

Demographic burdens on growth and wealth in Germany

The economic repercussions of a continuously ageing population are among the key economic and social policy challenges facing modern industrial society. Although Germany is not alone in this, it is one of the countries most affected by demographic changes – significantly more than the United States, France or the United Kingdom, for example. The first adjustment measures have already been initiated in various areas in which – as in the case of the retirement pension schemes – the implications for fundability have become evident. There is still much uncertainty, however, concerning the wider ramifications of the problem and the resultant adjustment requirements.

This article aims to remedy this at least to a certain extent. It first describes the emerging demographic trends and their foreseeable repercussions for economic growth. Subsequently, it outlines several economic policy options which may help to counteract the otherwise threatening burdens.

Demographic trends

Like many other industrial countries,¹ Germany faces marked and permanent demographic changes in the coming decades,

*Population
contraction*

¹ See the study by K McMorrow and W Roeger (2003), Economic and Financial Market Consequences of Ageing Populations, *European Economy Papers* No 182, Brussels.

which have no precise historical parallel. The reason for this is the combination of a declining or persistently low birth rate and rising life expectancy, both of which have been dominating the natural pattern of the population for around three decades. On balance, the most recent population forecast up to 2050 in its "medium variant" assumes a decline in the number of people living in Germany from the present figure of around 82 million to around 75 million.² It assumes that life expectancy at birth will increase by around six years, that the life expectancy of a 60-year old will go up by some 4½ years and that there will be a migration surplus of around 200,000 people each year. Other assumptions regarding life expectancy and the migration balance actually indicate a population decline to 67 million people. Only a high level of immigration and a sharp rise in life expectancy will keep the projected decline in population size up to 2050 within relatively narrow bounds.

Shifts in the age structure

From an economic viewpoint, the demographic problem over the longer term is attributable less to the emerging decline in the overall population than to the permanent shift in the age structure of the population and the relative contraction of the potential labour force, which will largely occur between 2015 and 2030. A declining or permanently low birth rate and a higher life expectancy will result in the elderly dependency ratio (the ratio of pensioners to those of working age) rising to an unprecedented level from currently 44% to almost 78% in 2050. An average effective retirement age of 60 is assumed, while the group of people of work-

ing age is defined as those aged between 20 and 59. On the other hand, the share of people not yet of working age (under 20 years) will decline, which means that the "overall dependency ratio" (the ratio of all persons not of working age to those of working age) will go up from 82% today to 112% by the end of the forecast period. This increase is only a little less pronounced than the simultaneous change in the elderly dependency ratio. On average over the next few decades, each person of working age will have to support an increasing number of citizens who are not of working age.

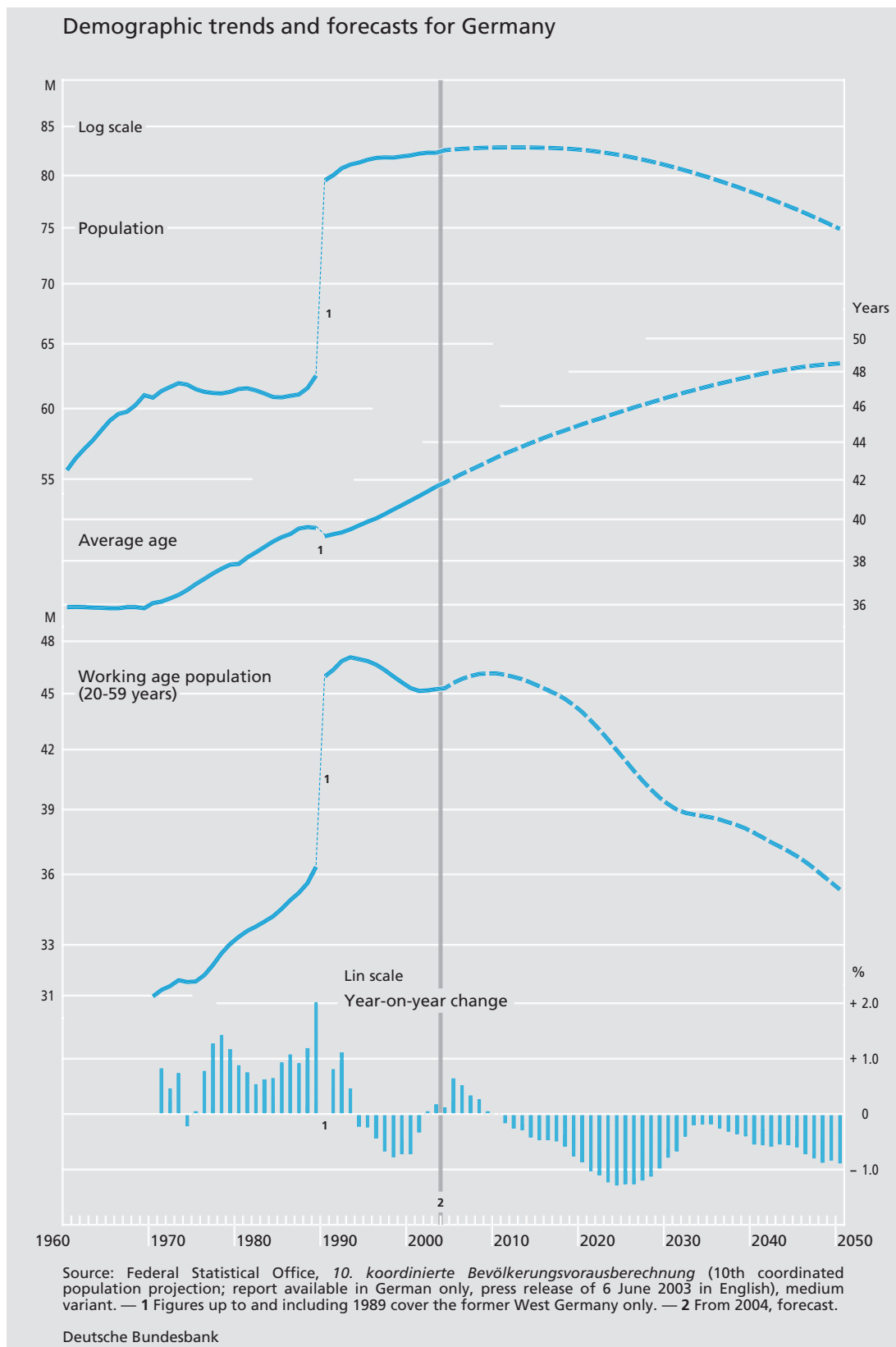
However, such forecasts are subject to considerable uncertainty. Although experience has shown that key determinants of population growth change only very slowly, the migration pattern is a major source of uncertainty. Another is the long forecast horizon; even small changes in the assumptions could lead to considerable deviations over such a long period of time. This is one of the reasons why the coordinated population projection always present several variants.

Forecasts subject to uncertainty...

Even if demographic forecasts thus have the character of a model, it would be highly negligent not to take the core implications of the currently available forecasts seriously. Inaccurate population forecasts in the past were mainly attributable to exogenous, abrupt changes, such as the slump in the birth rate due to the contraceptive pill or the political

... but should not be ignored

² See Federal Statistical Office (ed), *Bevölkerungsentwicklung bis zum Jahr 2050*, <http://www.destatis.de/download/veroe/bevoe.pdf>, Wiesbaden 2003.



“opening” of eastern Europe.³ Such processes and events are not usually predictable. Furthermore, experience shows that forecasts concerning the age structure tend to be more accurate than predictions about the size of the population or its spatial distribution.

Implications for growth and wealth

*Status quo
projection...*

In order to study the repercussions of the demographic change, it is useful to first pinpoint the other underlying conditions and to discuss the likely implications for the economy based on this scenario. This is not an economic analysis in the strict sense since neither market nor policy reactions are included. However, such a projection can make sense in order to highlight the likely risks if the economic policy status quo were to be retained or if only minor policy changes were to be made.

*... helps to
highlight the
dangers*

Under status quo conditions, the labour supply in Germany would decline relatively sharply. Given unchanged conditions concerning the development of the capital stock and its utilisation as well as technical progress, potential macroeconomic output would also increase less steeply or even decrease. According to the medium variant of the tenth coordinated population forecast up to 2050, the number of people aged between 20 and 59 – which presumably will continue to constitute the majority of the labour force in the future – will fall by an annual average of ½%. Assuming that this decline has a full impact on the production factor labour, the trend rate of GDP, given a pro-

duction elasticity of two-thirds, will decline by a computed annual average of ⅓ percentage point. Per capita income, which is often used as a rough measure of the general standard of living in an economy, would also fall. It should also be borne in mind that besides the above-mentioned direct effects that a deterioration in the age structure of the working population will have on output, additional indirect factors will also play a role, which may considerably magnify the overall effect. Thus account needs to be taken of the fact that technical progress and the process of structural transformation will be slower or less smooth if an ageing society is less innovative and mobile. Moreover, the burden on the factor labour from social security contributions is likely to increase further,⁴ which may also lead to social frictions.

Economic policy options

The highlighted demographic trends have been evident for a long time and are virtually irreversible. Even major adjustments in the birth rate would not be sufficient to stop the ageing process of the next two to three decades. The demographic challenge now is to find timely, appropriate economic and social policy answers for the economic risks and burdens resulting from demographic change.

³ See M Bretz (2001), Zur Treffsicherheit von Bevölkerungsvorausberechnungen, *Wirtschaft und Statistik*, Book 11/2001, pp 906-921.

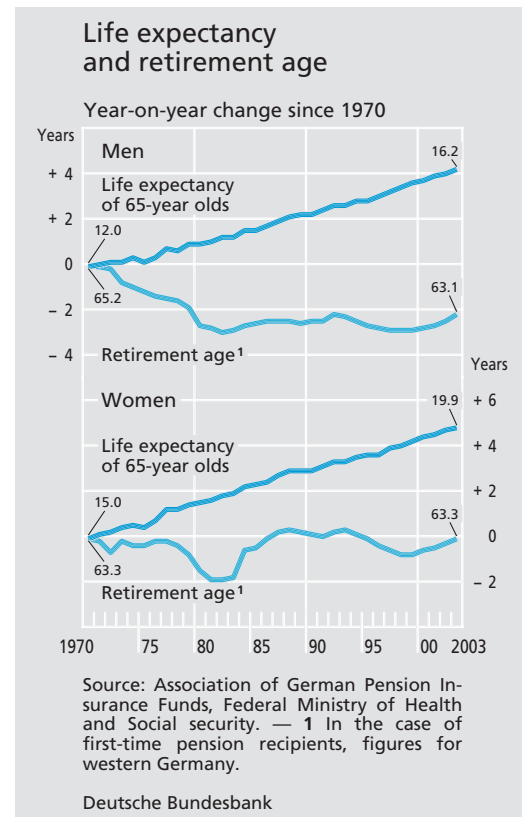
⁴ See Federal Ministry of Health and Social Security (ed), Achieving financial sustainability for the social security systems, Report by the Commission (available in English only as a summary), Berlin 2003 and German Council of Economic Experts, Annual Report 2003/04: Consolidate public finances – reform the tax system (available in English only as a summary), Stuttgart 2003.

*Extend working
hours*

A key aim should be to strengthen the foundations for economic growth in the next ten years in such a way as to absorb as far as possible the “demographic burdens” which will begin to make themselves felt by then.

An effective way of counteracting the demographically induced deterioration would be to extend the effective working life. This means either raising working hours during the phase of employment or adjusting the length of the active working life. This includes raising the statutory minimum age for claiming a pension in line with the increase in life expectancy and introducing appropriate benefit cuts for taking early retirement.⁵ It is also particularly important to make the incentive structures more employment-friendly. On the one hand, this concerns the various forms of premature retirement and, on the other, the employment disincentives for retirement pension recipients. The inference that people are retiring comparatively early nowadays is evident from the fact that there is a relatively low employment rate of persons aged between 55 and 64. Among the OECD countries, which in 2003 had an average labour market participation rate of 53% in this age group, Germany is in the bottom third with a rate of 43%. This is almost 7 percentage points lower than the level in 1970.

Moreover, it has to be borne in mind that in many areas the number of hours worked during the working life is rather low both by international standards and compared with historical levels in Germany. This is particularly the case when the new EU member states are included and the focus is on annual working

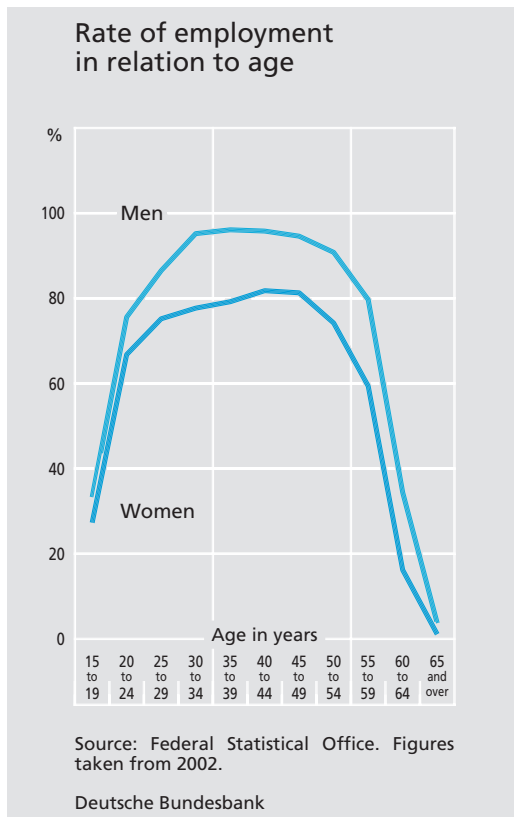


hours, ie incorporating negotiated annual holidays. Of the 25 EU countries, only the Netherlands, Denmark and France fare worse than Germany. With regard to the working time component it would doubtless be inappropriate to lay down rigid, general requirements; this would be just as inappropriate as the previous general shortening of working hours. More flexibility and the correction of employment-hostile incentive structures would, however, be meaningful in view of the looming problems.

In attempting to mitigate the demographic problems, another option would be to more vigorously activate the potential of the work-

*Participation
rate should be
raised*

⁵ See J Clemens (2004), Versicherungsmathematisch “faire” Abschläge bei vorzeitigem Renteneintritt, *Wirtschaftsdienst*, volume 84, pp 161-165.



ing population, i.e. to reduce the inactivity rate. One possibility would be to streamline the education and training process and shorten its duration, especially since the age for commencing employment has gone up significantly in Germany in recent decades and the traditional edge which Germany had in labour force participation among the 15-24 age group has meanwhile been completely eroded. Whereas in 1970, 70% of residents aged 15-24 were working, this figure had fallen to only 47½% in 2003. The OECD country average for this age group is, admittedly, likewise only one in two people. The frontrunner is currently the Netherlands with a participation rate of 71%.

It is possible that the necessary adjustment to the demographic change may occur voluntar-

ily to some extent if young people leave the education and training system earlier owing to the demographically induced reduction in the labour supply and a correspondingly improved vocational outlook. Even so, a political initiative aimed at shortening the duration of education and training in Germany – which by international comparison is fairly long – would certainly also be helpful. Allowing universities to freely select their students need not result in a loss of educational quality. In addition, the participation rate of women in the German labour force is still relatively low compared with other countries. This is certainly associated with the lack of childcare facilities and the traditional perception of the woman's role in the family. Expanding childcare facilities in line with requirements would certainly make it easier to reconcile work and family life. Furthermore, models need to be developed to enable women to smoothly re-enter the labour market following a period of child-rearing.

However, the approaches outlined above are not capable of providing a quick fix to this problem. Experience shows that the correction of incentive structures takes a long time and only gradually acquires a broader impact. However, these are important factors for shaping the future, with a signalling character which should not be underestimated.

An even more urgent and vital task is reducing the high structural unemployment. According to a broad consensus of estimates, this entrenched type of unemployment constitutes the largest part of overall unemployment in Germany. For example, the OECD es-

Reducing structural unemployment

timates for 2004 that some three-quarters of overall unemployment was non-cyclical. Germany's labour market development also fares badly compared with other EU countries.

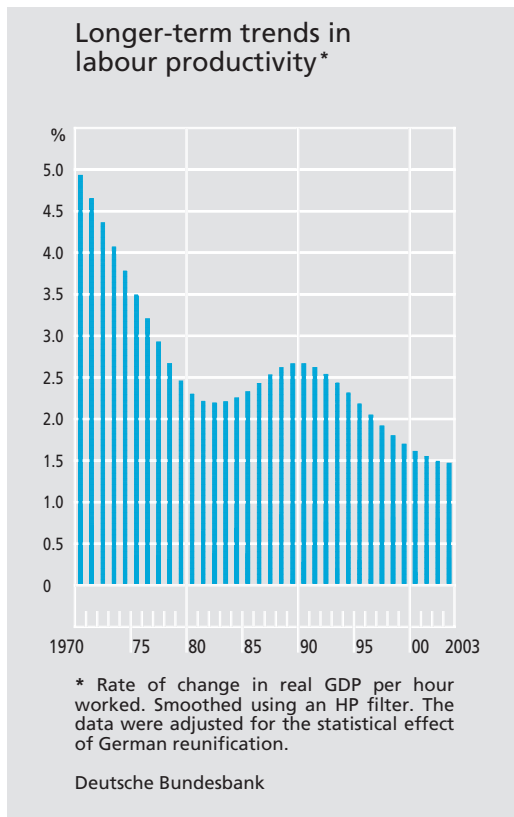
A reduction in the labour supply for demographic reasons does not necessarily result in a lower unemployment rate. It ultimately depends on how sharply wage demands react and on the wage elasticity of real wages. Furthermore, it is to be feared that the high and further rising contributions to the social security systems will widen the wedge between gross and net income, thus tending to reduce the degree of employment. Any political measure which lowers the high non-wage labour costs in Germany is suitable for alleviating this problem.

In the last few years both the social partners and the legislators have taken a series of measures aimed at increasing the labour market's flexibility and improving its ability to function.⁶ Additional corrections must follow. One area for consideration in this context is that employment protection legislation greatly impinges on firms' recruitment policy. Furthermore, the "favourability principle", which only allows deviations from the collective labour agreement if they are in the employees' best interests, should be more broadly interpreted to include job-saving aspects. This must be accompanied, as planned, by further narrowing the tax wedge on the labour market. The individual freedom of contract for both employees and employers should be enhanced in the process.



Another question is what effect the ageing of the population will have on structural unemployment. On the one hand, there could be a larger segment of people who gained their qualifications and skills many years before and whose knowledge and experience have become increasingly "outdated" even given a merely moderate rate of technical progress. A combination of low mobility and high vocational requirements could also push up mismatch unemployment. Compensatory developments must also be taken into account, however. For example, vocational training will become more worthwhile for some individuals if the size of the labour force contracts. Historical experience also indicates

⁶ For more details, see Deutsche Bundesbank, *Greater flexibility on the German labour market, Monthly Report*, September 2004, pp 43-57.



that immigrants often fill the niches in the labour market. Finally there is the possibility of offering person-related services as a complement to the general productivity progress. The compensatory factors will naturally have a greater impact if the structures on the labour market can be made more flexible with the help of wage policy and legislative measures and if the loss in value of human capital can be countered by popularising and implementing the principle of life-long learning. The observation that the incentive to invest in enhancing one's own human capital tends to decrease with age is presumably related to the (often only short) remaining working life. A longer working life, and therefore an extended amortisation period for such newly acquired knowledge, would increase the return on training investment and thus boost

the incentive to relearn and retrain among older people, too.

If it is assumed that one of the key problems of demographic change lies not only in its effects on per capita income but also its effects on the growth rate of overall output, the option of immigration should not be ignored. Labour market-oriented migration could curb the demographic trend.⁷ For example, a contracting (working) population will tend to increase the economic incentive of migrating to Germany. At the same time, however, the political framework must be adjusted accordingly. Germany is facing not only locational competition for mobile real capital but also increasing competition for a skilled workforce and human capital. This also requires, however, that the concrete design of the immigration rules – such as the level of a possible immigration quota or the qualitative criteria and integration measures – ensures that immigration will not overburden the social security systems.

Benefits of migration

The perfect solution would doubtless be to cope with the consequences of demographic change at least partly by raising the productivity rate of labour, be it by increasing labour efficiency or by equipping workplaces with more fixed capital. For many years, labour productivity has been in Germany, as elsewhere, the most important source for strengthening aggregate potential output. However, that source has trended down-

Improving the productivity path

⁷ The demographic influences on the labour market are discussed in detail by Axel Börsch-Supan (2001) in Labor Market Effects of Population Aging. NBER Working Paper No 8640. Cambridge MA, p 13 ff.

Saving behaviour in an ageing economy

Attempts are often made to explain private saving and consumption behaviour on the basis of the life-cycle hypothesis,¹ according to which the household decides at the beginning of its life cycle how much it wishes to consume or save in each period. This takes account of the expected income path at a given real interest rate and the initial financial endowment. Under the assumption of certainty equivalence, that is if uncertainty is disregarded, the optimising household strives to achieve constant consumption over time.²

By contrast, more recent precautionary savings models abandon the assumption of certainty equivalence and explicitly factor in uncertainty concerning labour income.³ In these models individuals save both for their retirement and to hedge against possible losses of income in times of recession. Uncertainty about future income is particularly high in the case of young people with a long expectation horizon. It can theoretically be demonstrated that if precautionary motives are taken into account in an extended life cycle model, this does not lead to a steady increase but rather to a u-shaped saving ratio profile during the working life and dissaving slows down with age.⁴ Empirical studies, however, indicate that negative saving in old age is almost non-existent in most industrialised countries.⁵ This is probably also due to significant bequeathing motives and a declining consumption capacity in very old age.⁶

The reasons behind the ageing process are also an important factor in saving behaviour over time. Pursuant to the life-cycle hypothesis, the household sector's aggregate saving ratio initially rises as the birth rate drops. First, the consumption requirements of young families fall and, moreover, the household income may be greater if women are working. Second, in an ageing economy with a statutory pension system based on the pay-as-you-go principle with constant contribution rates, young people will expand their own private pen-

sion provisions in order to, at least partly, compensate for the expected lower pension. The positive impact of larger-scale saving by young people is offset by the negative impact of the older generation's lower saving ratio. If the pronounced ageing of the population continues, the negative impact will predominate and consequently the aggregate private saving ratio will fall.

The industrial countries' economies are ageing not only as a result of falling or low birth rates but also because of rising life expectancy. The impact of a rising life expectancy on the household saving ratio has been examined in recent publications.⁷ The results show that a rising life expectancy is having a positive effect on the current saving ratio.⁸ This is also the case for future saving ratios. The saving ratio rises – according to the basic line of reasoning – for two reasons: firstly because of the longer life expectancy and secondly because of the uncertainty associated with increased life expectancy. Econometric analyses confirm this finding.

In the case of saving or consumption, age, cohort and time effects generally overlap. An age effect characterises behaviour patterns typical of a certain age group. Cohort effects reflect behaviour patterns of persons born in specific years. Temporal or macroeconomic effects represent behaviour patterns which can be traced back to certain events or circumstances. These three aspects can be differentiated using the Deaton-Paxson decomposition.⁹ Börsch-Supan, Reil-Held and Schnabel carried out corresponding studies for Germany.¹⁰ They found that the saving ratio in all cohorts of the medium age group (ie the age group between 30 and 50 years) is quite stable at approximately 12%. In the later stages of life, however, there is an initial sharp decline in the propensity to save before it stabilises at about 4 to 5%. Thus, even in very old age the population does not dissave but rather continues to accumulate assets.

1 See F Modigliani and R Brumberg (1954), *Utility analysis and the consumption function: an interpretation of cross-section data*, in J Flavell and L Ross (ed), *Social cognitive development frontiers and possible futures*, Cambridge University Press, Cambridge, pp 388-436. — 2 Under certainty equivalence, the interest rate corresponds to the subjective rate of time preference. — 3 See C Carroll (1997), *Buffer stock saving and the life cycle/permanent income hypothesis*, *Quarterly Journal of Economics*, Vol 112, pp 1-56. — 4 Taking into account the family structure can also lead to a u-form saving ratio profile during the working life, see J Tobin (1967), *Life cycle saving and balanced growth*, in W Fellner et al (ed), *Ten economic studies in the tradition of Irving Fisher*, Wiley, New York, pp 231-256. — 5 See J Poterba (ed) (1994), *International comparisons of household savings*, University of Chicago Press, Chicago and London. — 6 See F Modigliani (1988), *The role of inter-*

generational transfers and life cycle saving in the accumulation of wealth, *Journal of Economic Perspectives*, Vol 2, pp 15-40. — 7 Earlier studies had already established that dissaving falls as uncertainty about lifespan increases, see J Davies (1981), *Uncertain lifetime, consumption, and dissaving in retirement*, *Journal of Political Economy*, Vol 89, pp 561-577. — 8 See, for example, J Kagejama (2003), *The effects of a continuous increase in lifetime on saving*, *Review of Income and Wealth*, Vol 49, pp 163-183. — 9 See A Deaton and C Paxson (1994), *Saving, growth and aging in Taiwan*, in D Wise (ed), *Studies in the economics of ageing*, Chicago University Press, Chicago, pp 331-361. — 10 See A Börsch-Supan, A Reil-Held and R Schnabel (2003), *Household saving in Germany*, in A Börsch-Supan (ed), *Life cycle savings and public policy*, Academic Press, Amsterdam, pp 57-99.

wards significantly. The fact that the speed and nature of technical progress are by no means determined exogenously is demonstrated not only by the noticeably large differences in the standard of living between industrial countries, emerging markets and developing countries. Within the group of OECD countries, too, there are marked differentials which in some cases widened further during the 1990s.⁸ These cannot be explained solely by the fact that less wealthy countries need a longer convergence process in order to gradually catch up with the richer countries. The USA and Canada as well as Australia, the Netherlands and Norway also showed an impressive track record. Germany occupies a position in the lower reaches of the league table; moreover, a considerable part of the productivity gains was achieved at the expense of the employment rate. In the euro area, the higher employment growth was accompanied by a slowing of the productivity rate, whereas in the USA, employment and productivity gains went hand in hand in the second half of the 1990s.

Effects of ageing on productivity unclear

The effects of ageing on the growth rate of total factor productivity are not clear from a theoretical point of view. Thus it is plausible, albeit not absolutely demonstrated, that risk propensity and mobility decline with age and that therefore in an older population fewer risky investments and innovations will be made. The burdens on public finances may also result in considerable increases in taxes and social security contributions. The resultant distortions of relative prices lead to efficiency losses, which curb the rise of total factor productivity.

On the other hand, cross-section studies often indicate rising wages with age. Assuming a close correlation between wages and productivity, this would mean that older people are more productive than younger people, either because human capital increases with experience over the course of the working life or owing to training measures. On this view, total factor productivity may increase above the normal level as long as the proportion of older people in the working population goes up. Finally, a growing shortage of labour and the associated increase in wages could also intensify the search for labour-saving innovations. It is clear, however, that the problems associated with ageing can be only partially offset by an endogenous rise in total factor productivity.

For this reason, too, a comprehensive response to the challenges of future demographic burdens must be oriented primarily to investment and a higher capital intensity. A frequent counterargument to this is that in an ageing society, household saving declines. This leaves fewer internal resources available to be invested. Growth weakens accordingly. However, the suggested correlation between ageing and national savings is not clear-cut even in theory (see box on page 23). Although empirical studies tend to suggest a negative influence of an "old" age structure on saving, the quantitative estimates differ considerably.⁹ What is more, a decline in overall national saving can be counteracted using economic policy measures. Besides a

Make investment conditions more attractive

⁸ See OECD (2003), *The Sources of Economic Growth in OECD Countries*, Paris.

⁹ See K McMorrow and W Roeger (2003) loc cit.

consistent and sustained budget consolidation process, this can also be achieved by increasing the funded component of old-age provision.¹⁰

Furthermore, it must be borne in mind that at the international level the degree of capital mobility is very high. The main reason for this is the relative locational attractiveness of the competing economies. If German enterprises can continue to offer high returns, as a result of their innovative capacities or their technical knowledge, despite the demographic burdens, domestic saving capital will not flow abroad and foreign capital formation could additionally support the growth of the domestic capital stock. Attempts must therefore be made to make Germany a more attractive investment location. Fixed capital formation in Germany has evidently become considerably less attractive than investment abroad (including German financial investment abroad). At any rate, there has been a slump in investment in Germany on a broad front in the last few years.¹¹ The overall net investment ratio fell to only 3½% of the disposable income of the domestic sectors, compared with 7½% in the second half of the 1980s. This has been accompanied in recent years by an increasing outflow of domestic savings to other countries. In 2003 this amount reached 50% of total savings.

A possible growth scenario

Three fundamental conclusions can be derived from the above considerations. Firstly, there is a time window of around ten years

before the outlined demographic trends begin to weigh more heavily. Secondly, there is a whole series of economic policy options which can be used to ease or alleviate the arising burdens. Thirdly, the as yet unused potential for countermeasures is estimated to be fairly high in Germany. This applies in particular to the rate of employment and the labour force participation rate as well as to working hours.

The demographic burdens thus by no means inevitably imply a scenario of doom and gloom. However, it remains to be seen to what extent and when the economic policy options will be implemented. The precise combination of instruments will also have a bearing on the overall success. It would make little sense to rely on only one or a few economic policy adjustment parameters. The scale of the demographic shifts alone is likely to be too great to allow this. A more realistic and encouraging approach is therefore one which, focusing on the overall picture as well as the interdependencies, seeks to address diverse problems simultaneously. Under these conditions the wealth losses threatened by demographic change, which is without an historical precedent, will remain manageable.

Since the mid-1990s, the effective retirement age has risen by around one year. This is probably mainly associated with the introduction

¹⁰ See Deutsche Bundesbank, Prospects for, and obstacles to, a stronger reliance on funding in the statutory system of old-age provision in Germany, *Monthly Report*, December 1999, p 15-31.

¹¹ However, the trend decline in the net investment ratio is possibly overstated by the long phase of stagnation, – especially compared with 1991 and 1992, which were marked by the unification boom.

Demographics, wealth and growth: some fundamental relationships

Demographic influences are among the long-term determinants of (material) wealth or the general standard of living and the macroeconomic growth trend. Depending on the length of the observation period and the type of demographic change, various effects may occur which have an impact on the level or the growth of income.

As a rule, wealth is measured as real GDP per head of the population. This is only a very rough measure of the standard of living as it disregards depreciations of real and human capital, (net) transfer payments to the rest of the world and possible changes in the terms of trade as well as distribution and risk aspects which take account of the breadth of participation in welfare and the sustainability of an achieved income position. If, however, the primary objective is to identify possible economic policy approaches, it is quite useful to reduce the analytical framework to key variables and relationships.

The development of real GDP can be described using a simple growth decomposition. This builds on the definition of labour productivity and total hours worked, which in turn is derived from the number of employed persons and the number of hours worked per employed person.

The (real) per capita income (y) is thus determined by the average productivity of employed persons (AP) and the effective labour force participation rate (EPR) of the total population:

$$y = AP * EPR$$

The total population also includes various groups of persons who are not part of the potential labour force:

- people who, for reasons of age, are not able to work because they are either too young or too old, measured here by the overall dependency ratio (ODR);
- persons who are of working age but are nevertheless neither employed nor registered as unemployed. This group mainly consists of the inactive labour forces, but also of people who, for health or family reasons, for example, are not available for work or are available only to a limited extent as well as people in training, measured here by the inactivity rate (IR);
- unemployed persons, measured here by the unemployment rate (UR).

Thus, the overall effective participation rate, that is the proportion of the population employed, is calculated as follows:

$$EPR = \frac{(1-IR)(1-UR)}{(1+ODR)}$$

If, for the sake of simplicity, one also assumes a linear homogeneous Cobb-Douglas production function for the economy as a whole under competitive conditions with Harrod-neutral technical progress, the level of labour productivity per employed person is determined both by the progress component (A) and capital intensity (k) weighted by the profit ratio (α), ie by the two determinants of hourly productivity, as well as inter alia by the average working hours (h).

$$AP = A * k^\alpha * h^{1-\alpha}$$

Thus, the amount of per capita income (y) is calculated using the following basic equation:

$$y = \frac{A * k^\alpha * h^{1-\alpha} (1-IR)(1-UR)}{(1+ODR)}$$

The rate of change \hat{y} is therefore approximated as follows:

$$\hat{y} \approx \left[\hat{A} + \alpha \cdot \hat{k} \right] + (1-\alpha) \hat{h} - \left[\frac{\Delta ODR}{1+ODR} + \frac{\Delta IR}{1-IR} + \frac{\Delta UR}{1-UR} \right]$$

This simplified theoretical framework can be used to estimate the impact of variables influencing growth. Five major complexes can be differentiated, behind which are various determinants:

- the productivity component
- the working time component
- the demographic component
- the inactivity component
- the unemployment component.

However, the framework should not be interpreted mechanistically. The sometimes complex dependencies between the respective components and feedback mechanisms that compound the direct partial effects also need to be taken into account. For example, an increase in the female participation rate would probably reduce the average annual number of hours worked and could also have a dampening effect on the measured labour productivity in the economy as a whole. Furthermore, it should be borne in mind that although certain measures – such as changes in working hours – may affect the wealth and income level in the longer term, they will not have a lasting effect on the respective growth rate.

of benefit deductions for claiming early retirement. Since a significant number of new pensioners are still not fully affected by the deductions owing to transitional arrangements, the increase in the average retirement age is likely to continue. Furthermore, the earliest possible age at which it is possible to claim a pension as a result of unemployment or as part of age-induced part-time work is to be raised from 60 to 63 years between 2006 and 2008. This will also affect those insured persons who would have taken early retirement despite the deductions. Finally, after 2012, the special option of early retirement at 60 years of age for women will no longer apply. Furthermore, in 2008 the Federal Government is obliged to present its first report outlining the framework requirements for employing older employees. On this basis, a decision should then be made as to whether to raise the statutory retirement age, which is currently set at 65 years.

If by 2015 the average retirement age could be raised by two years, the potential labour force would be enlarged by around 2 million or 4½%. This would yield considerable relief, particularly for the factor labour. The contribution rates to the social security funds could be lower, not only as a result of the postponed pension payments but also owing to the potentially broader contribution base for the other social security schemes. The related requirement of actual employment for older employees will be easier to meet if the rise in the tax and social security burden can be successfully curbed. This could trigger mutually reinforcing impulses towards greater employ-

ment and a declining tax and social security burden.

Regarding the average working time, this scenario assumes that it will be lowered less and less on balance and that at the end of the forecast period it will be neutral vis-à-vis (potential) per capita income. This may nonetheless imply an increase in the working week or a corresponding cut in holidays if, in the case of an increasing labour force participation rate, the trend towards part-time employment continues.

If, in addition, the employment intensity of the growth process can be raised by removing obstacles which stand in the way of the development of a low-income sector, a significant decline in structural unemployment may be expected. A fall in the non-cyclical unemployment rate of around 3 percentage points over the next ten years appears to be realistic under these conditions.

Looking at productivity per hour, it should be remembered that it is partly endogenous and that technological changes are very difficult to anticipate. The extension of working time, the reintegration of unemployed persons into the employment process and the sectoral structural change are likely to have a dampening impact, whereas experience suggests that a faster pace of economic growth is associated with a higher productivity rate. The underlying model calculations used here are therefore based on a trend rate of labour productivity (on an hourly basis) of 1½% per year; this roughly corresponds to the current basic rate.

Adding together the aforementioned corrective measures, based on the given forecasts concerning the demographic trend, indicates a potential path for macroeconomic growth over the next ten years which is around $\frac{1}{2}$ percentage point above the average level over the past ten years. For real per capita income this implies a strengthening of the growth rate to $2\frac{1}{2}\%$ by the end of the forecast period. Compared with the meagre rates of

the 1990s and the first half of this decade, the improvement would therefore be quite large. At the same time, this would create a more favourable basis for tackling the emerging demographic burdens that will by then start to have an impact. It remains the central task of economic policy makers to pave the way to enable a growth scenario, such as the one presented here, to take shape.