Prospects for, and obstacles to, a stronger reliance on funding in the statutory system of old-age provision in Germany

The population of Germany, like that of many other industrialised nations, is undergoing a shift in age structure, which will place an increasing financial strain on social security systems. As a result, the question of whether the pay-as-you-go principle long prevalent in Germany should be accompanied, or even completely replaced, by the funding principle has been discussed in both the academic and political arenas, with special reference to the statutory pension insurance system. The principal features of these two financing alternatives are presented in the following, and their suitability is assessed in the light of the expected demographic trend. Some conclusions will be drawn concerning Germany on the basis of this assessment.

Basic features of the pay-as-you-go and funded systems

Systems of old-age provision are characterised by a variety of features and are subject to different principles of organisation depending on the country involved. In respect of their financing, all pension scheme variants may ultimately be reduced to two basic types: the "pay-as-you-go" system and the "funded" system. The pay-as-you-go system is based on the notion of what is known in Germany as "the contract between generations", according to which those members of society who are still able to work care for those no longer capable of working. In this system cur-

Two basic systems of old-age provision:

The pay-as-you-go system ...

rent revenue (arising from contributions or taxes) is applied directly to cover ongoing (pension) expenditure. The sole reason for holding a reserve is to ensure continuous liquidity against short-term fluctuations in inpayments and outpayments and so avoid having recourse to the credit markets. Key parameters governing a pay-as-you-go system financed by contributions are the pension level, defined as the ratio between average pension and average earnings, and the pensioner ratio, defined as the ratio of pension recipients to contribution-payers. If both the pension level and the pensioner ratio are known, then the contribution rate is automatically given as well. If the number of elderly persons increases and the pension level remains constant, the contribution rate must rise. The only exception to this rule presupposes that additional revenue sources have been found – for example, transfers from other public authorities; these transfers, however, must also be financed.

... and the funded system

In a funded, as opposed to a pay-as-you-go, pension insurance scheme, the budget is balanced over a period corresponding to average life expectancy and not annually; a phase, in which capital is accumulated, is followed by one in which it is liquidated. The cash value of contributions for each risk group (e. g. men or women of a certain age group) must be equivalent to the cash value of the corresponding pension payments.

Returns under each system

The individual return in a system of old-age provision is determined by the relationship between pension payments and contribution payments. In the case of someone joining an existing pension insurance scheme financed on a pay-as-you-go basis and with complete contribution equivalence,[1] the return roughly corresponds under simplifying postulates to the growth rate for total wages paid; this, in turn, is composed of the change in average earnings and the number of persons employed.[2] In a funded system, by contrast, the size of the return depends on the yield generated by contributions invested in the markets. Regardless of the type of financing involved, the individual return will be higher in each pension insurance scheme, the higher the life expectancy of the individual.

Significance of the financing system in an ageing population

Population forecasts

Long-term population forecasts for the Federal Republic of Germany predict a substantial decline in total population. In keeping with most demographic forecasts, the following arguments will assume that the population will decrease in the next thirty years by approximately 10 million, while the number of elderly persons is expected to rise by roughly 6 million. The ratio of persons 60 years of age or older to the number of persons of working age – what is known as the elderly dependency ratio – is likely to almost double to just under 75 % by 2030 (see the chart on page 17). Thus the pay-as-you-go system is caught in a dangerous dilemma, even if it is acknowledged that what is ultimately de-

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1 Excluding disability pensions and survivors' pensions as well as "non-insurance-related benefits" financed through contributions.
2 In the introductory period, however, the return is substantially higher.

cisive here is not the elderly dependency ratio but the ratio of pensioners to contribution-payers.
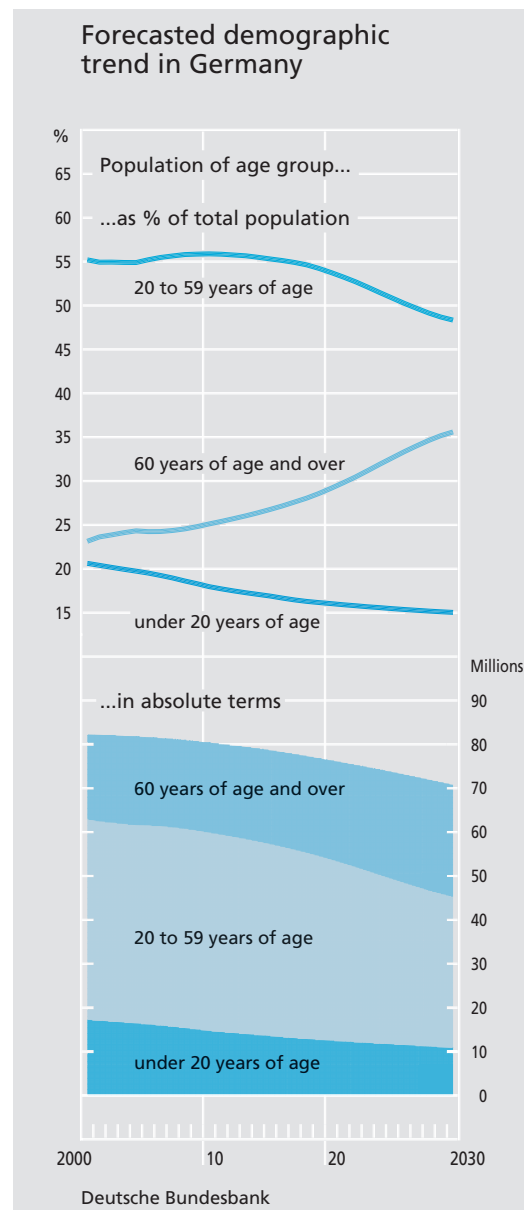
Importance of the labour market

The labour market situation will critically affect the direction in which the ratio of contribution-payers to persons able to work (i.e. potential contribution-payers) develops. Not all persons of working age offer their services on the labour market (i.e. persons not classified as being in the labour force), and not all of those offering labour services are employed in areas subject to compulsory insurance (unemployed persons, self-employed persons, civil servants). At the present time only an approximate two-thirds of those persons able to work are also contribution-payers. If this ratio were to persist unchanged, then the number of additional contribution-payers needed to stabilise the pensioner ratio would reach 17 million by the year 2030. Given the preceding it should be evident that an improvement in the labour market situation and a higher participation ratio in the labour force may ease, but even under exceptionally favourable conditions cannot resolve, the pension problem.[3]

Macro-economic significance of the demo-graphic trend ...

Even apart from the pension problem, the expected demographic changes cannot fail to affect growth and national product distribution, variables which will have an impact, in turn, on how the system of old-age provision is financed. The possible economic consequences of this demographic trend and their effect on the pension scheme are outlined

... illustrated by means of a simple growth model

with the aid of a simple macroeconomic model that is described more fully in the annex. In this model the projected population

Forecasted demographic trend in Germany

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parameters are treated as exogenous variables and their effect on the origin and distribution of national product is calculated as endogenously given (for details, see the table on page 18).

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3 The forecast assumed a constant immigration surplus of 80,000 persons per year, averaging 25 years of age. Sensitivity analyses allowing for a significantly higher degree of immigration indicate that even under these circumstances the shift in age structure can only be slowed down; it cannot be averted.

Model calculation for the origin and distribution of national product

Year 2000 = 100;
Rate of technical progress: 1.0 % per annum [1]

Item	2000	2010	2020	2030
Population	100	98	93	86
Elderly dependency ratio [2]	0.423	0.453	0.546	0.738
Origin of national product				
Constant employment ratio [3]				
Employment	100	99	90	75
Production	100	114	122	120
Per capita production [4]	100	117	131	140
Real wage	100	116	135	160
Rising employment ratio [5]				
Employment	100	103	99	86
Production	100	119	131	135
Per capita production	100	121	142	157
Real wage	100	115	133	157
Distribution of national product				
Constant employment ratio				
Constant contribution level				
Contribution rate	100	100	100	100
Pension level [6]	100	93	77	57
Per capita income				
of pensioners	100	111	115	109
of contribution payers	100	114	131	149
of non-pensioners [7]	100	119	138	156
Constant pension level				
Contribution rate	100	107	129	175
Pension level	100	100	100	100
Per capita income				
of pensioners	100	116	134	153
of contribution payers	100	113	122	124
of non-pensioners	100	117	129	129
Rising employment ratio				
Constant contribution level				
Contribution rate	100	100	100	100
Pension level	100	97	84	65
Per capita income				
of pensioners	100	115	123	122
of contribution payers	100	114	129	146
of non-pensioners	100	123	149	175
Constant pension level				
Contribution rate	100	103	118	153
Pension level	100	100	100	100
Per capita income				
of pensioners	100	117	136	157
of contribution payers	100	113	124	128
of non-pensioners	100	123	143	153

1 Significantly different results are obtained when other rates of technical progress are chosen. Assuming the rate of progress to be, for example, 0.5 % (1.5 %), per capita production at the end of the period under review would amount to 113 (174) or, in the event of an an improvement in labour market conditions, to 126 (194). — **2** Ratio of persons aged 60 and over to persons aged 20 to 59 years of age. — **3** Constant ratio of contribution payers to persons able to work. — **4** Production per unit of population. — **5** Increase in the ratio of contribution payers to persons able to work by 0.44 % per annum. — **6** Ratio of average gross pension to average gross earnings of employed persons. — **7** Persons younger than 60.

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The expected demographic trend will result in an initially muted decline in the number of employees subject to compulsory insurance, which will then accelerate at an increasingly rapid pace. This will be accompanied by a progressive slackening in economic growth. How extreme this slowdown turns out to be will depend not only on developments in the production factors, labour and capital, which are determined endogenously in the model, but also on the extent of the increase in total factor productivity; the latter may be viewed as being conditional on the rate of technical progress, and the value posited for it will have a considerable influence on the results obtained using the model. In the calculations for the main model variant, the rate of progress was assumed to be 1% per annum (for more details, see the explanations in the annex).

Effects on economic growth …

Assuming a constant employment ratio (defined as the ratio of contribution-payers to those able to work), real national product might even decline in absolute terms between 2020 and 2030; even then, real production per capita will increase in keeping with the shrinking population. If, alternatively, the employment ratio rises, then the increase in per capita production will be larger, while the increase in real wages will be partly offset by the hiring of additional labour with increasingly lower levels of productivity.

… and income distribution

As for the distribution of national product among "the old" and "the young", either pensioners or contribution-payers will be called upon to bear the brunt of this demographic shift in the form of a less favourable

trend in income, depending on whether the contribution rate or the pension level is kept constant. If the contribution rate remains unchanged, the disposable per capita income of pensioners will increase by only 9 % (22 %) during the entire 30-year period, assuming a constant (or rising) employment ratio, while the contribution-payers' disposable per capita income will rise by 49 % (46 %). If the gross pension level remains unchanged, the per capita income of pensioners will increase by 53 % (57 %) and that of contribution-payers by 24 % (28 %). Both calculations point to a substantial shift in the distribution of income between pensioners and the rest of the population; a lowering of the pension level would, however, have a relatively stronger impact on the real income of the pensioners concerned than would an increase in the contribution rate for the economically active population.[4]

Further aspects As revealing as it is to compare changes in real income when identifying distribution options, it is not possible to draft reform proposals solely on the basis of such comparisons. Assuming, for example, that the contribution rate were held constant, contribution-payers would, as a consequence of the relatively sharp rise in their disposable real income, be able to invest in an additional funded system of old-age provision; this would boost their total retirement income far beyond the pension provided by the pay-as-you-go system. This effect would especially benefit younger insured persons while age groups close to retirement age and pensioners would be more directly affected by the attenuated rise in their real income which would result from a reduction in pension

level. The foregoing analysis, which has been supplemented with cohort-specific considerations, demonstrates that a decision in favour of freezing either the pension level or the contribution burden will have a considerable impact on intergenerational income distribution. Accordingly, those who subscribe to the view that financial relief should be given to future generations at the expense of the present generation of pensioners would have to devote more attention to placing a ceiling on the contribution rate.

The model calculation data highlight the problems associated with preserving the pay-as-you-go pension scheme in its current form. They underscore the necessity of considering reforms that, for example, would encourage greater reliance on a funded system. These reforms could be implemented either on an individual basis or as part of a company retirement plan.

Even funded pension schemes, however, are not immune to demographic changes. If the period in which pension benefits are received is prolonged on account of higher life expectancies, larger contributions will be necessary here as well to hold the pension level constant. If, by contrast, the change in population is caused by a decline in the birth rate, this demographic shift will have no adverse consequences for funding in the immediate future. Still, given a shrinking population in the "mature" phase, capital liquidation on the part of pensioners is likely to exceed capital accumulation, a development which may

Demographic trend also affects funded systems

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4 The main reason for this is that the number of pensioners is smaller than the number of contribution-payers.

lead to falling asset prices and thus reduce pensioners' consumption potential. One alternative might be to invest abroad, but this would merely be adding political risks and the exchange rate risk – if the investment is made outside the euro area – to the original capital market risk. Finally, it is important to note that although Germany is particularly hard hit by the ageing of its population, other countries will by no means be spared this problem in the coming years.

The "Macken-roth thesis"

In particular, the "Mackenroth thesis", which maintains that total social security expenditure must always be covered by the national income of the current period,[5] has been adduced as proof that the funded and pay-as-you-go systems basically have the same effects in real economic terms. Considered in itself, however, this statement merely describes circular flow, i. e. accounting identities. More specifically, it presupposes a closed economy and a specific level of national income; it also overlooks the possibility that a given capital stock might be "depleted" through a failure to engage in replacement investments.

Consequences of the form of financing for economic growth

Most importantly, the assumption that national income may develop independently of the financing arrangement chosen has continually been questioned. The crucial hypothesis in this connection is that national savings and ultimately growth potential are curtailed by the introduction of a pay-as-you-go pension scheme and, conversely, that they are promoted by the introduction of a funded pension scheme. This hypothesis has been the subject of controversy in the academic literature. Nevertheless, the majority of empirical studies on this topic, which show marked differences both in their methodology and in their results, draw the conclusion that the national saving ratio would probably be reduced by introducing a pay-as-you-go pension system.[6] Alternatively, a limitation of the pay-as-you-go system would likely increase the national saving ratio and through the resulting decline in the real interest rate stimulate overall economic growth.

In choosing an adequate financing procedure for the system of old-age provision, it is important to consider not only its effects on the economy as a whole but also the individual return that can be earned in various systems currently in use. Models may be employed to show that in dynamically efficient economies the rate of wage increase in long-term equilibrium can, at its highest, be just as high as the capital market return.[7] Indeed, past evidence indicates that the capital market rate usually lies above the rate of increase in total wages paid. This is no less true today, although capital market rates are now at a very low level. Given the greater vulnerability of a pay-as-you-go system to demographic trends, its returns will presumably decline more steeply in future than those of a fully funded system.

Return-related considerations

5 Gerhard Mackenroth, Die Reform der Sozialpolitik durch einen deutschen Sozialplan, in: Erik Boettcher (ed.), Sozialpolitik und Sozialreform, Tübingen 1957, page 45.
6 See, for example, George A. Mackenzie, Philip Gerson, and Alfredo Cuevas, Pension Regimes and Saving, IMF Occasional Paper No. 153, Washington, D.C. 1997.
7 See, for example, David Romer, Advanced Macroeconomics, New York 1996, pages 81–85.

Difficulty in comparing returns

A simple comparison of returns, however, fails to do justice to the complexity of the German pension insurance system. It should be noted that in addition to enjoying certain tax privileges, the pension insurance scheme in Germany, apart from offering old-age benefits, also provides disability and survivors' benefits. Its services include non-insurance-related benefits as well, which, however, are backed by tax-financed grants from the Federal budget. Moreover, relationships that obtained in the past cannot simply be assumed to apply in the future, especially if an increased reliance on funded systems will at that time be accounting for additional revenue. For all of these reasons it is difficult, in the end, to attach an exact value to differences in returns.

Problems involved in the transition from a pay-as-you-go to a funded system

Current claims as an impediment to a change of system ...

The replacement of a pay-as-you-go system with a funded one introduces transitional difficulties which do not arise when a system of old-age provision is built up from scratch. More specifically, it should be borne in mind that the property-like entitlements which have so far been acquired in the context of the existing pension insurance scheme represent an implicit liability for the public social security system. Even if from this moment on no new entitlements were to be granted in the old system, the implicit debt would still have to be serviced until the last claim had been redeemed. During this long period, contribution-payers would be required to finance

their own funded pension scheme while simultaneously satisfying old claims.

A number of simulation studies have examined the effects of a full or partial transition to a funded pension insurance system for an ageing population. These calculations share the assumption that the interest rate/growth rate differential is positive and thus that the funded system offers a returns advantage. This assumption, in turn, makes a lower contribution rate possible in the future. At the same time these findings show a raising of the contribution rate to be necessary at the outset, the extent of the increase varying with the scope of the transition to the funded system being modelled. The result is a certain smoothing of the contribution rate's development, which in itself is to be welcomed, always assuming that the welfare losses associated with a rising levies' burden increase disproportionately.

... and the means of financing them

In the end, however, it should not be forgotten that the implicit debt of a pay-as-you-go pension system has to be serviced. Thus the shift to a fully funded system will inevitably entail additional financial strain. It is true that this burden may be distributed across generations in any conceivable manner with the help of government borrowing; an increase in efficiency, however, cannot be expected without appealing to more specific assumptions concerning the effects of social security contributions, on the one hand, and of taxes used to finance interest payments and debt redemption, on the other – particularly the effects which they might have on labour sup-

The basic problem involved in the transition from a pay-as-you-go to a funded system

Each year a pay-as-you-go pension system with pensions linked to wage increases exacts what is, in effect, an implicit tax (IT), amounting to the product of the difference in returns generated by the pay-as-you-go and funded systems times the cash value of the implicit debt (ID) of the pension system. The implicit debt is equal to those pension entitlements already owned by pensioners and contribution payers – their "social security wealth". Assuming constant contribution rates, these claims grow annually at the rate of total wage growth g. Had these assets been invested in the capital market instead, a return equivalent to r could have been earned. Thus each year all insured persons suffer a loss amounting to the implicit tax:

$$IT = (r–g) \, ID$$

Once the shift had been made to a funded system, pension claims acquired subsequently would no longer be subject to this implicit tax. It would still be necessary, however, to honour the old claims, either by borrowing at the interest rate r (here identified, for the sake of simplicity, with the capital market return) or by raising additional tax revenue at a rate reflecting the opportunity cost of the return foregone, i. e. r. If implicit debt is first converted, through borrowing, into public debt outstanding and the public debt ratio (the ratio of additional public debt to the total wages paid the insured) is held constant from that point on, an equal intergenerational distribution of the financing burden associated with the old claims is possible in long-term equilibrium, assuming there is no change in the age structure. Absolute debt must then grow each year at the rate g. Thus a portion of the interest payments due each year at the interest rate r must be shifted forward through additional borrowing; the remaining portion (r–g) must be raised each year through taxes. The resulting tax for the financing of interest payments (ZT) is the exact counterpart of the implicit tax:

$$ZT = (r–g) \, ID$$

In the case of a public debt ratio that declines over time, unsettled public debt may be allowed to grow only at a rate less than g. An even larger share of the financing would then have to be raised through taxation. This would, in turn, place a financial burden on the present generation vis-à-vis future generations in excess of that which would be incurred by the preservation of the pay-as-you-go system. In the case of a rise in the debt ratio, the converse applies. Any conceivable distribution of this burden across generations may, in principle, be modelled.

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ply.[8] This is, however, to abandon the hope that the gain in efficiency associated with a change of system might be distributed across generations in such a way that none would be worse off and at least some would be better off. The higher long-term returns which may be expected under a fully funded system can only be purchased at the price of additional financial strain, the cash value of which is, in principle, precisely equivalent to the returns advantage (see the adjacent explanations).

Incentive for the individual economic agent to change systems

There are, however, other arguments which speak in favour of a partial replacement of the pay-as-you-go system. Thus on the level of the individual economic agent an incentive exists to change systems, that is, to evade the insurance requirement – an incentive which is stronger, the larger the difference in returns to the individual concerned. The impetus to change systems may express itself, for example, in a preference for self-employment or in a transfer of earnings to the shadow economy. When viewed against this background, even so-called "pseudo-self-employment" and marginal employment arrangements appear to be more a symptom than a cause of the financing problems afflicting social security systems. Given a population that is simultaneously shrinking and age-

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8 It can be shown on the theoretical level that a pareto-efficient transformation of the system into a fully funded one is only possible if the effect of the various forms of financing (contributions, on the one hand, and the taxes needed to service public debt, on the other) on labour supply is such that the taxes needed to finance old claims result in fewer inefficiences than the pension contributions in the old system. The gains in efficiency, which result from the removal of distortions introduced by the pay-as-you-go pension scheme, may then be used to offset the transitional burden.

ing, the returns advantage of a fully funded system is likely to increase further and the assessment basis for contributions to erode at an even faster pace. Thus, if the system of old-age provision is to be placed on a basis that is sustainable over the long term, reforms are necessary which will also dampen the misguided incentives governing the actions of individual economic agents.

Need for a broader allocation of risk

Another argument in favour of a more balanced mixture of financing options, including a partly funded approach, is the need to allocate risk more broadly. Thus a public pay-as-you-go system is vulnerable not only to demographic shifts but, even more importantly, to changes in productivity and in the labour market. It is also subject to political risks such as a reduction in benefits or a weakening of the equivalence principle. The pension which in a fully funded system is provided on a privately financed basis corresponds to the returns earned and thus depends on developments in the capital market in general as well as on the particular form in which savings have been invested. The imponderables affecting such investments include exchange rate risks and those political risks peculiar to foreign investments. Consequences arising from the liquidation of assets on reaching old age must also be taken into account. Although claims against private pension insurance schemes are also subject to political risk, they differ from the entitlements in a public pension insurance scheme in enjoying the more extensive protection which is afforded private property vis-à-vis the state.
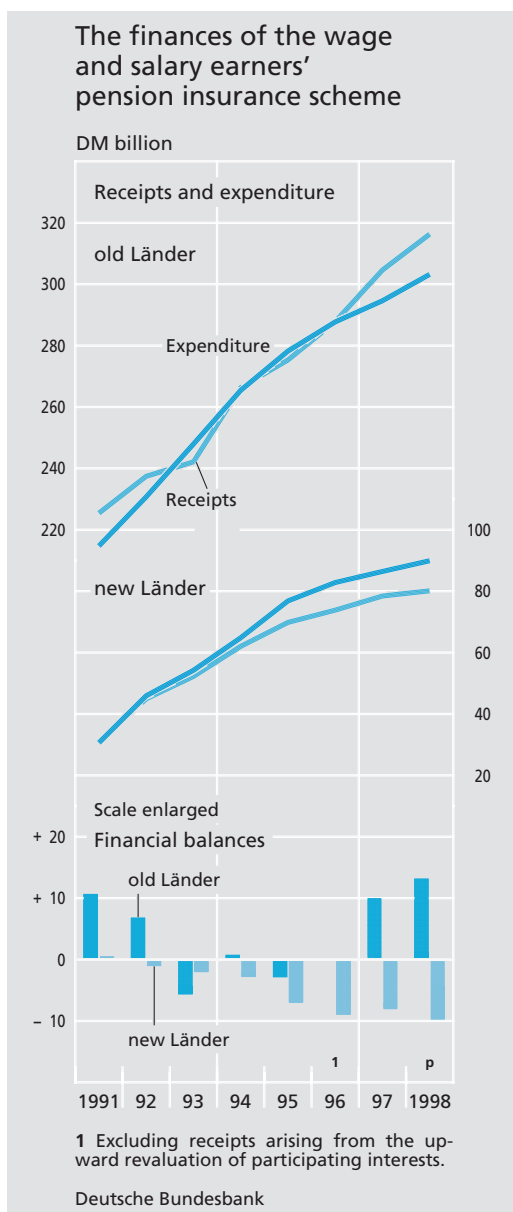
The statutory system of old-age provision in Germany: Starting position and outlook

In the nineties, the financing of the pension insurance scheme in Germany was accompanied by a rising contribution rate; the rate had to be raised from 17.7 % in 1991 to 20.3 % in 1997. This rise, however, was in essence not yet demographically motivated; rather, problems relating to the labour market, especially to that of the new Länder, were responsible.

Sharp rise in the contribution rate ...

The new group of insured persons originating in eastern Germany might have been integrated with less difficulty into the west German system if the ratio of pension recipients to contribution-payers and the ratio of average pension to average earnings for the new population group had corresponded more closely to the ratios then prevailing in the west German pension insurance scheme. These conditions were, however, not fulfilled during German unification. The ratio of pensioners to contribution-payers was considerably less favourable in the new Länder, primarily because of the substantially higher unemployment rate there but also because of the greater number of women holding pension entitlements of their own. The problem was compounded by the fact that the ratio of average pension to average wage was markedly higher in the east German Länder, chiefly owing to the past, near-continuous working life of its citizens, which was taken into account in the pension conversion process. Thus, the contribution rate for the new Länder, if viewed in isolation, would actually

... above all in the wake of reunification ...

The finances of the wage and salary earners' pension insurance scheme

DM billion

Receipts and expenditure

old Länder

Expenditure

Receipts

new Länder

Scale enlarged
Financial balances

old Länder

new Länder

1991 92 93 94 95 96 97 1998

1 Excluding receipts arising from the upward revaluation of participating interests.

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rapid deterioration in the financing of the pension insurance scheme. Between 1990 and 1995 the number of contribution-payers receiving benefits on reaching 60 years of age owing to unemployment, expressed as a percent of the total number of new old-age and disability pension recipients, virtually trebled in Germany from 7 ½ % to just over 22 % (see the chart on page 25). The effects of early retirement on the pension insurance scheme were twofold: Not only did pensions have to be paid out prematurely but revenue from contributions were lost as well. In the following two years, the share of early retirements stabilised at a relatively high level. 1998 offered hints of a decline. A major reason for this – apart from the fact that the regulation governing transitional old-age benefits in the new Länder had expired – was the 3.6 % deduction to be paid for every year of accelerated retirement (i. e. for every year of retirement prior to the normal retirement age). This arrangement, which had effectively been approved as part of the Pension Reform Act of 1992, was introduced in 1997, earlier than expected, in connection with the 1996 Growth and Employment Promotion Act.[10]

Reform plans of the previous Government ...

As a result of the pressure which the labour market, in particular, has exerted on pension

have had to have been significantly higher. This was avoided by integrating persons insured there in a pan-German pension insurance scheme, a move which necessitated substantial transfers of funds to east German pension insurance institutions.[9]

... and increase in early retirement

Since the beginning of the nineties, a higher incidence of early retirement – in the old Länder as well – has contributed to an even more

9 In 1998, just over DM 19 billion were transferred as part of a revenue-sharing programme within the pension insurance scheme which, given the smaller contribution potential of the new Länder, would have required a rise in the contribution rate of roughly 7 ½ percentage points. Conversely, the contribution rate in western Germany would have been approximately 1½ percentage points lower if this revenue-sharing programme had not been adopted.
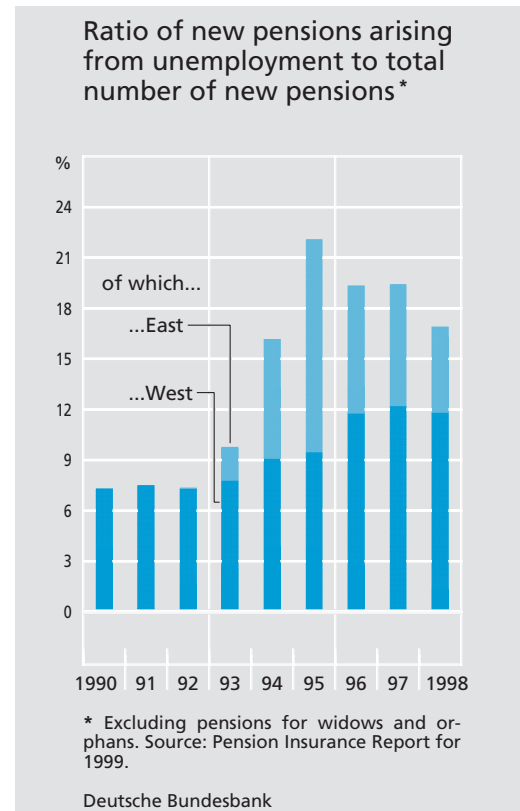**10** Even these deductions, however, have probably been set too low, given the costs incurred; consequently, an incentive for early retirement still exists and persons who decide to continue working are being "punished".

insurance contributions over the last decade, the statutory pension insurance scheme is poorly positioned to come to terms with future demographic problems. This was one of the reasons why the question of the future tenability of a pay-as-you-go system found its way relatively quickly onto the political agenda again despite the fact that the Pension Reform of 1992 was envisaged for the long term. The Pension Reform Act of 1999, which was passed at the end of the preceding legislative period, introduced, amid other changes, a demographic correction factor; the purpose of this factor was to ensure that from 1999 on annual pension adjustments would no longer depend solely on changes in net wages but that they would also decline in proportion to an increase in the life expectancy of the elderly and thus to a corresponding prolongation of the pension benefits period. Safety clauses were intended to guarantee that the use of this factor did not result in absolute pension cuts and that, in general, the net standard pension level did not fall below 64 % (as opposed to just under 70 % under the status quo).

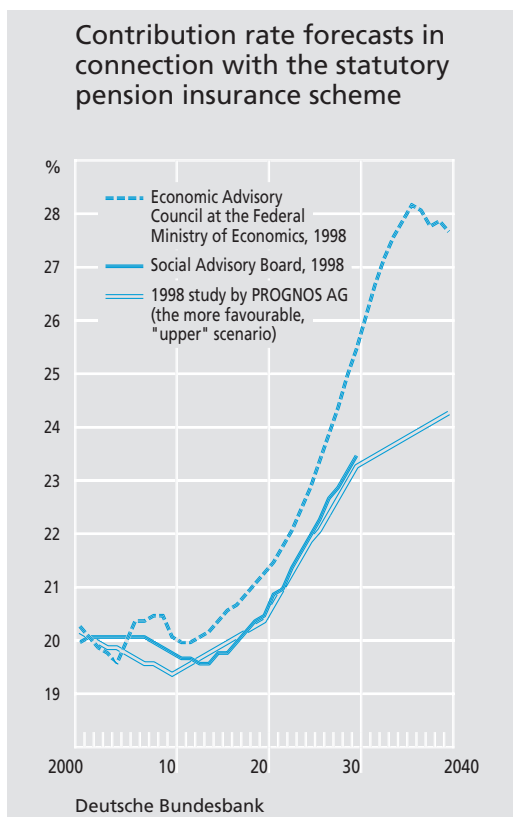*... replaced by programme of the current Government*

With passage of the "Act for the introduction of corrective measures in the social security system and for the safeguarding of employee rights" in 1998, the new Federal Government also rendered this correction factor inoperative for two years. The budget consolidation act, which has recently been approved, allows those pension increases that are in principle indexed to changes in net wages to be restricted in 2000 and 2001 to adjustments for inflation. This measure will likewise effect a lowering of the pension level, but

Ratio of new pensions arising from unemployment to total number of new pensions*

* Excluding pensions for widows and orphans. Source: Pension Insurance Report for 1999.

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one that will initially be more extreme while remaining, on the whole, more moderate. A more fundamental structural reform of the pension insurance scheme is being prepared for the period following 2001.

Aside from efforts to influence the benefits side, the last few years have also witnessed several measures designed to curtail the rise in the contribution rate simply by redistributing the financial burden. Thus an additional Federal grant financed by a value-added tax increase was introduced in 1998; it was the only way to prevent the contribution rate from being raised from 20.3 % to 21.0 % in 1998. The current Federal Government has been travelling along the same path, using the "ecological tax reform" to ensure that the contribution rate could be lowered to

Finance "restructuring" as a means of lowering the contribution rate

Contribution rate forecasts in connection with the statutory pension insurance scheme

%

- - - Economic Advisory Council at the Federal Ministry of Economics, 1998
—— Social Advisory Board, 1998
— 1998 study by PROGNOS AG (the more favourable, "upper" scenario)

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Council at the Federal Ministry of Economics shows a figure of 26% (see the above chart).[11] Other model calculations yield significantly higher rates.[12] When coupled with the realisation that these demographic trends will likewise affect tax payments (used to finance, *inter alia,* increasing Federal grants) and contributions to health and nursing insurance schemes, these long-term model calculations suggest an urgent need to act.

Prospects for changing the system of old-age provision in Germany

Complete change of system not possible given cost of transition

The deep-rooted structures underlying the German pension insurance system cannot be left out of account when considering the issues of pension reform in Germany and the intergenerational distribution of those financial burdens associated with demographic change. The magnitude of implicit debt and the corresponding cost of shifting to a fully funded system pose too large an obstacle to make such a transition feasible. The problem of risk allocation also makes a fully funded system appear less desirable.

"Refinancing" no real alternative in the end

Alternatively, the pay-as-you-go pension insurance scheme cannot be allowed to continue unchanged if contribution rates are not to be raised to unacceptable heights that

19.5% effective April 1, 1999. The tax on energy consumption is to be raised in four additional stages ending in 2003 so that additional funds may be funnelled to the pension insurance scheme.

Forecasts for the long-term development of the contribution rate

All the model calculations available on long-term trends in the contribution rate for the pension insurance scheme point to a demographically induced rise, the exact magnitude of which, however, varies considerably, depending on which assumptions underlie the model in question. Like the calculations which the Social Advisory Board *(Sozialbeirat)* solicited from the Ministry of Labour and Social Affairs, the latest study by PROGNOS AG concludes that the contribution rate will lie between 23% and 24% in 2030. A projection made by the Economic Advisory

11 These calculations are based on the legal situation at the time of the Pension Reform Act of 1999 and thus presuppose that the demographic factor has been introduced.
12 Divergent assumptions concerning future developments in the wage tax ratio are largely responsible for the difference in findings. If the ratio is assumed to rise, this will, in keeping with the present net adjustment procedure, slow down increases in pension benefits and thus the rise in the contribution rate.

would have an adverse impact on employment policy. At the present time, non-wage labour costs, a major component of which consists of the pension insurance contribution, appear to have already reached a point where they inhibit growth and curtail employment. The alternative adopted in the last few years, which removes the pressure on the pension scheme at the tax payer's expense, only obscures the problem in the end: The burden has not been reduced but merely relocated. Although this strategy has been justified, as a matter of policy, with reference to non-insurance-related benefits, this approach, if pursued far enough, would ultimately undermine the practice of contribution-based financing. Broad-based tax financing is, at best, consistent with the notion of a basic social security system, which would then have to be supplemented by a private, funded pension scheme – an arrangement that can, incidentally, be found in other countries.

A bolstering of the pay-as-you-go system through increased reliance on a funded system ...

One solution that suggests itself with regard to the German system of old-age provision is to reduce the ratio of average pension to average earnings in the pay-as-you-go system and so avoid a more substantial increase in the contribution rate. This, in turn, would leave room for a supplementary funded pension insurance system, which would suffice to close the gap opened up by pension cuts in the pay-as-you-go system, not least owing to the higher individual returns that could be expected.[13] The structural reform of the pension system envisaged by the Federal Government indicates that it is also intent on pursuing this option. Thus, according to the plan,

... being planned by the Federal Government

an initial amount equivalent to 0.5 % of earnings subject to compulsory insurance would be paid by the employees into a funded system of old-age provision in 2003; in each subsequent year up to 2007, the funded contribution would increase by 0.5 % percentage points, reaching in the end a maximum of 2.5 %. Insofar as these contributions reduce net wages and salaries, they would allow the pay-as-you-go system to award smaller pension increases, without this translating into a lower net pension level.
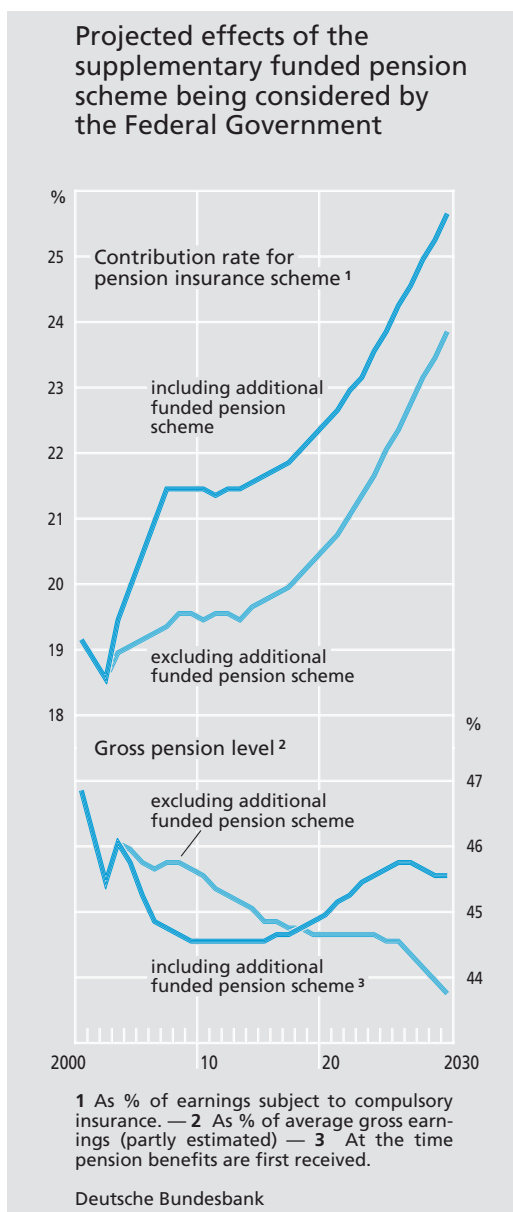
According to calculations, which the Ministry of Labour and Social Affairs provided for the Social Advisory Board's review of the 1999 Pension Insurance Report,[14] a funded pension insurance contribution could permanently lower the contribution rate of the pay-as-you-go system by 0.7 percentage points vis-à-vis the status quo; at the same time, the ratio of the gross standard pension to gross average earnings would decline by just over 1½ percentage points.[15] Although the total contribution, including the funded insurance contribution, would rise to just over 25 ½ % in the year 2030 (as opposed to just under 24 % under the status quo), new pension recipients could expect to receive overall bene-

Effects on the contribution rate and pension level

13 Studies conducted on elderly persons' sources of income suggest that the statutory pension insurance scheme is, indeed, the most significant component of old-age income in Germany but by no means the only one.
14 For more details, see the Social Advisory Board Review of the 1999 Pension Insurance Report (Gutachten des Sozialbeirats zum Rentenversicherungsbericht 1999), Bundesrats-Drucksache 655/99.
15 In order to make the effects on the benefits side more evident, pensions have been related to gross earnings rather than net earnings, the latter being more usual. As already indicated, this has no influence on the net pension level.

Projected effects of the
supplementary funded pension
scheme being considered by
the Federal Government

%

25   Contribution rate for
      pension insurance scheme [1]

24

23   including additional
      funded pension
      scheme

22

21

20

19   excluding additional
          funded pension scheme

18
                                              %

      Gross pension level [2]
                                              47

          excluding additional
          funded pension scheme
                                              46

                                              45

          including additional   44
          funded pension scheme [3]

2000   10   20   2030

1 As % of earnings subject to compulsory
insurance. — **2** As % of average gross earn-
ings (partly estimated) — **3** At the time
pension benefits are first received.

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payers closer to retirement age; the benefits
that they would receive under the pay-as-
you-go system would be reduced, without
their being able to take due advantage of the
funded pension scheme. Given that older
generations received comparably higher re-
turns under the statutory pension insurance
scheme, this intergenerational distribution
effect can certainly be defended.

However, the plans which the Federal Govern-
ment has presented to curb pension increases
cannot prevent levies for the pension insur-
ance scheme from rising again substantially.
To avoid this – an objective that is also in the
interest of the economy as a whole – it must
first be determined to what extent, if at all,
more stringent constraints may be imposed
on pension expenditure without diluting the
work incentive inherent in the pay-as-you-go
system. Concerns have often arisen on this
score since otherwise contribution-payers
with comparatively low levels of employment
income might end up close to the social assist-
ance threshold even after a contribution
period of many years. It should be borne in
mind, however, that holding the contribution
rate steady in a pay-as-you-go system – or at
least significantly reducing the size of the rate
increase – would also enable contribution-
payers in the lower income brackets to pro-
vide for their old age by accumulating capital;
as a result, their total retirement income
would exceed the benefits received from the
pay-as-you-go part of the pension insurance
system. It is also important to note that, unlike
pension benefits, social assistance is granted
only on the basis of need and is thus of an en-
tirely different nature.

*Examination
of more
far-reaching
measures
necessary*

fits in that year amounting to just over
45 ½ % of gross earnings (compared with just
under 44 % under the status quo), assuming
a 4 % interest rate on the funded part of the
contribution (for more details see the above
chart). The positive difference would increase
further in the following years. This approach,
however, also involves a transitional burden,
which would have to be financed mainly by
current pensioners and those contribution-

In the debate on pension policy, a raising of the retirement age has been proposed both as an alternative and as a supplement to a lowering of the pension level, which would be achieved by modifying the net-wage-related increase; early retirement would still be possible, although pensioners would have to be willing to accept actuarially calculated deductions. Given longer life expectancies and a corresponding prolongation of the retirement period, this approach seems logical, especially insofar as it combines reductions in expenditure with increased revenue from contributions.[16] It would, however, have to be adopted in the face of high unemployment, which is largely structural in nature; thus this approach would have to be coupled with fundamental reforms in the labour market, the introduction of which would have been necessary in any case. Moreover, unlike a lowering of the pension level, a raising of the retirement age would not cut into the benefits of current pensioners. Instead, future generations of pensioners alone, who have to reckon with lower returns anyway, would have to bear the burden in the form of a longer working life or of a deduction for early retirement.

Each of these approaches – or a combination of both – might be implemented without calling into question the status of the pay-as-you-go principle as the first and most important pillar in the system of old-age provision. Such measures are also necessary from a macroeconomic standpoint since they limit the size of government levies and keep younger generations from assuming too high a financial burden. In the pay-as-you-go system, a decline in the pension and earnings ratio could be offset by greater individual reliance on the funded system as a means of providing for old age. Given the demographic challenges, an inflexible insistence on retaining the benefits hitherto available would endanger the entire system and thus generate even greater uncertainty concerning the extent of future old-age provision.

Flexibility of pay-as-you-go system leaves room for further reforms

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16 A similar effect might be induced by arranging for prospective contribution-payers to enter the work force earlier, given that working life in Germany begins at a relatively late stage.

Annex

A macroeconomic simulation model

This annex presents, in rough outline, a simple model of the supply side of a national economy; its purpose is to highlight the long-term economic consequences of the forecasted demographic trend. The origin of national product is given by the following equations:

1. Overall economic production:
$$Y_t = e^{\delta t} B_t^\alpha K_t^\beta$$

2. Labour input (employed persons):
$$B_t = a m_t P_t (1 - r_t - k_t)$$

3. Capital input:
$$K_t = \beta Y_t (1 - \tau)/q$$

4. Real wage per employed person:
$$w_t = \alpha Y_t (1 - \tau)/B_t$$

5. Number of pensioners:

$$R_t = r_t P_t$$

Equation 1 presents a production function for the overall economy. It defines real gross national product (Y) in terms of the production inputs, labour (B) and capital (K), and technical progress (represented by the temporal index t). The rate of technical progress (δ) is constant; the production elasticities for labour (α) and capital (β) are also constant and their sum is less than one. For model calculation purposes α is set equal to 0.6 and β to 0.3. In the past the growth rate for technical progress (i.e. for that aspect of production growth that cannot be explained by the more intensive utilisation of production inputs) has amounted to roughly 1.5% per annum. If accompanied by a decline in both population and employment, the increase in general productivity could even be smaller. For the sake of model calculations δ is thus assumed to be 1% per annum. A rate of 1.5% per annum – or an even lower rate of 0.5% – is used as a control for sensitivity analysis purposes.

Equation 2 defines the relationships between forecasted population size (P), population structure (r, k) and employment (B). For the sake of simplicity, the age distribution of the population has been expressed solely in terms of the ratio of persons aged 60 and over to total population (r) and the ratio of persons younger than 20 to total population (k). In a status quo version the ratio of employed persons to persons able to work, which is determined by the labour market, is regarded as constant ($am_t = 0.68$). In a second version the assumption is made that the unemployment ratio is gradually halved and the ratio of persons outside the labour force gradually declines from 18% to 12%. More specifically, the assumption here is that the ratio am_t

increases by 0.44% per year, ultimately climbing to a value of 0.77 in 2030.

The model, as a whole, presupposes further that enterprises engage in production under competitive conditions and that the production factors, labour and capital, are put to use in a way that maximises profits. Equation 3 defines capital input as a function of production (Y), the rate of indirect taxation minus subsidies (τ), and real capital costs (q). For model calculation purposes both the rate of indirect taxation and real capital costs are regarded as constant ($\tau = 0.12$, $q = 0.04$). Hence a rise or fall in capital input is proportional to production. Equation 4 is a labour demand function. It gives the wage rate (w) at which demand for the employed, as defined in equation 2, subsists. As equation 4 makes clear, a rise or fall in real wage is proportional to average labour productivity (Y/B). Equation 5 fixes the number of pension recipients.

The following four equations determine the distribution of national product among pensioners and employees:

6. Profit:

$$G_t = Y_t(1-\tau) - w_t B_t - q K_t$$

7. Disposable income of pensioners:

$$YVR_t = z_t w_t R_t + \theta_t (G_t + q K_t)(1-\upsilon)$$

8. Disposable income of contribution-payers:

$$YVN_t = w_t B_t(1-b_t-\upsilon) + (1-\theta_t)(G_t + q K_t)(1-\upsilon)$$

9. Pay-as-you-go pension insurance scheme:

$$b_t w_t B_t = z_t w_t R_t$$

Equation 6 defines real profit as the difference between production proceeds (minus indirect taxes) and production costs. Production costs consist of real wage costs and capital costs. Equation 7 describes pensioners' aggregated real disposable income (zwR). This income is composed of pension

benefits, z being the gross pension level, and a percentage θ of enterpreneurial and property income (G + qk). Whereas pension benefits are tax-free, the remaining income is subject to an average direct taxation rate ($\upsilon = 0.25$). It is assumed that the percentage of enterpreneurial and property income that devolves upon pensioners corresponds to their share in the population, i.e. $\theta_t = r_t$. Equation 8 defines the income of wage and salary earners (= contribution-payers). This income may be divided into gross wages (wB) and a percentage $1-\theta$ of enterpreneurial and property income. Both income components are subject to the average direct taxation rate (υ). In addition, contributions to the pension insurance scheme are deducted from gross wages, b being the average contribution rate.

Consequently, receipts from the pension insurance scheme are equivalent to the amount bwB in each period, whereas zwR is what is paid out to the recipients of pension benefits. A strict application of the pay-as-you-go approach requires that both payment flows balance. This budget constraint, to which the pension insurance scheme is subject, is expressed by equation 9. Overall disposable income, i.e. gross national product minus direct and indirect taxes, may be obtained by adding together the aggregated income of pensioners and that of employees, provided aggregated income is calculated in accordance with the aforementioned budget constraint: $YVR + YVN = Y(1-\tau)(1-\upsilon)$. Per capita income is considered when evaluating changes in prosperity. Per capita income for pension recipients is equivalent to YVR/R, for contribution-payers to YVN/B, and for non-pensioners YVN/(P-R).

The expansion paths of the demographic variables (P, r, k) are treated as exogenously given. The model may be used to provide an endogenous explanation either for the contribution rate for the pension insurance scheme (b) or for the pension level (z). In the model calculations a policy of unchanging contributions (with b exogenous) is calculated first, followed by calculations for a policy upholding a constant gross pension level (with z exogenous).