions to funded second- and third-pillar pensions.

The reform proposal, published at the end of August 2003, comprises two major elements plus several accompanying measures. The first main element is a gradual increase of the normal

²³ The commission was in charge of making reform proposals for the pension system, health care, and long-term care insurance. We only refer to the proposals of the pension group which was chaired by the first author of this paper.

retirement age from 65 to 67 years; the second is a modification of the pension benefit indexation formula linking benefits to the system dependency ratio. The first element is accompanied by adjustments to the various early retirement ages, and the second element is accompanied by a revision of the Riester pension regulations. Although the main two elements directly serve to achieve the desired stabilization of contribution rates, the accompanying measures keep the system of pathways to retirement balanced and address some of the widely criticized aspects of the newly introduced second- and third-pillar pensions.

Increase of the normal retirement age. The commission proposes to increase the normal retirement age from 65 to 67 years. The increase is slow and gradual, starting in 2011 with monthly steps such that age 67 will be reached in 2035. This increase corresponds to two-thirds of the projected change in life expectancy at age 65.

In order to prevent substitution into early retirement and disability pensions as a result of the increase in the retirement age, the commission also proposed to increase the early retirement ages (to the same extent and on the same schedule as the normal retirement age) and to increase the actuarial adjustments for disabled and long-term insured workers. Since there were additional worries about the coverage for workers subject to extreme physical wear and tear due to long years of hard work, a new pension type was proposed to make it possible for workers with a service life of at least 45 years to retire two years earlier, however, with additional actuarial adjustments.

Change of the benefit indexation formula: The “sustainability factor.” The commission proposes to extend the Riester benefit indexation formula by a new factor, the *sustainability factor*. This factor reflects the development of the relative number of contributors to pensioners, the system dependency ratio, which is the most important long-term determinant of pension financing.²⁴ The new pension formula looks as follows:

$$PV_t = PV_{t-1} \frac{AGI_{t-2}}{AGI_{t-3}} \frac{1 - \delta_{t-2} - \tau_{t-2}}{1 - \delta_{t-3} - \tau_{t-3}} \left(\left(1 - \frac{PQ_{t-2}}{PQ_{t-3}} \right) \alpha + 1 \right)$$

²⁴ Strictly speaking, the sustainability factor will link benefits to the “equivalized system dependency ratio” in order to avoid distortions created by extremely low contributions and/or pension benefits. This ratio standardizes the number of pensioners by converting standard pensions into the number of “equivalence pensioners”. The number of “equivalence contributors” is likewise calculated by standardizing the average earner.

where $PQ = [\text{pensioners} / (\text{contributors} + \text{unemployed})]$

Note: The lags are due to data availability.

It includes the sustainability factor in the inner brackets, weighted by α , and replaces the one-time shift in the somewhat awkward “sensitivity parameter” d_t (see the earlier section on the Riester reform). If $\alpha = 0$, the current Riester pension adjustment formula would remain unchanged. If $\alpha = 1$, the new indexation formula would imply a purely income-oriented pension benefit adjustment policy. The commission set the value of α at 0.25, thereby fulfilling the Riester objectives of keeping the contribution rate under 20 percent until 2020 and under 22 percent until 2030.

The new pension formula will lead to further decreases in pension benefit levels vis-à-vis the path planned by the Riester reform. In contrast to the proposed demography factor in the failed 1999 reform attempt, the sustainability factor considers not only the development of life expectancy but also the entire demographic development (including changes in migration and notably in birth rates), as well as the development of the labor market. This is important as the inevitable reduction of the working-age population can be compensated by a higher labor force participation of women and elderly workers. The introduction of the sustainability factor thus allows directly linking pension adjustments to the crucial factors determining pension financing—namely, the number of contributors and benefit recipients. In doing this, the sustainability factor incorporates a self-stabilizing feedback mechanism into the system similar to the notional rate-of-return mechanism in NDC systems, see below.²⁵

Higher second- and third-pillar pensions would compensate for this decrease. Since the uptake of the funded supplementary Riester pension has been modest so far in the very beginning of this program, the commission proposed a host of administrative changes to occupational and private pensions to make the system easier to handle and thus more popular. Among these are the expansion of the group of entitled persons to all tax payers, dynamic pension benefits, and increased transparency in the private pension provision. These administrative changes accompany the proposed introduction of an exempt-exempt-taxed regime of ex post taxation. The steep rise in uptake described earlier is a clear indication that these measures were quite successful.

7. Realization: The 2004 and 2007 Reforms

Most of the Rürup proposals, and most significantly the introduction of the sustainability factor, were quickly passed by the German parliament on March 31, 2004. The shift in the retirement age, however, was not legislated. Since the commission proposed that the phasing-in period should start in 2011, it was decided that there was no need for immediate legislative action. Moreover, unions heavily opposed this adaptation of retirement age to life expectancy.

Two years later, with population aging high on the political agenda, the government changed its mind and announced a gradual increase from 65 to 67 years, being fully effective in 2019. The re-enactment of the Commission's proposal and the acceleration of the originally proposed schedule is considered a bold move since the politics of shifting the retirement age are clearly not favorable. According to survey results by Boeri, Börsch-Supan and Tabellini (2001, 2002 and 2004), raising the retirement age is one of the most unpopular pension reform options in Germany. An interesting result of this survey is that this option is particularly unpopular among those who are least informed about the costs of the current pension system. Hence, while early retirement is a well appreciated social achievement among Germans, awareness of the costs of early retirement may moderate the opposition to increasing the retirement age.

Another lesson from this survey is that the success of a reform depends on the flexibility in the hard choice between a later retirement age and a lower pay-as-you-go pension level, supplemented by private pensions that cut into consumption. As long as pensions are calculated in an actuarially neutral fashion, taking all side effects to the economy into account, there is no need for a "normal retirement age," and workers can decide themselves between working longer and saving more. The recent experience in the United States in the aftermath of the bubble burst appears to indicate that workers are quite aware of this substitution. Flexibility minimizes the opposition to reform proposals relative to proposals that make cuts in only one direction—say, increasing the normal retirement age.

The German Bundestag has passed this highly debated reform in the Spring of 2007, but only after introducing an array of escape clauses that will diminish the effect on the effective retire-

²⁵ See Börsch-Supan (2006).

ment age. Most importantly, the new pension type for workers with 45 years of service was introduced without the actuarial adjustments proposed by the Commission.

Moreover, as pointed out before, the actuarial adjustments in the German system are not actuarially neutral from the point of view of workers who decide about their retirement age.²⁶ As much as the government was slow and cautious to legislate the prospective increase in retirement age, it did not touch the current lack of actuarial neutrality. Interestingly, introducing actuarial neutrality has also been opposed by the employers' union, since it increases the costs of severance.

8. The “Quasi Notional Defined Contribution System”

To see, why the set of the reforms described in the preceding five sections have converted the German system essentially into a notional contribution system, without losing the politically much liked terminology and rhetoric of a defined benefit system, can be seen as follows. Stripped down to its economic essence, three mechanisms are the crucial ingredients which turn a defined benefit (DB) pay-as-you-go system into a notional defined contribution (NDC) system:

- (1) An accounting mechanism that credits all life-time earnings
- (2) A mechanism linking the final balance to the demographic and macroeconomic environment
- (3) An actuarial rule converting the final balance into an annuity.

As opposed to funded (or financial) defined contribution (DC) plans, however, claims on future benefits in notional DC systems are not collateralized by real capital but rest on government promises.

The first mechanism is realized in NDC systems by crediting all life-time contributions to an individual account, just like funded DC plans. This parallels in many respects the German and French point systems, except that the unit of credit is currency (Euro), not earnings points. These systems substantially differ from pension systems in which only the x best years are credited (at the extreme, only last year's earnings), and from Beveridgian systems that provide flat benefits (e.g., in the UK and the Netherlands). Nonetheless, there is nothing intrinsic in DB

²⁶ See Börsch-Supan and Schnabel (1999) and Börsch-Supan et al. (2004).

systems which prevents them from linking benefits to *all* life-time earnings.

The second mechanism is realized in NDC systems by the notional interest rate. In a funded system, the internal rate of return is r , the market rate of interest. In a PAYG system, the theoretical internal rate of return is $n+g$, where n is the rate of growth of the contribution base, and g the growth rate of labor productivity. In reality, most PAYG-DB systems have a systemic indexation linking benefits at retirement to the current wage level, thereby taking account of labor productivity g . Demography, however, usually enters through discretionary adaptations of the replacement rate to demographic changes (thereby taking account of n). One of the main features of NDC systems is the direct and automatic linkage to both wages and demography if the notional interest rate corresponds to the growth rate of the contribution base. In the Swedish NDC system, however, the government chose g as the notional rate of interest, leaving out a direct link of accruing interest to demography.²⁷ In an aging population, $n+g$ tends to be smaller than g since n is negative, and it is in most circumstances much smaller than r .

In turn, the German DB system after the 2004 reform indexes benefits to earnings growth *and* changes in the system dependency ratio via the so-called “sustainability factor”.²⁸ This approximates the effect of the accumulated interest in a NDC system, in which the internal rate of interest is the growth rate of the contribution bill $(1+n)*(1+g)$. This is easy to see in the stylized case when all contributions (normalized to one unit) are credited upfront. In this stylized NDC case the notional pension wealth after T years is $T*(1+n)^T*(1+g)^T$; the pension benefit is therefore $P=T*(1+n)^T*(1+g)^T/G$ where G denotes the annuity factor. In the German DB system, this average worker earns T earnings points, and during these T years, the average pension value PV will increase with the rate of wage growth (g) and the growth rate of the dependency ratio (n , if the number of pensioners remains constant): $PV_T = PV_0 *(1+n)^T*(1+g)^T$. Hence, the pension benefit is $P= T*PV_0*(1+n)^T*(1+g)^T$, proportional to the NDC value. Quite ironically, therefore, the German DB system comes closer to the idea of a pure NDC system than the NDC system implemented in Sweden.

²⁷ Demography enters directly through longevity-dependent annuities, and it bites into the reserve fund. In addition, Sweden has a re-balancing mechanism once these mechanisms fail (see Settergren, 2001).

²⁸ See Börsch-Supan and Wilke (2003) for details.

9. Conclusions

The German pension system generated early retirement ages and high replacement rates, but at high costs to society in form of a large cost percentage of GDP (about 12 percent) and high contribution rates (about 28 percent of gross income, of which 19.5 percent was in direct contributions and 8.5 percent in indirect contributions for state subsidies financed by general taxes). In the face of population aging, it was unsustainable: the demographic base for paying contributions was shrinking faster than economic growth could compensate for. The implicit debt of the system was steeply increasing.

The threat of financial failure precipitated a 15-year lasting reform process that took several steps, with some back and forth. A consistent development can only be constructed in hindsight. It produced a “Quasi Notional Defined Contribution” system marketed as a traditional defined benefit system. The system has reduced its implicit debt by two-thirds to a manageable and sustainable size by conventional public debt standards. It has transformed the monolithic pure pay-as-you-go system of the 1960s and 1970s into a multi-pillar system with public, occupational and individual private pensions. The first pillar will remain dominant with about a two-thirds share of total retirement income; voluntary funded pensions have to shoulder the remaining third.

To achieve this conversion, Germany needed two key reforms. The first one was the Riester reform in 2001 that reduced the tax and contribution burden by cutting benefits of the PAYG pillar and strengthening subsidized or tax-privileged private pensions in individual accounts or as occupational pensions. The reform was a historical step toward solving the demographic problems confronting the pension system. Its static benefit formula, however, did not succeed in stabilizing the public PAYG pillar.

This instability precipitated the creation of the Sustainability Commission. In contrast to the Riester reform, this commission took the political risk of proposing a rise in the normal retirement age and a further reduction in long-term benefits at the same time. As a major innovation, this reduction was rationalized by linking benefits to the system dependency ratio. This provides an automatic stabilizer, hence de facto converted the defined benefit system to a system that mimics an NDC system.

Future history will tell, whether the 15-year reform process will be a success. With the implicit pension debt under control, the eyes are now on retirement income. Maintaining the generous retirement income that Germans are used to, depends crucially whether the second and third pillars will fill the gap generated by cutting first-pillar benefits. Acceptance of the voluntary pensions have risen sharply in the recent three years. This makes optimistic. Acceptance, however, is not equally distributed. It is high in the upper third of the income distribution, and among families with children. The lower third of the income distribution is protected by the minimum pension provided through the Riester reform. Hence, there is still considerable work to be done to raise acceptance rates in the middle of the income distribution.

References

- Bäcker, G., R. Bispinck, K. Hofemann, and G. Naegele. 2000. *Sozialpolitik und soziale Lage in Deutschland*. Wiesbaden: Westdeutscher Verlag.
- Berkel, B., and A. Börsch-Supan. 2004. Pension Reform in Germany: The Impact on Retirement Decisions, *Finanzarchiv* 60, No.3, 393-421.
- Boeri, T., A. Börsch-Supan, and G. Tabellini. 2001. "Would You Like to Shrink the Welfare State? The Opinions of European Citizens." *Economic Policy* 32, 7-50.
- Boeri, T., A. Börsch-Supan, and G. Tabellini. 2002. "Would You Like to Reform the Pension System? The Opinions of European Citizens." *American Economic Review* 92, 396-401.
- Boeri, T., A. Börsch-Supan, and G. Tabellini. 2004. "How Would You Like to Reform Your Pension System? The Opinions of German and Italian Citizens." In *The Politics and Finance of Social Security Reform*, ed. R. Brooks and A. Razin, Kluwer.
- Börsch-Supan, A. 2000. "A Model under Siege: A Case Study of the Germany Retirement Insurance System." *The Economic Journal* 110 (461): F24-45.
- Börsch-Supan, A., and M. Lührmann. 2000. *Prinzipien der Renten- und Pensionsbesteuerung*. Frankfurter Institut – Stiftung Marktwirtschaft und Politik, Bad Homburg.
- Börsch-Supan, A., and R. Schnabel. 1999. "Social Security and Retirement in Germany." In *Social Security and Retirement Around the World*, ed. J. Gruber and D. A. Wise, 135-80. Chicago, London: University of Chicago Press.
- Börsch-Supan, A., R. Schnabel, S. Kohnz, and G. Mastrobuoni. 2004. "Micro Modelling of Retirement Choices in Germany." In *Social Security Programs and Retirement Around the World: Micro-Estimation*, ed. J. Gruber and D. Wise, 285-344 Chicago, University of Chicago Press.
- Börsch-Supan, A. und C. Wilke, 2003, *The German Public Pension System: How it Was, How it Will Be*, NBER Working Paper No. 10525.

- Börsch-Supan, A., Essig, L. und C. Wilke, 2005, *Rentenlücken und Lebenserwartung. Wie sich die Deutschen auf den Anstieg vorbereiten*, Deutsches Institut für Altersvorsorge, Köln.
- Börsch-Supan, A., A. Reil-Held and D. Schunk, 2006. *Das Sparverhalten deutscher Haushalte: Erste Erfahrungen mit der Riester-Rente*, Gutachten für das Bundesministerium für Bildung und Forschung, Mannheim Research Institute for the Economics of Aging (MEA).
- Bonin, H. 2001. "Will it last? An Assessment of the 2001 German Pension Reform." Institute for the Study of Labor (IZA), IZA Discussion Paper 343, Bonn.
- Fox, L. and E. Palmer (1999): Latvian Pension Reform, Social Protection Discussion Paper No. 9922, 09/99, World Bank.
- Gruber, J., and D. A. Wise, eds. 2004. *Social Security Programs and Retirement Around the World: Micro-Estimation*. Chicago, London: University of Chicago Press.
- Kommission für die Nachhaltigkeit in der Finanzierung der Sozialen Sicherungssysteme. 2003. Abschlußbericht. Bundesministerium für Gesundheit und Soziale Sicherheit, Berlin. <http://www.bmgs.bund.de/deu/gra/themen/sicherheit/kommission/index.cfm>.
- Leinert, J. 2003. "Die Riester-Rente: Wer hat sie, wer will sie: Vorausbewertung einer repräsentativen Umfrage zum Vorsorgeverhalten der 30- bis 50-Jährigen." Bertelsmann Stiftung Vorsorgestudien 18, Gütersloh, 2003, p. 14.
- OECD (Organisation for Economic Co-operation and Development). 2001. *Ageing and Income: Financial Resources and Retirement in 9 OECD Countries*. Paris: OECD.
- Prognos.1987."Gesamtwirtschaftliche Entwicklungen und Gesetzliche Rentenversicherung vor dem Hintergrund einer schrumpfenden Bevölkerung." Prognos AG, Basel
- Prognos 2001. "Reformoptionen für die gesetzliche Rentenversicherung: Auswirkungen der Rentenreform 2001 und die Verteilung der Umstiegskosten." Prognos AG, Basel
- Ruppert, W. 2000. "Betriebliche Altersversorgung." Institut für Wirtschaftsforschung (ifo), München.
- Schmidt-Hebbel (1999): Latin America's Pension Revolution: A Review of Approaches and Experience, Paper prepared for the World Bank's ABCDE Conference, April 28-30, 1999, Washington, DC.
- Schnabel, R. 1998. "Rates of Return of the German Pay-As-You-Go Pension System." *Finanzarchiv* 55 (3): 374-99.
- Settergren, O. (2001): The Automatic Balance Mechanism of the Swedish Pension System, *Wirtschaftspolitische Blätter* 2001/4.
- Valdés-Prieto, S. (1998): The Latin American Experience with Pension Reform, *Annals of Public and Cooperative Economics*, Vol.69 No4,December 1998.

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