Introduction of a Funded Component of Old-Age Provision Reduces Economic Growth

This report presents simulations of macroeconomic effects of two reform proposals for introducing a funded component into Germany's system of public pensions, currently financed on a pure pay-as-you-go basis. If the current pension level and the contribution rate are both to be maintained more or less unchanged by introducing a funded element, financed equally by employer and employee, by withholding 4% of the gross wage as a 'forced saving' – which are the core elements in a proposal made by the advisory council to the German economics ministry – significant growth and employment losses can be expected, in the short run. The proposal put forward by the German government under which a funded additional provision for old age would be introduced in different stages on a lower level would have less unfavourable growth effects in the short term, but in the longer run contribution rates would have to be raised and/or pension levels reduced.

Proposal by the advisory council to the ministry of economics

In 1998 the advisory council to the ministry of economics proposed supplementing the pay-as-you-go system with a funded component. In one of the variants proposed, 4% of the gross wage is initially to be withheld as forced saving. Thus, during the first 15 years the burden of pay-as-you-go contributions, plus the forced saving, is 4 percentage points higher than under the pay-as-you-go system alone. The supplementary contributions are saved in the form of capital, which can be desaved in around 25 years. If, on the other hand, pensions continue to be financed solely on a pay-as-you-go basis, the ageing of the population in Germany means that contribution rates will rise substantially in the long run. The advisory council claims that the additional saving during the initial phase will increase capital formation, not only enabling the contribution rate to be stabilised, but also providing an impetus to economic growth in the longer term.

The federal government's proposal

The federal government which was elected in 1998 stipulates that, within the framework of a reform of the public pension system, measures are to be taken to maintain pension levels in the longer term. In June 1999 the federal minister of labour and social affairs presented the outline of a new scheme, one relying on funded elements within the framework of statutory old-age provision. The concept differs from that put forward by the advisory council in a number of respects, most importantly in the level of forced saving: instead of 4% the rate of savings is to be just 2.5%, and this after a five-year interim period. The proposal seeks to achieve several goals:

- The planned introduction of a funded component aims to help stabilise the level of old-age provision in the future. Any increases in contribution rates are to be kept within strict limits, in order to restrict the burden imposed on today's contribution-payers.
- A simultaneous reduction in the pension level attempts to create greater 'inter-generational justice', in the sense that the contribution-payers of the future will not face an ever-increasing burden of contributions, and the pensioners of the future will have to do more for their own old-age provision today, by financing the funded component.
- Finally, the introduction of a funded component aims to diversify, to a greater extent than currently, the risks associated with old-age provision. Whereas pensions financed on a pay-as-you-go basis depend primarily on wage growth, funded pensions depend on international capital yields and exchange rate trends.

The government plans to introduce by law a supplementary, funded old-age provision starting in 2003. In the first year the contribution rate is to be 0.5% of the gross wage. In subsequent years this rate is to rise by 0.5 percentage points, reaching 2.5% in 2007. Originally this concept was to be implemented in the form of a corresponding obligation to pay into the scheme; more recently it has been proposed that the measure be realised by offering incentives for savings that are such as to provide an income in old age.

Under the scheme, savings for company pensions and private life-insurance contracts can be subsidised also. Those taking advantage of this possibility must therefore accept a reduction in their future pension entitlements, whereas those participating in the supplementary funded scheme more or less offset the reduction in the statutory pay-as-you-go pension by their capital income, which depends on the capital yield.

Problems in the transitional phase

Irrespective of how desirable, in principle, funded pension insurance schemes may be from an economic point of view,[1] specific problems inevitably arise in the transition from a pay-as-you-go to a funded system.

One important problem is that of dealing with the existing claims of those insured persons and pensioners whose pension entitlements are based on the pay-as-you-go system. The advisory council to the economics ministry consciously bases its proposal on imposing a double burden on current contribution-payers, whereas the federal government, with reference to the argument of 'intergenerational justice', plans to alter the existing pension-calculation formula in order to avoid too much additional burden by the pay-as-you-go contributions.

From a macroeconomic perspective it must be considered that the introduction of a significant funded component, such as proposed by the advisory council, among others, would raise the savings-to-income ratio by several percentage points, leading to a corresponding weakening in consumer demand. This, in turn, would directly reduce the level of economic activity. This would be countered only by the uncertain stimulatory effects of falling interest rates due to a bigger supply of capital. It is by no means certain that the additional capital stock, which would be forced, would find additional investment opportunities at home or abroad, in order to provide the expected growth impetus.

These macroeconomic effects are less serious for the proposal put forward by the federal government; on the other hand, its proposal to simultaneously reduce the level of pensions financed on a pay-as-you-go basis would also be damaging to economic activity by way of its effect on demand. However, if pensioners reduce their saving, the effect of both measures on demand could be minimised; of course, on the other hand the intended increase in the savings-to-income ratio of the economy as a whole does not materialise.

Contribution payers can react in various ways to a policy of forced saving or of incentives for certain forms of saving. They may reduce their voluntary saving – to the extent that it exists. Some of those affected, on the other hand, will reduce their consumption. The greater the extent to which private consumption and investment in housing construction are affected, the greater the negative short-term effects on the macroeconomy will be. Even assuming that the ex ante planned savings of private households (voluntary saving plus forced saving) are higher than under status quo conditions, the outcome in terms of ex post savings remains undetermined. Indeed, if the contractionary short-term demand effects predominate, the actual level of savings in the economy may well decline. The expected counter-weight to negative demand effects in the form of lower interest rates does not even arise in such a situation. Moreover, capital markets are now global in nature, so that changes in domestic savings have only a marginal influence on the rate of interest.

[1] On this see Gert G. Wagner, Ellen Kirner, Johannes Leinert and Volker Meinhardt, 'Fully funded insurance: no panacea for social security for the elderly', in: *Economic Bulletin,* vol. 36, no. 1, January 1999.

Quantifying short-term effects

In order to quantify the short-term effects of introducing a funded component into the statutory pension insurance system, an econometric business-cycle model was used. Reservations need to be made on the use of such a simulation model, because, for reasons of principle, it is not possible to analyse long-term effects using such a model. The use of such a model can nevertheless be justified because it is the short-run, knock-on effects that are of particular importance in the case of the introduction of a funded component.

The short-term macroeconomic implications of such a transition were calculated for three variants. Variant I is based on a proposal by the advisory council to the economics ministry, involving a high level of supplementary contribution payments and forced saving. In order to estimate the effects of the concept favoured by the federal government, which involves a smaller increase in the overall contribution burden and thus lower additional saving, two variants (II and III) were simulated.

Variant I: sharp increase in the overall contribution rate

In the first simulation (cf. table 1), which approximates to the proposal made by the advisory council to the economics ministry, the overall contribution rate is increased by a total of four percentage points, i.e. by two points each for employer and employee. It is assumed that there is no reduction in voluntary saving, i.e. that in ex ante terms the forced saving takes its full effect as supplementary saving. The additional revenues are assumed to flow to the banking sector that invests the funds both at home and abroad, earning interest. In this variant it is assumed that capital market interest rates are not affected by this additional investment, because the funds invested are negligible in terms of the global capital market. The nominal external value of the euro is

Assumptions of the model

In the DIW's econometric business-cycle model the most important national accounting aggregates and the level of employment and unemployment are all explained endogenously. The German economy is divided into four sectors: private households, firms, government and the 'rest of the world'. The simulation calculations are conducted on the basis of various assumptions.

One central assumption relates to the behaviour of collective wage bargainers. In the business-cycle model wage trends are geared to the rates of price increases and productivity growth and to the level of unemployment. To the extent that the introduction of a funded component alters these three influential variables, the wage-growth trajectory is also influenced.

Monetary policy influences can be incorporated into the model only indirectly. The expectations held by many of the proponents of a funded system that (long-term) interest rates will fall in the wake of rising private savings are almost certainly largely unrealistic, given the close interlinkages between the German and international capital markets. The model is able to simulate two extreme constellations. Either real interest rates or nominal interest rates are determined exogenously. Assuming nominal interest rates are exogenous, these are influenced neither by a changed savings behaviour nor by induced changes in prices. Such an assumption for the simulation would imply that Germany were a 'small' country within European Monetary Union. In the other extreme case – exogenous real interest rates – nominal interest rates change so as to reflect induced price changes; in this variant it is in effect implied that price changes in Germany determine the rate of interest in Europe. In actual fact the influence of induced price changes in Germany on the level of interest rates in Europe can be expected to lie between these extremes. Ultimately, though, these differences are only substantial if the induced price changes are significant.

A further assumption relates to the impact of the introduction of a funded component on the external value of the D-Mark and the euro, respectively. Here the problems are similar to those relating to interest rates. Either the induced changes in prices (and in other variables) do not influence the external value of the euro at all (assumption of an exogenous nominal external value of the D-Mark) or the external value of the euro is determined by the induced price changes in Germany (assumption of an exogenous real external value of the D-Mark). Both assumptions constitute extreme hypotheses.

The model is based on behavioural patterns for the west German economy. For statistical and econometric reasons it is not yet possible to estimate such a model for Germany as a whole, due to the lack of sufficiently long and stable time-series data for east Germany. Moreover, the model only simulates the economic processes that would result over the average of a business cycle. The advantage of these simulations over other model calculations lies in the fact that it is possible to quantify the degree of interdependence between economic variables.

also assumed to remain unaffected in this simulation. This has direct implications for Germany's competitiveness vis-à-vis its European and non-European trading partners. To the extent that unit labour costs in Germany rise, reflecting the increase in contribution rates to the social insurance system, German competitiveness declines and German exports decline compared with the status quo scenario. At the same time, firms also attempt to raise their prices on domestic markets. Higher prices and lower net wages exert a significant squeeze on private consumer spending. It is the marked fall in private consumption and the higher unit labour costs that exert the strongest contractionary effects of an increase in the contribution rate to the supplementary pension insurance scheme.

Five years after the introduction of the funded component in the statutory pension insurance system, GDP is 2.5 percentage points below its level in the status quo scenario. This means that the annual rate of growth is around 0.5% lower. This also has negative consequences for employment, which is more than 1% lower than the reference level. At the end of the five-year period this is equivalent to the loss of around 400 000 jobs in Germany as a whole.

Variants II and III: staged rise in supplementary contribution rates

Simulation studies II and III differ from the first one in three aspects:

- Contribution rates are not increased to the full extent, but rather in stages by half of one percentage points a year until, after five years, contribution rates have been raised by 2.5 percentage points.
- The increase is borne solely by employees.

Table 1

Variant I: Macroeconomic Effects of an Increase in Contribution Rates to Finance a Partially Funded Pension Insurance System

in % of status quo

	1st year	2nd year	3rd year	4th year	5th year
Assumptions					
Increase in the rate of contribution to the pension insurance fund, %-points	4.0	4.0	4.0	4.0	4.0
Results					
Employment	–0.7	–1.4	–1.3	–1.2	–1.2
Productivity (per person in employment)	–0.3	–0.4	–0.8	–1.1	–1.4
GDP, real	–1.0	–1.8	–2.1	–2.3	–2.5
Private consumption, real	–1.7	–3.1	–3.6	–3.7	–4.1
Government consumption, real	0.0	–0.2	–0.5	–0.7	–0.9
Price index of private consumption	0.0	0.5	0.8	1.0	1.3
Price index of GNP	0.5	1.0	1.2	1.4	1.6
Real external value (DM area)	0.4	1.0	1.3	1.5	1.7
Gross wage and salary income	1.0	0.2	–0.1	0.1	–0.3
Gross entrepreneurial income	–4.3	–2.2	–1.5	–1.8	–0.9
Net entrepreneurial income	–5.3	–2.2	–1.5	–2.0	–0.9
Net wages and salaries	–3.3	–4.1	–4.4	–4.1	–4.5
Collective wage rates	0.0	0.0	–0.5	–0.3	–0.8
Unit labour costs	2.1	2.1	2.0	2.4	2.3
Government budgets (including partial funding)					
Revenue	2.7	1.8	1.5	1.6	1.2
of which: taxes	–1.7	–2.9	–3.2	–3.1	–3.4
social insurance contributions	9.5	8.8	8.4	8.5	8.1
Expenditure	0.5	0.0	–0.7	–1.0	–1.3
of which: government consumption	1.4	1.1	0.6	0.4	–0.1
current transfers paid	–0.3	–1.1	–2.0	–2.6	–2.8

Source: Simulation using the DIW's version of the econometric business-cycle model of the six leading German economic research institutes.

– It is assumed that around one-quarter of the additional contribution payments by employees are offset by a reduction in voluntary savings (for life insurance premiums etc.). To this extent – to which the subsequent level of provision in old age is also affected – private consumption remains unaffected. In these scenarios, as in the first, it is not, however, assumed that substitution occurs via a reduction in spending on home ownership; in this regard all the scenarios are 'optimistic'.

The only difference between variants II and II is that in the latter it is assumed that the pension level is also reduced. In variant II the macroeconomic effects of introducing a funded component are comparatively moderate; after five years job losses would not exceed a maximum of 100 000. However, the volume of capital saved would also be significantly lower, because the staged rise in contribution rates by 2.5 percentage points after five years represents less than two-thirds of the 4-percentage-point increase in variant I. However, given that the burden is borne solely by employees, unit labour costs remain virtually unchanged. As a result there is no deleterious effect on German exports. The staged nature of the increase avoids shock reductions in disposable income and thus of private consumption and economic growth. In the fifth year after introduction GDP would be around three-quarters of a point lower than in the status quo scenario. In other words, average annual economic growth would be reduced by around 0.15 of a percentage point.

The additional cut in pension levels in scenario III is equivalent in quantitative terms to the rise in funded contributions, redistributing burdens between contribution payers and pensioners. The funds freed up by the cut in pension levels are not used to reduce the burden of pay-as-you-go contributions in this scenario, but rather for capital formation. By this means it is possible to save a significantly larger volume of capital than in

Table 2

Variant II: Macroeconomic Effects of an Increase in Contribution Rates to Finance a Partially Funded Pension Insurance System

in % of status quo

	1st year	2nd year	3rd year	4th year	5th year
Assumptions					
Increase in the rate of contribution to the pension insurance fund, %-points	0.5	1.0	1.5	2.0	2.5
Results					
Employment	–0.1	–0.1	–0.2	–0.3	–0.3
Productivity (per person in employment)	–0.1	–0.1	–0.2	–0.3	–0.4
GDP, real	–0.1	–0.3	–0.4	–0.6	–0.7
Private consumption, real	–0.2	–0.5	–0.8	–1.1	–1.3
Government consumption, real	0.0	0.0	–0.1	–0.1	–0.2
Price index of private consumption	0.0	–0.1	–0.1	–0.2	–0.3
Price index of GNP	0.0	0.0	–0.1	–0.2	–0.3
Real external value (DM area)	0.0	0.0	0.0	0.0	0.0
Gross wage and salary income	–0.1	–0.2	–0.4	–0.5	–0.8
Gross entrepreneurial income	–0.3	–0.4	–0.5	–0.8	–0.9
Net entrepreneurial income	–0.3	–0.5	–0.6	–0.9	–1.0
Net wages and salaries	–0.7	–1.4	–2.1	–2.9	–3.7
Collective wage rates	0.0	0.0	–0.1	–0.2	–0.4
Unit labour costs	0.1	0.1	0.1	0.0	0.0
Government budgets (including partial funding)					
Revenue	0.3	0.5	0.7	0.8	0.9
of which: taxes	–0.2	–0.5	–0.8	–1.2	–1.6
social insurance contributions	1.0	2.0	2.9	3.8	4.6
Expenditure	0.0	–0.1	–0.3	–0.6	–0.9
of which: government consumption	0.0	0.0	0.2	–0.3	–0.5
current transfers paid	–0.1	–0.3	–0.6	–1.0	–1.4

Source: Simulation using the DIW's version of the econometric business-cycle model of the six leading German economic research institutes.

variant II. On the other hand, economic growth is affected considerably more seriously than in variant II. The reduction in pension levels serves to further depress private consumption. After five years total output would be percentage points lower than in the status quo scenario, implying growth losses of 0.3 of a percentage point a year, and a fall in the level of employment of around 250 000 after five years. It should be noted that one reason why the macroeconomic effects are less pronounced than in variant I is because in both variants II and III partial substitution effects are assumed between voluntary saving and the additional compulsory contributions to the capital funded pension insurance scheme.

Conclusion

The model simulations of the short-term macroeconomic effects of introducing a funded component into the statutory pension insurance scheme reveal the economic problems during the introductory phase of a shift towards a more capital-funded system of old-age provision. Variants were analysed in which the burden of financing the formation of a capital stock is distributed in different ways. The implications of these different variants for income distribution would need to be considered separately.

The simulations have shown that the introduction of a significant funded component, one that would enable overall contribution rates to be stabilised, would be associated with growth losses of between 0.3 and 0.5 of a percentage point a year during the transitional phase. The growth impetus expected by proponents of the move towards a funded system will be achieved, if at all, only in the very long term; even if it is assumed that capital market interest rates are induced to fall by one percentage point, there is no decisive change in the simulation results.

Table 3

Variant III: Macroeconomic Effects of an Increase in Contribution Rates to Finance a Partially Funded Pension Insurance System

in % of status quo

	1st year	2nd year	3rd year	4th year	5th year
Assumptions					
Increase in the rate of contribution to the pension insurance fund, %-points	0.5	1.0	1.5	2.0	2.5
Decrease of transfers paid	–0.9	–2.1	–3.4	–4.8	–6.2
Results					
Employment	–0.1	–0.3	–0.5	–0.6	–0.7
Productivity (per person in employment)	–0.2	–0.3	–0.5	–0.7	–0.8
GDP, real	–0.3	–0.6	–0.9	–1.2	–1.5
Private consumption, real	–0.5	–1.1	–1.7	–2.3	–2.9
Government consumption, real	0.0	0.1	–0.1	–0.3	–0.4
Price index of private consumption	–0.1	–0.2	–0.3	–0.5	–0.7
Price index of GNP	0.0	–0.1	–0.2	–0.4	–0.6
Real external value (DM area)	0.0	0.1	0.1	0.1	0.0
Gross wage and salary income	–0.2	–0.4	–0.8	–1.2	–1.7
Gross entrepreneurial income	–0.6	–1.0	–1.2	–1.7	–2.0
Net entrepreneurial income	–0.7	–1.1	–1.3	–1.9	–2.2
Net wages and salaries	–0.8	–1.6	–2.6	–3.5	–4.5
Collective wage rates	0.0	0.0	–0.2	–0.5	–0.9
Unit labour costs	0.1	0.2	0.1	0.1	–0.1
Government budgets (including partial funding)					
Revenue	0.1	0.1	–0.1	–0.3	–0.5
of which: taxes	–0.4	–1.1	–1.9	–2.6	–3.4
social insurance contributions	0.9	1.8	2.5	3.1	3.7
Expenditure	–0.4	–1.0	–1.7	–2.5	–3.3
of which: government consumption	0.0	–0.1	–0.4	–0.7	–1.1

Source: Simulation using the DIW's version of the econometric business-cycle model of the six leading German economic research institutes.

In all the simulations lower growth leads to higher government deficits. If government were to seek to counter this by reducing spending or raising taxes, the growth losses would be even greater.

Raising the contribution rates in small steps, as envisaged by the German government, avoids subjecting the economy to a negative shock. It is also helpful, in terms of demand, if supplementary contributions are offset by a reduction in voluntary saving. If intensive use were made of this scope, the negative macroeconomic effects would be minor; of course, this would be at the cost of pension levels in future, however. Simulation variants that approximate to the concept proposed by the German government for introducing a supplementary, funded system of old-age provision are associated with short-term growth losses of between 0.3 and 0.15 of a percentage point a year. In the variant with the smallest growth losses (variant II), however, the capital stock formed is too small to avoid a rise in contribution rates in the longer term.

The contractionary impact on the macroeconomy of the introduction of a funded component applies irrespective of the institutional form they take, that is not just to statutory, but also to company pension schemes and private saving to provide more income in old age.

Irrespective of the short-run macroeconomic effects a move towards funded elements in the system of old-age provision must be combined with a credible system of security. In particular it is necessary for government to monitor and regulate the funded pension entitlements that insured persons will in future be able to acquire for their retirement in such a way that expectations are not disappointed.

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