

# Public Finance and Public Policy in the New Century

Sjibren Cossen and  
Hans-Werner Sinn, editors

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**The Crisis in Germany's Pension Insurance System and How it Can be  
Resolved**

by Hans-Werner Sinn

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## The Crisis of Germany's Pension Insurance System and How It Can Be Resolved

Hans-Werner Sinn

### 9.1 Introduction

*[I am concerned that] the feeling of human dignity, which I want even the poorest German to have, should be kept alive, that he should not simply be an object of charity without any rights, that he should have a peculium which belongs to him alone . . . which makes it easier for him to open many doors which otherwise would be closed, and which, if he can take his contribution out again when he leaves, ensures him better treatment in the house to which he has been admitted.*

—P. Stein, *Prince Bismarck's Speeches*

These are the words Bismarck used in his speech to the Reichstag on April 2, 1881, to justify his social legislation. It is significant that he used the word "peculium" for the public assistance he wanted the old and sick to receive. The peculium was the money Roman slaves were allowed to save up and could ultimately use to buy their freedom. Obviously, Bismarck saw the situation of the elderly as an underprivileged one, similar to that of the slaves in ancient Rome, and one from which it was necessary to liberate them.

Bismarck did succeed in liberating pensioners. People today are not stigmatized for being old and do not need to beg from their children to live a well-ordered life. However, a hundred years later, the pendulum has now swung in the opposite direction. The real problem today is the enormous burden facing contributors, not the stigma facing pensioners. The German pension system is strictly earnings related, with regard to both contributions and pensions. The combined rate of contributions by employers and employees to the pension insurance system in Germany is 20 percent of the gross wage. This burden will become even heavier in future, because there

will be more and more pensioners and fewer and fewer people available to work. Even today, many people are finding the contributions burden oppressive, and there are grounds for believing that this burden is one of the reasons for the high wage costs in Germany and for the resulting unemployment.

This chapter discusses the impending problem of financing the German pension insurance system and the possibilities available for sensible reforms that can prevent the system from breaking down under the weight of excessive contributions and from endangering Germany's political system. It starts from research carried out by Munich's Center for Economic Studies (CES) for the Advisory Council to the Federal Ministry of Economics and Technology,<sup>1</sup> and it comments on the reform proposal the German government made in 2000 as a reaction to the council report.

## 9.2 The Implications of Demographic Developments for the Pension Insurance System

There were no special financing problems when Bismarck introduced the pension insurance system, because the number of old people affected was very small relative to the number of young people. Figure 9.1 compares the German age pyramid in Bismarck's time with that in 1995. It can be seen that the number of elderly at the top of the pyramid in Bismarck's time was extremely small relative to the number of young people lower down. If birth rates and death rates had been constant, the pyramid would have looked the same in 1995 as it did in 1875. However, this was not the case. The pyramid for 1995, which is shown on the right, belies its name. It should more correctly be called a pine tree, not a pyramid, as the younger age groups contain fewer people than the older ones.

It is quite obvious that the pine tree structure creates problems for a pension insurance system that operates with PAYGO financing. Fewer and fewer young people must finance more and more old people. It is also quite obvious that the greatest difficulties are yet to come. The problem will become severe when the heavy branches now at the lower levels of the pine tree move up to the pensionable levels. This is what is going to happen in the 2030s. By then, it will hardly be possible to keep the PAYGO process operating in its present form.

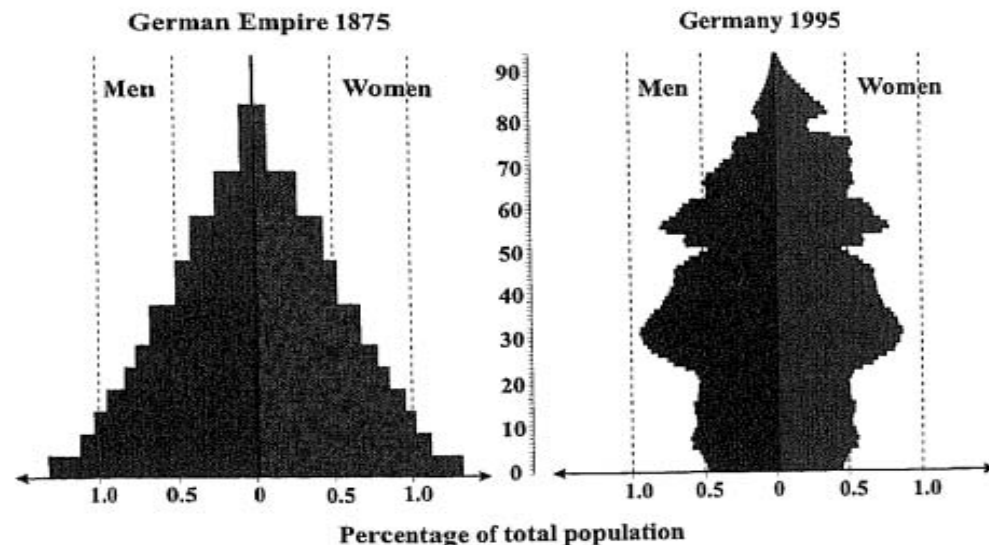


Figure 9.1

The German age pyramid in Bismarck's time (1875) and today (1995)

Sources: Statistisches Bundesamt, *Statistisches Jahrbuch*, table 3.11, Bevölkerung 1995 nach dem Alter, 62, 1997; Kaiserliches Statistisches Amt, *Statistisches Jahrbuch für das Deutsche Reich*, Vol. 30, April, 7–9, table 4, Die Bevölkerung am 1 Dez 1875 nach Geschlecht und 11 Altersklassen, 1878.

The pine tree has this shape because the growth rate of the German population has been falling continuously over time. Last century, this growth rate was about 1.1 percent, and it was the third highest in Europe after Great Britain and Finland.<sup>2</sup> Today, the growth rate is  $-0.1$  percent in terms of the native German population and  $+0.6$  percent when immigrants are included.<sup>3</sup>

The problem is that the Germans do not have as many children as they used to. Ten Germans now only have, on average, seven children. The population growth rate in Germany is no longer third from the top in Europe; in the OECD, it is now third from the bottom. Only Spain and Italy have even lower birth rates than Germany has.

The declining number of children is not the only thing that creates problems for the pension insurance system; increasing life expectancy does so, too. Medical advances are increasing the remaining life expectancy of a 65-year-old German man or woman by around 1.5 months each year—that is, by an additional year every eight

years. The gap between the number of births and remaining life expectancy is widening all the time, and this will create more and more trouble for the pension insurance system because the number of people of pension age is rising continuously relative to those of working age.

Declining birth rates and increasing life expectancy are trends that are observable in other countries, too. Most OECD countries have problems similar to Germany. Nevertheless, the problem seems to be more severe in this country than anywhere else in the world. Unless the current trends change fundamentally, Germany will have the oldest population in the world by 2030.

### 9.3 Implications for the Development of the Contribution Rate

The demographic distortion has serious effects for the contribution rates of the pension insurance system. Currently, 100 Germans of working age (between 20 and 64 years) support 25 older people. In 2035, they will have to support between 50 and 55 older people, depending on which population forecast is used.<sup>4</sup> One does not need to set up a forecasting model to see that there will need to be either a very large increase in the contribution rate or a considerable reduction in pensions.

Up to 1992, Germany had a pension system in which pensions were linked to the growth of gross wages. Based on this, the range of possibilities open to politicians for 2035 is between doubling the contribution rates for the same pensions and halving the pensions with the same contribution rates. The politicians can choose some point within this range but they cannot perform miracles. If they are to succeed in preventing the contribution rate from increasing from 20 percent today to 40 percent in future, pensioners must make sacrifices.

The Bundestag has defined a comprehensive program of sacrifices with its previous pension reforms. In 1992, it replaced tying the pension to gross wages with tying it to net wages; it has done away with early retirement; it has abolished the pension for occupational invalidity (due to decline in earning capacity); and it has made it more difficult to get a general disability pension. In 1997, it decided that the so-called "standard pension"—that is, the pension of someone who has paid contributions based on average income for forty-five years—should fall from 70 percent to 64 percent of the net wage

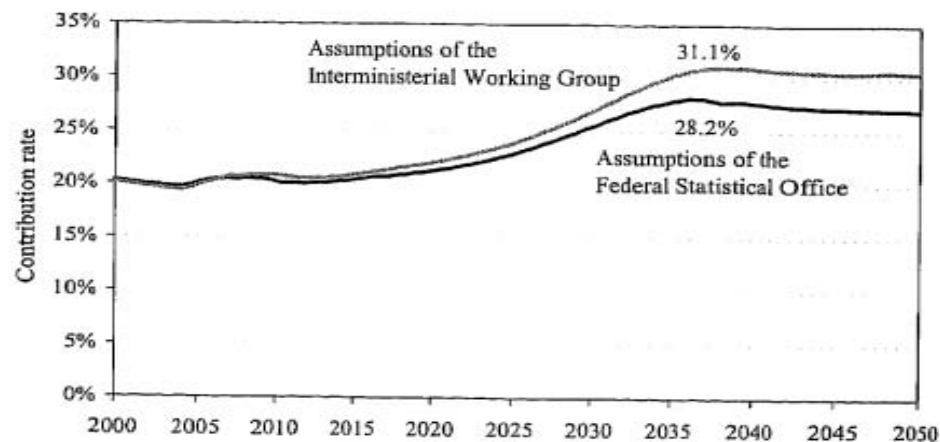
by 2030. However, this decision was quickly abolished by the new majority in the Bundestag, which instead imposed a moratorium on real pension adjustments to gain time for the implementation of more fundamental reforms. The reform implemented in 2001 has introduced a fiscal saving stimulus, which can be regarded as a first step toward a partially funded system,<sup>5</sup> as well as further implicit pension cuts resulting from redefining the net wage to which current pensions are tied. Net wages are now defined as gross wages minus taxes and contributions and minus recommended saving. The deduction of recommended saving reduces the base from which pensions are derived and therefore results in an effective pension cut without formally affecting the replacement rate, which is carefully watched by the public. For a while, it seemed that a PAYGO pension level of 64 percent, according to the new definition of net wages, was aimed at, which corresponded to about 61 percent according to the old definition; but then the proposal came under attack by various political groups that wanted to maintain a much more generous system. Ultimately, a level of 67 percent of net wages according to the new definition emerged, which corresponds to about 64 percent according to the old definition. This chapter discusses some of the alternatives for fundamental tax reform to shed some light on the general options available.

Figure 9.2 illustrates the results of the CES model for the case where the ultimate standard pension is 64 percent of net wages according to their old definition. Obviously, the contribution rate remains almost constant up to about 2020, increases rapidly after that, and by 2035 reaches its maximum value of between 28 and 31 percent.<sup>6</sup>

The two different figures refer to alternative population forecasts of the Federal Statistical Office and an Interministerial Working Group.<sup>7</sup> The lower forecast is based on the estimates of the Federal Statistical Office, which make the unrealistic, but cautious, assumption that life expectancy of west Germans will remain constant. The office also assumed that an additional eleven million foreigners will migrate to Germany up to 2030. The higher forecast assumes an increase in life expectancy of three years and lower immigration, of seven million people up to 2040.

Of course, the immigration figures assumed add a substantial degree of arbitrariness to the results. However, these are official assumptions which serve as useful benchmarks for the estimates. A





**Figure 9.2**  
The development of the contribution rate with alternative population forecasts  
Source: CES.

Note: The contribution rate is the sum of the employer's and the employee's contribution divided by gross wage income (net of the employer's contribution).

solution of the pension problem by immigration is theoretically conceivable, but not really a possibility. The immigration necessary by 2035 to keep the ratio of pensioners and persons of working age at today's level is more than 40 million people, or about 50 percent of Germany's current population.

The calculations are based on the essential characteristics of the German pension scheme, and they assume a constancy in the unemployment rate, the labor-force participation rate, the labor tax rate, the contribution rates for other social purposes, and the share of pensions covered by tax-financed contributions from the government budget. Sinn and Thum (1999) discuss the sensitivity of the results with regard to the assumptions, showing that official estimates that come up with lower contribution rates do so primarily by assuming increasing tax rates and higher sickness contributions which automatically reduce pension benefits. If these other components are taken into account, it turns out that the official estimates result in a significantly higher aggregate burden of contributions to the government sector than those presented here.

Contribution rates of the order of magnitude shown in figure 9.2 will not be affordable and would lead to a revolt by the young against the old. Undoubtedly, Germany is at the start of an initially

insidious but increasingly alarming crisis of the statutory pension insurance system, one that could have serious consequences for the state itself if suitable countermeasures are not taken quickly. Fortunately, the German government seems to have understood this and is therefore considering a more substantial reform. However, whether the discussed cut in relative PAYGO pension rights by only 1–4 percentage points is enough is open to doubt. Section 9.6 discusses this in more detail.

#### 9.4 Pay-As-You-Go versus Funding: Basic Remarks

Germany could have looked at the coming demographic distortion quite composedly if its pension insurance system had been a fully capital-funded system and not a contributory PAYGO one, because pensions could then have been financed by dispersing previous savings instead of by using the contributions of the working generation. With capital funding, the contributions to pension insurance are true savings which can be put onto the capital market and used to finance real investments. The stream of payments that the real investments produce can, if necessary, be used to pay back the loans to the savers, and thus the pensions can be paid without putting a burden on the contributors. The only problem then is to create the capital stock. It is great if you have one, but the accumulation process is arduous.

After the pension insurance system had been established by Bismarck, it proved possible to build up, in only ten years, a capital stock that could have financed pensions for seventeen years. Unfortunately, the World Wars and inflation thwarted the plan and destroyed the system's capital base. Today, the pension insurance system lives from hand to mouth. Its fund is only sufficient to cover it for eleven days.

Most Germans have no idea that the pension insurance system is a PAYGO one. They think that the money that they pay into the pension insurance system today is, in effect, savings that they will be able to use later. This belief is, of course, mistaken, as the contributions are all used up in financing today's pensioners. Nothing, but nothing, is being saved. The supposed savings are just an illusion.

The illusion is encouraged by the equivalence between contributions and pensions, which is the characteristic feature of the German pension system. The person who pays in twice as much as his

neighbor gets a pension that is about twice as large. One's contributions give a right to future pension payments and, to the contributor, this seems like paying into a savings account. The Federal Constitutional Court has even included the earned right to pension payments among the legal rights of ownership under Article 14 of the German Constitution.

In a PAYGO system, each generation when young pays its pension contributions to the old generation and acquires the right to receive pensions when it is old. These pensions are paid for by the next young generation's contributions. The first generation pays nothing for its pensions; each of the following generations must make payments to its preceding generation to acquire the right to its own pensions. These rights are a hidden implicit government debt, which, like an explicit government debt, must be paid for by the next generation. This implicit government debt is created when the first generation comes into the pension insurance system, and it is turned over from generation to generation. Because the pensioners' rights are linked to wage developments, the size of the implicit government debt grows continuously over time, even when the population size is constant.

Today, the cash value of the rights already acquired—that is, the implicit government debt—is around DM 10 to 12 trillion. That is more than Germany's total fixed assets and a multiple of the explicit government debt, which comes to DM 2.3 trillion. When the euro was introduced, the German debt-to-GDP ratio was just above the Maastricht limit of 60 percent. If the implicit government debt of the pension insurance is added in, the total debt-to-GDP ratio becomes about 350 percent.<sup>8</sup>

The PAYGO system offers contributors only a very modest return on the contributions they have paid in. Those who only had a few years left to contribute when the system was introduced in 1957 could pocket the initial profit and get a very high return on their contributions, one that was much higher than returns in the capital market. But anyone who entered the scheme in 1957 or later made a worse deal than a capital market investment. Figure 9.3 shows the results of detailed calculations for this carried out at CES. The graph shows the real inflation-adjusted returns that the different age cohorts of sample male pensioners who entered the pension insurance system after 1957 have received, or will receive in future, based

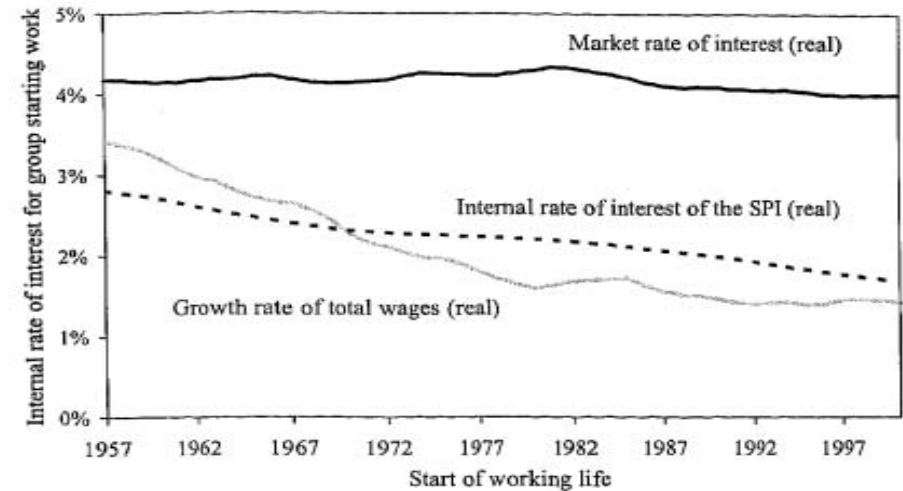


Figure 9.3

The internal return on the statutory pension insurance system (SPI)

Source: CES.

Note: The growth rates and interest rates are averages over periods of fifty years starting in the respective year shown on the abscissa. For the years after 2000, which gain importance in the right-hand part of the diagram, a constant annual real wage growth of 2 percent and a constant real rate of interest of 4 percent were assumed. These assumptions also underlie the calculations of section 9.6.

on current estimates. The cohort of the sample pensioners entered the pension insurance system at age 20. Some drew a normal age pension after forty-five years of contributing to the system, others drew an early general disability pension, and still others died before they had received any pension. Some of the age cohorts left widows and orphans who also drew pensions.

It can be seen that the real returns of the 20-year-olds who entered in 1957, and will normally become pensioners in 2002, are still almost 3 percent. Those who entered as 20-year-olds in 1990, however, can only expect a return on their contributions of 2 percent, and the young people who enter now can only count on a real return of about 1.5 percent. By contrast, savings invested in ten-year federal bonds and rolled over for fifty years would, as the top curve shows, have brought a real interest rate of about 4 percent.

It is not surprising that the returns on the PAYGO system are so low. Theoretically, they are explained by the real growth rate of total wages. Figure 9.3 shows that the theory comes pretty close to reality.



The growth rate of total wages has, in fact, fallen greatly in the last forty years. If, as a result of the demographic distortion, it falls further, the returns that the pension insurance system can offer will also fall.

At first sight, these data could be interpreted as a verdict on the German pension insurance system. In this interpretation, the system appears to be a completely inefficient way of arranging old-age provision; it should be abolished as quickly as possible and be replaced with a capital coverage system. Many observers have indeed interpreted the difference in returns in this way and see it as a reason to introduce a capital coverage system.

This appearance deceives. To call the difference in returns "inefficient" is to make a grossly mistaken economic interpretation. The truth is that the difference in returns is an essential feature of the intergenerational redistribution. The difference in returns is an integral part of the PAYGO system, from which one can no longer escape once this system has been set up. It is the mirror image of the initial profit that accrued to the first post-1957 pension cohort; it has already been distributed and cannot be taken back again. Each subsequent generation has acquired a claim against the next generation by paying its pension contributions, but these entitlements are never high enough to keep pace with a capital market investment. It is as if each generation is paying an implicit tax to service the implicit government debt that resulted from the gift made to the first generation. The pension insurance system is a zero-sum game being played by present and future generations in which the initial gain is mirrored by a loss of exactly the same amount for each subsequent generation when the present value of this amount is correctly calculated on an actuarial basis. In each period of time in an ongoing pension system, the present value of the implicit taxes to be paid by all future generations equals the present value of the then existing pension entitlements, that is, the implicit government debt.<sup>9</sup>

Naturally, changing over to capital funding is attractive, if by doing so the implicit tax hidden in the contributions can be avoided. But this is impossible because the pension entitlements already established cannot simply be swept under the table. An explicit tax would be needed to service these entitlements and, in present value terms, this would be just as high as the implicit tax that all successive generations would have to pay if the PAYGO system were to continue. Contrary to first appearances, it is not at all possible to

exploit the returns advantage of the funded system in a way that results in a net advantage for society. The claim that the funded system is more efficient than the PAYGO system because it brings higher returns is completely false from an economic point of view, as the higher returns only show up if the tax required to service past entitlements is disregarded.<sup>10</sup>

### 9.5 Resolving the Crisis by Partial Capital Funding

All this does not mean that capital funding has no useful function. On the contrary, the statutory pension insurance system is in urgent need of help from capital funding, but it needs it for a different reason—not because it is inefficient. This reason is the demographic crisis that was described in section 9.2. The problem is not finding a system that promises more efficiency in the next 1,000 years; it is resolving the dangerous crisis that will affect the present 30- to 40-year-olds when they reach pension age.

If a generation is to enjoy retirement without having to keep on working, it must make provision for it, and there are, in principle, two ways of doing this. Either people can save and finance their keep by drawing on these savings, or they can have children so that these children will take care of them later. In harsh economic terms, people who want to have comfortable retirement must have previously accumulated either real capital or human capital. Those who do not do one or the other must starve—for nothing, you get nothing in return.

In the past decades, Germans have chosen not to accumulate as much human capital as was usual in the past. This is the reason for the crisis. If they, nevertheless, still want to live comfortably in their old age, their only option is to substitute real capital for the missing human capital. The additional real capital secures some of the present nominal pension entitlements, and it prevents the subsequent generation from having to carry an unjustified burden that is economically not affordable. The rule must be to cope with the pension burden, which would otherwise be crushing, by shouldering part of this burden now. This does not mean that changing over completely to a capital funding system would be necessary. Real capital need only be built up by the amount of the missing human capital. Full funding is not required if the goal is to keep the pension crisis under control.<sup>11</sup>

It is sometimes argued that the present employed generation cannot be expected to bear the burden of accumulating capital as well as the burden of their pension contributions. The transition to even partial capital accumulation, it is said, in itself implies an unfair double burden. This position fails to recognize that the employed generation must always bear a double burden since they must always maintain their own children as well as their parents. This was the case in the pre-industrial family, it is the case in today's world with government pension insurance, and it can never be otherwise. The pension problem has arisen because the current employed generation has preferred to get rid of one of these burdens by having fewer children than was usual in the past. It is in no way unfair to ask this generation to put the money they save from not bringing up so many children into the capital market and to secure their pensions in this way. The necessary ability to pay is certainly there and there is no unfair second burden.

Of course, a problem does arise here when it is considered that some families have enough children but other families have none. If those people who are already financing the older generation with their pension contributions and who are also maintaining a sufficient number of children are forced to save more, they will be faced with a third burden which can truly be called unfair. A partial dependence of the pension on the number of children could help solve this problem, but this is a matter of justice between families rather than between generations, which is not considered in this chapter.

## 9.6 Results of Simulation Calculations

It is now time to be more specific. This section reports on the results of simulation calculations to discover the quantitative effects of alternative suggestions for reforms aimed at resolving the pensions crisis. The comparison refers to (I) the present system, (II) a complete transfer to capital funding, (III) undermining the contribution mountain by setting up a fund within the statutory pension insurance system, (IV) partial funding with a fixed private saving rate, and (V) partial capital funding with a variable private saving rate. All calculations assume a time path of the sum of all pension components which, for the "standard pensioner," is 64 percent of net wages according to their old definition (gross wages minus taxes and other contributions to the government, but including recommended

saving). It is important to note that the calculations take the time path of the sum of all pension components as given for all the alternatives, so that only the developments of the burdens differ. This assumption is typically not met by the reform proposals made in the political debate, but, without it, no meaningful comparison of the fundamental alternatives is possible. Pensions for widows, orphans, and the unemployable will, in any case, continue to be financed by way of PAYGO contributions. Capital funding will only be considered in relation to old-age pensions. The calculations are based on the assumptions mentioned above, including the relatively optimistic population estimates made by the Federal Statistical Office which abstract from the gradual increase in life expectancy. It is furthermore assumed that the real rate of interest remains constant over time and that wages grow at a constant real rate of 2 percent per annum.<sup>12</sup>

Figure 9.4 refers to the most radical reform conceivable: an immediate transfer to full capital funding of old-age pensions. All entitlements already established are respected and continue to be financed through PAYGO contributions. New entitlements, however, will be acquired entirely with capital accumulation from real saving. The lighter line in the graph gives the sum of the PAYGO contributions as a share of gross income and the saving contributions necessary to acquire entitlements the same as those with PAYGO financing. For comparison purposes, the development of the contribution rate in

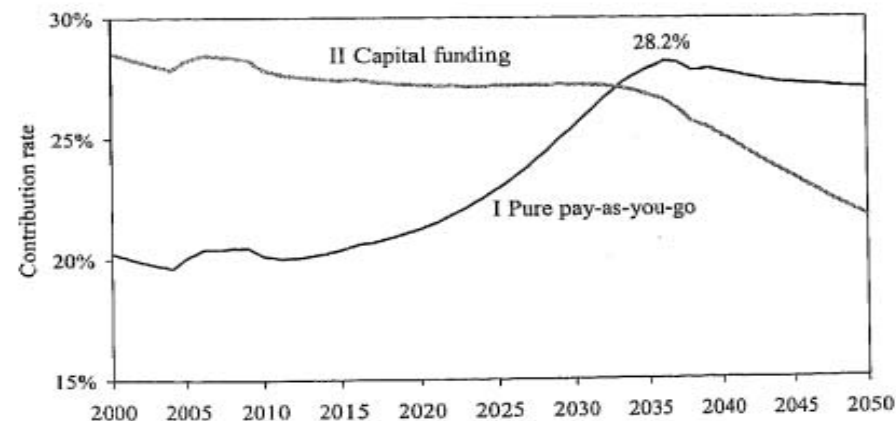


Figure 9.4  
Contributions vs. full capital funding

the unreformed PAYGO system is shown again, by the darker line. It can be seen that the initial burden in the case of complete transfer to capital funding is very high because the transition generation must pay twice—once for old people's pensions which are based on entitlements already acquired and once for their own later pensions which are to be financed through savings. Only very gradually over the following decades does the PAYGO financing of the entitlements already built up become less important and the total burden fall. Complete transfer will only occur around 2070.

It can be seen that the transfer to full capital funding takes the system out of the frying pan into the fire, because it is a mirror image of the PAYGO path. The increase in charges to over 28 percent of gross wages, which, under the present circumstances, is to be expected in the 2030s, starts immediately and so does the pensions crisis. Because, as was argued earlier, the transfer to capital funding makes no comparable long-term increase in efficiency possible, one can confidently reject this scenario.

It would be ideal if there were a reform that would get rid of the impending crisis without a new burden turning up somewhere else, but this kind of reform could only occur in never-neverland. The best that can be achieved in the real world is an even distribution of the inevitable burden over time. Only in this way can a confidence crisis in the pension insurance system, which at the same time would be a crisis of the state itself, be averted.

One obvious way to even out the burden over time is for the pension insurance system itself to accumulate the capital that could be used in the crisis years to contribute to financing pensions. The pension contribution mountain would, so to speak, be undermined. Figure 9.5 shows this undermining. It can be seen that permanent stabilization would be possible if the contribution rate were to be raised immediately from the current 20 percent to 23.3 percent and kept at that level. In this way, the pension insurance system could accumulate a capital stock in the years up to about 2025 and this capital stock would then gradually be drawn down because the contribution rate would no longer be sufficient to finance pensions. In this version, capital would only be accumulated in a transition phase. In the long run, the pension insurance system's capital stock would once again be zero.

Regardless of how attractive the undermining solution may appear at first sight, it fails to take into account the covetousness

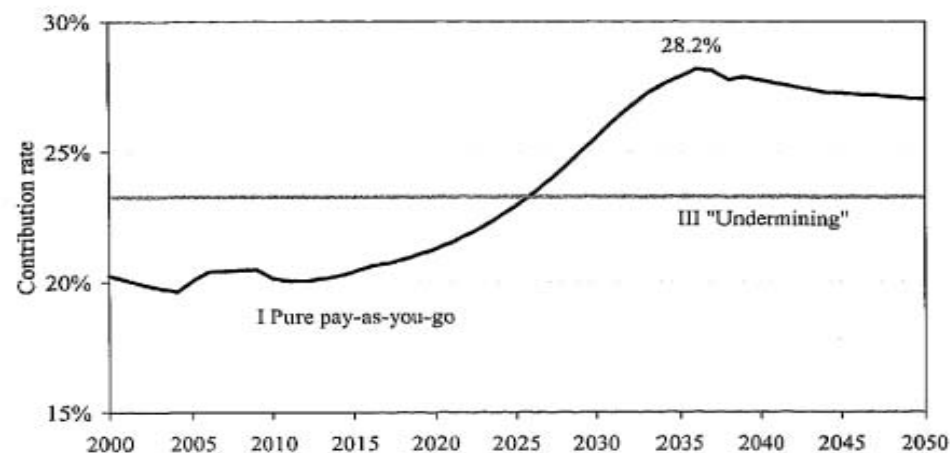


Figure 9.5  
Pay-as-you-go vs. undermining

with which the politicians would look at a capital stock accumulated by the pension insurance system. It is hard to imagine a future federal minister, who wants to win the next election, resisting the pensioners' desire to use the capital stock prematurely. As a German proverb goes, dogs don't stockpile sausages.

Evening out the distribution must be brought about in another way, without the pension insurance system accumulating capital. One conceivable possibility is to oblige people to save a certain minimum fraction of their gross income so that part of the later pensions can be financed by dissolving the savings. The savings will have to be placed with private capital funds of the saver's choice, and the government will watch the average performance of these funds. It calculates the average funded pension entitlements accumulated by the single age cohorts and cuts the PAYGO pensions, and with them the contribution rates, accordingly. The funds are fully private and compete with one another, but their financial standing is strictly controlled by the regulatory authorities to reduce the investment risk involved. The saving is obligatory because many people with only low ordinary pension entitlements would not save voluntarily, knowing that by doing so they would only reduce their entitlement to receive social aid. As private saving creates a positive fiscal externality, voluntary decisions are insufficient. This is one of the many second-best examples where one type of intervention necessitates another one.



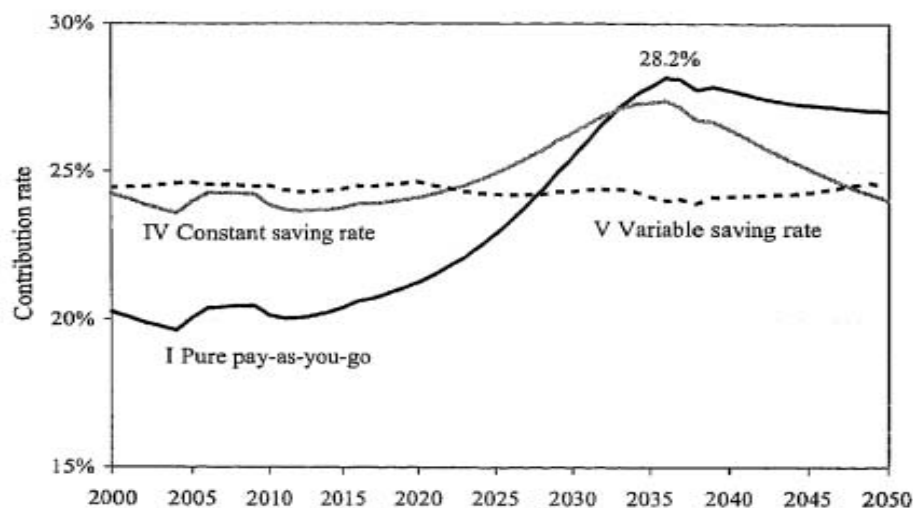


Figure 9.6  
Two alternative saving models

Figure 9.6 demonstrates the implications of this proposal for the case of a saving rate of 4 percent of gross wages. It shows that the time path of the overall financial burden involved—the sum of PAYGO contributions and the saving rate—will remain in the neighborhood of 24 percent for a long time, but will rapidly increase after 2020 and eventually reach a peak level of 27 percent in 2035. Only in the following years will the overall burden be lower than it would have been with an ongoing PAYGO system that generates the same time path of pensions.

Obviously, a fixed saving rate is not able to smooth the time path of the financial burden involved with securing old-age pensions. Other alternatives with different values of the fixed saving rate were calculated, but the end result was always similar. In the neighborhood of the critical year, 2035, the remaining PAYGO contributions necessary to reach the desired pension level are still so high that the addition of a constant saving rate creates a problematic peak in the overall burden.

In 2000, the German government proposed a seemingly similar plan which foresees a gradual increase in the saving rate from 0 to 4 percent from 2008 onward. This plan, too, suffers from the problem described. It is a big step forward for the German debate to

think about funded elements as such; however, the proposal will be unable to smooth the time path of the financial burden.

A problem with the German proposal is also that it defines the PAYGO pensions rather than the sum of these pensions and the funded pension elements. In the model analyzed here, about 50 percent of the old-age pensions will be funded in the very long run and, up to 2035, about a quarter of the old-age pensions will be funded. This means that the PAYGO component of the standard pension will have to decline to about 50 percent of net wages according to the old definition. By way of contrast, the government proposal sets the PAYGO component relative to the same base of at least 60 percent in 2030. This figure seems far too high if the goal is to maintain reasonable pension benefits and will lead to a significantly higher burden peak than that shown in figure 9.6.

Since the fixed saving rate policy does not work, it seems reasonable to try an alternative with variable saving rates. Path V in figure 9.6 shows a policy where the saving rate is initially 4 percent and is then adjusted over time so as to keep the sum of the PAYGO contributions and the saving rate roughly constant over the next fifty years, even in the critical fourth decade.

It can be seen that smoothing the time path of the burden is in fact possible, and that the burden is permanently lower in the crisis years after 2028 than with an ongoing PAYGO system. At the peak of the crisis in 2035, the contribution rate is more than 3 percentage points lower than the rate to be expected without a reform. Up to the peak of the crisis, a quarter of the old-age pensions can be financed from savings and, in the long run, half capital funding will be achieved, as in the case of a fixed saving rate of 4 percent. In the very long term—in the last quarter of this century—the burden will fall below that associated with the undermining solution. The transfer to partial capital funding is then complete.

In figure 9.7, it can be seen how the smoothing of the path of the burden comes about through varying its components. The top curve shows the sum of the PAYGO contributions and the compulsory saving rate, whose path is already known from figure 9.6. The curve below this shows the necessary PAYGO contributions. The curve begins with the present value of 20 percent, then rises only very slowly because more and more capital-funded pension components are available. At the peak of the demographic crisis, a contribution burden of only 23 percent will be reached, which is much lower

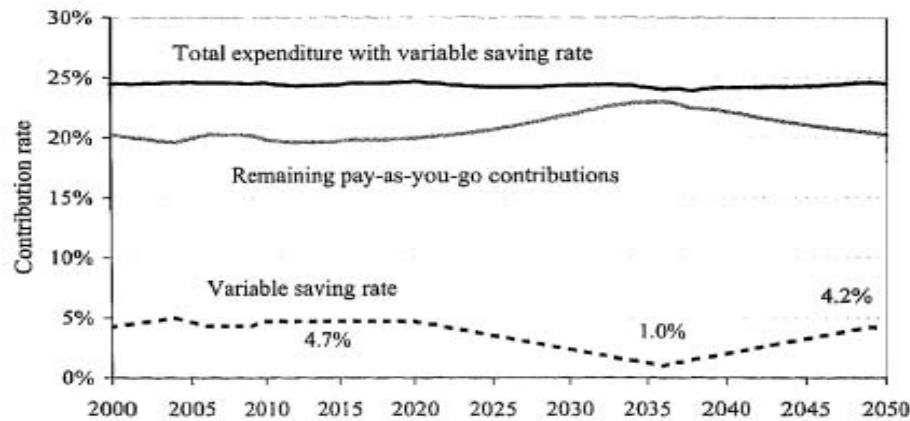


Figure 9.7  
The path of the saving rate  
Source: CES.

than the 28 percent that must be expected with the present system. The bottom curve shows the path of the compulsory saving rate which, together with the PAYGO contributions, makes up the total expenditures.

Up to about 2020, the compulsory saving rate is over 4 percent; it falls to only 1 percent up to 2036, when it again rises gradually. This variability in the compulsory saving rate is what determines the smoothing of the path of the total burden.<sup>13</sup>

In the next twenty years, the aggregate savings generated by this policy are between 3 and 4 percent of national income unless saving is crowded out that otherwise would have taken place. This is not too much and not too little. Some critics of capital funding maintain that the capital market cannot absorb more capital from savings, and others maintain that savings are irrelevant because national expenditure can only be financed from the national product of the current period. This is not the place to explain why these statements are misleading, if not completely wrong.<sup>14</sup> But one thing is certain. Germany's saving rate today of around 9 percent is well below the 15 percent that brought Germany prosperity and growth in the 1960s. It could only be to the economy's benefit if the saving rate were to rise by 3–4 percentage points as a result of capital funding of pension insurance. One would not reach the saving rate of the 1960s but one would be getting closer to it. An increase in saving produces an

increase in national product, and that increase in national product will make future pension expenditure easier to afford than it otherwise would have been.

## 9.7 Concluding Remarks

It has been shown that the German pension insurance system is sliding into a demographic crisis and that partial capital funding on a private basis, but under government supervision, is a way to avoid disaster. Partial capital funding is the golden mean between the extremes of pure PAYGO financing and pure capital funding. It unites the strengths of both the systems and, last but not least, is the best insurance strategy with respect to the idiosyncratic risks involved with both alternatives.

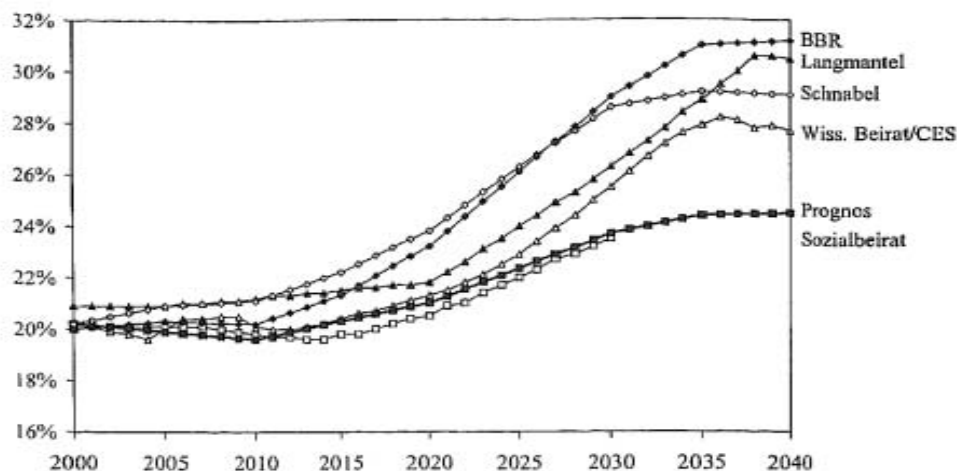
Bismarck wanted to prevent the old and the sick from being "pushed aside" by the young. The reform presented in this chapter will prevent the pension insurance system from one day being pushed aside by the young and, with it, perhaps the state itself, too.

## Appendix: Comments on Alternative Contributions Forecasts

The forecast shown in figure 9.2 is a conditional estimate in which the conditions are assumptions that need not be accepted. Other results follow from other assumptions. Figure 9.8 gives an overview of alternative forecasts that have been made recently in different places. It can be seen that the range of forecasts of the contribution rate for 2040 is about 25–31 percent. The third curve from the bottom shows the lower of the forecasts made at CES.

A look at the other forecasts shows how sensitive the calculations are to alternative assumptions. It is noteworthy how low the estimates of the contribution rates made by Prognos AG for the Federal Ministry of Labor and the Federal Association of Pension Insurance Institutions are.<sup>15</sup> A third of the difference between this and the CES forecast (1.25 percentage points) stems from the fact that Prognos AG assumes increases in the federal grant over and above that determined in 1997, and two-thirds (2.45 percentage points) from the fact that it assumes a large increase in other, differently based rates of taxes and charges on wage incomes. The higher the other charges, the lower the pension entitlements implied by the German pension formula and the lower the resulting contributions burden. Prognos





**Figure 9.8**

Alternative forecasts of the development of the contribution rate

Sources: Sozialbeirat (1998); Prognos (1998); Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft (1998); Schnabel (1998); Langmantel et al. (1997); Besendorfer, Borgmann, and Raffelhüschen (BBR) (1998).

implicitly assumes that the total burden on wage incomes from income tax and charges for pension, health, unemployment, and nursing insurance will be an alarming 70 percent, while the CES forecast implicitly assumes a total burden of 66 percent. Here, the tax needed to finance the increased federal grants, which Prognos really must impute, is not even included. Reduced to a single denominator, the pension burden indicated by Prognos is relatively low because both the other burdens and the total burden on employees are assumed to be relatively high. Looking at the Prognos calculations as a whole, the arguments in favor of partial capital funding are considerably stronger than with the CES forecast. Since some politicians have interpreted the Prognos forecast as giving an all-clear signal for the pension problem, this indicates that the calculations published by Prognos have been grossly misinterpreted.

The CES forecast is a status quo prediction. It assumes a constant rate for charges for other purposes, because it wants to isolate the effect of the demographic distortion on pension contributions. There will be several more tax reforms and changes in the pattern of other charges by the time the peak of the crisis arrives. In view of this political uncertainty, it makes little sense to carry out the calcula-

tions on the basis of the current income tax progression scale. The pension reduction that will be produced through this mechanism as a result of adjustment of net wages is an artifact that will certainly not reflect the reality of the next four decades.

The CES forecast used in this chapter is the more cautious of its two alternative forecasts because it assumes a large immigration (11 million) and no further increase in life expectancy in west Germany. The east German life expectancy is assumed to increase until it reaches the west German level. If it is assumed, as the Interministerial Working Group assumes (see figure 9.2), that there will be a further increase in life expectancy of three years and lower immigration (7 million), then the CES forecast, too, largely coincides with the top three forecasts shown in figure 9.8.

## Notes

The author wishes to thank Juli Irving-Lessmann, Marcel Thum, Jakob von Weizsäcker, and Frank Westermann for careful research assistance and the members of the Council of Advisers to the German Federal Ministry of Economics and Technology for stimulating discussions. The chapter has been developed from a lecture in German that was given to the annual assembly of the Bavarian Academy of Sciences and from calculations for the council. Useful comments of two anonymous referees are gratefully acknowledged.

1. Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft, 1998. See also Sinn (1997; 1998a, b).
2. See Mitchell (1981).
3. See Statistisches Bundesamt, *Statistisches Jahrbuch der BRD*, Wiesbaden, Germany, various issues.
4. See Statistisches Bundesamt (1994) and Interministerielle Arbeitsgruppe (1996).
5. Following 2008, those who are insured in the German Statutory Pension Scheme are expected to save an amount of up to 4 percent of their gross wages (to be phased in starting from 2002) in order to augment their retirement income. Provided that the money is invested in a special class of certified products, savings are subsidized at a rate that is at least equal to the marginal tax rate of the individual (which is at a maximum of 42 percent following 2005), with special allowances for low-wage earners and those who are raising children. Among a host of other regulations, legal restrictions require that the amount saved must be warranted on a nominal basis, that the funds cannot be drawn on before the individual reaches age 60, and that part of the accumulated funds must be annuitized no later than at age 85.
6. An outline of and commentary to alternative contribution forecasts are given in the appendix.
7. See note 4.

8. Of course, this is not a net debt if the taxpayers' obligation to service the debt is subtracted. The debt net of the present value of taxes necessary to service the debt is zero by definition for all states that do not go bankrupt, regardless of their pension and borrowing policies. The term "government debt" always refers to a gross debt concept.

9. For a formal proof of these statements, see Sinn (2000).

10. There are a couple of other arguments for an efficiency gain resulting from the transition to a funded system, including a reduction in the labor-leisure distortion or the ability to earn high-risk premiums in the world capital market. These arguments are not well-founded though, since the possible efficiency gains do not result from the funded system itself and can easily be achieved in an ongoing PAYGO system. For example, the introduction of individual accounts within a PAYGO system (e.g., as in Germany) will reduce the labor-leisure distortion to a minimum. This minimum cannot be reduced further by introducing a funded system, since the explicit tax this system requires in order to satisfy old pension entitlements will also result in a labor-leisure distortion. In fact, the labor-leisure distortion will be even more problematic since the transition concentrates the implicit tax burden that was formerly distributed over all generations on the transition generation without changing its present value. Similarly, the risk premiums could easily be earned by a society if the government borrowed funds in the capital market and invested them in international equities. See Sinn (2000) for proofs and extensive discussions of these issues as well as further references to the literature.

11. There are at least two straightforward ways of calculating the volume of partial funding necessary to compensate for the lack of children: (i) the replacement rate is constant, and funding is used to smooth the time path of the sum of contributions and required savings relative to wages; (ii) the replacement rate is constant, and funding is used to smooth the time path of the implicit wage tax rate. This chapter investigates possibility (i). For an investigation into possibility (ii), see Sinn and Werding (2000).

12. These assumptions are stylized status quo projections from the last two decades, reflecting partly a preference for simplicity and easy interpretability of the model and partly the belief that Germany is too small to affect the time paths of the world market rate of interest, the capital intensity of German industry, and technological progress. Even if many of the aging industrialized economies carried out similar reforms, it is not clear how strongly the world market rate of interest would be affected, given that the world is full of population-rich and underdeveloped economies which offer indefinite investment possibilities. Nevertheless, a general equilibrium formulation would, of course, have its merits. See Miles (1999) for pension forecasts in a general equilibrium framework.

13. Of course, in practice, executing the policy will be more difficult than in theory. If the population, growth, and interest forecasts assumed stay valid, policymakers could simply derive the required saving rate by deducting from the calculated value of four the increment of the contribution rate above 20 percent that follows by applying the pension formula to current wages. If the population forecasts and the expectations about growth and interest rates change, it will be necessary to recalculate the then-relevant starting value of the saving rate and proceed thenceforth again according to the rule described. The Council of Advisers to the Federal Ministry of Economics and Technology (Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft 1998) discussed the possibility of setting up a Pension Council that would regularly update the calculations along the lines suggested earlier.

14. The two problems relate to the Ricardian equivalence problem but seem to be mutually exclusive. If funding implies more aggregate savings, future national product will be higher and hence it will be easier to finance pensions, but there may be an absorption problem for the capital markets. (The moderate increase in saving rates cited in the text excludes this possibility.) If, on the other hand, Ricardian equivalence implies that funding does not imply more aggregate savings, future national product will not increase and the second fear will have some foundation. Clearly, however, the capital market could not be overcrowded with funds in this case. (There is a myriad of reasons why Ricardian equivalence may not hold or may not have this implication.) See Sinn (2000) and Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft (1998) for a more thorough discussion of the alternatives.

15. Further details can be found in Sinn and Thum (1999) and Werding (1999).

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