

# Reforming the German Public Pension System

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## ABSTRACT

Chancellor Bismarck introduced public pensions in Germany more than 120 years ago. That system has expanded into one of the most generous pension systems in the world. Most workers receive virtually all of their retirement income from it. Costs are almost 12 percent of GDP, more than 2.5 times as much as the U.S. Social Security System. The pressures exerted by population aging, amplified by negative incentive effects, are large. The German pension system is stuck between Scylla and Charybdis: Given the pace of demography in Germany, neither a continuation of the defined-benefit pay-as-you-go system was feasible nor a full transition to a funded defined-contribution system. Scylla is a very large contribution increase in the pay-as-you-go system, Charybdis is the consumption loss in order to pre-fund the other pillars.

Finding a politically and economically feasible balance is the main challenge for the German pension reform. The reform process began in 1992 and reached its peak in the 2001 and 2004 reforms. The 1992 reform started a time table along which the worst incentives to retire early were abolished. The 2001 reform converted the exemplary monolithic Bismarckian public insurance system into a complex multipillar system. Finally, the 2004 reform converted the pay-as-you-go pillar into a quasi notional defined contribution (NDC) system. This paper delivers an assessment in how far these reform steps will solve the German pension problems.

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# 1 Introduction: The Historical Background

The German pension system was the first formal pension system in the world, designed by Bismarck almost 120 years ago. 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. It has survived two major wars, the Great Depression, and more recently, unification. It has been praised as one of the causes for social and political stability in Germany. Times have changed, however, and these days, this system is under severe pressure from population aging and adverse incentive effects.

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: 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 – about 30 percent of expenditures – are so-called “non-insurance benefits” such as benefits paid to German immigrants after opening the iron curtain. Any surplus, however, remains in the system. It is not transferable into a “unified budget” such as in the United States.

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 less than 60 and even lower in East Germany.<sup>1</sup> The system converted to a de facto pay-as-you-go system when most

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<sup>1</sup> Average retirement age in a given year is the average age of those workers receiving public pension income for the first time. Source: VDR (2002).

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.<sup>2</sup> This is substantially higher than, e.g., the corresponding U.S. net replacement rate of about 53 percent.<sup>3</sup> 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 life<sup>4</sup> in favor of a flexible choice during a “window of retirement” 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, further increasing the number of beneficiaries and extending the “window of retirement” between 60 and 65.

It is no surprise that the German public pension system is the single largest item in the social budget. In the year 2001, public pension expenditures amounted to some 200 billion Euro, 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 (14.2 percent of GDP). It is more than 2.5 times as expensive as the U.S. Social Security System (4.4 percent of GDP).<sup>5</sup>

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<sup>2</sup> 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 that are usually higher than the life-time average.

<sup>3</sup> Using the same replacement rate concept as in footnote 3.

<sup>4</sup> At least 35 years.

<sup>5</sup> OECD (2001).

While the generosity of the German public pension system is considered a great social achievement, negative incentive effects and population aging are threatening the very core of the German pension system. While 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, however, Germany – together with Italy and Japan – will experience a particular 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 due to a relatively low level still in the 1970s, and a more incisive baby boom/baby bust transition (e.g., relative to the United States) to a very low fertility rate of 1.3 children per women, 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 2030.

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, in 2003 at 19.5 percent of gross income, was projected at the end of the 1980s to exceed 40 percent of gross income at the peak of population ageing in 2035 if the accustomed replacement rates and the indication of pensions to gross income were maintained. This led to a major pension reform in 1992. This reform abolished the indexation of pensions to gross wages in favor of net wages. While this is still more generous than indexation to costs of living (such as in the U.S.), it was an important move away from the destabilizing feedback loop in which pensions increased when taxes and contributions heaved upwards. In addition, the 1992 reform introduced adjustments of benefits to early retirement age and abolished the generous “window of retirement” for all but those who have long service lives. Benefit adjustments are, however, not fully actuarial. Changes in mandatory retirement ages are being introduced with a very long delay. First cohorts started experiencing these adjustments in 1997; the adjustments will be fully phased in by 2017.

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. Another “parametric” reform introduced by the

conservative government and due to become law in 1999 failed after the change in government in 1998. As a remarkable irony in politics, the social democratic secretary of labor Walter Riester successfully passed a major reform bill through parliament in 2001. This reform bid farewell to the pure pay-as-you-go system and introduced a multipillar pension system with a small but growing pre-funded pillar. The new system will be fully phased in about 2050, but its main implications will be felt from 2011 onwards. The main insight was that no pension reform will succeed in keeping contribution rates “bearable” unless it entails a substantive pre-funded component.<sup>6</sup>

Hailed as the “reform for a century”, the pension budget fell in another crisis not even two years later, mainly due to the unexpectedly deep recession and the lack of a sizeable reserve fund. In late fall of 2002, the government was forced to establish a reform commission for the “Sustainability in Financing the Social Insurance Systems”, popularly called “Rürup commission”.<sup>7</sup> It delivered concrete proposals in August 2003, and most of them became law in 2004. Most significantly, it transformed the pay-as-you-go pillar into a notional defined contribution (NDC) look-alike by introducing a sustainability factor into the benefit indexation formula and recommended an increase in the normal retirement age.

This paper describes the current reform process (Section 2) and assesses the past and current reform process, culminating in the “Riester reform” of 2001 (Section 3) and the reform induced by the “Rürup Commission” in 2004 (section 4). It concludes with the question whether these reforms will solve the problems of the German pension system (Section 5).

## **2 The German Pension Reform Process**

After the remarkable expansion of the German pension system after 1972, four dates mark the pension reform process in Germany: 1992 and 2001 have seen two major pension reforms,

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<sup>6</sup> Of course, “bearable” is ill defined. Currently, taxes plus all social security contributions are slightly more than 50% of total labor compensation. While Germany has lower net wages than its main EU competitors, total labor compensation for industrial workers is the highest in the OECD. It is argued that the wedge, perceived as a pure tax, between net wage and total labor compensation, is number one reason for the slow growth of the German economy since the early 1980s.

<sup>7</sup> Named after its chairman Bert Rürup. The commission’s charge was to make proposals for pension, health and long-term care reform. The first author co-chaired the pension reform working group.

with a further strengthening of the 2001 reform in 2004. A reform due to become law in 1999 failed after federal elections, but some elements were resurrected in the 2004 reform. In addition, there was a constant flurry of smaller adjustments in between.

From its beginning, the point system (see Subsection 2.2) can be regarded as a first and important element of the NDC approach. Together with the central measure of the 2004 reform, the sustainability factor, and the almost actuarial adjustment factors introduced in 1992, the German PAYG system will almost perfectly emulate a NDC system from the year 2005 on.

## **2.1 The 1992 Reform**

The main changes in the 1992 reform were 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. This mechanism will become particularly important when population aging will speed up since it implies an implicit mechanism of burden sharing between generations.

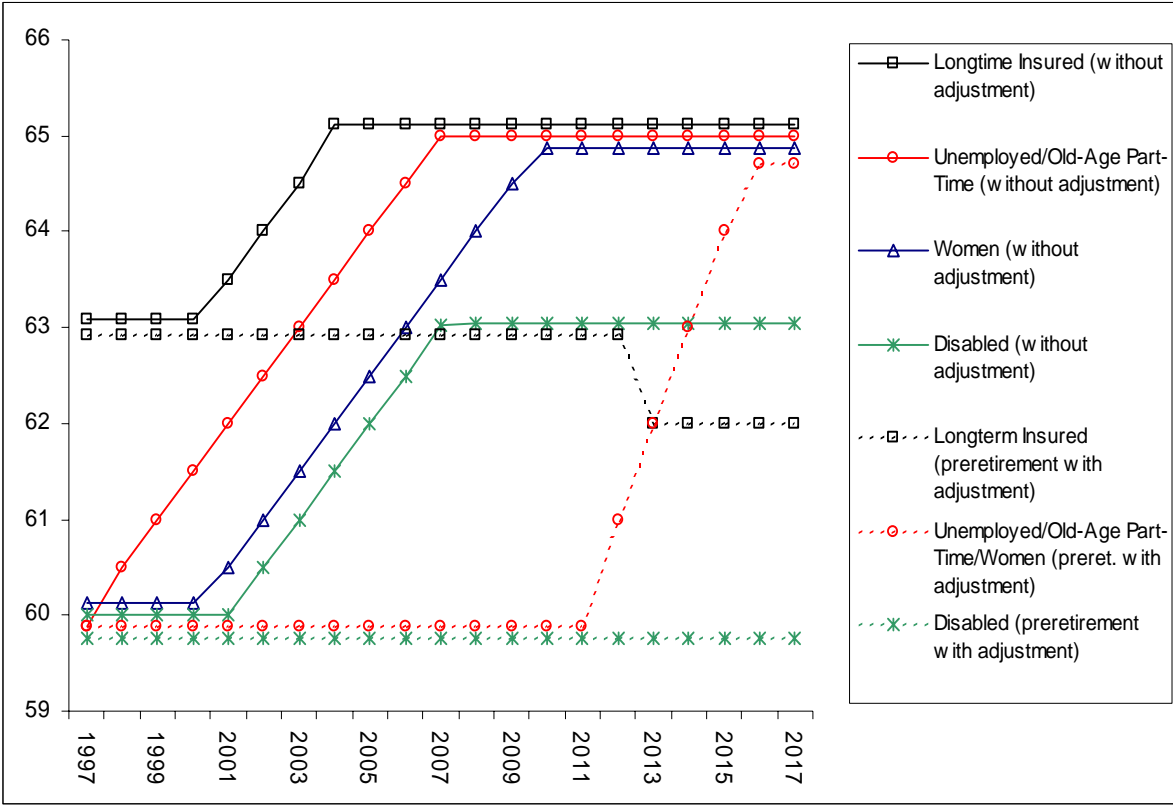
The second important element in the 1992 reform was the introduction of “actuarial” adjustments to benefits to retirement age and an increase in the “normal” retirement ages for all pension types, except disability pensions (age 63), to 65. These changes have been described in Börsch-Supan and Wilke (2003). They will reduce incentives to retire early, although the “actuarial” adjustments are not actuarially fair in a mathematical sense except for very low discount rates. The introduction of benefit adjustments to retirement age in Germany mimics the automatic benefit adjustments within a NDC system approach where benefits are adjusted to retirement age by the annuity formula. However, in contrast to a NDC system, the adjustments in the 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% discount rate would imply.

## **2.2 The 1999 Reform**

The 1999 pension reform was supposed to lower the replacement rate according to a pre-specified so-called “demographic factor”, a function of life expectancy plus several correction

factors. It was revoked after the change of government in 1998. A side effect of this reform, which was not revoked, was a gradual change of eligibility ages for pensions for women and unemployed from age 60 to age 65. This change will be fully implemented by 2017 and effectively leave a “window of retirement” for healthy workers only if they have at least 35 years of service. 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). Figure 1 depicts the new eligibility regulations and adjustment paths for the various pension types. 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, see the projections by Berkel and Börsch-Supan (2003).

**Figure 1: Retirement age with and without “actuarial” adjustments (1992 and 1999 reforms)**



Source: Authors' compilation

## **2.3 The Riester Reform in 2001**

On May 11, 2001 a new pension reform act was ratified in Germany, popularly referred to as the “Riester reform” after the then labor minister Walter Riester. The 2001 reform is a major change in the system. It will change the monolithic German system of old-age provision to a genuine multi-pillar 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. The reform aimed to achieve three main objectives:

### **(1) Sustainable contribution rates**

The key objective of the Riester reform was to stabilize contribution rates and thus (a) to limit further increases in non-wage labor costs and (b) 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.

### **(2) 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. In comparison with the definition of net earnings which applied prior to the reform, this 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.

### **(3) 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. Subsection 2.4 describes in detail how costs in the PAYG pillar are cut. The emerging gap is supposed to be filled by private individual and

occupational pensions. Subsection 2.5 describes the subsidies for the private supplementary funded pensions. Subsection 2.6 describes the changes in occupational pension. An assessment of the likely economic success of the Riester reform follows in section 3.

**Table 1: Overview of the core elements of the Riester-Reform**

Measure	Content	Pillar
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	0
New adjustment formula	Reduction in pension level by about 10 percent	1
Abolition of occupational incapacity pensions	Discontinuation of occupational incapacity pensions; replacement by two-tier general invalidity pension	1
Reform of women's and survivors' pensions	Modification of income rules for survivors' pensions; introduction of "pension splitting for married couples"	1
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	2
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	3

*Source:* Authors compilation

## 2.4 The PAYG pillar: reducing the replacement rate

The calculation of the current monthly pension value  $PV_t$  for a specific year  $t$  takes account of the development of the earnings of all workers (see Börsch-Supan and Wilke, 2004, for details). This procedure is intended to guarantee that the so called "standard pension replacement rate" remains stable and does not fall behind the development of current average earnings.<sup>8</sup> Before the 2001 reform, the objective of safeguarding standards of living in old age

<sup>8</sup> The reader is reminded that the word 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 of all current workers.

was considered to be met if pensions were worth 70 percent of average net earnings. Thus they more than maintain 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.

In 2001, the Riemer 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 ( $\tau_t$ ) 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  $\tau$  after 2010. It thus simply decreases 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. Note that the awkward jump in the sensitivity factor  $d_t$  reflects the aims since the system dependency ratio is still flat until 2010 and then quickly rises.

## **2.5 The new funded pillar: introducing supplementary funded pensions**

A crucial component of the Riemer reform is 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 which, 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 Riemer pensions can be occupational or individual pensions. Since many

restrictions apply, it remains to be seen, how many workers actually start building up private pensions.

The main restriction 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 only be available for investment vehicles which guarantee payment of a life annuity payable from the date of retirement. Investment vehicles which provide for lump-sum disbursements are not subject to state subsidies.<sup>9</sup> 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 incentives provided by the state can take two forms: direct savings subsidies or tax-deductible special allowances. The tax authorities automatically compute which of the two forms versions is most advantageous.

**Direct savings subsidy.** All dependently employed and certain self employed workers who pay personal contributions to a certified retirement pension policy are entitled to receive a direct retirement savings subsidy. The subsidy is paid directly into the beneficiary's saving account. A basic subsidy and a child subsidy for each child for which child benefits were received during the previous year is paid. Child subsidies are payable to the mother. In the case of married couples, both partners receive a basic subsidy if they have each taken out their own supplementary private pension policy. In addition, non-entitled partners (such as mothers not in paid employment) are also entitled to receive the full subsidy for their own retirement pension policy provided that the respective married partner subject to compulsory insurance contributions has paid his or her minimum personal contribution to their supplementary retirement pension policy (see below).

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<sup>9</sup> If a lump-sum payment is chosen, all subsidies have to be reimbursed to the tax authorities.

**Table 2: Direct savings subsidies**

From ... on	Savings rate	Basic subsidy in Euro/Year	Child subsidy in Euro/Year
2002	1 percent	38	46
2004	2 percent	76	92
2006	3 percent	114	138
2008	4 percent	154	185

Table 2 shows the maximum incentive subsidies available as of 2002. In order to qualify for the maximum subsidy the beneficiary must invest a specified percentage of his or her gross earnings (denoted as “saving rate”). This percentage increases until 2008 in four steps (“*Riester-Treppe*”). The percentage is applied to the actual earnings level, capped at the same cap as the PAYG contributions are (about 2 times average earnings). If less money is invested, the state subsidy is reduced accordingly. The scheme is complicated by the fact, that the subsidy is included in the savings amount. Hence, the actual saving rate necessary for the maximum subsidy is lower than the percentages indicated in the second column of Table 2. In turn, certain minimum amounts are necessary, see Table 3.

**Table 3: Minimum Savings**

Year	No child	One child	Two or more children
2002 – 2004	45	38	30
As of 2005	90	75	60

**Tax deductible special expenses.** Alternatively, qualifying retirement savings can be deducted as “special allowances” from income taxes. This is usually more advantageous for workers with higher than average earnings. Saving rates, caps etc. are the same as in the subsidy case. Table 4 shows the maximum tax-deductible contributions to private retirement savings accounts.

**Table 4: Maximum Savings**

<b>From ... on</b>	<b>Tax deductible special expenses in Euro/Year</b>
2002	525
2004	1.050
2006	1.575
2008	2.100

**Criteria for individual pension plans eligible for subsidies/tax relief.** Individual retirement accounts only qualify for state promotion if they meet criteria laid down in the new Certification of Retirement Pension Contracts Act (“AltZertG”). It contains a long list of rules which make the system complex for customers and potential insurers alike, see section 3. 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. The investor must be committed to making regular, voluntary pension contributions.
2. Pension benefits may only be paid out when the beneficiary reaches the age of 60 at the earliest or upon reaching retirement age.
3. At the beginning of the disbursement phase, the accrued pension contributions (inclusive of subsidies) must be guaranteed (i.e., the nominal rate of return must be nonnegative).
4. Pension payments must guarantee lifelong benefits which retain or increase their nominal value, i.e. in the form of a life annuity or disbursement plan linked to lifelong annual installments.
5. The disbursement plan must continue to provide benefits until the beneficiary reaches the age of 85 and subsequently provide a life annuity guaranteed by the capital available at the beginning of the disbursement phase.
6. Supplementary survivor’s coverage must not have features which offset the original plan.
7. Initial commission and administrative charges must be spread equally over a period of at least 10 years.

8. The investor must be informed about the following issues before taking out the policy:  
The level and distribution over time of commission and administrative costs, the cost of switching to a different policy, the costs of financial management, the costs involved in changing to a different insurer.
9. The investor must be informed once a year during the term of the policy about how his or her contributions are being used, capital formation, costs and yields, and also about whether and to what extent the insurer takes account of ethical, social and ecological investment criteria.
10. The investor must have the right to suspend contributions during the saving phase, to allow the policy to continue running without making additional contributions, or to terminate the policy by serving three months notice to the end of the quarter.
11. Policy rights may not be assigned or transferred to third parties. Claims to pension benefits cannot, as a result, be bequeathed.

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.

**Deferred taxation.** While old-age pension contributions will be tax exempt during the saving phase, pension payments during the benefit phase 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.<sup>10</sup>

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<sup>10</sup> Börsch-Supan and Lührmann (2000). The “tax credit” feature depends on the an income or consumption tax point of view.

## 2.6 State promotion of occupational pension schemes

The Riester reform remained largely undecided on the role of occupational pensions versus individual accounts. Traditionally, occupational pensions have 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.<sup>11</sup> 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 is the general right to convert part of the 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 or 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 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 which 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. (See below and Table 5) Collective bargaining agreements, however, have precedence over the right to convert salary. This means that an employee covered by a binding collective agreement is only entitled to convert his or her pay into pension if this is explicitly provided for in the terms of the collective agreement. This rule makes sure that employers and unions can impose their own rules on occupational pension plans.

**Investment vehicles and eligibility for Riester subsidies/tax relief.** The Riester reform also introduced pension funds as a vehicle for occupational pensions – an investment vehicle which is widely used in other countries, but was not permitted in Germany. There are now five different investment vehicles in German occupational pension schemes (see Table 5 for an overview of their features). Only three of them are eligible for Riester incentives: (1) direct insurance, (2) staff pension insurance and (3) pension funds. As the employer has to provide

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<sup>11</sup> See Ruppert (2000).

the employee with the possibility to benefit from the Riester incentives, this means – especially for smaller companies – that some companies now have to restructure their pension schemes.

**Table 5: Types of occupational pension systems**

Features	Investment Vehicles				
	Direct pension promise (Direkt-zusage)	Benefit funds (Unterstützungskasse)	Direct insurance (Direktversicherung)	Staff pension insurance (Pensionskasse)	Pension funds (Pensionsfonds)
Tax on contributions	Tax free		1. Flat-rate tax 2. Fully taxed but Riester subsidy/ tax deductible expense	1. Flat-rate tax 2. Fully taxed but Riester subsidy/ tax deductible expense 3. Tax free until 4% of BMG	1. Fully taxed but Riester subsidy/ tax deductible expense 2. Tax free until 4% of BMG
Tax on benefits	Fully taxed		1. Tax on returns only 2. Fully taxed	1. Tax on returns only 2. Fully taxed 3. Fully taxed	1. Fully taxed 2. Fully taxed
Investment	Internal		external		
Investment rules	None		Acc. Insurance Supervisory Act		None
Insolvency scheme	Membership in pension insurance fund (PSV)		No		Membership in PSV
State supervision	No		Federal Insurance Authority (Bundesaufsichtsamt für das Versicherungswesen).		

*Note:* BMG = upper earnings threshold („Beitragsbemessungsgrenze“).

*Source:* Author's compilation

### 3 An Assessment of the Riester Reform

Will the recent reforms, and in particular the Riester reform, solve the problems of the German public pension system? An important and still open question is whether the new voluntary supplementary private pensions, the so-called Riester pensions, will be accepted by the German workers who were used to the all-caring public system. This is topic of subsection~3.1. Subsection 3.2 then asks, whether the new supplementary private pensions will suffice to offset the cuts in the PAYG pillar if workers actually participate. Finally, subsection 3.3 combines these results and poses the main question: Will the Riester reform put the German system of old age provision on a stable and lasting new foundation?

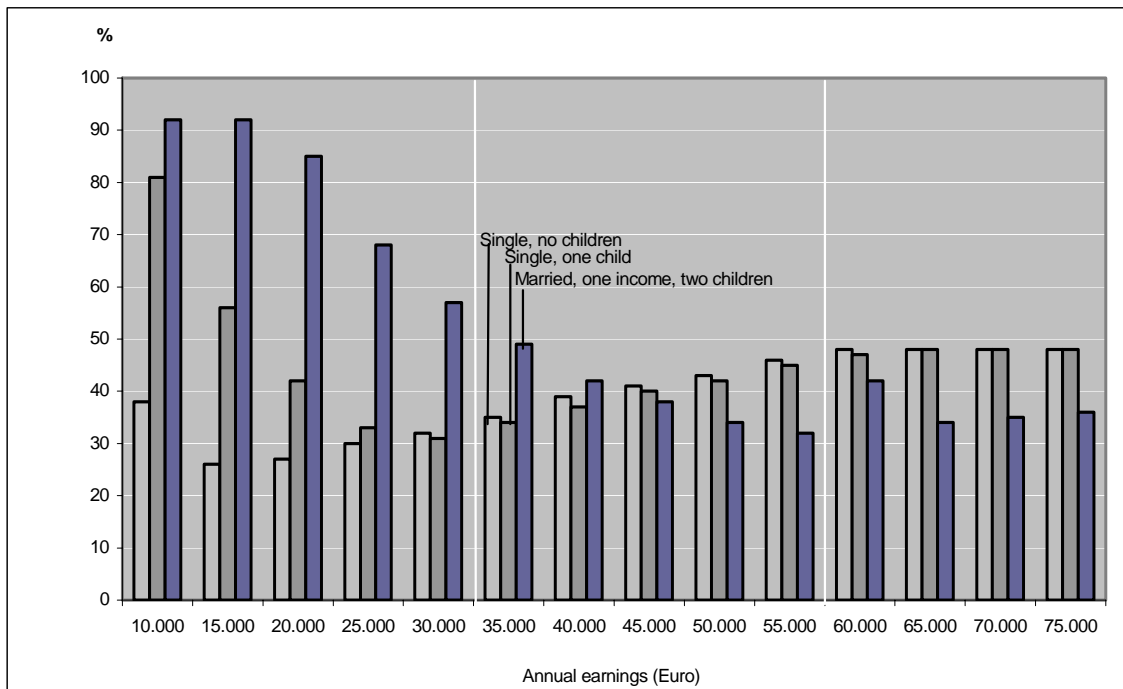
#### 3.1 Will the “Riester” pensions actually take off?

Since the new pensions are voluntary, one of the most debated issues in the context of the Riester reform is the question whether workers will actually overcome the temptations to procrastinate. How many will build up supplementary pensions? How much will they save? At this point, only one year since their introduction, it is too early to tell. 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 US, IRAs needed at least as long to be accepted by a large share of households. In this section, we look at the design and the incentives in order to understand who is likely to take up the private Riester pensions.

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

visible in Figure 2 which shows the subsidy as a percentage of savings in form of the new supplementary pensions.<sup>12</sup>

**Figure 2: Depth of subsidies to Riester pensions**



*Note:* Direct subsidy/the tax advantage as a percentage of savings in form of the new supplementary pensions.  
*Source:* Deutsche Bundesbank (2002).

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.

The picture of Figure 2, however, is misleading insofar as 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.

<sup>12</sup> We use the word “subsidy” for both the direct subsidy and the tax-deductible special allowance.

**The form of the Riester incentives.** While 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 complaints 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 which severely restrict private providers' scope to develop new private insurance products and which 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.<sup>13</sup>

What is more, the certification rules merely serve to create a formal product standard without creating the transparency needed in order 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 which prescribe the sort of pension dynamisation which is needed in order to ensure that the value of pension benefits paid out from the saved capital can be maintained over the long term. Non-dynamised Riester benefits will very quickly lose their value, even at very modest rates of inflation.

**Preliminary evidence on take-up rates.** First survey results show that demand for Riester products is sluggish: only around 9 percent had actually taken out a policy by mid 2002; a further 16 percent planned to conclude a policy by the end of 2002. By early summer 2003, however, the take-up rate has increased to about 35 of all eligible workers.

This comes during 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

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<sup>13</sup> Stiftung Warentest (2002).

of a Riester policy. The other half prefer other savings and insurance products, and/or occupational pensions.<sup>14</sup>

Moreover, many households, especially in the higher income brackets, merely may 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 which lead to a lower savings rate.<sup>15</sup>

**Mandatory private pensions?** Surveys have shown that a large section of the population would actually welcome the introduction of mandatory supplementary private pensions.<sup>16</sup> This preference may be explained by savers' lack of confidence in their ability to exercise the discipline needed to build up additional old-age provision by themselves and the fiscal externality imposed by those who speculate on general social assistance rather than save.

The argument generally cited in favor of mandatory supplementary old-age provision are poverty in old age and adverse selection on the insurance market.<sup>17</sup> Poverty in old age, however, is currently not an important problem in Germany. This may change in the future because of the benefit cuts, but has been addressed by the Riester reform through the introduction of the new minimum income guarantee.

As far as adverse selection is concerned, compulsory provision could lead to a monopoly position being established by a single provider if this product and the offers it generates proves to be unattractive for smaller competitors in which case coercion would bring about even less rather than more product variety.

Finally, making supplementary pensions mandatory will give the savings a tax-like character and may therefore create negative incentive effects.<sup>18</sup> The very idea of reducing the tax and

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<sup>14</sup> Leinert (2003).

<sup>15</sup> See Börsch-Supan and Lüthmann (2000).

<sup>16</sup> Boeri, Börsch-Supan and Tabellini (2001, 2002a, b).

<sup>17</sup> Börsch-Supan (2002b).

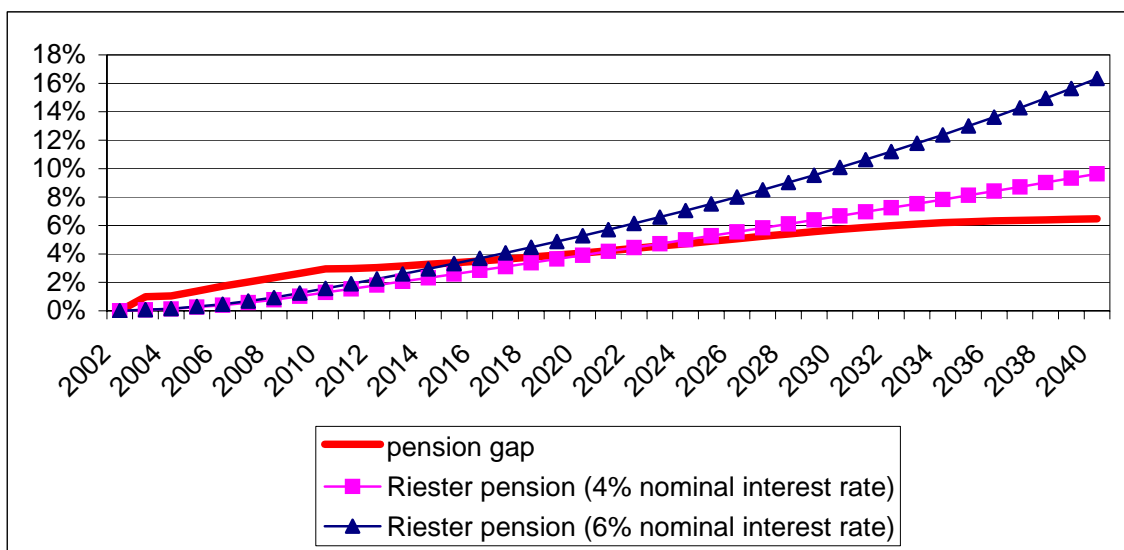
<sup>18</sup> Summers (1989).

payroll-tax-like contribution burden in order to stimulate economic growth would then be jeopardized.

### 3.2 Will the “Riester” pensions fill the pension gap?

Main point of introducing the Riester pensions was to compensate for the reductions in the pay-as-you-go public retirement insurance scheme. Model calculations show that an envisaged savings rate of 4 percent of gross income is in principle sufficient to close the gap which will open up in old age provision as a result of the cuts in state pensions. Figure 3 illustrates the growing pension gap (defined as the difference between today’s and forecasted future gross pension levels) and the level of additional benefits provided by the Riester pension based on different assumptions regarding rates of return.

**Figure 3: Filling the pension gap**



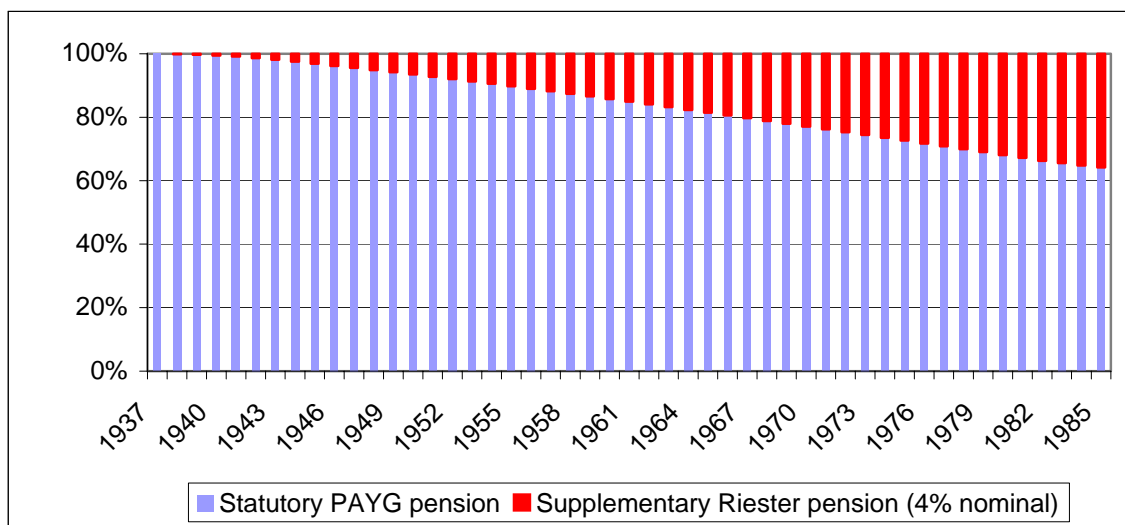
Source: MEA calculations based on the Rürup commission’s demography and labor market projections.

While the Riester pensions can fill the pension gap in the long run, they are however, not sufficient for the older cohorts. Younger cohorts born after 1970 will be in a position to build up even higher pension entitlements than was previously the case, thanks to their supplementary pension savings. Older cohorts, however, will need to save more than the envisaged maximum saving rates in Table 2 in order to close this gap entirely during the time

still available to them. Obviously, rather than a slow increase to a fixed 4 percent of gross income, initial saving rates have to be high and be tailored to each cohort.<sup>19</sup>

Given successful take-up, the future composition of retirement income will be quite different from the current monolithic one. Figure 4 outlines this development by birth cohort in the year of their retirement under the assumption that the insured cohorts have adhered to the recommended Riester savings rates of Table 2.

**Figure 4: Composition of retirement income by birth cohort**



Source: MEA calculations based on the Rürup commission's demography and labor market projections.

Figure 4 shows that even at full uptake, 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.

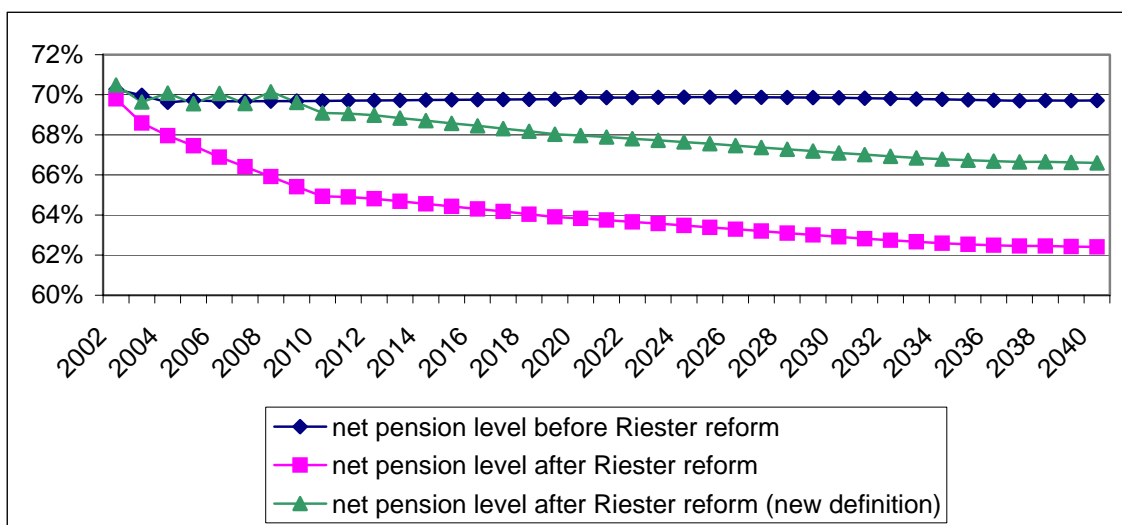
<sup>19</sup> See the proposals by Birg and Börsch-Supan (1999) and Börsch-Supan (2002b).

### 3.3 Will the “Riester” reform stabilize the German pension system?

Of course, the main litmus test of the Riester reform is whether the shift from PAYG to a partially funded pension system will stabilize the contribution rates for the younger generation with acceptable replacement rates for the older generation. The Riester reform actually was quite courageous in writing into the law that the standard pension replacement level must not fall below 67 percent and at the same time that the contribution rate must not exceed 20 percent until 2020 and 22 percent until 2030. Can these promises be kept?

The answer is – quite unambiguously – no. Our answer is based on the “official” demography and economic projections adopted by the “Rürup commission” and the Ministry for Health & Social Security.<sup>20</sup> We look first at standard replacement rates.<sup>21</sup> Model calculations of the long-term impact of pension adjustments demonstrate that, as a result of the new Riester adjustment formula, future pension levels will fall more than first predicted by the government, see Figure 5.<sup>22</sup> They will fall below 67 percent very quickly, and eventually reach 62 percent.

**Figure 5: Development of pension levels prior to and after the 2001 reform**



Source: MEA calculations based on the Rürup commission’s demography and labor market projections.

<sup>20</sup> The demographic projections (fertility, mortality, migration) are considered realistic by academic demographers while the economic assumptions (growth, employment) are slightly optimistic.

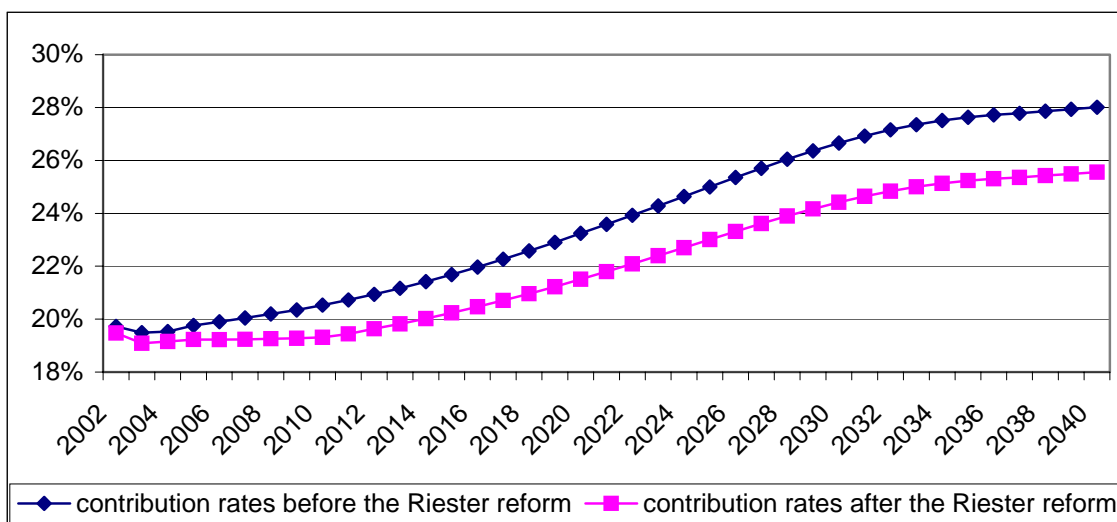
<sup>21</sup> The reader is reminded that the standard replacement rate does NOT relate to the LAST earnings before retirement. Rather, the “standard replacement rate” refers to the pension of a worker, who had 45 earnings points, divided by the average net earnings off all current workers.

<sup>22</sup> See also Bonin (2001) and Prognos (2001).

The scale of this reduction also clearly demonstrates that the pension benefits provided by the PAYG public retirement insurance scheme will not be sufficient in themselves – that is without supplementary pension provision - to safeguard pensioners’ standards of living in old age.

Although the new adjustment formula will in effect bring about a larger reduction in pension levels than was perceived by public opinion, the most dramatic difference between promise and current projection relates to the objective of stabilizing contribution rates. Figure 6 depicts our projection for the long-term development of contribution rates prior to and after the reform.

**Figure 6: Contribution rates prior to and after the 2001 Reform**



Source: MEA calculations based on the Rürup commission’s demography and labor market projections.

While the Riester reform substantively reduces the contribution rate to the PAYG pillar, Figure 6 shows that the 20 percent line will be exceeded by 2014, and 22 percent by 2022.

The apparent failure of the Riester reform to reach its main objectives – stabilization of the contribution rate at acceptable pension benefit levels – was not accidental. As a matter of fact, the overoptimistic demographic and economic assumptions were chosen in a fragile political compromise between reformists and unions that enabled the Riester reform package to pass the parliamentary hurdles.

## **4 Introduction of a Quasi-NDC System: The 2004 Reform**

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.<sup>23</sup> 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 a very different situation than Riester 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 to enhance future growth. This paradigm shift away from thinking in pension claims towards 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.

### **4.1 The 2003 reform proposals**

The reform proposal, published end of August 2003, comprises two major elements plus several accompanying measures. The first main element is a gradual increase of the normal retirement age from 65 to 67 years, the second 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. While the main two elements directly serve to achieve the desired stabilization of contribution rates, the accompanying measures keep the

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<sup>23</sup> The commission was in charge of making reform proposals for the pension system, the health care and the long-term care insurance. We only refer to the pension proposals.

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. It will therefore simply offset future increases in the total value of accumulated benefits generated by a longer pension reciprocity duration. The reasoning behind this increase in retirement age is that the prolonged life span necessitates a commensurable increase in the active part of it, unless the pension system is continuously being expanded.

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 (at the same extent and 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 introduced which makes 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 so-called “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.<sup>24</sup> The new pension formula looks as follows:

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

where PQ = [pensioners / (contributors + unemployed)]

Note: The lags are due to data availability.

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<sup>24</sup> 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.

It includes the sustainability factor in the inner brackets, weighted by  $\alpha$ , and replaces the one-time shift in the somewhat awkward “sensitivity parameter”  $d_t$ , see section 2.4. If  $\alpha$  equals zero, the current Riester pension adjustment formula would remain unchanged. If  $\alpha$  equals one, the new indexation formula would imply a purely income-oriented pension benefit adjustment policy. The commission set the value of  $\alpha$  at 1/4, thereby fulfilling the Riester objectives to keep 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, see section 4.2. 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 the entire demographic development (including changes in migration and notably in birth rates), as well as the development on the labor market. This is important as the inevitably 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 to directly link 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 Börsch-Supan (this volume).

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 (as was mentioned in section 3.1), the commission proposed a host of administrative changes to occupational and private pensions in order 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, increased transparency in the private pension provision. These administrative changes accompany the proposed introduction of an EET-type ex post taxation of pensions.<sup>25</sup>

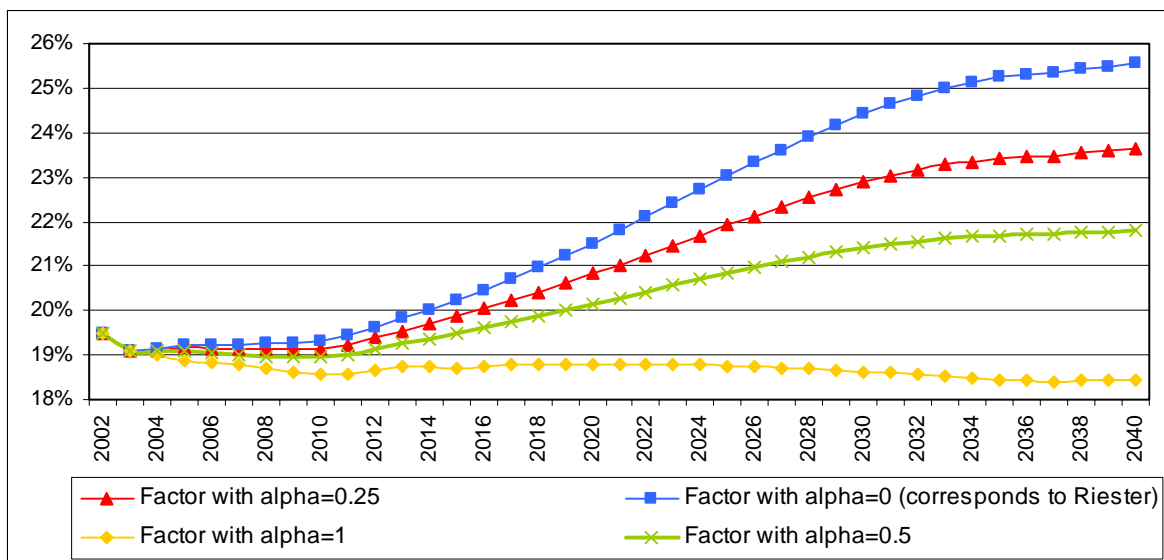
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<sup>25</sup> A parallel commission, also headed by Bert Rürup, proposed to keep pension contributions and capital gains tax exempt (symbolized by “EE”), and to tax benefits (symbolized by “T”). See Börsch-Supan and Lührmann (2000).

## 4.2 Long-term effects of the sustainability factor

Are the reform proposals by the Rürup commission sufficient to counteract the foreseen consequences of demographic change and stabilize the system? Will it keep the contribution rate below the targets set by Riester, and at the same time generate a level of pension income that, taking all pillars into account, corresponds to today's level? This subsection presents a projection of the main components of the reform proposals and takes a look at their long-term effects.<sup>26</sup> Figure 7 and Figure 8 illustrate how the introduction of the sustainability factor and the increase of the retirement age affect contribution rates and pension levels for varying values of  $\alpha$ .

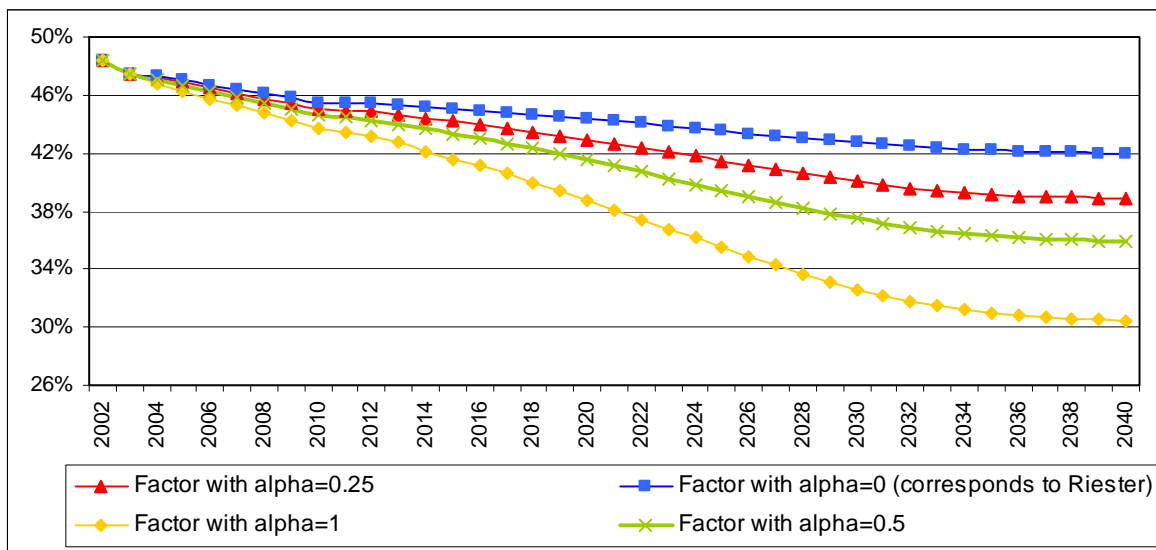
**Figure 7: The effects of the sustainability factor on the development of contribution rates**



Source: MEA calculations based on the Rürup commission's demographic and labor market projections.

<sup>26</sup> The official projections of the reform commission are presented in 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>).

**Figure 8: The effects of the sustainability factor on pension levels**



Source: MEA calculations based on the Rürup commission's demographic and labor market projections.

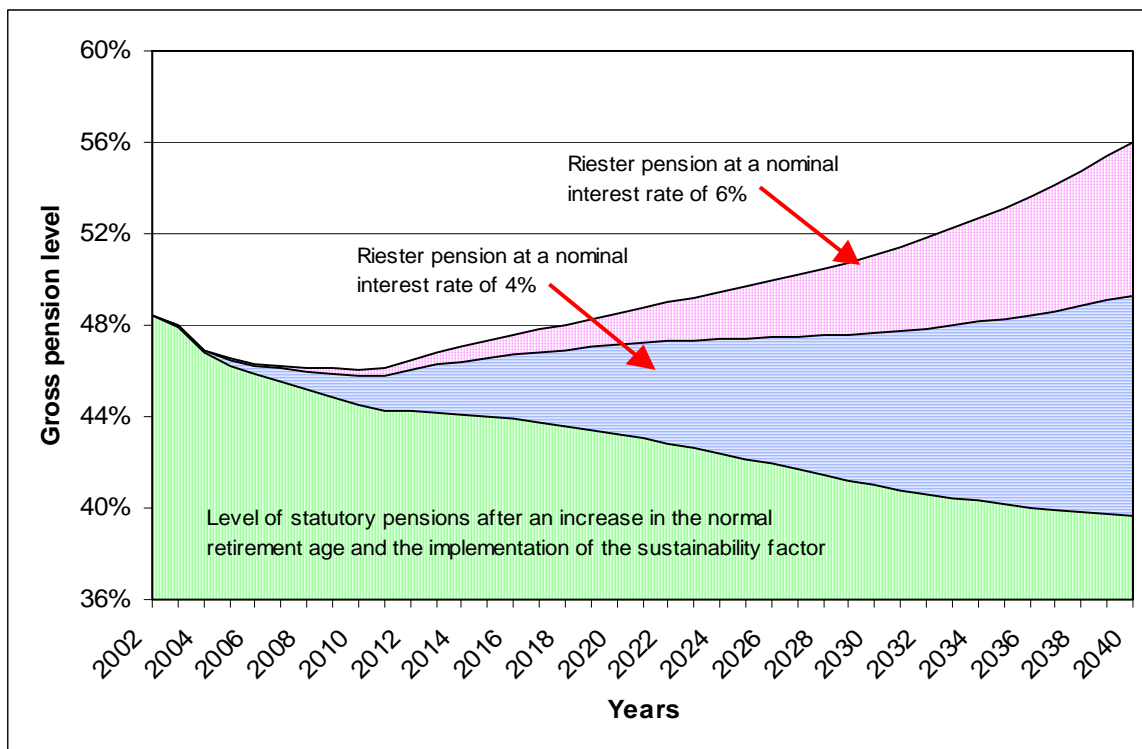
If  $\alpha$  equals one, the sustainability factor generates a purely income-oriented pension benefit policy. The contribution rate will remain stable, while benefits will decline to around 30 percent of gross earnings.

A weighting factor  $\alpha$  of 0.5 would spread the additional financial burden created by the increasing dependency burden more equally between contributors and beneficiaries. It results in a contribution rate of 20.1 percent in 2020, 21.4 percent in 2030, and a benefit level in 2030 of around 37 percent of gross earnings.

The commission's reform targets are just met when  $\alpha$  is set equal to 0.25. It results in a contribution rate a little lower than 23 percent in 2030, while the level of pensions is just over 40 percent of gross earnings.

Taking account of the increase in the normal retirement age to 67, which increases pension benefits according to the German benefit formula, and adding second and/or third pillar pensions, the Rürup proposal manages to deliver an income level for retirees that is comparable to today's income level – however, only after about 2030, see Figure 9. This projection assumes a saving rate of 4% into second and third-pillar pensions from 2009 on, starting in a stepwise fashion according to Table 2.

**Figure 9: Total pension level including private Riester pensions**



Source: MEA calculations based on the Rürup commission's demographic and labor market projections.

Figure 9 quite clearly shows the crux of all transition models: the transition generation will have to pay extra in order to maintain their total retirement income when the income from pay-as-you-go pensions is reduced. More refined transition models show that a saving rate of 8% is sufficient for the cohort with the highest transition burden (Birg and Börsch-Supan, 1999).

Most of the Rürup Commission proposals, and most significantly the introduction of the "sustainability factor", have been passed by the German parliament on March 31, 2004. The shift in the retirement age starting in 2011, however, was not legislated. The new grand coalition, formed in the Fall of 2005, has put this step on the 2006 legislative agenda, which will complete the Rürup Commission reform agenda.

## 5 Conclusions

Germany has failed to reform its defined-benefit pay-as-you-go pension system in time. It is now in a difficult position because maintaining the old monolithic DB system would lead to very high contribution rates, while a substantial transition to a pre-funded system is impossible due to the short remaining time before the baby boom generation will retire. The main balancing act is thus to reduce current benefit promises far enough to keep contribution rates at a bearable level, but only so far that the loss in benefits can be offset by pre-funded pensions. Scylla is the contribution increase in the pay-as-you-go system, Charybdis the consumption loss in order to pre-fund the other pillars.

The Riester reform in 2001 attempted to reduce the tax and contribution burden by transforming the monolithic PAYG system to a multipillar system with subsidized or tax-privileged private pensions in individual accounts or as occupational pensions. The reform was an important first step towards solving the demographic problems confronting the pension system. It did not, however, stabilize the public PAYG pillar in the coming decades because the benefits were still higher than a sustainable level.

This instability, made visible by the deeper than expected recession in 2002, precipitated the creation of the “sustainability reform 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. It therefore provides an automatic stabilizer and de facto converts the defined benefit system to a system which mimics a NDC system. This mechanism became law in March 2004, with the last remaining step – the change in retirement age – now on the agenda but still to be legislated in 2006.

## References

- Berkel, B., and A. Börsch-Supan (2003): Pension Reform in Germany: The Impact on Retirement Decisions, *Finanzarchiv*, in press.
- Boeri, T., A. Börsch-Supan, and G. Tabellini (2001): Would you like to Shrink the Welfare State? The Opinions of European Citizens, *Economic Policy*, Vol. 32.
- Boeri, T., A. Börsch-Supan, and G. Tabellini (2002a): Would you Like to Reform the Pension System? The Opinions of European Citizens, *American Economic Review*, May 2002.
- Boeri, T., A. Börsch-Supan, and G. Tabellini (2002b): How would you Like to Reform your Pension System? The Opinions of German and Italian Citizens, in: R. Brooks and A. Razin (eds.), *The Politics and Finance of Social Security Reform*, Kluwer, in press.
- Börsch-Supan, A. (2000a): A Model under Siege: A Case Study of the Germany Retirement Insurance System, *The Economic Journal*, Vol. 110 No. 461, F24-45.
- Börsch-Supan, A. (2000b), Incentive Effects of Social Security on Labour Force Participation: Evidence in Germany and Across Europe, *Journal of Public Economics*, Vol. 78, 25-49.
- Börsch-Supan, Axel, and Christina Wilke (2003). The German Social Security System: How it Was and How it Will Be, *NBER Working Paper No. 10525*, Cambridge, Mass., and *MRRC-Working Paper*, University of Michigan, Ann Arbor.
- Börsch-Supan, A., und M. Lührmann (2000): *Prinzipien der Renten- und Pensionsbesteuerung*, Frankfurter Institut – Stiftung Marktwirtschaft und Politik, Bad Homburg.
- Börsch-Supan, A., and R. Schnabel (1998): Social Security and Declining Labor Force Participation in Germany, *American Economic Review* 88.2, 173-178.
- Bonin, H. (2001): Will it last? An assessment of the 2001 German pension reform, *IZA Discussion Paper* (343), Bonn
- Bundesministerium für Arbeit und Sozialordnung, (BMA) (1997): *Statistisches Taschenbuch*, Bonn: Bundespresseamt.
- Casimir, B. (1989): *Staatliche Rentenversicherungssysteme im internationalen Vergleich*, Lang, Frankfurt.
- Cutler, D., and L.M. Sheiner (1998): Demographics and Medical Care Spending: Standard and Non-Standard Effects. Mimeo, Harvard University.
- Deutsche Bundesbank (2002): Kapitalgedeckte Altersvorsorge und Finanzmärkte, Monatsbericht Juli, Frankfurt am Main.
- Jacobs, K., Kohli, M. and Rein, K. (1990): Germany: the Diversity of Pathways, in: M. Kohli, M. Rein, A.-M. Guillemard, and H. van Gunsteren (eds.), *Time for Retirement: Comparative Studies of Early Exit from the Labor Force*, Cambridge University Press, Cambridge, New York.
- 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 14, Gütersloh
- OECD (2001): *Ageing and Income: Financial Resources and Retirement in 9 OECD Countries*, Organisation for Economic Co-Operation and Development, Paris.
- 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
- Riphahn, Regina T. (1995): *Disability Retirement Among German Men in the 1980s*, Münchner Wirtschaftswissenschaftliche Beiträge, Nr. 95-20, Ludwig Maximilians Universität München.
- Ruppert, W. (2000): *Betriebliche Altersversorgung*, Institut für Wirtschaftsforschung (ifo), München.
- Schnabel, R. (1999): *Opting Out of Social Security: Incentives and Participation in the German Public Pension System*, SFB504-Discussion Paper No. 99-42, University of Mannheim.
- Stiftung Warentest (2002): *Riester-Rentenversicherungen: Die Lücke schließen*, FINANZtest 9/2002
- Summers, L. (1989): *Some Simple Economics of Mandated Benefits*, *American Economic Review*, Vol. 79, No. 2, May 1989.
- Verband deutscher Rentenversicherungsträger (VDR) (2002): *Die Rentenversicherung in Zeitreihen*, Frankfurt am Main.