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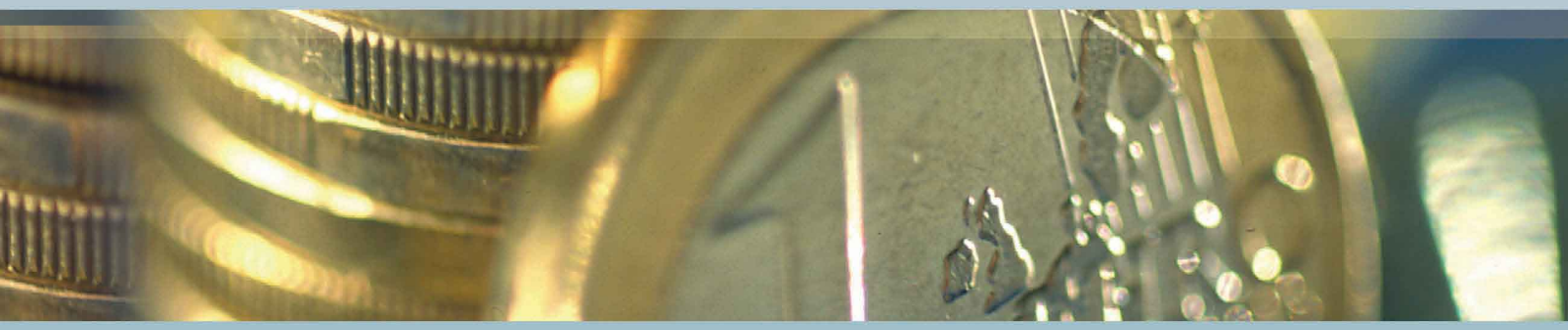

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Country Study: Raising Germany's Growth Potential

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European Commission
Directorate-General for Economic and Financial Affairs
Publications
BU1
B – 1049 Brussels, Belgium

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The principal authors were Georg M. Busch, Heinz Jansen, Stefan Kuhnert, Karolina Leib, Peer Ritter, Michael H. Stierle and Michael Thiel. The report benefited from contributions by Carsten Brzeski, Christine Gerstberger, Jan In´t Veld, Kieran Mc Morrow, Gaëtan Nicodème, Werner Röger, Eric Ruscher, and Christoph Walkner. Valuable comments and suggestions by Karl Pichelmann and Peter Weiss are gratefully acknowledged. Statistical and editorial assistance was provided by Andrzej Erdmann, Karl Gradinger, Gaspar Ros Moreno, and Pascale Tindall.

Comments on the Country Study would be gratefully received and should be sent to:

Directorate-General for Economic and Financial Affairs
Member States I: Denmark, Germany, Finland, Austria, and Sweden
European Commission
B-1049 Brussels

or by e-mail to georg.busch@ec.europa.eu

Raising Germany's Growth Potential

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OVERVIEW

Germany emerges from a prolonged stagnation …

At the beginning of 2007, many economists and market observers believe that the economic recovery that took hold in Germany in 2006 is set to continue. Such optimism is grounded in the fact that demand and output are growing more strongly than at any time in the present decade and have led to an impressive turnaround in public finances and unemployment. This encouraging situation differs markedly from the one when DG ECFIN last time took an in-depth look at the German economy (European Commission 2002). At that time, amid the international downturn that followed the burst of the ICT bubble, the country was in a gloomy mood and the economy held back in quasi-stagnation that was to last for five years.

The aim of this study is to analyse whether the currently strong economic outlook might merely be a cyclical swing around a continuing feeble trend of potential growth of currently 1¼% only, or whether it may be taken as ushering in a lasting period of stronger growth against the background of improved competitiveness, labour and product markets reforms, changes in tax regimes, and the reunification shock wearing off. The analysis therefore focuses less on the most recent movements in indicators than on the nature of longer-term structural changes that have occurred over the past years.[1]

…overcoming imbalances built up in the wake of reunification…

Over the last two decades, Germany's economy has been exposed to three major challenges: German reunification, global market liberalisation and integration into EMU. Being highly export-oriented by tradition and with a technologically strong manufacturing sector to rely on, the economy held up remarkably well in the face of the first challenge of intensifying international competition and actually benefited from globalisation, even in periods of rising labour costs and an appreciating currency. The most formidable of the three challenges was reunification in the early nineties which, owing to the specific conditions and constraints under which it took place, was a severe drag on economic performance. Thus, the positive demand shock arising from the sudden gains in East German households' purchasing power pushed up wages and inflation. The resulting loss in external price competitiveness was exacerbated by the ERM crisis, which resulted in an additional effective appreciation of the Deutsche Mark. Moreover, 4 to 5% of GDP was regularly transferred to the eastern part of the country for the reconstruction of infrastructure and of the industrial base as well as for income maintenance of the unemployed, putting a severe strain on public finances. The task of lifting the economy out of the protracted quasi-stagnation that followed the short-lived post-reunification boom became the main challenge facing German economic policy in the following years.

[1] The current study is undertaken on the basis of statistical information available up to 13 February 2007.

…that required adjustment within the framework of EMU

Since the reunification boom ebbed away, the growth performance of the German economy has been unsatisfactory. From its long-term average of 3¼% in the three decades up to 1990, annual GDP growth abated to 2% in the second half of the nineties and further still, to a modest ¾%, in the first half of the present decade when for several years Germany's growth lagged behind the rest of the euro area. Adjustment started in the mid-nineties, but had not yet been completed when Germany entered EMU. External competitiveness was restored through wage moderation and labour-shedding over an extended period. Although nominal and real interest rates were low by historical standards, higher inflation in partner countries meant that real interest rates were on average more than ½ percentage point higher in Germany than the euro area average between 1999 and 2006. German exports largely benefited from a booming world economy, greater exchange rate stability brought about by EMU and the gradual restoration of price competitiveness. However, domestic investment and consumption failed to respond to the external stimulus as they were held back both by the adjustment that had become unavoidable in order for the imbalances caused by reunification to unwind and by a number of structural rigidities that had built up over the years.

Wage moderation restored price competitiveness…

After the hefty wage increases during the reunification boom and the rapid catch-up of East German wages towards western levels, from the mid-nineties onwards wage negotiators reverted to more moderate settlements in the face of high and steadily rising unemployment. As a consequence, nominal unit labour costs have fallen by 20% since 1995 against the average of Germany's major trading partners. Faced with widening budget deficits, notably in the social security accounts, after the integration of the East German population into the system, the government sought to offset the rapidly rising benefit claims by cutting down on expenditure not fixed by legal commitment, notably investment. Taxes were increased, albeit with a lag, but since 2000 direct taxes were again cut in order to give new impetus to private demand. As a result, the general government deficit rose above the ceiling of 3% of GDP and stayed there for four consecutive years (2002-2005), while debt rose from 39½% shortly after reunification to 68% of GDP in 2005. Social security contribution rates kept rising unabated, to meet the ever higher claims to unemployment and other benefits. At the same time, the corporate sector sought to restore profitability in the face of rising labour costs by holding back domestic investment while resorting to labour-saving rationalisation or the relocation of production to lower-cost areas. A major aggravating factor was the cutback in public and private construction, which since 1995 dragged annual GDP growth down by an estimated ¼ percentage point, though it now appears to have bottomed out.

…but unemployment and budget deficits increased…

…and the private sector lost confidence in a sustainable recovery

In this environment, private households, for their part, became increasingly reluctant to spend more. In addition to the squeeze in their real disposable income resulting from lean wage gains, terms-of-trade losses and higher taxes, their confidence was undermined by the rise in

unemployment and worsening job prospects as well as by growing doubts about the sustainability of the social welfare system and the uncertainty about how far reductions to entitlements and benefits would have to go. They therefore stepped up their precautionary saving, such that the income tax cuts introduced stepwise since 1999/2000 did not provide the hoped-for stimulus to overall private demand. With both corporate and household demand sluggish, the re-gained export strength failed to translate into a broad-based and sustained revival of activity until well into 2005, and the economy for a long time remained caught in a low-growth-low-expectations trap. Rising unemployment and the ageing of the population put permanent upward pressure on government expenditure and, despite serious and largely successful efforts to keep it in check, the erosion of the tax and contribution base undermined progress towards fiscal consolidation, while the share of social transfers in total expenditure increased considerably.

The growth problem was partly caused by reunification…

Against this background, the earlier ECFIN study that reviewed Germany's growth performance in the nineties showed that a substantial part of the growth shortfall of Germany vis-à-vis its European partners could be attributed to the economic consequences of reunification. While some aspects like the reconstruction of East Germany's morose infrastructure was necessary, the study found that other aspects like the subsidy-driven construction bubble, and the excessively fast increase in wages and welfare levels in the East were costs largely imposed by policy choice with lasting consequences.

…but much of it is structural…

For a long time, policy makers failed to address the underlying structural deficiencies – partly because the growth slowdown was mistakenly seen as being largely a cyclical phenomenon, and partly because they hesitated to change institutions which had come to be identified as the cornerstones of the German post-war economic and social success story. The necessary reforms, violating vested interests and implying financial sacrifices, were bound to be unpopular. Indeed, given the highly successful post-war track record of the German economy, much of the public failed to see the need for reform despite the profound changes in the framework conditions. As long as such reforms were deferred, overall wage moderation had to bear the brunt of the necessary adjustment and price competitiveness was effectively restored. Eventually though, in recent years policy has moved to address a number of structural issues, related notably to the labour market and the social retirement scheme. Both, wage moderation and early reforms have probably paved the way for the strong resumption of growth in 2006. Further momentum can be expected from these reforms as well as from those envisaged and announced in the National Reform Programme in the context of the EU Lisbon Strategy for Growth and Jobs.

…with obstacles to labour input, capital formation and technological progress.

From a cyclical perspective, the current recovery was unusually slow in its early stages compared with previous business cycle episodes. Although the rebound in 2006 was also reinforced by temporary factors ahead of the VAT increase, growth should remain strong in 2007 and 2008, benefiting already from recent reforms and the strengthened competitive position. However, not all impediments to stronger growth have been overcome and economic performance remains constrained by a number of structural deficiencies. Next to reunification, already the ECFIN study of 2002 on Germany identified rigidities in the labour market as one of the key factors holding back growth compared with other EU Member States. Nevertheless, labour input has traditionally provided only modest contributions to potential growth and cannot therefore entirely explain the downward trend over time. Indeed, this study reveals that, in a growth accounting framework, capital formation and total factor productivity have also slackened significantly, particularly since the late nineties. It therefore sets out to investigate, from a production function perspective, some of the causes of this weakening performance with regard to all three variables.

The contribution of labour to potential growth has traditionally been weak…

One set of structural problems relates to the functioning of the labour market and its institutional set-up. From a situation of full employment until the mid-seventies, unemployment has been ratcheting up with each cyclical downturn, rising above the EU average since the turn of the millennium to peak in 2005 above 5 million or 12% of the labour force. While German reunification posed the extraordinary challenge of how to reabsorb the labour that became redundant in the transformation process, the problem of weak job creation has deeper roots. Thus, employment growth between 1995 and 2005 (+3¼%) has lagged behind the EU average (+12½%) even in the western part of the country. Even the moderate wage policy sustained over a long time was not able to prevent large-scale layoffs and did little to stimulate hiring until the end of 2005. A number of indicators provide firm evidence that unemployment has become largely structural: for example, the non-accelerating wage rate of unemployment (NAWRU) is estimated to have increased from 7¼% in 1995 to almost 8½% in 2005, and, against the general European trend, is only now turning around.

By long tradition, wage formation in Germany is relatively centralised, and although this facilitates wage moderation at the overall level, it inhibits wages from adequately reflecting differentials in labour productivity and companies' profitability. This not only deprives the low-qualified of job opportunities, but also leads to a brain-drain of the best-qualified, who represent the most innovative part of the labour force. Other problems relate to the social security system. By international standards, and also in relation to domestic earnings, social benefits have been relatively generous in terms of both level and duration, thereby also requiring high rates of social contributions, which drive a wedge between (high) labour costs for the employer and (low) take-home pay for the employee, creating strong disincentives for the former to recruit and for the latter to take up work, particularly

where low-paying jobs are concerned. This tax wedge widened considerably in the early 1990s as a consequence of reunification and has remained far above the EU average since then.

…with some improvements linked to recent labour market reforms

In response to the growing imbalance, and following the announcement in March 2003 of the so-called *Agenda 2010*, the government has introduced a series of important reforms designed partly to raise the efficiency of the labour exchange and placement services and partly to strengthen incentives for the unemployed to take up work. To facilitate their return to the job market, new forms of subsidised employment have been created. While the new measures will need time to take their full effect and a full assessment would be premature at this stage, the latest developments signal a positive turnaround on the labour market that may go beyond the improvement in cyclical conditions. Yet some important causes of unemployment, such as the set-up of the wage formation process or the restrictive employment protection legislation, remain to be addressed so as to facilitate a smooth adjustment of the job market.

Excess construction investment has now been corrected…

Since the mid-seventies, the German investment ratio has fallen from 24% to 19% of GDP. The biggest single factor in the long decline has been the shrinking of the construction sector, where the necessary downsizing from the early-post-war-era levels, although interrupted by the post-reunification boom, actually accelerated between the middle of the nineties and 2005, only to stabilise in 2006. Large excess capacity created on the back of generous subsidies, notably for residential building, the subsequent withdrawal of fiscal incentives, and tighter constraints on government budgets contributed to the persistence of the construction downturn. In marked contrast to other Member States, real estate prices have been flat in Germany for more than a decade, providing no boost to private consumption via wealth effects.

Private investment in machinery and equipment, as a share of GDP, has been rather volatile since the late eighties, with no clear trend. Yet the obvious response to reunification, the completion of the EU internal market, the introduction of the euro and the increasing momentum of globalisation, all calling for corporate restructuring, would have been an increase in investment. This suggests that there have been impediments to capital formation. Temporary factors have probably been at work, such as the loss of external competitiveness after reunification and the need for balance sheet restructuring of companies at the beginning of the present decade, which may explain to some extent the hesitant pick-up in investment at the early stage of the current cyclical recovery. Indeed, developments in 2006 suggest that the backlog of corporate spending is finally starting to unwind.

…but corporate financing and taxation still include

However, corporate financing and corporate taxation present more fundamental impediments to business capital formation. While large companies are increasingly resorting to capital market financing, established credit relations between borrowers and their "home bank"

impediments to capital formation

remain the dominant form of financing, notably for smaller and medium-sized companies. And although, with all its pros and cons, bank loan financing has proved efficient for established companies, it may be less so for the financing of new companies including innovative, high-risk start-up businesses. Moreover, German banks' profitability is low by European standards, which points to operational and institutional inefficiencies, since the sector has been largely shielded from external competition; it will face stronger pressure for adjustment in the future. Corporate taxation, for its part, suffers from a relatively high nominal tax burden, a rather complicated tax code, and a narrow tax base. This leads to relatively low actual revenues, even though at close to 40%, the nominal overall corporate tax rate is one of the highest in Europe. With the trend in tax rates of neighbouring countries heading clearly downwards, Germany risks losing out in the international competition for tax bases. In addition, the split in tax rates between retained earnings and distributed profits undermines the mobility of capital with regard to its optimal allocation for the financing of investment. The corporate tax reform of 2000, while causing heavy revenue losses to the government, has not substantially improved the investment climate from the tax side.

Productivity growth needs to be strengthened by innovation…

More generally, Germany's innovative capacity needs to be reinforced. The study illustrates that on many of the conventional indicators for innovation efforts and spending on research and development, Germany performs rather well, even if it regularly ranks behind the US and the European top performers. However, innovation appears to be concentrated in a relatively small number of large companies and geared towards rationalisation and cost reduction rather than developing and introducing new products. Small and medium-sized companies clearly lag behind the industrial leaders and their position has apparently weakened over time. It is they who are most constrained in their access to venture capital, especially since the *Neuer Markt* has been closed. The study also confirms that Germany has maintained its strong position in traditional sectors of manufacturing, such as the automotive, chemical and machine tools industries, but has been less innovative in frontier technologies and in the service sector, where lags in the adoption and diffusion of innovation may have contributed to the observed slowdown in productivity growth.

…and higher qualification of the labour force

Results from the PISA studies conducted by the OECD indicate that there is a need to improve the supply of highly-qualified labour. German schoolchildren score below the OECD average in mathematics and science, and there are no nationwide benchmarks for educational achievement. With the predominance of half-day schooling, early selection and low mobility between educational streams, Germany's education system is failing to mobilise its full human resources potential. At the tertiary level, the system is characterised by a lack of performance standards for and competition between universities, relatively long study periods and high drop-out rates. Finally, there is evidence that barriers to entrepreneurship are relatively high, notably

the heavy regulatory and administrative burdens involved in starting up and running a business.

*
* *

This study investigates a number of these structural deficiencies. It uses a growth accounting approach to shed some light on the causes of low labour force participation and high unemployment, identifies financing and tax obstacles to investment, and looks at ways to boost productivity via technology, specialisation and the supply of qualified human capital. In some areas, such as the labour market, the German authorities have initiated reforms, though they still need time to show their full impact. In others, such as corporate taxation, reforms are under consideration. These efforts are welcome and encouraging, since they raise public awareness of the need for adjustment and help overcome political inertia and popular resistance to reform. However, to maintain the momentum of boosting potential growth substantially in the longer run the reform process must continue.

A comprehensive reform agenda stands the best chance of boosting potential growth…

What the analysis shows is that, in spite of the drag from reunification progressively easing, there are multiple factors holding back Germany's potential growth, relating both to incentives for economic agents' behaviour and to the institutional settings in a broad range of areas. They therefore need to be addressed in the framework of a comprehensive reform strategy. No single policy measure, even if its importance is generally recognised, can by itself be expected to take the economy onto a sustained higher growth path. Under the EU Lisbon strategy for growth and jobs Germany has been recommended to take action notably in three areas: (*i*) to improve the sustainability of public finances by continuing fiscal consolidation; (*ii*) to improve competition in product and services markets; and (*iii*) to tackle structural unemployment, notably by giving the low-skilled better access to qualifications and pursuing reform of the tax-benefit system. Thus, simultaneous action along these lines as well as on the priorities identified in the present context, will most likely prove to be the most promising approach.

…and closing the gap with the euro area average or the US

The potential benefits to be reaped by a comprehensive reform agenda are illustrated in this study by model simulations showing the effects of policy measures simultaneously addressing the various identified impediments to growth. Thus, the fruits of reform efforts made in different areas are simulated as a higher rate of labour force participation, a cut in the effective corporate tax rate, a reduction in both the equity risk premium and in corporate mark-ups and an increase in total factor productivity. On these assumptions, the model calculations suggest that Germany could, even in the cautious scenario, catch up from potential growth currently estimated at 1¼% to the EU average growth trajectory of 2¼% p.a. over the next ten years. In an alternative scenario of bolder reform efforts, Germany could boost its

potential growth rate to more than 3% and thus grow as fast as the US economy did in the first half of this decade. Thus, even though these model-based simulation results should obviously be taken with caution and only convey an order of magnitude of potential benefits of a comprehensive reform strategy, they give strong grounds to believe that Germany can definitely leave behind the sluggish growth experienced in the first half of this decade.

A brighter short-term outlook…

Developments in 2006 may support such optimism. It appears that Germany has finally emerged from the trough of the lengthy and cumbersome adjustment process, with external competitiveness restored and the economic legacy of reunification less burdensome. Exports are providing strong forward momentum and are accompanied by a rebound in investment. Unemployment has been brought onto a firm downward trend and, most importantly, the number of jobs covered by regular employment contracts is heading up for the first time since the beginning of the decade. Higher tax revenues, rising even beyond the cyclical "dividend", and firm control over government spending brought the string of excessive budget deficits to an end in 2006, one year earlier than expected. The improved outlook for job opportunities and public finances should boost household confidence and consumer spending, such that any setback from the VAT increase in early 2007 may prove short-lived.

…is a window of opportunity for embracing reform…

A brighter business cycle outlook in a climate of restored private sector confidence offers an excellent opportunity for pressing ahead with structural reform, since it enhances both its popular acceptance and its chances of success. In this context, a higher employment level may facilitate further moves towards greater labour market flexibility, notably with regard to job protection regulations and wage-setting arrangements, key issues not addressed by the *Hartz* reforms. On corporate financing, the government has recognised the need for a competitive corporate tax system and a proposal has been made for reform, to take effect in 2008. What still needs to be done to stimulate investment is to adapt financial market legislation in such a way as to facilitate the adjustment of the banking structure to the European internal market framework and encourage the supply of risk capital via a deeper and more sophisticated equity market. To boost technical progress and productivity, further steps need to be taken towards liberalising goods and services markets, notably for the network industries. As far as human capital formation is concerned, the government has taken action to encourage the quest for excellence in higher education. Such efforts should be strengthened by allowing universities to compete with each other for students, teaching staff and resources on the basis of defined and agreed evaluation criteria, thereby mobilising additional private capital for education and research.

…building upon the rewards already achieved

Finally, for all the need for change and reform, policymakers should preserve and build on the gains already achieved. The corporate sector and in particular export-oriented manufacturers have managed to

maintain or even increase their technological advantage and restore profitability in a challenging environment, supported by sustained wage moderation. With past losses in price competitiveness having been corrected, wages should now grow in line with productivity, helping to support the positive turnaround on the labour market that has just begun. Fiscal policy, for its part, should ensure that the early achievements in deficit reduction are firmly locked in and the momentum of consolidation is maintained until budget balance in structural terms is reached. Sound public finances in line with the Stability and Growth Pact will in themselves lay a solid foundation for stronger growth on a sustainable basis.

1 INTRODUCTION

In May 2002, DG ECFIN issued a study on the German economy (European Commission 2002), which diagnosed Germany's weak growth performance in the latter part of the 1990s and investigated its causes. The study found that growth of GDP, at 1.6% p.a. between 1995 and 2001, was almost 1 percentage point below that of its EU partners, even if the faster-growing cohesion countries, namely Spain, Ireland, Portugal and Greece, were excluded. Focusing on the past decade, with the economic "shock" of German reunification, its economic repercussions and the subsequent adjustment, the study concluded that the largest part of the growth gap could be attributed to the direct and indirect effects of reunification, that the decline in the construction sector since the mid 1990s in East as well as to a lesser extent in the West played an important role, and that lack of structural reforms compared with other EU member states significantly aggravated the situation. As to macro-economic management and conditions, the study did not find any substantial differences compared with other EU Member States, except for a temporary excess in wage increases –also related to reunification – and its subsequent unwinding, but did identify structural rigidities in the labour market as the residual factor explaining the growth differential.

The years that have passed since the study was made have seen a further weakening of Germany's growth performance. Indeed, average annual GDP growth did not exceed ¾% in the first half of the present decade, and even stagnated in 2002-03. And although by that time external demand had picked up strongly, monetary conditions were easy and budgetary policy was relaxed, such stimulus nevertheless failed to ignite a firm recovery of domestic demand and employment. The belief that economic activity was going through an only transient sluggish phase started to give way to a growing awareness that profound changes have occurred in the economic environment and framework conditions over the years, to which policy, institutional settings and private agents in Germany have not only been slow to respond, but have also overstrained themselves by being extended to the eastern Länder and their very different starting conditions, with the result that they appear to have become unsustainable.

The policy response to the growing recognition of major structural impediments in the economy has been to implement a number of reforms in the last few years, notably addressing the functioning of the labour market. While these need more time to take their full effect, our projections suggest that even once they have done so their contribution to raising the growth potential up to the end of the decade is likely to be limited. Moreover, our analysis shows that the growth contribution from labour input has traditionally always been small or even slightly negative, and that the predominant factor in the growth slowdown has in fact been a secular fall in the investment ratio and a decline in the pace of total factor productivity growth.

Therefore, the present study, taking a broader view on the drivers of growth in a production function approach, sets out to examine in turn the role and evolution over time of labour input, capital formation and productivity in turn. It not only looks back at the process of adjustment after both reunification and the advent of EMU, which should by now have come to a close, which may also partly explain the current recovery; it also reaches out into the future, by trying to estimate the impact of a comprehensive reform strategy ten years from now and beyond. The main emphasis of the analysis is on the driving forces behind the growth process and the reasons for their apparent fatigue. The quasi-stagnation of activity earlier in the decade has triggered a widespread reform debate in policy quarters and the research community. This has led to concrete reform steps for the labour market and, most recently, to a proposal from the government for a company tax reform. Both are examined in this study, but beyond that we do not enter into the

more political debate on which concrete measures should actually be taken. Therefore, the study should not be read as – and indeed does not aspire to provide – a blueprint for a government programme.

The study is organised as follows: Chapter 2 reviews Germany's growth performance since the early 1990s and tries to disentangle cyclical from trend factors. As a scene-setter, it addresses the different factors that have shaped events and resulted in major imbalances. Chapter 3 is devoted to labour market issues, illustrating developments in labour force participation, employment, unemployment and wages, followed by a description of institutional provisions and a review of recent reform efforts. Chapter 4 focuses on capital formation: following a description of the longer-term trend in investment, machinery and equipment as well as construction, it pinpoints two aspects as possible impediments to growth: corporate financing on the one hand, and corporate taxation on the other. Chapter 5 deals with selected issues in the broad area of technological progress, namely innovation in technology and human capital, industrial specialisation, and factors affecting market entry and openness. Finally, Chapter 6 takes a look into the future, exploring in two simulation scenarios the possible impact of a comprehensive reform-oriented policy strategy on Germany's growth potential.

The key message is that no single policy measure or action in just one area should be expected to be the panacea to the growth problem: a comprehensive strategy, simultaneously addressing labour and capital input and productivity, is needed if the German economy is to be turned from a laggard into the driving force of growth in Europe.

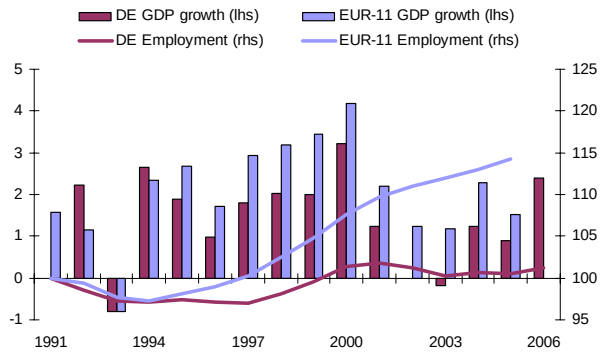
2 GERMANY'S GROWTH PERFORMANCE SINCE REUNIFICATION

This chapter sets out to analyse why Germany's economic growth in the late 1990s and the early parts of the current decade has been among the lowest in Europe and the OECD. In the first section, we discuss Germany's economic performance over the past 15 years with a reference to the euro area economy.[2] As this analysis will make clear, there are two aspects to be distinguished: one is the degree to which Germany's economic development is influenced by cyclical factors and whether the current cycle is unusual compared with previous ones; another aspect is to what extent slow growth in Germany has become entrenched as a structural problem. Both aspects are dealt with in the second section of this chapter.

2.1 Adjustment to mounting economic imbalances

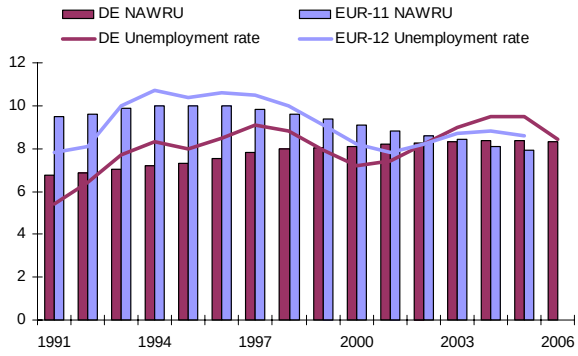
Since the mid 1990s, Germany has been lagging behind other euro area member states in terms of economic growth and employment. Graph 2.1 shows that real GDP growth in Germany fell behind the euro area average in every single year between 1995 and 2005. At the same time, employment trends in Germany and in the other countries that later formed the euro area also diverged significantly. While Germany in net terms has hardly generated new jobs since 1991, the rest of the euro area added almost 15% to its workforce during the past 15 years. This striking difference is also reflected in the unemployment statistics (see Graph 2.2). Until the mid 1990s, Germany's unemployment rate was typically about 2 percentage points below the euro area average. Thereafter, this gap narrowed more and more, as other euro area economies reduced their unemployment rate at a faster pace during periods of stronger economic growth and Germany experienced stronger increases during cyclical downswings. Furthermore, Germany's "non-accelerating-wage rate of unemployment" (NAWRU) is estimated to have increased, against the euro area trend-, by nearly 1½ percentage point since 1995, to reach almost 9% in 2005. Only in 2006, with growth reaching 2.7% in Germany and the euro area, the widening of the growth and employment gap has come to a halt.

Graph 2.1 **Real GDP growth and employment in Germany and the rest of the euro area**
1991-2006



Note: Gross domestic product in 2000 market prices. Employment in persons; all domestic industries (National accounts), 1991=100.
Source: Commission Services.

Graph 2.2 **Unemployment in Germany and the euro area**
1991-2006



Note: Unemployment rate: Eurostat definition. NAWRU: Non-accelerating wage rate of unemployment.
Source: Commission Services.

[2] A recent study by the Commission Services provides a comprehensive analysis of divergences of growth and inflation among euro-area economies. Chapter VII of that study is closely related to the analysis in this section. See European Commission (2006e).

2.1.1 Growing imbalances in the wake of reunification

The origins for the German economy's underperformance in terms of growth and employment date back to the years immediately following reunification, when wages increased well in excess of productivity. At the same time, Germany' external price competitiveness suffered further, when in 1992 pressures in exchange markets, which were also the consequence of high German interest rates in the aftermath of reunification, led to a crisis of the Exchange Rate Mechanism and a subsequent appreciation of the D-Mark. In spite of the ensuing recession in Europe and the currency appreciation, wage increases continued to erode German price competitiveness until 1995, when the real effective exchange rate was some 20% higher than in 1991 (see Graph 2.5).[3]

As a consequence of the strong real exchange rate appreciation, Germany steadily lost export market shares between 1992 and 1995, and the current account balance deteriorated on average by 1.3% of GDP per year. The contribution of net exports to real GDP growth was strongly negative in 1992 and, in spite of easing domestic demand which contained imports, remained zero or slightly negative until 1995. By contrast, the other economies that later became members of the euro area experienced on average an 8% decline in their real exchange rate between 1992 and 1995 and their exports of goods and services grew at a faster pace than Germany's in this period.

The loss in competitiveness in the early nineties was accompanied by the wholesale disappearance of eastern Germany's manufacturing sector, increasing unemployment, and rising taxes and social security contributions. In addition, large overcapacities had been built up in the construction sector, in particular in housing, resulting from the boom in the wake of reunification. Indeed, a former study on the German economy (see European Commission 2002) concluded that up to two thirds of the growth gap between Germany and its European partners since the mid-1990s must be ascribed to direct or indirect effects of reunification in combination with developments of the West-German construction sector.

Digression: The economic shock of reunification

The influence of reunification, respectively East Germany, is pervasive in all aspects of economic performance in Germany, three of them being of particular relevance: the state of the catching-up process, the transfer mechanism, and the mutual influence of East and West on each other's growth prospects.

Catching up

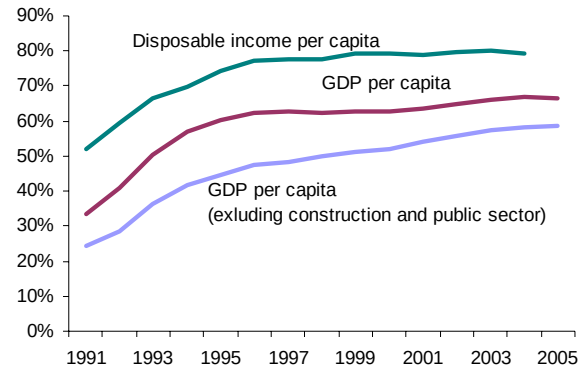
As can be seen from Graph 2.3, following rapid initial growth in the early 1990s, eastern Germany's catching-up in terms of GDP came to a de-facto halt in the mid 1990s, making the last 10 years appear like a lost decade, with eastern GDP per capita hovering at two thirds of western levels. However, a more nuanced picture emerges when considering GDP excluding construction and the public sector. This curve serves as a proxy for the sustainable part of the eastern economy, because it excludes the two sectors that are most heavily influenced by subsidies and make up an over-proportional share of the eastern economy. The curve shows on the one hand that the eastern German economic capacity is weaker than what is suggested by overall GDP

[3] For a more detailed analysis, see Jansen (2005). Hansen and Röger (2000) provide an estimate of real equilibrium exchange rates.

figures, at less than 60% of western levels. On the other hand, since 1995 this gap narrowed by 13 percentage points, rather than the 6 percentage points of the overall GDP. The difference is explained by the shrinking construction sector and, to a lesser extent, by lower growth in public services.

A third curve in Graph 2.3 reflects disposable income. Here, the eastern Länder have achieved 80% of Western levels, and arguably more, if one accounts for the generally lower costs of living in the region. This curve fully reflects transfers from the West. The difference between relative disposable income and the other two curves is suggestive of the volume of transfers the area receives.

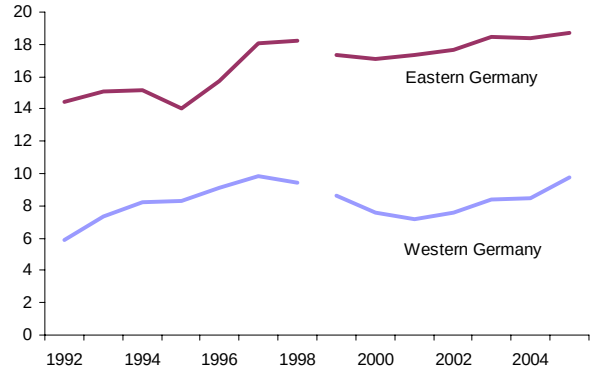
Graph 2.3 **GDP in eastern and western Germany**
in %, 1991-2005



Note: Western Germany = 100, excluding Berlin.

Source: Arbeitsgemeinschaft VGR der Länder.

Graph 2.4 **Unemployment in eastern and western Germany**
in %, 1992-2005



Note: Before 1999 Berlin was grouped Western Germany, since 1999 with Eastern Germany.

Source: Bundesanstalt für Arbeit.

East-West net capital flows

Net capital flows (government and private) from western to eastern Germany can be calculated as the difference between the absorption (i.e. investment and public and private consumption) and the GNP of each German Land.[4] Table 2.1 shows for each individual Land the estimated current account balance or, what is equivalent, the net financial flows. Since most of the financial flows are related to direct and indirect government and social security transfers, the figures serve as a good proxy for net intra-German transfer volumes. Unfortunately, investment and state expenditure data at the Länder level become available only with substantial time lag, making it impossible to have a clear estimate of the trends after 2004. Nevertheless some clear conclusions emerge from the analysis:

- Net financial flows from western to eastern Germany have been and continue to be of considerable size. They peaked in the mid-1990s at over € 110 billion annually and have since then fallen to around € 70 billion.
- Parallel to the reduction in absolute capital flows, a much more significant reduction in their relative importance is taking place. Capital flows fell from around 60% of GNP in most eastern Länder (excluding Berlin) in the early nineties to shares between 22 and 28% in 2004.

[4] For a more in-depth discussion, see Jansen (2004).

For the West, transfer volumes fell from a peak of 7.7% of western GNP in 1994 to 3.6% in 2004.

- For the five New Länder the current account deficit in 2004 remained in the relatively narrow range of 22 to 28% of GNP. By contrast, net capital flows differ substantially among western Länder, ranging from a substantial 10% of GNP in Hesse to net receipts of over 5% in the Saarland.[5] Increasingly, the transfer system is financed by Hesse, Baden-Württemberg and Bavaria, where absolute net capital outflows have remained more or less unchanged since the mid-1990s. Practically all other western Länder, which had lower transfer burdens to start with, have seen their burden ease substantially from their peak levels, e.g. North Rhine-Westphalia saw its contribution fall from €33 billion in 1995 to € 8 billion in 2004.

Table 2.1 **Estimated intra-German net capital flows of individual Länder**

	in billion €				as % of GNP			
Land/Region	**1991/1992**	**1995/1996**	**1999/2000**	**2003/2004**	**1991/1992**	**1995/1996**	**1999/2000**	**2003/2004**
Baden Württemberg	-20.4	-26.9	-29.4	-24.3	-8.4	-10.1	-10.0	-7.5
Bavaria	-13.4	-20.8	-23.0	-22.1	-5.0	-6.8	-6.8	-5.9
Bremen	-0.6	-0.4	0.3	0.2	-3.6	-2.4	1.5	1.2
Hamburg	-3.6	-6.4	-6.6	-2.1	-7.7	-12.4	-11.6	-3.1
Hesse	-13.1	-18.6	-20.3	-19.4	-9.5	-12.0	-12.0	-10.5
Lower Saxony	-1.1	-4.7	1.5	6.4	-0.7	-2.7	0.8	3.2
North Rhine Westphalia	-25.0	-30.4	-16.5	-8.5	-6.4	-7.1	-3.6	-1.7
Rhineland-Palatine	-4.4	-3.0	-1.0	0.2	-5.5	-3.4	-1.0	0.2
Saarland	0.4	0.9	1.5	1.4	2.0	4.0	6.2	5.4
Schleswig-Holstein	-3.0	-2.8	-1.2	-1.0	-5.4	-4.5	-1.8	-1.4
Total West	**-84.1**	**-113.2**	**-94.6**	**-69.1**	**-6.0**	**-7.2**	**-5.5**	**-3.7**
Berlin	7.9	8.8	8.2	6.2	12.7	12.0	11.2	8.6
Brandenburg	11.5	17.3	15.8	10.5	46.4	43.9	35.0	21.4
Mecklenburg-W. Pomerania	11.2	14.1	11.0	8.7	68.3	53.3	37.9	28.4
Saxony	23.6	34.0	27.5	19.4	56.9	51.1	37.5	24.2
Saxony-Anhalt	15.8	21.6	17.2	12.8	65.7	56.5	41.1	28.9
Thuringia	14.0	17.4	15.0	11.4	63.0	50.4	37.7	26.5
Total East + Berlin	**84.1**	**113.2**	**94.6**	**69.1**	**44.0**	**40.7**	**31.3**	**21.6**

Note: Positive (negative) values denote net capital inflows (outflows).
Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder; European Commission calculations.

East-West interdependencies

As Graph 2.3 shows, the effect of the transfers was to achieve a rapid and impressive catching-up of eastern living standards, but a less pronounced improvement in eastern productive capacity. Graph 2.4 reveals that the main factor here is the large unemployment in the East, which persists despite, or indeed because of the transfers from the West. This is because on the one hand East Germans certainly benefit from higher purchasing power than they would otherwise have. On the other hand, social transfers (which make up more than 80% of the overall transfers) create poverty traps in the East and push up reservations wages. Notably, at least before the Hartz labour market reforms, it was not unusual for welfare benefits, in particular for families, to exceed the average take-home pay of a worker in eastern Germany. Accordingly, there was little resistance

[5] These figures have to be interpreted in the context of an overall German current account surplus of over 4% of GNP vis-à-vis the rest of the world, and which would need to be added to every state to calculate the net total net outflows, as opposed to the intra-German flows. This implies that for instance, the overall capital outflows of Hesse amount to close to 15% of GDP.

in the East against wage demands in excess of productivity developments. The aim of recent labour market reforms (discussed in Chapter 3) of creating a wedge between net wages and welfare benefits is therefore a belated but crucial step for correcting this disincentive, in particular in the context of the labour market in the East. Without further reduction of the negative influence on the labour market, the effect of transfers might well be to slow the regional development of the East despite the state aids that attract investment.

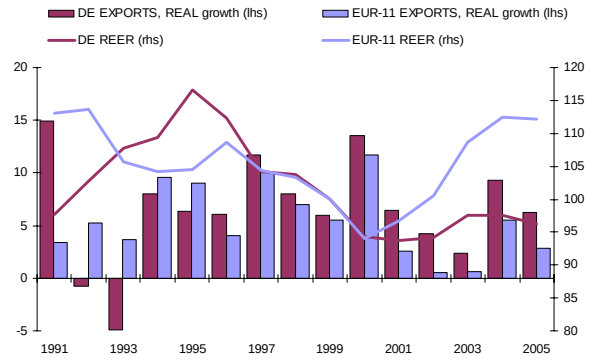
For the West, the situation is more clearly negative. Most immediately, its purchasing power is reduced. In addition, the concomitant increase in taxes or relative decline in infrastructure quality make it difficult for western Germany to attract business compared with other countries that are not burdened with an equivalent drain of resources.

To sum up, eastern Germany is not the source of all German problems, but exerts a significant strain on the economy. The East has reaped massive benefits from unification. However, some aspects might also have entailed unintended costs. Notably, progress in eastern Germany might have been more helped if it had not be been accompanied by the strict application of all western regulations. Similarly, the design of the transfer system could and can be adjusted to minimise the risk of developing a culture of dependency. Consequently, reforms in Germany as a whole are likely to have larger repercussions in the East than in the West.

2.1.2 Restoration of external competitiveness over the past decade

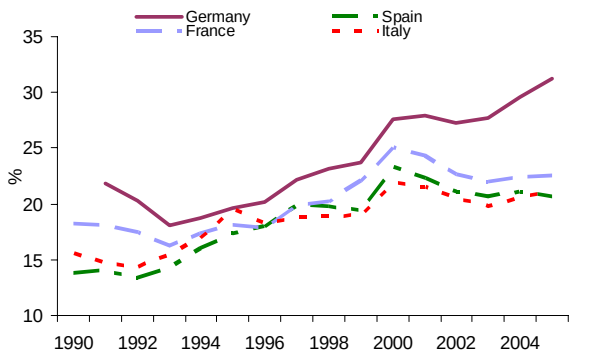
Germany's cost and price competitiveness started recovering from 1995 onwards, with increases in nominal compensation per employee only slightly above or even below productivity gains. By 2000, Germany's real exchange rate had dropped back to its 1991 level. As a result, German export performance was in line with the expansion of foreign markets over 1996-2000 and the contribution of net exports to real GDP growth turned positive again.

Graph 2.5 **Real effective exchange rates and export growth in Germany and the rest of the euro area**
1991-2005



Note: EUR-11: Euro area excluding Germany; Real effective exchange rates based on nominal unit labour costs; 1999=100. Exports of goods & services at 2000 prices.
Source: Commission Services.

Graph 2.6 **The degree of economic openness in the four largest euro area economies**
1990-2005



Note: Average of total exports and imports of goods as a percentage of GDP at market prices

Source: Commission Services.

After the so-called dotcom bubble had burst in 2001, economic growth fell further in Germany, with cumulated real GDP growth amounting to a meagre 3½% between 2001 and 2005.

Continued wage moderation with nominal wage increases averaging only 2½% per year, coupled with average productivity growth of 3½% prevented an increase in the real effective exchange rate despite the strengthening of the euro. Yet quite the opposite has taken place in the rest of the euro area, where this rate started to appreciate in 2000, and a 15% gap in the real exchange rate has opened since then between Germany and the rest of the euro area. Germany may, by now, not only have corrected its original competitiveness problem. In relation to other euro area economies, Germany has even become more price competitive than it was in the early 1990s. Also, a current account surplus in the order of 5% of GDP does not suggest a need for further improvements in price competitiveness. Yet this does not automatically indicate that an "equilibrium" real exchange rate has been reached, because the relatively low productivity of eastern Germany is likely to have reduced the equilibrium values that are calculated on the basis of West Germany alone. Furthermore, Germany still has one of the highest labour cost levels in Europe, and a further increase in the international division of labour will most likely set limits to future wage increases. The adjustment process that has been ongoing for ten years may therefore not automatically come to a halt.

Last but not least, German companies engaged in large foreign direct investment (FDI), notably between 1998 and 2000. Although the effects of FDI on the domestic economy are still much debated,[6] buoyant FDI activity has promoted Germany's further integration into the world economy. This is evidenced by an accelerated increase since 2000 in the degree of economic openness: as is shown in Graph 2.6, the average of total imports and exports of goods as a share of GDP increased from 23.7% in 1999 to 31.2% in 2005. This compares with a rather flat profile of this indicator during this period for France, Italy and Spain.

2.1.3 Dismal performance of domestic demand up to 2005

The restoration of Germany's external price competitiveness has taken place in a period when other euro area countries experienced a sharper decline in real long-term interest rates than Germany.[7] The more favourable real interest rate developments in the euro area outside Germany gave a substantial impulse to domestic demand in countries such as Portugal, Spain and Ireland. In Germany, on the other hand, real interest rates above the euro-area average may have initially counteracted the dynamics of competitiveness adjustment, and moderate wage increases and stagnant employment dragged on domestic demand. From 1999 to 2005, domestic demand contributed less than 1% to overall real GDP growth (Jansen 2005, p. 2). Capital formation and private consumption have only recently started recovering. As will be discussed in greater detail later in this chapter, by way of a protracted decline in investment the German economy's lopsided growth composition has contributed to the erosion of the growth potential. This also indicates that Germany should not take too much comfort in competitiveness gains that are largely relying on wage restraint rather than productivity improvements, in particular since, as the recent experience has shown, improved external competitiveness does not always translate immediately into a stimulus for the domestic economy.

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6 See for a comprehensive study Knödler (1999) and the papers presented in session 2 of the *INFER* Annual Conference 1999, published in Stierle (1999). For more recent papers see Fuhrmann (2004) and Jäckle (2006). According to recent estimates by the Deutsche Bundesbank (2006), outward FDI by German companies may have a favourable impact on domestic investment in the long-run.

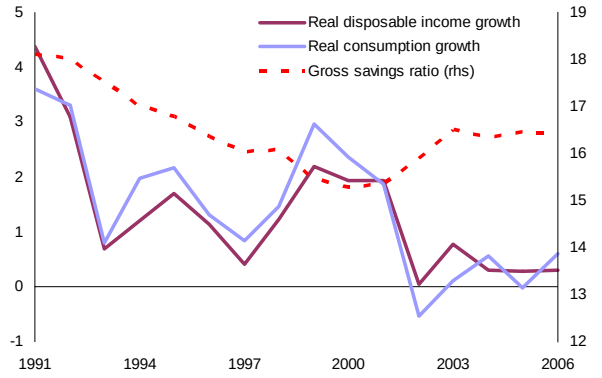
7 Chapter 5 of the EU Economy Review 2006 (see European Commission 2006e) sets out that measuring real interest rates in Germany over this period is rather complex because exporters faced very different real interest rates than other economic agents.

Seen from the demand side of the economy, consumer spending has been a major source of weakness since the beginning of the decade, with real private consumption remaining virtually stagnant between 2001 and 2005 and only slightly recovering in 2006.[8] The dismal performance owes much to sluggish growth in household disposable income (Graph 2.7). This in turn may be largely ascribed to moderate wage developments and particularly a contraction of employment.[9] The causality is to some extent circular, with low demand bringing about low growth, causing again low demand. Beyond this pure cyclical slump, however, two additional factors have constrained consumer spending:

First, since the beginning of the decade, German households have had to absorb large terms-of-trade losses which have exerted sizeable pressure on purchasing power. Between 2000 and 2005, annual inflation was about 0.7 percentage points faster when measured by the consumer price deflator rather than the GDP deflator (Graph 2.8). The terms-of-trade losses partly reflect external shocks such as surging oil prices, but were mostly generated domestically as a result of the competitiveness adjustment process through which the economy has been going since the mid-1990s. In the rest of the euro area, the consumption and GDP deflators have, on average, expanded at a similar pace over the past five years.

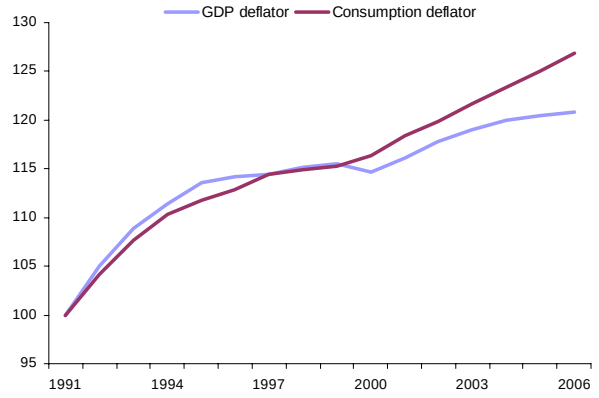
Second, after a decade of continuous decline, the German savings ratio picked up significantly in 2002 and 2003 and has remained constant since. Such a development appears at odds with past behaviour of German households which used to smooth consumption by lowering their savings rate during the recessions of the early 1980s and early 1990s. It is also at odds with the more growth-supportive savings behaviour registered in some other countries both within the euro area (e.g. Spain, Greece or France) and outside the euro area (United Kingdom, USA).

Graph 2.7 **Private consumption and savings**
in %, 1991-2006



Source: Commission Services.

Graph 2.8 **GDP and consumption deflators**
index 1991=100, 1991-2006



Source: Commission Services.

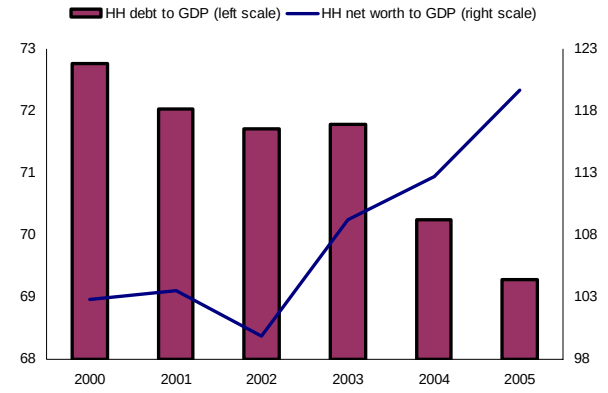
Signs of spending restraints are also visible when looking at the balance sheets of German households. Graph 2.9 shows that, subtracting the stock of financial liabilities from corresponding assets, the sector has strengthened its net worth significantly, reaching almost 120% of GDP in 2005. In addition, debt as a share of GDP has started to decline, down from

8 The other stumbling block of domestic demand, capital formation, is dealt with in detail in Chapter 4.

9 For the respective roles of employment and wages in supporting household consumption see European Commission (2006c), pp. 15-20.

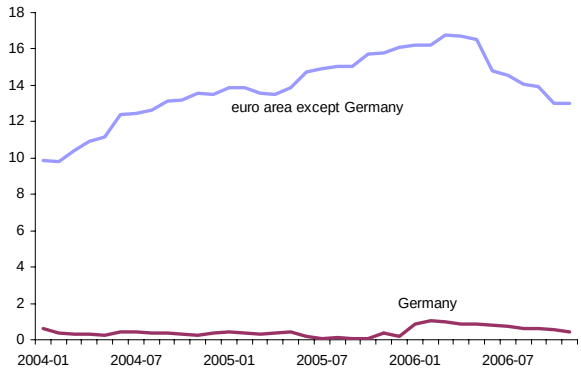
about 73% of GDP to below 70%. Yet, as Graph 2.10 illustrates, this increasingly solid state of household finances means also that the credit development is continuing to advance at a subdued pace, falling well below rates computed for a euro area aggregate excluding Germany.

Graph 2.9 **Households' debt and net financial wealth**
ratio to GDP in %, 2000-2005



Source: Deutsche Bundesbank, Eurostat, Commission Services calculations.

Graph 2.10 **Monetary financial institution lending to households in Germany and the rest of the euro area**
y-o-y growth, 2004m1-2006m11



Source: ECB, Commission Services calculations.

A study undertaken by the National Institute of Economic and Social Research for the European Commission (see Box 2.1) sheds some light on why private consumption in Germany remains weaker than would be suggested by the growth in disposable income, especially when compared with developments in other countries. The study suggests that private households appear to be more financially constrained than their counterparts in other countries, notably in the UK and the US. In addition, private consumption in Germany has not benefited from a stimulus provided by house prices contrary to many other countries both within and outside the euro area. Finally, recent pension and labour market reforms may have induced households to step up precautionary saving (see also Box 2.2 for an assessment of the possible impact of pension reforms).

Box 2.1 **Private consumption in the euro area – A NIESR study**

A recent cross-country study undertaken by the National Institute of Economic and Social Research (2006) compares the determinants of private consumption in the USA, Germany, the UK, France, Italy and Spain. The study's main findings are summarised in Table 2.2. The estimation results suggest that financial wealth plays a comparatively limited role for consumption in Germany. The long-term coefficient of financial wealth is small and statistically not significant in the short-term dynamics. This could be a sign that German households are still subjected to liquidity constraints limiting the possibility to use wealth to smooth spending across time and across the cycle. This is consistent with the observation that consumption by liquidity-constrained households tends to be closely tied to income developments. Disposable income tends to play a lesser role in the estimated equations of countries with more liberalised financial markets such as the UK and the USA.

At the same time, there is some evidence of a comparatively strong impact of house prices on private consumption. Yet real house prices in Germany have decreased steadily since the mid-1990s, by more than about 1.5% annually. In the meantime, real house prices have increased rapidly in most other EU countries and the US. They have, for instance, gained about 6% per year in France. As a consequence, contrary to other countries that have benefited from rising house prices, private consumption in Germany has been held down by weak house prices. Simulations with the equation presented in the table indicate that house prices could have added close to half a percentage point annually to German consumption growth over the last few years if they had increased as rapidly as in France.

Last but not least, pension reforms and ageing have probably exerted a significant pressure on household spending in recent years in Germany (see also Box 2.2). Neither Ricardian effects (as measured by the government budget balance) nor confidence effects (as captured by the NAIRU, volatility in equity price or consumer confidence) appear to play a significant role in explaining fluctuations in German household spending. The estimated equation presented in Table 2.2 over-predicts annual consumption growth by an average of more than half a percentage point for 2002-04. This suggests that factors that are not captured in the equation, such as pension and labour market reforms have been weighing on household spending in recent years.

Table 2.2 **Estimated consumption equations in Germany and several selected countries**

(endogenous variable: changes in real private consumption – all coefficients are significant at the 5% level)

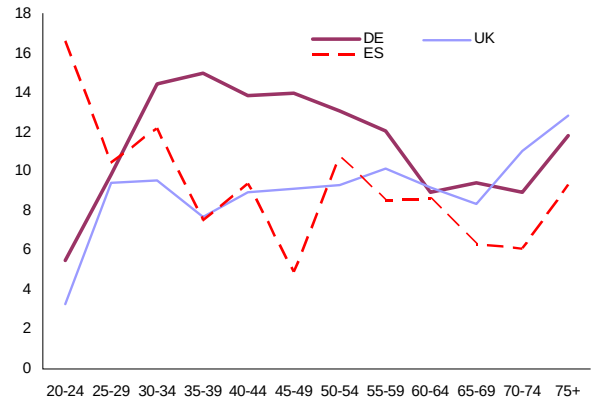
Exogenous variables	Germany	Spain	UK	Italy	France	USA
	74Q1-04Q4	82Q1-04Q4	74Q1-04Q4	74Q1-04Q4	74Q1-04Q4	74Q3-04Q4
Long-term relation						
Real disposable income (lagged 1)	0.947	0.874	0.866	0.789	0.951	0.865
Real financial wealth (lagged 1)	0.053	0.126	0.134	0.211	0.049	0.135
Constant	-0.059	-0.017	-0.016	-0.045	-1.076	-0.190
Short-term dynamics						
Error correction term	-0.334	-0.093	-0.071	-0.081	-0.286	-0.222
Change in real disposable income	0.742		0.198	0.208	0.449	0.167
Change in real financial wealth			0.021	0.260		0.029
Additional determinants						
Change in real house prices (1)	0.157	0.071	0.106			0.089
Real interest rate (lagged 1)				-0.5E-3		-0.4E-3
Share of population aged 20-39					0.192	
Share of population aged 40-64					0.160	0.043
Share of population aged 65+					-0.054	
Consumer confidence						0.8E-4
Change in government balances (2)						-0.001

Note: Data for private consumption, disposable income, financial wealth and house prices are in logs.
(1) Lagged by 1 quarter for the USA. (2) Government balances as a share of GDP. Data for the USA are in level.
Source: National Institute of Economic and Social Research (2006).

A higher savings ratio can in particular be observed among younger households in Germany, when compared with other countries such as the UK or Spain (see Graph 2.11). This is one of the

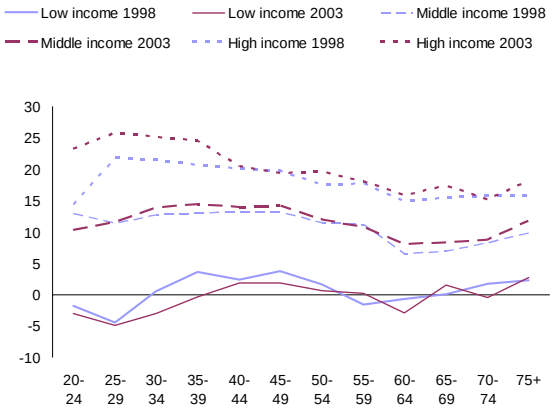
main factors explaining the comparatively high level of the overall savings ratio in Germany.[10] High savings among the younger population is difficult to reconcile with the life-cycle theory, but could be explained by the presence of liquidity constraints in Germany. It could also be explained by the rise in precautionary savings related to concerns about future pension prospects.[11] Arguably such concerns should primarily affect younger households as public pension payments are likely to be curtailed progressively. It is consistent, that the socio-economic group of young high-income households appears also to be the main driver of the overall increase in the savings ratio observed in Germany since the beginning of the decade (see Graph 2.12). Such households have increased their savings-ratio substantially between 1998 and 2003 while savings by low income households have fallen over the same time period. High income households probably have substantial leeway to adjust their savings behaviour.

Graph 2.11 **Savings ratios by age cohort in Germany, Spain and the UK**
in %, 2003



Source: National Institute of Economic and Social Research (2006).

Graph 2.12 **Savings ratios by income and age cohort**
in %, 1998 and 2003



Source: National Institute of Economic and Social Research (2006).

Box 2.2 **Pension reform and its impact on household saving**

Germany has one of the most generous pension systems in the EU and, like the rest of the EU, is faced with a substantial increase in the share of elderly people over the next decades. Currently, pension expenditures amount to about 12% of GDP. In response to the demographic developments, the government passed in January 2001 the so-called 'Riester reform', with the aim of a gradual reduction of the replacement rate from 70% to 62% in 2040 and to build up a second tax-privileged private pillar. This was amended in 2004 with the introduction of an additional sustainability factor, which assures that an upper limit of the contribution rate of 23% will be respected.[12]

10 According to national account data, Germany and Italy had the highest household savings ratio among the EU15 in 2005.

11 Labour market reforms are another possible explanation. However, any short-term effect of labour market reforms on precautionary savings is likely to be mostly felt among low-income households who tend to be more directly exposed to their impact. In any event, given the timing of recent labour market reforms in Germany, this possible effect is unlikely to have been felt already substantially in 2003.

12 For a more detailed description of the German reform process see Börsch-Supan and Wilke (2004).

One principal goal of these reform initiatives is to create a second funded pillar next to the current pay-as-you go system. This essentially requires an increase in the savings rate, at least temporarily. Therefore, current subdued consumption behaviour in Germany could be partly explained by the expected reduction of retirement income. These reforms are already in place, but they will affect mainly future pensioners and may thus induce a change in saving behaviour among the current population of working age.

Life-cycle model calculations can be used to assess how the envisaged change in the German pension system is likely to impact on current consumption. According to the life-cycle hypothesis a distinction must be made between the response of consumption to ageing in the absence of a pension reform and the response of consumption to the pension reform. Concerning the pure ageing-related response of consumption, two effects must be separated. First, because the period spend in retirement is becoming longer, people of working age will tend to save more in order to smooth consumption over the life cycle. But there is also an effect going into the opposite direction because of a higher proportion of low-saving retirees in the population. However, over the transition period (in which the number of retirees is still relatively small), the first effect dominates the second. Simulations with ECFIN's ageing model[13] suggest that this pure ageing-induced effect could account for a decline in the private consumption to GDP ratio by 0.3 percentage points since 2001.

To this increase in the saving behaviour that would have happened anyway, one must add the savings response caused by the pension reform itself. A reasonable modelling assumption is that pension contributions will not exceed 23% until the year 2030 and, as a consequence of this financing constraint, pensions in 2030 will be reduced by about 20%, compared to a path with a replacement rate fixed at the current level of 70% (replacement rate in 2030: 56%). Consequently, the forward-looking consumers have to at least partially compensate an expected loss of pension income reaching 20% in 2030 via increased savings today.

Based on these assumptions, the ageing model calculates that the pension reform itself could have caused a decline in the aggregate consumption-to-GDP ratio of roughly 0.25 percentage points since 2001. This figure assumes that all households optimally adjust savings in order to smooth consumption over their life span. It should be interpreted as an upper bound of the downward adjustment, because a sizeable fraction of German households might be liquidity-constrained. Thus, the combined effect of saving for (longer time in) retirement and compensating future income losses due to the pension reform could explain a decline of the consumption-to-GDP ratio by about one-half percentage point in Germany since 2001.

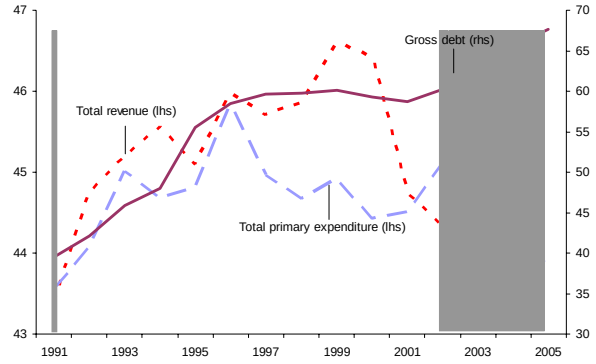
Public finances under strain

The weakness in private consumption was accompanied by public expenditure restraints, in particular after 2003. Problems in the area of public finances have been accumulating for a long time, with a further deterioration in the aftermath of the economic slowdown following the bust of the "dotcom" bubble. In 2006, however, the general government deficit fell well below 3% of GDP. Fiscal institutions came under intense pressure after reunification, when the existing tax, social security and transfer system was by and large maintained. The situation was aggravated by the continued low growth, which limited the scope for consolidation through increased revenues. Moreover, as a consequence of a less "tax favourable" growth composition, i.e. mainly export-driven growth, and several significant cuts in direct tax rates, revenue increases have lagged

[13] See McMorrow and Röger (1999 and 2003) for detailed descriptions of this model.

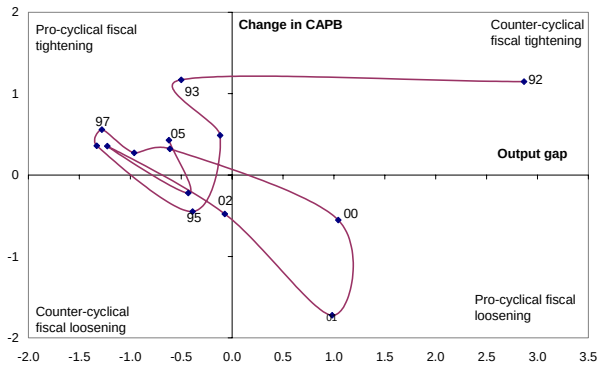
behind (already weak) GDP growth since 2000. As a result, government revenue as a share of GDP dropped from 46.6% in 1999 to 43.5% in 2005 (see Graph 2.13) and is expected to have remained at this level in 2006. This is in sharp contrast to developments in the rest of the euro area where stronger GDP growth has dampened the decline in the revenue share. Primary expenditure, i.e. total government expenditure excluding interest payments, was more restrained in Germany over the past decade than in other euro area member states. Much of the consolidation in government expenditures took the form of retrenched investment (see Chapter 4), while public consumption remained relatively unchanged until 2003 and started to decline modestly thereafter. However, with GDP growth in 2000-2003 being much weaker than in the rest of the euro area, the primary expenditure ratio has increased by more than in other euro area countries during that period. This ratio dropped significantly in 2004-2005 and is expected to have further receded in 2006, while it increased slightly in the rest of the euro area. It is, however, rather the drop in the revenue ratio than the temporary increase in the primary expenditure ratio that has led to a persistent primary deficit since 2002. Recent preliminary data suggest that the primary balance turned positive again in 2006. In cyclically- adjusted terms, the primary balance turned negative, when massive tax cuts in 2001 led to a collapse of the revenue ratio. Graph 2.14 illustrates that the cyclically-adjusted primary budget balance (CAPB) decreased by 1.7% of GDP in that year. Fiscal policy was further relaxed in 2002, when economic growth fell below its potential. In the following years, however, negative output gaps complicated fiscal tightening.

Graph 2.13 **General government: Revenue, primary expenditure and debt**
in % of GDP, 1991-2005



Note: UMTS receipts in 2000 are excluded; shaded areas mark periods with primary deficits.
Source: Commission Services.

Graph 2.14 **Fiscal stance**
1992-2005

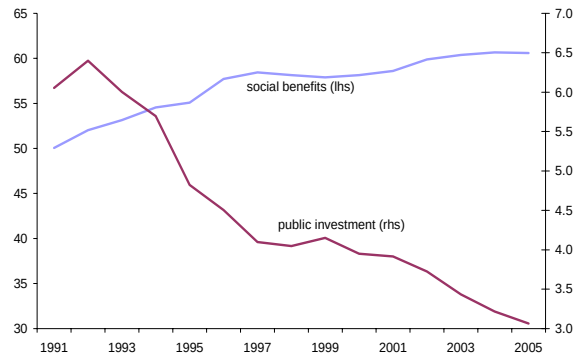


Note: CAPB – cyclically adjusted primary budget balance; figure for 2000 corrected for UMTS receipts.
Source: Commission Services.

As Graph 2.15 shows, the composition of expenditure has shifted over time. The share of social benefits in primary expenditure increased from 50.1% to 60.6% between 1991 and 2005, while public investment fell from 6.1% to 3.1% of primary expenditure. These are long-term trends and not related to consolidation efforts after the government deficit rose above the 3% of GDP ceiling in 2002. The trend in social benefits is primarily driven by expenditure on pensions, due to population ageing but also due to early retirement schemes of the past. In addition, the steady increase in unemployment (see Chapter 3) contributed to rising social benefits. The pressure on public budgets from rising social benefits has certainly been at the cost of public investment, but there may also have been a downward adjustment as public investment needs following reunification levelled off. Public spending on education, which in the national accounts is mostly recorded as consumption, has been rather constant over time at about 9½% of primary expenditure, but has been falling somewhat since 2002.

The social security system has repeatedly been reformed. In particular the public pension system has been subject to reforms over the last decade. When the recently announced increase in the statutory retirement age to 67 years will have been implemented, the system appears to be broadly sustainable. However, this measure needs to be extended to civil servants. Graph 2.16 shows that if the government's plans until 2009 are adhered to, the share of age-related expenditure in GDP will decrease due to the reforms until 2009 and rise, due to demographics, thereafter. The need for further corrections in the long run depends not least on whether potential output can be raised and whether the recently enacted labour market reforms will provide substantial relief to public finances. Under current policies, the pressure from social benefits on public finances is going to last. Graph 2.16 shows that even if the government's austerity plans until 2009 are adhered to, public debt is bound to approach 100% of GDP by 2050.

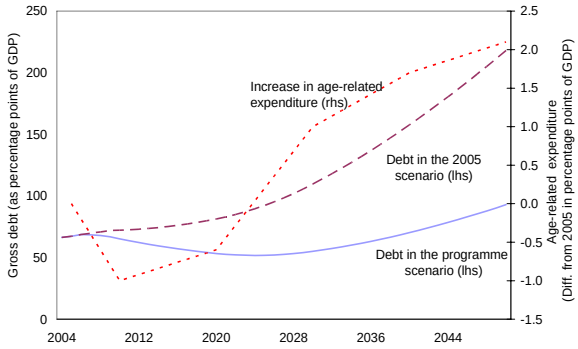
Graph 2.15 **Public expenditure on social benefits and investment**
in % of primary expenditure, 1991-2005



Note: The inclusion of the Treuhand debt into the federal budget in 1995 and the UMTS receipts in 2000 (both recorded as capital expenditure) are excluded.

Source: Commission Services.

Graph 2.16 **Long-term sustainability of public finances**
2004-2050



Note: Rhs: Gross debt as percentage points of GDP. Lhs: Age-related expenditure in differences from 2005 in percentage points of GDP. Calculations on the basis of data provided in the German stability programme update February 2006.
Source: Commission Services.

2.2 Cyclical movements and long-term developments

In the previous section it was argued that Germany underwent a protracted period of adjustment to correct post-reunification imbalances. While there are now clear signs that domestic demand, notably private investment, is finally picking up, the question remains why it took so long for the external impulse to spill over. Since the full benefits of globalisation can only be reaped within a favourable domestic macroeconomic environment, it appears that deeper-rooted structural problems may have prevented a swift transmission. For a deeper understanding of the German economy's driving forces, it is instructive to separate their cyclical components from the- long-term determinants.

2.2.1 Is the current business cycle unusual?

It is a common perception that, despite its relative size, the German economy typically does not generate its own business cycle. With the obvious exception of the reunification boom, an upswing would usually start with a rebound in foreign demand. Booming exports would then raise profits, respectively, sales expectations and firms would start to invest, eventually increasing employment and private consumption. The external impulse would in the end translate

into a sustained recovery of domestic demand. In many ways, the present cycle differs from this pattern, notably because domestic demand has responded very late to a strong external impulse.

For analytical purposes, business cycles can be identified as deviations of economic activity from a long-run trend. Accordingly, expansions (contractions) are marked as periods when real GDP growth is above (below) its long-term trend rate.[14] The decomposition of a time series into its components, i.e. trend, cycle, season, and irregular variations partly depends on the method of decomposition used. In particular, the trend estimation does not only specify the long-run trajectory of the time series, but also the movement of its other components. Analytically even more important is the possibility that one method might identify a short cycle as a full business cycle, while another might identify it only as a mini-cycle within a longer business cycle. However, the following argument appears to be very robust to the choice of the filtering method.[15]

Table 2.3 summarises the outcome of the business cycle dating exercise.[16] Applying the Christiano-Fitzgerald (1999) band-pass filter, five full business cycles in addition to the current upswing have been identified between 1970Q1 and 2006Q3. The first two cyclical recoveries, defined as periods exhibiting positive changes in the output gap, followed two major oil price shocks in the mid seventies and the beginning of the eighties. The following boom at the beginning of the nineties was caused by German reunification. That decade witnessed two more, albeit short-lived economic upswings. As regards the current recovery, which has started in the fourth quarter of 2003 and has now lasted for 13 quarters, its duration, though not its strength, comes close to the boom phases after the oil price shocks.

Until the most recent economic recovery, boom phases had not only become more short-lived. With the exception of the reunification boom, they also appear to have become less and less strong. While average quarterly real GDP growth during the recovery after the first oil price shock was still about 1%, this rate declined almost continuously to an average growth rate of about 0.3% during the current cycle. This confirms the general view that Germany recently has had more trouble than in the past in getting out of economic doldrums. However, it does not provide a full answer to the question whether the current business cycle is unusual. In order to investigate this issue, movements in real GDP caused by cyclical factors have to be distinguished from output movements due to long-term growth factors.

The most striking development over the last three decades is the gradual decline in the overall growth rate of real GDP. This is illustrated by columns 5 and 8 of Table 2.3, which show that during the upswing following the first oil price shock about two-thirds of the increase in real

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14 See, e.g., Canova (1998). The classical business cycle analysis describes movements in actual economic time series, in particular the identification of expansions and contractions in the absolute level of aggregate economic activity. The NBER and the CEPR, for instance, define recessions as a significant decline in the level of economic activity, usually visible in two or more consecutive quarters of negative growth in GDP, employment and other measures of aggregate economic activity.

15 The results are also in line with DG ECFIN's estimates according to the commonly agreed production function method, which are, however, based on annual data. Moreover, we found that, while the choice of the filter method has some effect on the cycles' magnitude (amplitude), it does not influence the dating of the business cycles (i.e. on the cycles' frequency). With the exception of the cyclical recovery in the mid-80s, which only the Christiano-Fitzgerald band-pass filter is identifying as being very strong, the deviations of the cycles' amplitudes are rather small.

16 Paternoster (2005) recently analysed business expansion periods for the euro area and its five major economies. We deviate from his analysis by comparing the recent upswing with separate past upswings, instead of their average.

GDP was related to potential growth. In later expansions, this ratio was only matched during the reunification boom. From the mid-nineties on, both trend and cyclical factors have contributed less to economic recoveries. A comparison between the current upswing and its two forerunners suggests that during the first seven quarters after their respective troughs cyclical factors have equally contributed to the economic recoveries. However, the current recovery stands out in that the contribution of potential growth falls markedly behind. This is in line with the results of other studies that the German economy's potential growth has significantly decreased after the mid nineties.[17]

Table 2.3 **Real GDP growth across recovery periods**
1970Q1 to 2006Q3

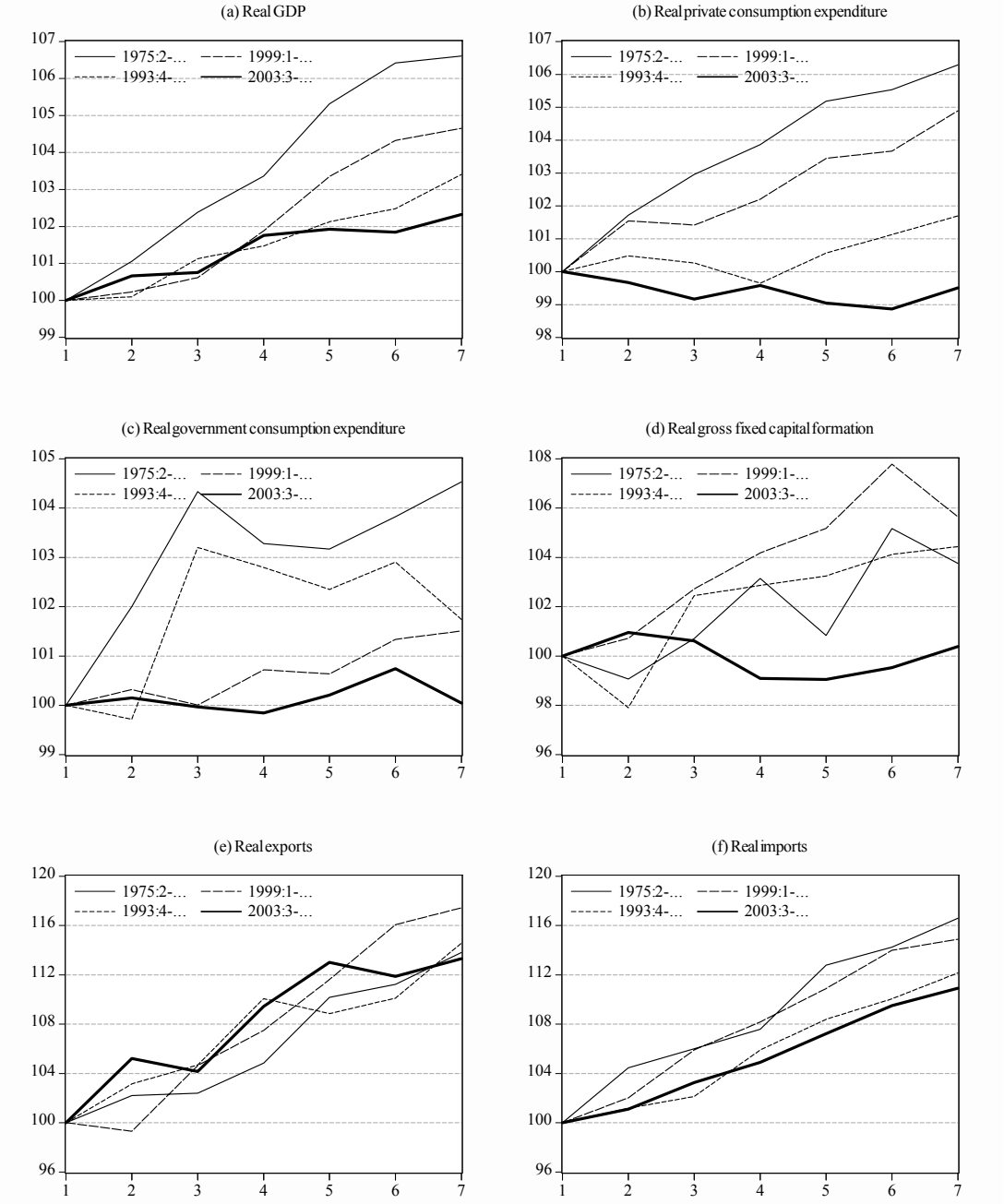
			Full cycle			first 7 quarters		
Cycle	Trough	Duration of upswing (in quarters)	Average quarterly growth of real GDP (in %)	…of which attributable to increase in potential output	… of which cyclical	Average quarterly growth of real GDP	…of which attributable to increase in potential output	… of which cyclical
I	75Q2	17	0.95	0.64	0.31	1.15	0.67	0.48
II	82Q4	13	0.53	0.18	0.35	0.70	0.20	0.50
III	89Q3	9	1.21	0.79	0.42	1.61	1.11	0.50
IV	93Q3	7	0.52	0.26	0.26	0.52	0.26	0.26
V	98Q4	7	0.61	0.31	0.30	0.61	0.31	0.30
VI	*03Q3*	*≥ 10*	*0.31*	*0.16*	*0.15*	*0.39*	*0.13*	*0.26*

Note: Cycles as identified by the Christiano-Fitzgerald (1999) band-pass filter, assuming business cycle durations between 8 and 32 quarters.
Source: Commission Services.

Not only does the current upswing of the German economy appear weaker than previous upswings on both cyclical and trend accounts, it also differs in its main expenditure components. For expositional convenience we restricted our analysis to four recoveries, omitting the expansion in the mid-80s and the special case of the reunification boom. As can be seen from Graph 2.17, after 7 quarters real GDP was only 2.3% above the level reached at the cyclical trough in 2003q3. This is 1 percentage point less than in the 1993q4 upswing, half the increase achieved during the previous upswing and even 4.5 percentage points less than in the upswing following the first oil price shock, each after the same period of time.

[17] It should, however, be kept in mind that the growth contributions have been calculated on the basis of the Christiano-Fitzgerald band-pass filter, and while other methods indicate the same turning points, they nevertheless yield somewhat different results regarding the magnitude of the output gaps, i.e. the amplitude of the business cycles. One should thus be cautious in drawing quantitative conclusions from the above analysis regarding the development of potential output in Germany.

Graph 2.17 **Real GDP and its expenditure components across various upswings**



Source: Deutsche Bundesbank, Commission Services

In the first seven quarters of the current recovery, all domestic demand components stayed extremely weak, remaining basically at their starting level. After seven quarters, real private consumption was even lower than at the cyclical trough in 2003q3, warranting the prominence this fact has taken in policy debates. Interestingly, the contribution to growth of real government consumption has also been declining over consecutive upswings. In the current recovery, there was virtually no contribution to GDP growth from public consumption expenditure after seven quarters. Furthermore, investment was strikingly weak in the initial phase of the current upswing. Real gross fixed capital expenditure of the whole economy was at least 4% higher after seven quarters in previous recoveries. As capital formation is of crucial importance not only for short-

term aggregate demand but in particular with regard to long-run growth prospects of the economy, its weakness during the first quarters of the current recovery is of even greater concern than the weakness of private consumption.

Finally, external trade has contributed more than in the past to the current upswing. This, however, is not attributable to exceptionally strong increases in exports. In fact, recent export growth does not differ much from past recoveries. It is rather subdued import growth that, as a consequence of sluggish domestic demand, has contributed to an above-average contribution of net external trade. It also appears that cyclical recoveries in Germany are not always triggered by an impulse from external demand.

2.2.2 The long-term perspective: a secular decline in potential growth

Germany's potential growth rate has declined substantially over the last 10 years. Table 2.4 indicates that the period average of over 2½% p.a. experienced over the 1985-1995 period has been slashed to less than half that rate in recent years. Even if one allows for the effects of reunification in temporarily boosting the period averages around 1990, Germany has nevertheless seen its long run average performance of 2-2¼% p.a. reduced to slightly more than 1% at present. According to latest Commission services calculations, the decline in potential growth stopped in 2004 when its annual rate fell to 0.9%. Since then, potential growth has accelerated to 1.3% in 2006, suggesting that past reform measures are finally taking effect.[18]

The production function approach applied in the calculation of potential growth also allows determining the relative contribution of labour supply, capital input and total factor productivity (TFP) to potential output.[19] According to this calculation, about 1.0 percentage point of the current average potential output growth of 1.2% annually stems from total factor productivity increases. The contribution of capital accumulation to growth amounts to 0.4 percentage points, whereas the reduction in labour input reduces potential growth by about 0.2% annually. While this clearly points to problems in the German labour market, labour input is not the main reason for the recent slowdown in potential growth, because the growth contribution of labour supply has always been poor during the last quarter of a century. Instead, slowdowns in the rate of capital accumulation and total factor productivity (TFP) growth are responsible for the drop in potential output growth.

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[18] The possible impact of past and future reform measures on potential growth will be discussed in Chapter 6.

[19] Potential growth is an unobservable variable and can only be calculated by approximation. One set of methods relies on a statistical approach, as followed in the business cycle dating exercise in the previous section (see Apel and Jansson (1999), Cerra and Saxena (2000), Forni and Reichlin (1998), Giorno et al. (1995), Hodrick and Prescott (1980), Mc Morrow and Röger (2001)). An alternative approach, which was officially adopted by the ECOFIN council and applied by the Commission, is the production function approach (see Denis et al. (2006) and Röger (2007)). This method allows the possibility of examining the underlying economic factors which are driving any observed change in the potential output indicator and consequently the opportunity of establishing a meaningful link between policy reform measures with actual outcomes.

Table 2.4 **Potential Growth Rates and the contributions from Labour, Capital and Total Factor Productivity**
Period Averages 1981-2005

		Contributions to Potential Growth				
	Potential Growth	**Total Labour input (hours)**	***of which due to***		**Capital Accumulation**	**Total Factor Productivity (TFP)**
			Persons employed	***Hours per Employed***		
1981-1985	2.0	-0.1	*0.6*	*-0.6*	0.7	1.4
1986-1990	2.7	0.1	*0.7*	*-0.6*	0.7	1.8
1991-1995	2.6	0.0	*0.5*	*-0.5*	0.8	1.7
1996-2000	1.7	-0.2	*0.2*	*-0.4*	0.7	1.2
2001-2005	1.2	-0.2	*0.1*	*-0.3*	0.4	1.0

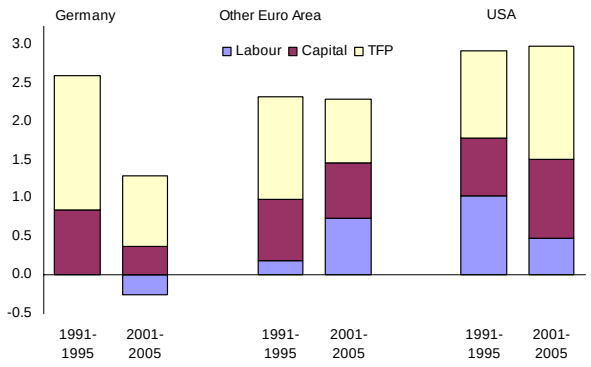
Source: Commission Services.

Developments in Germany are in stark contrast to those in other countries. As Graph 2.18 shows, other economies like the USA and the rest of the euro area have maintained the level of their potential growth rates, even if substantial shifts in the relative contributions might have occurred. An important aspect is that, even though falling labour input explains relatively little of the German growth *decline* since the early 1990s, it makes up a substantial part of the difference in the *level* of potential growth between Germany and other countries. The growth in capital input is also poor compared with either the United States or other European countries. Only in terms of total factor productivity is Germany relatively strong, but remains well behind that of the United States and its own historical standards. The following sections will analyse the role of the individual input factors in more detail.

Labour and capital contribution to growth

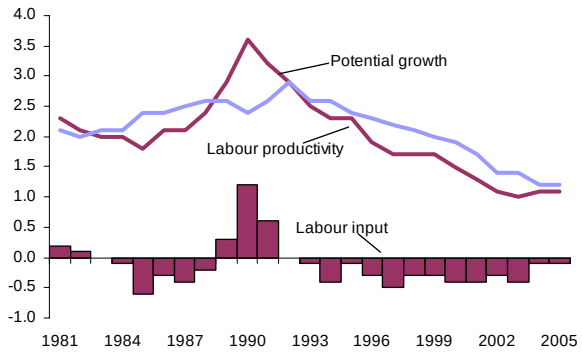
With the exception of the reunification boom, labour input has been in permanent decline over the last quarter of a century (Graph 2.19).[20] This marks the most important contrast between Germany and other countries, which succeeded in generating growth by way of increased labour input.

Graph 2.18 **Potential growth rates in Germany, the rest of the euro area and the USA**
annual % change



Source: Commission Services.

Graph 2.19 **Potential growth rates, labour productivity and labour input**
contributions to annual growth in %, 1981-2005



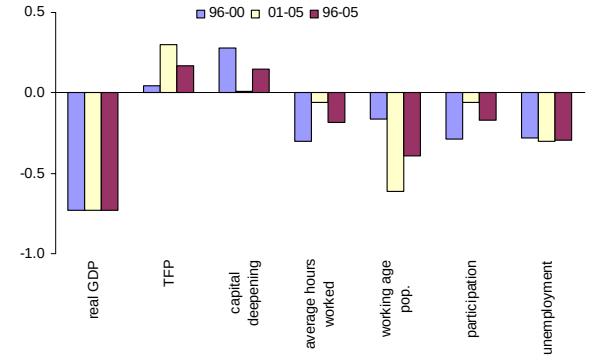
Source: Commission Services.

20 Here as in all following charts, data before 1991 refer to West Germany.

Graph 2.20 shows that Germany's potential output, *ceteris paribus*, would be a full percentage point higher if the economy had achieved labour input growth comparable to that of the other euro area members.[21] A large part of the shortfall of the labour contribution to growth vis-à-vis the rest of the euro area is due to demographic factors. Indeed, about half of the gap in real GDP growth between Germany and the rest of the euro area over the period from 1996 to 2005 can be attributed to the growth differential for the working-age population. Graph 2.21 illustrates that, in contrast to developments in the rest of the euro area and in particular the US, the working age population in Germany has stagnated over the past ten years.

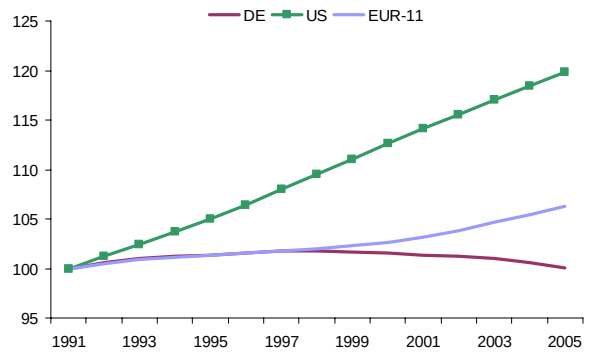
Another decisive component in the past had been the secular trend towards a shorter work week and longer annual vacation. Reductions in hours per employed alone reduced potential output by 0.6% annually throughout the 1980s (see Table 2.4). Since the early 1990s, this aspect has become less important, as the reduction in the work week has increasingly become less important in wage negotiations, respectively, the ability of unions to push through the desired working time reductions. In recent years, it is indeed noticeable that the weekly working time has started to increase in many jobs. However, this is more than compensated by the fact that the share of (often low-paying) part-time jobs is increasing, not least in the context of recent labour market reforms (see Chapter 3). As a consequence, the working hours per employee continue to shave off about 0.3% of growth every year. However, in 2006, the trend decline in the average working time per employee may have come to a halt.

Graph 2.20 **Real GDP growth and its components: Differences vis-à-vis the euro area**
1996-2005



Source: Commission Services.

Graph 2.21 **Working age population: Germany, the US and the rest of the euro area**
1991=100



Source: Commission Services.

In the past, the decrease in working hours per employed used to be more or less compensated by an increase in employment, which contributed about ½% of GDP growth up until the early 1990s. Since 2001, however, overall employment has stagnated, with the decline in the working-age population being offset by an increase in the participation rate. Moreover, labour productivity

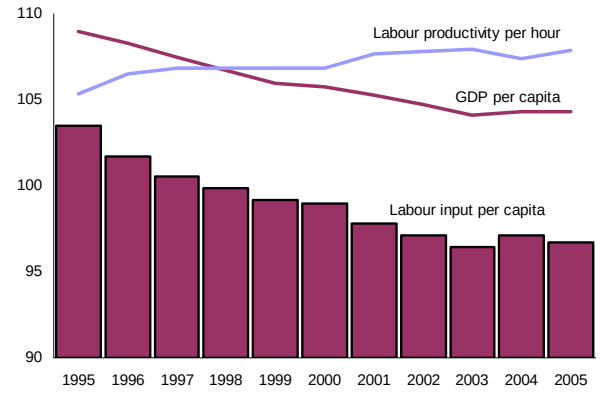
21 Assuming a Cobb-Douglas-production function where Y denotes the level of GDP, L employment, H the average hours worked per person employed, K the capital stock, WP the working age population, PART the participation ratio as a share of WP, ur the rate of unemployment and α the labour share in income, real GDP can be written as $Y = \frac{Y}{H \cdot L} H \cdot L = A \cdot \left(\frac{K}{H \cdot L} \right)^{1-\alpha} H \cdot WP \cdot PART \cdot (1-ur)$. In terms of growth rates g this is $g_Y = g_A + (1-\alpha)(g_K - g_L - g_H) + g_H + g_{WP} + g_{PART} - g_{ur} \cdot \frac{ur}{1-ur}$. The expression $(g_K - g_L - g_H)$ is referred to as capital deepening, i.e. the increase in the capital labour ratio.

growth as a whole has declined from a peak of nearly 3% p.a. in the early 1990's to 1¼% in 2004 and 2005. Yet, while Germany has an obvious labour productivity problem, it is interesting to note from Graph 2.22 that, as a result of a more severe deterioration in the euro area as a whole, its relative productivity performance vis-à-vis the euro area has in fact slightly improved over the period 1995-2005.

Graph 2.23 reveals that also the contribution of a rising capital stock, or capital deepening to growth, has fallen very rapidly in the first half of this decade. Until 2000, the contribution of capital deepening to growth held steady at about ¾ of a percentage point. Since then, the capital contribution has fallen precipitously to about ¼% at present. Lower capital accumulation therefore explains a growth slowdown of ½ percentage point over the last five years. It is directly related to the fall in investment volumes that has occurred since the burst of the ICT bubble. Even the substantial gain in competitiveness, due to falling unit labour costs that has taken place since, has not resulted in a substantive pick-up in investment volumes, which would have increased the growth contribution of capital inputs.

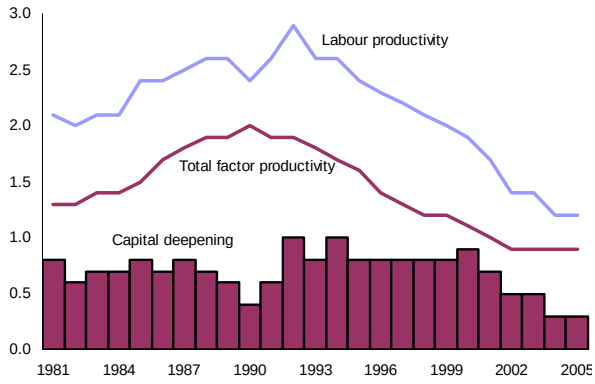
The fall in capital growth and its persistence are quite remarkable. As will be seen in Chapter 4, low investment volumes can be explained by a combination of factors. An important aspect is overinvestment, especially in construction, that took place in the early 1990s in the wake of reunification. An additional aspect is that Germany appears to have entered the Euro at a too high exchange rate, straining many companies' competitiveness. At the same time, the relatively protected German capital market before the introduction of the Euro resulted in allocative inefficiencies and low returns on investment. Since then, companies adjusted by directing an increasing share of their investment abroad. Even though there are signs that the process is coming to an end, not least due to falling unit labour costs, the stagnating domestic market still holds back investment growth. These factors are also partly captured in the falling total factor productivity growth.

Graph 2.22 **GDP per capita levels accounting: Germany relative to the euro area**
euro area=100, 1995-2005



Source: Commission Services.

Graph 2.23 **Decomposition of labour productivity growth**
annual % change, 1981-2005



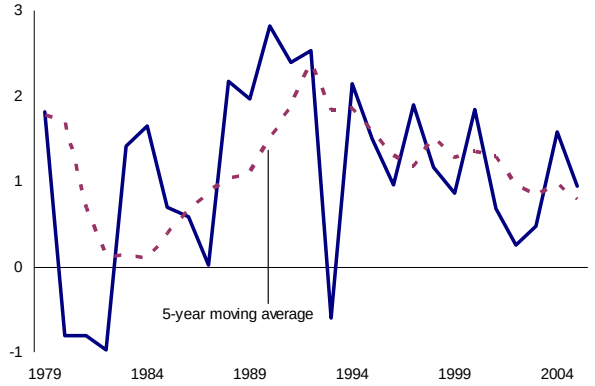
Source: Commission Services.

Total factor productivity

Total Factor Productivity (TFP) - the residual generated in the course of the growth accounting exercise - is typically thought of as a measure of technological progress.[22] However, it is important to distinguish between embodied and disembodied technological change. Embodied technological change which arises from changes in the composition of production inputs (capital and labour) refers to improvements in the design or quality of new capital goods or intermediate inputs. Embodied technology diffusion involves the purchase of machinery and equipment incorporating new technology and their introduction into production processes. Disembodied technological change is not incorporated in any specific factor and can be the result of research and development (R&D) that leads to improved production processes, or a consequence of learning-by-doing. Disembodied technological change reflects shifts in the production function. Within the neoclassical framework, when no adjustments are made for changing capital quality, TFP growth reflects both disembodied and embodied technological progress. When adjustments are made to the capital stock, TFP encompasses only disembodied technological change. Here, we will focus on both aspects of technological progress.

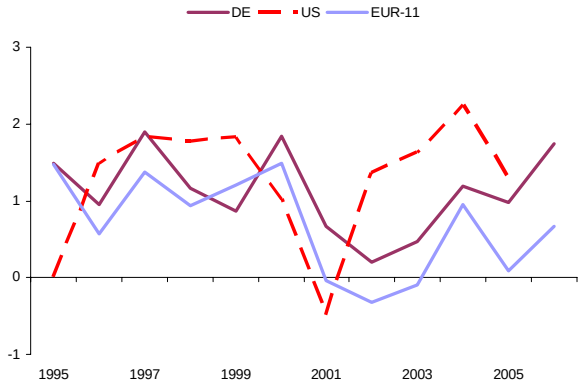
The derivation of TFP growth as a residual implies two caveats in the interpretation of the figures. First, Germany's TFP growth varied a lot during the last decades. Since these movements are also affected by the business cycle (Skoczylas and Tissot 2005), it is instructive to have a look at longer trends. As can be seen from Graph 2.24, TFP growth slowed down significantly in the early 1980s, from about 1.7% in the late seventies to approximately -0.8% in the beginning of the 1980s. It recovered in the second half of 1980s to about 1.5% and remained around this level in the 1990s. However, it slowed down again in 2000-2004 to approximately 0.9%.

Graph 2.24 **Long-term development in German total factor productivity growth**
1979-2005



Note: Annual percentage change.
Source: AMECO.

Graph 2.25 **TFP growth in Germany, the rest of the euro area and the US**
1995-2006



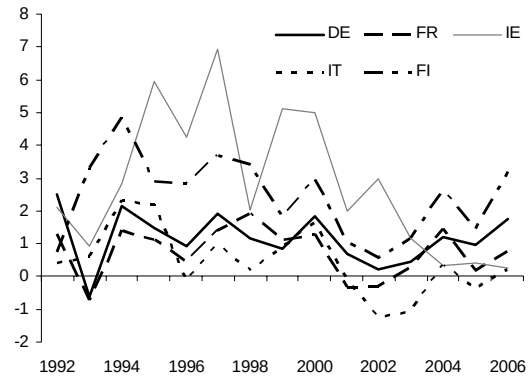
Note: Annual percentage change.
Source: AMECO.

22 Only in the pure Solow model (assuming perfect competition and constant returns to scale) the growth of TFP equals the contributions of the technological progress. Other models recognize that not all technological change translates into TFP growth. The residual captures also other, non-technology related, factors like adjustment costs, scale and cyclical effects, pure changes in efficiency and measurement errors. For further discussion see Griliches (1996).

Second, TFP cannot be strictly separated from the capital and labour input as the statistical analysis might suggest. In a sense it is arbitrary whether a shift from a low-skilled to highly skilled worker is calculated as an increase in (effective) labour supply or in productivity. Conventionally, no qualitative weighting of labour supply (or capital) is made. This does not render the analysis of TFP meaningless. Although TFP reflects the combined efficiency of labour and capital, it cannot be solely boosted by increases in capital or by eliminating unproductive labour. The growth of TFP is mostly determined by innovation and the diffusion of innovation developed domestically and abroad, which in turn are influenced by institutional factors such as regulations.

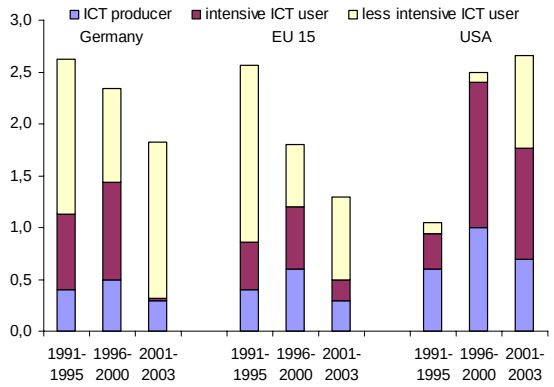
Recent growth accounting computations reveal that the significance of the TFP growth as a source of GDP growth has declined over time not only for Germany but for many countries, probably mostly due to an insufficient speed of knowledge transfer and lack of appropriate regulatory adjustments. Graph 2.25 reveals that during 1995-2005 the decline in TFP growth was more pronounced in the euro area than in Germany. With the exception of 2000 and 2001, German TFP growth was below the rate for the US economy. While the difference between the two countries has substantially shrunk in 2004 and 2005, it was caused by the worsening growth performance of the US TFP and not by the improvements in the German productivity growth. A good deal of the 2006 rebound in German TFP growth can be attributed to a short-term GDP boost in response to tax changes. The corresponding negative effects of these measures can be expected to drag down TFP growth in 2007. In the EU, countries like Finland and France experienced some TFP growth acceleration during 2001 and 2004, while Ireland has experienced a further decline of TFP growth since 2002 (see Graph 2.26). The exceptionally high TFP growth of the Irish economy during the 1990s had been mostly driven by technology transfers via massive foreign direct investment (FDI) from the US and other OECD countries, attracted by low corporate tax rates, well-educated labour force and Irish accession to the EU. In case of Finland, Maliranta (2003) reports that high TFP growth rates can be attributed to the positive effects of reallocation of resources towards more productive firms. Honkapohja et al. (2007) suggest that the Finnish process of resources reallocation was fostered both by increased product market competition and by increased requirements for asset returns in financial markets.

Graph 2.26 **TFP growth in the EU**
1992-2006



Note: Annual growth in percentage.
Source: AMECO.

Graph 2.27 **Sectoral contributions to total change in hourly productivity**



Note: Annual percentage change.
Source: AMECO.

EEAG (2006) reports that countries experiencing higher TFP growth rates enjoy the lowest degrees of product market regulation (close to the US levels). In contrast, weaker TFP growth performers have much more regulated product markets. In addition, Germany and Italy have

comparably higher employment protection legislation, though Italy has not experienced a large decline in labour input as Germany did. It may well be that more traditional sources of growth might be less sensitive to regulatory intervention than growth relying increasingly on high technology and new products, where competition should be encouraged (Nicoletti and Scarpetta 2003).

The role of ICT

Germany's growth performance therefore compares poorly in both labour input and labour productivity terms. In addition, unlike a large number of other euro area economies, it cannot attribute much of the decline in its productivity trend to short-run trade-off effects from the introduction of labour market reforms aimed at integrating more low-skilled workers into the economy. It would appear therefore that the productivity decline is overwhelmingly structural in origin. In order to explore this structural productivity issue in a little more detail, it is instructive to group productivity data that the Groningen Growth and Development Centre (GGDC)[23] compiled for 56 different sectors into three categories, namely ICT producing sectors, ICT-intensive and non-ICT intensive sectors. This approach allows isolating the importance of ICT in driving overall productivity growth, revealing significant differences between Germany, the EU-15 and the US.[24] The main conclusions to be drawn from this breakdown are:

Firstly, the overall decline in German labour productivity of 1 percentage point between 1991-1995 and 2001-2003 is similar to that which occurred in the EU-15 as a whole. It is, however, in stark contrast to the 1¼ percentage points acceleration in US productivity over the same period.

Secondly, Graph 2.27 shows that the divergence of German, respectively, EU-15 and US productivity during 2001 and 2003 is almost totally ICT-related. The contribution of ICT-producing services and manufacturing sectors to overall productivity growth in the US is about double that in Germany and in the EU-15. This factor alone accounts for about ½ a percentage point of the difference in productivity growth. Even more striking is the difference in the contribution of ICT intensive sectors. In Germany, these sectors barely contributed to productivity growth during 2001 and 2003, while in the US they accounted for the bulk of the productivity increase during this time period. In addition, contrary to developments in the US, the contribution of the ICT intensive sectors to productivity growth in Germany is in fairly decline, while its drop is less dramatic in the EU15.

On the other hand, Skoczylas and Tissot (2005) argue that higher US TFP growth cannot be solely attributed to a greater use of IT equipment, as the bulk of the IT investment occurred after the US TFP growth started to accelerate. They report that there had been acceleration in trend TFP in the US since the 1970s, a period of substantial structural reforms. Conceivably then, ICT use could also be an indicator for rapid innovation, rather than a cause for it.

Only in the less ICT intensive industries, Germany is broadly holding its own, and performs well in comparison to the EU15 and the US. Clearly, however, Germany's productivity growth has fallen behind that of other countries, because the technical progress connected to the advances in ICT has essentially bypassed the country. This is the case both in the production of the ICT itself and in the use of ICT as a production input. The data also suggest that Germany is falling behind in other high-tech areas and is becoming increasingly locked into the low and medium-technology sectors. Chapter 5 will discuss this aspect in greater depth.

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23 For more details see Timmer and Van Ark (2005).

24 For details on methodology see Denis et al. (2004), p. 26.

2.3 Summary

Germany's economic growth in the early years of the present decade has been among the lowest in the OECD. Germany had to cope with the consequences of reunification and the subsequent appreciation of the D-Mark, which was exacerbated by strong wage increases above productivity growth in the early 1990s. Adjustment started in the mid-1990s, but was not yet completed when Germany entered the European Monetary Union. As a consequence, the euro entry exchange rate was overvalued. The restoration of external competitiveness took the form of protracted wage moderation.

At the same time, a high structural government deficit limited the room for manoeuvre on the fiscal side. Among other factors, sluggish private household demand and the unwinding of the earlier over-investment in construction led to a sharp fall in investment starting in 2000. This fall further reduced potential growth – already low on account of Germany's structural rigidities – to slightly above 1%. A positive external contribution to growth from 1999 onwards compensated partly for the decline in consumption and investment. However, the restoration of external competitiveness has finally started to translate into higher investment. With private consumption also slightly picking up, economic growth was buoyant in 2006. Although the recent recovery is partly related to anticipatory effects in connection with fiscal measures, it is evident that the recovery of the German economy is now more broadly based.

This chapter has argued that part of the recent low growth performance in Germany can be explained by cyclical factors, compounded by the fact that in the current business cycle it has taken an unusually long time for the external impulse to be translated into domestic demand. This is because domestic demand was long held back by the savings ratio ratcheting up to a higher level, an increase that was triggered by an unavoidable regime change in the pension system and necessary labour market reforms. Low domestic demand also appears to have had knock-on effects in dampening investment, thus dragging out the rebound longer than would otherwise have been the case. However, if low growth were mainly a matter of a weak cycle combined with some transitional effects of reforms, much of the problem would solve itself, once a full upswing manifested itself.

The bulk of the growth problem, though, is structural in nature. Since reunification, not only has Germany's potential growth fallen behind its own historical levels, but its economic growth has also fallen behind that of other countries. This chapter has provided a first assessment to determine the relative importance of labour and capital inputs and of total factor productivity growth in accounting for this two-fold decline. The conclusion it draws regarding Germany's own long-term evolution is that the decline in total factor productivity growth, which has traditionally been the major contributor to GDP growth, and the weak performance of capital formation are the factors that are mainly responsible for the overall decline in economic growth. In particular, capital formation has long suffered from the cutback of excess capacities in the construction sector that built up in the wake of reunification.

In a cross-country perspective, developments on the labour market are the main determinant of growth gap between Germany and the rest of the euro area. Indeed, about half of this gap over the period from 1996 to 2005 can be attributed to low German growth in the labour force. The following chapters will analyse selected trends and problems in each of these components in greater detail.

3 UTILISING THE EMPLOYMENT POTENTIAL

Before the 1990s, the German economy was characterised by both high rates of economic growth and relatively low unemployment. However, in each year since 1992, real GDP growth has been persistently lower in Germany than in the euro area aggregate or the EU15. Unemployment rates trended upwards and since 2001 the harmonised rate of unemployment has been higher in Germany than in the EU15. Since 2003 it has also been higher than in the euro area. Similarly, employment creation in Germany could not follow the pace of other European economies. The suitability of labour market institutions has increasingly been questioned (see also European Commission 2002) and from 2003 onwards significant labour market reforms have been implemented in Germany.

The growth-employment problem risks becoming more severe in the future. Current projections of demographic developments bode ill for a return to the high rates of potential growth recorded in the past. Population is forecast to fall by 5 million from 82.7 million in 2005 to 77.7 million in 2050 and working-age population even by 10 million, implying that by 2050 there will be 1.4 persons of working-age per person outside the working-age of 15-64, compared to 2.0 in 2005.[25] Long-term projections by the European Commission (2006b) foresee that employment growth will be continuously negative from 2020 onwards and potential GDP growth will decelerate further when the baby-boomer generation retires around 2030, rebounding somewhat until 2050.[26] As standard practice, this scenario is built on a no-policy assumption. Sensitivity tests support the notion that an increase in labour utilisation will be essential for brightening the gloomy long-term outlook for the German economy.

Against this background, this chapter focuses on the question of whether the subdued employment record in Germany could be due to the design of labour market institutions and the German welfare system. The first section briefly reviews the main labour market developments in Germany in comparison to those in the EU, providing evidence of increasing divergence. The following section reports on the evidence of how labour market institutions influence labour market developments, again comparing the design of institutions in Germany with those in other EU countries. Finally, the third section provides a first attempt to assess the impact of recent labour market reforms in Germany.

3.1 Labour market developments

3.1.1 Employment and participation

Since the end of the short-lived reunification boom, the German employment performance went through three different phases. The first phase started in 1991 and lasted until 1997. In this time, the number of employed persons fell from a peak of more than 39 million to 37.5 million. Job losses were particularly pronounced in eastern Germany where employment declined by 12.5%, compared with 1.3% in western Germany (including Berlin, see Graph 3.1). Somewhat unnoticed in the public debate was that all the employment losses of the period 1991-97 were recovered in a second phase 1997-2001, when total employment climbed back to its 1991-level. However, the

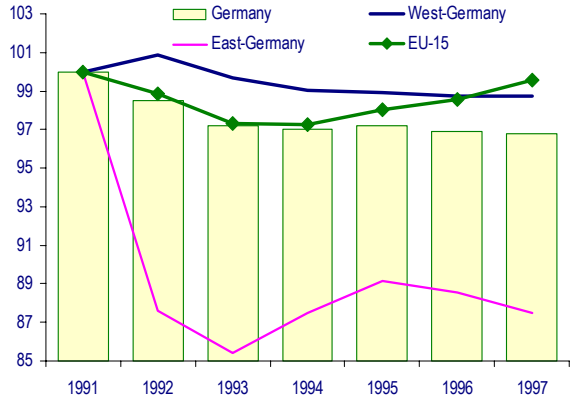
[25] See Carone (2005) and Carone et al. (2005).

[26] According to an estimate by the German Statistical Office (Statistisches Bundesamt 2006), these developments might even be more severe.

employment gains were restricted to western Germany while the level in the eastern Bundesländer hardly stabilised. The subsequent third phase during the economic slowdown from 2001 onwards has again taken a heavy toll on employment. It fell by 0.6 million until 2003, once again stronger in the East than in the West. Employment increases in 2004 were partly offset by a slight reduction in 2005 (see Graph 3.2). Only in the course of the recent, by fiscal measures temporarily reinforced upswing employment grew back to more than 39 million at the end of 2006.

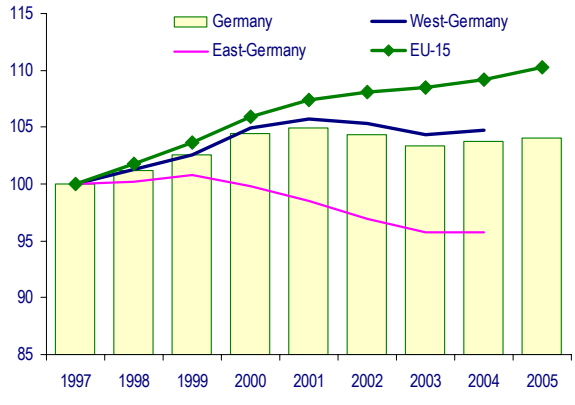
Despite the strong divergence of employment trends in Germany, it is apparent from Graph 3.2 that employment growth in the EU15 had been stronger than in western Germany during the cyclical upswing of the late 1990s and even markedly stronger during the growth slowdown from 2001 onwards. This contrasts with the observation in Graph 3.1 that employment trends in the early 1990s have been quite similar in Germany and the EU15 and even more resilient in western Germany than in the EU15. This was the time when the impact of reunification on the labour market was the most obvious. However, divergence in employment performance has become more marked the more time has passed since reunification.

Graph 3.1 **Employment:** 1991-1997



Note: Western Germany including Berlin, 1991 = 100.
Source: German statistical office, Commission Services.

Graph 3.2 **Employment:** 1997-2005



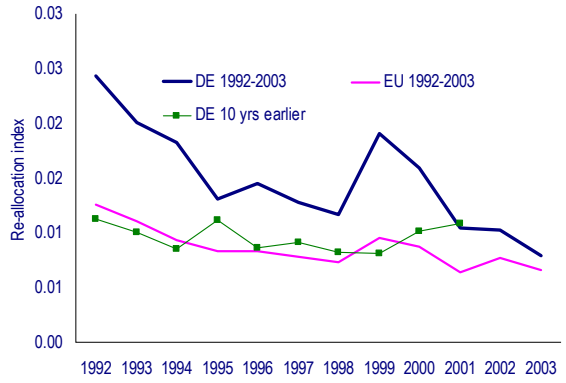
Note: Western Germany including Berlin, 1997 = 100.
Source: German statistical office, Commission Services.

The 1990s have been a decade of rapid structural change in the German economy. This is witnessed in Graph 3.3 by the high levels of job-reallocation in Germany in the 1990s compared with the EU15 and compared with the 1980s. This implies that labour flows caused by sectoral change were much higher in Germany than in the EU15. The gap was particularly marked in the early 1990s, but has remained at a higher level until the end of the sample in 2002. This observation holds even when the two sectors with the largest job losses over the whole period, namely construction and public administration, are deducted from the sample.

In the early 1990s, employment declined mainly in industry and expanded in the construction sector. In the period 1997-2002, employment shares in industry developed broadly similar to those in the EU15 while the overall employment growth in Germany was half as fast as that in the EU15 in 1997-2002. The sectoral breakdown does not confirm the absence of employment creation in low-paid services in Germany. The top four sectors in terms of employment creation pay wages below average. Nevertheless, the contribution to employment growth was higher in each of these four sectors than in the EU15 average. More discernible was the difference among sectors with job destruction in Germany, especially construction, public administration and wholesale trade. An increase in the number of jobs in the EU15 contrasts with a strong decline of

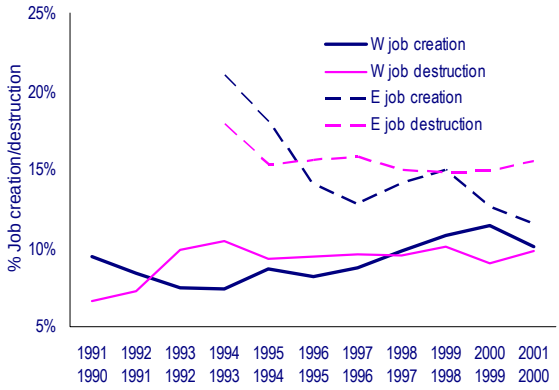
employment in these sectors in Germany. Moreover, employment creation in retail trade and legal, technical and advertising services was strong in the EU15 between 1997 and 2003 while fewer jobs were created in these sectors in Germany over the same time. Related to the breakdown of sectors according to their use or production of ICT, as it is applied in Section 2.2, the less intensive ICT-using industries are among those with both highest job creation and destruction. Hence, when measured in terms of employment growth of the corresponding sectors, no clear picture can be drawn regarding a widening or closing of a technological gap measured.

Graph 3.3 **Re-allocation index, Germany and EU15**



Note: The index is the absolute change in the share of sectoral employment in total employment, summed up over 56 sectors times 0.5.
Source: Groningen Growth and Development Centre, Commission Services.

Graph 3.4 **Rate of job construction and destruction**



Note: W stands for western Germany, E for eastern Germany. Excluding Berlin from both aggregates.

Source: IAB, Commission Services.

Both job creation and destruction have been higher in eastern Germany than in western Germany and, while especially the rate of job construction has converged from the second half of the 1990s onwards, regional differences in the size of labour flows have remained important. Graph 3.4 reveals some variation in the job creation rate over time whereas the destruction rate has been relatively constant from the mid-1990s onwards. Since changes in unemployment are largely driven by changes in net job flows, this implies that a lack of job creation was more important for the increase in unemployment than job destruction.

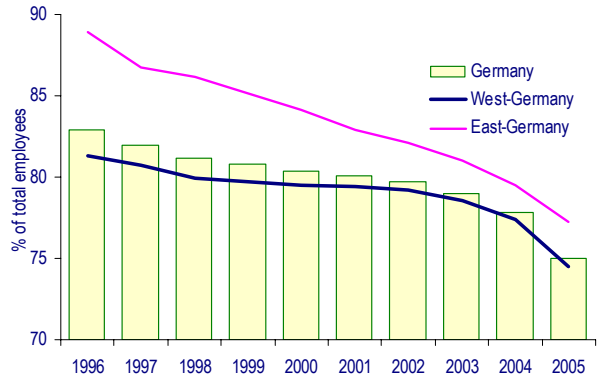
Though labour turnover, which is the average of both the job construction and the job destruction rates, was much higher in eastern Germany, it is notable that the turnover rate in western Germany rose from 8 to 10% over the 1990s, implying a 25% increase. The magnitude of labour turnover is sometimes considered an informative indicator of labour market flexibility and thus the data underlying Graph 3.4 suggest that labour market flexibility increased in Germany. Yet, analyses note that Germany has one of the smallest turnover rates in the EU even if the sample is controlled for differences in firm size, firm age and sectoral composition.[27]

A further development that has sparked attention in Germany has been the rising gap between the total number of employed and the number of unemployed subject to social security contributions. People not contributing can be self-employed or have earnings below legally defined thresholds.

27 There is no official internationally comparable data on labour flows. A relatively low number for Germany is reported by Davis et al. (1996) for the period 1978-88. Germany is number 11 out of 13 EU countries in terms of the relative size of the labour flow in the 1990s in the analysis by Gomez-Salvador et al. (2004) with firm data from Amadeus.

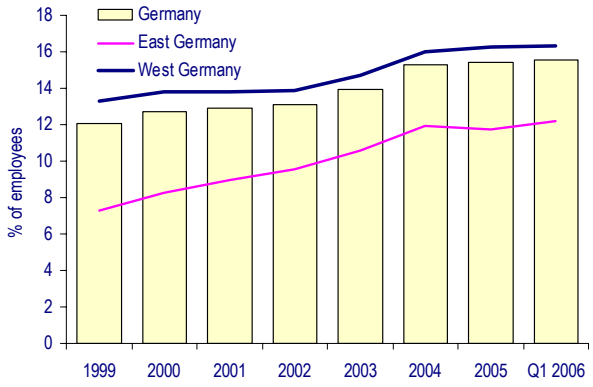
This kind of employment has continuously increased rapidly over the last years in Germany accompanied by a marked slowdown in "regular employment", that could only be turn around in 2006. In eastern Germany the share of employees that contribute to the social security system in total employment has fallen more severely, but remained above the level in the West. Some discussion arose on whether the labour market reforms enacted contributed to this development (see below).

Graph 3.5 **Share of employees subject to social security contributions in total employment**
1996-2005



Note: There have been several breaks in the threshold from which onwards employees contribute to social security.
Source: Commission Services.

Graph 3.6 **Share of employees earning a low wage** not contributing to the social security system in total employment
1999-2006



Source: Federal Employment Agency.

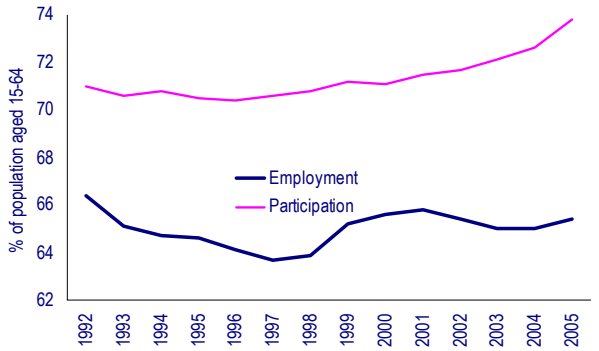
In addition, those in work tend to work fewer hours. While the number of employed in 2005 was marginally higher than in 1991, both total and average hours worked were 6% lower. The decline in hours worked was particularly strong in the first half of the 1990s and again since 2001, i.e. when employment in persons also declined. Only in 2006 this trend could have come to an end. The largest part of the reduction in hours worked is due to both the spreading of part-time work and those in part-time employment working fewer hours. Although the reduction of working-time featured prominently in collective wage bargaining in the 1990s, actual hours worked in full-time jobs have hardly fallen.[28]

As regards developments in labour supply, until 2002 net immigration more than offset the natural decrease of German population. However, since 2003 population in Germany is decreasing, in contrast to the last decades since 2005 more Germans are emigrating than coming back and according to first estimates of the German Statistical office overall net immigration has been falling strongly to only a marginally positive number in 2006. The employment rate has broadly behaved like absolute employment, indicating that changes in population structure had little impact on employment trends. While the employment and the participation rate used to move in tandem, the gap between them has widened after 2001. The participation rate has continued to increase while the employment rate declined until 2004 or did not grow as strong as the participation rate as in 2005, implying an increase of unemployment (Graph 3.7). Furthermore, since the labour market trough of 1997, employment and participation rates have

[28] This is at least indicated by the labour force statistics, which shows a pro-cyclical development of actual hours worked, with the 2004 entry equal to those in the early 1990s. EEAG (2004) found that the lower statutory working hours across countries, the larger is the gap between actual and statutory hours.

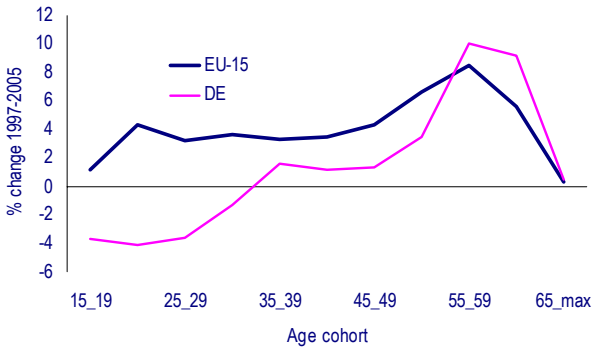
increased by much more in the EU15 than in Germany, especially for the younger age-cohorts (Graph 3.8). The differences are marked for male and female employment rates alike. Thus, gender-specific developments and age-cohort effects, i.e. a particularly strong ageing of the German populations, do not explain the weaker employment performance in Germany. If the reason for the pick-up in participation is to be seen in joint socio-demographic factors such as the entrance of age cohorts of young female with a higher degree of education and therewith being more interested in employment than previous cohorts, Germany has missed a chance for lifting its rate of labour utilisation.

Graph 3.7 **Employment and participation rate** 1992-2005



Source: Commission Services.

Graph 3.8 **Age-specific employment rates, Germany and EU15**



Source: Commission Services.

3.1.2 Unemployment

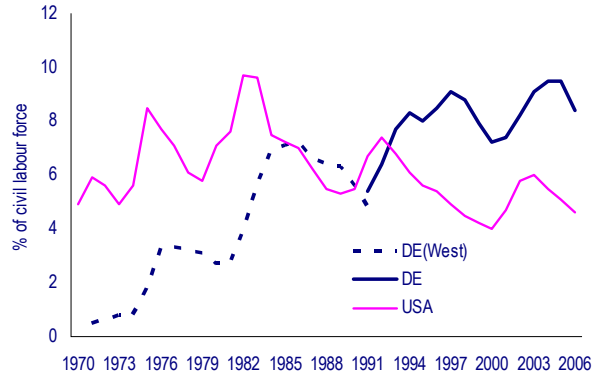
Unemployment in Germany, which until the last slowdown used to be lower than in the EU15, was in 2005 1 percentage point higher than in the euro area and almost 2 percentage points compared to the EU15. Only in 2006 when the various fiscal measures stimulated temporarily domestic demand and as a consequence the German labour market situation brightened substantially, these differences could be reduced. In a longer term view, unemployment in Germany has increased with every cyclical downturn, without returning to its previous level in the subsequent boom period (Graph 3.9). Both the peaks and the troughs in the unemployment rate have increased from business cycle to business cycle, yielding a continuous increase in the average rate of unemployment. The opposite trend has taken place in the USA. Since the early 1980s the rate of unemployment declined with each boom by more than it had increased in the previous recession. Other European countries seem to have shared the stepwise increase in unemployment over the business cycles, but many of them experienced a break with this pattern. For example, in France and Belgium, where the trend in unemployment had closely mirrored the development in Germany, the peak of unemployment in 2003 had been lower than the previous peak in 1997 and the trough of 2002 was at about the same level as the trough of the early 1990s.

The persistence of unemployment in Germany has become evident in a lengthening of the duration of unemployment spells (Graph 3.10). The share of long-term unemployment in unemployment has increased, particularly in eastern Germany, where in 2005 43% of all officially registered unemployed remained so for longer than 1 year. This compares to 37% in

Germany as a whole. According to the Labour Force Survey, the share of long-term unemployed was even higher at about 50%, compared to around 40% in the EU15.[29]

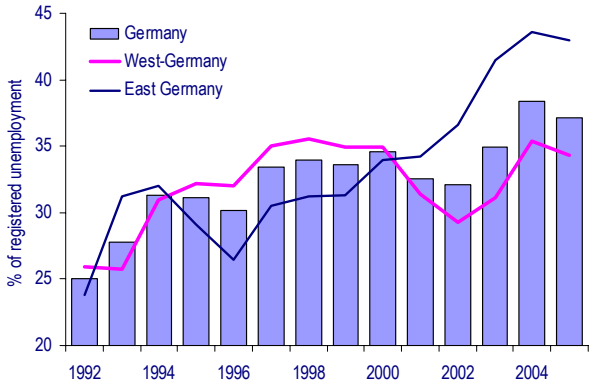
Unemployment rates have been much higher in eastern than in western Germany and clear signs of convergence have not emerged, even if in 2006 unemployment in the East fell slightly more than in the West. Regional differences in unemployment remain higher than in most other euro area countries (ECB 2002) and have become more pronounced during the previous cyclical upswing. This is also true for differences within the West and the East and can be interpreted as indicating a low regional mobility. This hypothesis is consistent with the findings of a survey in 2000 among 20.000 unemployed, which revealed that unemployed are more willing to accept a change in their occupation, working hours or income than a change of their residence in order to find a new job (Brixy and Christensen 2002).

Graph 3.9 **Unemployment rate in Germany and USA**
1970-2006



Note: Western Germany until 1991.
Source: Commission Services.

Graph 3.10 **Long-term unemployment**
1992-2005

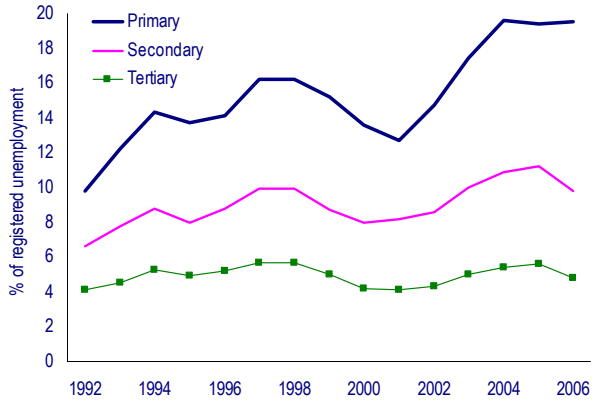


Source: Commission Services.

Unemployment decreases with the degree of education (see Graph 3.11). Rates of unemployment by educational attainment are consistently higher for those with primary education than for those with secondary and tertiary education. After 2001, rates rose significantly for those with lower education, picking up to more than 19%, while those with tertiary education remained close to 5%. Similarly, in contrast to the other groups those with primary education seem not to profit from the recent labour market improvement. In comparison with comparable rates of unemployment for the EU15, there is a deterioration of the German unemployment rate for all three educational groups (Graph 3.12), but it is particularly sharp for primary education and also still remarkably strong for secondary education. In contrast, in the EU15 unemployment among low-skilled workers developed in proportion to other education groups, suggesting that in Germany labour market conditions were less favourable for low-skilled than in the EU at large.

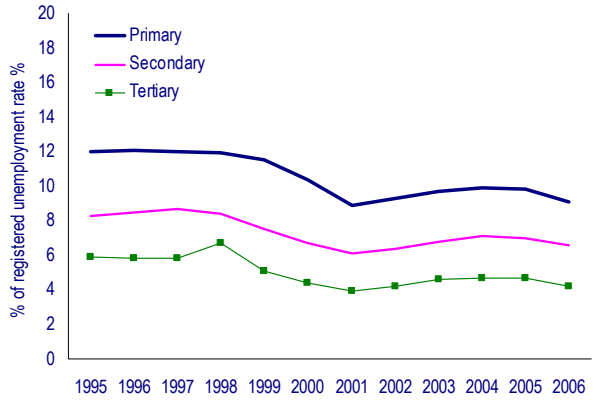
[29] The definitions between employment and unemployment differ in the official German statistics and the Labour Force Survey, with the indications from the latter being more strongly based on a self-assessment of the interviewees.

Graph 3.11 **Unemployment rate by education level**
1992-2006



Source: Labour force survey.

Graph 3.12 **Unemployment rate by education level in EU15**
1995-2006

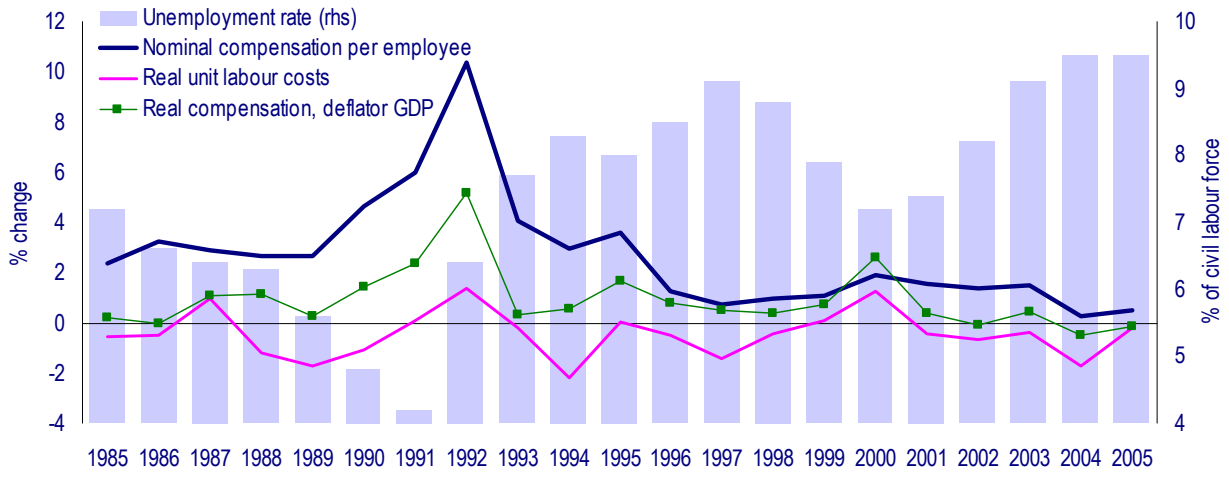


Source: Labour force survey.

3.1.3 Wage developments

Rising unemployment in Germany from 2001 onwards took place in an environment of decelerating wage growth (see Graph 3.13). Disproportionate increases in wages, which could be regarded as unsupportive to employment, were last recorded at the beginning of the 1990s and were linked to the reunification boom and the attempts to close the gap in wages between the East and the West. Since 1993, actual wage growth in Germany has been persistently one of the lowest in the euro area and real unit labour costs have fallen by a cumulating 6.5% between 1992 and 2005. Some of the decline in real unit labour costs is estimated to be caused by the reduction in employment, which led to an increase in the capital-labour ratio and therewith to a statistical boost to labour productivity. Nevertheless, taking this factor into account, aggregate wage growth in Germany can on average be considered as moderate. Indeed, nominal unit labour costs have grown by much less in Germany than in the EU (see Graph 3.14).

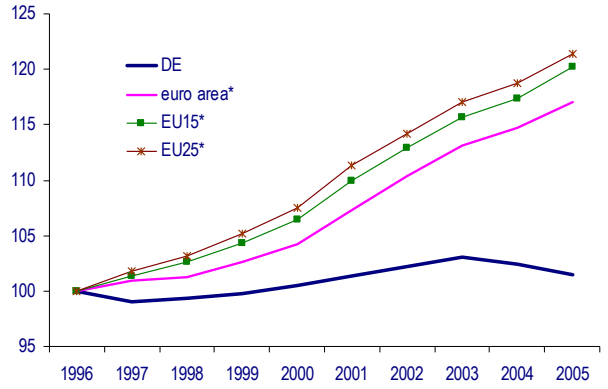
Graph 3.13 **Labour costs and unemployment**
1985-2005



Note: including western Germany until 1991.
Source: Commission Services.

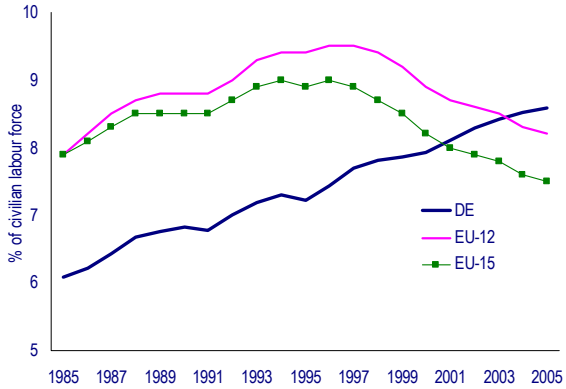
DG ECFIN's estimates of the non-accelerating wage rate of unemployment (NAWRU), which controls for other factors (productivity, terms-of-trade, bargaining power),[30] display for Germany, the EU15 and euro area aggregate an increase in structural unemployment until the mid-1990s (Graph 3.15). However, between 1996 and 2005, the NAWRU estimates suggest a decline of structural unemployment by 1¼ to 1½ percentage points in the EU15 and the euro area, whereas it increased by a further 1¼ percentage points in Germany. Since 2002 the NAWRU has been higher in Germany than in the EU15 and since 2004 it has also been higher than in the euro area. The diverging trends of the NAWRU in the EU and Germany suggest that differences in economic structures matter more than relatively similar cyclical forces.

Graph 3.14 **Nominal unit labour costs**
1996 = 100



Note: * EU aggregates excluding Germany.
Source: Commission Services.

Graph 3.15 **NAWRU estimates for Germany, euro area and EU15**
1985-2005



Note: including western Germany until 1991.
Source: Commission Services.

It is a hotly debated issue whether the German wage level is appropriate, in particular against still high rates of unemployment. International comparisons of wage levels suffer from the fact that differences in sectoral composition, in working time and productivity across countries reduce the reliability of headline figures. Notwithstanding these caveats, aggregate data suggests that compensation per employee in the total economy was higher in 1993 in Germany than in the euro area. This has changed over time; in 2005 the average wage per employee was lower in Germany.[31] If, however, the comparison is restricted to wages in manufacturing it turns out that the ranking and even the distance have remained broadly constant between Germany and the euro area aggregate between 1993 and 2005. The 2002 Structure of Earnings Survey data by Eurostat also suggests that hourly wages in all broad industry categories are higher in Germany than in the euro area, with the difference being particularly marked in manufacturing and the least so in hotels and restaurants (NACE G) and financial intermediation (NACE J). Thus, the wage gap is highest in sectors where international competition is the most intense, but where employment has been similar to the EU average (see above). It is positive but smaller in service sectors, although fewer jobs were created in services in Germany than in other countries. Moreover, based on hourly wages, data from the 2002 Structure of Earnings Survey indicates that individual hourly

30 For a description of the concept used, see European Commission (2004b), Annex 1 of Chapter 3.

31 Compensation includes gross wages plus both employees and employers contribution to social security. Note that it is more meaningful to compare the level of German wages with those of the euro area than with those of the EU15 because the latter may be distorted by exchange rates, especially of the euro vis-à-vis the British pound.

wages are higher in German than in the euro area across most ages, industries and education levels.[32]

The lack of a consistent relationship between relative sectoral wages and employment is somewhat puzzling at first sight. However, it is in line with the observation of a decline in industrial employment in the early 1990s, which was accompanied by capital-labour substitution. The resulting productivity enhancements in industry allowed higher wages to be paid to the remaining workers, while the dismissed workers were forced to look for jobs elsewhere in the economy, which led to downward pressure on wages in the service economy. However, this wage pressure did not lead to additional jobs in the German service economy, in contrast to the EU15 at large.

3.2 Labour market institutions

Since the mid-1990s, an increasing number of empirical papers have shown that labour market institutions have an important impact on labour market results. The main analytical tool has been cross-country analysis with quantitative indicators of labour market institutions taken from the OECD, Nickell et al. (2002), or other sources. The significance of the coefficients of the different labour market institutions in cross-country regressions have led to a reasonable degree of consensus on the institutions that matter.[33] This section analyses whether the subdued labour market performance in Germany in comparison with other EU countries can be empirically explained by individual institutions.

3.2.1 Wage setting institutions

The design of the German wage setting system has been the subject of enduring controversies, with the criticism directed at its impact on both the wage level and wage differentiation.[34] The bargaining power of trade unions has consistently been regarded a crucial determinant of excess wage growth. While union density may be considered a good proxy of unions' bargaining power, it is not identical to the coverage of collective wage bargaining. In Germany, the coverage of collectively agreed wages is much higher than the share of union members in the work force. The collective agreement is legally binding only when the employee is member of the trade union concerned and the employing enterprise is member of the employers association. However, the contract is normally extended by individual agreement between the employers concerned and those employees that are not member of the trade union. The collective agreement can also be declared generally binding by the government. In this case it would apply to all employees and enterprises irrespective of their membership in the trade union and association, respectively.[35]

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32 European Commission (2005b, Chapter 5, annex 3) shows that hourly wages in Germany are higher even if these and some further factors (being a non-manual worker, working part-time and the duration in enterprises) is controlled for.

33 For an overview of the literature see European Commission (2004b), Arpaia and Mourre (2005), Blanchard (2005).

34 See Wissenschaftlicher Beirat (2004), Sachverständigenrat (2005), Schnabel (2004), Ochel (2005a) and Möschel (2005).

35 In the beginning of 2004, such a declaration by the government with an effect on wages has been in place for 0.6% of the collective agreements, of which the most prominent one covers minimum wages in the construction sector. The overall number of agreements that were declared as generally binding was 476 but only 44 were related to wages, see Bundesministerium für Wirtschaft und Arbeit (2005). The possibility of

Moreover, wage agreements continue to hold until they expire even if the enterprise leaves the employers' association. Therewith, enterprises in employers association have no possibility to adjust wages to firm-specific conditions unless an opt-out clause is explicitly agreed in the collective agreement.[36]

Whereas many economists agree that both trade union power and the coverage of collective wage setting have a significantly positive impact on unemployment, the effect tends to be counterbalanced by a higher degree of coordination in wage bargaining. Calmfors and Driffill (1988) suggest that there could be a U-shaped relationship between the centralisation of wage setting and its economic efficiency. Both a very decentralised and a centralised system could be superior to interim levels. Recent analyses by the OECD on this issue are less conclusive because no robust relationship could be established between indicators of the coordination of wage-setting and indicators of wage growth or unemployment.[37] The OECD evidence appears more conclusive indicating that a higher union presence in wage setting leads to reduce inequality and increase relative wages of the main disadvantaged groups on the labour market (women, elderly and young workers), while no evidence was found on these groups' relative employment performance.

The comparison of indicators of wage setting in Germany and its peers reveals a high degree of co-ordination in wage bargaining. In comparison with other continental European countries, Germany is endowed with higher degrees of bargaining centralisation, co-ordination and lower coverage of collective bargaining (see e.g. OECD 2005a). When developments over time are looked at, it is apparent that union density and coverage rates have declined. They were about 10 percentage points higher in the 1980s than in 2000. The degree of centralisation has also dropped and the flexibility embedded in the German system of wage bargaining has risen, although this is not yet visible in aggregate indicators. Social partners have increasingly agreed on including flexible elements in collective agreements. Opt-out clauses have gained a growing role since the mid-1990s. In 2005, 75% of establishments covered by collective bargaining made use of one or more opening clauses. They aimed at ensuring the level of employment or the survival of the firm against concessions on pay or working conditions. However, only a small share of these opening clauses addresses basic pay, most of them aim at a reduction of labour costs through one-time measures or changes in working time.[38] Reportedly, breaches of contracts have also become more common, especially in eastern Germany.[39]

The question arises whether and how the wage setting system in Germany has contributed to the weak labour market performance. Especially the application of West-German wage agreements to eastern Germany and the unions' request for rapid catch up of eastern German wages to the West's levels has often been quoted as a source of rising unemployment in the East after reunification. The transfer of West-German labour market institutions and regulations may have aggravated the problem. While policy discussions on wage developments usually focus on negotiated wages, an important point to note is that although a large share of labour contracts is subject to collective agreements, those in fact represent the floor of actual wages which have been

---

the government to declare collectively agreed wages as generally binding has been criticised, because it implies a government intervention and in particular allows the government to fix sector specific minimum wages while constitutional law guarantees the freedom of collective bargaining.

36 See Wissenschaflticher Beirat (2003) or Sachverständigenrat (2005).

37 For an overview, see European Commission (2004b), OECD (2004) or EEAG (2004).

38 See WSI Works and Staff Council Survey (EIRO 2005).

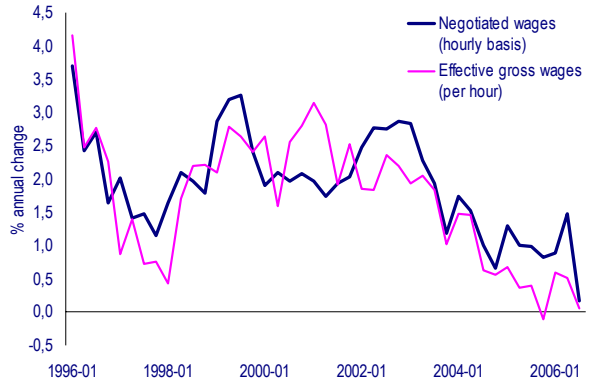
39 For a review of recent developments in the German system of wage setting, see Ochel (2005a) and Eiro (2005).

traditionally higher. A recent empirical analysis revealed that almost half of the western German firms paid a wage higher than the negotiated wage in 2002 (Kohaut and Schnabel 2003). The average wedge was about 10%. Though the fact that many firms voluntarily pay higher wages than required may indicate that labour costs are not too high, the study suggests that both share and wedge have declined over time. Graph 3.16 shows this wage drift: actual wage growth has been lower than negotiated wage increases in each year except in 2000 and 2001. These exceptions were the peak of the previous cyclical boom and the subsequent year.

At first sight, the comparison of the wage gap between Germany and the euro area in supports the hypothesis of Calmfors and Driffill (1988), i.e. that the intermediate German system might be most unfavourable for using the employment potential. Graph 3.17 gives a breakdown of the wage gap in dependence on how wages are settled. Even if the wage gap is relatively high for individual contracts too, the gap to the euro area is highest if wages are negotiated industry-wide in individual regions (Flächentarife) in both manufacturing and services.

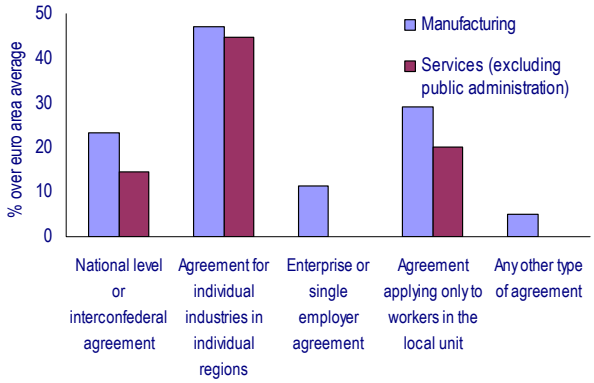
Recently, the inclusion of flexible elements in collective agreements has increased flexibility at the firm level, without substantially undermining the system of collective wage bargaining. Wage growth has continued to be moderate in Germany and it may even be possible that the implicit decentralisation has contributed to the negative wage drift, i.e. to an actual wage growth below collectively agreed wage increases. A question is, however, whether the increased conditionality of wages on company-specific developments has fostered wage differentiation within firms. It is also open whether the increasing degree of flexibility within the system of area-wide wage agreements has had any impact on the employment prospects of outsiders relative to the strong bargaining position of insiders.

Graph 3.16 **Actual and negotiated wage growth**
1996-Q3 2006



Source: Commission Services.

Graph 3.17 **Wage difference between Germany and euro area by type of collective pay agreement**



Source: Commission Services.

Economic discussions on the effect of the German wage setting systems not only focus on the level but also on the structure of wages. The reason for a compressed wage structure is usually seen in a high degree of centralisation of collective bargaining, which tends to lead to higher wage increases at the lower end of the wage scale, either as an explicit objective of trade unions to reduce inequality or implicitly through the agreement on lump-sums rather than proportional wage increases.[40] Prasad (2004) found that the wage structure in Germany has been very stable

[40] See EEAG (2004) and European Commission (2005b, Chapter 5).

over the period 1984-1997 and argued that the rigidity of the wage structure in combination with macroeconomic shocks has contributed to high unemployment among unskilled workers. Recent studies (Möller 2005, Gernandt and Pfeiffer 2006, Kohn 2006), however, provide evidence that between the early 1990s and 2004 the wage dispersion widened, even if only jobs on which social contributions are levied are considered. At the time of reunification, the wage dispersion in eastern Germany was lower than in the West as a result of the previous political system and a depreciation of human capital after reunification. Although convergence in the wage levels slowed down, dispersion widened faster in the East so as to become more similar to western level. Möller (2005) also analyses whether the wage structure is compressed in the sense that the wage dispersion in the lower half of the wage distribution is lower than that in the upper half. He finds that dispersion widened more for low-skilled than for skilled. There is no consensus in the literature whether the increased wage dispersion was due to changes in the composition of the work force or to a diverging remuneration of its characteristics. What may have caused these developments is not fully understood, but the sectoral shifts outlined above towards more low-skilled employment and the decreasing union coverage, both of which are more pronounced in the East, may be part of the explanation.

3.2.2 Generosity of the unemployment benefit system

Differences in the structure of the unemployment benefit system appear to be an important and strong determinant of cross-country differences in unemployment. Indicators of internationally comparable replacement rates, i.e. the ratio of income out of work and in work, and of the duration of unemployment entitlements are usually found to be significant variables in cross-country regressions on unemployment. That is, the magnitude of monetary incentives plays an important role in shaping labour supply decisions.[41] The duration of unemployment benefits and the strictness, with which the unemployment benefit system is run, are furthermore seen as equally important if not stronger determinants of unemployment because they are assumed to have a more direct impact on search efforts than the level of benefits. A telling example in this regard is Denmark. The tightening of unemployment benefit availability requirements is regarded as a crucial contributing factor to the decline in structural unemployment since the mid-1990s (Hasselpflug 2005).

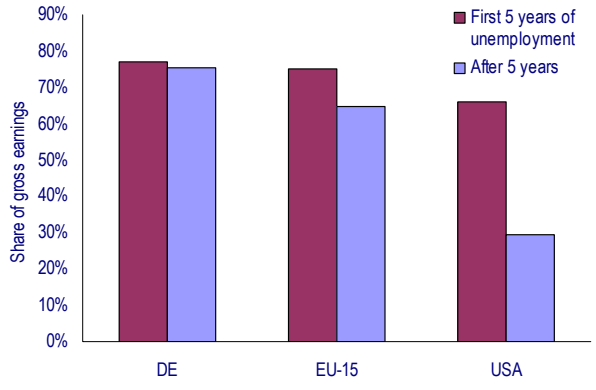
Net replacement rates are at about the same level in Germany as in other European countries in the first year of unemployment. They are, however, higher for the low paid wage earner. What is furthermore particular in Germany is the combination of relatively generous long-term unemployment benefits and one of the least strict availability requirement indices (Graphs 3.18 and 3.19). Thus, if either a low replacement rate or a strong regression of benefits during the duration of unemployment or strict control enforces an efficient job search, Germany may be in an unfavourable position, as none of the elements provides strong incentives to unemployed for doing so. Moreover, if habituation effects are a problem in Germany, the design of the unemployment benefit system is likely an important determinant of persistent unemployment.

The effect of the unemployment benefit system on the duration of unemployment in Germany has been subject of a number of empirical studies. Using microeconomic data for Germany, Steiner (2003) finds that the duration of unemployment benefits is much more important for leaving unemployment than the level of the benefits. The exit rates declines steadily over the duration of

[41] See European Commission (2004b), Layard et al. (2005), Blanchard (2005). For an empirical analysis with German data of the impact of replacement rates on the transition rate from welfare to work, see Schneider and Uhlendorff (2004).

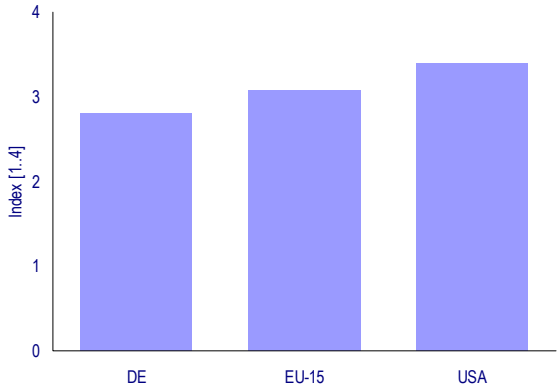
unemployment. But it jumps markedly for those unemployed that are not entitled to long-term benefits, whereas it remains at a low level for those that are entitled for further benefits. On the basis of responses from a survey among unemployed, Christensen (2005) computed that an increase of the replacement rate by 1% increases the average duration of unemployment by 2%. Lee and Wilke (2005) found that the responsiveness of the duration of unemployment to the magnitude of benefits is particularly strong for high-skilled unemployed.

Graph 3.18 **Net replacement rates in first and over five years of unemployment**
2004



Note: The data shows the replacement averaged over three family types and two income categories (67 and 100% of APW).
Source: OECD wage and benefits statistics, Commission Services.

Graph 3.19 **Strictness of job availability requirements**
2004



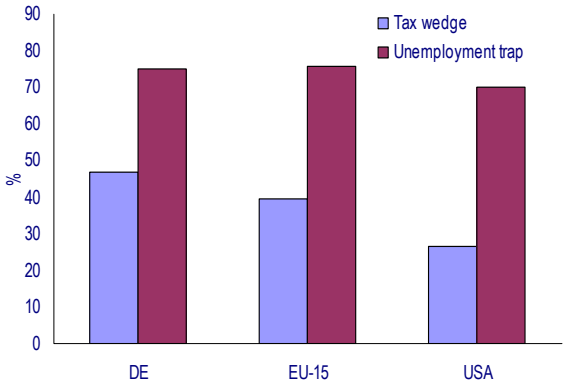
Note: The stricter the job availability requirements the higher the index.
Source: Hasselpflug (2005), Commission Services.

Additionally to these effects, high replacement rates tend to increase the reservation wages, i.e. the wages starting from which employees start to accept job offers. Hence, high levels of replacement rates in combination with generous long-term unemployment benefits could be a reason for the high levels of officially registered low skilled and long-term unemployed.

3.2.3 Labour taxes

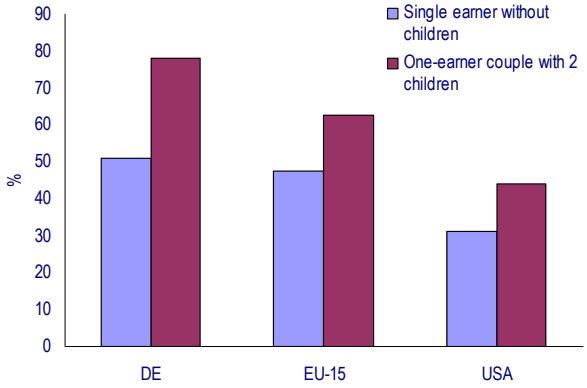
Taxes on labour, such as social security contributions or personal income tax, drive a "wedge" between the marginal product of labour and the marginal value of leisure. The change in the relative price of leisure tends to discourage the individual's labour supply. Since taxation also reduces the worker's net income it may well be that the income effect offsets the substitution effect, leading to no precise prediction of the direction of the overall effect of a change in taxes. Notwithstanding this caveat, the empirical literature points to important interaction effects between labour taxes and other labour market institutions, in particular unemployment benefits.

Graph 3.20 **Tax wedge on labour costs at 67% of the APW wage level in EU Member States**
2005



Note: The tax wedge measures the income tax plus social security contributions expressed as a percentage of labour costs. The unemployment trap measures the tax wedge plus the withdrawal of benefits when an unemployed person returns to employment. Both indicators are for single persons without children earning 67% of the average worker.
Source: Commission Services.

Graph 3.21 **Low-wage tax wedge**
2005



Note: Tax wedge for moving from 33% to 67% of average worker earnings.

Source: Commission Services.

A comparison of international tax rates is difficult because of differences in the relevance of the various taxes in the tax system and because of differences in coverage and financing methods of social security systems across countries. Moreover, individual tax rates vary with a number of factors including income and family situation. Of special interest for the German case seems to be the situation of low-wage earners and of those moving from unemployment to low wage employment. Calculations of these persons' tax rates reveal that the tax rate of low-wage workers in Germany is higher than in almost all EU15 countries (Graph 3.20). Unemployed persons re-entering full-time employment are faced with a high average effective tax rate as it is also the case in other EU15 countries. The low-wage trap (Graph 3.21), which describes the financial situation of an individual moving from 33% to 67% of the salary of an average worker, is also higher in Germany than in the average of the EU15. Thus, workers in Germany have fewer incentives than in most other countries to increase their labour supply, aggravating further the problem of high reservation wages as described above.

The design of unemployment systems and their interaction with tax rates have been subject of extensive empirical research at the micro level. Evidence on their importance has increasingly been drawn from "political experiments", for instance the introduction of tax benefits for low-skilled unemployed or those in low tax brackets in the USA or the UK.[42] There have been a number of experiments with wage subsidies in Germany, but the coverage was quite limited and take up rates were too low to consider the results as representative (Hesse 2005).

3.2.4 Employment protection legislation

Though many economists believe that employment protection legislation (EPL) plays a key role for labour market flexibility, empirically the impact on unemployment is ambiguous. In most econometric investigations differences in the EPL index across countries are not significantly

[42] See the proceedings of the workshop "make work pay" in Brussels 21/22 March 2005, Carone and Salomäki (2005).

correlated with differences in the rate of unemployment. An often quoted reason is that whereas high hiring and firing costs may discourage job creation in an upturn, they also reduce job losses in a downturn. Layard et al. (2005) see little conclusive evidence for the impact of EPL on structural unemployment except that a more stringent EPL seems to raise long-term unemployment. In a review of the empirical literature, Young (2003) concludes that, if anything, the literature points to an unfavourable impact of EPL on the size of labour market flows. These two problems, the increase in long-term unemployment and a decline in the turnover of unemployed, have been marked over the past decade in Germany. In combination with the substantial sectoral change observed over the same time, they suggest that EPL may have aggravated insider-outsider problems and therewith contributed to subdued German labour market performance. Moreover, EPL may also reduce job mobility. A recent comparison of job transition rates in the USA and Germany concluded that stringent labour market regulation leads to a more risk-averse hiring policy of firms. The chance of finding a job in a different occupation is considerably lower in Germany than in the USA and the negative signalling effects of unemployment are stronger (Gangl 2004).

Comparing the OECD-indices of EPL for permanent employment across countries reveals the expected picture of low employment protection in the USA compared to the EU15 average and Germany.[43] Germany combines a relatively high EPL with generous unemployment benefits. However, in many countries, including Germany, there has been a trend towards an easing of EPL (Graph 3.22). In most circumstances, however, easing was related to temporary work contracts. Indeed, the OECD EPL-indicator for permanent employment in Germany increased slightly from the 1980s to 2003 whereas the index for temporary contracts declined markedly. The latter is largely due to liberalisation of the conditions under which temporary contracts can be offered. This is likely to have contributed to the increase in temporary employment and the rising gap between jobs that contribute to the social security system and those that do not. While temporary contracts are often seen a stepping stone to durable work contracts, the available evidence from household panel data is not reassuring. Transition rates have been much lower than expected (se European Commission 2004a). Thus, while easing of EPL has increased labour market flexibility, the focus on precarious work contracts has led to a fragmentation of the labour market without addressing any underlying insider-outsider problem.

Graph 3.22 **Employment protection legislation**

Note: A higher number of the index indicates a more strict protection. EU15 aggregate is the unweighted average excluding Luxembourg.
Source: OECD (2004), Commission Services.

43 In the databank compiled by the Fraser institute, Germany is considered to have of the most stringent hiring and firing rules in the world. Differences in the assessment may be due to different compilation methods (expert surveys versus legal rules) and in particular a different weight attached to the actual legal practice.

The mixed results from economic theory are also reflected in differing opinions on the relevance of EPL in Germany. On the one hand, a survey by an institute close to the employers' association among German firms revealed that almost 80% of them consider employment regulations as a major obstacle to employment creation (Institut der deutschen Wirtschaft 2004). Within the area of employment regulation employment protection was classified the most important problem. Especially, the unpredictable outcome of court-rulings is said to create considerable uncertainty about the actual costs of dismissals and therewith on the incentives of firms to hire new staff. On the other hand, a survey conducted by the German trade unions suggests both that EPL has little impact on actual dismissals and that costs of employment protection are severely overestimated.[44] Moreover, the share of dismissals that were challenged by courts may be much lower than sometimes estimated, i.e. in the range of 11-15% rather than 27%.[45]

3.2.5 Active labour market policies

Active labour market policies (ALMPs) are generally seen as instrumental in reducing unemployment. Though the evidence from cross-country estimations is generally supportive of ALMPs, the result may be driven by the positive experience in some Scandinavian countries.[46] It has also been argued that public employment services and training programmes could have quite different effects. A further issue to note is that placing unemployed persons in ALMPs automatically reduces the official number of unemployed. Studies that try to correct for this impact tend to be less conclusive.

Spending on ALMP in Germany is higher than in the EU15 on average, but lower than in some Scandinavian countries. Figures are, however, somewhat distorted by the differences in unemployment levels. For instance, Germany has lower ALMP expenditures related to the level of unemployment than the average of the EU15 (Graphs 3.23 and 3.24).

ALMPs have been an important tool in eastern Germany. In 1991, approximately a third of the labour force in eastern Germany participated in some ALMP measures.[47] Recent empirical analysis yielded somewhat ambiguous results on the effectiveness of ALMPs in Germany. For instance, Lechner et al. (2005) find with a microeconomic panel of eastern German workers that long-term employment prospects and earnings increased, but registered unemployment and males were hardly affected. Using a macroeconomic approach with regional data, Hujer et al. (2002) find positive effects of ALMPs in western Germany, but weak or no robust effects for eastern Germany. Wunsch (2005) points to considerable data problems, which may have distorted the results of earlier studies. Nevertheless, the overall evidence is in favour of substantial lock-in effects in the short term, because most participants discontinue searching for a job during the measure. If at all, positive employment effects seem to materialise only in the longer run.

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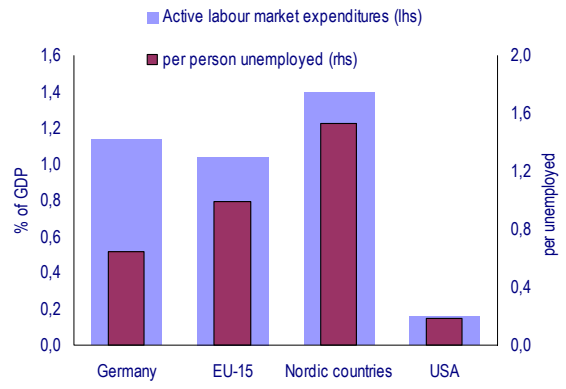
44 Pfarr et al. (2004a, 2004b), Bothfeld and Ullmann (2005).

45 See Pfarr et al. (2004a) Jahn and Walwei (2003) as well as Bonin (2004).

46 For instance, Elmeskov et al. (1998) find a negative relationship between ALMP and unemployment once Sweden is excluded from the panel.

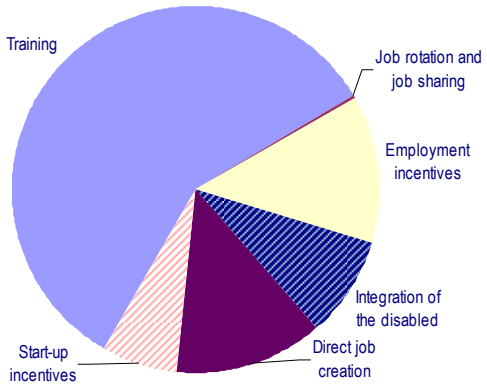
47 For an in-depth review of the instruments used in Germany and experiences, see Wunsch (2005).

Graph 3.23 **Spending on active labour market policy**
2003/04



Note: Public expenditure in active labour market programmes (including public employment services and administration), Nordic countries are DK, NL, SF, SE.
Source: OECD (2005a), Commission Services.

Graph 3.24 **Participants in active labour market policy**
2003



Note: Participants except out-of work income support (68% of total) and early retirement (1%).

Source: OECD (2005a), Commission Services.

3.3 Labour market reforms

Compared to other EU countries, Germany has been a laggard in the conduct of labour market reforms. One reason could have been expectations that some of the labour market problems were the adverse consequence of German reunification and would lose in importance over time. The dismal labour market performance has also been described as a consequence of weak growth. Consequently, the policy agenda in Germany has strongly focused on measures to restore price competitiveness and to stimulate economic growth. Though it has been recognised that the increase in social security contributions had contributed to high labour costs, measures to lower them were modest. However, a change in the paradigm has apparently occurred with the results of the Hartz Commission in 2002. Since then a number of proposals to reform the German labour market have been discussed and implemented. This section describes and evaluates these labour market reforms in Germany. Of course, since labour market reforms often need several years before their effects are visible, an in-depth evaluation of the effects would be premature. Hence, the tentative assessments below are mainly based on the potential contribution of the reform measures against the structural problems of the German labour market and the institutional design described above.

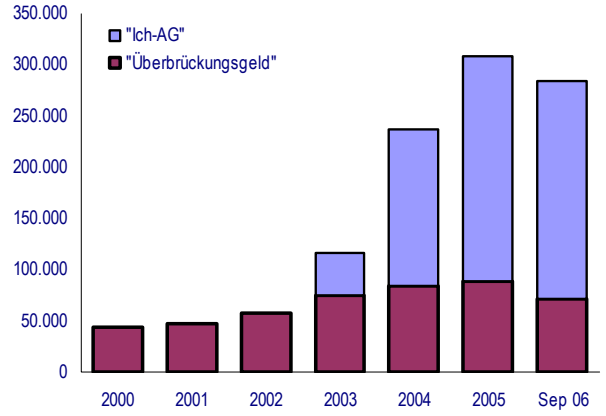
3.3.1 Activation policies (Hartz I-III)

Following the recommendations of the Hartz-Commission, substantial efforts were devoted in Germany to improving the contribution of labour market policy to the placement of unemployed into jobs (Hartz I – Hartz III and the Job-Aqtiv programme). The effectiveness of labour market policies was scrutinised, with the major impact being a reorganisation of the German Federal Employment Services aimed at improving the contribution of the public agency on the matching of unemployed persons to jobs (creation of job centres, more intense counselling and profiling through case workers). Several measures aimed at strengthening the incentives of the unemployed for searching a job. For example, stricter requirements were introduced for registering as unemployed and for job availability. Moreover, competition in employment services was strengthened. The use of private placement services can be paid by the public

employment service. Personnel service agencies (PSA) were founded, who employ jobless people and "loan" them to firms for a limited time. The intention of this measure was to construct a bridge into permanent employment. A further prominent innovation was the introduction of measures that help unemployed set up their own business.[48]

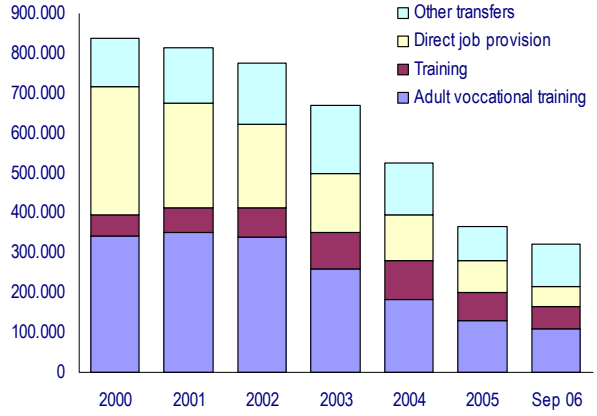
So far, experience has not met expectations in some of the programmes.[49] For example, vouchers for the use of private employment services have been little used. In the first two years, the placement of only 1% of the outflow of unemployed in employment was financed through public vouchers. This is in line with the observation that private placement activities concentrate their activity on high-skilled workers. The newly founded PSA acquired a very small market share of 7% of all casual workers, which represent just 1.5% of employees subject to social security contributions.[50] The results with the promotion of self-employment have been more mixed. Demand was high. In 2005, 220,000 Ich-AGs were subsidised (Graph 3.25). While around 20% of the Ich-AGs subsidies in 2004 were no longer subsidised one year later, 40% of the persons that discontinued self-employment found employment.[51] Nevertheless, the potential to create additional employment has been judged as small,[52] in particular because firms were undersized and had little growth potential. The number of persons in active labour market programmes has strongly declined over the last years, i.e. reduced by more than 60% between 2000 and September 2006, mainly in direct job creation schemes and publicly-financed adult vocational training (Graph 3.26).

Graph 3.25 **Persons receiving employment subsidies to establish a firm**
2000-September 2006



Source: German Federal Employment Agency.

Graph 3.26 **Subsidised training and employment, persons in public programmes**
2000-September 2006



Source: German Federal Employment Agency.

Though it is not yet possible to evaluate the medium to long-term impact of some of the new tools in fostering employment on a sustainable basis, the ambiguous results so far may suggest

48 The "Existenzgründungszuschuß" ("Ich-AG") and the "Überbrückungsgeld" have been replaced by the "Gründungszuschuß" as from August 1, 2006.

49 This is the main message of the interim results of an evaluation report on the German labour market reforms on behalf of the German government (Bundesregierung 2006). A similar assessment was earlier spelled out by Sachverständigenrat (2005) and Wunsch (2005).

50 For an evaluation of the Personnel Service agencies (PSA) see Hess et al. (2006).

51 See Wießner (2005) and Baumgartner et al. (2006).

52 See Niefert/Tchouvakhina (2005). More optimistic is the assessment of May-Strobl et al. (2005).

that gains from a higher efficiency of placement services may be limited. A reason could be that the tools used so far are not effective in overcoming some obstacles to matching. One would expect stronger effects on the matching process from measures that increase mobility across regions and occupations compared to measures that take the regional and occupational distribution of unemployed persons as given.

3.3.2 Labour market regulation

Since the 1980s, Germany has considerably loosened employment protection of temporary contracts, accompanied by relatively little modifications to employment protection of regular work contracts. This is also evidenced by the changes of the OECD indicator of EPL for both regular and temporary contracts between the 1980s and 2003 (see Graph 3.22). The reforms implemented in 2003 (Gesetz zu Reformen am Arbeitsmarkt) concerned a change in the coverage of EPL (which is not binding for new workers in firms with less than 10 employees), the introduction of severance payments in exchange for the right to challenge a dismissal in court,[53] clarification of the selection criteria that enterprises have to take into account for some dismissals and liberalisation of the unconditional use of limited contracts (4 rather than 2 years for new enterprises).

Despite these reforms, for most workers in Germany EPL has remained stringent. The limited scope of changes to EPL makes it unlikely that they have a strong impact on labour market structures and in particular on firms' hiring practices. That is, the changes to EPL neither influence the position of insiders relative to outsiders nor should they lead to a less risk-averse hiring policy of most of the firms nor can they be expected to have a strong impact on the firms' leeway to adjust labour costs to changes in demand. Consequently, most observers expect only a small impact of the change in EPL on employment and unemployment at large, but rather on the structure of unemployment, where the new rules may facilitate job search by new entrants, people returning to work and unemployed persons (Walwei 2002). Little effect is expected from the recent liberalisation of EPL for small enterprises, i.e. the lifting of the threshold from 5 to 10 employees. Since it represents a return to rules that applied until the late 1990s, the impact of the previous tightening can be used for an assessment. Studies doing so have not detected a strong impact on the pace of job creation.[54]

3.3.3 Unemployment benefits and social security contributions (Hartz IV)

The enacted reforms of the unemployment benefit system, of which most measures fall under the Hartz II and Hartz IV regulations, concerned a number of changes towards entitlement periods, strictness in administration and access to a number of subsidies directed at stimulating employment in the low-wage sector. Important individual steps were the sharpening to incentives to work by lowering social security rates for very-low-wage jobs ("Mini-jobs", up to € 400), a sliding scale for the contributions to be paid by those in low-wage jobs ("Midi-jobs", € 400-800),

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[53] The use of severance payments could be an effective means to reduce the number of law suits. It is, however, the choice of the dismissed worker whether he challenges the dismissal or accepts the severance payment. Thus, it is not obvious whether the new rule reduces the amount of legal uncertainty faced by the firm.

[54] See Jahn and Walwei (2005), Bauer et al. (2004), Bonin (2004) and Verrick (2004). From a further increase of the threshold to e.g. 20 employees a significant positive labour market impact could be expected as then additional 200,000 enterprises would benefit and about 1/3 of all employees would fall under the new rules.

and the possibility of temporary low-wage jobs in municipal and charitable organisations to supplement welfare ("1 €-Jobs") to help long-term unemployed back into work. An important measure was the merger of the support for long-term unemployed with social assistance for all those able to work. Whereas the benefits payments for long-term unemployed in the old system was linked to previous earnings, the new scheme (ALG2) is means-tested and usually equal to the level of social assistance. As from 2006, entitlement to unemployment benefits (ALG1) was shortened to 12 months and 18 months for people older than 55.[55]

Most of the reforms have been in place for only a short time, which makes it difficult to evaluate their effects, particularly as short and long-term effect may be different. Besides important distributional aspects,[56] one consequence has been a statistical increase in unemployment by an estimated 300,000 to 400,000 caused by a shift from hidden into official unemployment.[57] At the same time the number of people employed with low wages has increased by around 1 million persons since spring 2003, when the reform was enacted. These jobs were found mainly in small enterprises and especially in the retail sector, hotels and restaurants and cleaning services, where 25-50% of all employees fell into this category (see Kalina and Voss-Dahm 2005). While to date it is difficult to judge whether a crowding-out of employment subject to social security contribution has taken place, available empirical analyses of sectoral developments indicate the contrary; regular and low-wage employment are both influenced positively in many firms and sectors.[58] Consequently, these reforms, increasing the flexibility the labour market for low wage employment and addressing a particularly difficult segment of the labour market, should have contributed substantially to stabilise overall employment during recent years when employment subject to social security was falling.

As regards the incentives to accept a job, opinions in the literature are somewhat divided. Following the experience in Denmark, the tightening of job availability requirements and the reduction of reservation wages will lead to higher work incentives. Especially the shift from the insurance-based ALG1 to the means-tested ALG2 should increase the desire to prevent long-term unemployment.[59] On the other hand, problem groups seem to have little incentive to enter regular employment compared to remaining in low-wage employment. With the new rules, financial incentives have become better for high-skilled and those with a partner in employment, but may have deteriorated for single parents, unemployed couples and low-skilled.[60] The reduction of social security contributions for low-wage employment reduces disincentives to expand working time, which under the previous system was exposed to very high marginal tax rates. Beneficiaries from this adjustment might however not necessarily be unemployed persons but mainly those who use a low-paid job as additional source of income.[61] According to simulation studies, the

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55 Brief descriptions of the reforms enacted can be found in Wunsch (2005), Kaltenborn et al. (2004) and Ochel (2005b).

56 See Tobsch (2005), Schulte (2004) and Blos and Rudolph (2005).

57 The reasons were that people that were not entitled to benefits in the old system were forced to be registered at unemployed, the facilitation of administrative procedures has made it easier to ask for benefits and finally the fact that the benefits are administered by the Federal Employment Agency may have reduced the social stigma of recipients. See Bundesagentur für Arbeit (2005) and Sachverständigenrat (2005).

58 See Bundesagentur für Arbeit (2004), Strotmann and Vogel (2004) as well as Bach et al. (2004).

59 For studies on the impact of benefits on the duration of unemployment in Germany, see 3.2.2. The degressivity of benefits over time is, however, somewhat smoothed by a smoothing parameter, implying that benefits equal to the subsistence income will only be reached after 4 years of unemployment.

60 See Boss et al. (2005), Boss and Elender (2005), Sachverständigenrat (2005), Freytag and Renaud (2004), Christensen (2004).

61 See Arntz et al. (2003), Knabe (2003), Wissenschaftlicher Beirat (2004).

reform of mini-jobs will have only a small impact on total employment.[62] Similarly, there is scepticism if the incentives to take up a low-wage job are sufficiently improved and consequently use low-wage jobs as stepping stone into permanent employment subject to social security contributions. Fertig et al. (2004) conducted a survey among persons with low wages, finding that only few people in low-wage jobs aim at regular employment.[63] Cichorek et al (2005) calculate that a large increase in gross income is required in the regular labour market to achieve a higher net wage once the threshold is achieved.

As the design of the unemployment benefit system in Germany clearly provides fewer incentives for taking up work than in other countries, the reforms constitute an important step in the right direction. This is particularly true for the reduction of high reservation wages especially of low-wage earners, the sharpening of job availability requirements and a stronger regression of unemployment benefits over the duration of unemployment. Through their effect on search efforts by unemployed these reforms should contribute to reducing the persistence of unemployment. Moreover, lower reservation wages and higher search efforts can also be expected to dampen wage pressure. To reduce the high unemployment of low skilled, action in the area of low wages was warranted. Even if some scepticism remains of whether the measures may lead to lock-in effects in the low-wage labour market segment, it may well be that entrance in this job market will foster transition into regular employment later in the career of low-skilled unemployed. This is above all relevant if the signalling of formal qualification or work experience in the matching of unemployed to jobs has an important role. In this case, even by allowing the long-term unemployed to demonstrate capabilities, 1€ jobs may have an important effect on their employability.

3.4 Summary

After being a "high growth-low unemployment" economy, since the mid-1990s Germany has been lagging behind other euro area countries in terms of economic growth and employment. To some extent, the deterioration in the relative labour market performance is the consequence of German reunification. However, the divergence in labour market trends between Germany and other countries became more evident over time since reunification. Only in 2006 with higher growth, partly due to temporary stimuli related to anticipatory effects of the VAT increase as from 1 January 2007, this gap could be reduced. German labour markets have faced a higher pace of structural change than in the past without sufficient capacity to adapt to it. Fewer jobs have been created in services, regional differences between eastern and western Germany in unemployment have increased, and the likelihood of moving from unemployment into employment has declined. The consequence has been a sizeable increase in unemployment, especially among the low-skilled, and in the duration of unemployment. Weak labour demand and deteriorating job prospects for all qualification levels have resulted in overall increased skill requirements for an individual's job entry. This is, for example, evidenced by a higher share of qualified employees in previously low-skilled jobs, which seems to be crowding out the low-skilled.[64] The increase in unemployment has become permanent through habituation, i.e. people in unemployment reducing their job search efforts over time, or lock-in effects, i.e. firms

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62 See Arntz et al. (2003), Steiner/Wrohlich (2004) and Bargain et al. (2005).

63 The opposite result was obtained by the Bundesagentur für Arbeit (2004), finding large flows of 440.000 persons that changed from a low-wage jobs into regular employment within one year. At the same time about the same number of persons changed from regular employment into low-wage employment.

64 Evidence of this mechanism has been documented in Hieming et al. (2005).

becoming reluctant to hire from among the unemployed because of the assumption that 'unemployed' equals 'less productive', an assumption which may indicate a potential insider-outsider problem.

Although the significance of a deterioration of the employment prospects of the low-skilled is uncontroversial, opinions differ as to what the reasons for it are. One obvious one has been the shrinking employment in the construction sector. Further factors are skill-biased technical progress, the relative wage of the low-skilled and their taxation as well as insufficient demand for the services of low-skilled. A comparison with other countries does not reveal any single labour market institution in Germany as being particularly detrimental to employment. The structural component of unemployment, and hence the NAWRU, seem to have increased mainly because of the way different labour market institutions interact. It seems to be particularly critical that, even under conditions of high and persistent unemployment, the German social system provides high benefits relative to net wages and these are retained over a long period of unemployment. This holds particularly true for the long-term unemployed with relative generous benefits, which were neither tightly administered by the Public Employment Services nor sufficiently declining over time. This means that the incentive to avoid remaining unemployed for long is weaker than in other countries. The same holds for the tight and virtually unchanged employment protection legislation (EPL) for regular work contracts. EPL for regular contracts seems to be more stringent than in other countries, meaning that insiders have a strong bargaining position relative to outsiders. In addition, the above-described insider-outsider problem is aggravated by the German wage bargaining system. Moreover, restrictive EPL may have held back the acceleration of structural change after reunification and technical progress since. While EPL may cushion job destruction, it also reduces the incentives to create jobs and, when hiring, to adopt a risk-averse selection of employees. This can also be expected to reduce the chances of unemployed to re-enter the labour market.

Following the proposals by the so-called Hartz Commission in 2002, a number of changes to labour market institutions was enacted within a relatively short time. They were mainly intended to reduce disincentives to take up work and improve the process of matching unemployed persons to vacant jobs and create better incentives to participate in the labour market, especially for the low-skilled. Changes to EPL were introduced and some of the reforms to the tax and benefit systems present a landmark change. Their positive consequences are likely to materialise only in the medium to long run and cannot therefore be assessed at the current juncture. But it is clear that they address an area that has been identified as being of crucial importance for employment. So far, employment in the low-wage market segment seems to have benefited from these reforms. It is, however, unclear whether the employment gains will rise further. The focus on measures to stimulate employment in the low-wage sector seems to have contributed to a labour market duality. The political debate on issues such as minimum wages, wage subsidies and low-productivity traps has intensified, while the underlying structural problems are not yet being sufficiently addressed.[65] In particular, the reforms do not touch upon the wage bargaining system as a potential source of inefficiencies. The full positive long-term effect of the recent measures will probably depend on whether entry into low-wage jobs can increase individuals' chance of transition to jobs with higher pay and productivity in the future – something that is influenced *inter alia* by the relative bargaining position of insiders to outsiders and the degree of wage differentiation.

[65] See e.g. Chapter seven of Sachverständigenrat (2006).

4 REMOVING IMPEDIMENTS TO CAPITAL FORMATION

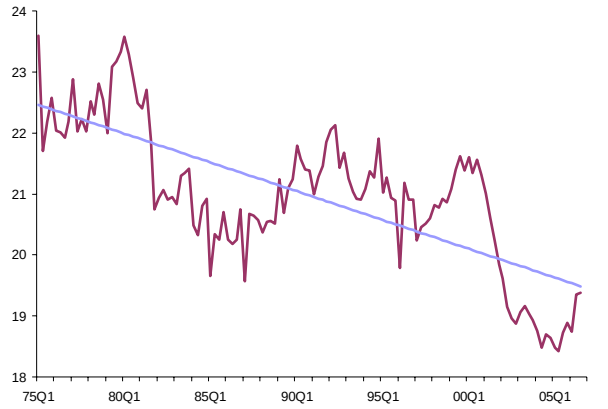
The analysis in Chapter 2 identified weak developments in terms of capital accumulation and total factor productivity as the root cause for the sharp decline in potential growth in Germany over the past decade. This chapter discusses capital formation in more detail, with special emphasis on private machinery and equipment investment and construction. It then discusses the financial sector and the corporate tax system in Germany as potentially important determinants of private sector investment decisions.

4.1 Declining investment trend

In Chapter 2 it was argued that the weak performance of gross fixed capital formation was for a long time a striking feature of the current economic upswing in Germany. Graph 4.1 shows that, as a share of GDP, real gross capital formation has been on a downward trend since the mid-1970s. The German investment share rose above trend during the reunification boom and the "dotcom"-bubble, but it has plunged down far below trend after 2001Q2. The subdued performance of gross fixed capital formation came to an end only in 2005Q3, when the investment share started to increase again. It therefore appears that the development of gross fixed capital formation has a cyclical and a structural (i.e. trend-related) component.

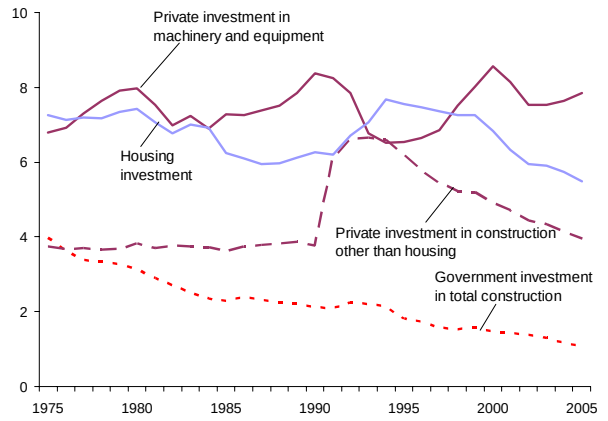
In order to understand the forces driving gross capital investment, it is instructive to investigate its components in more detail. Although government fixed investment as a share of GDP has been on a declining path already since 1975, its amount is too small to explain the recent drop in fixed investment (Graph 4.2). Government investment, which is mostly in construction, is now of roughly the same size as the "other investment" category, which mainly comprises acquisitions of computer software. Instead, it is private investment in machinery and equipment, in housing and in other construction that have driven downward the investment ratio after 2001. Together, these items accounted for more than 90% of gross fixed capital formation in 2005.

Graph 4.1 **Real gross fixed capital formation**
as percent or real GDP, 1975Q1-2006Q3



Note: Until 1990 data for West Germany in 1995 constant prices; from 1991 data for Germany as a whole on the basis of chain indices.
Source: Deutsche Bundesbank, Reuters-Ecowin.

Graph 4.2 **Main components of gross fixed investment**
as percent or real GDP, 1975-2005



Note: 1990 data for West Germany in 1995 constant prices; from 1991 data for Germany as a whole on the basis of chain indices.
Source: Deutsche Bundesbank, Reuters-Ecowin.

Furthermore, Graph 4.2 suggests that, as a share of GDP, private investment in machinery and equipment has always been largely driven by cyclical factors. It declined strongly after the bust of the "dotcom" bubble, stabilised in 2003 and has recovered since 2004. This is in contrast to the

development of private investment in housing and other construction, which, since reunification, has apparently been governed by structural factors and, as will be detailed below, by fiscal measures. In particular the share of housing investment has been on a perennial downward trend. The following sections discuss the developments in private machinery and equipment investment and construction in greater detail.

4.2 Investment in machinery and equipment

Economic theory and empirical evidence suggest a close relationship between investment in machinery and equipment, overall economic activity and capital costs (see Box 4.1).[66] Graph 4.3 provides an estimate of the "investment gap", i.e. the deviation of private investment in machinery and equipment from its long-run equilibrium. Up to reunification boom economic upswings were associated with positive investment gaps. With the exception of a brief period in 2000, this is no longer the case during the more recent cyclical recoveries. This suggests that Germany had experienced a period of strong over-investment in machinery and equipment. A significant part of this took place in the wake of reunification but already in the 1980s, when the investment gap barely turned negative during cyclical downswings. The weak performance of private machinery and investment between 2002 and 2004 may thus just be an adjustment of excess capacity, which was possibly fuelled by "artificially" low borrowing costs as a consequence of the fact that debt issued by state-owned banks (*Sparkassen*) had been guaranteed by the government[67] and by government subsidies after reunification. The fact that the investment gap did in machinery and equipment not immediately close when the current upswing set in may thus not be surprising. Notwithstanding the moderate increase in the investment gap that has taken place since 2005, the persistence of the investment restraint clearly sets the current upswing apart from previous ones.

A likely explanation for this lack in machinery and equipment investment lies in the fact that the increase in final demand during the current upswing has so far mostly been driven by strong exports. However, external demand is still exposed to considerable risks related to huge imbalances in the world economy and volatile oil prices, rendering sales expectations unstable. Domestic demand, on the other hand, has only recently started to rebound, and it is still unclear to which extent this recovery is linked to anticipation effects related to discretionary fiscal measures. Employment and wages have until recently also grown only moderately, and, although monetary policy has been accommodating over the past years, the abolishment of government subsidies to state-owned banks is likely to have increased the financing costs of investment, making fewer investment projects profitable. This might explain why, despite substantial profits accumulated in 2004 and 2005, German companies were reluctant to invest during that time period (see Graph 4.4).

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66 See Kuhnert (2005) for a similar assessment based on a slightly different data set.

67 This point was made, for instance, by Broadbent et al. (2004). The financing conditions of investment are dealt with in Section 4.4.

Box 4.1 **A vector-error-correction model (VECM) for private investment in machinery and equipment**

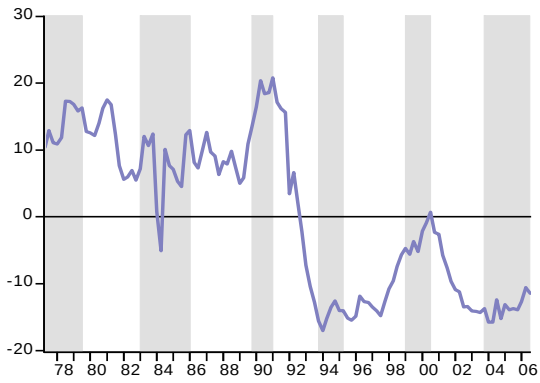
A VECM was estimated comprising real private investment in machinery and equipment (inv), real final demand (fin), real long-term interest rates (rl) and some dummy variables (Dum), accounting inter alia for reunification. All variables except for the interest rates are defined in logs. Based on quarterly seasonally adjusted data at constant prices for 1976Q1-2006Q3, one co-integration relationship was identified. The growth rate of private investment in machinery and equipment can be described as follows:

$$\Delta\log(inv_t) = -\underset{(5.11)}{0.19}\cdot\left[\log(inv_{t-1}) - \underset{(12.16)}{1.23}\log(fin_{t-1}) + \underset{(2.00)}{0.02}\,rl_{t-1} + cons\right] + \Sigma_{i=1}^{4}\beta_i\Delta\log(inv_{t-i}) + \Sigma_{i=1}^{4}\gamma_i\Delta\log(fin_{t-i}) + Dum$$

$R^2adj = 0.60 \qquad SEE = 0.02$

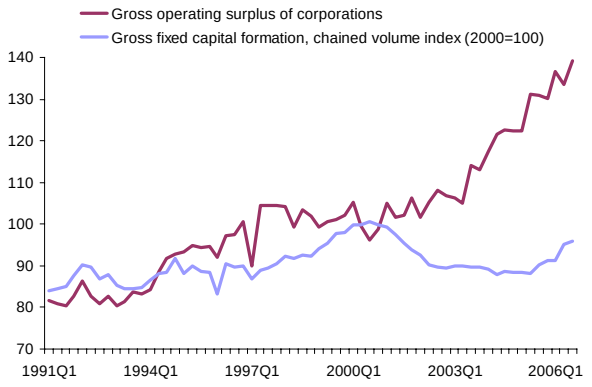
Real final demand and the constant term were found to be highly significant in the co-integration equation. The demand elasticity above one suggests that accelerator effects are at work in machinery and equipment investment. The relatively small value of the "loading coefficient" (0.19) indicates that deviations of investment in machinery and investment from its long-run equilibrium dissipate only gradually. Real long-term interest rates were found to be only a weakly significant determinant of private investment in machinery and investment. This should not, however, be taken as evidence that financial conditions have little effect on private investment behaviour. Firstly, real long-term interest rates are only a rough proxy for capital costs and do not take into account other important factors like taxes, amortisation rules and the price of investment goods. Secondly, several studies, as for instance von Kalckreuth (2001) and Breitung et al. (2003) found that while capital costs may not be significant on an aggregate level, there is clear evidence for the interest rate being an important explanatory variable when firms' investment decisions are analysed using panel data.

Graph 4.3 **Private machinery and equipment "investment gap"**
1977Q2-2006Q3



Note: Percentage deviation of actual investment from its long-run equilibrium. Shaded areas mark periods of cyclical upswings, as identified in Section 2.2.
Source: Commission Services.

Graph 4.4 **Corporate profits and gross fixed capital formation**
2000=100, 1991Q1-2006Q3



Source: Destatis, AMECO.

The long slump in machinery and equipment investment may therefore not give much cause for concern from a cyclical perspective. It does so, however, from a structural viewpoint (Orellana et al. 2005, 12). Also, the presently observable rebound of investment activity may largely be due to

anticipations effects related to fiscal measures, and a (temporary) slowdown of machinery and equipment investment in 2007 still appears likely.

4.3 Construction investment

Since the middle of the 1990s, construction investment is weighing on gross fixed capital formation and growth in Germany. Real construction investment has almost steadily fallen since 1995 at annual rates of up to 6%. A good deal of the current rebound in construction activity is related to discretionary fiscal measures. As construction investment is equivalent to around one tenth of GDP, its strong and steady decline between 1995 and 2005 had a severe impact on economic growth. Without construction investment, GDP growth in Germany would have been on average more than ¼ percentage point higher per year since 1995. Even if a cyclical pattern exists, Graph 4.2 indicates that the long lasting decline in construction investment is by and large a structural phenomenon. In order to understand the underlying reasons for this development one has to go back to reunification. Moreover, it is important to distinguish between different segments of construction investment.

German reunification and public transfers to the East, mainly through federal and, to a lesser degree, European funds, led to a substantial boom in different segments of construction during the early 1990s. The housing stock in East Germany needed to be either demolished or substantially refurbished. In addition, the migrant flows to West Germany from the eastern *Länder* and ethnic Germans from other countries led to an increasing activity in housing construction. Presenting more than a half of overall construction activity in Germany, private housing investment has remained sluggish during the last years in spite of huge subsidies for owner-occupied housing and of historically low real interest rates. In the East, the phasing out of several additional subsidies like the special depreciation allowance for housing investments in the second half of the 1990s contributed to a reduction in construction investment Political discussions about the abolition of subsidies for owner-occupied housing investment in Germany led only to a temporary increase in building permits in 2002 and 2003 (see Graph 4.5). Reasons behind the weak real estate market can also be seen in labour market uncertainties due to high unemployment and slow growth in real disposable income. However, particularly in the East the main determinant for private housing investment can be seen in demographic factors: in some regions the population is shrinking due to low fertility rates and above all to migration especially of young and well educated workers to economic centres and to the West. According to the German Federal Statistical Office (Destatis), the vacancy ratio of apartment units increased in the Eastern *Länder* from around 5-8% in 1993 to 10-18% in 2002, the latest date for which figures are available.[68] This can at least partly explain why currently around two thirds of housing investment in East Germany is not linked to new buildings but to renovation of existing houses (Bartholmai and Gornig 2005, p. 594).

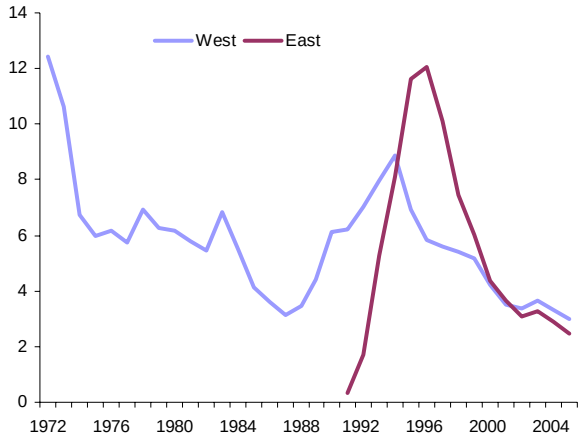
The recovery in 2006 of housing investment is largely related to anticipation effects in the forefront of the VAT increase as from 1 January 2007, which made housing investment more expensive. It is very likely that a significant share of investments planned for 2007 and 2008 were brought forward to 2006, increasing the housing investment growth rate in this particular year. This time shift in production and demand may have been reinforced by the abolition of subsidies for owner occupied housing, which are still valid for those having received their building permit before the end of 2005. Unsurprisingly, towards the end of 2005 an increase in building permits

[68] Similarly, but less pronounced, the vacancy ratio in the Western *Länder* increased from 1-2 % in the late 1980s to 5-8 % in 2002.

could be observed. A strong decline of housing investment can therefore be expected at the beginning of 2007, with only a gradual recovery thereafter. Moreover, the long term declining trend will not be affected by this shift in the time pattern of investment. In the long run, labour market trends play a dominant role. However, future increases in employment and wages remain uncertain. In addition, the abolition of subsidies for owner-occupied housing investment will weigh on this sector.

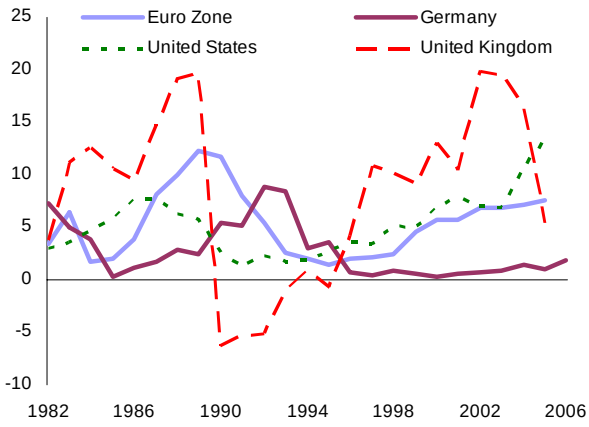
Similarly, it is unlikely that housing investment will get a boost from rising house prices. They increased in the 1970s and 1980s, but over-investment in the East German housing market after reunification and partly also in the West led to a stagnation of house prices (see Graph 4.6). This development was reinforced by the abolishment of housing subsidies.[69] Housing prices could increase again in some sectors where over-capacities are being cut back, and investments in these sectors could become profitable again. Nevertheless, especially in the East, with a declining population and still existing excess supply, housing investment will most likely come in the form of renovation. As a consequence, housing investment may merely stabilise in the coming years despite an improved macro-economic environment. On the other hand and in contrast to some other European countries, subdued house price developments may safeguard against risks of overheating and sudden drops in housing investment.

Graph 4.5 **Housing building permits**
per 1000 inhabitants, 1972-2005



Source: Destatis.

Graph 4.6 **House prices in selected countries**
in %, y-o-y, 1982-2006



Source: Reuters-Ecowin, ECB and national sources; series are not strictly comparable.

While industrial and office construction was also weak, there are important differences to housing. In 1999, optimism about growth prospects led to over-investment, not only on the stock market but also in business construction.[70] Industrial plants had either to be newly built or to be brought to competitive levels. Large investments in office buildings created substantial overcapacities in some larger cities (see Graph 4.7). This mismatch between supply and demand still exists in important office locations like Frankfurt/M. or Munich and has to be resolved before new major investments will be undertaken. Similarly and also linked to slow growth of private

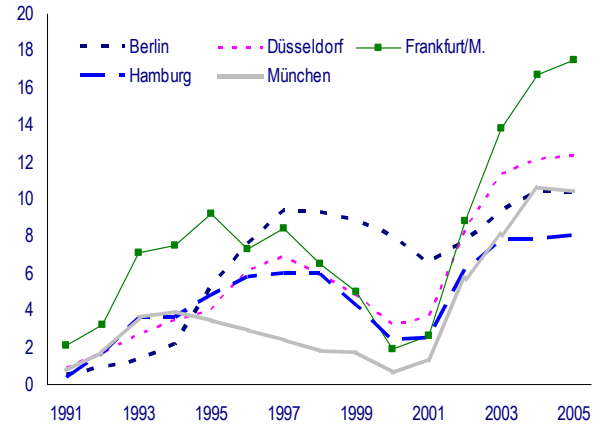
69 See e.g. DekaBank (2005), ECB (2006) and Girouard et al. (2006). In addition to a factual description of house price developments, these papers provide model based assessments of house price developments. For Germany they do not find evidence for a strong undervaluation of houses.

70 Non-housing private investment, representing nearly 30% of construction investment, mainly consists of investment in office buildings, retail centres and factories. Underground engineering, particularly for the energy sector, only accounts for one third of private non-housing construction investment.

consumption in Germany, profitability of investment in new retail centres was questionable. However, as excess supply has led to low real estate prices by international comparisons, more and more foreign investors are being attracted. This could give hope for at least stabilising or even rising real estate prices, making new investments more profitable.

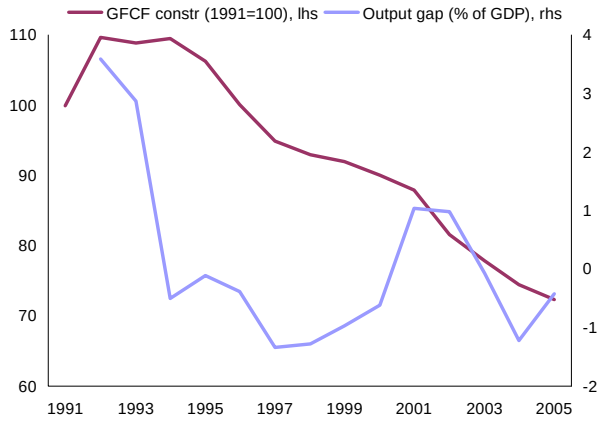
Building of new factories depends heavily not only on cost factors but also on demand prospects and the current capacity utilisation. As in particular domestic demand has hardly contributed to economic growth during recent years and, consequently, capacity utilisation was below average, construction investment in factory buildings remained sluggish. Yet, with growth prospects brightening and increasing capacity utilisation, more and more related investments can be expected in the coming years (see Graph 4.8). Hence, while the bleak prospects for quantitatively important housing investment argue for an only moderate contribution of construction investment to potential output growth in the near future, the outlook for investment in construction other than housing, which is in effect more relevant for potential output growth, is more favourable.[71]

Graph 4.7 **Office vacancies in selected cities**
in % of total floor space, 1991-2005



Source: Jones Lang LaSalle GmbH.

Graph 4.8 **Output gap and construction investment**
1991-2005



Source: Destatis, AMECO.

Finally, public infrastructure investment may raise total factor productivity via reduced transaction costs for enterprises and improved workers´ mobility. Public infrastructure had to be almost completely rebuilt in Eastern Germany. However, between 1991 and 2005, the share of public fixed capital formation in total fixed capital formation declined from over 11% to less than 8%. This is the second lowest share in the euro area after Austria (5.5%). Primarily, this reflects a longer-term trend (see Graph 4.2). In the 1970s in West Germany, the share of public investment in total investment amounted to up to 20% and has been declining to 11.4% in 1990. The decline in public investment after reunification was concentrated at the level of local government, which in 1991 was responsible for over 60% of public investment. The share of investment in total expenditure of local governments declined in Eastern and Western Germany alike, while social expenditure grew, a trend which was already discussed in Section 2.1. Although there is evidence

[71] As a matter of fact, other construction investment is conducive to potential growth mainly via investment in factories as a complement to machinery and equipment investment. In contrast, housing investment, although being included in the growth accounting exercise in Chapter 2, has no direct impact on the supply side. It would therefore be more appropriate to calculate potential output on the basis of total value added net of housing.

that budgetary consolidation is often undertaken by reducing public investment, this does not necessarily imply that social expenditure has fully crowded out public investment. The trend of declining public investment, which has occurred in many OECD countries, may also reflect a shift in the boundaries between public and private investment, for example through privatisations (see European Commission 2003). Moreover, public investment might particularly be subject to decreasing returns.[72] In any case, public investment should rather be seen as a necessary precondition for economic growth and less as driving force in itself. The evidence on the effect of public capital on long-run growth is not clear-cut in the literature. According to the survey by Romp and de Haan (2005) the effect is positive but depends on the specific circumstances under which the public capital is provided. Hence, as now the main infrastructure in the Eastern *Länder* has been refurbished, contributions to potential growth by further public investment would generally speaking be less pronounced than in the 1990s.

4.4 Financing corporate investment: current situation and prospects

An efficient allocation of capital is a major condition for sustained economic growth and the financial system plays a crucial role in channelling savings to investment and providing opportunities for inter-temporal consumption smoothing. The focus of the subsequent analysis is on the contribution of the German financial sector to the process of economic growth via investment financing. Starting with (i) a brief review of recent corporate balance sheet restructuring since 2002, it subsequently explores the effects of ongoing structural shifts in Germany's financial sector such as notably: (ii) the rising pressure for shareholder value, (iii) low profitability and consolidation pressure in the banking sector, and (iv) the contribution of financial innovations in addressing specific financing needs of Germany's corporate sector.

Corporate balance sheet restructuring

It appears that the favourable financing conditions, which now have prevailed for several years, did not substantially contribute to a recovery in investment activity of the German non-financial corporate sector until early 2006. On the contrary, private investment activity has recently rebounded despite rising long-term interest rates. The weak impact of lower interest rates can to some extent be explained as a reaction to the deterioration in the net financial position recorded in 1999 and especially in 2000, which were much larger than in the rest of the euro area (see Graph 4.9).[73] These increases in net external funding gave rise to accumulated debt liabilities, which became progressively unsustainable as the global economy slowed in the aftermath of the 2000 stock market correction. Thus, for much of the period since then, companies have been engaged in balance-sheet restructuring, taking advantage of low interest rates to re-finance existing debt while simultaneously limiting their investment activity. In response to these consolidation measures, the level of accumulated corporate debt has come down from almost 67% of GDP in 2002 to about 60% of GDP in 2004 (see Graph 4.10). Although it is difficult to say whether the

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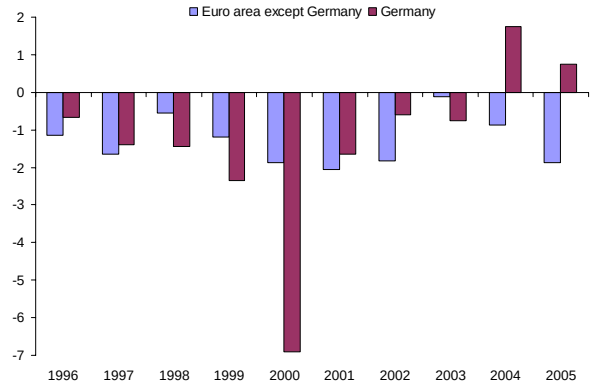
[72] See, for instance, Moreno et al. (2002) and Del Mar Salinas-Jiménez (2004). For a literature review see, e.g., de la Fuente (2000) who concludes that "returns to such investments are probable quite high in early stages, where infrastructures are scarce and basic networks have not been completed, but fall sharply thereafter" (p. 41). A non-monotonic relationship between infrastructure investment and long-run growth is found also e.g. by Bougheas et al. (2000).

[73] Subtracting the UMTS licence costs of 50,8 billion euros from the year 2000 figure would result in a net financial deficit of about 4.4% of GDP, which is still significantly higher than the deficit recorded in the rest of the Euro area. Another consideration would be that the UMTS licenses are subject to depreciation for tax reasons, resulting in a tax reduction, presumably lowering the need for non-financial corporations net external funding from 2001 onwards.

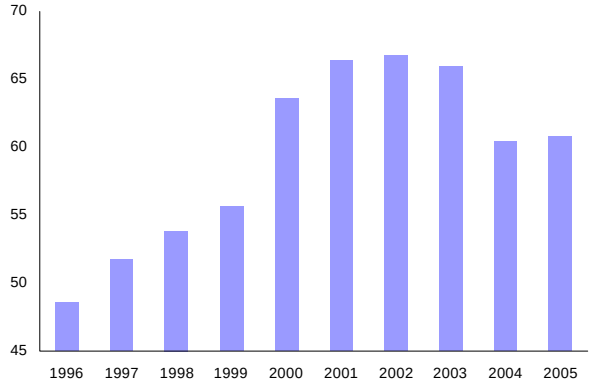
process of balance sheet consolidation is completed, it would seem that overall balance sheet positions have significantly improved and corporations are now in a good position to embark on new ventures, as is also evidenced by the slight increase in the debt to GDP ratio in 2005. The subsequent analysis explores whether ongoing shifts in Germany's financing structures can be expected to be conductive to investment financing.

Graph 4.9 **Net financial position of the non-financial corporate sector, Germany versus rest of euro area**
in % of GDP, 1996-2005



Note: Greece, Ireland and Luxembourg are excluded due to data availability.
Source: Deutsche Bundesbank, Eurostat, own calculations.

Graph 4.10 **Non-financial corporations, Germany**
Debt to GDP ratio in **%,** 1996-2005



Source: Deutsche Bundesbank, Eurostat, European Commission calculations.

A changing financial environment

Driven by deregulation, technical innovation, globalisation, progressing European financial market integration and the introduction of the euro, Germany's capital markets have evolved substantially over the past decade. The first observation in this respect is that, even though market-based financing has gained in importance for larger companies, Germany's financial system remains still dominantly bank-based (ECB 2002b, 66-89). While the respective pros and cons of bank or market-based financial systems are a topic of ongoing debate (Levine 2002), and both types of systems may be efficient from a historical perspective (Monnet and Quintin 2005), different incentive structures apply with regards to market imperfections such as asymmetric information and moral hazard.[74] In this context, the advantages of a bank-dominated system are typically seen in a reduction of information and control problems by long-term relationships between borrowers and lenders, while market-based systems tend to be more transparent and dynamic (Sachverständigenrat 2005, Table '48, 463). This suggests that the German "house-bank" system may have efficiently financed established companies, but may have been less adequate to finance young and innovative companies (Schäfer, Werwatz and Zimmermann 2004).

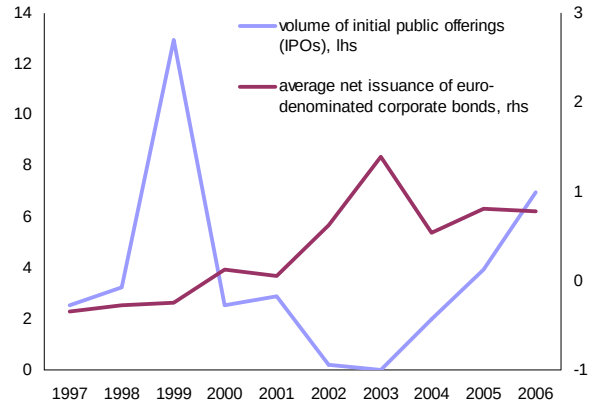
The financing opportunities offered by deeper and more liquid pan-European bond markets have been used extensively by Germany's public borrowers[75] and the financial sector, which

74 Moral hazard describes the situation where the redistribution of risk changes people's behaviour, typically in such a way that they don't bear the full adverse consequences of their actions.

75 Given their high quality (triple-A rating) and liquidity, German central government bonds are generally the benchmark against which other euro denominated bonds are priced. Bond based financing of the German Länder and agencies such as Kreditanstalt für Wiederaufbau (KfW) has also increased.

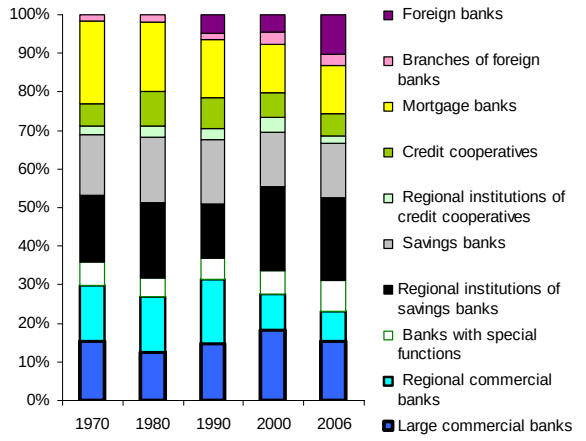
compensated for the ongoing reduction of private deposits by an increased issuance of bonds.[76] Bond issues by German corporations have also increased compared to pre-euro levels, even if their share in corporate financing is still quite limited (Sachverständigenrat 2005, 459). Graph 4.11 illustrates the strong growth in the issuance of corporate bonds and equities in the early years of EMU, when the development of the German equity market accelerated in response to the global equity boom of the 1990s, leading to the (temporary) introduction of the "Neuer Markt" as a lower regulated listing place for young enterprises.[77] However, the painful consolidation process following the bursting of the stock market bubble in spring 2000 implied a serious setback for the emerging German equity culture, even if stock markets have recovered since spring 2003 and equity issuance from German companies has again increased substantially in 2005 and 2006.

Graph 4.11 **IPOs (market value) and net issuance of coporate bonds**
in EUR bn, 1997-2006



Source: Deutsche Börse and Deutsche Bundesbank.

Graph 4.12 **Lending to corporations by different banking groups**
in % of total, 1970-2006



Source: Deutsche Bundesbank.

A main side effect of increased market financing is that the typical German system of corporate governance, the so-called "Deutschland AG", which is characterised by a dominant role of banks in a complex system of cross-shareholding and the exertion of voting rights ("Depotstimmrecht") as well as a production-oriented, company-centred management system is under pressure to unwind (Jürgens and Rupp 2002). While increasing pressure for shareholder value can be expected to yield efficiency gains,[78] some aspects of a shift to a more market-based financial system are a matter of controversial debate. Main examples are the emergence of hostile takeovers and fears that hedge funds and private equity investors engender too aggressive cost cutting and restructuring. There are also concerns about some cases where investors squeezed out profits of companies they took over and then left. However, on balance the involvement of highly sophisticated investors should improve the efficiency of financial markets by better risk

[76] German banks dominate widely in the issuance of unsecured bonds and Pfandbriefe (covered bonds) in the euro denominated bond market.

[77] About six years after its introduction, the German “Neuer Markt” was closed down and replaced by the “TecDAX” as the new index for the 30 largest technology companies.

[78] This process has been supported by legislative measures to increase transparency and investor protection and capital gains from the sale of cross-corporation shareholdings are generally exempted from tax by the German tax reform in 2000.

allocation and market liquidity, even if stability risks related to the opaque nature of the hedge fund industry might raise some unease.[79]

Implications of low profitability and consolidation pressure in the banking sector

Even if direct capital market financing may increasingly be an alternative for Germany's larger companies, the wide majority of Germany's smaller and medium-sized companies will remain mainly dependent on bank financing. This puts the focus on potential inefficiencies in Germany's banking sector that is divided into three main "pillars". Graph 4.12 illustrates that the share of different banking groups has been rather stable over the past decades. Notably, the market share of large commercial banks is rather limited, while relatively small public sector and co-operative banks, which do not have profit maximisation as primary business objective, remain important especially for the funding of smaller local enterprises.[80]

While tight lending margins resulting from competition between banks are in principle positive for Germany's corporate sector, limited profitability might also lead to credit rationing behaviour. There was some concern over a possible credit crunch in Germany, notably in the context of a decline in profitability and subsequent losses of commercial banks and of *Landesbanken* (the central institutions of the savings banks) associated with the stock market downturn and the 2001 recession. However, lending by the savings banks and cooperative banks remained broadly stable and subsequent research suggests that the decline in bank lending was probably both demand and supply side driven.[81] In the meantime, especially large and internationally oriented banks have successfully engaged in substantial cost-cutting to restore profitability,[82] which has indeed progressively recovered with particularly strong results of large commercial banks in 2005. Credit has also started to expand, notably from commercial and foreign banks (see Graphs 4.13 and 4.14).

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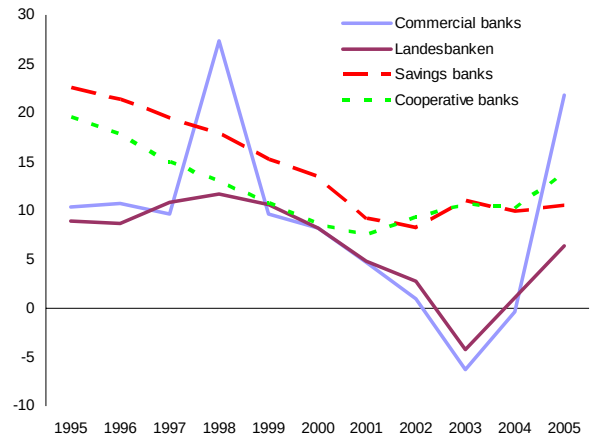
79 See e.g. the discussion in Sachverständigenrat (2005), pp. 463-473.

80 For a description of the characteristics of different banking groups see e.g. Hackethal (2003).

81 Research from the RWI (Nehls and Schmidt 2003) based on a disequilibrium-model and an estimation of a credit supply and a demand-function, found excess-demand particularly in the second half of 2002, emanating from a drop in earnings in the banking sector and applying most severely to large banks. Polleit (2004) finds that the slowdown in bank loan expansion is largely driven by a decline in the demand for loans but does not rule out that supply-side restrictions have also played a minor role. Buch et al. (2006) find a positive impact of sectoral growth on the lending by savings banks, credit cooperatives (including their regional institutions), smaller banks, and banks that are highly specialized in specific sectors.

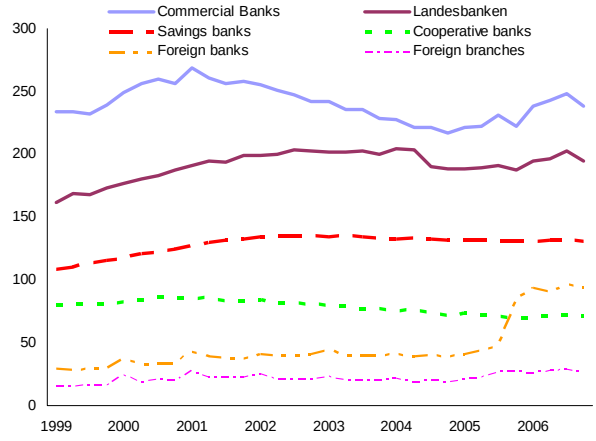
82 Private banks cut their operating costs by 14% between 2001 and 2004, while the costs of other banking groups still increased somewhat (by 1%); See: Bundesverband Deutscher Banken (2006), p. 47.

Graph 4.13 **Profitability of different German banking groups**
return on equity in %, 1995-2005



Source: Bundesverband Deutscher Banken.

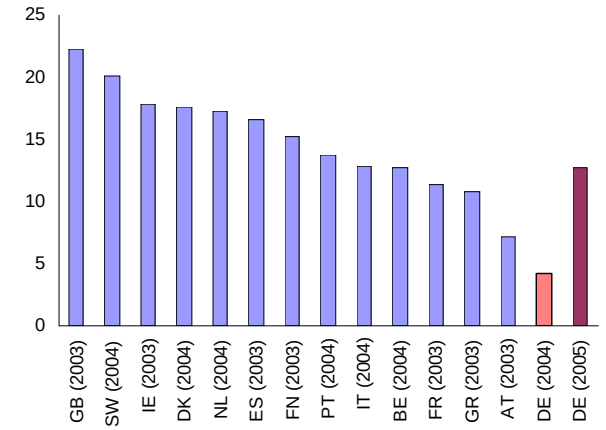
Graph 4.14 **Recent evolution of corporate lending by different banking groups**
amounts outstanding in EUR bn, 1999Q1-2006Q3



Source: Deutsche Bundesbank.

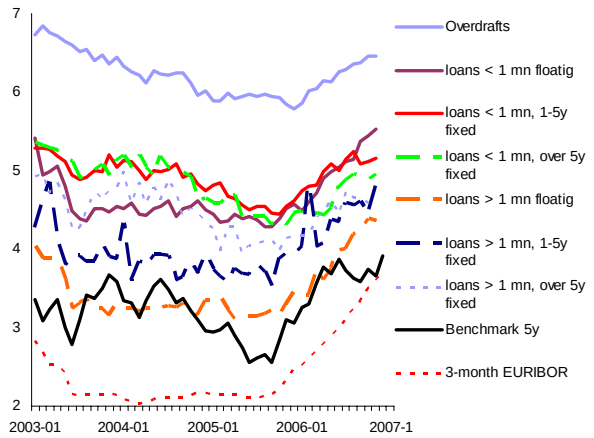
However, it has to be emphasised that, despite recent improvements, the profitability of German banks was low in comparison with other European countries in 2003 and 2004 (see Graph 4.15) and that the German banking sector remains under consolidation pressure. German banks participated in the euro area-wide trend of banking consolidation, but legal restrictions on mergers across bank types may have limited synergies effects. Consolidation took place predominantly through M&A involving smaller banks of the same sector and the number of branches per population is still above the euro area average (ECB 2005). While cross-pillar consolidation remains a controversial issue in Germany, other European countries are more advanced in the restructuring their public banking sector, e.g. via transformations of the legal status of savings banks that allows the investment of private capital or by removing limitations on their regional activity (Sachverständigenrat 2004, 294-303). The IMF (2003; 2006) has recently suggested that similar reforms should also benefit Germany's banking system. The phasing-out of the state guarantees (*Anstaltslast* and *Gewährträgerhaftung*) for public banks as from mid-2005 could act as a trigger in this respect because it removes an arguably unfair competitive advantage of public banks in terms of rating and associated funding costs compared with commercial banks. While it is too early to judge possible medium-term effects, it does not appear that the lending conditions for companies have deteriorated recently in terms of higher risk premiums over benchmark rates (see Graph 4.16).

Graph 4.15 **The profitability of European banks**
return on equity before taxes in %, in 2003 or 2004



Source: Bundesverband Deutscher Banken.

Graph 4.16 **Lending to corporations, new business**
effective interest rate in %, 2003m1- 2006m12



Source: Deutsche Bundesbank.

The particular financing needs of Germany's small and medium-sized enterprises

Given the importance of small and medium sized enterprises for the German economy, financing conditions of the so called "Mittelstand" attract specific attention. The KfW-Mittelstandspanel (KfW 2005) reports financing difficulties especially for smaller companies and start-ups, where credit applications were mainly rejected because of a lack of securities, an insufficient solvency of the company and a changed business policy of the bank, e.g. with regard to the offered products or target companies. On the other hand, the KfW-Mittelstandspanel presents evidence that high lending costs and security requirements are the main reason for innovative small and medium-sized enterprises (SMEs) to reject a bank credit offer. In this context, the effect of bank consolidations on SME lending is a matter of debate (Deutsche Bundesbank 2005). Evidence provided by various studies is not conclusive, but a substantial deterioration is not expected.[83] In the meantime, fears that the new capital adequacy rules would hamper specifically SME financing were defused by the impact assessments on Basel II (PricewaterhouseCoopers 2004, 90-97). Furthermore, amendments to the Capital Requirements Directive (CRD), which implements Basel II at EU-level, were welcomed to improve the impact of the new credit-rating rules on small businesses (e.g., UEAPME 2005).

However, transparency requirements on companies are expected to increase, which facilitates the risk assessment process, and SMEs will need to strengthen their equity base and diversify their sources of financing (KfW et al. 2006). In this context, financial innovations can contribute to the efficiency of Mittelstand financing. The "True Sales" initiative launched with the support of the KfW and several German banks in 2003 to facilitate the securitisation of SME loans,[84] could contribute to improving SME's access to finance through better risk management and financing opportunities for banks (GBRW 2004). Moreover, easier access to the stock market and private equity as well as the availability of specific forms of mezzanine financing (a hybrid of self and external financing) would contribute to remedying the comparable low share of German companies' own capital, while alternative sources of external financing such as factoring, leasing,

83 See the discussion in Sachverständigenrat (2005), box 17, pp. 484-492.

84 The term "true sale" refers to the fact loans are removed from the banks balance sheets in the contrary to "synthetic" transactions where only the risk of the loans are transferred to the capital market.

asset backed securities, commercial papers, as well as syndicated loans and structured loans could also be further developed.[85]

4.5 The German corporate tax system: an impediment to growth?

In 2005, the total tax burden including social contributions[86] reached 39.7% of GDP in Germany, which was below the EU25 average of 40.4%. The tax burden in 2005 was half a percentage point lower than the 1995 figure, followed by a slight increase in the second half of the 1990s and a decrease of similar size after 2000. A remarkable feature of the German tax system is how little it used to rely on indirect taxation compared to other EU Member States. Indeed, the share of direct taxation (including social contributions) amounted to 70.2% of all tax receipts in 2005, while the share in the EU25 amounted to only 66.5%. Although the share of direct taxes in total taxation has been lowered in Germany since 2000 through cuts in corporate and personal income tax rates, the social systems in Germany are overwhelmingly financed by social contributions on wages with rising contribution rates. On 1.1.2007, Germany increased the standard VAT rate from 16% to 19% coupled with a decline in the social contribution rate. This will lower the share of direct taxes in total tax receipts to about 68% in 2007, which is still about two percentage points higher than the EU25 average. The shift from direct to indirect taxation is a structural improvement. For an individual investor indirect taxation through VAT does not burden the intertemporal allocation of capital, in contrast to the structure of direct taxes currently in place (and also after the planned company tax reform in 2008).

When total tax revenues are disaggregated according to economic function, Germany collects less tax revenues on capital, which amounted to 5.8% of GDP in 2004, than the EU-average at 8.6% of GDP (European Commission 2006a). Excluding taxes on stock (mainly wealth and inheritance taxes) from this, the tax revenue on capital and business income amounted to 4.7% of GDP in Germany in 2004, again below the EU-average at 5.7%. Capital and business income includes both taxes paid at the level of the corporation and taxes paid at the personal level, for example on dividends and interest but also on income from partnerships. Partnerships are the predominant legal form of businesses in Germany and fall under personal income taxation. The revenue from taxing corporations amounted to 2.2% of GDP in 2004, against 2.8% in the EU.[87] The fact that Germany's revenues from capital taxation (in any of the above definitions) are below the EU-average, does not change if the revenues are related to total taxation instead of GDP.

The statutory tax rate on corporations in Germany is composed of three taxes, the corporate tax (*Körperschaftsteuer*), the local tax on industry and trade (*Gewerbesteuer*) and the "solidarity surcharge" (*Solidaritätszuschlag*, introduced to contribute to fiscal transfers after reunification). Between 1975 and 2000, Germany's corporate tax system distinguished between retained and distributed profit via a split-rate imputation system. With 40% in 2000, the statutory tax rate on retained earnings was higher than the one on distributed profit (30%). At the level of the private investor, tax payments at the corporate level were reimbursed and interest, dividends and, to

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85 See e.g. the discussion in Sachverständigenrat (2005), pp. 477-484.

86 This includes the categories D.2, D.5, D.61 and D.91 in the European System of National accounts (ESA95).

87 Looking at revenues from taxing corporations abstracts from the choice of the entrepreneur to incorporate or to remain a partnership, which itself may depend on the tax system but also other considerations, for example on control and ownership.

some extent, capital gains were taxed under personal income tax. In 2001, Germany implemented a corporate tax reform (accompanied by several steps of reducing personal income tax rates). This reform brought the statutory tax rates for retained earnings and for distributed profits down to 25% at the corporate level.[88] To calculate the full statutory tax rate including local taxes and surcharges, the local business tax and the solidarity surcharge must be added. Assuming an average business tax of 16.2%, the statutory tax rate on corporations amounted to 38.3% (in 2006). While the statutory rate is lower than before the 2001 reform,[89] it is still topping the European corporate tax league (Graph 4.17), since similar reforms have been carried out in other Member States. At the level of the private investor, taxation at the corporate level would only be partially reimbursed under the 2001 reform, creating a (partial) exemption system.[90] Moreover, the tax base was broadened via several measures, such as the tightening of both depreciation and thin capitalisation rules.[91]

Thus, despite the high statutory tax rate on corporations by international comparison, Germany collects comparatively little revenues. One reason for this may be the shifting of taxable profits abroad. Corporations with locations in different countries might engage in tax arbitrage by optimising payments between the parts of the corporation. For example, internal transfer prices between subsidiaries or common expenses can be used to allocate taxable profits to the jurisdiction with the lowest tax rate. The deductibility of debt financing in most countries can also be used to move the cost of financing to countries with high statutory rates. Indeed, empirical studies show that the statutory tax rate (combined with the tax deductibility of debt) is the main determinant for profit shifting across jurisdictions and Germany seems to suffer from this.[92]

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88 For an exhaustive presentation of the reform, see Keen (2000), Zitzelsberger (2002), European Commission (2004c). In addition to the cut in statutory rates, capital gains taxes on proceeds from the sale of shares by corporations were eliminated from 2002. Partnerships, which make out about 80% of companies in Germany, also benefit from lower personal income taxes and from the possibility to deduct the local business tax (*Gewerbesteuer*) from their federal tax liabilities.

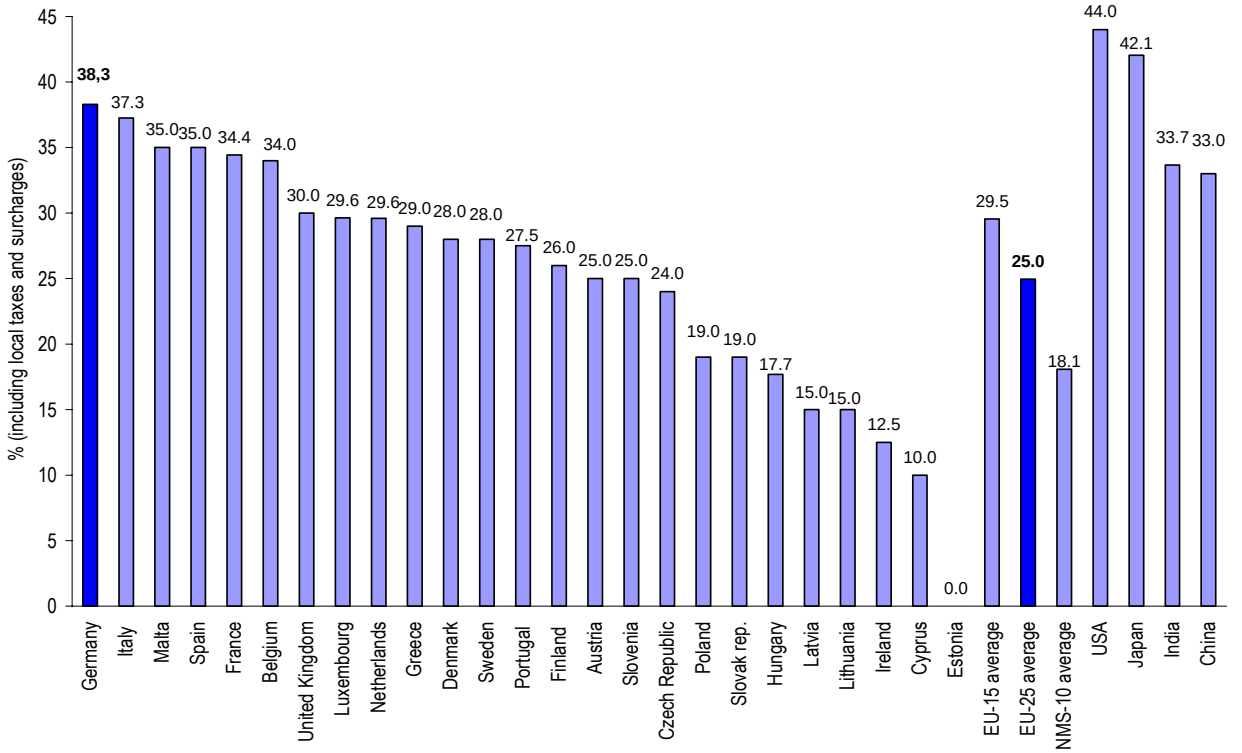
89 Assuming an average local business tax rate at 17.49%, it was for example 57.4% for retained earnings in 1997.

90 Prior to the 2001 reform, domestic dividends were subject to corporate taxation on distributed profits and to a 25% (plus solidarity surcharge) withholding tax. Both taxes were then taken as an indirect tax credit for the shareholder. This system came under criticism as it did not provide an indirect tax credit for foreign shareholders, neither did it allow foreign corporate income taxes to be credited against the German income taxes. Therefore, in 2001 Germany switched to a partial exemption system for companies (tax credit at 95%) and for individual shareholders (tax credit at 50%).

91 Thin capitalisation rules are designed to prevent companies from high debt-to-equity ratios in tax systems which are favourable to debt-financing of investment.

92 Huizinga and Laeven (2007), Weichenrieder (2006), Huizinga, Laeven and Nicodème (2006).

Graph 4.17 **Statutory corporate tax rates in 2006**
(including local taxes and surcharges)



Note: Estonia: rate on reinvested profit; 23% if distributed.
Source: Commission Services.

Moreover, corporate taxes are one determinant of the user cost of capital and thus of real investment. With capital mobility, corporate taxes influence decisions in which country production facilities would be located. There is empirical evidence that, at the margin, taxation matters for investment decisions.[93] Hence, a high tax rate could act like a deterrent on real investment, leading to relatively low corporate tax revenues. In this regard, a distinction is often made between the statutory rate, described above, and effective rates. Effective tax rates are stylised tax rates that are calculated on investment projects with different sources of financing and different rates of return, taking into account the main specifics of a tax system such as depreciation rules and debt deductibility. For Germany, Harhoff and Ramb (2001) report an elasticity of investment to user cost of capital, which includes the effective marginal tax rate, of -0.42. De Mooij and Ederveen (2003) review the empirical literature on the impact of company taxes on the allocation of foreign direct investment and report that the median value of the effective tax rate elasticity in the literature is around -3.3. The European Commission (2001, 102-110) looked at the impact of the 2001 German tax reform on domestic investment. Abstracting from personal income taxes, the reform has lowered the average (i.e. for various types of financing) cost of capital for marginal investment from 7.3% to 6.8%. However, the effect is different across means of financing. Using retained earnings has become cheaper, equalling the cost for issuing new equity and reflecting the streamlining in the (decreased) statutory rates. At the same time, the use of new equity became slightly more expensive and the costs of capital when using debt increased due to a lower value of interest deductibility. The results are similar in the case of investment with a higher pre-tax rate of return and when one

93 For a discussion, see Devereux and Griffith (2002). In particular, there are difficulties with measuring both the tax burden and FDI and some studies show that taxation has only a second-order role compared to market size, infrastructure and other economic and geographical characteristics.

introduces personal taxation. Following the 2001 reform, the effective average tax rate (EATR), which measures the tax burden of a hypothetical investment over a range of returns, has only slightly decreased from 32.8% to 30.1%. Consequently, the European Commission found no change in Germany's ranking with the second highest effective corporate tax rate in the EU. Given the high effective corporate tax rate in Germany, one might expect a considerable negative impact of the current company tax system on real investment.

In February 2007, a draft law for company taxation reform was published by the German Minister of Finance. Besides reducing the tax burden to promote investment in Germany, one of the goals is to reduce tax arbitrage by international profit-shifting of multinationals with given production facilities in different jurisdictions. The proposed measures are as follows. The corporate tax rate (*Körperschaftsteuer*, KSt) would be lowered from 25% to 15%. The local trade tax (*Gewerbesteuer*, GewSt), which has a tax base similar to the KSt, will be lowered, too. The average GewSt rate currently amounts to roughly 16½%, but is then deducted from the KSt. The proposal foresees the lowering of the rate but would abolish the deductibility of the GewSt from the KSt. The net impact of these two reforms would be to decrease the statutory corporate tax rate from over 38% to about 29%. Moreover, the tax base for the local trade tax (GewSt) would be changed. Currently, it is similar to the KSt base with the exception that only 50% of long-term interest paid can be deducted. The KSt allows a full deduction of interest. It is now proposed that 75% of all interest can be deducted from the GewSt. In turn, also rents, leasing rates and licences enter the local tax base to some extent. Partnerships (*Personenunternehmen*) would be able to credit the GewSt to their personal income tax at a higher rate than currently. They also receive a tax reduction for retained earnings.

Companies with very large interest expenditure would able to deduct interest expenditure only up to 30% of gross profits. This "interest barrier" (*Zinsschranke*) applies only for interest expenditure exceeding € 1 bn. This aims at reducing international profit-shifting for very large corporations and would replace existing thin capitalization rules to limit profit-shifting. The depreciation allowance would be reduced as previously planned. Before 2001, it amounted to 30% of the residual value of the investment good, from 2001-2005 it amounted to 20%, in 2006/7 it was raised back to 30%, and is proposed to be lowered from 2008 on to 20% again.

The reform also considers the introduction of a withholding tax (*Abgeltungssteuer*) at the personal level as from 2009. At present, interest received from savings and half of dividends received are taxed under the personal income tax system. Capital gains are tax-free, provided the asset is held for over a year and the ownership in a corporation does not exceed 1%. In the new system, the withholding tax would now tax dividends, savings and realised capital gains at a rate of 25%. In the current system, capital gains are not taxed between corporations.

For the shareholder, the 2008 reform proposal constitutes a move from the half-exemption system to a dual income tax system. Under the 2001 system, the dividend is first subject to the corporate income tax at the level of the company. After this operation, half of the dividend is then taxed at the shareholder's level. Under the 2008 reform proposal, dividends would be taxed at the full (but lower) rate at the company level and then with the withholding tax at the level of the owner as from 2009. It seems that the reform does not lead to a tax relief for shareholders, especially not for those that hold shares over a longer period of time. Moreover, the owner of the company would continue to prefer debt financing of investment over financing from retained earnings or issuing new equity.

As Germany is a net-loser of tax revenues through profit-shifting, the planned reduction is therefore a step in the right direction. Whether the other measures to limit profit-shifting will have indeed a stronger impact than those currently in place is not easy to determine. For

comparing physical investment decisions across tax systems, the statutory tax rate is only an imprecise proxy because of differences in the tax base, so for example in the deductibility of interest expenditure or different depreciation rules. At first sight, it seems that the reform would lower the effective tax rate, which takes the tax base into account, on corporations in Germany.

Overall, it seems that the recent reform proposal would improve the relative attractiveness of Germany as regards company taxation in the EU and reduce the user cost of capital. However, effective tax rates abstract from the issue of profit-shifting. The proposal envisages a considerable tightening of rules against shifting profits abroad in order to finance the reduction in the statutory rate. If it was the case so far that production of multinational companies in Germany benefited from the fact that profits could be moved abroad to mitigate the domestic tax liability, then a tightening of these rules might to some extent offset the positive effects from lowering effective taxation. On the other hand, if profit-shifting was not as large an issue as suggested by the measures in the reform proposal, then lowering the tax burden on companies would impose a higher burden on public finances than envisaged by the reform proposal. Furthermore, the reform proposal does not eliminate the tax-preference for debt-financing of investment, which, in the light of the discussion of Germany's financial system above, may be a point for improvement.

4.6 Summary

Germany's fixed investment to GDP ratio has been on a strong downward trend over the past 30 years, and its decrease markedly accelerated after the second quarter of 2001 with dramatic consequences for potential growth. Private investment activity has recently rebounded, but it is unclear to what extent this reflects longer lasting trends or whether it is mainly driven by anticipation effects related to fiscal measures. The trend decline in the fixed investment ratio is almost entirely attributable to the reduction of excess capacity in the construction sector. Machinery and equipment investment, on the other hand, seems to follow a cyclical pattern. The prolonged weakness in capital formation during the first two years of the current cyclical upswing points to more fundamental impediments to business investment, notably in the areas of corporate financing and corporate taxation

While large companies are increasingly resorting to capital market financing, established credit relations between borrowers and their "house bank" remain the dominant form of financing, especially for smaller and medium-sized companies. And although, with all its pros and cons, bank loan financing has proved efficient for established companies, it may be less so for the financing of innovative, high-risk business start-ups. Moreover, German bank profitability is low by European standards, which points to operational and institutional inefficiencies, since the sector has been largely shielded from external competition; it will face stronger pressure for adjustment in the future. Bank profitability has recently been on the rise, suggesting that some adjustment has already taken place.

As regards the corporate tax system, Germany has over the last decades been a country with comparatively high tax rates and a complicated tax code. The corporate tax reform of 2001, while causing heavy revenue losses to the government, has not substantially improved the investment climate from the tax side. However, the recently proposed corporate tax reform envisages limiting the possibility to shift taxable profits abroad, which would allow a considerable reduction to be made in the statutory corporate tax rate. Even though the tax base

will be broadened compared with the status quo, the reform should lead to a reduction in the effective tax rate and thus be favourable for investment.

5 ACCELERATING TECHNOLOGICAL PROGRESS

In their assessment of the European growth performance, Sapir et al. (2004) write that post-war growth in Europe was based on "imitation", meaning the assimilation of existing technologies and their incremental improvement. Industrial structures, however, are now under pressure to adapt to the greater demand for less standardised, more customised products. Innovation at the technological frontier has become the main driver of growth. "The balance between imitation and innovation has thus shifted decisively in favour of the second. In addition, a greater proportion of that innovation is radical than incremental" (Sapir et al. 2004, p. 38).

This chapter identifies the main determinants of TFP growth in terms of innovation and knowledge diffusion. In particular, it addresses the question what could have possibly been driving TFP performance. Section 5.1 provides a brief overview of Germany's position in the international context, both in terms of output (patents) and input (R&D investment, human capital). Section 5.2 looks at how innovative activity is distributed across industries. Since innovative activity depends not least on market dynamics, Section 5.3 looks at factors that could influence such dynamics, in particular through new entry.

5.1 Innovation

This section will focus on German innovative capacity and subsequently consider its major determinants. Unfortunately, direct measurement of the innovative activities and organisational change is difficult due to data limitations; therefore, we will use standard measures of innovation performance and knowledge transfer and then investigate their long-term determinants.

Despite its weak TFP growth performance, Germany seems to be doing very well in terms of its innovation performance when looking at standard indicators. The European Innovation Scoreboard 2005 (European Commission 2005a) ranks Germany among the innovation "leading countries" along with Switzerland, Finland, Sweden and Denmark. Graph 5.1 displays the so called innovative capacity index[94] constructed by Porter and Stern (2003) to estimate "*a country's potential to generate a constant stream of future innovation*". Germany was ranked fifth out of 80 countries under consideration, ahead of Sweden, Denmark and Switzerland. Furman, Porter and Stern (2002) found that Germany's innovative capacity grew strongly in the 1980s, and the high level was maintained in the 1990s despite a drop-off resulting from reunification.

Germany holds a strong position in terms of innovation output. In 2003, the German share in triadic patent families[95] was 13%, just behind Japan with 26%, the EU25 with 34% and the US with 36% (Graph 5.2). Even though Germany filed the highest share of ICT-related (14.3%) and biotechnology patents (12.8%) at the European Patent Office in 2001, Germany's patents, as measured by the OECD Patent Specialisation Index,[96] were not specialised in these most rapidly

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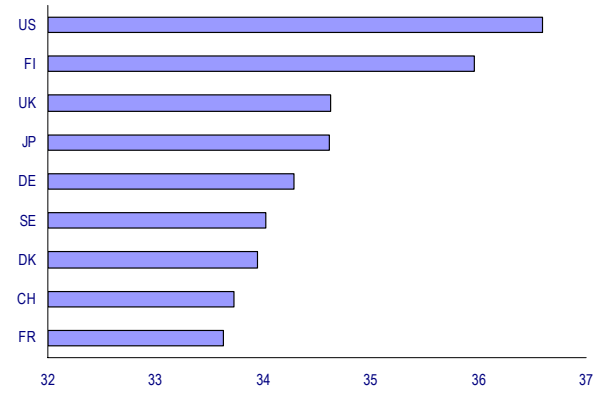
94 The innovative capacity index results from five sub-indices: availability of R&D human resources, regulatory aspects of relevance to innovation, development of specialised clusters of companies and support institutions, intensity of networking between clusters and companies and the public sector part of the innovation system, gearing of corporate strategies and processes to innovation.

95 "Triadic patent families" are a set of patents taken at the European Patent office (EPO), the Japanese Patent Office (JPO) and the US Patent and Trademark Office (USPTO).

96 The specialisation index (SI) is calculated as the share of country A in a specific technology area (i.e. bio-technology or ICT-related patents) divided by the share of country A in all technology areas (total EPO patents of country A). For example, when the SI of biotechnology patents is greater than 1, the country has a

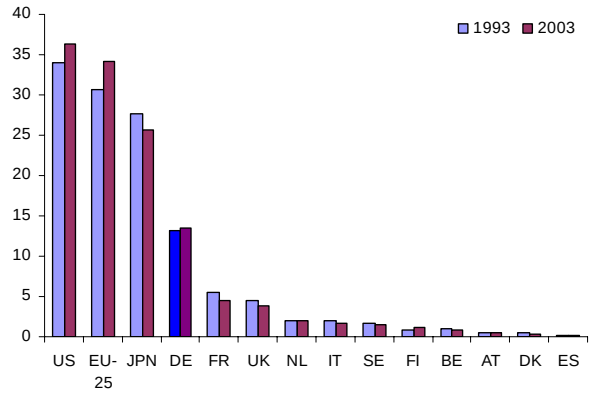
growing areas of patenting (with scores of 0.54 in case of biotechnology patents and 0.7 for ICT-related patents).

Graph 5.1 **Innovative Capacity Index**
2003



Source: Porter and Stern 2003.

Graph 5.2 **Country share in triadic patent families**
1993, 2003



Note: Patent counts are based on the inventor's country of residence, the earliest priority date and fractional counts. 2003 data is OECD estimate.
Source: OECD Patent Database, September 2006.

5.1.1 Technology production and diffusion

In terms of R&D intensity, Germany performs well. Gross domestic expenditure on R&D (GERD) in 2005 amounted to 2.5% of GDP, which places Germany well above the European average (EU25 - 1.9%), as can be seen from Graph 5.3, but still falls short of the Lisbon target at 3% of GDP. Two thirds of total R&D spending is funded by the private sector as business enterprise R&D expenditure (BERD).[97] GERD as a percentage of GDP rose between 1995 and 2005 by 3.2 percentage points annually on average (Graph 5.4), higher than in the EU25, but less than in Finland (12.2 percentage points) and Sweden (9 percentage points). The growth in GERD in Germany exceeded slightly that in the US (2 percentage points), but GERD as a percentage of GDP in the US was higher in 1995 than in Germany. Graph 5.4 further reveals that the growth in GERD in Germany was almost exclusively driven by the private sector (BERD), which is also true for those countries with higher growth in GERD than Germany, especially for Austria, where private investment in R&D seems to have replaced investment from other sources.

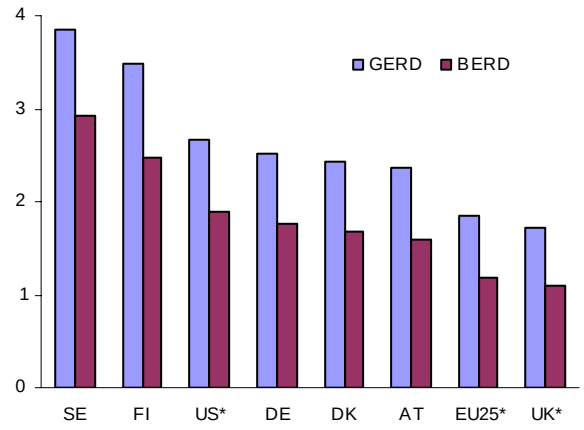
Innovation in Germany is concentrated mostly in large companies, i.e. a small group of large firms is responsible for a high share of aggregated R&D investment. Overall, the number of innovative enterprises has risen, but innovation is primarily directed towards cost-reduction and not towards introducing new products to expand their market position (Rammer 2005). The share of innovative SMEs fell steadily between the 1990s and 2003, from 66% to 58%, and SMEs'

higher share in biotechnology patents relative to its share in all technology areas. Conversely, when the SI of biotechnology patents is below 1, the country has a lower share in biotechnology patents than in all technology areas combined (OECD 2005).

97 Business enterprise expenditure on R&D (BERD) covers R&D activities carried out in the business sector by performing firms and institutes, regardless of the origin of funding (OECD 2005).

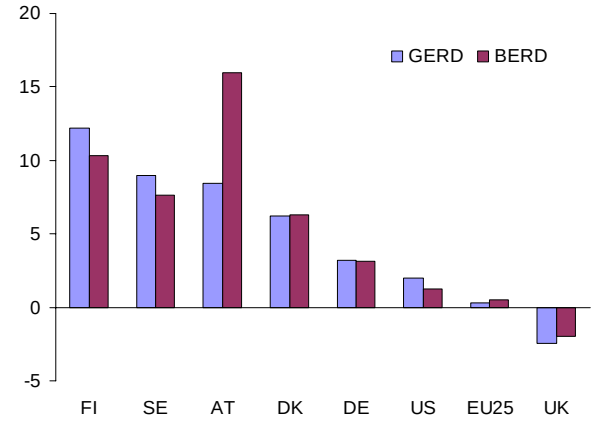
spending on innovation has been declining. In 2003, only 8.5% of BERD was performed by the SMEs.[98]

Graph 5.3 **R&D expenditure GERD and BERD**
as percentage of GDP, 2005



Note: GERD stands for Gross Domestic Expenditure on R&D; BERD stands for Business Enterprise Expenditure on R&D.
* UK, US: 2004
Source: Eurostat.

Graph 5.4 **GERD and BERD**
% of GDP, annual percentage point change, 1995-2005



Note: UK, US: until 2004; AT from 1998.

Source: OECD.

Some 85% of all R&D expenditure in Germany stems from the medium-high technology sectors, i.e. automotive, chemical and machine tooling industries.[99] A little above 25% of R&D expenditure in total manufacturing took place in foreign affiliates. This may seem low when compared to over 70% in Ireland and Hungary, but is actually quite high in relation to their proportion of turnover. But German companies are progressively locating their production and research facilities abroad. While in 1979 only 5% of R&D activities were located externally, in 1999 it was already 15% (Deutsche Bank 2003).German companies make up the largest share of foreign ownership of inventions in most EU Member States. Although research facilities in foreign countries might weaken the regional innovation systems in Germany, the German offshoring of R&D could be also seen to have certain advantages, i.e. German firms gaining access to specific assets and international tacit knowledge.

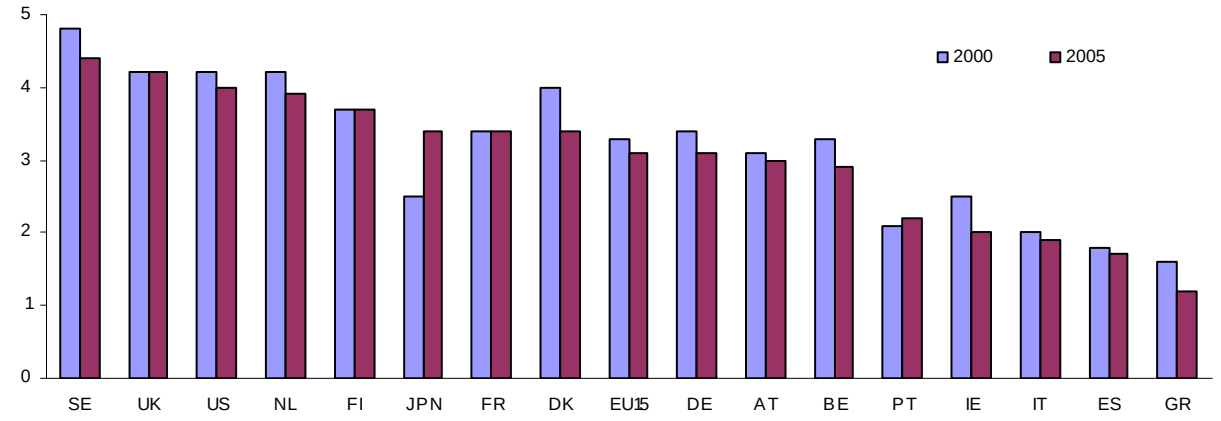
R&D investment affects TFP mostly indirectly and first must be successfully translated into innovative products or processes which in turn require dissemination and timely adoption in the economy. Acquisition of technology and its diffusion typically takes place through patent purchases, imitation of technology embodied in imports, and through learning-by-doing. A successful adoption of technologies developed at home or elsewhere requires adequate levels of technical and absorptive capacity. Often it demands organisational and technical changes at the firm level. The application of ICT is increasingly perceived as a key enabler for knowledge and technology diffusion throughout the economy and thus as a major contributor to the productivity growth (see also Chapter 2 above). ICT affects productivity via three channels: ICT investment, ICT production and ICT spillovers, which directly contribute to TFP growth. Even though ICT

98 Defined as companies employing less than 250 employees.

99 Eurostat and the OECD disaggregated manufacturing industry according to technological intensity. High-technology is, for example, aerospace, pharmaceuticals, computers, electronics-communications, scientific instruments. For details, see: http://europa.eu.int/estatref/info/sdds/en/htec/htec_base.htm.

production is an important contributor to productivity growth, it is the use of ICT which is crucial for accelerated productivity growth.

Graph 5.5 **Expenditure on IT**
as percentage of GDP, 2000 and 2005



Note: Hardware, software and other services expenditure.
Source: Eurostat.

Table 5.1 **ICT contributions to TFP in Germany and in the US**
1990-95 and 1995-2000

	1990-1995		1995-2000	
	DE	**US**	**DE**	**US**
TFP	1.73	0.74	1.14	1.39
Production of ICT, excluding software	0.18	0.28	0.29	0.76
Office and computer equipment	0.12	0.11	0.12	0.18
Semiconductors	0.04	0.13	0.16	0.55
Communication equipment	0.02	0.03	0.02	0.03
Other producers	1.55	0.46	0.85	0.63

Note: Percentage points: TFP includes changes in the quality of labour; western Germany: 1990-1991, linked to reunified Germany: 1991- 1995.
Source: Van Ark and Inklaar 2003.

The pace of ICT diffusion in Germany slightly slowed down over the past years. Graph 5.5 shows that the investment in IT goods decreased from 3.4% to 3.1% of GDP between 2000 and 2005, which is much lower than in the US and just at the EU15 average. While, due to the lack of adequate data, it is impossible to look at the distribution of ICT investments across sectors, it is possible to analyse the productivity performance of the industries considered to be using ICT more intensely (Table 5.1). The table shows that the acceleration of TFP growth in the US in the second half of the 1990s is to a large extent due to the production of ICT, especially semiconductors, whereas in Germany the contribution of ICT production to TFP growth stayed almost unchanged throughout the 1990s.

Van Ark and Inklaar (2003) report a sizeable productivity gap between Germany and the US for sectors using ICT intensively, in particular for services. The average annual productivity growth in ICT-using sectors in the US increased rapidly from 1.9 to 5.4% during the 1990s, while in Germany it decreased to 0.9% in 1995-2000, mainly driven by the insurance sector and ICT-intensive business services.

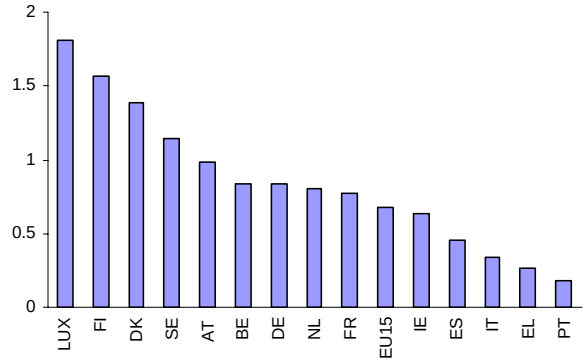
Despite obvious difficulty to quantify ICT spillover effects, Van Ark and Inklaar (2003) argue that a strong acceleration in contribution to economy-wide TFP growth by "other producers", which are assumed ICT users, could be an indication that such effects take place. Table 5.1 shows that in the US TFP growth from "other producers" accelerated from 0.46 percentage points in 1990-1995 to 0.63 percentage points in 1995-2000. In Germany, by contrast, the contribution to TFP growth from "other producers" decelerated from 1.55 percentage points to 0.85 percentage points in the late 1990s, which mirrors the overall decline in TFP growth. Despite this drop, "other producers" continue to contribute proportionally more to TFP growth in Germany than in the US, which may also reflect a different industry structure.

5.1.2 Qualification of the labour force

An adequate supply of highly-skilled labour force is commonly regarded as a key policy instrument for increasing productivity, as it helps to secure both successful production and diffusion of innovation throughout the economy. The availability of well educated labour force is determined by various elements such as the quality of the education system, its adaptability to market needs, the attractiveness of professional careers in science and technology and (international) mobility of highly skilled workers. Germany's performance regarding many of the above listed factors appears relatively weak compared with other countries.

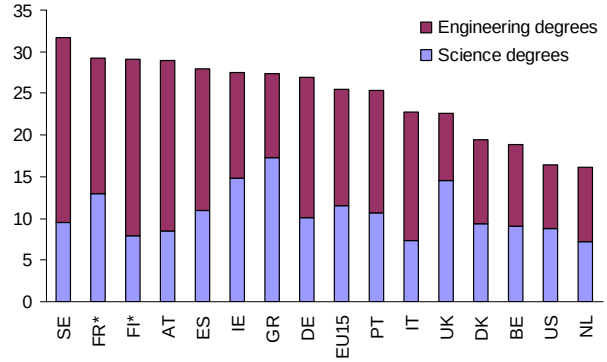
Empirical evidence suggests that education policies vary with a country's distance from the global technological frontier. At the frontier, countries invest more in tertiary education, whereas countries further behind the frontier were shown to invest more in the primary and secondary education. Those countries focus more on the adoption and development of existing technologies than the innovation-driven growth countries at the frontier (Aghion, Meghir and Vandenbussche 2005).

Graph 5.6 **Share of R&D personnel in business enterprise sector**
2004



Note: Headcount (percentage of the labour force).
R&D personnel: scientists, engineers and administrative and support staff. SE, DE, EL, PT: 2003.
Source: Eurostat.

Graph 5.7 **Science and engineering degrees**
2004



Note: S&E degrees as a percentage of total new degrees; FR, FI: 2003.

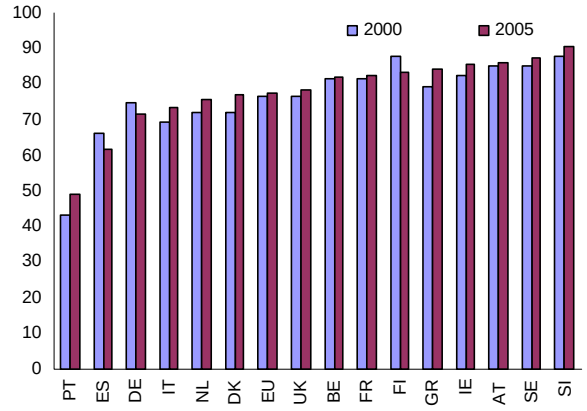
Source: OECD 2005b.

In terms of R&D personnel in the business sector, Germany ranks middle, with almost 0.9% share in the labour force (Graph 5.6), but the number of researchers is not increasing. Even though the total number of tertiary graduates has been steadily declining, mostly due to high drop-out rates, Germany still maintains a relatively high share of new degrees in science and engineering of total new degrees by international comparison, with 27%, though considerably behind leading Sweden at 32% (Graph 5.7). Yet, the share of population with tertiary education in Germany (24.6%) in 2004 was considerably smaller than that in the US (38.2%) or in Japan (40.5%), but above the EU25 (2003: 23.8%).

Only receiving 12% of their total funding for R&D from enterprises, universities rely heavily on government funding. Funds are distributed uniformly and are hardly linked to any performance indicators. Competition among university faculties for funds is limited, although it has been stepped up on the basis of research proposals. However, a scientific performance evaluation to provide the basis for the allocation of public funds as, for example, in the UK, does not exist. Remuneration of university personnel does not depend on performance results and most professors are still employed on the basis of life-time tenure. The salaries offered in particular for top academic teachers and researchers are often not differentiated enough to allow effective competition with the private sector or academic institutions abroad.

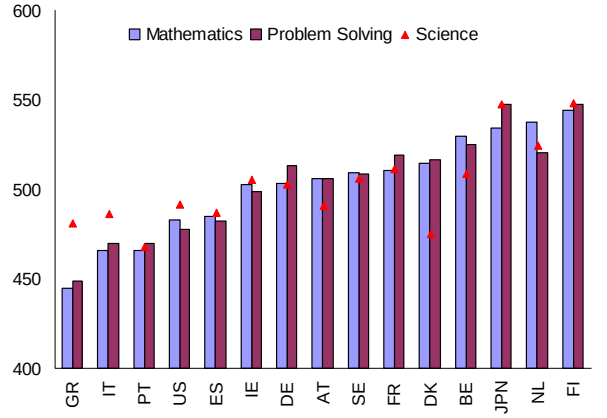
According to the OECD (2006b), public expenditure on tertiary education as a percentage of GDP in Germany lies at the OECD average and only slightly below the share spent in the US (1.1% of GDP in Germany and 1.2% of GDP in the US in 2003). However, the private sector contributes about 1.6% of GDP to tertiary education in the US – whereas in Germany the private sector only contributes about 0.1% of GDP. Although in some European countries the private sector contribution is up to 0.3 percentage points higher than in Germany (for example in UK, Ireland, and Spain), it remains considerably below the US. One of the factors explaining this difference is certainly the greater degree of financial autonomy in US tertiary education institutions in fund-raising (donations, tuition fees) as well as in spending these funds.

Graph 5.8 **Youth education attainment level**
2000 and 2005



Note: Percentage of the population aged 20 to 24 having completed at least upper secondary education.
Source: Eurostat.

Graph 5.9 **PISA 2003 mean scores**



Source: OECD.

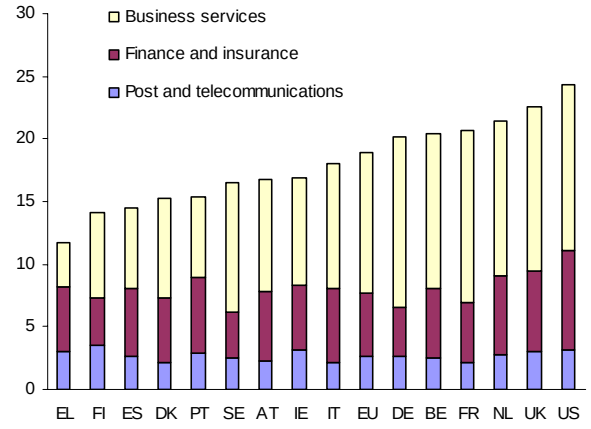
Graph 5.8 shows that the level of educational attainment in Germany, as measured by the percentage of the population aged 20 to 24 having completed at least upper secondary education, has steadily declined. With 71.5% in 2005, it has further slid below the average in the EU25

(77.5% in 2005). The share of early school leaving amounted to 12.1% in Germany in 2004. The PISA[100] scores in mathematics, problem solving and science are average (Graph 5.9). Deeper analysis of the PISA results revealed that a large number of pupils from socially disadvantaged or immigrant backgrounds remains disadvantaged due to an early selection procedure into different types of schools, which are predominantly half-day schools without nation-wide standards of educational attainment. At 2.9% of GDP, public expenditure on primary, secondary and post-secondary (non-tertiary, i.e. basic dual vocational training) education in Germany has been lower than the OECD average, while the private contribution has been slightly higher through the dual basic vocational training in companies (OECD 2006b). However, on secondary education (excluding basic vocational training), Germany spends about the OECD average (expenditure per student relative to GDP per capita). In contrast to the OECD average, expenditure on a student in upper secondary education is considerably higher than on one in lower secondary education. In primary education, expenditure per student relative to GDP per capita falls short of the OECD average (based on full-time equivalents, OECD 2006b). Empirical evidence shows, furthermore, that student performance improves with external exams, as well as with school autonomy over textbook choice, over hiring teachers, and over how to use the allocated funds (Fuchs and Woessmann 2004). While there is indication that Germany is currently performing relatively well in terms of inputs into innovative activity (R&D expenditure, current personnel) as well as the innovative activity itself (patents), this performance is at risk because of weaknesses in the education system.

5.2 Industrial specialisation in knowledge-intensive sectors

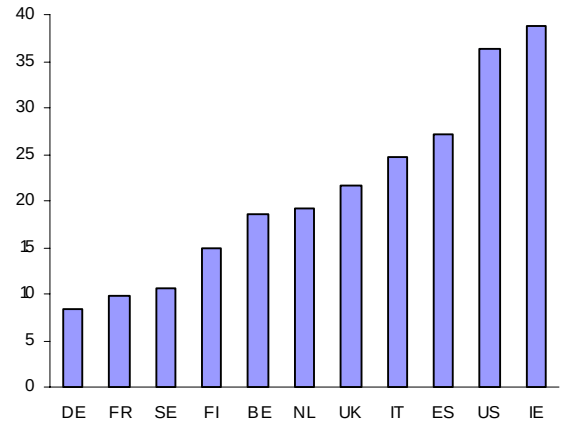
This section will show how innovative activity is distributed across industries. Recent empirical research (van Ark and Inklaar 2005) demonstrates the increasing importance of the services sector for economic growth, in particular in the context of aggregate productivity growth. Especially, knowledge-intensive services are gaining importance due to their three-fold positive impact on the economy: provision of services directly to consumers, provision of inputs to innovative activities of other industries and, lastly, support of technology diffusion.

Graph 5.10 **Knowledge-intensive market services**
Share of total gross value added, 2002



Source: OECD, STAN Indicators, STAN Database, May 2005; National Accounts for OECD countries, Vol II, 2005.

Graph 5.11 **Share of services in business R&D**
2004



Source: OECD ANBERD Database, 2005

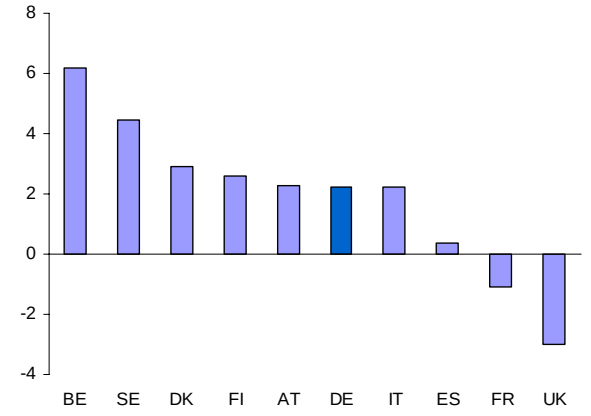
[100] PISA stands for Programme for International Student Assessment, a study undertaken by the OECD.

In line with the OECD average, Germany's services sector accounted for 70% of total gross value added in 2005. However, the productivity growth in services has been sluggish. In the US, services accounted for the bulk of productivity growth. Knowledge-intensive market services, such as post and telecommunications, finance and insurance as well as business services, stood for 20% of Germany's value added, which is far behind the US, the UK or France, but already above the EU average (OECD 2005; Graph 5.10). The increasing importance of services sector is not reflected in German structure of R&D. Only 8.3% of BERD in 2004 took place in services sector which was the lowest share reported within the EU (Graph 5.11).

Fuchs and Roehn (2005) look at the sector contributions to German TFP growth in the 1990s, showing that TFP growth accrued mostly to services at the beginning of the 1990s, in particular to the non-market services, while it accrued to manufacturing at the end of the 1990s. This could be traced back to the reunification period and large non-market services in the former GDR. The contribution of services to TFP growth has drastically diminished in the late 1990s. This is also the case for the construction sector as well as of the water and electricity sector. At the same time, the initially smaller contribution of manufacturing began to rise; however it could not offset the deceleration of TFP growth in other sectors. Actually, manufacturing turned out to be the only sector with an increasing TFP growth during the period considered (from 0.19% to 0.36%).[101] Unfortunately, it cannot be established whether this increase can be attributed to accelerated TFP growth in medium- or high-technology industries.

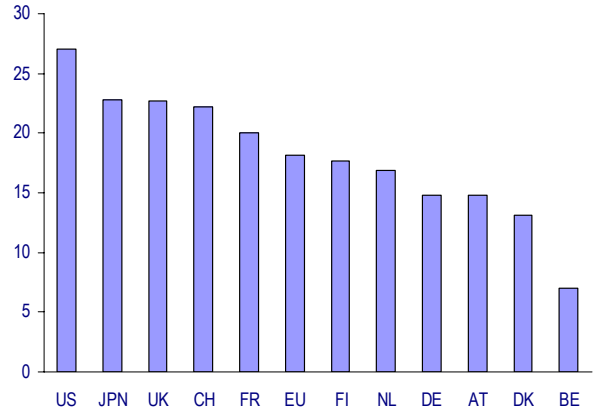
Graph 5.12 shows that the average annual growth rate of high-technology sector value added between 1997 and 2002 has been average by international comparison.[102] Consequently, the export share of high technology is relatively low (Graph 5.13). Much of the German industrial production and export takes place in more traditional, medium-technology industries like automobiles and mechanical engineering.

Graph 5.12 **Value added in high technology sectors**
1999-2004



Note: Average annual growth rate.
Source: Eurostat.

Graph 5.13 **High technology exports as percentage of total exports**
2004



Source: Eurostat.

In the 1990s, world trade in high-tech industries has increased, whereas trade in medium-tech industries stagnated and the trade in the non-R&D-intensive goods (medium-low and low-tech)

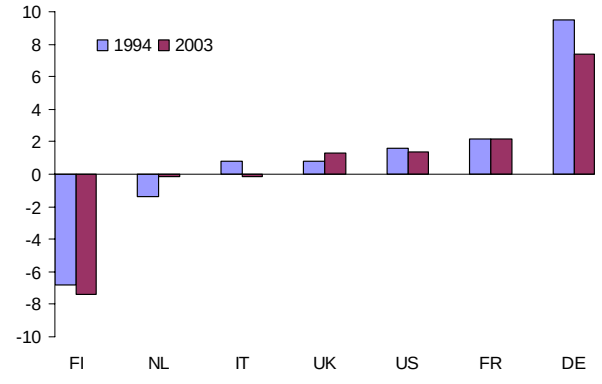
101 See Fuchs and Roehn (2005) for more of descriptive statistics on German sectoral growth accounting.

102 For a definition of "high-technology", "medium-high technology" etc., see footnote 99.

steadily declined. 2000-2001 brought a rapid slowdown in trade of high-technology goods and services. However, there are first signs of recovery as the share of high-tech industries in trade has been increasing recently.

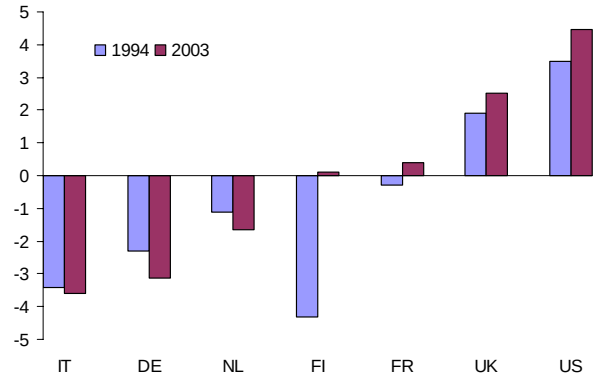
As can be seen from Graphs 5.14 and 5.15, German export performance remains powered by medium high-tech sectors, such as electrical machinery, motor vehicles, chemicals and machinery and metal products (accounting for more than 50% of Germany's manufacturing exports), and a relatively small number of large companies.

Graph 5.14 **Contribution to the manufacturing trade balance, medium-high technology industries**
1994 and 2003



Source: OECD 2005b.

Graph 5.15 **Contribution to the manufacturing trade balance, high technology industries**
1994 and 2003



Source: OECD 2005b.

5.3 Factors affecting new entry

Intensified competition stimulates innovation and encourages implementation of new technologies (Griffith, Harrison and Simpson 2006). This is the essence of structural change, meaning the reallocation of factors within and across different sectors of the economy, e.g. the movement of labour and capital across industrial sectors as well as within the sectors. The entry and exit of firms can lead to an increase in TFP and aggregate productivity, even if there is no productivity growth observed within existing firms.

5.3.1 Financing of innovation

There is a broad agreement that capital market structures affect investment in research and development (Hall 2002; Himmelberg and Petersen 1994; Hao and Jaffe 1993). As Hall (2002, 2005) highlights, R&D investment is unique. Firstly, 50% or more of R&D spending consists of wages of R&D personnel who produce tacit rather than codified knowledge, easily lost if R&D employees leave the company. Secondly, there is a high degree of uncertainty associated with the output. Thirdly, there is a problem of asymmetric information between inventors and investors. Inventors have better information about the likelihood of success and the nature of the contemplated innovation projects than the potential investors.

Generally, large firms do not have major problems to finance their R&D investment. But SMEs and start-up companies often have limited access to traditional sources of finance (bank credits)

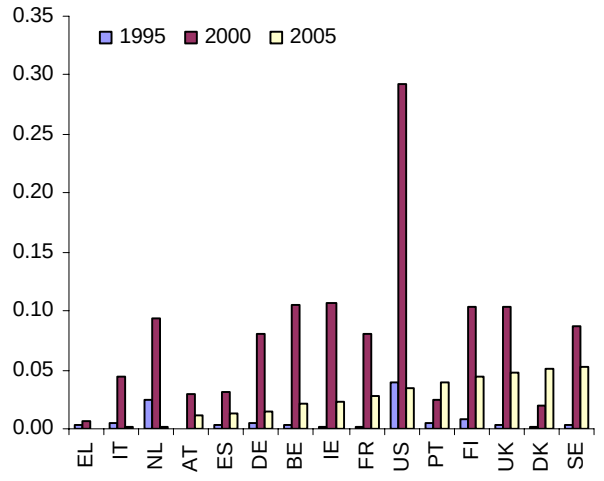
due to the lack of an established track record, little tangible assets suitable as collateral and uncertain outputs. This is particularly true for Germany, where the universal banks dominate the financial market, which often require collateral for granting loans and do not provide management support.

Venture capital investment does not only finance the seed, start-up and expansion phases of a firm's life cycle, but it can also provide managerial skills, guidance and business expertise (Sapienza 1992). However, developing a well-functioning venture capital market takes time and the German financial market structure is not conducive to this kind of financing.

Empirical evidence for the US shows that increases in venture capital investments in an industry are associated with significantly higher patenting rates (Kortum and Lerner 2000) and increased innovative activity (Hellmann and Puri 2000). On one hand, this could just reflect a greater incentive to patent in order to attract financial support (Hall and Ziedonis 2001), but on the other hand there is also evidence that the patents from firms financed through venture capital are more likely to be cited than other patents (Kortum and Lerner 2000). Evidence for Germany (Engel 2002) suggests that firms backed by venture capital grew faster than those without such support.

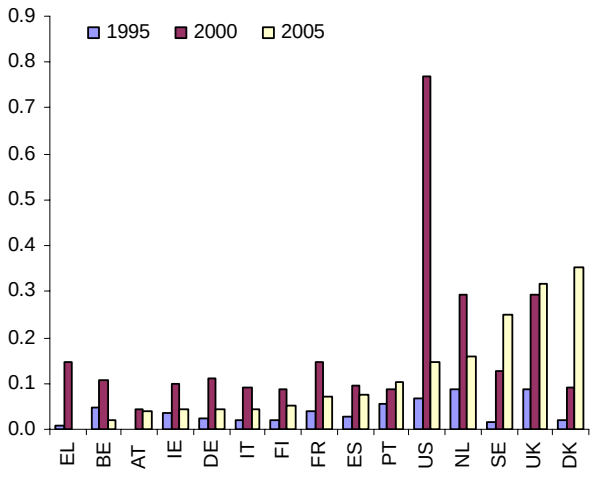
German venture capital investment has drastically declined since 2000 when the speculative bubble burst on the *Neuer Markt* and temporarily closed the most important exit route for venture capital investors.[103]. In Germany, the venture capital market is smaller (as a percentage of GDP) than, for example, in the Netherlands, Sweden, UK, Denmark and the US. Comparing the ratios between venture capital investment at the expansion stage with that at the early stage of innovation, the former's share is over three times larger in Germany; however this is not much different from the relative shares in the US, while in the UK, Sweden and Denmark expansion stage venture capital financing weighs even more. In 2005, signs of venture capital market recovery are visible in both segments (Graphs 5.16 and 5.17). In October 2005, Deutsche Börse Frankfurt created the Entry Standard segment, which is part of the open market but with tighter regulation and which could offer a new exit option for venture capitalists.

Graph 5.16 **Venture capital investment - early stage**



Note: As percent of GDP; early stage = seed + start-up.
Source: Eurostat.

Graph 5.17 **Venture capital investment - expansion stage**



Note: As percent of GDP.
Source: Eurostat.

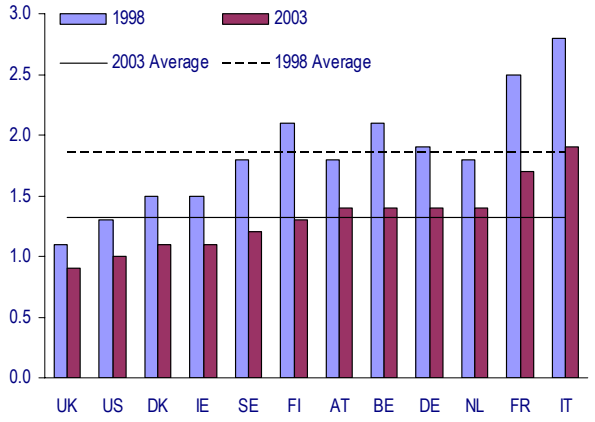
103 Venture capital investors usually sell their investment or seek a stock market listing in order to realise a capital gain.

5.3.2 Regulation

Product market regulation also determines the easiness with which resources are redeployed and new firms can enter the market. Regulation is often shaped by incumbents, the administrative burden can be costly and labour market regulation may also create some kind of structural persistence.

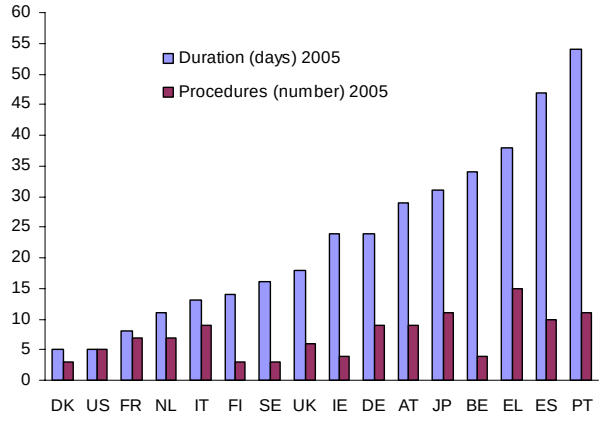
There is a growing consensus that product market reforms that foster competition induce more efficient deployment of production factors by reallocating resources from less to more productive firms (sectors) and thus contribute to higher TFP growth. Interestingly, empirical evidence suggests that a large contribution to overall productivity growth stems from productivity changes *within* sectors, rather than from shifts *between* the sectors (OECD 2003). The relationship between regulation and competition-induced allocative efficiency has received much of attention in the recent productivity growth literature.[104] Empirical evidence shows a positive influence of higher levels of competition induced by the product market reforms on entry and exit of companies (Cincera and Galgau 2005) as well as on TFP (Nickell 1996) and labour productivity (Griffith, Harrison and Simpson 2006).

Graph 5.18 **Overall index of the stringency of Product Market Regulations**
1998 and 2003



Note: Static indicator computed for the year 1998 and 2003
It consists of three elements: 1) direct state control of economic activities, through state shareholdings or other types of intervention in the decisions of business sector enterprises and the use of command and control regulation; 2) barriers to private entrepreneurial activity, through legal limitations on access to markets, or administrative burdens and opacities hampering the creation of business; 3) regulatory barriers to international trade and investment, through explicit legal and tariff provisions or regulatory and administrative obstacles.
Source: Conway, Janod and Nicoletti 2005.

Graph 5.19 **Entry regulations**
2005

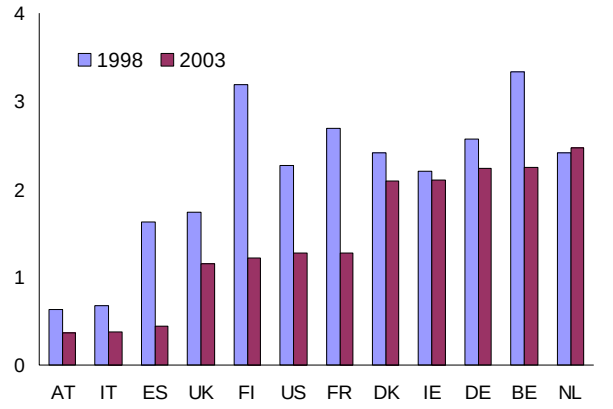


Source: World Bank 2006.

Graph 5.18 shows the OECD composite product market regulation indicator, which reveals that Germany achieved some improvement in product market regulation between 1998 and 2003. This was driven mostly by reducing the extent of state control through removing of price controls and relying less on 'command-and-control' regulation to achieve its policy objectives (Conway et. al. 2005).

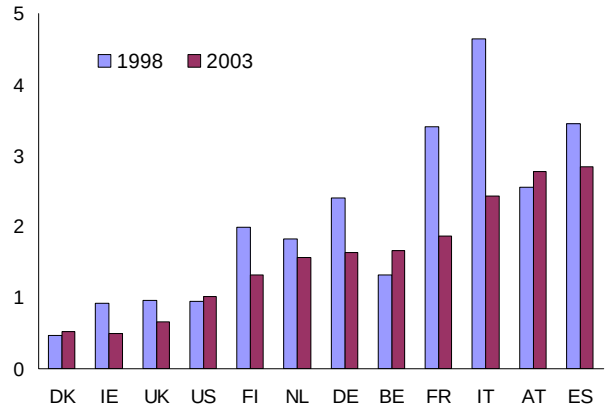
104 Maliranta (2003), Honkapohja et al. (2005).

Graph 5.20 **Regulatory and administrative opacity**
1998 and 2003



Note: "Regulatory and administrative opacity" encompasses these sub-indicators: "Licenses and permits systems", which reflects the use of 'one-stop shops' and 'silence is consent' rules for getting information on and issuing licenses and permits; "'communication and simplification of rules and procedures", which reflects aspects of government's communication strategy and efforts to reduce and simplify the administrative burden of interacting with government.
Indicator range 0 to 6, least to most restrictive.
Source: Conway, Janod and Nicoletti 2005.

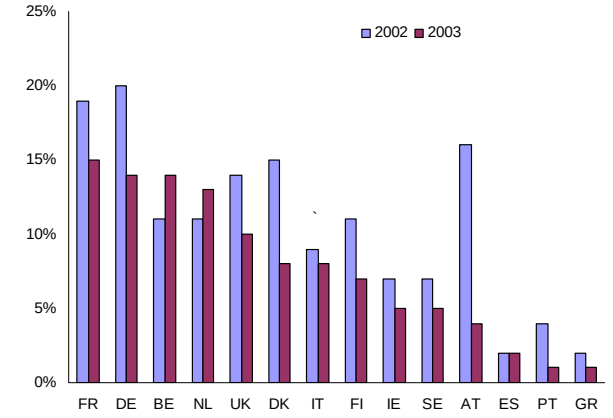
Graph 5.21 **Administrative burdens on start-ups**
1998 and 2003



Note: Administrative burdens on start-ups encompasses these sub-indicators: "Administrative burdens for corporations", which measures the administrative burdens on the creation of corporations; "administrative burdens for sole proprietors", which measures the administrative burdens on the creation of sole proprietor firms, "sector-specific administrative burdens", which reflects administrative burdens in the road transport and retail distribution sectors.
Indicator range 0 to 6, least to most restrictive.
Source: Conway, Janod and Nicoletti 2005.

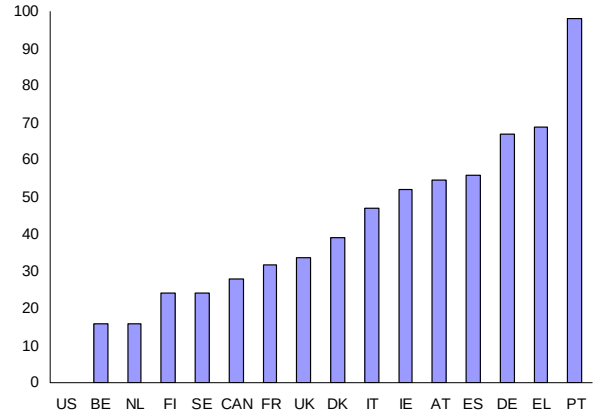
Yet, little progress has been made in reducing barriers to entrepreneurship, which remain rather high in international comparison as evidenced by the two sub-indicators displayed in Graphs 5.20 and 5.21. These OECD findings are corroborated by the number of days and procedures needed to set up a business (Graph 5.19) and by survey data (Graph 5.22).

Graph 5.22 **Administrative burdens as major constraint for SMEs**
in %



Note: Share of SMEs picking "Administrative burdens" from a list of major constraints for business performance
Source: Eurostat.

Graph 5.23 **Firing costs**
In weeks of wages, 2005



Source: World Bank 2006.

As was shown in Chapter 3, Germany's employment protection legislation (EPL) is considerable. Firing costs in international comparison are shown in Graph 5.23.[105]

5.4 Summary

Relatively high scores in terms of standard R&D and innovation indicators suggest that Germany's innovative capacity is high. R&D spending is above standard, and so is the flow of patents. Nor does the supply of science graduates to R&D appear to give any reason for concern in the near future. Therefore, it seems that it is not the lack of innovation per se, but rather its late adoption and diffusion which have contributed to weaker productivity growth rates. This is exemplified by the relatively slow ICT-uptake across German industries. Decelerating TFP growth in more traditional industries has not been sufficiently compensated for by TFP growth in other sectors. R&D is conducted mostly by large businesses. Moreover, as growth is becoming driven by radical innovation, Germany's move towards high-technology sectors seems slow.

All of these points to the problem that the persistence of the economic structures that fostered Germany's post-war growth cannot now keep up the TFP growth rates of the past. For example, conditions do not encourage new entry, the venture capital market is small, and the regulatory burden remains considerable. It might be that the apparently low return (in terms of TFP) to the production of innovation results from a suboptimal allocation of innovative activity. This is not to contest the outstanding innovative activity in Germany. Rather, the mechanisms which channel the substantial innovative potential towards its most productive applications may be working suboptimally. Indeed, this chapter provides some evidence that the market dynamics are weaker than would be desirable for higher TFP growth.

Moreover, given Germany's poor results in pre-tertiary educational performance in international comparisons, the future use of innovation in production and perhaps also innovative activity might be in danger. Reforms of post-tertiary education would also be desirable, and it is promising that this is now being debated. In this regard, it is interesting to note that it is not so much because of lower public spending that the funding of tertiary education in Germany falls short of that of the US, but rather because greater spending from private sources in the US, possibly coupled with a greater autonomy of US tertiary education institutions.

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[105] According to the World Bank, the firing cost indicator measures the cost of advance notice requirements, severance payments and penalties due when dismissing a redundant worker, expressed in weekly wages. See: http://www.doingbusiness.org/methodology/hiringfiringworkers.aspx.

6 SCENARIOS FOR POTENTIAL GROWTH

The preceding three chapters have investigated recently implemented reform measures and remaining structural weaknesses for the three main components of potential growth. Based on the production function approach followed in this study, this final chapter gives an outlook until 2010 assuming a no-policy-change scenario. It shows that with existing reforms alone potential growth will only improve marginally over this short time horizon. Two scenarios are drawn to show the likely positive impacts of a continuation of structural reforms. Simulations reveal that a reinforced reform strategy is needed to complement the modest progress resulting from already undertaken reforms. If a consistent and comprehensive in-depth reform agenda is followed, Germany has the potential to become a high-growth country again.

6.1 Current outlook until 2010

The current outlook for potential growth shows only a small improvement despite the strong growth we saw in 2006. As described in Chapter 2, some of the adjustment processes in the aftermath of the German reunification and the start of EMU have been (partly) overcome. This might have contributed to the remarkable increase in potential growth by nearly half a percentage point since 2004. However, taking these factors into account, based on the following methodology potential growth might improve only slightly until 2010, if no further policy measures are undertaken to address the above-described structural weaknesses. On the basis of the Commission Services autumn 2006 forecast for 2006-2008 (European Commission 2006d) and ECFIN's medium-term projection to 2010, a potential growth of slightly below 1½% is predicted over the whole period (Table 6.1). In the short term the Commission services autumn 2006 forecast is included into the estimation. For 2009-2010 a careful evaluation of the likelihood that the 2006-2008 rates of growth for labour potential, productive capacity and TFP will persist, has been undertaken.[106]

In terms of its composition, DG ECFIN projects a marginal recovery in TFP from an annual growth contribution of 1.0% at present to 1.2% in 2010. This is however partially offset by deterioration on the labour input side: The positive effects of an increasing labour participation and a NAIRU that is decreasing from 8.3% in 2006 to 8.1% in 2010 are more than counterbalanced by a decline in the working age population, as a result of population ageing.[107] The overall contribution from capital accumulation is also predicted to fall marginally. The declining workforce combined with the maintenance of the investment share at about 19% of GDP ensures a modest recovery in capital deepening, with the result that the labour productivity growth rate should increase by about a quarter of a percentage point over the period as a whole.

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106 For a description of the methodology applied see Denis et al. (2006).

107 Note that the medium-term projection of the NAIRU might not fully capture those effects of recent policy changes set in after the time horizon of the short-term forecast. More precisely, ECFIN's NAIRU calculations consist of applying a Kalman Filter to a Phillips curve relationship which uses information until 2008 from the autumn 2006 forecast on actual unemployment, nominal wage growth, productivity growth, the growth rate of the terms of trade and changes in the wage share to extract a structural unemployment rate. After 2008 the NAIRU is mechanically extrapolated so as to reach a stable level after 3 years.

Table 6.1 **Potential Growth Rates and the contributions from Labour, Capital and Total Factor Productivity** 2001-2010

	Potential Growth	Contributions to Potential Growth		
		Labour input (hours)	Capital Accumulation	Total Factor Productivity (TFP)
2001-2005	1.2	-0.2	0.4	1.0
2006	1.3	0.0	0.3	1.0
2007	1.4	0.0	0.3	1.0
2008	1.4	0.0	0.4	1.1
2009	1.4	-0.1	0.4	1.1
2010	1.4	-0.2	0.4	1.2

Source: Commission Services.

This country study has argued that the contraction of the construction sector has come to an end and international price competitiveness might be restored (see also European Commission 2006e). These factors had played a crucial role in holding back growth in Germany in the 1990s (European Commission 2002). The German economy has therefore gained momentum after a factual stagnation in the first years of this decade. Moreover, some, partly far-reaching, reforms have already been undertaken and others are close to implementation. Some positive impacts can already be seen in the strong growth of 2½% in 2006, which benefited also from temporary positive effects of budgetary measures like the increase in the standard VAT rate as from 2007, the increase in building permits in the forefront of the abolition of owner occupied housing investment as from 2006, and the improved depreciation rules until the end of 2007. Similarly, recent labour market reforms and, as a consequence, increasing labour market participation and decreasing NAIRU are contributing to a slightly higher potential growth in the second half of this decade compared with recent years. Furthermore, the methodology underlying the estimation of potential growth[108] might underestimate the positive effects of recent reforms because some components in the production function are calculated on the basis of data predating the reforms. However, as shown in Chapter 3, the employment performance in Germany only improved in 2006 and unemployment is still relatively high. Consequently, the current actual potential growth in Germany should still be well below those in other countries.

Yet, if the pace of reform in Germany were to accelerate over the coming years, the differential in potential output growth between Germany and the OECD average might close. Reforms aimed at improving Germany's productivity performance, speeding up investment and raising its employment rate are all fundamental to an increase in its long-term growth potential. These measures call for a **wide-ranging policy agenda in the spirit of the Lisbon process, which was initiated by the EU council in 2000 and reviewed in 2005, aiming at creating vibrant, globally competitive, knowledge-based, economies on the basis of national and EU structural reform programmes. I**f corresponding reform measures are undertaken in a systematic, consistent and forceful manner, Germany will grow faster again.

[108] See Section 2.2.2, in particular footnote 19.

6.2 The possible impact of further reforms: two scenarios

The positive impact of an increased reform pace has been analysed by a recent study of the Netherlands Central Planning Bureau (Gelauff and Lejour 2006). It estimated the likely economic impact of realising the Lisbon objectives by further reforms on individual Member States' growth and employment performances. In this context, the CPB study focuses on five important Lisbon goals, namely the implementation of the services directive, the reduction of administrative burdens, the achievement of goals to improve human capital, the 3%-target on research and development expenditures, and the 70% target for the employment rate. The study estimates that the successful introduction of these five key measures over the coming years could increase German GDP by 10 to 19% over the period to 2025 (Table 6.2). This translates into an additional growth rate of ¾ to 1¼ percentage points, which would boost ECFIN's baseline medium term potential growth rates for Germany from around 1¼% at present to a long run minimum of 2% and possibly as high as 2½%. In the most optimistic CPB scenario (i.e. GDP gains of 19%), increasing R&D expenditure towards an artificial target of 4.5% of GDP (50% of the gains) and augmenting the employment rate (40% of the gains) are the main drivers. Measures such as the implementation of the Services Directive, human capital improvements and easing of the administrative burden would collectively account for only around 10% of the Lisbon gains.

Table 6.2 **GDP level effects of successfully achieving five key Lisbon goals**

	Employment Rate	Human Capital	Services Directive	Administrative Burden	R&D	Total
			Lower Bound			
EU	**6.3**	**0.5**	**0.2**	**1.4**	**3.5**	**11.9**
Germany	**4.9**	**0.5**	**0.2**	**1.5**	**3.1**	**10.3**
			Upper Bound			
EU	**9.2**	**0.5**	**0.2**	**1.5**	**11.6**	**23.0**
Germany	**7.2**	**0.5**	**0.3**	**1.5**	**9.6**	**19.1**

Source: Gelauff and Lejour 2006.

These estimates are unavoidably subject to high uncertainties and should only be taken as indication for the magnitude of a positive impact of further structural reforms. In addition, an important point to note in relation to the CPB's employment rate shock is that their assessment of the gains does not take into account the significant budgetary risks of introducing the labour market reforms needed to achieve the Lisbon targets. For the EU as a whole, the CPB suggests that the achievement of the 70% employment target would require income tax rates to fall by 8 percentage points and social security benefits would need to decrease by 10%-22% relative to wages. These are substantial adjustments that are likely to lead at least to temporary revenue losses. While one can question the feasibility of introducing such reforms, the CPB nevertheless, realistically, allows for the productivity-reducing effects of a rapid increase in the employment rate if this is achieved mainly via an inflow of low-skilled workers. Regarding the R&D side, the CPB also highlights the high degree of uncertainty attached to the estimated gains from investments in this area, with empirical research yielding social returns to R&D ranging widely between 30 and 100%.

DG ECFIN has estimated the potential effects of further reforms using the QUEST II model.[109] More precisely, two scenarios have been investigated; both of them are based on the assumption that labour market inefficiencies as described in Chapter 3 will be overcome to a different degree. This could lead to an increase in the participation rate in Germany and to a substantially reduced persistence of unemployment. Both scenarios also include reforms that increase investment by reducing taxes on the corporate sector as well as increasing the efficiency of the capital market, where further action is needed as explained in Chapter 4. Finally, it is assumed that measures are undertaken in order to raise total factor productivity as discussed in Chapter 5. Both scenarios differ with regard to the degree to which further reforms will be undertaken. The first scenario can be regarded as a cautiously optimistic one where substantial further reforms will be undertaken in addition to those already announced by the German government. The second scenario is more optimistic. It shows the full potential of higher growth in Germany when in-depth reforms are brought forward forcefully. For both scenarios, the baseline takes into account the expected impact of the reform measures introduced in Germany until autumn 2006.

In the cautious scenario, further reforms will increase growth in Germany to around 2% annually (see Table 6.3 and Graph 6.1). Consequently, in this scenario Germany could catch-up with the rest of the euro area. This result is the more remarkable as in contrast to most other European countries and the US, population growth in Germany is projected to be negative. The main driver of this growth stimulus would be an increase in total factor productivity, which contributes about half of the stimulus of the combined reform package. All other measures, like labour market reforms, reducing the effective corporate taxes, as well as increasing the efficiency in capital and product markets, would contribute nearly equally to the other half of the increase in potential growth. These substantial positive growth effects would be accompanied by an increase in employment of around 4% and a drop in the unemployment rate by 3 to 4 percentage points.

Due to positive spill-over effects between the reform measures, a strategic and combined reform agenda would result in a higher growth effect than summing up the growth effects of the isolated single reform measures. This result is in line with the findings in the economic literature on economic reforms, pointing to generally positive interaction effects between product and labour market reforms. While there is little empirical work on the interaction effects, a few studies find significantly positive effects.[110] The reasons for the positive spill-over effects can be seen in the fact that by removing distortions on product or labour markets, reforms open opportunities in the other market. For example, if deregulation in a product market leads to higher firm entry and higher output, employment is likely to increase. Labour market reforms may contribute to making firms more competitive, leading to higher output.[111]

According to the QUEST model estimates, the combined effect of all measures would be 5 to 10% higher than the sum of the parts. However, this is likely to be an underestimation, because these interactions are difficult to model. The positive synergy effects in the QUEST model result

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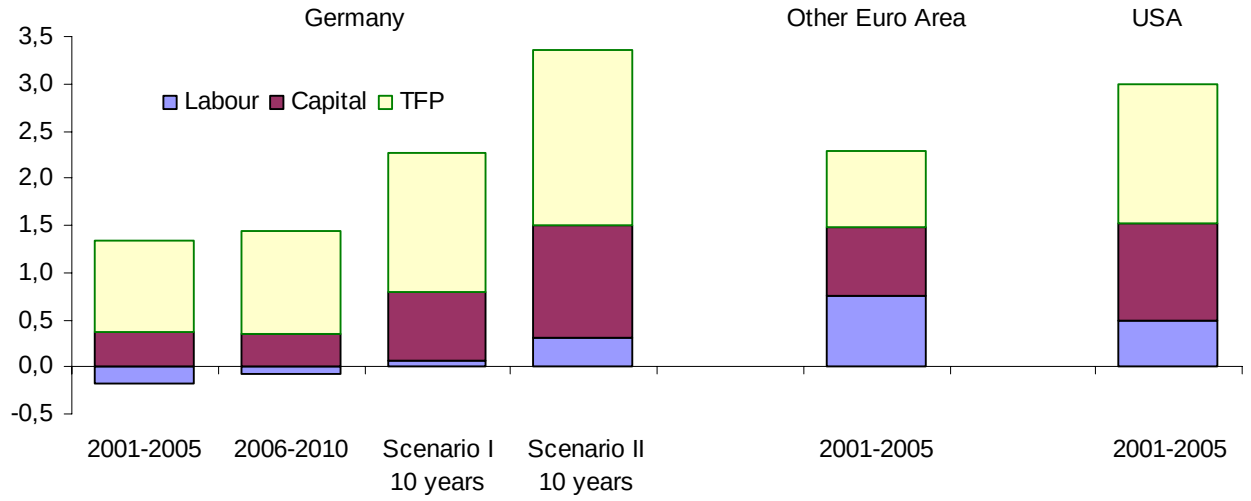
109 For more information on the model, the scenarios and the results see box 6.1.

110 The estimates in Nicoletti and Scarpetta (2005) as well as Danninger and Berger (2006) found significant interaction terms, pointing to cross-market synergies between the degree of regulation on product and labour markets. Estevão (2005) presents empirical evidence based on a panel of OECD countries that more regulation in the product markets leads to weaker macroeconomic effects from wage moderation because it reduces competition and lowers labour demand elasticity.

111 See also OECD (2006a), pp. 26 ff. on the need for a comprehensive and consistent reform strategy to increase growth in Germany.

mainly from interactions between policy measures increasing investment and productivity.[112] This positive effect is partly offset by a slower employment growth if all reforms are undertaken simultaneously than the sum of isolated measures. This is to be expected as labour shortages in some market segments lead to the effect that the additional impact on employment becomes smaller as the reduction in the unemployment rate becomes larger.

Graph 6.1 **Scenarios for potential growth**



Note: Displayed are contributions to potential growth in percentage points.
Source: Commission Services.

Table 6.3 **Impact on potential growth by selected reform measures in a cautious reform scenario**

Reforms	**NAIRU**		**Corporate tax**		**Equity Risk premium**		**Mark-up**		**TFP**		**Sum of isolated measures**		**Simultaneous measures**	
Years	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**
Growth	0.13	0.08	0.12	0.11	0.12	0.10	0.21	0.13	0.35	0.41	0.89	0.79	0.95	0.84
- capital	0.02	0.02	0.11	0.10	0.12	0.10	0.12	0.08	-0.02	0.03	0.34	0.31	0.38	0.34
- TFP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.40	0.40	0.40	0.40
- empl.	0.11	0.06	0.02	0.02	0.01	0.00	0.08	0.05	-0.01	0.00	0.21	0.13	0.21	0.12
Unempl.	-1.8	-1.9	-0.3	-0.6	-0.1	-0.1	-1.3	-1.5	0.1	0.0	-3.3	-4.1	-3.3	-3.9

Notes: The columns of the single policy measures give the impact if only the corresponding reform will be undertaken. In contrast, the last column gives the results if all reforms will be undertaken simultaneously. Time horizon is given in years after introduction of reforms. Growth effect: Additional annual average growth rate in percentage points due to the corresponding reforms. Private capital stock, total factor productivity and employment: Contributions to potential growth in percentage points. Contributions do not completely add up to the total growth effect as contributions of public capital and energy are not given. Unemployment: change in the unemployment rate in percentage points.
Source: Commission Services.

In the scenario where all reforms are undertaken in a systematic, consistent and in-depth manner, growth effects are substantially stronger (see Table 6.4). In total, against the background of the relatively low starting point, it would not seem out of reach to even nearly triple the potential growth rate in Germany to slightly more than 3%. As in the cautious scenario, the main drivers would be those reforms leading to higher total factor productivity. However, the other reforms are also needed to achieve this positive result, as they would contribute around half of the total

[112] More precisely, in the QUEST model the positive spill-over results mainly from the interaction of changes in the mark-up with changes in TFP and corporate taxes. With a lower mark-up, the effect of a reduction in corporate taxes and/or increase in TFP on capital formation is larger.

overall growth effect. In this scenario, both private capital deepening and the increase in total factor productivity would contribute around three quarters of a percentage point to the increase in potential growth. The stock of private capital would grow in the course of the next 20 years by more than 40%. In this scenario, even the current marginally negative contribution of employment (measured in hours worked) to potential growth could be turned into a slightly positive factor. Also in the bold reform-oriented scenario, substantial spill-over effects would increase the efficiency of the reform measures by nearly 10%, if undertaken in a systematic and combined way.

Table 6.4 **Impact on potential growth by selected reform measures in a bold reform-oriented scenario**

Reforms	NAIRU		Corporate tax		Equity Risk premium		Mark-up		TFP		Sum of isolated measures		Simultaneous measures	
Time	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**	**10**	**20**
Growth	0.28	0.17	0.23	0.21	0.31	0.25	0.41	0.26	0.68	0.82	1.80	1.55	1.94	1.68
- capital	0.04	0.04	0.22	0.19	0.30	0.26	0.24	0.16	-0.03	0.06	0.73	0.64	0.83	0.72
- TFP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.79	0.77	0.79	0.77	0.79
- empl.	0.25	0.13	0.04	0.04	0.02	0.01	0.16	0.09	-0.02	0.00	0.44	0.26	0.39	0.20
Unempl.	-4.1	-4.3	-0.6	-1.1	-0.4	-0.3	-2.5	-2.9	0.3	0.0	-7.2	-8.6	-6.3	-6.5

Notes: See Table 6.3.
Source: Commission Services.

Overall, both scenarios show that a reinforced systematic reform agenda could enable the German economy to close its growth gap to other industrialised countries. The estimates of the growth impact in both scenarios show the potential for growth in Germany. If these figures are added to the potential growth outlook as described above for the short term period from 2006 to 2010, these results would mean that Germany could in the cautious scenario nearly catch-up to the average of the other euro area countries within the next 10 years. In the reinforced reform-oriented scenario, Germany could even start to grow as fast as the US economy did in the first half of this decade. While the results should be taken with the adequate caution and only be seen as an indication for the order of magnitude of potential positive impacts of structural reforms (see Box 6.1), they illustrate that a reinforced reform effort could bring Germany back on a higher growth path.

Box 6.1 **Model and shocks used for assessing the potentials for growth**

The potential impact on the German growth potential has been estimated with the most recent version of the macro-economic model QUEST II of DG ECFIN. For modelling the impact of reforms, the following characteristics of the model are the most important: The baseline of the model simulations is a simple no-policy change scenario which is a purely technical extrapolation of the 2006-2010 projections described above. Results for the impact of reform measures are given as differences from this baseline. Most shocks have been introduced into the model in a manner which removes inefficiencies and distortions of the economy and hence affects the GDP level, bringing it to a higher steady state. When translating the level effects into growth effects, the impact on potential growth seems to diminish in the long run. Only the increase in the TFP has a long-lasting positive and even accelerating impact on the growth rate itself. It is assumed that the effect on government finances is neutral in the long run. This is achieved by offsetting changes in (lump-sum) transfers to households. Hence, the debt-to-GDP ratio is not affected by the shocks introduced into the model. Both positive effects on the public budget, e.g. via growth

and lower unemployment as well as in the short run negative effects like a reduction in the corporate tax, are compensated by corresponding changes in lump sum taxes. Changes in the corporate tax enhance the profitability of investments and lead to a higher capital stock. Consequently, the capital intensity of production increases, but the impact on employment remains positive despite substitution effects.

For both scenarios the caveat has to be kept in mind, however, that a macroeconomic model is not detailed enough to introduce specific reform measures. To estimate the impact, the reforms have to be translated into quantitative shocks to specific model variables. Hence, the results should be interpreted with the corresponding care and only taken as indicative of the order of magnitude.

In the cautious reform scenario the following shocks have been introduced to the model: on the labour market, a set of reform measures are undertaken, leading to a decrease in the NAIRU by 2 percentage points. As the current NAIRU in Germany is estimated to be slightly below 9% and several other EU member states feature levels below 4%, this assumption can be regarded as cautious, even if it implies substantial reforms. To allow capital deepening to contribute more to potential growth, a reduction of the effective corporate tax by 5 percentage points has been used as a shock to the model. In addition, it is assumed that measures undertaken to raise the efficiency of the capital market in Germany will lead to a decrease in the equity risk premium by 10 basis points. Moreover, measures to increase competition on product markets, particularly for network industries, have been quantified so as reducing the mark-ups in the German economy by 15%. This cuts the gap in mark-ups between Germany and the more competitive markets in the UK and the USA to a half. Finally, a set of measures as described in Chapter 5 is supposed to allow the German TFP to move up by half the difference between the current low level and levels seen until the early 1990s, i.e. an improvement of the German TFP by 0.4 percentage points.

For the bold reform-oriented scenario, more far-reaching labour market reforms have been assumed, bringing the German NAIRU down by half from currently slightly below 9, but nevertheless remaining clearly above the level of the best-performing European economies. Similarly, a substantial corporate tax reform is assumed to bring the effective corporate tax rate down by 10 percentage points. In addition, capital market reforms are supposed to bring the risk premium on interest rates down by a quarter of a percentage point. Product market reforms and, as a consequence, fiercer competition should allow mark-ups to drop by 30% of their current German level to the current UK and US rates. Finally, by undertaking a full and systematic set of in-depth reforms described in Chapter 5 to improve R&D, education and productivity spill-overs, TFP growth is assumed to reach again levels seen in the 1980s and first half of the 1990s. This implies a TFP growth increase by 0.8 percentage points.

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