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# **THE EU ECONOMY 2006 REVIEW**

## **ADJUSTMENT DYNAMICS IN THE EURO AREA** **Experiences and Challenges**



# Adjustment Dynamics in the Euro Area: Experiences and Challenges

- EU Economy Review 2006 -

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# I. OVERVIEW

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# OVERVIEW

## 1. Economic and monetary union in the early years: achievements and adjustment challenges

The introduction of the euro has been a decisive success. International confidence in the currency has been strong, and the euro has changed the face of global capital markets. The economy of the euro area has weathered successfully the common shocks experienced by its members since 1999 – including the bursting of the dotcom bubble, the September 11 events, the surge in global commodity prices, and the persistence of wide global imbalances. Indeed, monetary union eliminated, by its nature, the currency turmoil which, in earlier decades, all too frequently engulfed its members at times of international financial stress. Domestically, meanwhile, the adoption of the euro has been associated with an extended period of price stability: the low level of inflation and inflationary expectations testify to the credibility of the common monetary policy. Overall, policy coordination has led to a reduced number of policy-induced shocks at national level, usually smaller in size and impact. Thus a number of concerns raised in the period leading to monetary union have proved unfounded.

While some Member States have fully enjoyed the benefits of belonging to the currency union, notably by experiencing high growth rates, growth performance on average in the euro area – and particularly in the largest economies – has been disappointing. Concerns about growth performance, it should be noted, long pre-date the adoption of the euro, and recent experience has led to a reinvigoration of the Lisbon Strategy to foster a sustained acceleration of economic growth across the European Union. However, in relation to the functioning of monetary union, it is particularly important to understand one aspect of this experience better. This is the marked and persistent divergence of growth and inflation among euro-area economies.

One example of such divergences in economic performance is the protracted period of slow growth and low inflation in Germany, from 2001 onwards, which contrasts with a prolonged period of high growth and more rapid inflation in Ireland and Spain. Some divergences, including this one, partly reflect the process of economic catching up underway in certain euro-area members. But even within the latter group, there have been marked differences over an extended period. Most strikingly, since 1990 Ireland has achieved particularly rapid real convergence, which has led to living standards above the euro-area average since 1997. On the other hand, Portugal experienced a stalling of real convergence after 2000.

There is a question of what factors lay behind such divergences. Do they reflect mainly strong country-specific developments, tied to a combination of one-off effects – German unification, interest rate declines in the initial run-up to the euro, or the stresses of real convergence in some members? Are they related to long-standing issues about progress in enhancing the flexibility of markets, the mobility of labour, or the adequacy of fiscal stabilisers – many of which had been identified in the debate that took place during the years when monetary union was being designed? Or could they signal challenges that had not been anticipated in the functioning of the euro area – for instance: unexpected interactions between growth, prices and fiscal positions; inter-country spillovers; or unexpectedly strong financial market dynamics? Answering these questions may shed light on the functioning of monetary union.

This Review focuses on these divergences in economic performance, and it does so by using a range of analytical techniques to explore the dynamics of adjustment in the euro area. The focus is essentially on adjustment at the macroeconomic level, in terms of short- to medium-term influences on growth, employment, inflation, real exchange rates and current account imbalances. The goal is to identify possible policy lessons that can help assure an increasingly efficient functioning of the euro area in the period ahead. This could be relevant in three respects: to understand how adjustment challenges in its members can best be addressed; to ensure that



future members benefit from these lessons of experience; and to safeguard the euro area's continuing resilience in the event of future global stress

## **2. The nature of the adjustment process**

A starting point in this analysis is the process through which economies adjust to country-specific economic disturbances, at the macroeconomic level, under monetary union. This can be illustrated by an economy that experiences a stronger cyclical boom than the rest of the euro area – because of a specific shock or the economy's response to a common shock. Experience in the Netherlands during 1997 to 2005 is a helpful example, because developments in this case do not involve issues about economic catching up. As the economy entered a strong boom, the cyclical situation became tighter than the euro-area average, and thus to some degree out of line with common monetary conditions. Inflation started to accelerate, leading to overheating of the economy.

There is a complicating factor, inherent to some degree in all monetary unions. National real interest rates tend initially to fall as inflation accelerates in a boom (and conversely in a slowdown). This channel may tend to amplify swings in output and inflation. Indeed, measured on a backward-looking basis, real interest rates have fallen during the booms in euro-area members. Real interest rates at the national level can thus affect the adjustment path in a perverse (i.e. pro-cyclical) direction.

In the absence of national monetary policy, or the use of other instruments, the adjustment process that brings cyclical conditions back in line with the euro-area average in such cases is a loss of national competitiveness, which tempers the boom. This is indeed what occurred in the Netherlands between 2001 and 2004. The reverse occurs, of course, at times of country-specific cyclical weakness. This equilibrating process, operating through the "competitiveness channel", should be dominant over the medium term and should assure a dynamically stable adjustment process under monetary union.

This means that the scale and duration of divergences in growth and inflation among euro-area members, following country-specific shocks, will depend importantly on two sets of factors. First, they will depend on the nature and scale of the specific shocks and trends. Second, they will reflect the relative strength of the competitiveness and real interest rate channels in shaping the profile of adjustment. Several types of shock are explored in the Review. German unification exemplifies a major country-specific shock, with clear spillovers to neighbouring economies. Other familiar instances have been the fall in interest rates as some countries approached euro adoption, or the impact of tourism and migration on the housing market. Such events that trigger cyclical divergences are thus a key focus in this study: they include also productivity shocks in different sectors of the economy, and the relaxation of credit constraints as financial integration deepens.

There is significant scope for national policies to influence the adjustment process through the fiscal stance and, over the medium-term, structural policies. It is therefore important to understand how, as adjustment in the euro area evolved, it was affected by the interaction of policy initiatives with adjustment through market channels such as wages and prices. A better understanding of this process in the early years of monetary union can provide valuable lessons to enhance the functioning of the euro area in the future.

## **3. The approach to analysis in this study**

To explore the dynamic nature of adjustment among euro-area economies, the Review is organised as follows:

- It first sets the stage by recalling how adjustment in the euro area was expected to function in the run-up to its creation in 1999 (Chapter II: Objectives, expectations and current issues).
- Area-wide economic trends in the early years of monetary union are then reviewed to assess how consumption, investment, inflation and financial market performance have evolved under monetary union (Chapter III: Economic developments and adjustment).
- This is followed, in turn, by an investigation of how the competitiveness and real interest rate channels of adjustment have worked, and a discussion of the impact of fiscal policies as well as labour, product and financial market reforms (Chapter IV: Market adjustment – the competitiveness channel; Chapter V: Market adjustment – the real interest rates channel; and Chapter VI: Policy-based adjustment).
- This leads to an integrated assessment of adjustment experience: an econometric model identifies how key factors have interacted, and selected country case studies draw on this in exploring economic developments and policy experience (Chapter VII: Country adjustment experience).
- The final section of the study considers opportunities and challenges facing euro-area policy-makers – focusing on routes to enhancing adjustment dynamics, including during real convergence (Chapter VIII: Adjustment and surveillance issues).

The study draws on a range of analytical techniques to explore the working of the euro-area economy. These include time series analysis and modelling, and six country case studies that seek to identify interactions between market developments and policy design in the spirit of a surveillance analysis.

#### **4. Main findings about adjustment experience**

The key conclusion of the Review is that, over the medium term, the adjustment process in the euro area is indeed dynamically stable, because changes in competitiveness dominate the process of adjustment following country-specific shocks. But this channel can operate slowly, and it is not exempt from some overshooting. The analysis stresses that the real interest rate channel is complex to analyse: backward-looking measures based on consumer prices fail to capture expectations, which are anchored by the credibility of the ECB's monetary policy; and economic agents face different sets of prices, capital costs and time horizons. The Review finds that pro-cyclical changes in real interest rates are somewhat less important than previously thought in explaining divergences in growth and inflation. By contrast, country-specific shocks – including developments in risk premia, credit constraints, and productivity in traded and non-traded goods – are powerful explanatory factors.

An important message about the adjustment process is that the interaction of several factors in a country can prove strong and mutually-reinforcing. In Spain, for example, several factors came together to shift demand towards non-traded goods, and specifically housing: a fall in risk premia, a relaxation of credit constraints on households, migration and demographics. This kind of effect – and specifically in residential investment – is evident in several economies: it is particularly instructive, because the empirical review of area-wide trends highlights the behaviour of investment – notably residential investment – as an important source of growth divergences. It emerges here as driven quite strongly by one-off factors and real economic changes, but often acting in combination.

Wage and price setting behaviour influences the efficiency of the adjustment process, taken together with underlying trends in productivity. Quite significant differences existed in the extent to which wages responded to changes in national output gaps, and in particular the emergence of cyclical slack. Italy, the Netherlands and Portugal, for example, experienced sluggish wage adjustment at times of weak activity. Recent surveys show that prices in the euro area change relatively infrequently. Prices of services are especially sticky, which is an indication of a lack of competition in services markets. Only 20% of the price changes in services are price declines, as opposed to 40% in other product markets. Also, in some cases productivity growth has played a rather modest role in facilitating real exchange rate depreciation. Thus adjustment through changes in competitiveness could be slow, resulting in a less efficient process and wider economic divergences. There are risks that wage and price dynamics could cause some overshooting in country-specific booms and downturns.

The analysis suggests that policies may need to help ensure that overshooting is dampened and problematic spillover effects are contained, including by avoiding a pro-cyclical fiscal stance or rapidly addressing undue developments at the sectoral or microeconomic level. In particular, further structural reforms are needed to increase the responsiveness of domestic prices to shocks. Even though the gap with the US has narrowed, euro-area product markets remain highly regulated. The creation of a more integrated and competitive Internal Market, particularly in services, should help ensure that prices adjust more rapidly to changing supply and demand conditions. During the period 1999-2006, a number of Internal Market directives and regulatory reforms aimed at opening up markets to competition were adopted and competition policy rules were revised according to economic principles. Nevertheless, sectoral enquiries show that effective competition in sectors that have been legally opened up to competition is still limited. A more effective implementation of agreed reform measures and a more ambitious reform programme are therefore essential to speed up the process of price adjustment in product markets. Similar action is required in labour markets, where progress with reforms has been steady but slow.

The analysis also points to a more prominent role for financial markets in the inter-country adjustment process than was anticipated. During the first few years of the euro area, there has been an overall sizeable reduction of interest rates in the euro area as a result of the credibility of the set-up concerning the conduct of monetary policy. Coming on top of this trend, the decline of risk premia and the easing of credit constraints in countries, which had experienced substantial differences with respect to the average situation in other countries, before the adoption of the euro, opened up new economic opportunities, including scope for higher household borrowing and growth in the non-traded goods sector, and notably in housing. With a good investment climate and an adequate supply of human skills, there was scope for capital to flow strongly to the traded goods sector also (as in Ireland). Productivity growth could then underpin income gains, competitiveness, and contribute to the servicing of external liabilities, though this was a demanding set of conditions to have in place. But the influence of financial markets was not always benign in terms of a swift and linear adjustment process. Asset markets tended to boom as real interest rates declined, so that wealth effects could amplify the "perverse" real interest effects noted above, thus widening swings in output and inflation.

The study highlights that key gains from financial integration are yet to be fully tapped. It appears that cross-border asset holdings are beginning to contribute to the smoothing of incomes at times of adjustment stress, but there is great potential for this process to strengthen. Evidence from the United States also points to the scope for greater integration in, and securitisation of, national mortgage markets in order to dampen downswings in localised real estate cycles.

The experience with fiscal policy in the adjustment process is also reviewed. One feature of interest is the association of periods of real effective appreciation in euro-area economies with strong revenue performance – since both are likely to occur during country-specific booms. During such upswings, reflecting strong internal demand, it was easy to overestimate the underlying strength of revenues, which were boosted temporarily by a consumption-rich composition of GDP and, in some cases, asset market booms. There was also a tendency to revise potential growth up too sharply, and to factor it into wage agreements and budgetary projections. This sowed the seeds of boom-bust dynamics. These effects, in combination, can be observed in the Netherlands in the period until 2004; and they are a reason for continuing vigilance in Spain. Conversely, fiscal consolidation during country-specific downswings – induced by weak internal demand – proved very arduous, even where nominal expenditure growth was well-contained, as was the case in Germany.

Partly as a result of these factors, there is evidence during the early years of monetary union of a failure to accelerate fiscal consolidation in good times. And, as a corollary, fiscal flexibility in a number of cases was not sufficiently available to buffer economic activity during the downswing. It becomes crucial to focus on the composition of growth in the assessment of cyclical conditions.

Taken together, labour market, financial and fiscal factors in each euro-area economy had the potential to interact in ways that could have accelerated efficient adjustment. By contrast, it is evident that they can also have mutually-reinforcing pro-cyclical effects – amplifying swings in output and inflation and stretching out the adjustment process. Slower adjustment is not necessarily less desirable if it involves less output sacrifice and lower social costs. But the concern here is that a problematic interaction of policy and market forces could increase adjustment challenges. Experience in the Netherlands illustrates this risk. Pro-cyclical developments in the financial markets, wages and the fiscal stance proved mutually-reinforcing. This suggests that, even after many years of de facto monetary union (considering also the long period of exchange rate stability within the so-called "DM area"), economic agents and policy-makers had not fully internalised dynamic risks in the adjustment process.

The study also sheds light on experience with nominal and real convergence, and accelerated financial sector integration, under the euro. Several findings deserve highlighting:

- During nominal convergence, interest rates fell significantly in some cases, providing a stimulus to activity; but countries differed widely in the extent to which they used this opportunity to achieve a durable acceleration of fiscal consolidation – with experience in Italy and Portugal being particularly cautionary in this regard.
- During real convergence – i.e., economic catching up – conditions varied significantly across countries as regards the attractiveness of investment in the traded goods sector. Ireland is the most striking case of strong inflows of investment to this sector. This triggered productivity growth in tradeables that helped to preserve competitiveness, reducing the need for later adjustment in the real exchange rate, in spite of stronger inflationary dynamics reflecting the catching up in living standards.
- During accelerated financial integration, as borrowing constraints on households were eased, there were major differences in supply response in the housing market, and hence in experience with asset price inflation. The strong supply response in Portugal meant that the subsequent economic slowdown was not accompanied by the bursting of an asset price bubble. However, the scale of housing booms in countries such as Spain may raise some questions of efficiency in the allocation of foreign and domestic savings at times when real interest rates were falling or low.

Finally, recent experience also confirms that spillover effects within the euro area can be sizeable. The scope for such spillovers is well-recognised in the case of fiscal policies, and they can also arise if inefficient functioning of labour markets slows the adjustment process. Moreover, strong housing investment across several large euro-area economies affects other members through demand effects (the shift to non-traded goods) and, simultaneously, through the resulting tightening of monetary conditions across the area.

The issues emerging from this analysis, it is recognised, do not map one-to-one with those highlighted in the academic and policy debate that took place in the run-up to creation of the monetary union. Some concerns that had been raised before the introduction of the euro did not materialise. Questions about economic flexibility and fiscal room for manoeuvre proved very relevant to recent adjustment experience. On the other

hand, the impact of policy and market interactions, of cross-country spillovers and of financial market dynamics looms larger than anticipated.

## 5. Issues for policy consideration

This analysis of adjustment experience in the early years of monetary union sheds some light on opportunities and challenges for policy-makers, and on the scope for further "learning" about this environment by other economic agents. There is significant scope for national policies to respond to shocks in the short run, and major scope to enhance adjustment capacity over time. Given spillover effects, moreover, the benefits from effective policy co-ordination among euro-area members are heightened; and the interaction between macroeconomic and structural policy becomes of stronger common concern

Among the policy actions that can have immediate effect, three issues from recent experience deserve particular attention.

- First, to ensure that fiscal policy does not retard adjustment to country-specific shocks, thus magnifying divergences in economic activity. This requires strong focus on the underlying development of budget balances supported by careful analysis. First, country-specific booms – particularly those originating in the non-traded goods sector – can lead to over-optimism about the underlying fiscal position. Second, the flexibility of fiscal policy in the event of shocks can be improved by consolidation in "good times." This also helps to dampen the appreciation of real exchange rates and to offset the impact of positive wealth effects on consumption during country-specific booms. Where risks exist of real exchange rate overshooting, a careful approach to fiscal management is particularly important: for example, a pro-cyclical stance could aggravate such risks. Third, where shocks are permanent, the efficient operation of tax and benefit systems, rather than cyclical stabilisation, is the key to fostering the necessary resource reallocation.
- Second, to ensure that the social partners have appropriate information about adjustment challenges and the implications of different lines of action. It seems particularly important to analyse whether current wage and price developments are benign in terms of adjustment needs. Along with fiscal policy, well-adapted wage- and price-setting – closely reflecting productivity developments also in relation to the rest of the euro area – the potential for overshooting in intra-euro-area real exchange rates is a key concern.
- Third, in the field of policy co-ordination at EU level, including in the Eurogroup, to develop a shared understanding of wage, price and competitiveness trends, as well as interactions between developments in the real economy and fiscal adjustment goals. The scope for addressing inter-country spillovers deserves close attention in this connection.

The efficiency of adjustment dynamics within the euro area can also be enhanced by an acceleration of progress in structural policies, the effects of which are felt only in the medium term.

- First, shifts in countries' competitiveness positions reflect both wage and productivity developments. Experience illustrates how productivity growth can enhance the efficiency of adjustment – especially by reducing reliance on extended periods of low nominal wage growth. Thus, reforms to boost productivity are of key importance.
- Second, the efficient working of labour and product markets can clearly contribute to the adjustment process, and here the apparently low responsiveness of costs in some economies to the emergence of cyclical slack is a key point of concern. This needs to be understood in the context of each country's market institutions and frameworks, in order to highlight ways in which the welfare costs of slow adjustment can be reduced.
- Third, at the level of the euro area, financial integration is key: rising cross-country asset holdings can smooth incomes during adjustment, while retail market integration can dampen credit shocks and foster new investment. These effects are especially valuable in a monetary union without a large federal budget or strong labour mobility.
- Fourth, monetary union itself may have subtly affected the nature of systemic risk – with different profiles in economic adjustment, fewer market crises, greater financing ease, a dampening of market signals to policy-makers, and the interaction of complex real interest rate environments with asset markets. These changes need to be internalised by financial market institutions, and their supervisors, with particular alertness to distortions or failures of governance that could foster pro-cyclical market behaviour.

Policy priorities along these lines can help foster more efficient adjustment to country-specific shocks, minimise output losses, and reduce risks of financial sector stress. They would help to improve adjustment to common shocks. Moreover, the structural policy priorities identified here would typically contribute also to raising potential growth rates – by fostering higher productivity, improving the efficiency of labour and product markets, and unlocking the gains from deeper financial integration for investment and regional specialisation. Potential growth, indeed, can benefit to the extent that the euro-area economy experiences an increasingly efficient adjustment process and assures a yet more stable setting for investment.

These priorities, indeed, map very clearly on to key elements in areas where the European Union has established policies and strategies. The reformed Stability and Growth Pact lays an emphasis on consolidation in "good times" that appears even more warranted in light of the discussion above about fiscal elasticities and risks of inadvertent pro-cyclicality. It also builds explicit links between fiscal policy and structural reforms. The Lisbon Strategy highlights structural reform priorities such as stimulating market entry and getting people into work, which are promising in terms of efficient adjustment as well as growth. The findings of this study further underscore the crucial contribution of well-targeted reforms in a setting of monetary union. A dynamic Internal Market contributes to adjustment in the euro area through two channels: first, by creating a more competitive business environment it ensures that companies adjust their prices to reflect changing supply and demand conditions; and second, by facilitating the movement of resources towards more dynamic firms, sectors or regions. Sufficiently strong competition in product markets also helps to ensure that wage moderation and productivity gains are reflected in lower price levels. Financial market integration, moreover, is a core objective at the EU level; and the discussion in this study lends added emphasis to the steadily growing role that this can play, over time, in improving the quality of adjustment in those Member States that participate in the euro area. In addition, the findings of this Review with regard to interactions across countries, and spillover effects, confirm the importance of achieving a shared understanding of adjustment challenges, which is a pre-requisite for effective governance of the euro area.

Understanding and improving the functioning of economic and monetary union is important to allow all Member States of the EU take full advantage of the potential benefits of the currency union. This means achieving and sustaining higher rates of growth in the euro area, while preserving the stability of prices and of the exchange rate. Thanks to the deep integration of the euro area within the EU, higher growth and stability therein would have positive effects for all Member States of the European Union. Improving the functioning of economic and monetary union can also help to reinforce support for joining the euro area in those non-participating Member States, where doubts subsist as to the effective benefits of joining the euro area. Finally, learning lessons from the first few years of the euro area will contribute to facilitating a smooth entry of those Member States that are in the process of joining the euro area, starting with the accession of Slovenia and continuing with the other countries over the coming years. These Member States, as has been the experience of many euro-area countries during the first years of the euro area, would most probably undergo significant real adjustment in their economy, even after having achieved the nominal convergence necessary to adopt the euro. Continuing the effort of understanding which policies are necessary to address this continuous adjustment, and which errors to avoid, will certainly be a major contribution towards facilitating a smoother integration of EU economies within the monetary union.

## II. EMU: OBJECTIVES, EXPECTATIONS AND ISSUES

### Summary

*To place in context Member States' adjustment experience in the early years of monetary union, it is helpful to review upfront what were the goals and expectations at the time the euro was created. This is important in order to establish whether the euro project is "on track" – developing along the lines and at the pace anticipated. It should also help identify issues where deeper analysis is called for, and where there may be challenges for policy to enhance the functioning of the euro area. Looking back, plans and preparations for monetary union advanced at an uneven pace from the end of the 1960s. The landmarks were a series of official reports, culminating in the Maastricht Treaty on European Union. The reports include notably the Werner Report, the MacDougall Report and finally the Delors Report. The ultimate goal – to establish Economic and Monetary Union (EMU) in Europe – remained unchanged, but the design philosophy evolved substantially. One key influence on official thinking was the ongoing academic debate about prerequisites for a successful monetary union. A second and important influence was experience, during the intervening decades, of economic management and policy co-ordination in a setting of progressively opening capital accounts. These factors influenced the final architecture of monetary union, and shaped the goals and expectations held when it was established in 1999. The key analytic issue that emerged during this policy debate and emerging experience was the way in which national economies would respond to country-specific shocks – including as the existence of monetary union brought about further changes in the real and financial sectors, and in policy performance. Events have borne out the assessment that this would prove a key issue. The launch of the euro was impeccable; the euro has transformed the face of international financial markets; and the euro area economy has coped well with common shocks. But there have been marked and protracted divergences in growth and inflation among euro-area members, accompanied by sizeable shifts in real effective exchange rate and current account imbalances. This experience confirms that adjustment dynamics in the euro area are a key topic for further analysis, and they are thus the main focus of this Review.*

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# EMU: OBJECTIVES, EXPECTATIONS AND ISSUES

## 1. EMU: Shaping the ideas

EMU is among the most intensively researched steps in the history of European integration. Since the goal of EMU was endorsed by the Hague Summit in 1969, and especially since it was revived by the European Council in Hannover in 1988, a complex and extensive body of work on EMU has grown. Much of this research has taken the form of cost-benefit analysis, with economists weighing the expected gains from a single currency against its expected negative side-effects. On the benefit side, there has been widespread discussion of both the microeconomic advantages of a single currency – including transaction-cost savings, reduced uncertainty, greater price transparency in the context of an integrating EU economy – and the macroeconomic rewards of EMU's stability-oriented monetary-policy framework. On the cost side, the macroeconomics of adjustment to country-specific shocks and country-specific responses to shocks have dominated academic discussions.

The crux of the debate on the cost side has been whether EMU – with its irrevocably fixed exchange rates and one-size-fits-all monetary policy – allows sufficient degrees of freedom for Member States to adjust to economic shocks with country-specific effects. This section revisits the academic and policy research debate on adjustment under EMU in the period running up to the launch of the euro.

The sheer quantity of research on EMU makes it difficult to provide a well-focused snapshot of where opinions stood on the issue of adjustment to country-specific shocks on the eve of EMU. What is clear, however, is that the theory of optimum currency areas was a common thread running through much of this debate. The point of departure was an influential paper by Friedman (1953) which implies that countries giving up flexible exchange rates – e.g. by forming a monetary union – will find it difficult to adjust to country-specific shocks in the absence of a high degree of price and wage flexibility. Building on this analysis, Mundell (1961) argued that members of a supranational monetary union could still adjust to country-specific shocks without relying on price and wage flexibility if countries possess a sufficient degree of capital and labour mobility. McKinnon (1963) questioned Friedman's analysis further, arguing that flexible exchange rates make ineffective adjustment mechanisms in more open economies as fluctuations in the nominal exchange rates will be offset by price-level changes. Under such circumstances, the adjustment options of open economies may be no worse under monetary union than under flexible exchange rates. Both McKinnon (1963) and Kenen (1969) introduced fiscal policy into their analysis, arguing that budgetary stabilisers could help to cushion the impact of country-specific shocks, following the irrevocable fixing of exchange rates.

This early work on optimum currency areas prompted a number of economists to explore the ex-ante optimality of EMU. By and large, this literature was sceptical about the optimality of a monetary union among EU Member States. In the first place, the evidence suggested that country-specific shocks were likely to occur under EMU, especially among economically peripheral Member States. Bayoumi and Eichengreen (1993), for example, found that economic disturbances, particularly on the supply side, were both smaller and more closely correlated among the EU "core" of Germany, France, Belgium, the Netherlands and Denmark than among "peripheral" Member States, such as Portugal, Ireland, Greece and Spain. Furthermore, there was a widespread perception that labour mobility among EU Member States was too low and prices and wages too rigid to allow for a sufficient degree of adjustment to country-specific shocks under EMU (Eichengreen, 1993; Decressin and Fatás, 1995; OECD, 1994).

This scepticism about the ex-ante optimality of EMU should be treated with caution for a number of reasons. Firstly, as Buti and Sapir (1998) argue, the effectiveness of the exchange rate as a shock absorber will depend on the category of shock in question. Only in the exceptional case that economic shocks stop at the national border, are



exogenous and temporary in nature and originate from variations in aggregate demand, they suggest, can the exchange rate be considered a plausible channel of adjustment. Secondly, empirical evidence implies that the exchange rate and macroeconomic imbalances were driven by different categories of shock in the pre-EMU period. Canzoneri, Viñals and Vallés (1996), for example, find that relative output between EU Member States during the pre-EMU period was driven by supply shocks while the exchange rate was driven mainly by monetary and financial shocks. Thirdly, it is doubtful whether any monetary union can be considered optimum in a strict sense of the term. Krugman (1990), for one, casts doubt on the optimality of the US monetary union by asking, provocatively, whether a Mid-Western dollar might not have promoted a smoother adjustment to regional shocks in the 1980s. Fourthly, there is a growing body of evidence to suggest that the criteria for an optimum currency area may be endogenous. Frankel and Rose (1997) implied that the creation of EMU would of itself generate the conditions necessary for a smoothly functioning monetary union over time, as economic structures and business cycles adjust to the single monetary policy and exchange rate and the incidence of country-specific shocks diminishes.

The theory of optimum currency areas also inspired an extensive literature in the 1990s on the ex-post optimality of EMU. The key issue in this strand of the debate was not whether EMU would be an optimum currency area at the moment of its launch but how Member States could enhance the euro-area's optimality once the single currency was a reality. In tackling this issue, economists focused on two inter-related research questions. The first concerned the exposure of Member States to economic shocks with country-specific effects. The second concerned the adaptability of Member States to such shocks.

The literature in the run up to EMU on exposure offered contrasting views on the likely impact of the euro. Some economists argued that EMU would decrease Member States' exposure by reducing the scope for policy errors and smoothing adjustment to certain categories of shock. Buti and Sapir (1998), for example, suggested that the EMU could, *ceteris paribus*, dampen the 'political business cycle' in macroeconomic policy-making by curtailing opportunistic behaviour in interest-rate and budgetary decisions. Buitter (1995) argued that EMU could reduce the exposure of Member States on the grounds that flexible exchange rates tended to complicate adjustment to money-demand and money-supply disturbances. Other economists were more cautious about the impact of EMU on exposure. A particular point of contention here was whether EMU would lead to convergence or divergence between the economic structures of euro-area members. Krugman (1991) argued in favour of divergence, suggesting that European economic integration would spur industrial diversification thus increasing the potential for idiosyncratic shocks among Member States. Funke, Hall and Ruhwedel (1999) presented partial evidence in favour of convergence, noting that the comparative importance of industry-specific shocks had fallen in OECD countries since the 1970s.

There is a positive relationship between the extent of exposure and the need for adaptability under EMU in so far as Member States that face a high probability of economic shocks with country-specific effects will be more reliant on adjustment mechanisms. Two main approaches to adaptability were explored by economists in the run up to EMU, the first focusing on enhancing policy-based adjustment and the second focusing on market-channels.

Following McKinnon (1963) and Kenen (1969), a recurring argument in the run up to EMU was that the irrevocable fixing of exchange rate reinforced the need for enhanced budgetary stabilisation in the face of country-specific shocks. Economists were divided, however, on the question of whether such stabilisation should take place at the Member State or EU level. Eichengreen and Wyplosz (1998) were among those who argued that Member States' automatic budgetary stabilisers should be allowed to cushion the impact of country-specific shocks. Other economists argued that an EU-level stabilisation mechanism could be a second-best solution for a monetary union characterised by low factor mobility and regulatory barriers in product, labour and capital markets (Goodhart and Smith, 1993; Obstfeld and Peri, 1998). An unresolved issue in this literature concerns the extent of centralised stabilisation in other monetary unions. In a widely cited study, Sachs and Sala-i-Martin (1992) argue that the US federal budget plays a significant role in cushioning the impact of economic shocks with asymmetric effects. Their estimates indicated that between 1970 and 1988 federal taxes and transfers in the US absorbed 40 cents of every 1 dollar shock to regional personal income. These results have been criticised, however, for confusing the stabilisation and redistribution roles of the US federal budget by focusing on the levels of regional personal income (von Hagen, 1993).

A related issue in the policy-based adjustment literature concerned the likely impact of EMU on wage-bargaining and practices at the Member States level. Economists were less certain on this point, in part, because EMU was expected to subject national wage bargaining systems to competing pressures. On the one hand, by removing a traditional plank of the national policy mix – i.e. monetary policy – EMU was expected to complicate efforts to ensure wage moderation through centralised agreement at the Member State level. On the other hand, by fostering increased economic integration and greater competitive pressures, EMU was expected to provide incentive for a centralised commitment to wage moderation so as to protect market shares. For Danthine and Hunt (1994), the pressures towards decentralisation as a result of increased economic integration in Europe were likely to outweigh the incentives for greater centralisation, as Member States with centralised wage bargaining were expected to be slower to adjust to economic shocks with asymmetric effects. Soskice and Iversen (1998) disagreed with this line of

reasoning, suggesting that the pursuit of a non-accommodating monetary policy from the ECB and the need for enhanced fiscal stabilisation under EMU would provide incentives to pursue wage moderation through social pacts.

On the eve of the euro's launch, few economists expected EU Member States to adjust to country-specific shocks via policy-based channels alone. For this reason, considerable attention was devoted to the question of how to enhance the functioning of market-based channels of adjustment. One strand of this literature considered the possibility of fostering greater geographical labour mobility in the EU, with economists who viewed the comparative immobility of the EU labour force as the product of linguistic and cultural differences (Jonung and Sjöholm, 1999) being more circumspect on this issue than those who concentrated on less immutable obstacles, such as deficiencies in inter-regional job matching, the non-portability of pension rights and social security entitlements (Braunerhjelm et al., 2000). A second strand of this literature asked whether EMU would provide a sufficient catalyst for structural reform in product, labour and capital markets. Wyplosz (1991) sounded a positive note, suggesting that the pursuit of a non-accommodating monetary stance by the ECB had the potential to speed up the adjustment of prices and wages to their equilibrium values. Bean (1998) assumed a more agnostic position on the grounds that the necessity of greater flexibility under EMU must be weighed against, *inter alia*, the potentially complex interactions between the euro-area's one-size-fits-all monetary policy and uncoordinated structural reform efforts. For Buti and Sapir (1998), EMU alone was unlikely to produce structural reforms, leaving it up to policy makers to respond to the irrevocable fixing of exchange rate by stepping up the pace of structural reforms. A related issue, although one which was comparatively neglected in the literature, concerned the role of financial markets in the process of adjusting to country-specific shocks. One study by Asdrubali, Sørensen and Yosha (1996) found that financial markets play a pivotal role in the adjustment to regional-specific shocks in the USA, with capital and credit markets smoothing over 50% of shocks to gross state product over the period 1963-90 as compared with less than 15% by the federal budget. Buti and Sapir (1998) argued that a comparable degree of adjustment could be achieved under EMU providing the euro spurred integration in bond and credit markets.

In sum, a number of economists were sceptical about EMU's *ex-ante* optimality, while others were more positive about the options available to policy makers to promote *ex-post* optimality. In the first place, many economists stressed the need to enhance policy-based adjustment to country-specific shocks by enhancing budgetary stabilisers and encouraging greater responsiveness among wage setters. There was also a broad consensus on the need to enhance market-based mechanisms of adjustment including labour mobility, price and wage flexibility and financial market integration. At the same time, there were a number of open questions in this debate, including the merits of budgetary stabilisation at the Member States versus the EU level, the likely effect of the euro on wage bargaining institutions and the extent to which EMU would provide sufficient incentives for Member States to reform product and labour markets.

## **2. EMU: Policy initiatives and market experience**

During some thirty years of discussion, the blueprint for EMU remained faithful to the original vision of establishing a full economic and monetary union. But it evolved significantly in light of global economic circumstances as well as changes underway in the European Union. In the development of official thinking about the architecture of EMU, it is possible to distinguish three phases, which reflected in turn: (i) the economic reasoning presented in the Werner Report of 1970, from which the blueprint for a single currency originated, and which addressed the basic pre-requisites of OCA theory; (ii) the specific experience of the oil-price shocks in the 1970s, which ultimately established a stability-oriented policy orthodoxy across the EU; and (iii) the crisis in the European Monetary System (EMS) in 1992/3, which demonstrated the limitations of intermediate exchange-rate arrangements and reinforced the political commitment to launch (the third stage of) EMU by the 1999 deadline. The effects of these influences are considered below.

### **2.1 Early policy initiatives**

At the Hague Summit in 1969 a high-level group of experts was established under the chairmanship of the Luxembourg Prime Minister, Pierre Werner, to examine how the creation of a single currency could be achieved. The Report proposed that the final stage of EMU be launched by 1980. It called for: (a) the progressive stabilisation of exchange rates among the Member State currencies, leading to the irrevocable fixing of rates implied by the adoption of a single currency; (b) the establishment of a Centre of Decision for Economic Policy which would exercise "a decisive degree of influence over ... the essential features of the whole of the public budgets, and in particular variations in their volume, the size of balances and the methods of financing or utilising them"; (c) a lowering of the remaining barriers to trade in goods and services between Member States; and (d) more specifically in relation to the financial sector, the liberalisation of capital movements and a degree of "technical" harmonisation in the activities of financial markets and intermediaries (Werner, 1970).

The blueprint for a single currency proposed in the Werner report in part reflected the terms of the debate, underway since the early 1960s, on whether the European Economic Community (EEC) was in fact an OCA. The proposals in

the Werner Report can be interpreted as recognition that further progress was required in terms of market integration for this to be the case. Thus, a key area in which the Werner Report set the tone for future discussions of EMU was that it accepted the concept of an EMU that did not entirely fulfil the criteria for an OCA at the time of its launch. Instead, the report proposed flanking policies to promote the ex-post optimality of EMU by enhancing Member States' capacity to adjust to country-specific shocks. Secondly, the Werner Report's choice of flanking policies combined policy-based and market-based modes of adjustment. In particular, it highlighted the importance of budgetary stabilisers at the Member State level – albeit by giving the Community a significant coordinating role in this field – and measures to increase the responsiveness of prices and wages to country-specific shocks by linking EMU to the need for further trade and financial market integration.

Financial market developments, however, intervened to arrest the process of implementation of the Werner report: strains emerged in the Bretton Woods system and, amid a wave of instability in foreign exchange markets, the system effectively collapsed in 1973. The single-currency project was postponed for many years but, nevertheless, there are clear echoes of this original blueprint in the architecture of EMU today.

Despite the collapse of the Bretton Woods system, the EU commitment to exchange-rate stability endured in the form of multilateral pegging arrangements, such as the Snake and the EMS. Exchange rate management via these arrangements was, however, complicated by the absence of a clear anchor currency (to substitute for the US dollar in the now defunct Bretton-Woods system) and the effects of successive oil-price shocks. From the mid-1970s to the mid-1980s, a combination of low economic growth and high inflation was accompanied by episodes of severe exchange rate tension among EU currencies, and repeated realignments of their multilateral pegs. Such realignments typically entailed a high economic and political cost for devaluing Member States and had a profound effect on the approach to macroeconomic management across the EU.

Accordingly, when the blueprint for the single currency was revived in the late 1980s, it reflected not only the implications of OCA theory but also lessons learned from the experience of stagflation. The source of this stagflation was to be found in macro-economic policy failures, notably in responding to the supply shocks implied by higher oil prices via accommodative monetary and budgetary policies. As these policy failures became apparent, active demand management strategy fell from favour as a means to durably support economic growth. Macroeconomic stability, as the basis for sustainable growth, moved into the ascendancy and was to be delivered by a monetary policy targeted uniquely on price stability and budgetary discipline.

In this context, the relative success of the German economy in weathering stagflation had established the deutschemark as the de facto anchor currency within the EU and so extended the role of the EMS from being an instrument of exchange-rate stabilisation to being also a mechanism for disinflation via the imported policy credibility of the Bundesbank. Furthermore, the anchor-currency role of the deutschemark ensured that the Bundesbank's concept of central banking – based on principles of independence, credibility and rules-based policy conduct – became the preferred model for other Member States. This emphasis on deeply embedded macroeconomic stability, as well as the policy framework and institutional arrangements to deliver it, were integral to the concept of EMU eventually adopted in the Maastricht Treaty of 1991.

While concrete plans for EMU were essentially "on hold" by the late 1970s, official attention to the link between adjustment to country-specific shocks and the irrevocable fixing of exchange rates continued. At the request of the Commission, an influential "Report on the Role of Public Finances in European Integration" was prepared by an independent team of economists led by Ronald MacDougall (European Commission, 1977). A key premise of the MacDougall Report was that EMU would entail a substantial increase in the Community budget to help cushion the impact of economic shocks which may occur within the currency area. Although the MacDougall Report was also never fully implemented, its conception of adjustment under EMU is interesting for two reasons. Firstly, like the Werner Report, the MacDougall Report envisaged a key role for the Community in budgetary stabilisation, in this case through the creation of a Community budget in the region of 5-7% of GDP. Secondly, unlike the Werner Report, the MacDougall Report was sceptical of market-oriented mechanisms of adjustment, justifying its proposals for Community based stabilisation, in part, as a way of avoiding "excessive levels of migration" in the currency area.

## ***2.2 Through the exchange rate turbulence of the early 1990s***

At the European Council in Hanover in 1988, EU leaders reaffirmed their commitment to the goal of EMU and charged an independent committee, led by the Commission President Jacques Delors, with the task of proposing concrete stages towards its realisation. Like its predecessors, the Delors Committee recognised that flanking policies would be required to enhance EMU's ex-post optimality. In a break from the Werner and MacDougall Reports, however, the Delors Report argued that the responsibility for adjustment to country-specific shocks should remain primarily with the Member States, with the EU being given a limited role in this field (Committee for the Study of Economic and Monetary Union, 1989). This departure may have been due to a number of reasons, including concerns that a supranational economic authority, such as the Werner Report's Centre of Decision for Economic Policy, could jeopardise the independence of the European Central Bank (Dyson, 2001) and that an EU-level

stabilisation mechanism could create a problem of moral hazard by encouraging Member States to leave themselves unnecessarily exposed to country-specific shocks (Delors, 1989).

Like the Werner Report, the Delors Report favoured a combination of policy-based and market-oriented modes of adjustment to enhance the ex-post optimality of EMU. More specifically, it proposed a three-pronged strategy to economic adjustment under EMU. Firstly, it called for a strengthening of competition policies including a stepping up of anti-trust measures and a reduction in distortionary government subsidies. The underlying assumption here was that well-functioning markets were a key requirement under EMU but that the single currency alone was unlikely to foster the necessary reforms (see Bean, 1998). Secondly, the Delors Report called for enhanced regional and structural policies with a view to, inter alia, improving the process of resource allocation under EMU and narrowing regional and structural imbalances under monetary union. The fact that such funds were to be focused on poorer Member States revealed a concern among the committee that economically peripheral Member States may find it harder to adjust under EMU (Delors, 1989). Thirdly, the report called for a coordination of macroeconomic policies to ensure a policy mix that is consistent with the smooth functioning of EMU. In the budgetary sphere, it proposed that rules would be required to govern "the size and the financing of national budget decisions" while leaving budgetary policies in the hands of national and regional authorities in keeping with the principle of subsidiarity. The implication here was that adjustment under EMU would entail increased budgetary stabilisation at the national level but that due regard should be given to the potential side effects of higher deficits among other members of EMU (Buti and Sapir, 1998).

The heightened focus on stability in macroeconomic management in the Member States should, in principle, have facilitated multilateral exchange-rate management in the period leading up to the launch of EMU. While there was a period of unchanged exchange rates from 1987 to 1992, exchange-rate management was again complicated by two important factors – one originating in financial markets and the other in the real economy.

- The first factor was the opening of capital accounts. The proposals in the Werner Report on market integration, which had been carried over into the EMU project, were delivered by completion of the Single Market Programme (SMP) in 1992. One element of the SMP was the liberalisation of capital movements, which was largely achieved by the SMP deadline and so considerably ahead of the scheduled EMU launch date of either 1997 or 1999. The progressive opening of Member State capital accounts - in conditions where the scale of international financial flows had grown dramatically and financial markets had become highly sophisticated relative to the late 1960s – fundamentally altered the operating environment of the EMS by creating the so-called inconsistent trinity of exchange-rate fixity, monetary policy independence and free movement of capital.
- The second factor was strains in the exchange rate mechanism (ERM) of the European Monetary System (EMS) resulting from the interaction of economic effects from German unification and the policy tensions created by the liberalisation of capital movements as discussed above. More specifically, inflation pressure caused by the positive demand shock to the then west-German economy caused the anchor role of the DEM to malfunction, and the other Member States were required to defend their exchange-rate pegs with interest rates that were inappropriate to their domestic economic conditions. As economic imbalances – many of which had emerged long before German unification - accumulated in Member States, exchange rates became increasingly misaligned. Ultimately, efforts to preserve fixed exchange rates proved futile, amid a wave of speculation fuelled by massive international capital flows. The outcome was a sequenced realignment of exchange rates and a loosening in the formal exchange-rate constraints within the EMS.

In the immediate aftermath of the EMS crisis, Member States were confronted with a clear choice between a return to free-floating exchange rates (implying another indefinite postponement of the single-currency project) and a reinforced commitment to EMU by intensifying the stability orientation of their macro-economic policies. Moreover, it was clear that the launch of EMU could not be delayed for too long, because the inconsistent trinity meant that the EMS would not be sustainable over time.

The decision to opt for a reinforced commitment to EMU cemented the underlying commitment to macroeconomic stability as the basis for a sustainable single currency. It also established 1999 as the absolute deadline for adopting the single currency, triggering an accelerated process of convergence toward the required levels of macroeconomic stability among the Member States. While an acceptable level of stability was achieved by the deadline, it involved considerable pressure on Member State economies – in particular in bringing fiscal policy in line. In this setting, it is the policy agenda for enhancing market integration and flexibility was, de facto, a secondary priority in many Member States. The euro area was created in 1999 in conditions – as regards the impact of structural reforms – that fell well short OCA criteria. These initial circumstances implied a period of transition to a long-run steady state in which full OCA criteria would be met.

### 3. Stabilisation and adjustment in EMU

#### 3.1 Policy assignment under EMU

The priority given to macroeconomic stability is clearly reflected in the assignment of policies within EMU. Moreover, the architects in the end stuck closely to the Delors Report by establishing a system of economic governance that was designed, inter alia, to enhance policy-based and market-oriented modes of adjustment mechanisms while preserving Member States' autonomy over budgetary policies and structural reform.

In simplified terms, this policy framework can be described as follows:

- An independent **monetary policy** is conducted by the European Central Bank (ECB) and targets the maintenance of price stability at the euro-area level as its primary objective. Monetary policy can contribute to the broader economic and social objectives of the EU, but only to the extent that price stability is not jeopardised. Price stability is defined as an inflation rate close to but below 2%. While the Treaty provisions and a clear medium-term orientation exclude the use of monetary policy as an instrument for *directly* stabilising the euro-area economy, the medium-term orientation – guided by the objective of price stability – helps to ensure that monetary policy focuses on those shocks that it can effectively address and does not itself become a source of instability.<sup>1</sup> Of course, the price-stability objective applies to the euro area as a whole and, therefore, monetary policy does not respond to inflation conditions in individual Member States.
- **Budgetary policy** remains a Member State responsibility, but is co-ordinated via Treaty provisions. National budgetary policies are conducted so as to support the area-wide monetary policy in maintaining stable prices at the national level, while acting as an instrument of cyclical stabilisation (mainly through the operation of the automatic stabilisers) within the constraints of the excessive deficit procedures in the Treaty, as elaborated by the Stability and Growth Pact (SGP). The assumption is that a stability-oriented budgetary policy at national level will, by extension, contribute to a stability-orientation in the aggregate stance of policy for the euro area. This specific role for national budgetary policy in supporting the centralised monetary policy in achieving its price stability objective is, of course, additional to the more classical roles of resource allocation and income distribution. Moreover, the Treaty provisions on budgetary policy co-ordination also have a longer-term focus, with the objective of ensuring sustainability in Member States' public finances.
- Within an environment of stability-oriented macroeconomic policies, **structural policies** (at both meso- and micro-economic levels) also remain a Member State responsibility and are conducted so as to maximise productive potential. In addition, structural policies should be designed to enhance the flexibility of markets so as to increase the resilience and adaptability of the Member State economies - and by extension the euro area as a whole – to shocks. There are no specific Treaty provisions governing the conduct of structural policies in the Member States, although co-ordination in this area is envisaged through the Broad Economic Policy Guidelines. The Lisbon strategy for growth and employment has provided a framework for relatively loose co-ordination of structural policies among the Member States.

To the extent that EMU is in the steady state and economic policies are conducted in a manner consistent with their assigned objectives, this policy assignment can be expected to provide the conditions for sustainable economic growth at both euro-area and Member State levels. At the euro-area level, the orientation of monetary and budgetary policies is intended to stabilise economic output around potential, while appropriate structural policies at both euro-area and Member State level enhance both potential output and economic flexibility.

However, even in the steady state, the EMU framework has implications for economic management in individual Member States relative to the pre-EMU period, notably in terms of their access to stabilisation policies. The most obvious constraint in this respect is the loss of a national monetary policy as an instrument of nominal adjustment, with monetary conditions in the individual Member States determined exogenously via the stance of the single monetary policy and exchange rate. The loss of national exchange rates also has implications for nominal adjustment, although the vast majority of the Member States had been operating under a quasi-fixed exchange-rate regime for many years prior to the launch of EMU.

#### 3.2 Exposure and adaptability to shocks

As Member States are no longer able to adjust the stance of monetary policy to sustain non-inflationary growth, the burden of macroeconomic stabilisation shifts to budgetary policy, which remains a national responsibility. Budgetary policy already plays a stabilisation role via the operation of the automatic stabilisers within the strictures of the

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<sup>1</sup> See speech by Otmar Issing, Member of the Executive Board of the ECB, at International Conference “Stability and Economic Growth: The Role of the Central Bank”, Mexico City, 14 November 2005.

Treaty-based procedures on budgetary discipline. While this stabilisation role can be extended beyond an automatic response to cyclical conditions – again within the Treaty strictures – the limitations of discretionary budgetary policy as an instrument of stabilisation have been widely documented, notably the tendency toward pro-cyclicality in the policy stance due to long inside lags and/or due to biases linked to the political cycle. Two further limitations can be identified in the more specific context of EMU. First, the relative openness of the Member States limits the scope of budgetary policy in influencing either output or inflation at the national level due to leakage effects. Second, the need to safeguard longer-term public-finance sustainability – in the context of often already high public debt ratios and demographic pressures – means that discretionary budgetary policy is not available during the down-cycle in most of the Member States. On this basis, budgetary policy is available to stabilise Member State economies but cannot substitute fully for national monetary policy.

The constraints which the EMU policy framework imposes on macroeconomic stabilisation in the Member States highlight the need for compensating measures elsewhere in the economy. Within these macro-stabilisation constraints, the economic cycle in an individual Member State can be expected to follow a largely unhindered progression determined by real exchange-rate movements and, to a lesser extent, by offsetting movements in the real interest rate (except, of course, for the effects of the automatic budgetary response). Changes in the real exchange rate will influence the cycle through the so-called competitiveness channel and, in turn, depend on the degree of integration and underlying flexibility of markets. If markets are insufficiently integrated and/or flexible, the cycle is likely to be extended amid a slow adjustment in relative prices. A progressive appreciation in the real exchange rate can be expected in the up-cycle, as domestic demand rises (fuelled by a decline in real interest rates) and inflation pressures mount relative to trading partners. The loss of competitiveness implied by the real appreciation will ultimately trigger a down-cycle in the economy, with the risk of significant output and employment losses associated with real exchange rate depreciation through disinflation.

As predicted by OCA theory and reflected in the blueprint for the single currency in both the Werner Report and EMU, the risk of such extended cycles in Member State economies is reduced in an environment where relative prices can adjust freely in conditions of integrated and flexible markets. While the EMU policy framework is solidly founded on the principle of macro-economic stability, smooth adjustment in Member State economies – and by extension the smooth functioning of the euro-area economy - depends crucially on the conduct of appropriate micro-economic policies. Once these microeconomic policies have delivered the necessary degree of market integration and flexibility, EMU can be said to be in the steady state (always allowing for the absence of a centralised budgetary policy and significant cross-border labour mobility) and the constraints on macroeconomic stabilisation in the Member States are no longer a major concern.

During a transitional period, however, risks remain of a less efficient or predictable process of economic stabilisation in the Member States. In this context, it was recognised from the outset that, during the early years of EMU, some euro-area members would be more vulnerable to economic shocks with country-specific effects. Firstly, the fact that several countries entered EMU with budget deficits of close to 3% of GDP limited their room for budgetary manoeuvre until such time as compliance with the Stability and Growth Pact's medium-term objectives had been achieved (Eichengreen and Wyplosz, 1998). Secondly, given the complexity of Europe's product and labour market institutions, it was clear that structural reforms to enhance the responsiveness of prices and wages to economic shocks would not be achieved over night (Buti and Sapir, 1998). Indeed, some authors, such as Jacquet (1998), predicted that it was not until EMU's macroeconomic framework was in place that the urgency of structural reform in some Member States would be fully understood. Thirdly, it was argued in some quarters that the launch of EMU itself might give rise to temporary asymmetries. Buti and Sapir (2001), for example, warned of a transitional "EMU shock" as Member States that had previously been part of the DM zone adjusted to a monetary policy based on economic conditions in the euro area rather than Germany and economically peripheral Member States absorbed the demand-side effects of the sharp drop in interest rates triggered by accession to the euro area. Under such circumstances, it was recognised that the main task of economic policy in the early years of EMU was to 'manage economic disturbances while "ferrying" the new regime towards its steady state by reducing exposure to asymmetric shocks, increasing the adaptability to symmetric and asymmetric shocks and ensuring price stability' (Buti and Sapir, 2001).

#### **4. Experience with country-specific shocks under monetary union**

During the three decades of analysis and debate that led up to monetary union, the core issue in research and policy debates lay in the internal dynamics of EMU in the face of country-specific shocks, or common shocks affecting members differently. How large might such asymmetric effects be in practice, in light of recent business cycle experience in Member States? Would product and (particularly) labour markets respond sufficiently flexibly to such shocks, avoiding serious output and employment costs? To what degree should the modest size of the EU budget be a cause of concern, in terms of the capacity for buffering shocks to national economies?

Broadly, experience in the early years of monetary union confirms that this has been the key challenge. The creation of the euro was implemented with exceptional efficiency. The common monetary policy achieved strong credibility,

as evidenced in the low rates of inflation and of inflationary expectations. The role of the euro has transformed international capital markets, and it rapidly took its place as a leading currency in global markets. Moreover, the economy of the euro area has successfully weathered a series of common shocks – including the dotcom boom, the impact of 9/11, the recent rise in oil prices, and the emergence of large global imbalances. Thus many of the concerns expressed prior to the launch have not materialised. While there have been significant difficulties in implementing the procedures for budgetary co-ordination among the Member States, the fear of a generalised breakdown in discipline in the euro area – when the constraints of preparations for euro adoption had been removed – has proven to be unfounded.

By contrast, questions have arisen in the policy community and among academics about the internal adjustment process within the euro area, and in particular protracted divergences in growth and inflation among the Member States. These have involved some major shifts in intra-euro real effective exchange rates, accompanied in some cases by large current account imbalances. The German economy, for example has grown very slowly and experienced steep real depreciation, while the reverse has been the case in Spain. Ireland underwent strikingly successful real convergence, but in Portugal the same process aborted quite soon after euro adoption. The situation in Italy has become strained in terms of both macroeconomic policy challenges and underlying competitiveness.

Some element of these differences in inflation rates and – to a lesser extent – growth rates can be traced to the dynamics of real convergence within the euro area, as the less-developed Member State economies catch up with the more developed Member States. However, the extent of differences has focused attention on the efficiency of adjustment under monetary union, and whether it is fostering increasingly optimal conditions through endogenous effects and policy initiatives.

To a degree, the issues raised by this experience can be traced to concerns identified in the run-up to monetary union. The economies experiencing adjustment problems under the euro typically had not advanced as much as hoped in creating flexibility – either fiscal, or structural, or both. So adjustment problems, and their spillovers, could be attributed to a reform deficit.

But the recent period also raises some questions about adjustment within the monetary union that may not have been fully anticipated. For example, it was anticipated that national real interest rates could, for a time, undergo a perverse shift during adjustment to country-specific shocks; but experience has raised questions whether asset markets potentially amplify this effect, particularly in the conditions of ample global liquidity that have applied since the late 1990s. The risks of a consciously pro-cyclical fiscal policy had been well identified; but a question also arises about the scope of inadvertent pro-cyclicality during extended booms, when revenues are swollen by asset market developments and a consumption-rich composition of GDP. There had been marked concern about low labour mobility, but the possibility of weak or delayed responsiveness in prices and wages at times of cyclical slack had perhaps not been systematically identified. The scope for national fiscal, financial and labour market developments to interact in a mutually-reinforcing manner also deserves to be probed more than in the past. And spillovers of fiscal policy had been considered, but the scope of spillovers from private sector activity – for example, when there are strong housing booms in many euro-area economies – deserve to be explored also.

The remainder of this study therefore focuses primarily on adjustment to country-specific shocks in the euro area. It seeks to elucidate how flexibly economies have responded in conventional OCA terms, but also to shed light on aspects of policy and market dynamics that had not been fully anticipated. This allows some conclusions on: whether adjustment under the euro is functioning stably over the medium-term; where there are stresses, what forces or rigidities are driving these; and in light of these findings, what policy improvements at the national or euro-area level could help improve the efficient working of the monetary union.

# III. ECONOMIC DEVELOPMENTS AND ADJUSTMENT

## Summary

*An assessment of developments in key macroeconomic variables in euro-area countries over a period spanning the creation of the euro area in 1999 reveals a number of interesting features. First, Member States have had diverse experiences in terms of GDP growth and inflation. Second, a closer look at the data uncovers diversity in the components of growth and in underlying economic fundamentals. For example, some countries, such as Germany, have relied primarily in recent years on the external sector as a driver of growth, while domestic demand has been the key factor in others, e.g. Spain. Within the euro-area, Germany has experienced a steady improvement in competitiveness vis-à-vis the other 11 countries since 1999, while Greece, Spain, Ireland, Italy, the Netherlands and Portugal have lost ground. Third, potential discriminating features such as country size or "catching-up" cannot explain all of the observed divergence in economic performance. For example, among catching-up countries, both Spain and Ireland have experienced robust growth since 1999, while the Portuguese economy has stagnated. Empirical analysis of behavioural relations for private consumption and investment expenditures show that, while these differ across countries, there is practically no series break around the time of euro adoption. To the extent economic performance across countries diverged, this in part reflected disturbances or "shocks" in the determinants of these expenditures. In particular, a significant part of the divergence in performance after euro adoption reflected investment behaviour, especially investment in residential housing. Financial markets underwent increasing integration across the euro area. It is too early to determine from the data how this has affected risk-spreading and income smoothing across euro area at time of real sector shocks, and thus buffering the adjustment process. Inflation developments, also, suggest issues to be explored more deeply in the remainder of this Review. On the one hand, there was notable success in keeping area-wide inflation close to the ECB's definition of price stability, and achieving high credibility in terms of inflation expectations. On the other hand, there were significant and persistent divergences in inflation across the area, which need to be better understood.*



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# ECONOMIC DEVELOPMENTS AND ADJUSTMENT

## 1. Macroeconomic developments across the euro area – a bird's eye view

This section presents a snapshot of the evolution of the main macroeconomic indicators across euro-area countries for the period 1992 to 2005, which encompasses seven years before and after the creation of the euro area in 1999. The aim of this section is to provide an overview of the varied experiences of the twelve countries making up the euro area. From this overall view, we identify six countries that, because of their diverse experiences within the euro area, serve as useful case studies for an analysis of how economic adjustment is progressing in the euro area. These are Germany, Spain, Ireland, Italy, the Netherlands and Portugal.

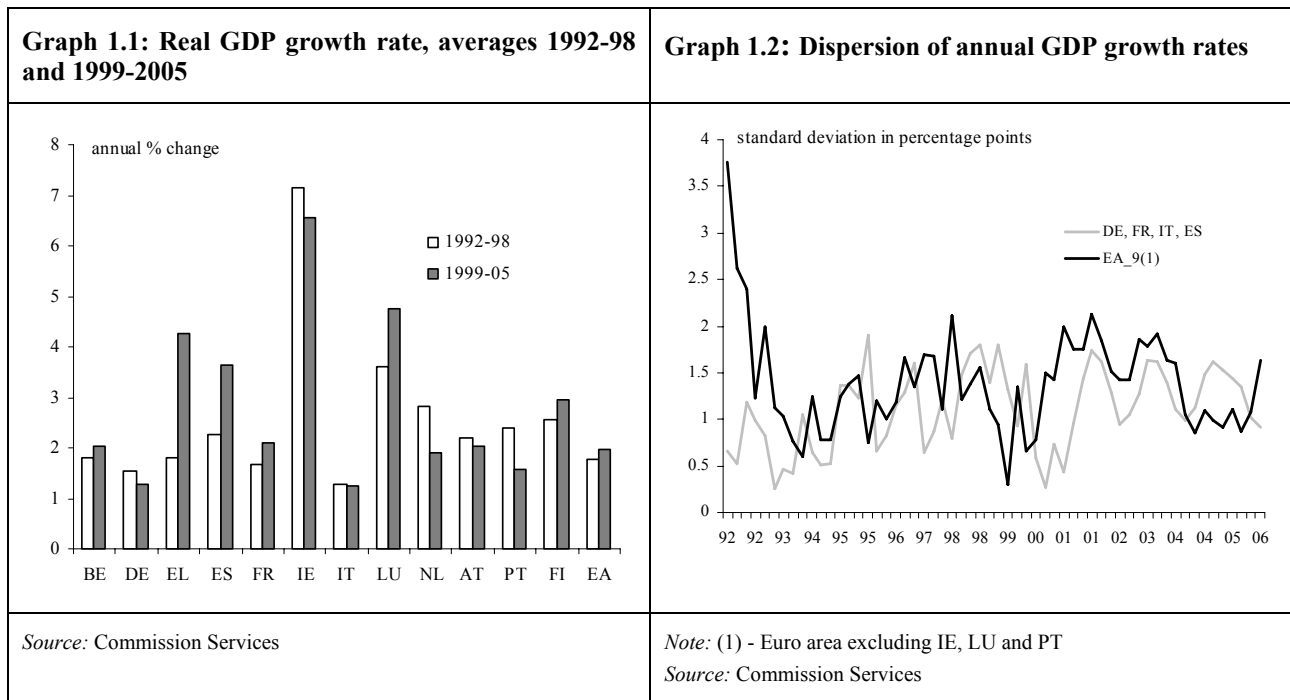
The macroeconomic indicators covered below are: real GDP growth and its main components – private consumption and investment – inflation, employment, unemployment, wages, productivity, the real effective exchange rate and the current account balance. A summary of comparative macroeconomic performance is presented in the tables annexed to this chapter.

### *Real GDP*

The relatively modest economic performance of the euro area since 1998 hides considerable differences across individual Member States. A glance at average growth rate in the period 1999 to 2005 in Graph 1.1 reveals three country groupings: Germany, Italy, the Netherlands and Portugal with growth below the euro-area average; Belgium, Austria and France with growth slightly above the euro-area average; Greece, Spain, Ireland, Luxembourg and Finland with growth appreciably above the euro-area average.

Differences in growth performance were already apparent in the pre-1999 period. A comparison of rankings prior to and after the creation of the euro area shows that the position of Ireland at the top and Germany and Italy at the bottom remained unchanged between the two periods. Among the remainder, Greece, Spain and Luxembourg improved their growth ranking by enhancing their growth performance vis-à-vis the pre-1999 period, while the Netherlands and Portugal lost considerable ground through a sharp fall in their average growth rates. The pace of economic activity in Belgium, France and, to a lesser extent, Austria shadowed the euro area quite closely during both periods.

More specifically, the Greek economy accumulated a positive GDP growth differential of about 20 percentage points vis-à-vis the euro area during the period 1999-2005. This is a marked difference with the pre-1999 period when there was practically no growth divergence with respect to the euro area. For Spain, the corresponding growth gaps were 14 percentage points (1999-2005) and 4 percentage points (1992-98). The Netherlands and Portugal provide contrasting experiences to Greece and Spain. While the Netherlands significantly outperformed the euro area during 1992-98, the pace of growth decelerated after 1998. Similarly, Portugal's economic performance was weaker after the creation of the euro area compared to the pre-1999 period, with an accumulated negative GDP growth differential of about 3 percentage points vis-à-vis the euro area since 1998. A deterioration in the already-subdued growth performance between the pre- and post- 1999 periods is also visible in Italy and even more so in Germany: both countries have recorded a cumulative negative growth gap of about 5 percentage points since 1998 vis-à-vis the euro area.



A calculation of the standard deviation of year-on-year economic growth rates in each quarter over the past fifteen years in euro-area Member States provides an indication of the extent to which individual GDP growth rates have converged. A decrease in the standard deviation implies that divergence is decreasing, and vice-versa. Given the relative short-time spans involved, a change larger than one standard deviation is considered as statistically significant. This indicator suggests considerable convergence of GDP growth among euro-area countries between 1992 and 1996 (Graph 1.2). However, in the subsequent two years before the creation of the euro area, during which the economies pursued different fiscal and monetary policies in order to meet the Maastricht criteria, a divergence in growth rates emerged as shown by a rising standard deviation. GDP growth rates converged in 1999 and 2000 but growth differentials increased again in the next two years. This increased divergence in GDP growth rates took place in the midst of a prolonged euro-area slowdown, to some extent reflecting the different degree of resilience of euro-area economies. The data for the last four years, however, suggest that some moderate convergence may be underway.

As noted previously, there have been marked differences in the growth performance of some euro-area economies before and after the creation of the euro area. While the process of catching-up may go some way towards explaining divergent experiences, it is not a discriminating factor in this respect. For example, while Spain, Ireland and Greece grew much faster than larger, sluggish growth, countries such as Germany and Italy, Portugal did not succeed in sustaining the pace of catching-up that was evident before 1999. Growth divergences are not perfectly correlated with country size either. For instance, the Netherlands shared a similar decelerating growth experience to Portugal, while per capita GDP growth in France has outperformed that of Italy and Germany both before and after the creation of the euro area.

Underlying the observed differences in GDP growth are divergences in the contributions of the domestic and foreign sectors to growth. For the euro area as a whole, the average contribution of domestic demand (excluding stock building) increased from 1.5 to 1.9 percentage points between 1992-98 and 1999-2005, while the average contribution of net trade diminished considerable from 0.28 to 0.08 of a percentage point. Within this overall trend, the experiences of Germany and Spain are in striking contrast. Germany witnessed a sharp rise in the contribution of the external sector and a substantial fall in the contribution of domestic demand, while Spain had the opposite experience. The Netherlands and Austria shared the same trend as Germany, although the changes were less pronounced. In Greece and Portugal the average contributions from the external sector was negative in both periods, while France and Italy joined the group with a negative contribution from the external sector in 1999-2005.

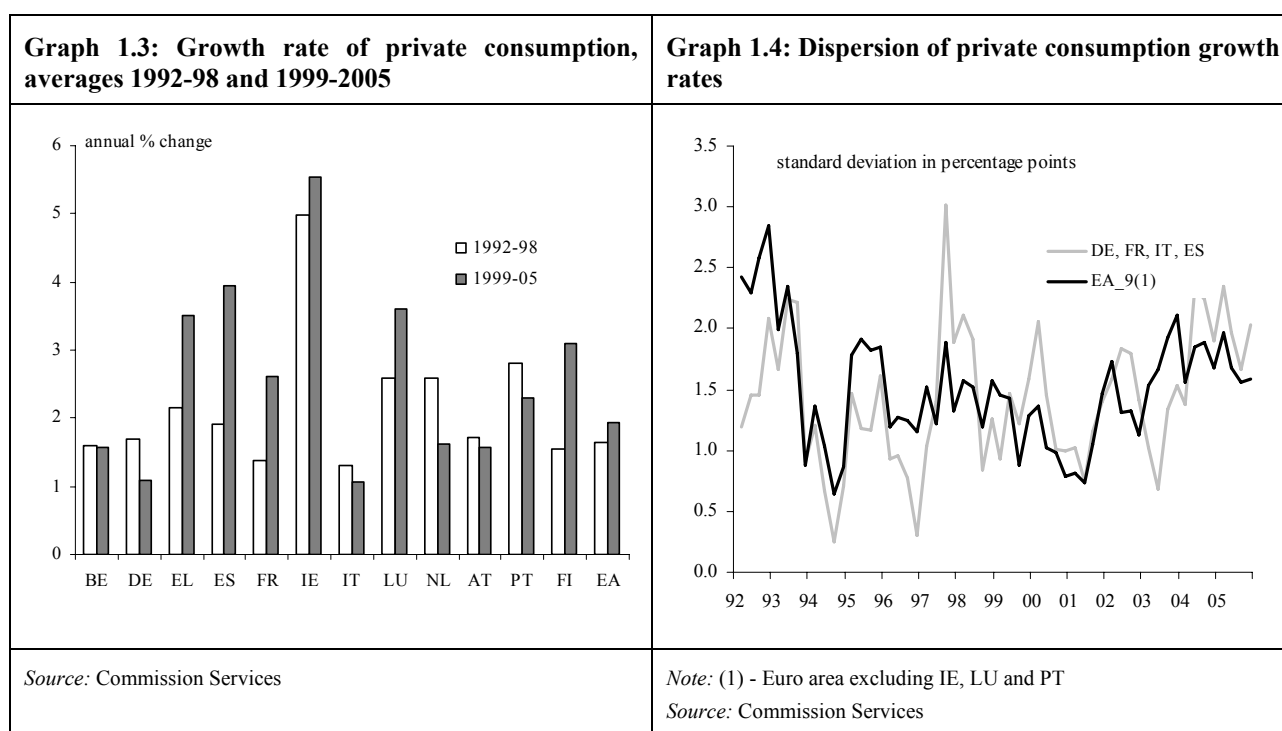
#### Private consumption

Graph 1.3 shows the performance of private consumption in euro-area countries before and after the start of the third stage of EMU. Since 1999, growth in private consumption has been consistently faster than in the euro-area average in some Member States. This is particularly the case of Ireland, which accumulated a (positive consumption) gap of about 30 percentage points vis-à-vis the euro area between 1999 and 2005. But Spain, Luxembourg, Greece, Finland, France and Portugal also experienced stronger consumption growth than the euro area. On the other hand, the pace of

consumer spending in Germany and Italy has been very weak since 1998 with a cumulated negative growth gap of about 7% in both countries compared to average growth in the euro area. Subdued consumer spending after the start of the third stage of EMU was observed also in Austria, Belgium and the Netherlands.

Even more telling than cross-country divergences in consumption growth are the differences in the performance of private consumption before and after 1999 in some euro-area Member States. This is particularly the case for Spain, where private consumption has been booming since 1999, while it grew broadly in line with the euro-area wide average during 1992-1998. The differences in consumer spending patterns before and after the creation of the euro are striking also in such countries as Greece, Finland and France. It is noticeable that French consumer spending has outpaced the euro-area average since 1998 while, in marked contrast, private consumption growth in France was more subdued than in the euro area before the creation of the euro area. The performance of private consumption in France is also significantly different from the experience of Italy and Germany, where the negative gap vis-à-vis the euro-area average growth rate in private consumption growth widened after 1998 compared to the period 1992-1998. Private consumption growth in Belgium, Austria and the Netherlands was also weaker after 1998 compared with the pre-1999 period.

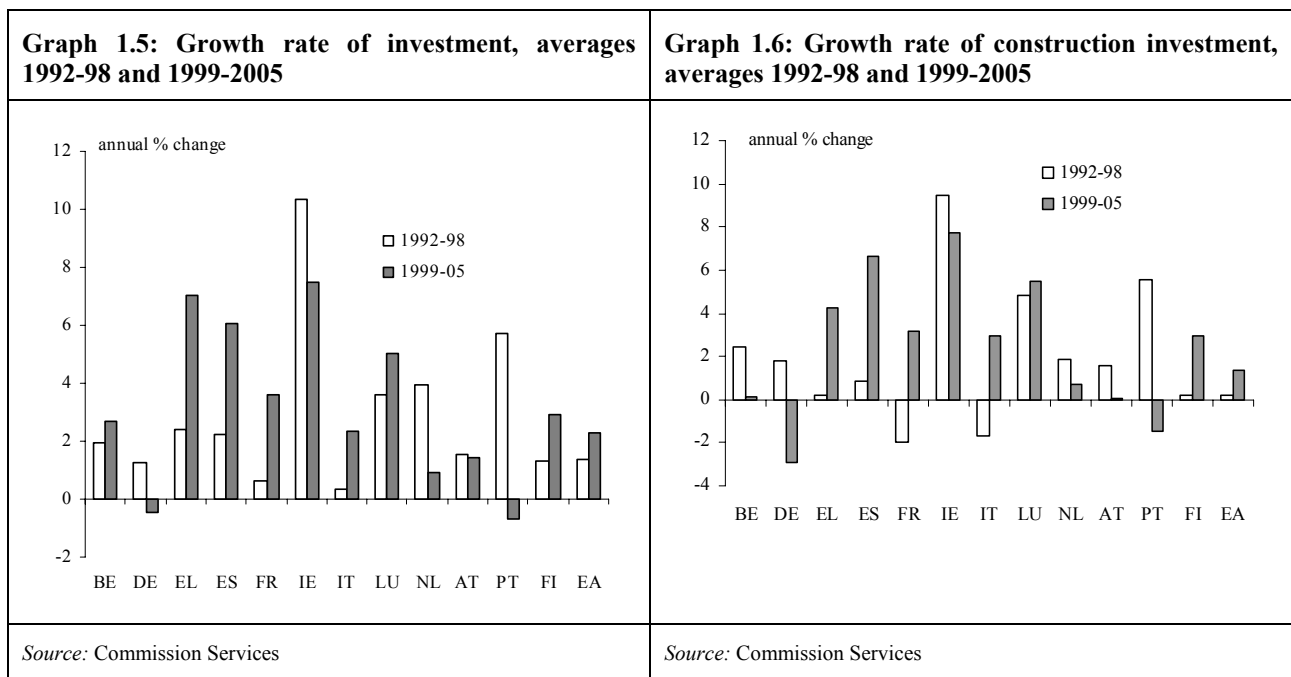
Another perspective to this issue of divergence in private consumption growth across euro-area countries is provided by looking at the standard deviation over time of the year-on-year growth rate. There is some evidence that variations in consumption growth rates have somewhat increased in recent years, particularly among the four largest euro-area Member States (see Graph 1.4).



### Investment

Investment spending has also been characterised by significant diversity across the euro-area Member States. Although the euro area experienced the beginning of an investment boom in 1997-98, the economic downturn in the first half of the 1990s – with euro-area investment spending registering a 6.3% drop in 1993 – meant that investment growth averaged only 1.3% for the euro area as a whole in the period 1992-98. During that period, by far the highest investment growth was observed in Ireland, with average annual investment growth of 10.3%, followed by Portugal with 5.7% and the Netherlands 3.9%. In contrast, Italy and France experienced much lower investment growth, of 0.3% and 0.6%, respectively, with investment spending in Germany growing around the euro-area average of 1.3%.

In the period from 1999 to 2005, investment growth averaged 2.3% in the euro area. This period also includes significant business-cycle movements, with high investment growth in the euro area as a whole in 1999 and 2000 followed by a protracted slowdown and a slight pick-up in investment spending in 2004 and 2005. Germany and Portugal experienced annual average declines in investment spending during the period of 0.4% and 0.7%, respectively, while investment grew very moderately in the Netherlands. Investment growth was again strongest in Ireland, at 7.5%, despite some moderation following the bursting of the ICT-bubble, while Greece and Spain also experienced very robust average annual investment growth, of 7% and 6.1%, respectively.



As a whole, investment spending has remained roughly constant as a share of euro-area GDP, around 20-21%, with some cyclical swings, including a trough in 1993 at 19.8%, and a peak in 2000 at 21.4%. In the current recovery, the investment ratio has improved slightly from 20.6% in 2002 to 20.9% in 2005. There are significant divergences across Member States, with the share of investment in GDP in Spain increasing from around 22% in 1995 to more than 28% in 2005. Similarly, the share of investment in GDP has increased by more than 5 percentage points in Ireland and Greece, to above 25% in 2005. On the other hand, in Germany, the share of investment in GDP has diminished from above 21% in the mid-1990s to around 18.5% in 2005. In the Netherlands and, in particular, Portugal, the investment rate peaked in 1999 and since been adjusting downwards.

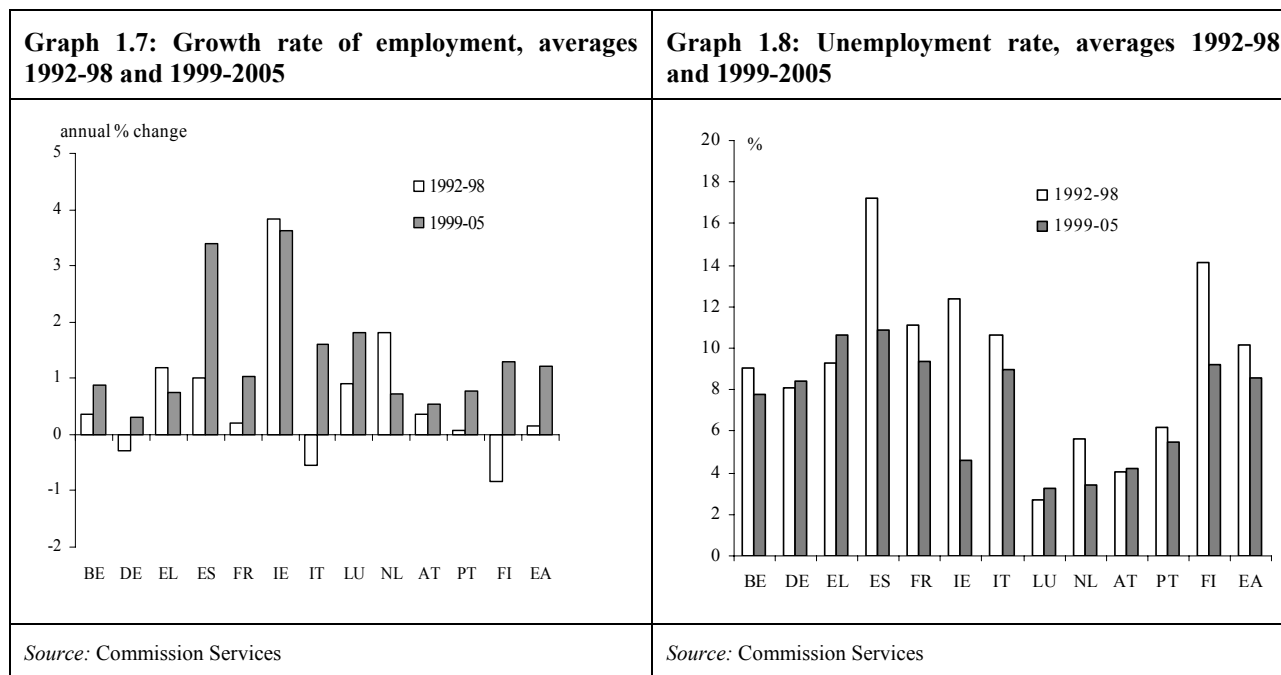
Looking at the breakdown of investment by product, a significant part of the divergence stems from construction investment, primarily due to differences in housing markets. In the period 1992-98, construction investment grew on average by 0.5% per year in the euro area. France and Italy experienced an annual average contraction of construction investment in that period of 2% and 1.7%, respectively, whereas construction investment growth averaged 1.8% in Germany, due to very strong construction activity in 1992-94, and 0.8% in Spain. The highest rates of growth during that period were seen in Ireland and Portugal, at 9.5% and 5.5%, respectively.

The positive growth rate in Germany during that period was however due to very strong growth in the wake of unification in 1990, which was followed by a period of prolonged contraction in construction. The only year with positive growth in construction investment in Germany since 1994 was 1999. As a consequence, Germany has experienced an average annual contraction of 2.3% in construction spending since 1995 (by 2.7% in the period 1999-05). In contrast with the contraction in the period 1992-98 period, construction investment averaged around 3% in France and Italy. While construction investment has continued to be strong in Ireland, Spain and, to some extent Greece, experienced strong booms in the construction sector, during which average construction growth reached 6.6% and 4.2%, respectively. Despite the downward adjustment in Germany, the growth rate of euro-area construction investment averaged 1.4% annually in the period 1999-2005.

#### *Employment and unemployment*

An examination of the data reveals a strong correlation between employment growth and real GDP growth over the whole period 1992-2005. Thus, at first glance, relative employment differences appear to be as persistent as growth differences. But an investigation of individual performance at the Member State level uncovers some interesting nuances. Spain, Ireland and Luxembourg witnessed above-average employment and output growth in both periods, while Greece was unable to sustain strong employment growth in 1999-2005 despite a robust growth performance. Italy succeeded in moving from an overall trend of job loss in the period 1992-98 to one of average employment growth in the post-1999 period despite a slowdown in growth, while Germany suffered from job loss in the period 1992-98 and the lowest average rise in 1999-2005. Austria and Portugal both improved their average employment growth despite a worsening growth performance. The Netherlands' experience of above-average growth and employment performance in 1992-98 was followed by below-average performance on both counts in the post-1998 period.

Using the change in the rate of unemployment rather than employment growth does not yield a systematically different picture. Differences in employment performance match differences in the change of unemployment rates.<sup>1</sup>



### Wages and labour productivity

The overall euro-area trend of declining growth in nominal wages (proxied by nominal compensation per employee) between the pre- and post- 1999 periods is shared by all participating countries apart from France, Ireland, Luxembourg, the Netherlands and Finland. Among the countries in the former category, Germany stands out in the sense that it moved from a position of wage growth above the euro-area average in the pre-1999 period to below the euro-area average in the post-1998 period. Among the other large countries, while average wage growth in Spain and Italy fell, it remained above the euro-area average, while the slight rise in average wage growth in France left it close to the euro-area average. For the smaller countries, the rising wage growth in the Netherlands took it above the euro-area average, while Portugal's average wage growth (although falling) remained above the euro-area average.

The largest deviations from the euro-area average in both periods were recorded by Greece and Portugal, while Ireland's wage growth was markedly above the average in the post-1998 period. In the case of Ireland, this is in line with strong employment growth and GDP performance. In contrast, Portugal's employment growth was relatively weak in both periods. Spain combined a surge in employment growth in the post-1998 period with a slowdown in wage growth while the Netherlands experienced rising wage pressures and slowing employment growth.

Despite the significant differences in the wage formation systems across euro-area countries, wage developments over the past 10 years appear broadly in line with cross-country differences in employment performance. Countries with relatively low employment growth also had relative low growth of hourly labour costs over the period 1992-2005. Portugal and Greece, with a relatively high wage growth and weak employment performance are the most notable exceptions. Since Greece joined the euro area only in 2001, the high wage growth may be explained by the devaluation of the Greek currency relative to the euro before the adoption of the euro.<sup>2</sup>

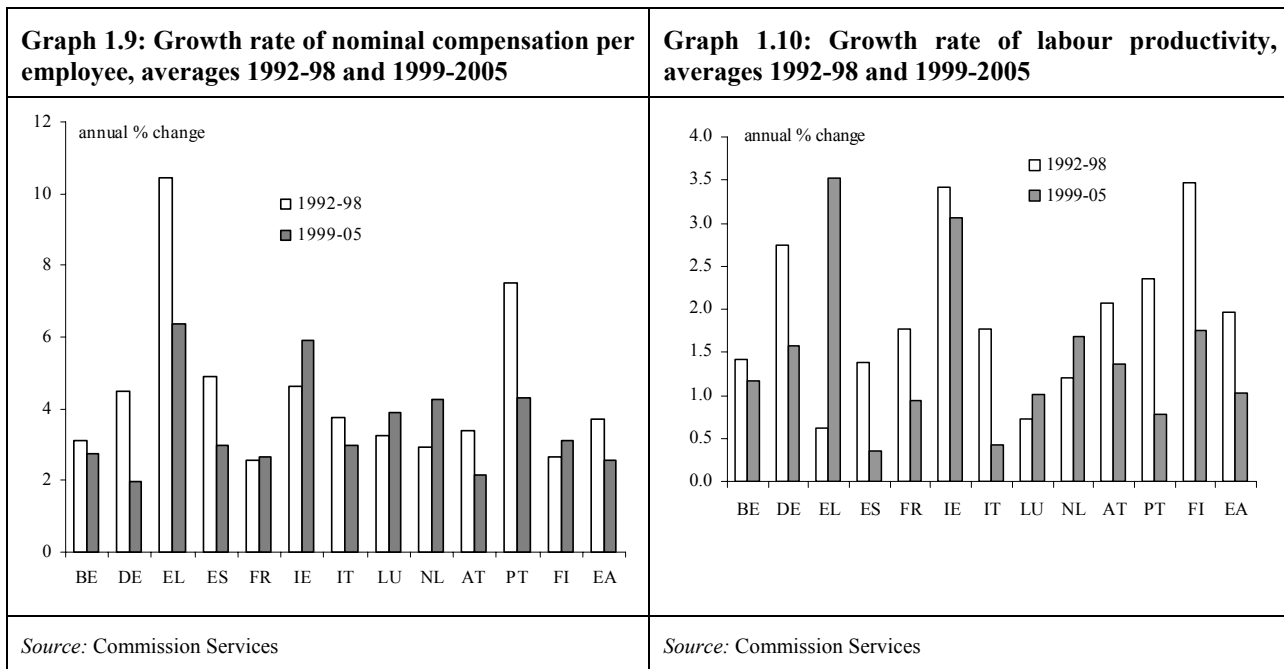
Starting from a low wage level in the mid-1990s, Ireland combined strong employment and wage growth. Greece, Portugal and Spain, all with relative low wage levels in the mid-1990s, had different price and quantity dynamics over the last 14 years. Indeed, only Spain managed to combine high wage growth with high employment growth.<sup>3</sup>

<sup>1</sup> A notable exception is Luxembourg. The country combined strong employment growth with a sizeable increase in the rate of unemployment, reflecting its special situation as regards very low rates of unemployment in the 1990s that varied between 2% and 3% and the large inflow of cross-border commuters in response to labour supply shortages.

<sup>2</sup> Greek producers that only serve the domestic market were less exposed to wage pressure than the graphs might suggest. However, Greek producers operating in the euro-area market were faced with the highest increase in domestic labour costs in the euro area.

<sup>3</sup> The ranking in terms of nominal ULC is somewhat more uneven because the productivity performance has differed from wage developments in some countries.

Overall and across the different indicators, employment growth is consistently linked to wage growth in those euro-area Member States with a high initial wage level.<sup>4</sup>

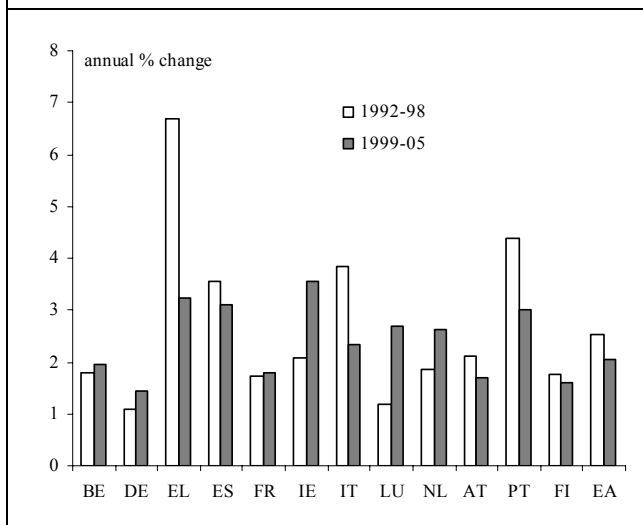


The measure of labour productivity used in Graph 1.10 is GDP output at constant 2000 prices per person employed.<sup>5</sup> The overall euro-area trend of declining growth in labour productivity between the pre- and post- 1999 periods is shared by all participating countries apart from Greece, Luxembourg and the Netherlands. Among the countries in the former category, the biggest decelerations took place in Spain, Italy, Portugal and Finland. Portugal stands out in the sense that it moved from a position of labour productivity growth above the euro-area average in the pre-1999 period to below the euro-area average in the post-1998 period; and this took place while average wage growth, though falling, remained above the euro-area average. Italy's deceleration was much sharper than the deceleration in nominal wage growth. Although Germany's average labour productivity growth rate diminished, it remained above the euro-area average. On the other hand, both Greece and the Netherlands succeeded in raising average growth in labour productivity from below to above the euro-area average.

<sup>4</sup> The use of alternative indicators such as nominal unit labour costs does not change the picture substantially.

<sup>5</sup> Note that for data comparability reasons, it was not possible to use the GDP per hour worked indicator of GDP since the series does not start until 1996.

**Graph 1.11: HICP inflation rate, averages 1992-98 and 1999-2005**



Source: Commission Services

Inflation performance across euro-area countries in the years preceding the start of the third stage of EMU was characterised by a considerable degree of convergence towards low inflation. In the early 1990s, most Member States recorded average annual inflation rates higher than 3½%. Spain and Italy had inflation rates in excess of 6%, while Portugal and Greece registered even double-digit inflation rates. By 1998, the year when the Maastricht nominal convergence criteria were assessed, inflation across these countries had fallen to close to 1% on average, with only three countries showing annual inflation rates above 2% (of these countries only Greece recorded inflation above 2½%). The period since the creation of the euro area saw a continuation of low inflation in most countries, with inflation in the area as a whole accelerating somewhat to just above 2% on average. In fact, in spite of sharp increases in oil prices and an initial sharp depreciation of the euro, for most Member States, the euro-area period corresponds to one of unprecedented price stability. Another stylised fact of the early years of the third stage of EMU is the existence of persistent inflation differentials. Countries

that displayed below average inflation in one year, tended to remain below average for several years, and vice versa (see Graph 1.11). This seems to be a specific characteristic of inflation dynamics in the euro area, while other large monetary unions, like the US, tend to display less persistent inflation differentials.<sup>6</sup>

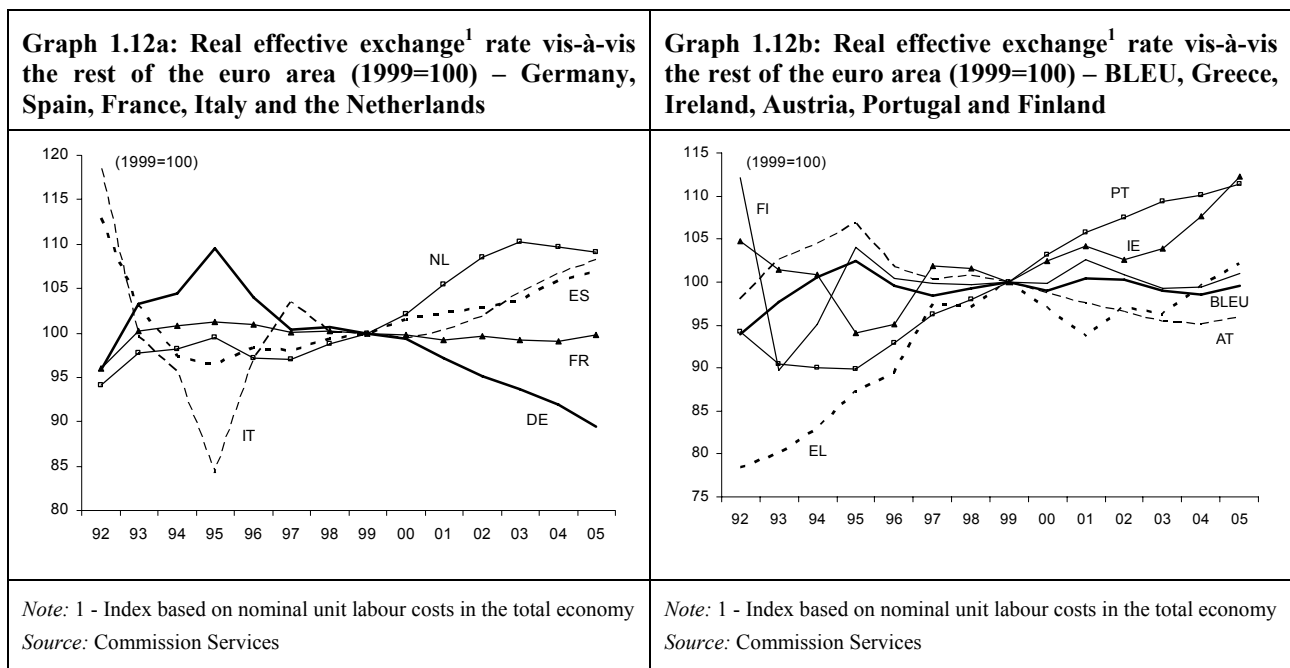
*Competitiveness and the current account balance*

In this sub-section, we consider below the evolution of cost competitiveness as measured by an indicator of the real effective exchange rate (REER) against the rest of the euro area. More specifically, the index of cost competitiveness used is based on nominal unit labour cost (for the total economy).<sup>7</sup> Under the euro, changes in competitiveness vis-à-vis the other euro-area countries can only be achieved through relative (price or) cost movements. While the large movements observed before 1999 (which were mostly the result of devaluations within the ERM) are no longer present, cumulative changes in competitiveness since 1999 have been sizeable in some cases (Graphs 1.12a and 1.12b).

<sup>6</sup> See Chapter V for further analysis.

<sup>7</sup> Despite a large literature on competitiveness, there is still no clear consensus on how to measure cost competitiveness. See Lipschitz and McDonald (1992) and Marsh and Tokarick (1996).





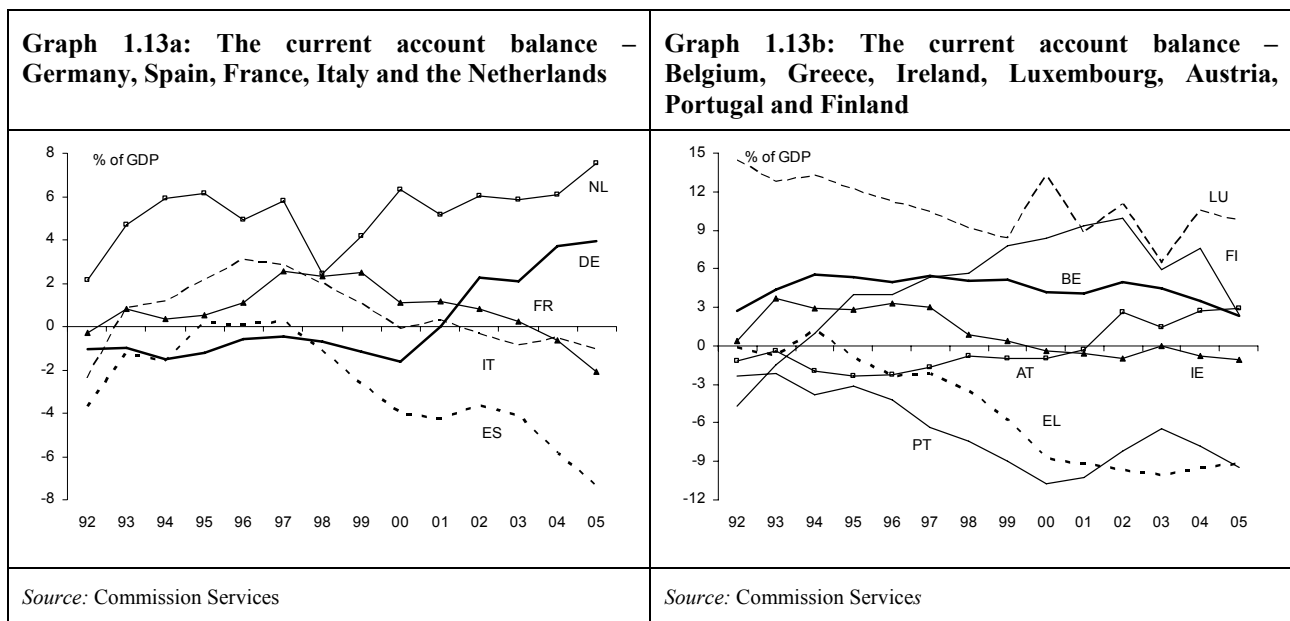
Three groups of countries can be distinguished. The first group includes Germany and, less strikingly, Austria, which have become more competitive since 1999. The second group comprises a set of countries – BLEU (Belgium/Luxembourg), France and Finland – where competitiveness has remained fairly stable over the period 1999-2005. The final group is characterised by deteriorating competitiveness positions, where the six remaining Member States (Greece, Spain, Ireland, Italy, the Netherlands and Portugal) witnessed a rise in their REER by at least 7% since 1999 (for Greece since 2001).

Developments in current account balances<sup>8</sup> (Graphs 1.13a and 1.13b) place euro-area countries in groups that are somewhat similar to those observed for competitiveness. Since 2000, Germany, the Netherlands and Austria have increased their current account surpluses considerably. The evolution of the current account mainly reflects relative developments in domestic and foreign demand (and, to a lesser extent, competitiveness developments). Improved competitiveness helped Germany to take advantage of foreign demand growth, while German domestic demand has been rather sluggish. Growth of domestic demand in the post-1999 period has also been weak in the Netherlands and Austria.

The current account deficits of Greece, Spain, Ireland and Portugal, on the other hand, have widened significantly since 1996. In the run-up to 1999, the exchange rate risk premia of Spain, Ireland and Portugal diminished. Between 1996 and 1999, real interest rates fell by more than 300 basis points in these countries, giving a boost to domestic demand. As a result of buoyant domestic demand and a lack of competitiveness, the overall current account balances of Spain, Ireland and Portugal worsened by, respectively, 7½%, 4¼% and 5¼% of GDP between 1996 and 2005.<sup>9</sup> For Greece, euro-area participation in 2001 led to comparable developments at a later stage.

<sup>8</sup> Note that the current account balances are aggregate balances, which do not allow a distinction to be made between intra- and extra- euro-area balances.

<sup>9</sup> Note that the higher oil prices have amplified the deterioration.



### Emerging picture

Based on the above illustration of the behaviour of various macroeconomic indicators, several countries stand out as interesting cases to investigate in greater depth in order to learn more about the nature of adjustment in the euro area. These include three large countries – Germany, Spain and Italy – and three small countries – Ireland, the Netherlands and Portugal. While not comprehensive, this list of countries serves to capture key features of interest in terms of adjustment dynamics. These features include protracted divergences (for example, Germany versus Spain in terms of GDP growth and its composition, inflation, and real exchange rate developments) catching-up experiences<sup>10</sup> (for example, Spain versus Portugal in terms GDP growth and housing market developments) and policy interactions.

Before focussing on this set of countries (particularly in Chapter VII), we consider several key indicators – consumption, investment, inflation and financial market indicators – in greater detail in the following sub-sections.

## 2. A closer look at key real and financial variables

### 2.1 Consumption

This section analyses the behaviour of consumer spending across euro-area Member States over a period encompassing the creation of the euro area (1989 to 2004). With the help of a standard empirical model of consumer behaviour, which has an "error-correction" form, the long-run equilibrium relation between consumption and its driving forces – income, wealth and interest rates – is evaluated. This section also investigates whether the data provide support for a stable relationship among these variables or whether there is evidence that structural changes have taken place in some euro-area countries, possibly related to changes in the adjustment process in the run-up to the creation of the euro area or thereafter.

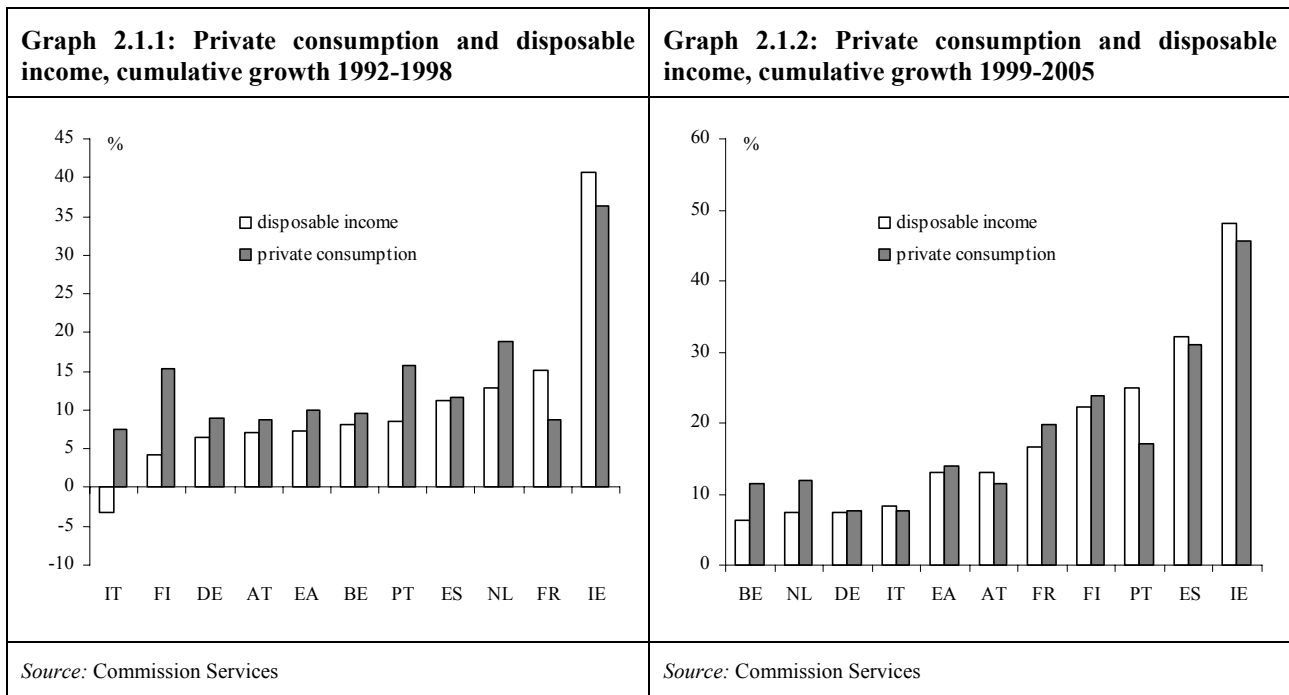
#### 2.1.1 The factors influencing consumer spending

The facts presented in the first section of this chapter show that growth rates of consumer spending have varied both across time and among euro-area countries. Before proceeding to the empirical results, we consider the behaviour of some of the variables presumed to influence consumption behaviour.

*Disposable income:* Despite the growing importance ascribed to wealth effects in explaining household consumption, real disposable income remains potentially the most important variable for explaining consumer spending. As illustrated in Graphs 2.1.1 and 2.1.2, countries with relatively high rates of household income growth also tend to have high rates of consumer spending growth and vice-versa. In Germany and Italy, in particular, weak consumption growth after 1999 paralleled weak income growth. In France, on the other hand, robust consumption growth paralleled healthy income growth. Spanish consumption and income were robust before and after 1999. However, while consumption was weaker than income growth during the period 1992-1998, it has outpaced income growth since the inception of the economic monetary union. The weakness of consumption in the Netherlands and Belgium

<sup>10</sup> Greece would also be an interesting case to study, but data limitations preclude this for the moment.

after 1999 appears to be largely explained by income developments. On the other hand, Portuguese consumption bears little relation to income both before and after 1999.



There is evidence that consumption and disposable income have been more synchronised after the creation of the euro area than during the pre-1999 period. Over the period 1992–1999, the average correlation between the annual growth rate of private consumption and disposable income was 0.58 in the euro area compared to 0.77 in the period after 1999. However, the degree of correlation has varied also across countries. In the three largest euro-area countries, it ranges from 0.93 in Germany to 0.77 in France and 0.64 in Italy.

*Saving rate:* With an unchanged saving rate, low consumption growth is generally associated with low income growth. However, the saving rate in several euro-area countries has been far from constant in the last fifteen years. An examination of the household gross saving rate across euro-area participants reveals various patterns. Among the four largest countries, only in France has the saving rate remained broadly unchanged over the last 10-15 years. There was a limited increase at the beginning of this decade, with a spike in 2002 that was, however, corrected in 2003. In Italy, the saving rate fell by about 10 percentage points between 1992 and 1998, partly as a result of a strongly diminishing inflation rate. However, the saving rate appears to have risen again since the beginning of this decade. A similar saving pattern is observed also in Germany, although from a markedly lower starting position. On the other hand, the saving rate has continued to decline in Spain, thus providing additional support to consumption growth on top of healthy income growth.

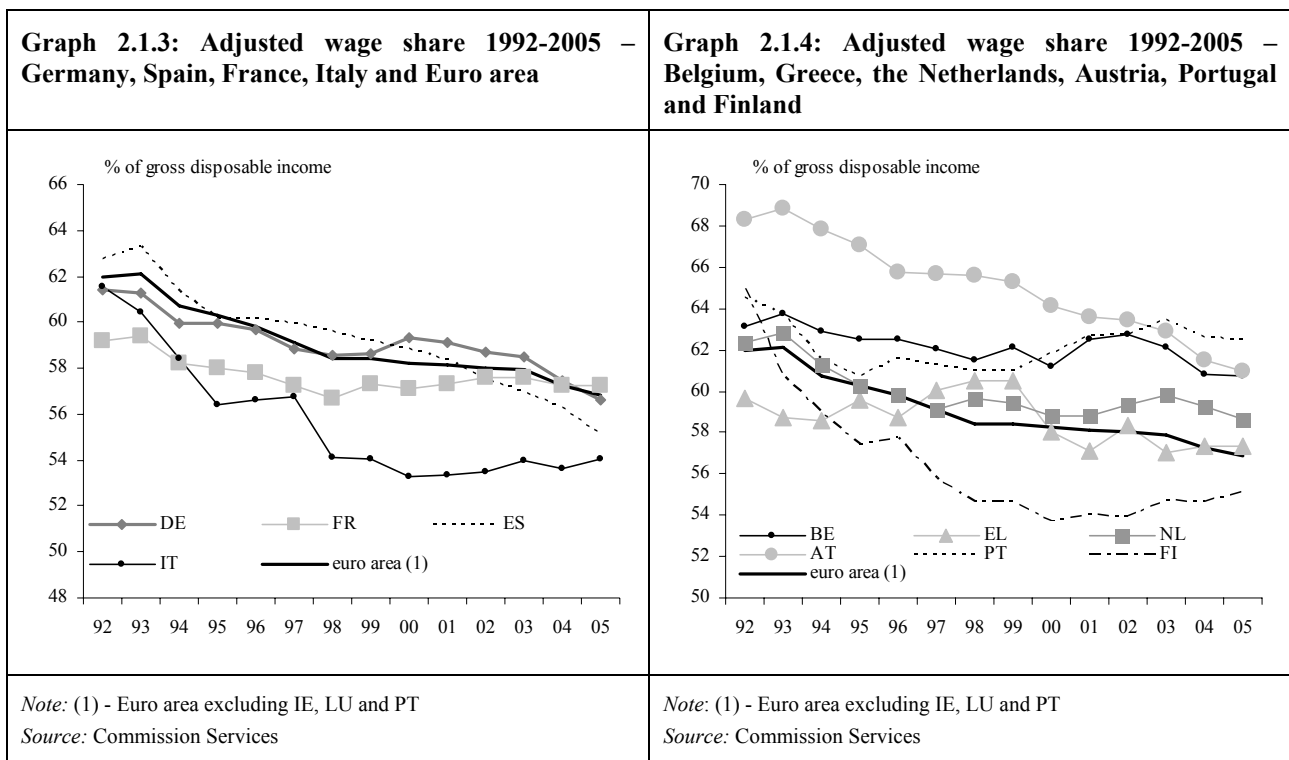
In most of the remaining euro-area Member States, household saving rates have generally shown a downward trend, the only exceptions being the Netherlands and Portugal in the early years of this decade. While household saving rates since 1999 have exhibited different patterns across euro-area countries and influenced consumption developments, it is worth noting that the level of the saving rate in several euro-area countries (and, in particular, in the four largest Member States) is currently not very different from the level observed towards the end of the previous decade when the economy was booming. This argument supports the view that the current subdued level of private consumption in some Member States has more to do with weak income growth than with the rise in the saving rate.

As the rise in the savings rate took place mainly in 2001-2002, a period of subdued economic activity in the euro area, it is difficult to reconcile with stylised business-cycle findings. For example, the permanent income hypothesis would indicate that, following a (temporary) fall in income, households would draw on their savings to smooth consumption over time. In addition, the stabilisation of inflation and a roughly constant ratio of financial assets to disposable income over the last few years would imply a levelling off of households' saving rates, but it cannot explain the recent increase.

A number of factors may have led households to increase precautionary savings. These include higher uncertainty due, inter alia, to geopolitical tensions, lack of clarity about the timing and size of some structural reforms, and/or the lingering effects of past exceptional losses in equity holdings. In some countries, it is possible that perceptions of high inflation since the euro changeover may have led households to overestimate actual inflation and accordingly

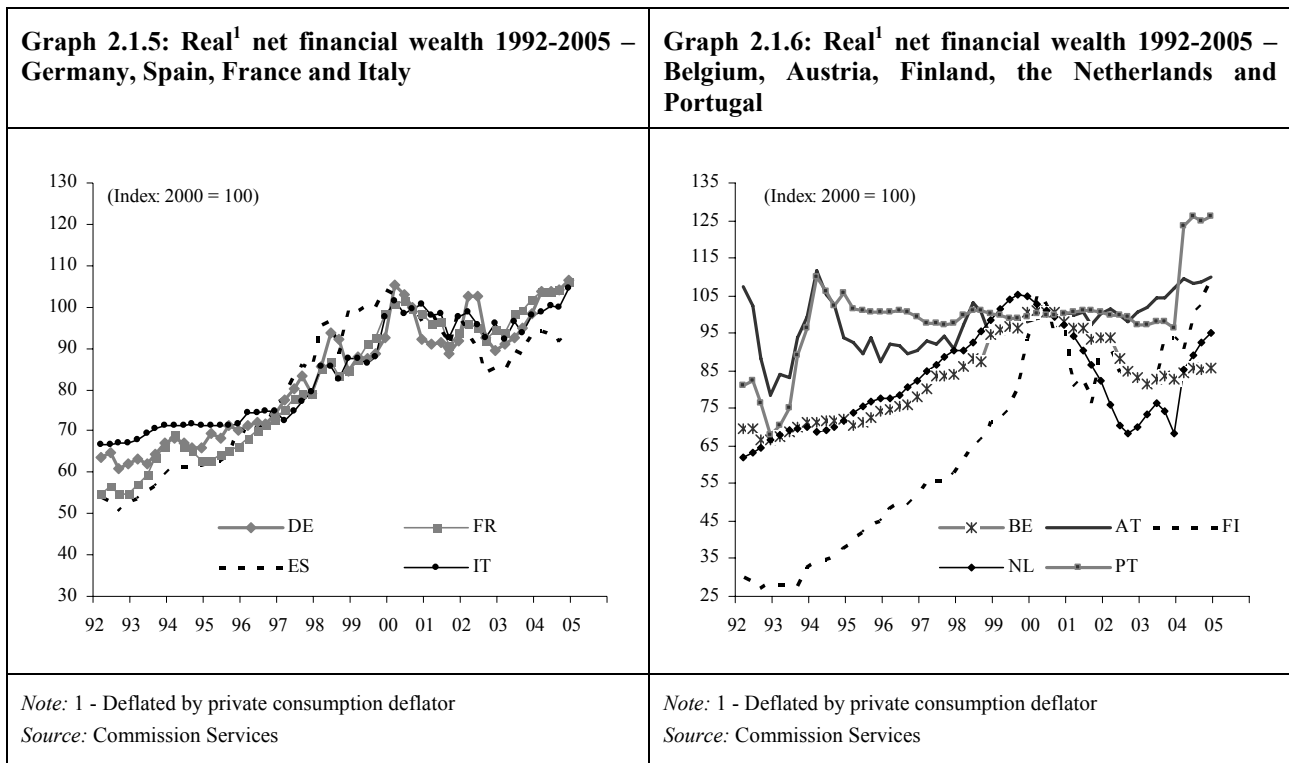
reduce their consumption. All of these factors may have induced households to save more and to accumulate, in particular, liquid assets such as those included in the monetary aggregate M3. Other elements of more long-lasting consequence, which may have encouraged households to increase savings, include policy debates on pension and health care reforms. Finally, following the strong rise in house prices in some Member States, households may have been induced to save more in order to accumulate funds to cover higher down payments required for future house purchase.

*Wage share:* Developments in the wage share<sup>11</sup> may provide another element to help understand consumption patterns across euro-area Member states. As shown in Graphs 2.1.3 and 2.1.4, an overall decline in the wage share may be observed for most euro-area countries since the beginning of the 1990s. Among the four largest euro-area economies, developments in Italy and Spain stand out. In Italy, the wage share dropped by about 8 percentage points during the past decade and broadly stabilised since 2000, while in Spain the trend-decline extended to recent years. The decline in the wage share was much less pronounced in France and Germany. In the latter, however, the decline of the wage share has been sizeable during the last three years. Also among the smaller euro-area economies, the picture is far from uniform with a decline in the wage share being more evident in Austria and limited to the previous decade in Finland. By contrast, Portugal registered an increase in the wage share since the beginning of this decade, partly reflecting the sharp deceleration in GDP growth.

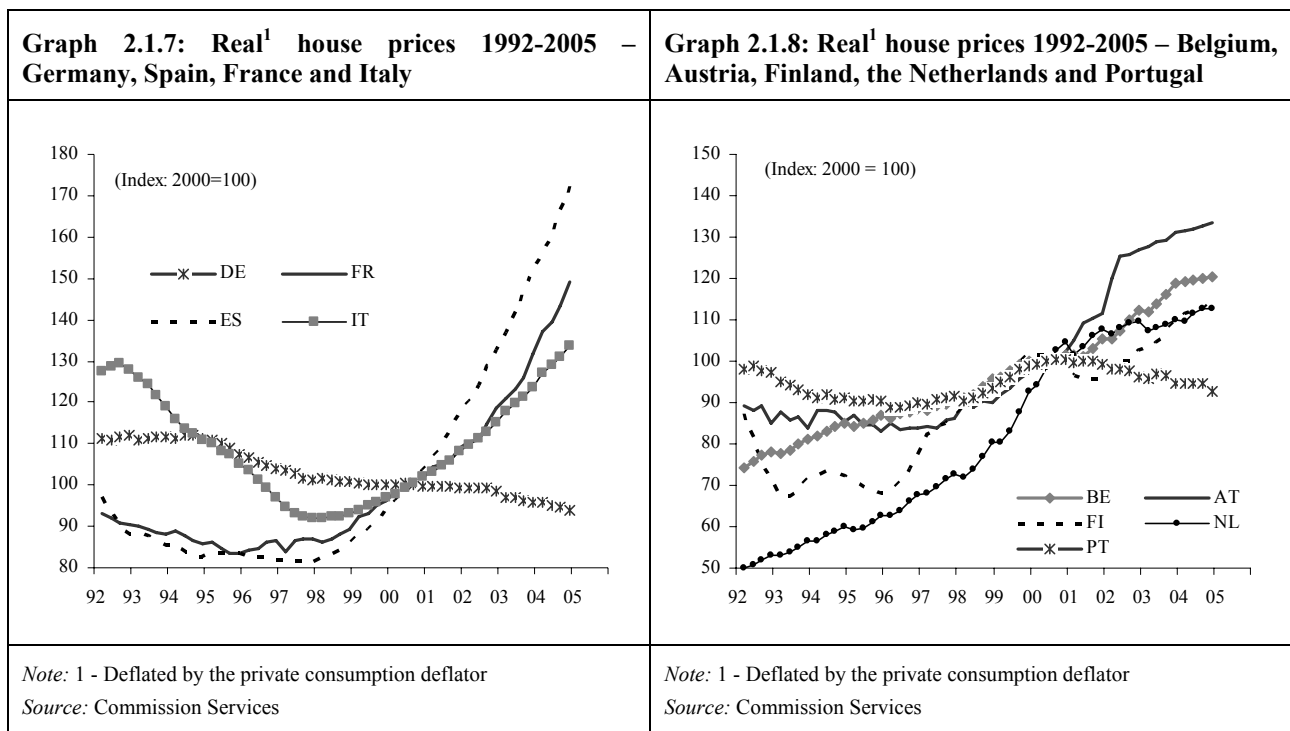


*Wealth:* There has been considerable research on the interaction between stock market prices and consumer spending in different countries. While the traditional view is that these effects are quite significant in Anglo-Saxon countries but remain relatively small in larger euro-area countries, most empirical analysis suggests that the stock market boom of the 1990s provided support to household spending in several euro-area countries. However, the contraction of households' financial wealth at the beginning of this decade (Graphs 2.1.5 and 2.1.6), stemming from the collapse in share prices, was not reflected by any sharp decline in consumer spending growth in several countries, like Spain, France and Denmark. This could reflect the presence of offsetting influences in these countries, for example rising house prices. Indeed, due to the pick-up of residential property prices in several euro-area Member States (but not in Germany) over the past few years (Graphs 2.1.7 and 2.1.8), the reduction of total household wealth since 2000 has been less marked than that of financial wealth.

<sup>11</sup> The graphs refer to the adjusted wage share, which is defined as compensation per employee as a percentage of GDP at market prices per person employed. The adjusted wage share reflects only changes in relative incomes and not changes in the composition of employment between employees and self-employed.



There are several possible channels through which developments in housing markets may spill over into private consumption. Firstly, changes in house prices affect spending via changes in wealth and relative prices. However, positive wealth effects for landlords might well be offset by negative wealth effects for new buyers. In addition, to the extent that changes in house prices are also reflected in rents, they will also affect consumption expenditures of tenants. Furthermore, rises in imputed rents could be a source of negative income effect for owner occupiers. A second channel is linked to the existence of credit market imperfections and asymmetric information. Insofar as houses may be used as collateral, an increase in house prices allows households to obtain additional credit to (perhaps) boost their consumption. Thirdly, housing markets also constitute a transmission channel of monetary policy, in the sense that changes in monetary policy affect the structure of mortgage rates. Hence, the current disposable income of indebted households and, more generally, its allocation between current and future consumption are affected.



*Interest rates:* Following the implementation of a common monetary policy, convergence in nominal interest rates has been strong in the euro area since the early 1990s. However, convergence in real interest rates is less evident as inflation differences persist across euro-area Member States. Real interest rates, both short- and long-term, are currently much higher in countries such as Germany compared, for example, to Spain. These differences are likely to have supported consumer spending - particularly on durables goods and residential investment – in those countries with relatively low real interest rates.<sup>12</sup>

### 2.1.2 Consumption equations

In order to investigate possible cross-country differences in consumption behaviour in the euro area, we carried out a panel data model for private consumer expenditure for a number of euro-area countries and for the euro area as a whole. According to standard life-cycle theory of consumption, real consumer expenditure is largely driven in the long run by real (disposable) income, real wealth and real interest rates. The wealth term, which includes both financial wealth (defined as net acquisition of financial assets less liabilities) and tangible wealth (largely represented by the value of real estates in the case of households), is intended to capture non-labour income streams, while the real interest rate denotes inter-temporal substitution effects in consumption. The short term-dynamics of these explanatory variables explains fluctuations of consumption around its long-run equilibrium. A benchmark model of consumer behaviour can therefore be represented by a standard error-correction equation,<sup>13</sup> details of which are to be found in Annex B.

Expected changes in government balances may also be relevant in explaining the dynamics of private consumption. As rational agents will try to anticipate future tax changes in a Ricardian manner, a consumer faced with an improvement (deterioration) of the fiscal position is expected to raise (lower) his/her consumption, for a given constellation of the remaining variables. In order to test for the significance of these non-Keynesian effects on consumption, a variable indicating the government budget surplus/deficit (as a percentage of GDP) was also included in the estimated error-correction equation.

### 2.1.3 Econometric results

Quarterly data covering the period 1989Q1-2004Q4 and the variables real private consumption, real personal disposable income, real net financial wealth, real house prices, real short-term interest rates and government fiscal position as a percentage of GDP were used to set up a balanced panel for eleven euro-area countries (EA11: Euro area excluding Luxembourg). Nominal variables were deflated using the consumption price deflator (at 2000 prices) and a log transformation of the data was adopted to make the errors variance-stationary.

<sup>12</sup> A discussion of the appropriate definition of the real interest rate for different economic agents is contained in Chapter V.

<sup>13</sup> For a survey, see Deaton (1992).

Panel models were estimated: (1) to evaluate the long- and short- term effects assuming common dynamics across the group of countries; (2) to investigate whether the (long- and short-term) dynamics differ across countries; and (3) to test for presence of structural breaks associated with the creation of the euro area in 1999. The results of the estimated panel models and the tests of the robustness of the results are presented in Annex B. The results of the regression analysis may be summarised as follows.

For the euro area as a whole (pooled data):

(1) The speed of adjustment indicates only moderate convergence to the long run-equilibrium;

(2) In the long run, real disposable income, real financial wealth, real interest rates and the budget deficit have a significant effect on the behaviour of private consumption expenditure. The long run elasticity of consumption expenditure with respect to disposable income is 0.67, while the long run elasticity with respect to financial wealth is 0.05;

(3) In the short run, the results imply that a 1% increase in real disposable income leads to a rise in private consumption expenditure of 0.3%, while the effect of a rise of 1% in real house prices in the short run is smaller (0.05%). An improvement in the fiscal position of the government also has a small (albeit positive) effect on consumption in the short run

Allowing for country-specific differences in behaviour:

(1) The speed of adjustment ranges from quite slow in Italy, Portugal and the Netherlands to relatively rapid adjustment in Germany and France. Statistical tests suggest a change in the speed of adjustment between the two sub-periods only in France and Italy (with Portugal a borderline case at the 10% significance level) although the extent of the deviation compared to the pre-1999 period is fairly small;

(2) Country-specific long-term dynamics effects between consumption and income are detected for Spain, Ireland, the Netherlands and Portugal, while a euro-area participation effect on this relationship is present in the case of France and Finland (and perhaps Belgium). Country-specific effects of financial wealth on consumption are significant in Greece, France, Italy, the Netherlands, Austria and Finland with support for a structural break in the relationship for the post-1998 period for Belgium, Spain and Ireland. Long-run dynamics between consumption and interest rates suggests a significant country-specific effect in most euro-area countries apart from Germany, France and Portugal. There is no evidence of a specific euro-area effect on this relationship. A positive long-run effect of the budget deficit on consumption is detected in Belgium, Germany, Spain and Italy and, for the period after 1999, in Belgium, Italy, Austria, Portugal and Finland;

(3) Structural breaks in the long-term relationship between consumption expenditure and the explanatory variables – possibly related to euro-area membership – are detected in a number of cases: between consumption and disposable income in the case of France and Finland (and at the limit Belgium); and between consumption and financial wealth in the post-1998 period for Belgium, Spain and Ireland;

(4) Significant differences are found in the short-term dynamics of consumption across countries. Responses to disposable income differ significantly among Belgium, Germany, Greece, France, Ireland, Italy, the Netherlands, Austria and Finland. The size of the dynamic income term in particular varies markedly, from almost 0 in Spain and Portugal to 0.7 in Germany. As regards differences in responses to real wealth, they appear to be significant for Spain, Portugal and Finland, while Ireland, Italy, the Netherlands, Austria and Finland display the largest short-term Ricardian effects on consumption; and

(5) There is little evidence of structural breaks in the short-term dynamics for the period following the creation of the euro area. The only exceptions are: Belgium and Spain as regards differential effects on consumption stemming from the short-term dynamic of income; Ireland as regards house-prices dynamics; and Finland as far as the short-term impact of the government budget deficit is concerned.

#### **2.1.4 Conclusions**

A notable divergence in consumption patterns among euro-area countries is evident over the last fifteen years. Since the introduction of the euro, private consumption growth has been persistently stronger in countries such as Spain, France and Ireland and much more subdued spending growth has been evident in Germany and Italy. These differences reflect the influence of a large number of explanatory factors including strong wealth effects from housing in some countries as well as divergent saving-rate patterns. However, differences in the pace of expansion of real disposable income – the key driving force of consumer spending in the euro area – stand out as the prominent explanatory factor.

An estimated panel model for private consumer expenditure suggests that variations in real disposable income, real interest rates, real financial wealth and government borrowing conditions broadly explain consumption behaviour in the euro area. Indicators of consumer confidence can help to understand consumption behaviour but they appear to be highly correlated with indicators of wealth. Statistical tests show that it would be inappropriate to assume a common equation with common dynamics for all countries considered, as country-specific effects are significant for many explanatory variables.

Apart from some country exceptions, there is no overwhelming evidence of structural breaks (related to euro-area participation in 1999) in the speed of adjustment or in the short-run or long run relationships across euro-area countries.

## **2.2 Investment**

Investment spending is typically a strongly cyclical and volatile component of GDP. The investment behaviour of firms in particular, but also the residential investment of households, depends on expected returns and the cost of capital, especially interest rates. Potential changes in adjustment behaviour of investment spending following the creation of the euro area are most likely to stem from changes in the operation of the real interest rate and competitiveness adjustment mechanisms (described in more detail in Chapters IV and V). Changes to the adjustment process can occur either directly or through the influence of business cycle conditions on profits and domestic demand. It should be noted that the period we are examining has not only witnessed the introduction of the euro but also increasing globalisation, the enlargement of the EU, the bursting of a global stock market bubble and major geopolitical shocks. Although these elements are to some extent exogenous to all euro-area Member States, differences in adjustment to such shocks may be expected since countries differ significantly, e.g. with respect to openness, export specialisation, etc.

The empirical analysis below focuses in particular on eight euro-area Member States, namely, Germany, France, Italy, Spain, the Netherlands, Ireland, Portugal and Finland. These have been selected in order to cover a mix of core and periphery countries as well as to encompass a major part of the euro-area economy. Finally, it should be noted that some of the shifts seen over the period may be partly the result of once-off adjustment to the new financial environment that has disproportionately benefited lower-income euro-area countries in the so-called periphery (as opposed to the “core” member countries).<sup>14</sup> Thus, observed business cycle behaviour may be influenced by this transition to the one-off change and is not necessarily indicative of the adjustment pattern in the euro area once this transition has run its course.

### **2.2.1 Recent trends and developments in investment spending in the euro area**

The facts presented in the first section of this chapter show that the euro-area experienced an investment boom in the second half of the 1990's, which reached its peak at the end of the decade, around the time of the introduction of the euro in 1999. An important factor in this boom was the optimism surrounding the ICT sector. After the bursting of the ICT bubble and the ensuing global downturn, investment spending experienced a period of retrenchment. Strong divergences in investment behaviour were observed across euro-area countries. In Germany, investment declined during five consecutive years from 2001 to 2005 (a cumulative fall of 11%). Portugal and the Netherlands also experienced severe declines in total investment (investment in Portugal declined by 10% in 2002). In contrast, investment spending in Spain remained robust, growing on average by 4.9% in 2001-2005. Ireland, which saw average investment growth in excess of 15% in the second half of the 1990's, also experienced average growth of around 4.9% in 2001-2005. In France, investment briefly dipped in 2002 and has since experienced moderate growth, (around 2.5% annually), while investment spending in Italy has been flat in recent years, growing by 0.5% on average in 2001-2005.

Looking at the breakdown of investment by equipment and construction, it is striking that most of the divergence seems to be due to construction investment. For the four big euro-area countries, equipment investment boomed in the second half of the 1990's. Subsequently, equipment investment dipped in 2001 and has since recovered, although Italy experienced a renewed fall in 2005. A similar picture also holds for the four smaller countries under consideration. The significant degree of synchronisation of equipment investment is likely to be due to the importance of the global industrial cycle in influencing equipment expenditure.

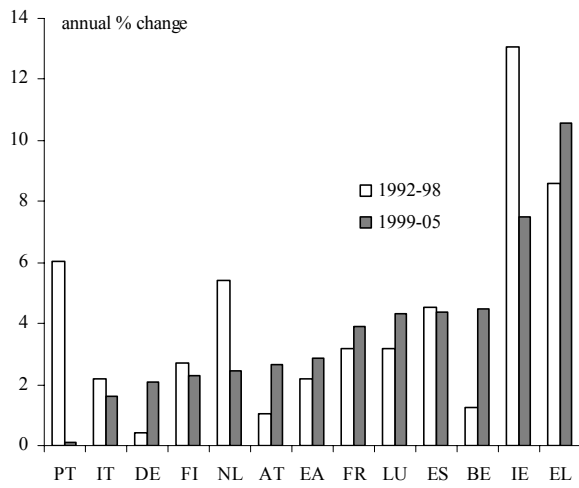
In contrast, there has been significant divergence in the behaviour of construction investment. Germany has undergone a prolonged contraction in construction: the last year with positive growth in construction investment was 1998. As a consequence, Germany has experienced an average annual contraction of 2.5% in construction spending since 1995. Spain has, on the other hand, registered very strong growth in construction investment, with more than 6% average annual growth since 1997 (5.5% since 1995). Italy and France experienced more moderate developments, with average annual growth in construction investment over the last five years of 2.3% and 1.7%, respectively. For the smaller countries, there have also been divergent developments. Portugal and the Netherlands have both witnessed contractions in construction investment since 2001; the decrease was sustained in Portugal, while construction investment in the Netherlands grew slightly again in 2004 and 2005.

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<sup>14</sup> See Lane (2006).

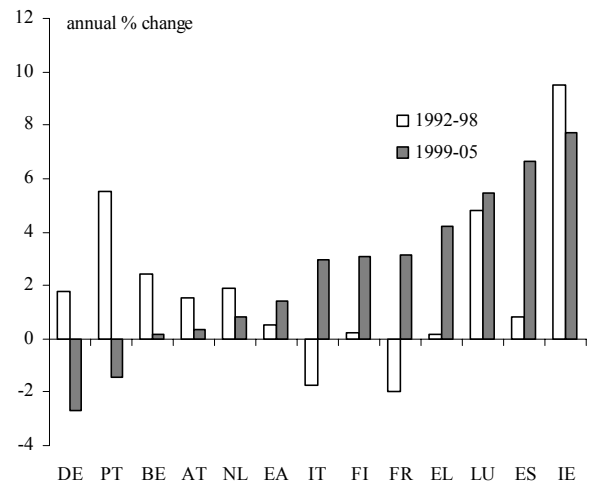


**Graph 2.2.1: Rate of growth of equipment investment, averages 1992-98 and 1999-2005**



Source: Commission Services

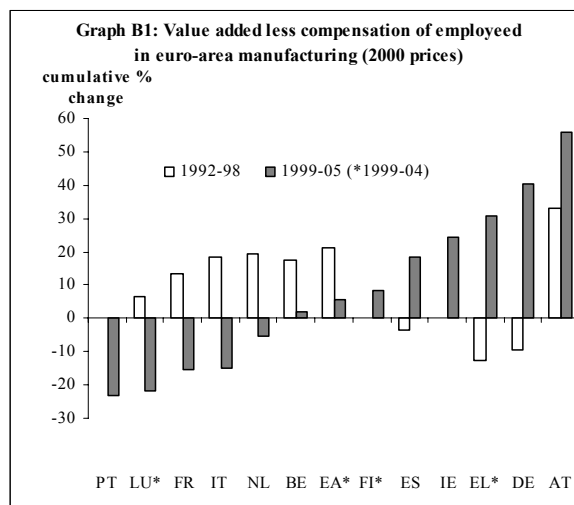
**Graph 2.2.2: Rate of growth of construction investment, averages 1992-98 and 1999-2005**



Source: Commission Services

### Box 1: Differences in profitability developments by sector across euro-area Member States

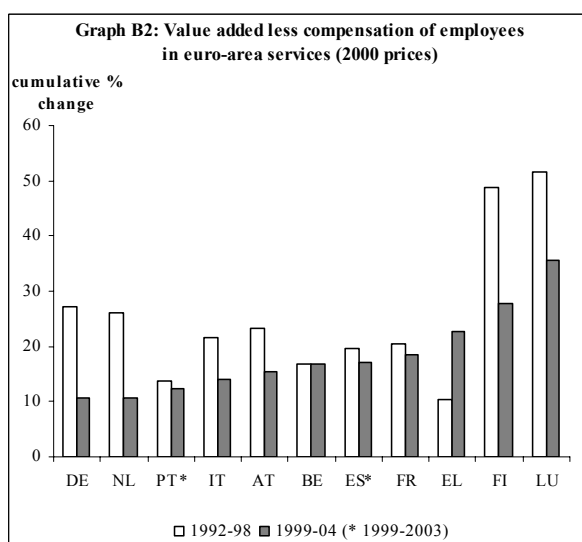
This box provides a brief picture of divergences in profitability at the sector level among Member States, which may be important in determining the cross-country differences in the adjustment of investment spending in the euro area. Given limited data availability, it is not possible to obtain direct measures of returns to capital, and hence the incentive to invest. We gross value-added less the compensation of employees as a proxy measure of profits (before depreciation of capital and taxes).



Source: Commission Services

In the manufacturing sector, between 1992 and 1998, Ireland (168%), Finland (150%) and Portugal (70%) experienced much stronger growth in this proxy measure of profits than the other euro-area Member States. At the other end of the spectrum, Germany experienced stagnation in the manufacturing sector during the same period, with a cumulative fall of 10% profits, while France experienced moderate growth of around 13.5%. For the euro area as a whole, the manufacturing sector experienced a more robust expansion of 21% in gross value added less compensation of employees.

Between 1999 and 2005, the impact of the downturn is visible, with a generally weaker development in profitability, but this masks diverging patterns in the manufacturing sector. Overall, the Austrian and German manufacturing sectors experienced the strongest growth in profitability, with German profitability expanding particularly strongly in 2004 and 2005. Greece, Spain and Ireland also saw improvement in profitability in the manufacturing sector, whereas Portugal experienced retrenchment in the manufacturing sector (a fall of 23%) – readjusting after the boom in the earlier period. France and Italy saw stagnation in this period with a drop in manufacturing profitability of around 15%.



Source: Commission Services

In the services sector, developments in profitability have generally been more similar across countries and over time. In the period 1992-98, Luxembourg and Finland stand out, with growth in profitability of around 50%. Germany and the Netherlands also experienced stronger growth in services sector profits in the period 1992-98, but subsequently experienced the lowest growth rate (10%) in the euro area in the 1999-2004 period. Italy experienced a more moderate slowdown in profitability. In contrast, the growth in services sector profitability was more stable in France, Spain and Belgium.

### 2.2.2 Modelling investment behaviour

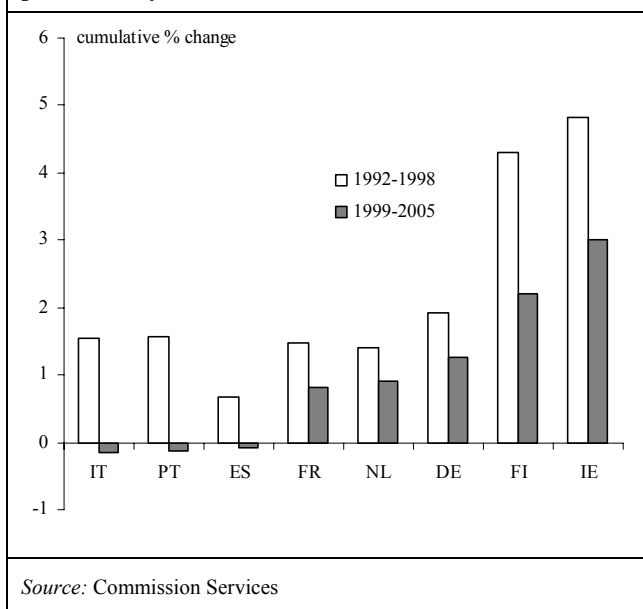
Investment is a volatile component of GDP and is traditionally difficult to model.<sup>15</sup> The aim is to find a parsimonious dynamic model of investment based on standard economic theory. The standard neoclassical growth model<sup>16</sup> determines a steady state relationship between gross investment (I), output (Y) and the real cost of capital (CK) which depends on the real interest rate (r) and the relative price of capital (PK):

$$I = \alpha + Y - CK$$

The constant term  $\alpha$  is determined by the steady state growth rate, the rate of depreciation and the share of capital in production. This long-run relationship can be estimated and incorporated in an error correction model in order to better capture the dynamic behaviour of investment spending (see Annex C for details).

Looking more closely at the explanatory variables, one reason behind the different trends in investment spending is likely to have been the divergent behaviour of real interest rates. Countries in the periphery of the euro area, engaged in catching up in terms of GDP per capita, such as Spain, benefited from a significant drop in real interest rates. The real interest rate, as measured by using 10-year government bond yields and the rate of change of the GDP deflator, fell from around 6% in 1995 to close to zero for Spain. For countries considered to be in the core of the ERM, in particular Germany, the real interest rate has fallen by less, although these countries also benefited from the global drop in interest rates. For Germany, the real interest rate has remained above 3%. The fall in interest rates is likely to have played a part in the boom in housing markets, which has yet to cool down, and indeed may look unsustainable in some countries, e.g., Spain.

**Graph 2.2.3: Cumulative growth in total factor productivity, 1992-98 and 1999-2005**



Other variables that are probable candidates for explaining some of the differences in investment include total factor productivity and the size of the labour force. In the neoclassical growth model, the desired change in the capital stock depends on growth in productivity and the labour force. Higher productivity should lead to a higher level of capital, ceteris paribus, and similarly a larger labour force should also lead to a higher desired level of capital. Strong divergences in both of these variables have been observed across euro-area countries. Among the larger countries, Spain has exhibited relatively strong growth in the labour force, in excess of 2% in recent years, whereas the size of the labour forces has barely changed in Germany and France, and Italy has recorded slightly higher growth. Among the smaller countries, Ireland stands out with around 3% labour force growth in recent years. Where productivity developments are concerned, some divergences are also apparent. For Germany and France, total factor productivity growth has fluctuated around 1%, whereas Italy has experienced declining productivity growth, with negative growth in recent years. Spain

has also been characterised by declining total factor productivity, although the rate of decline has been very gradual. Ireland has also been subject to declining total factor productivity growth, from a rate of change in excess of 5% in the second half of the 1990s to close to zero in recent years. Consequently, while labour force developments may continue to fuel divergences in investment with high growth in Spain and Ireland, productivity developments would suggest some slowdown in investment in these countries.

In the estimation of the dynamic equation changes in the real effective exchange rate and the stock market are also introduced, in order to capture, respectively, changes in competitiveness and expectations about the future. Given that construction investment, as discussed earlier, has contributed significantly to differences in investment growth among the euro-area Member States, we estimate relationships for total investment spending and for non-construction investment in order to assess the extent to which construction investment influences the results.

### 2.2.3 Econometric results

In the empirical analysis, quarterly data are used in order to better capture the business cycle adjustment (also due to the relatively short sample available), and to provide more scope for detecting any effects of euro-area participation.

<sup>15</sup> See, for example, Chirinko (1993) and European Commission (2001), Chapter 3: "Determinants and benefits of investment in euro area".

<sup>16</sup> See, for example, Pelgrin et al. (2002).

The data from Eurostat cover the period from first quarter of 1980 to the last quarter of 2005. However, for Ireland and Portugal, quarterly data are only available for a very restricted period, in which case data from the OECD are used. In the case of Ireland, only data on housing investment are available from the OECD, whereas for Portugal no breakdown of investment into different types of capital is available. For Germany, data are only available from 1991 onwards. The series start earlier for most other countries, although stock market data or interest rate data are not always available for the entire sample period, in which case a truncated sample is investigated.

The empirical analysis of total and non-construction investment encompasses: (1) estimation of a long-run equilibrium relationship and the short run dynamics for investment for each individual country considered; (2) investigating whether the (long- and short-term) dynamics differ across countries; and (3) testing for presence of structural breaks associated with the creation of the euro area in 1999. The results of the estimated individual and panel models (for eight countries: Germany, Spain, France, Ireland, Italy, the Netherlands, Portugal and Finland) and the tests of the robustness of the results are presented in Annex C. The results of the regression analysis may be summarised as follows<sup>17</sup>.

For total investment:

(1) Looking at the estimated long-run parameters, there are considerable differences across countries. The interest rate coefficient has the wrong (positive) sign in the case of Germany, France, Spain and Finland, although for France and Finland it is insignificant. The problem of estimating the elasticity of investment with respect to the cost of capital is well known (see e.g. Schaller (2006) for a recent discussion).

(2) The estimated panel model, more or less confirms the results obtained from the individual country models. A positive long-run elasticity of investment to output is found (1.4), with a much higher coefficient for the Netherlands, and slightly higher for Italy, Spain, Ireland, Finland and Portugal. Looking at the auxiliary variables, growth in the value of the stock market affects investment positively in Germany, Ireland and the Netherlands. Changes in competitiveness, as measured by the real effective exchange rate, only matter in the case of Finland, with the expected negative sign. As with the some of the individual country equations, a positive long-run coefficient on the real interest rate is also found for the panel-model, with no significant differences across countries. Stock-market valuations are found to support investment (with a two quarter lag), while an appreciation of the real effective exchange rate dampens investment (with a lag of three quarters).

(3) The speed of adjustment is highest for Germany and the Netherlands.

For non-construction investment:

(1) The results are more homogenous across countries than in the case of total investment. The error-correction term is significant for most countries (except Ireland) with a somewhat larger adjustment coefficient in Italy and the Netherlands.

(2) Concerning the long-run link between non-construction investment and GDP, the coefficient is much higher for Germany, whereas for the other countries the coefficient appears similar to that found for total investment. A positive coefficient on changes in the interest rate is found for Germany, Italy, the Netherlands and Ireland, possibly reflecting the pro-cyclical pattern in interest rates. Changes in stock market valuations are found to increase growth in non-construction investment in Spain, the Netherlands and Ireland. Changes in competitiveness only matter in the case of Spain, with a positive coefficient, possibly reflecting a Balassa-Samuelson type effect of a catching-up economy.

(3) For non-construction investment there is evidence of a somewhat faster adjustment compared to total investment. The long-run elasticity of investment to output is estimated to be around 1.1, with a much lower coefficient for Germany and Italy (0.3) and slightly lower for Spain (0.7). The long-run elasticity of non-construction is insignificantly different from zero. However, for France, Italy and the Netherlands, a negative long-run elasticity (-0.03 to -0.04) is found.

Regarding tests of possible effects of euro-area participation:

(1) There is some evidence of instability in the parameters of the estimated relationship, but generally such instability in equations appears before the introduction of the euro, in the mid-1990's or earlier, in particular for Ireland and Finland.

(2) For Germany and Italy, there is an indication of slower error-correction (more persistent investment) in the euro-area period in Germany, and faster in Italy and Ireland. However, such effects are not found for non-construction investment. In terms of changes in the dynamic adjustment to interest rate changes, there is evidence of some effect in France and Finland but no evidence of a structural break in the adjustment to stock market valuations or to changes in external competitiveness.

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<sup>17</sup> Note that the results should be treated with caution because the hypothesis of "no co-integrating relationship between the variables" could not be rejected for all countries. This is particularly the case for total investment. The results for equipment investment are more encouraging. See Annex C for details.

(3) From the panel estimation for total investment, structural shifts in the error-correction mechanism are found for Germany, Italy, the Netherlands, Ireland and Portugal, with indications of much more rapid adjustment to equilibrium in the post-1998 period for Italy and Ireland, and much slower adjustment for the Netherlands (in fact the estimated coefficient indicates divergence from equilibrium). Concerning the long-run parameters, there is evidence that the elasticity of investment to output is higher after the introduction of the euro for Italy and Ireland, and lower for the Netherlands. The only country for which a significant change in the elasticity of investment to interest rates is Ireland, with a shift to a positive (albeit small) long-run elasticity of investment to the real interest rate.

(4) For non-construction investment, there is little evidence overall from the individual country models (apart from the case of Ireland) of a change in the dynamic adjustment behaviour after 1998. From the panel model for non-construction investment, evidence of considerably faster adjustment to equilibrium in the post-1998 period is found for Germany, Italy and Ireland. Concerning the long-run parameters, the estimated elasticity of investment to output is somewhat lower for Germany, Italy and Ireland in the post-1998 period, whereas the elasticity with respect to interest rates is more positive for Germany, Italy and the Netherlands.

#### **2.2.4 Conclusions**

There is evidence of considerable differences across the countries considered in the response of total investment to changes in its determinants, while the results are more homogeneous in the case of non-construction investment. This supports the earlier hypothesis (from an inspection of the data) that much of the observed divergence in investment performance originated in construction investment. While the empirical results should be treated with due caution due to the well-documented problems of measuring certain explanatory variables, such as the cost of capital, variations in output appear to be consistent in explaining investment performance.

Overall, while there are differences for some countries, no overall robust evidence emerged of structural changes in the adjustment behaviour of investment growth as a result of the creation of the euro area. This would seem to be in line with other studies that have examined whether investment in the current business cycle recovery has been weaker than would have normally been expected (see e.g. Orellana et. al (2005) for a discussion of this issue). Barrel (2006) investigated whether investment spending in major EU economies was lower than would be predicted with investment equations from standard macro-econometric models and found that there was no evidence of investment being inexplicably low, indicating that investment was behaving more or less in line with fundamentals. For Germany, the Deutsche Bundesbank (2004) also found no evidence of a structural break in investment for Germany.

### **2.3 Inflation**

Over the last few years, considerable attention has been devoted to the subject of inflation differentials in the euro area. Most of the analysis has attempted to identify the possible sources of such differentials.<sup>18</sup> However, relatively little attention has been paid to the possible consequences for macroeconomic adjustments within the euro area stemming from the presence of persistent inflation differentials among Member States. This issue is explored in some detail throughout this Review, through an assessment of both the main arguments put forward in the economic literature on this topic and the empirical evidence available so far.

This section seeks to set the scene for such analysis by providing a general characterisation of emerging inflation trends across euro-area Member States. To obtain a comprehensive picture, this is done by examining developments in the three most commonly used summary measures of inflation – the GDP deflator, the private consumption deflator and the HICP. The analysis is organised in the following manner. The focus in sub-section 2.3.1 is on investigating how these indicators are empirically related to each other and whether they yield a similar broad picture in terms of overall inflation trends within countries. In sub-section 2.3.2, the focus shifts to examining inflation divergence across euro-area Member States during the periods preceding and following the start of the third stage of EMU. Given that the degree of exposure to the external environment has been recently identified as a potentially important source of inflation dispersion in the euro area,<sup>19</sup> the analysis is complemented here by econometric results on the exchange-rate pass through at the level of import prices across Member States (reported in Box 2).

#### **2.3.1 Co-movement between the GDP deflator, the private consumption deflator and the HICP<sup>20</sup>**

Due to differences in coverage and statistical methodology, it is unlikely that the three general inflation indicators considered here would exhibit a close positive relationship at all times. On the other hand, there are several reasons why the broad price trends described by these indicators might be expected to be rather similar over the medium term. One of these is that consumption-based price measures (like the HICP), by definition, focus on the prices of

<sup>18</sup> See, for example, Angeloni and Ehrmann (2003), ECB (2003d, 2005c), Bråten and Orellana (2005b), and the references therein.

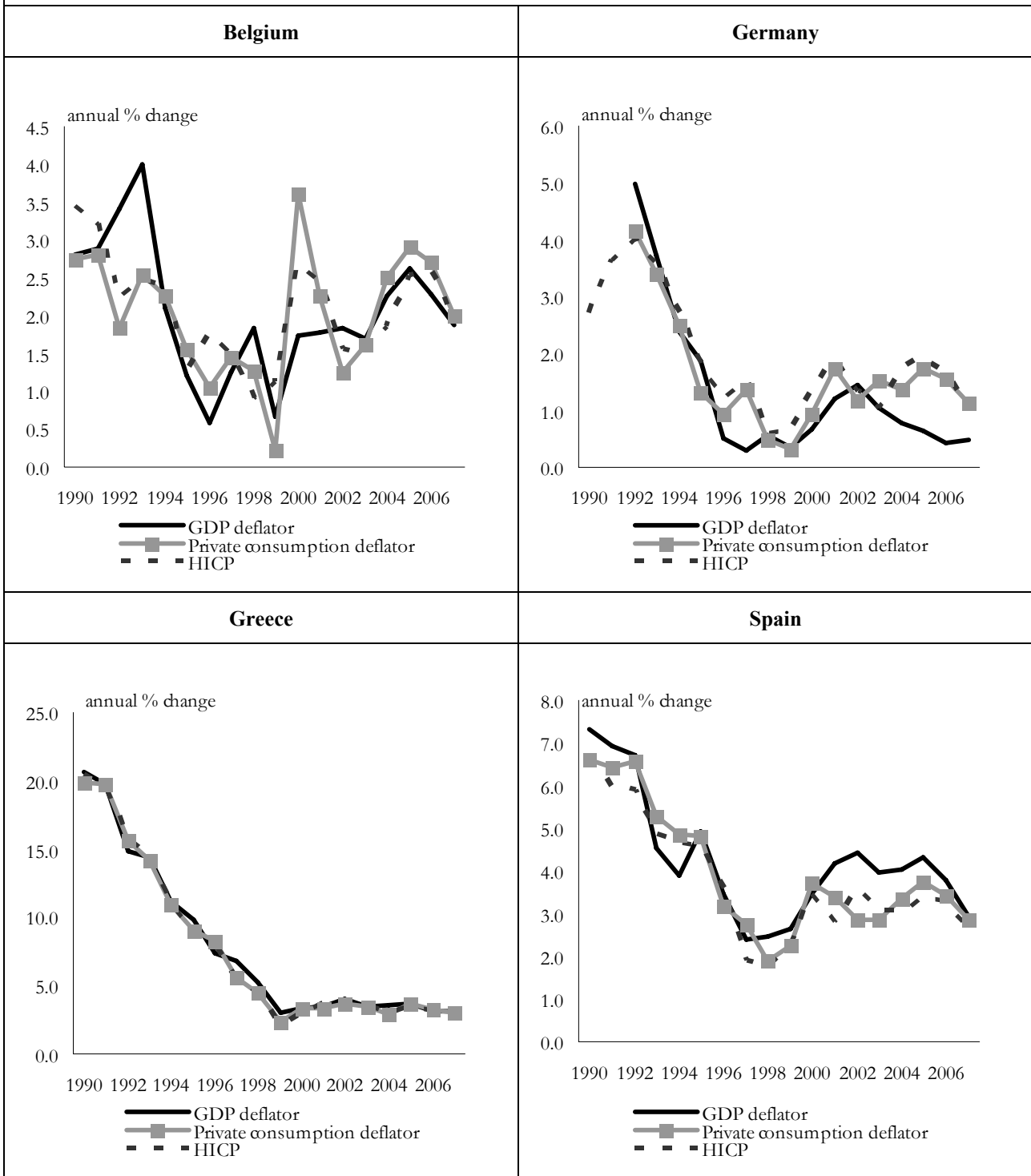
<sup>19</sup> See, for instance, Honohan and Lane (2003, 2004), Campa and González Minguéz (2006) for evidence pointing in such direction.

<sup>20</sup> Note for some countries, the HICP was not available for some of the early years of the sample. The national CPIs were used instead to complete the data series.

goods and services that are at the very end of the production process in the economy. The prices of all other goods and services – such as investment goods – have an intermediate character and their evolution is one of the factors that will determine consumer price developments. Thus, consumption-based price measures can be considered to capture overall inflationary price pressures in the economy quite well. Looking at the GDP deflator, it can be recalled that consumption is generally the single most important national expenditure component, typically accounting for between 50 and 70% of GDP. This means that developments in consumption prices tend to have a sizable impact on price developments as described by the GDP deflator.

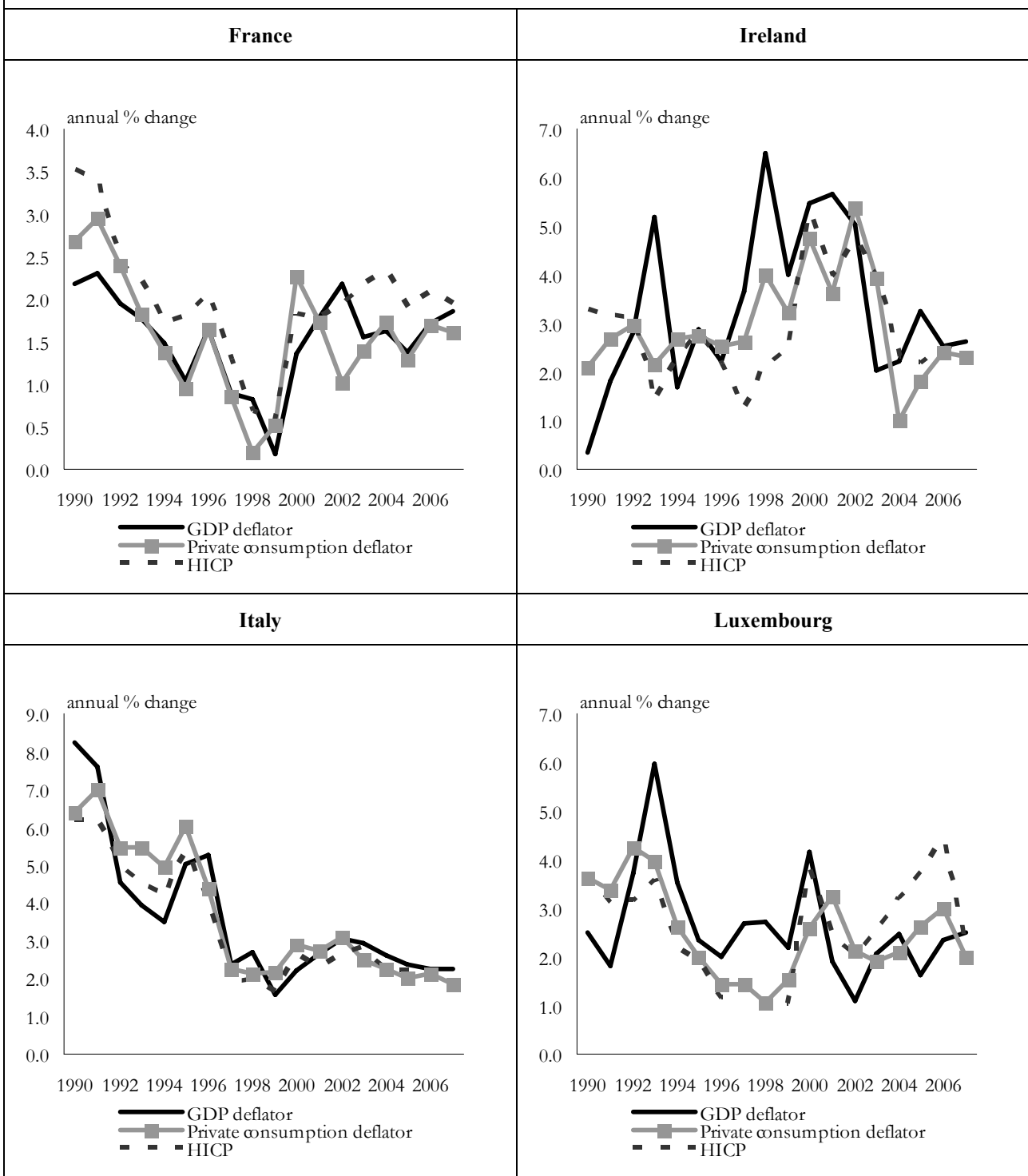
Indeed, the data since the early 1990s show for that most euro-area countries these three price indicators have followed each other rather closely (Graphs 2.3.1-2.3.3). The countries where differences between the indicators appear to be more marked are Belgium, Ireland, Luxembourg and Finland. However, there do not seem to be systematic differences between the three indicators in any case considered over the full sample period.

**Graph 2.3.1: GDP deflator, private consumption deflator and HICP – Belgium, Germany, Greece and Spain**



Source: Commission Services

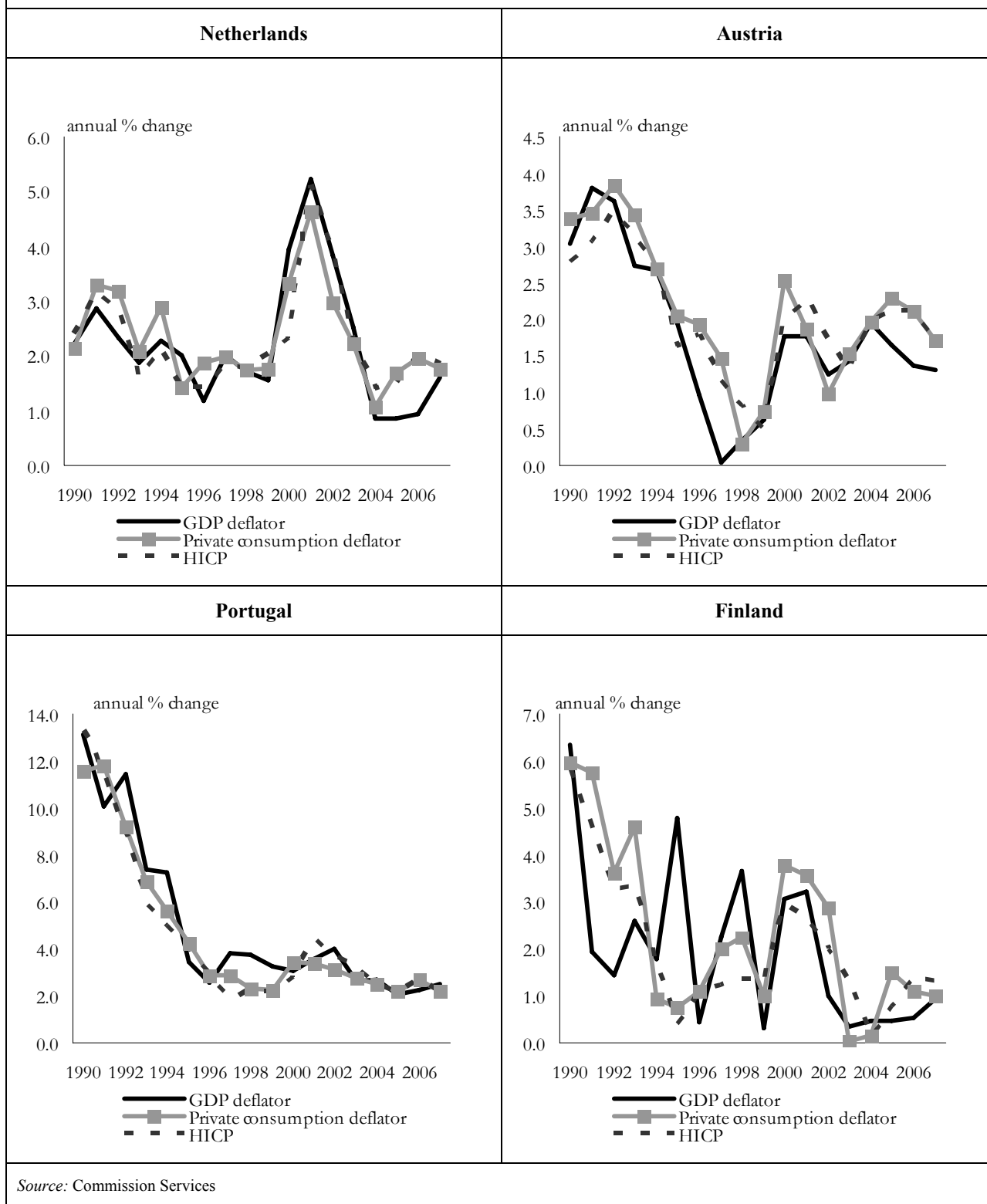
**Graph 2.3.2: GDP deflator, private consumption deflator and HICP – France, Ireland, Italy and Luxembourg**



Source: Commission Services



**Graph 2.3.3: GDP deflator, private consumption deflator and HICP – The Netherlands, Austria, Portugal and Finland**



The broad picture that emerges from these data is one where the annual rate of increase in the three indicators followed a broad downward trend over much of the 1990s. This reflects the progress made in all these countries towards convergence to low inflation levels, required for participation in the third stage of EMU.

The dis-inflationary trend was generally interrupted around the time of the creation of the euro area. Thereafter, the various price indicators display an inverted "u" trajectory. In response to a sequence of inflationary shocks – such as

surging oil prices, the initial euro depreciation, the effects on food prices of diseases among animals and increases in administered prices and indirect taxes – inflation began to increase somewhat during the early years following the creation of the euro area. Although inflation generally subsided from 2002 onwards, in most cases it has not yet returned to the low levels that prevailed at the start of the third stage of EMU.

Shifting the spotlight to the period since the establishment of the euro area, some differences between the three price indicators become more apparent. For instance, it is interesting to note that in some countries (e.g. Germany, Luxembourg, the Netherlands and Austria) consumer prices have, for the past few years, been growing at a faster pace than the GDP deflator, while the opposite has been the case for Spain. Whether these differences contribute to, or are a reflection of, differences in GDP growth performance between these countries is a question that remains to be settled and is touched upon elsewhere in this Review.

The data for the euro area as a whole are presented in Graph 2.3.4. As was the case for most individual countries, the three price indicators give the same overall picture, with no single indicator being systematically higher or lower than the others over the full sample period.

<p><b>Graph 2.3.4: Inflation in the euro area – selected price indicators</b></p>	<p><b>Graph 2.3.5: Correlation between selected inflation indicators in the euro area – the GDP deflator and the private consumption deflator</b></p>																																																																																																				
<p>annual % change</p> <table border="1"> <caption>Estimated data for Graph 2.3.4</caption> <thead> <tr> <th>Year</th> <th>GDP deflator</th> <th>Private consumption deflator</th> <th>HICP</th> </tr> </thead> <tbody> <tr><td>1990</td><td>4.7</td><td>4.5</td><td>4.5</td></tr> <tr><td>1991</td><td>4.6</td><td>4.4</td><td>4.4</td></tr> <tr><td>1992</td><td>4.4</td><td>4.2</td><td>4.2</td></tr> <tr><td>1993</td><td>3.8</td><td>3.6</td><td>3.6</td></tr> <tr><td>1994</td><td>2.8</td><td>2.8</td><td>2.8</td></tr> <tr><td>1995</td><td>2.7</td><td>2.6</td><td>2.6</td></tr> <tr><td>1996</td><td>2.1</td><td>2.0</td><td>2.0</td></tr> <tr><td>1997</td><td>1.4</td><td>1.3</td><td>1.3</td></tr> <tr><td>1998</td><td>1.0</td><td>0.9</td><td>0.9</td></tr> <tr><td>1999</td><td>1.4</td><td>1.3</td><td>1.3</td></tr> <tr><td>2000</td><td>2.4</td><td>2.3</td><td>2.3</td></tr> <tr><td>2001</td><td>2.5</td><td>2.4</td><td>2.4</td></tr> <tr><td>2002</td><td>2.5</td><td>2.4</td><td>2.4</td></tr> <tr><td>2003</td><td>2.0</td><td>1.9</td><td>1.9</td></tr> <tr><td>2004</td><td>1.9</td><td>1.8</td><td>1.8</td></tr> <tr><td>2005</td><td>1.8</td><td>1.7</td><td>1.7</td></tr> <tr><td>2006</td><td>1.7</td><td>1.6</td><td>1.6</td></tr> </tbody> </table> <p>Legend:  — GDP deflator  —■— Private consumption deflator  - - - HICP</p>	Year	GDP deflator	Private consumption deflator	HICP	1990	4.7	4.5	4.5	1991	4.6	4.4	4.4	1992	4.4	4.2	4.2	1993	3.8	3.6	3.6	1994	2.8	2.8	2.8	1995	2.7	2.6	2.6	1996	2.1	2.0	2.0	1997	1.4	1.3	1.3	1998	1.0	0.9	0.9	1999	1.4	1.3	1.3	2000	2.4	2.3	2.3	2001	2.5	2.4	2.4	2002	2.5	2.4	2.4	2003	2.0	1.9	1.9	2004	1.9	1.8	1.8	2005	1.8	1.7	1.7	2006	1.7	1.6	1.6	<table border="1"> <caption>Estimated data for Graph 2.3.5</caption> <thead> <tr> <th>Country/EA</th> <th>corr(GDPdf,PCdf)</th> </tr> </thead> <tbody> <tr><td>BE</td><td>0.60</td></tr> <tr><td>DE</td><td>0.92</td></tr> <tr><td>EL</td><td>1.00</td></tr> <tr><td>ES</td><td>0.91</td></tr> <tr><td>FR</td><td>0.78</td></tr> <tr><td>IE</td><td>0.57</td></tr> <tr><td>IT</td><td>0.89</td></tr> <tr><td>LU</td><td>0.45</td></tr> <tr><td>NL</td><td>0.89</td></tr> <tr><td>AT</td><td>0.91</td></tr> <tr><td>PT</td><td>0.96</td></tr> <tr><td>FI</td><td>0.55</td></tr> <tr><td>EA</td><td>0.93</td></tr> </tbody> </table> <p>Legend: ■ corr(GDPdf,PCdf)</p>	Country/EA	corr(GDPdf,PCdf)	BE	0.60	DE	0.92	EL	1.00	ES	0.91	FR	0.78	IE	0.57	IT	0.89	LU	0.45	NL	0.89	AT	0.91	PT	0.96	FI	0.55	EA	0.93
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Correlation coefficients may also be used to assess how closely linked the three price indicators considered here are. Graph 2.3.5 shows that contemporaneous correlations between the GDP deflator (GDPdf) and the private consumption deflator (PCdf) are in most cases between 0.8 and 1, indicating a high degree of co-movement between these two price indicators. For the euro area as a whole, the coefficient is 0.93. However, for Belgium, Ireland, Luxembourg and Finland, the contemporaneous correlation coefficient is considerably lower.

Regarding the correlations between the GDP deflator and the HICP, Graph 2.3.6 shows that these are not distinctly different in magnitude from those between the GDP deflator and the private consumption deflator (0.96 for the euro area as a whole). Only for Ireland and Luxemburg are the correlation coefficients noticeably lower.

As expected, a tighter link is found between the private consumption deflator and the HICP. Correlation coefficients are above 0.9 in most cases (0.98 for the euro area as a whole). The notable exceptions are once again Ireland and Luxembourg, where the correlation is 0.7.

The correlation coefficients reported here thus support the impression that the three price indicators considered here are closely linked and tend to move together over time. Hence, foreshadowing the discussion in Chapter V on the appropriate inflation rate series to use in defining real interest rates, the finding here is that using any one of these price indicators should indicate broadly the same evolution over time, although not necessarily identical levels at any given point in time.

### **2.3.2 Inflation dispersion**

As might be expected from the analysis in the previous section, a fairly similar picture emerges for developments in inflation dispersion across euro-area Member States using any one of the three price indicators. Indeed, all these indicators suggest considerable inflation convergence over much of the 1990s. For instance, the spread between the Member State with the highest and that with the lowest inflation rate narrowed from around 20 percentage points at the beginning of the decade to less than 5 percentage points in 1999 (Graph 2.3.8). Similarly, measured by the standard deviation – a measure of dispersion less affected by outliers –, inflation dispersion across euro-area Member States dropped from around 5-6 percentage points at the beginning of the decade to less than 2 percentage points in 1999.

However, progress towards convergence paused as the euro area came into being in 1999. Since then, inflation divergence increased somewhat in the first two years of the euro area and gradually subsided thereafter.

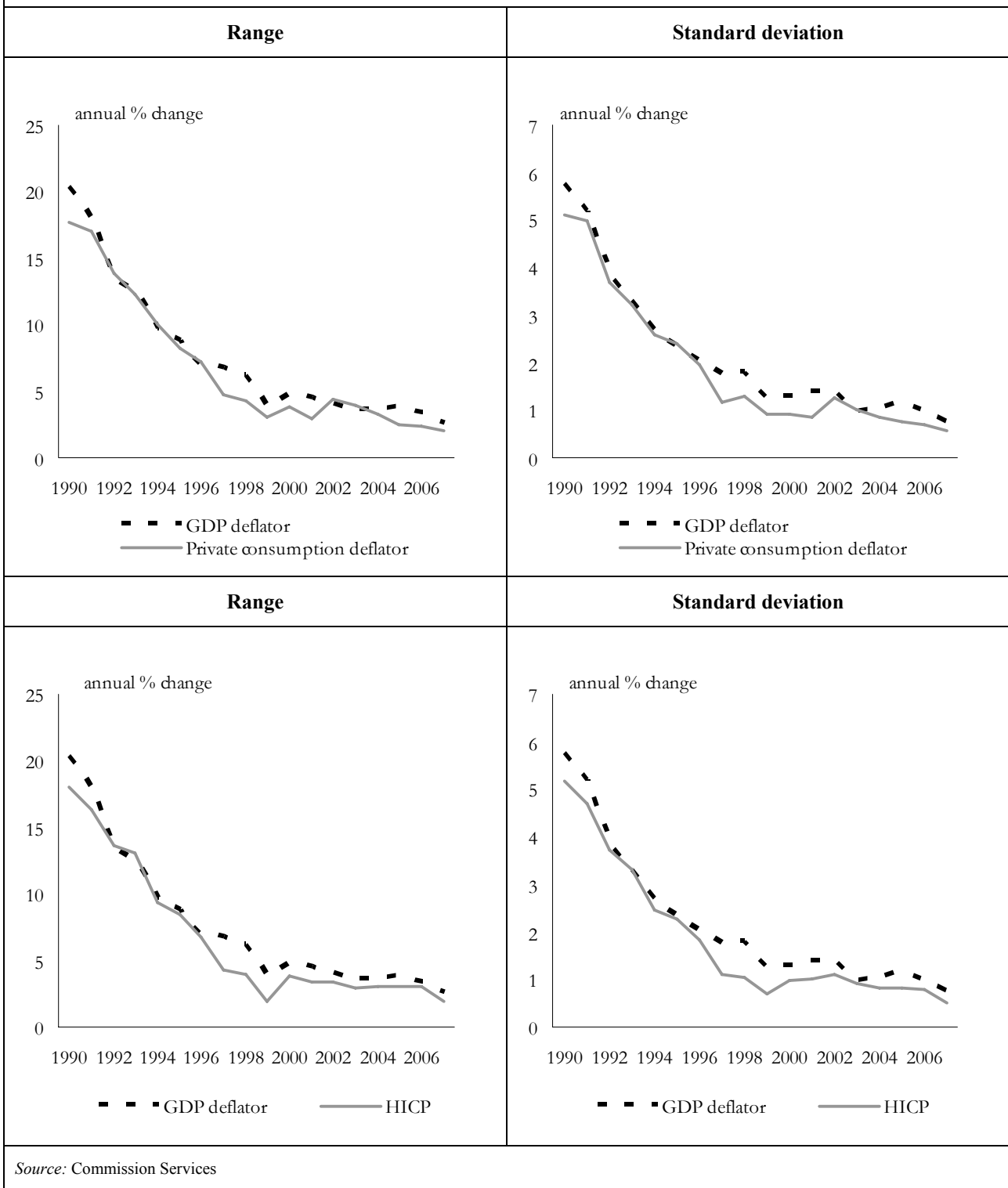
One systematic difference between the inflation indicators considered here is that the lowest inflation rate is in many cases given by the GDP deflator (Graph 2.3.9). This means that the spread between the Member States with the highest and lowest inflation rates is also generally larger when measured using the GDP deflator.

Given that the picture in terms of price developments and inflation dispersion is fairly similar across the three indicators analysed here, the remainder of this section focuses on the HICP, which is a natural choice for analysing inflation developments in the euro area. This price indicator has the advantage of being the most comparable price measure across the EU Member States, thus minimising the possible differences in inflation developments among countries due to cross-country variation in statistical methodology.<sup>21</sup> Note also that, in addition to being an indicator that sums up all inflationary price developments in the economy, a consumer price index is also the most well-known price measure among private economic agents and, consequently, also the price indicator most often referred to in national nominal contracts in product, labour and financial markets.

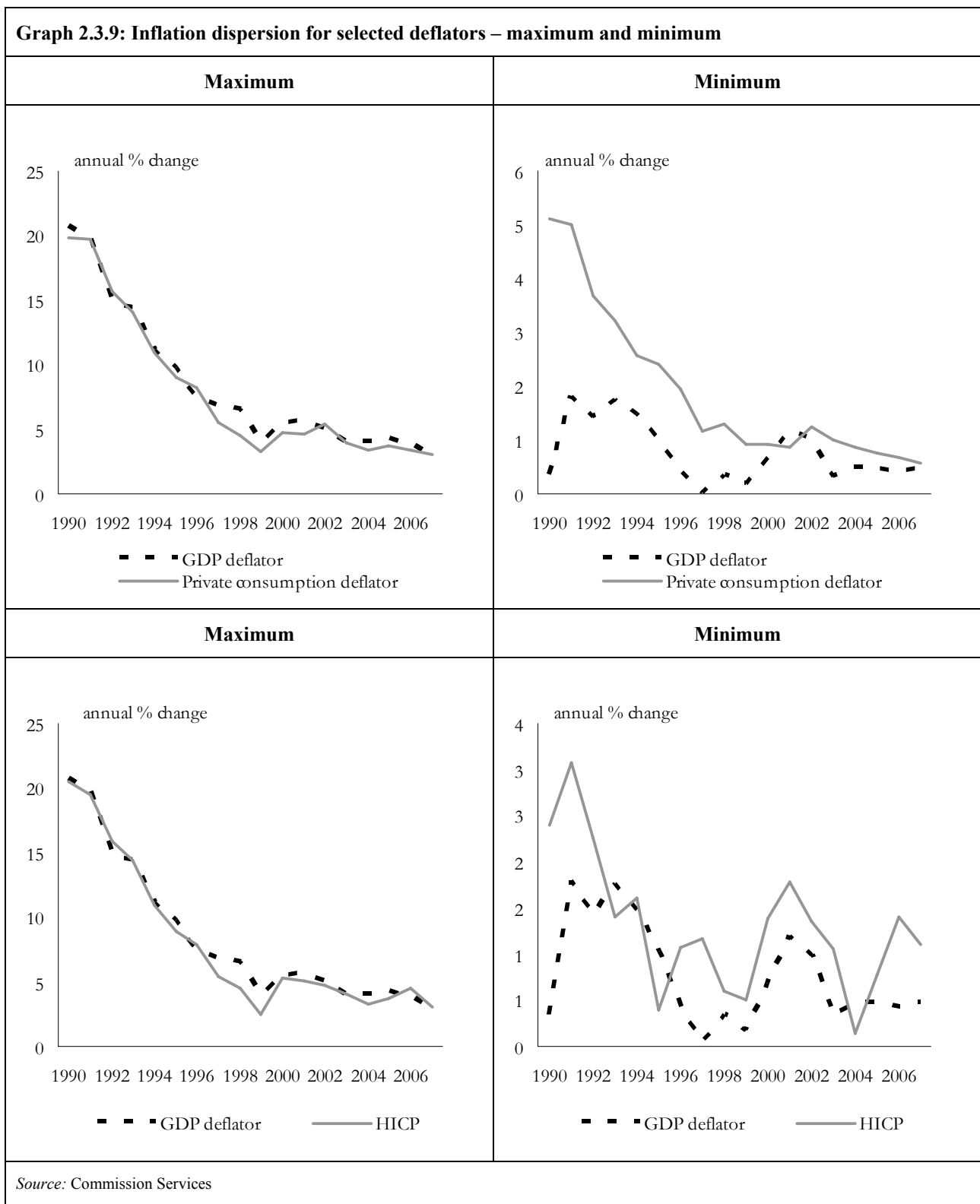
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<sup>21</sup> This was also a key argument in the choice of the HICP for examining progress in inflation convergence as well as in the quantification of the monetary policy objective of the ECB.

**Graph 2.3.8: Inflation dispersion for selected deflators – range and standard deviation**



Source: Commission Services



Looking specifically at the country level, the table below provides data on inflation differentials relative to the euro area since 1998. A feature that stands out from these data is that some countries, such as Belgium, Germany, France and Austria, have persistently recorded below-average inflation rates, while others, like Greece, Spain, Ireland and Portugal, have registered above-average inflation rates for most of the period since 1998. Another feature that stands out is that these differentials have an asymmetric character. The countries with above-average inflation have registered differentials at least twice as large as those of the countries with below-average inflation. A further noteworthy aspect of the data in the table is that, among the countries with persistently above-average inflation, Ireland and Portugal had closed the differential by 2005, while Greece and Spain retained inflation differentials somewhat above 1 percentage point, roughly unchanged compared to the level in 1999. Indeed, the finding that,

unlike other large monetary unions, the euro area is characterised by persistent inflation differentials has been also documented in the now large body of literature looking at this issue (see for instance ECB (2003d), ECB (2005c), Braten and Orellana (2005) and the references therein).

	BE	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI
1999	0.0	-0.5	1.0	1.1	-0.5	1.4	0.6	-0.1	0.9	-0.6	1.1	0.2
2000	0.6	-0.7	0.8	1.4	-0.3	3.2	0.5	1.7	0.2	-0.1	0.7	0.8
2001	0.0	-0.5	1.3	0.4	-0.6	1.6	-0.1	0.0	2.7	-0.1	2.0	0.3
2002	-0.7	-0.9	1.6	1.3	-0.4	2.4	0.3	-0.2	1.6	-0.6	1.4	-0.3
2003	-0.6	-1.1	1.3	1.0	0.1	1.9	0.7	0.4	0.1	-0.8	1.2	-0.8
2004	-0.2	-0.3	0.9	1.0	0.2	0.2	0.2	1.1	-0.7	-0.1	0.4	-2.0
2005	0.3	-0.3	1.3	1.2	-0.3	0.0	0.0	1.6	-0.7	-0.1	-0.1	-1.4
Avg. 1999- 2005	-0.1	-0.6	1.2	1.1	-0.3	1.5	0.3	0.6	0.6	-0.3	1.0	-0.4

*Source:* Commission Services

The literature also suggests that examining the causes of inflation divergence is not a straight-forward task since the sources of inflation differentials tend to vary across countries and across time. For instance, there is evidence indicating that for some countries part of the differential is due to benign structural factors, such as catching up in income and price levels. There is also evidence that divergence in cyclical positions and in the exposure to the external environment plays an important role.<sup>22</sup> In addition, some evidence suggests that rigidities in labour and product markets may account for part of the differentials, particularly for their protracted nature. The latter points to a potential additional benefit from structural reforms that increase the flexibility of euro-area economies: such reforms could limit the scope for long-lasting inflation differentials by increasing the capacity of national economies to adapt to an ever changing economic environment.

<sup>22</sup> Box 2 provides some empirical evidence on the latter at the level of import prices.

## Box 2: The impact of euro-area membership on exchange-rate pass through

Exchange rate pass-through (ERPT) is the extent to which changes in the exchange rate are transmitted to domestic inflation, instead of being absorbed in profit margins or mark-ups. It is quantified as the elasticity of the local currency prices (of imports, or at later stages in the distribution chain) with respect to the exchange rate.

In this box, we restrict the analysis of ERPT to import prices. We follow the approach taken by Campa and González Minguéz (2006), but with some differences, specifically regarding data frequency, sample period, and the choice of foreign prices and trading partners. This approach is based on equation (1):

$$\Delta \ln(UVI_{t}^{ij}) = c^{ij} + \sum a_m^{ij} \Delta \ln(ER_{t-m}^{ij}) + \sum b_m^{ij} \Delta \ln(FP_{t-m}^{ij}) + v_t^{ij} \quad (1)$$

where the superscripts indexed by  $i$  and  $j$  refer, respectively, to a sector and to an importing Member State, while  $\sum$  is the sum over  $m = 0$  to 1. The variables in the equation are: UVI = import unit value index of sector  $j$  in country  $i$ , denominated in local currency; ER = exchange rate for sector  $j$  of country  $i$ , expressed in terms of units of local currency per unit of foreign currency; and FP = a foreign price index of sector  $j$  in the countries of origin of these imports, expressed in foreign currency.

Equation (1) is estimated by ordinary least squares and the short-run and long-run ERPT elasticities are derived for each of the sector/Member State<sup>1</sup> combinations. Short-run exchange rate pass-through estimates are given by the estimated coefficients  $a_0^{ij}$ . Long-run coefficients are given by  $\sum a_m^{ij}$  (summed over  $m = 0$  to 1).

Exchange rates and foreign prices are calculated as sector-weighted averages vis-à-vis eight main trading partners.<sup>2</sup> Unit value indices are used instead of import prices, since no price data are available for extra-euro-area imports.<sup>3</sup> We focus on the latter as this is the part of Member States' imports that has continued to be exposed to exchange rate fluctuations since the creation of the euro area. Series for unit values in Eurostat's NICE domain start only in 1995. Due to methodological changes, the series cannot be correctly linked to indices available for the period prior to 1995. As a result, our sample contains only 44 observations (1995Q1-2005Q4) and consequently the conclusions below must be treated with caution. The need for caution is reinforced by the results of the unit root tests of the quarter-on-quarter changes in the variables: while all exchange rates and all foreign prices (except for capital goods) are stationary, we could not reject the null hypotheses of a unit root for about half of all unit value series.

As commodities are subject to a world price, imports of commodities have a very high degree of ERPT. It is therefore more interesting to analyse groupings of less homogenous goods, where ERPT might be less stable over time. As unit value indices are available according to the Broad Economic Categories (BEC), we have combined them with national account deflators as proxies for foreign prices and have chosen the following sector breakdown of the BEC: total, capital goods, consumer goods and consumption goods. The latter category comprises consumer goods including cars and fuels.

Given the ERPT estimates obtained according to the methodology described above, we wish to test whether euro-area participation has changed the degree(s) of ERPT. Membership of the euro area might lead to reduced ERPT for two main reasons.<sup>4</sup> The first is the reduced share of the individual Member State's imports that is exposed to exchange rate fluctuations. The second reason is the convergence of Member States' inflation rates towards lower inflation, observed in the run-up to 1999. Member States that have experienced substantially lower inflation rates since 1998 might, as a result, experience lower ERPT.

In view of the small sample size and the fact that adjustment to the euro area is a gradual process (as opposed to an abrupt structural break), we do not use a Chow test alone on a fixed breakpoint to assess whether euro-area membership has changed ERPT. Instead, we perform a two-stage process: first, CUSUM and CUSUMSQ statistics are calculated and charted. These statistics suggest then possible breakpoints. If these are in the 1998-2001 period, a Chow test is applied on the suggested breakpoint.<sup>5</sup>

Out of the thirty-two equations (four sectors for eight Member States), CUSUM and CUSUMSQ suggest possible breakpoints in the 1998-2001 period for only ten cases. Chow tests applied to these ten cases yield only six equations with a statistically significant structural break.<sup>6</sup> However, in five out of the six cases, ERPT in the second sub-sample is higher than in the first. These results hence reject the hypothesis of lower ERPT as a result of euro-area membership.<sup>7</sup>

<sup>1</sup> The eight euro-area Member States concerned are Belgium, Germany, Greece, Spain, Ireland, Italy, the Netherlands and Portugal.

<sup>2</sup> The exchange rates used are the geometrically weighted averages of the bilateral exchange rates against eight trading partners. Foreign prices are the geometrically weighted averages of the appropriate deflators (GDP, GFCF, consumption) of the eight trading partners. In both cases, the weights used are the shares of the trading partner's exports in the Member State's imports of the appropriate product category from all eight trading partners taken together. The eight trading partners are chosen according to their weight in extra-euro-area imports and the availability of series for the appropriate deflators. The eight trading partners are: the United Kingdom, United States, Japan, Switzerland, Czech Republic, Poland, Norway and Denmark.

<sup>3</sup> Unit values are seasonally adjusted indices for extra-euro-area imports. The raw indices were taken from Eurostat's NICE domain. Unit value indices have well-known drawbacks. Unit values are calculated as the value of the products divided by their quantity, which is proxied by the weight of the products in terms of tonnage. For some products, where the decline in weight does not match a decline in quantity, unit values would yield a distorted picture of price developments. Unit values also do not correct for changes in quality.

<sup>4</sup> Bråten and Orellana (2005a) point to an effect that might work in the opposite direction, namely the change in product composition. In the euro area, commodities represent a higher proportion of trade exposed to exchange rate changes than in the past. Given that the euro prices of commodities tend to quickly reflect exchange rate changes, this change points to an increase in measured ERPT.

<sup>5</sup> Possible breakpoints that are situated outside this period are unlikely to be related to euro-area membership.

<sup>6</sup> Statistically significant structural breaks were found for Belgium in consumption goods (2000q4), Spain in capital goods (2000q2), Ireland in total goods (1998q3), Italy consumer in goods (2000q1), Italy in capital goods (1998q2) and Portugal in consumer goods (2000q2).

<sup>7</sup> The results are in line with the findings of Campa and González Minguéz (2006) and Campa, Goldberg and González Minguéz (2005). These authors find little evidence in favour of the existence of a statistically significant structural break in the transmission of exchange rate movements into import prices across euro-area countries. They also note that: "Tests for structural break are known to have very low power, especially in short samples like the recent history of the creation of the euro. A wider decline in pass-through may be taking place, but it is too early to ascertain whether this change is taking place and too early to determine the structural explanations for such declines."



### 2.3.3 Conclusions

This section has reviewed emerging inflation trends in the euro area as depicted by the three most commonly used price indicators, the GDP deflator, the private consumption deflator and the HICP. The broad picture that has emerged is one where the annual rate of increase in these three indicators followed a downward trend over much of the 1990s. This reflected the progress made in all these countries towards convergence to low inflation levels, which was required for participation in the third stage of EMU. As a result, and despite important differences in coverage and statistical methodology, a fairly similar picture emerges for developments in inflation dispersion across euro-area Member States from all these price indicators: one of considerable inflation convergence over much of the 1990s. However, the dis-inflationary trend was generally interrupted at the time of the creation of the euro area. Thereafter, the various price indicators display an inverted “u” trajectory. In response to a series of inflationary shocks – like surging oil prices, the initial euro depreciation, and increases in indirect taxes – inflation first increased during the early years of the euro area. Partly reflecting differences in exposure to these common shocks, coupled with differences in initial conditions, inflation dispersion also increased in the early years of the third stage of EMU. Although inflation generally subsided from 2002-3 onwards, in most cases it has not yet returned to the same low levels that prevailed at the start of the third stage of EMU. The same observation also holds for inflation differentials.

## 2.4 Financial markets

This section provides a short overview of financial market integration across the euro area. It focuses on developments in the money, bond and equity markets. It also discusses developments in the banking sector with a focus on lending behaviour and private sector indebtedness.<sup>23</sup>

### 2.4.1 Financial integration

According to the European Central Bank, the market for a given financial instrument is considered fully integrated if all economic agents with the same relevant characteristics acting in that market face a single set of rules, have equal access and are treated equally (ECB, 2005b). It is further proposed that financial integration can be measured by two broad indicator types, namely price-based and quantity-based indicators. While price-based indicators measure discrepancies in the prices of identical financial products, quantity-based indicators are used to assess the extent to which investors have internationalised their portfolios.

The importance of financial market integration stems from the well-documented finance-growth nexus. Here, the theoretical literature and a growing body of empirical literature identify a smooth functioning financial system as a prerequisite for economic growth.<sup>24</sup> The more efficiently the financial system can intermediate savings, the more savings will be available to support productive investment. In this respect, an efficient financial system can improve investment performance along three lines:

- (i) Portfolio diversification. The opportunity to share risks via the financial system may induce savers to allocate a higher fraction of their savings to riskier projects, which tend to be more profitable on average.
- (ii) Enhanced quality of investment. The availability of financial intermediaries may allow an enhanced evaluation of projects, thereby raising the profitability of investment.
- (iii) More long-term projects. The availability of a liquid financial market allows a larger proportion of savings to be invested in projects of longer-term duration, which are typically more productive than shorter-term projects.

Against this background, financial integration works to advance the efficiency of financial systems, via two channels. First, benefits will emerge from scale effects through the increase in the number of actual and potential counterparts for financial transaction. An increase in the breadth and depth of the financial market reduces transaction costs and translates into lower cost of capital for borrowers and higher returns for investors. Second, financial integration improves efficiency of intermediation by intensifying competition among financial intermediaries. In addition, deeper financial integration also increases financial stability, which is crucial to a well-functioning monetary policy.

### 2.4.2 The money market<sup>25</sup>

The introduction of the euro has led to significant money market integration. The national money market, which is broadly defined as the market for inter-bank short-term debt or deposits, was denominated in a single currency from 1 January 1999 onwards. As a consequence, the market for unsecured inter-bank deposits integration is characterised by full convergence in nominal short-term interest rates across the euro area. Following the

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<sup>23</sup> Given the complexity of the issue, this section is not exhaustive and a more sophisticated discussion can, for example, be found in reports issued by the European Central Bank (2005b), the European Commission (2001), and "EMU after five years" (European Commission, 2004a).

<sup>24</sup> See, for example, Levine (2004) and King and Levine (1993a, b and c). See also Gianetti et al.(2002) for a discussion of the finance-growth linkage for the euro area.

<sup>25</sup> See Chapter V for a discussion of various definitions of the real interest rate.

implementations of a common monetary policy, nominal short-term interest rates had already converged towards the average for the 12 euro-area countries prior to 1999. This average rate fell from 11.29% in 1992 to 3.09% in 1998<sup>26</sup> and reached 2.96% in 1999. During the period 1992-1999, one can distinguish two groups of countries in terms of their evolution relative to the latter average. A first group – Austria, Belgium, Finland, France, Germany, and the Netherlands – recorded nominal short-term interest rates that diminished gradually and remained generally below the average over the whole period, before converging to the common nominal short-term interest rate in 1999. A second group – Greece, Spain, Ireland, Italy, and Portugal – registered nominal short-term interest rates generally above the average until 1999. For instance, both Italy and Spain experienced a fall in nominal short-term interest rates by 9.1 percentage points, while Portugal and Greece recorded falls of 11.9 percentage points and 9.6 percentage points respectively. Germany, the Netherlands, Austria, France and Belgium experienced drops in nominal short-term interest rates ranging from 5.7 percentage points in Austria to 6.8 percentage points in France. With the creation of the euro area and the emergence of the ECB as the ultimate provider of liquidity for all Member States, nominal short-term interest rates converged to a single rate (averaging 2.96%) in 1999 and have fallen since then to an annual average of 2.19% in 2005.

### 2.4.3 Bond market developments

Full financial integration implies that the Law of One Price holds, that is, assets with identical risks and returns should be priced equally regardless of where the transaction takes place across the euro area. As an immediate consequence, financial integration in the euro area should be characterised by a convergence of bond yields, largely driven by elimination of exchange rate risk. Second, financial integration should lead to an increasing correlation between different bond yields, as they react to more common shocks. Finally, the return on bonds in a large area should be less volatile, as specific local conditions should offset one another via the diversification mechanism.

Indeed, convergence in euro-area benchmark yields began well ahead of the third stage of EMU in 1999, as Member States reduced inflation rates and consolidated budgets in order to meet the Maastricht criteria. Before the introduction of the euro, yield spreads on government bonds were determined by: (i) expectations of exchange rate fluctuations; (ii) different tax treatments of bonds issued by different countries; (iii) credit quality; and (iv) liquidity. In the run-up to the introduction of the euro, investors progressively discounted the elimination of the exchange rate risk for the Member States most likely to participate in the euro area. Coupled with the elimination of different tax treatments in the course of 1990, the relevant yield spreads had become tightly compressed to about 30 basis points in excess of the 10-year (German) benchmark towards the end of 1998. This compression of yield spreads contrasted sharply with the situation at the beginning of 1992, when several euro-area Member States had yield spreads between 400 and 700 basis points above the German benchmark.

Although euro-area yield spreads relative to the (euro-area) benchmark have slightly fluctuated since 1999, they have remained within a very tight range by previous standards. Broadly speaking, the evolution of spreads can be split into four phases: (i) a modest widening of spreads for several countries from 1999 to early 2001; (ii) a strong and further compression in spreads from 2001 to mid-2003; (iii) stable and very tight spreads from mid-2003 to end of 2004; and (iv) a moderate widening of the spread of Italian, Greek and Portuguese bonds since the start of 2005. As previously mentioned, in light of the elimination of exchange-rate risk and different tax treaties, credit and liquidity risk remain the two main determinants of euro-area spreads. Since 1999, the loss of direct control over monetary policy resulted in downgrades in long-term “domestic” currency ratings for some euro-area government bonds. However, credit risk in euro-area government bonds overall declined in the early years after the creation of the euro area, stimulated by strong growth and sustained budgetary consolidation efforts. As a result, euro-area credit ratings converged toward the highest grade.<sup>27</sup> However, the subsequent economic slowdown was accompanied by an easy fiscal stance in many euro-area Member States, resulting in a reversion of the earlier trend in ratings from mid-2004 onwards, with downgrades for Italy, Greece, and Portugal.<sup>28</sup>

Recently, investor discrimination between euro-area government bonds on the basis of underlying budgetary performance (hence, implied credit risk) has been limited. The spreads on euro-area non AAA rated issuers (i.e. Greece, Italy, Portugal, and Belgium) have been compressed toward the benchmark and the reaction of spreads to the rating downgrades has been modest and has emerged with a considerable delay. Also, the absolute level of yields in the government bonds of downgraded Member States had declined despite their reduced credit ratings. These developments raise the concern that financial markets are not playing their role in terms of disciplining governments in their conduct of budgetary policy. Part of the explanation is that there has been little incentive for investors to diversify away from the EU, given that budgetary expansion in the euro area has been less than in the US and Japan.

<sup>26</sup> If Greece is excluded from the euro-area average, the nominal short-term interest rate is 2.96% in 1999 rather than 3.08%.

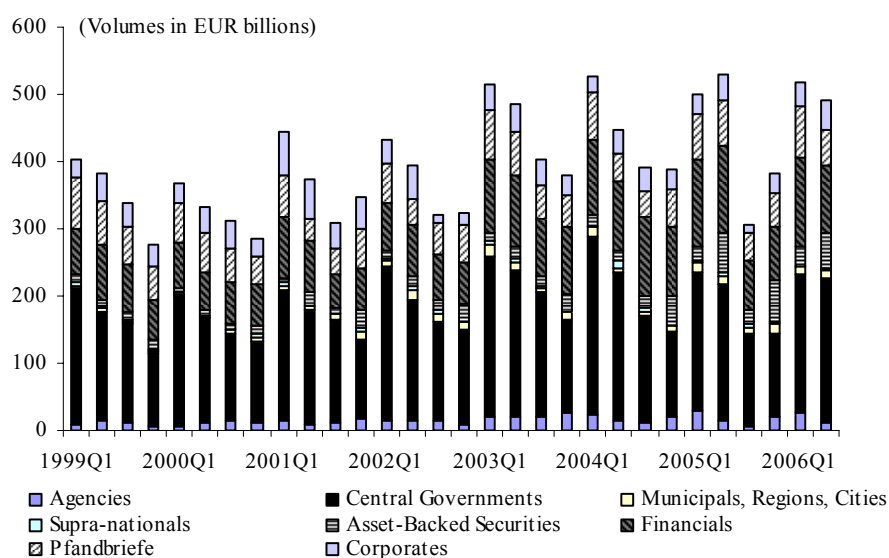
<sup>27</sup> Austria, France, Germany, Luxembourg, and the Netherlands had already been assigned the highest credit quality (Aaa by Moody's and AAA by S&P and Fitch) before 1999. Ireland, Spain, and Finland were upgraded in 2001/2002 and Belgium had been upgraded to AA by Fitch in mid-2002. All rating agencies improved the ratings for Italy and Greece from 1999 to 2004.

<sup>28</sup> Italy was downgraded to AA- by S&P in July 2004. Greece was downgraded by both Fitch and S&P to single -A at the end of 2004 and Portugal was assigned a negative outlook by S&P and finally downgraded to AA- at the end of July 2005.

Also, credit premiums tend to be small as long as default risks remain within reasonable ranges, but rise rapidly with the perception of serious financial difficulties. As long as there is no significant breach of the Stability and Growth Pact, which would have a sufficient impact on risk of debt default, the limited discrimination between euro-area borrowers with regards to credit risk is likely to remain.

Greater liquidity and depth of the euro-denominated bond market has also been reflected in higher issuance rates. The increase in the latter was particularly strong in 1999, with a growth rate of 18.9% relative to 1998.<sup>29</sup> The early months of 1999 were also characterised by high corporate activity, which forms part of the notable changes in the composition of bond issuance relative to the pre-1999 situation. For once, there was a sharp rise in non-sovereign issuance in 1999 with the combined issuance of the corporate and financial sectors more than quadrupling vis-à-vis 1998. The following year (2000) marked a decline in total bond issuance by 7%, partly due to reduced government borrowings and decline in market sentiment caused by rising interest rates and oil prices. This trend was reversed in 2001, when bond issuance increased again by 13% attributable to higher activity in the first months of the year, which was largely driven by corporate and financial issuers. Issuance volumes stayed constant in 2002, with the first quarter of 2002 marked by high government issuance activity in contrast to subdued private sector issuance following the Enron scandal. Since 2002, first quarter gross issuance has stabilised at high levels albeit with a changing composition. While 2003 was marked by an increase in issuance of 20% across all issuer categories – except for supranational institutions, corporations, and asset-backed securities – the first quarter of 2004 was characterised by heavy issuance in the central government section which was again reversed in the first quarters of 2005 and 2006.

**Graph 2.4.1: Issuance activity in euro since 1999**



Source: Commission Services and ECB

#### 2.4.4 Equity market developments

Like other financial market segments, equity market integration across the euro area has advanced albeit at a slower and less evident pace. In theory, various factors and developments could have led to greater stock market integration.

- In a broad sense, efforts of the EU Member States to adhere to the Maastricht criteria have led to greater nominal and real convergence, and hence greater business cycle synchronisation. In theory, this real business cycle synchronisation can bring about higher cross-country correlations in expected corporate earnings.
- The introduction of the euro has improved transparency, standardised pricing in financial markets, and reduced investors' transaction and information costs.

<sup>29</sup> See European Commission (2001) for bond issuance data pre-1999.

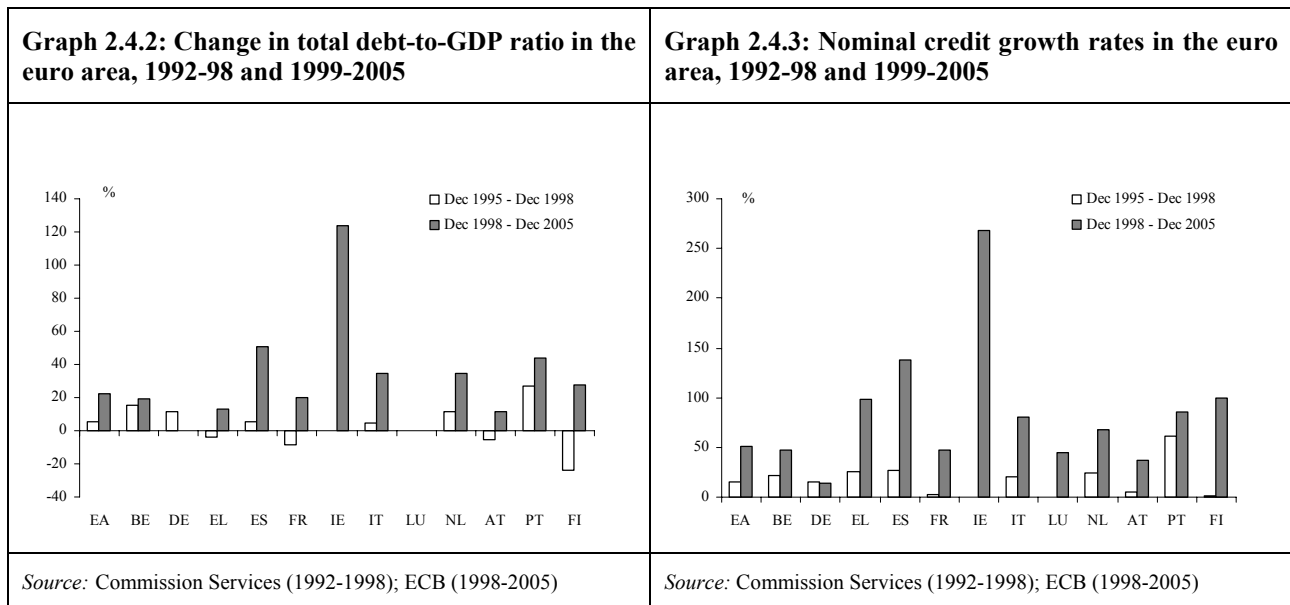
- Several legal restrictions were abolished in the run-up to the establishment of the euro area, e.g. the previous restrictions on the foreign currency composition of assets held by institutional investors, which were required to hold assets primarily in domestic currency.
- Broadening investment opportunities across the participating Member States could have affected market expectations long before 1999, thereby leading to greater integration of stock markets as the probability of a monetary union became greater.
- As noted previously, the introduction of the euro eliminated intra-EU currency risk, thereby reducing the overall exchange rate exposure of EU stocks.

In practice, it proves, nonetheless, difficult to isolate the impact of the euro on equity markets from that of other unrelated developments, such as the relaxation of controls on capital movements and foreign exchange transactions, improvements in computer and telecommunication technology which have lowered the costs of cross-border information exchange and financial transactions, and the expansion of multinational operations of major corporations along with greater stock market consolidation as a global phenomenon. The majority of empirical studies address equity-market integration by asking two related questions: (i) How strongly are European equity markets integrated and (ii) How much of equity market integration is attributed to euro-area membership?

Fratzscher (2001) tested for financial integration by applying the uncovered-interest-rate-parity condition to asset prices for 16 OECD countries. He found that European stock markets were highly integrated from 1996 onwards and further confirmed that on reduced exchange rate uncertainty and the convergence of interest and inflation rates have had a significant impact on European financial integration. More specifically, the reduction of exchange-rate uncertainty seems to explain much of the high degree of volatility in financial integration in the 1990s, in particular in the periods of low integration during the ERM crisis in 1992-1993 and 1995 as well as the rapid increase in integration since 1996 in the run-up to the introduction of the euro. Hardouvelis et al. (2004) found that in the second half of the 1990s stock markets converged towards full integration, as forward interest rate differentials vis-à-vis the German benchmark and inflation differentials against the three best-performing states shrank towards zero. Supporting evidence of the role that participation in the euro area played in equity market integration comes from non-member experiences. The UK, for instance, does not show significant signs of increased integration with the other European stock markets. Bartram et al (2006) provide evidence of greater equity market integration across the euro area, albeit only for large equity markets such as France, Germany, Italy, the Netherlands and Spain. Recently, there has also been supporting evidence that integration in EU equity markets has been mainly evident in more sectorally-correlated movements in equity prices across the Member States. This is corroborated by ECB (2004a), which suggests a possible shift in asset allocation from country-based to sector-based strategies from 2001 onwards – based on an assessment of dispersion of monthly equity returns.

#### **2.4.5 Credit developments**

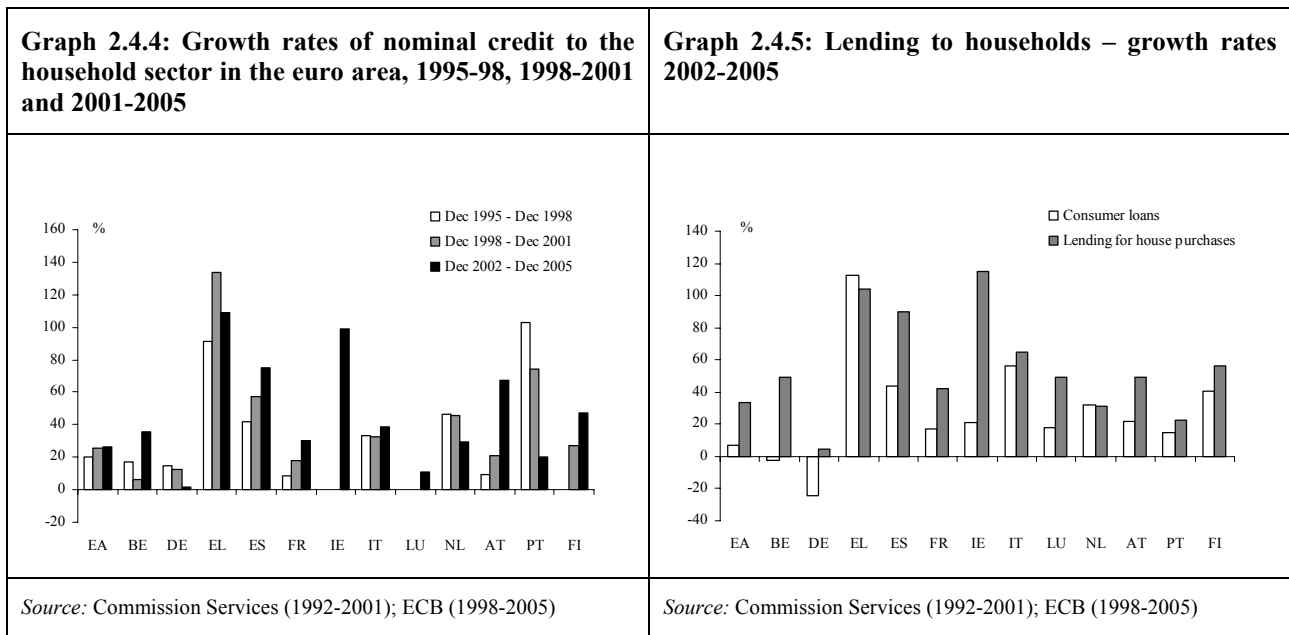
Falling inflation and convergence in real short-term interest rates associated with euro-area membership are also reflected in a surge of private sector credit growth in the euro area. Here, the effective elimination of exchange rate risk has been a major contribution on both the demand (as private sector agents revised their income expectations upwards) and the supply side (as banks were able to refinance domestic credit operations abroad at a significantly reduced risk). Total debt-to-GDP, as an indicator for financial deepening, has increased since the introduction of the euro in 1999, notably in Spain, Italy, Portugal, the Netherlands, and Finland. Among the euro-area countries, Ireland registered the biggest change in the debt-to-GDP ratio between 1999 and 2005, amounting to 124%. Conversely, Germany, Austria, and France exhibited very moderate increases in the debt-to-GDP ratio. These developments are also reflected in the nominal growth rates of total credit. While total credit was growing slowly in the larger Member States like Germany and France, smaller Member States like Greece, Portugal, Spain and especially Ireland experienced a surge in lending activities in the private sector in anticipation of euro-area membership. Thereafter, credit grew by 270% in nominal terms between 1999 and 2005 in Ireland and by almost 100% and 140% in Greece and Spain, respectively.



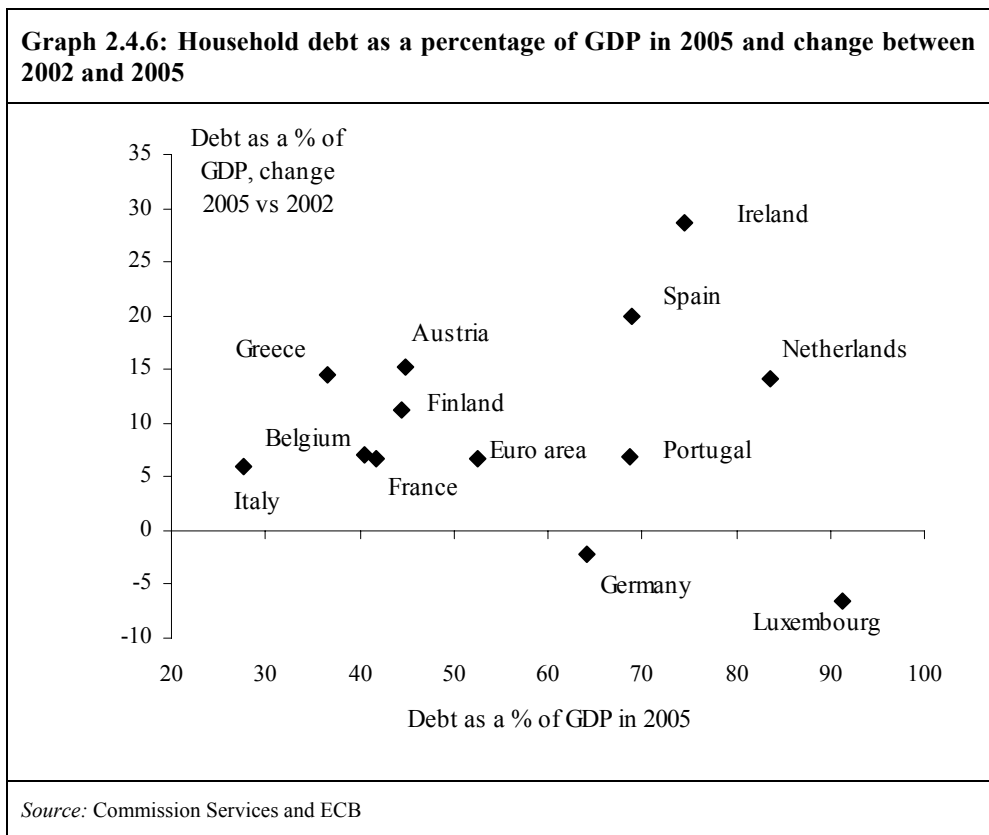
#### 2.4.6 The household sector

Credit developments were most pronounced in the private sector. Households, in particular, appear to have revised their permanent income expectations upwards. The resulting increased credit demand was willingly met by the banking sector, partly as the effective elimination of the exchange rate allowed them to refinance domestic credit operations abroad. The heterogeneous pattern of credit growth across the euro area is strongly reflected in the household sector: While Belgium, France, and Luxembourg experienced moderate increases and household lending effectively diminished in Germany in the last three years, Greece, Ireland, Spain and Portugal experienced a rapid increase in household credit. Analogous to overall credit, household lending booms in these countries started between 1 and 4 years prior to euro-area accession and peaked in the accession year.<sup>30</sup> In Portugal, for example, nominal credit growth grew by 103% between 1995 and 1998. Nonetheless, credit growth experience differs across these countries. The interplay of various factors (pro-cyclical fiscal policy resulting in an increase in debt levels, a drop in domestic demand as private sector agents re-assessed their financial position in combination with a weak external outlook, an increase in interest rates, low productivity despite high lending) eventually drove the Portuguese economy into recession. Part of the explanation is the strong bias of credit towards the household sector, whereas in Ireland corporate loans were the major source of expansion in these years. However, in the last three years, Ireland appears to have experienced yet a second peak in credit growth. In contrast to the earlier convergence experience, this time household loans – which have grown by almost a 100% in nominal terms – have taken over the role as the major force behind credit expansion. Household credit was primarily driven by the expansion in loans for housing purchases. Between 2002 and 2005, Ireland witnessed an increase in loans for house purchases amounting to 115% in nominal terms. Similar developments have been observed for Greece and Spain.

<sup>30</sup> Data for Ireland are only available from 2002 onwards for the same source.

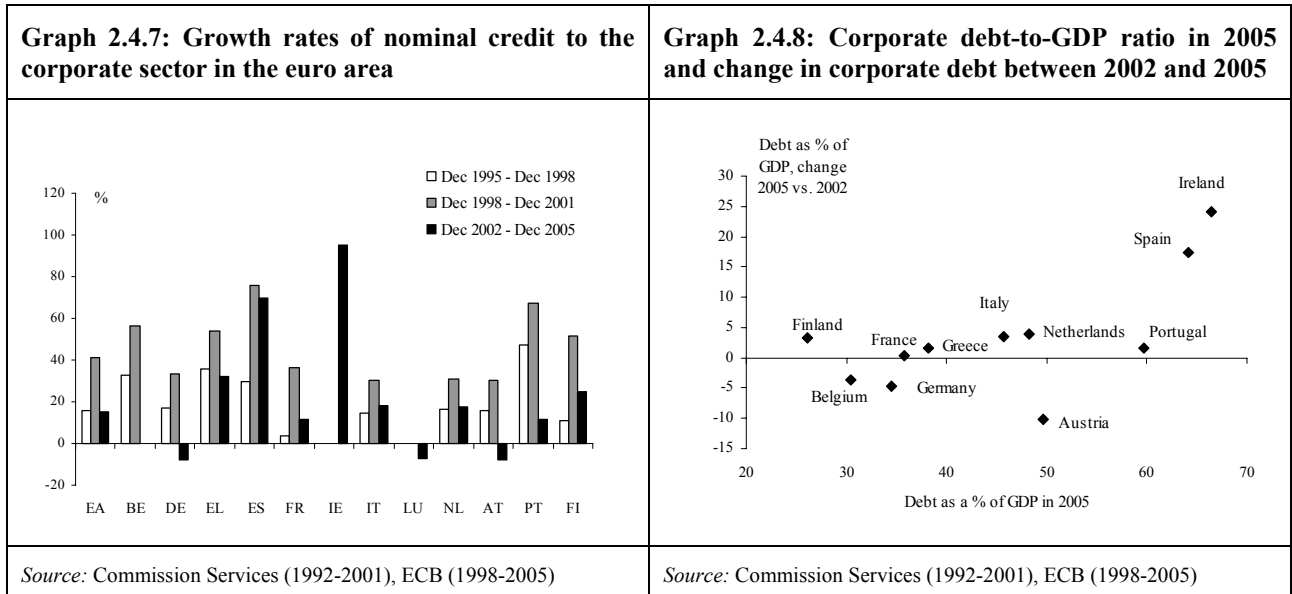


As a consequence of increased household lending, there has been a steady accumulation of household sector debt in the euro area since the introduction of the euro in 1999. The debt-to-GDP ratio is currently above 60% in Germany, Ireland, the Netherlands, Ireland, and Luxembourg, and continues to increase rapidly in several Member States, for example, Ireland and Spain. In contrast, Germany and Luxembourg have been experiencing negative growth rates. In the light of the strong pace growth of housing loans in some countries, high levels of indebtedness run the risk of leaving households vulnerable to adverse shocks, such as changes in interest rates, income or the value of house prices. Such shocks could induce households to re-assess their debt exposure and lead to a period of balance-sheet consolidation, which could depress economic activity, as witnessed in the case of Portugal.



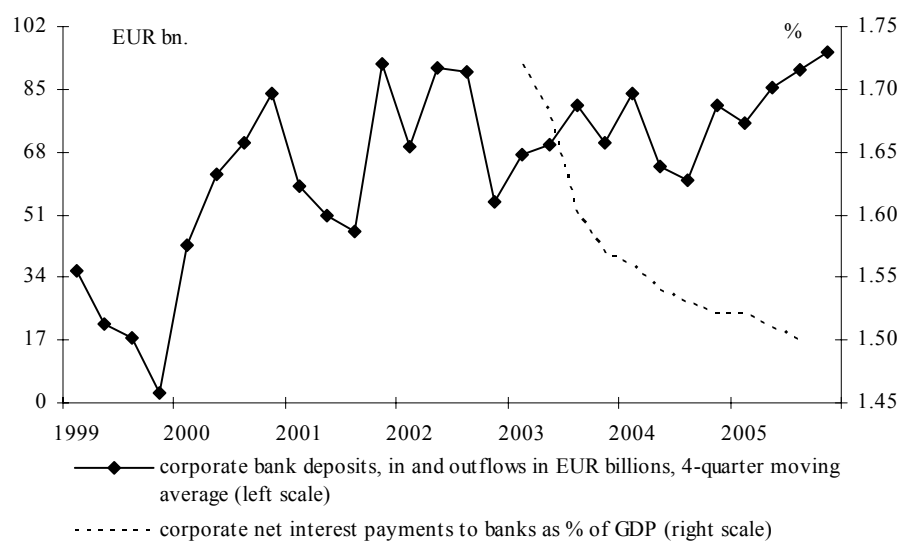
### 2.4.7 The corporate sector

Compared to pre-1999 credit growth rates, credit growth in the corporate sector increased after the creation of the euro area. A surge in debt-financed investment in the late 1990s followed by the equity price correction in 2000 resulted in a sharp drop in the corporate sector's net financial wealth and triggered a phase of balance-sheet consolidation. In this context, the pace of debt accumulation in the euro area has slowed since 2001. Compared to the household sector, changes in corporate debt have, however, been less pronounced in recent years.



Balance-sheet consolidation has also involved a process of debt restructuring, amid historically favourable financing conditions (see above). Outstanding debt has been refinanced at lower interest rates and longer maturities. In this context, it is notable that the amount of net interest paid to banks has declined from about 1.8% of GDP in 2003 (when the data series begins) to about 1.5% in 2005, while the share of longer-term debt obligations (i.e. outstanding loans and debt securities issuance with maturity of more than one year) has risen from about 64% in 2001 to about 68% in 2005. Companies have also accumulated substantial cash balances, amid a strong recovery in profitability. Inflows to corporate bank deposits have been rising at record rates, in stark contrast to the period before 2000 when inflows fell to zero.

**Graph 2.4.9: Corporate bank deposits and net interest payments to banks (euro area)**



Source: Commission Services and ECB

### 3. Closing remarks

As documented in this chapter, economic developments in the early years of monetary union have been marked by significant and persistent divergences in key macroeconomic variables, including growth, inflation, intra-euro-area real effective exchange rates, and current account balances. Several findings emerge from this discussion that are very helpful in understanding the adjustment process in the euro area, and feed into the analysis in later chapters.

First, the basic behavioural relationships of consumption and investment differ across countries, but show practically no series break around the time of euro adoption. To the extent economic performance in countries diverged, this in part reflected disturbances or "shocks" in the determinants of these expenditures. Such divergences are clearly evident in the consumption and investment data, and their pattern is already suggestive about the way in which adjustment challenges emerged and were resolved. In particular, a significant part of the divergence in performance after euro adoption reflected the behaviour of investment. Within investment, residential housing played a prominent role.

These results suggest a need to probe how events in the run-up to euro adoption influenced investment behaviour. One major strand in developments clearly reflects the aftermath of German unification. This involved an extended period of sluggish investment, and extended real exchange rate adjustment. A second element is related to the strong and sustained expansion of residential investment in some countries, which may have reflected both real sector and financial influences.

Second, the counterpart to such trends can be seen in financial market developments. On the one hand, balance-sheet restructuring after German unification dampened corporate demand for credit. Financial markets responded to this adjustment, accommodating in particular a lengthening of corporate debt maturities. On the other hand, some euro-area economies experienced a sizable decline in risk premia and easing of consumer borrowing constraints. This triggered a strong expansion in household borrowing, and a shift of resources to non-traded goods and in particular housing investment. Here, financial market shifts were drivers of real sector developments, and capital flows drove changes in current account positions.

More generally, financial markets underwent increasing integration across the euro area. It is too early to determine from the data how this has been affecting risk-spreading and income smoothing across the euro area at a time of real sector shocks, and thus buffering the adjustment process. The literature indicates that this had a trivial impact in the 1970s and 1980s, compared with the scope of smoothing in the United States. During the 1990s this process began to lift off in the EU, and it is likely that it accelerated after adoption of the euro.



Third, inflation developments, also, suggest issues to be explored more deeply in the remainder of this Review. On the one hand, there was a striking success in keeping area wide inflation close to the ECB's target range, and achieving high credibility in terms of inflation expectations. On the other hand there were significant and persistent divergences in inflation across the area, which need to be better understood. How far do they reflect price level shifts that were consistent with inter-country adjustment? And how did they relate to underlying wage and productivity behaviour? These are issues that must be explored in order to shed light on the efficiency of the adjustment process.

## Annex A: Table of macroeconomic indicators

Table A1: Macroeconomic indicators - euro-area countries

		BE	DE	EL	ES	FR	IE	IT	LU	NL	AT	PT	FI	EA
GDP	1992-98	1.8	1.5	1.8	2.3	1.7	7.2	1.3	3.6	2.8	2.2	2.4	2.5	1.8
	1999-05	2.0	1.3	4.3	3.6	2.1	6.5	1.2	4.8	1.9	2.0	1.6	2.9	2.0
	Difference	0.2	-0.3	2.5	1.4	0.4	-0.6	0.0	1.2	-0.9	-0.1	-0.8	0.4	0.2
	Std. Dev	0.2	0.2	1.8	1.0	0.3	0.4	0.0	0.8	0.6	0.1	0.6	0.3	0.1
Private consumption	1992-98	1.6	1.7	2.2	1.9	1.4	5.0	1.3	2.6	2.6	1.7	2.8	1.5	1.7
	1999-05	1.6	1.1	3.5	3.9	2.6	5.5	1.1	3.6	1.6	1.6	2.3	3.1	1.9
	Difference	0.0	-0.6	1.3	2.0	1.2	0.6	-0.2	1.0	-1.0	-0.1	-0.5	1.6	0.3
	Std. Dev	0.0	0.4	1.0	1.4	0.9	0.4	0.2	0.7	0.7	0.1	0.4	1.1	0.2
Investment	1992-98	2.0	1.3	2.4	2.2	0.6	10.3	0.3	3.6	3.9	1.5	5.7	1.3	1.3
	1999-05	2.7	-0.4	7.0	6.1	3.6	7.5	2.3	5.0	0.9	1.4	-0.7	2.9	2.3
	Difference	0.7	-1.7	4.6	3.9	2.9	-2.8	2.0	1.4	-3.0	-0.1	-6.4	1.6	0.9
	Std. Dev	0.5	1.2	3.3	2.7	2.1	2.0	1.4	1.0	2.1	0.1	4.5	1.1	0.7
Inflation	1992-98	1.8	1.1	6.7	3.5	1.7	2.1	3.8	1.2	1.9	2.1	4.4	1.7	2.5
	1999-05	2.0	1.4	3.2	3.1	1.8	3.6	2.4	2.7	2.6	1.7	3.0	1.6	2.0
	Difference	0.2	0.3	-3.5	-0.5	0.0	1.5	-1.5	1.5	0.8	-0.4	-1.4	-0.2	-0.5
	Std. Dev	0.1	0.2	2.4	0.3	0.0	1.0	1.1	1.1	0.6	0.3	1.0	0.1	0.3
Unemployment	1992-98	9.0	8.1	9.3	17.2	11.1	12.4	10.6	2.7	5.7	4.0	6.2	14.1	10.1
	1999-05	7.8	8.4	10.6	10.8	9.4	4.6	9.0	3.3	3.4	4.2	5.4	9.2	8.5
	Difference	-1.2	0.3	1.4	-6.4	-1.8	-7.8	-1.7	0.5	-2.2	0.2	-0.7	-4.9	-1.6
	Std. Dev	0.9	0.2	1.0	4.5	1.3	5.5	1.2	0.4	1.6	0.1	0.5	3.5	1.1
Employment	1992-98	0.4	-0.3	1.2	1.0	0.2	3.8	-0.6	0.9	1.8	0.4	0.1	-0.8	0.2
	1999-05	0.9	0.3	0.7	3.4	1.0	3.6	1.6	1.8	0.7	0.5	0.8	1.3	1.2
	Difference	0.5	0.6	-0.5	2.4	0.8	-0.2	2.2	0.9	-1.1	0.2	0.7	2.1	1.1
	Std. Dev	0.4	0.4	0.3	1.7	0.6	0.1	1.5	0.6	0.8	0.1	0.5	1.5	0.7
Compensation per employee	1992-98	3.1	4.5	10.5	4.9	2.6	4.6	3.8	3.3	2.9	3.4	7.5	2.7	3.7
	1999-05	2.7	2.0	6.4	3.0	2.6	5.9	3.0	3.9	4.2	2.1	4.3	3.1	2.6
	Difference	-0.4	-2.5	-4.1	-1.9	0.1	1.2	-0.8	0.6	1.3	-1.2	-3.2	0.4	-1.2
	Std. Dev	0.3	1.8	2.9	1.4	0.1	0.9	0.5	0.4	0.9	0.9	2.3	0.3	0.8

Note: For the periods 1992-98 and 1999-2005, the figures for all variables, except unemployment, are average annual growth rates for the periods concerned. Unemployment is expressed as the average rate for the periods concerned.

Source: Commission Services

## Annex B: Analysis of consumer expenditure – details of econometric results

### B1. Model and econometric results

According to standard life-cycle theory of consumption, real consumer expenditure is largely driven in the long run by real (disposable) income, real wealth and real interest rates. The wealth term, which includes both financial wealth (defined as net acquisition of financial assets less liabilities) and tangible wealth (largely represented by the value of real estates in the case of households), is intended to capture non-labour income streams, while the real interest rate denotes inter-temporal substitution effects in consumption. The short-term-dynamics of these explanatory variables explains fluctuations of consumption around its long-run equilibrium. A benchmark model of consumer behaviour<sup>31</sup> can therefore be represented by a standard error-correction equation of this form<sup>32</sup>:

$$D\ln\text{CONS} = a + b \cdot \ln\text{CONS}(-1) + c \cdot \ln\text{RDY}(-1) + d \cdot \ln\text{RW}(-1) + e \cdot \ln\text{RHP}(-1) + f \cdot \text{RR}(-1) + g \cdot D\ln\text{RDY} + h \cdot D\ln\text{RW} + k \cdot D\ln\text{RHP} + l \cdot \text{DRR}$$

where: **D** is the first difference operator; **ln** is the natural log operator; **CONS** is real private consumption; **RDY** is real (personal) disposable income; **RW** is real (net) financial wealth; **RHP** is the real price of housing; and **RR** is the 3-month real interest rate.<sup>33</sup> In the above equation, the parameter *b* represents the speed of adjustment towards long-run equilibrium of consumption, while the ratios  $(-c/b)$ ,  $(-d/b)$ ,  $(-e/b)$  and  $(-f/b)$  measure the long-run effects on consumption of real income, real financial wealth, real house prices<sup>34</sup> and the real interest rate, respectively. The remaining parameters explain the short-term dynamics of consumption. The coefficient on income is boosted when there are liquidity constraints on the availability of credit, since this implies that consumption is closely tied to the receipt of income. In contrast, the ability to consume out of wealth – in particular, tangible wealth – is enhanced when there are no liquidity constraints, since wealth can be used to smooth consumption over time. Hence, we should expect the short-term and long-term dynamics in consumption equations to be influenced by the existence of liquidity constraints.

In addition to the explanatory variables already mentioned, uncertainty and the situation regarding government public finances are two additional variables which may be taken into account by consumers when they assess their income and wealth patterns. Higher uncertainty, for instance, will induce the consumer to choose a higher level of (precautionary) saving for a given configuration of income and wealth, thus reducing the level of consumption. To capture the effect of uncertainty on consumption, a consumer confidence indicator is often used as proxy for uncertainty in standard consumption equations. When added to the above specification of the consumption equation, confidence effects (as measured by the DG ECFIN Consumer Surveys indicator) turned out to be significant. However, the inclusion of confidence effects also led to insignificance of a number of other variables, including short-term wealth effects,<sup>35</sup> for both financial and tangible wealth. Overall, the consumer confidence indicator provided very little additional independent information about consumer behaviour and it was therefore excluded from the analysis. Expected changes in government balances may also be relevant in explaining the dynamics of private consumption. As rational agents will try to anticipate future tax changes in a Ricardian manner, a consumer faced with an improvement (deterioration) of the fiscal position is expected to raise (lower) his/her consumption, for a given constellation of the remaining variables. In order to test for the significance of these non-Keynesian effects on consumption, the variable DEF indicating the government budget surplus/deficit (as a percentage of GDP)<sup>36</sup> was included in the estimated error-correction equation.<sup>37</sup>

Quarterly data covering the period 1989Q1-2004Q4 and the variables real private consumption (CONS), real personal disposable income (RDY), real net financial wealth (RW), real house prices (RHP), real short-term interest rate (RR) and government fiscal position as a percentage of GDP (DEF) were used to set up a balanced panel for eleven euro-area countries (EA11: euro-area excluding Luxembourg). Nominal variables were deflated using the consumption price deflator (at 2000 prices) and a log transformation of the data was adopted to ensure that the errors are variance-stationary. In a first step, a panel model was estimated for the set of 11 euro-area countries to provide a

<sup>31</sup> For a survey, see Deaton (1992).

<sup>32</sup> This is an extension of a model developed in Al-Eyd and Barrell (2006).

<sup>33</sup> Additional lags may be considered for the variables in order to capture the short-term dynamics.

<sup>34</sup> Housing wealth is, by definition, the (average) house price multiplied by the housing stock. Without a measure of housing stock, it was not possible to scale the effects of house prices in the long-run regression. Thus, the (long-run) marginal propensity to consume out of housing wealth could not be calculated.

<sup>35</sup> We find that confidence is Granger-caused by wealth, but does not Granger-cause wealth.

<sup>36</sup> In this context, an increase in the level of the DEF variable means either a higher government surplus or a lower government deficit. In both cases, one would expect a positive (long run) effects on consumption.

<sup>37</sup> According to the standard life-cycle model of consumption, the age-composition of the population is likely to have an impact on aggregate consumption patterns as individuals are expected to save when young (and working) and dis-save when old (and retired). Due to the lack of quarterly data, the impact of demographic changes was not considered in this analysis.

basis to evaluate the long- and short- term effects assuming common dynamics across the group of countries. In a second step, since there are good reasons to presume that (long- and short-term) dynamics differ across countries, a series of pooled regressions were carried out, relaxing in turn the restrictions on the dynamics of the speed of adjustment, the long-run structure of common coefficients and ultimately the dynamics involving only short-term effects in order to check for significant country-specific effects. With the help of a dummy variable which takes on a value of 0 before the creation of the euro area (1999) and 1 for the subsequent years, we test for presence of structural breaks in the estimated pooled regressions.

The results of the balanced panel estimation for the aggregate of EA\_11 are shown in Table B1 below. The error-correction-model (ECM) value (speed of adjustment) is highly significant, revealing a strong co-integrating relation between consumption, income and wealth although the value of -0.082 for the speed of adjustment indicates only moderate convergence to the long run-equilibrium. Examining the long run-relationships, the results show that the long-run elasticity of consumption expenditure with respect to disposable income is 0.67 (the ratio of the income coefficient to the error correction coefficient), while the long-run elasticity with respect to financial wealth is 0.05. Lower real interest rates and an improvement of the budget deficit both have long-run effects on consumption, on average. The short-term effect of a 1% increase in income is a rise in consumption of 0.3% while the effect of a rise of 1% in real house prices in the short run is smaller (0.05%). Note also that an improvement in the fiscal position of the government also has a small (albeit positive) effect on consumption in the short run.

**Table B1: Panel results for consumer expenditure (1989Q1 – 2004Q4)****Dependent variable:** DLNCONS = First difference of log of consumption**Method:** Pooled EGLS (Cross-section SUR)**Sample time period:** 1989Q1 - 2004Q4

<i>Variable</i>	<i>Estimate</i>	<i>Std. error</i>	<i>t-statistic</i>	<i>Probability</i>
Constant	0.1614	0.0279	5.78	0.000
LN(CONS)(-1)	-0.0822	0.0112	-7.37	0.000
LN(RDY)(-1)	0.0543	0.0104	5.24	0.000
LN(RW)(-1)	0.0039	0.0017	2.34	0.020
RR(-1)	-0.0011	0.0002	-6.81	0.000
DLN(RDY)	0.3223	0.0281	11.46	0.000
DLN(RDY)(-3)	0.1288	0.0258	5.00	0.000
DLN(CONS)(-1)	-0.1324	0.0327	-4.05	0.000
DLN(RHP)	0.0502	0.0154	3.27	0.001
DEF(-1)	0.0005	0.0002	3.48	0.001
D(DEF)(-1)	0.0025	0.0006	4.49	0.000

**Weighted Statistics**

R-squared	0.42	Mean dep. var.	0.60
Adjusted R-squared	0.40	S.D. dep. var.	1.30
S.E. of regression	1.01	Sum squared resid.	651.75
Durbin-Watson stat.	2.01		

**Unweighted Statistics**

R-squared	0.35	Mean dep. var.	0.006
Sum squared resid	0.04	Durbin-Watson stat	2.080

**Implicit long-run effects:**

LN(RDY)(-1)	0.66
LN(RW)(-1)	0.05

*Note:* All variables are expressed in averages across countries. The Akaike and Schwarz information criteria are used to determine the appropriate lag structure.

*Source:* Commission Services

The first part of Table B2 presents the pooled mean group estimates when we allow for cross-country differences in the error-correction term. The model appears consistent with different ECM values across countries ranging from a slow speed of adjustment found in Italy, Portugal and the Netherlands to a relatively rapid adjustment found in Germany and France. The second part of the table presents the results of tests for a structural break in the speed of adjustment before and after the creation of the euro area across euro-area countries. The reported coefficients should be interpreted as deviations from the estimates shown in the first part of the table. Statistical tests suggest a change in the speed of adjustment between the two sub-periods only in France and Italy (with Portugal a borderline case at the 10% significance level), although the extent of the deviation compared to the pre-1999 period is fairly small.

<b>Table B2: Pooled mean group estimates – speed of adjustment (1989Q1 – 2004Q4)</b>		
<i>Variable</i>	<i>Estimate</i>	<i>t-statistic</i>
BE - LN(CONS_BE(-1))	-0.108	-4.12
DE - LN(CONS_DE(-1))	-0.124	-4.70
EL - LN(CONS_EL(-1))	-0.110	-3.65
ES - LN(CONS_ES(-1))	-0.090	-3.68
FR - LN(CONS_FR(-1))	-0.155	-5.39
IE - LN(CONS_IE(-1))	-0.097	-4.50
IT - LN(CONS_IT(-1))	-0.037	-1.57
NL - LN(CONS_NL(-1))	-0.073	-3.35
AT - LN(CONS_AT(-1))	-0.119	-4.33
PT - LN(CONS_PT(-1))	-0.066	-2.49
FN - LN(CONS_FN(-1))	-0.108	-4.81
<b>Structural break (1999)</b>		
FR - D_FR(-1)*LN(CONS_FR(-1))	<b>0.002</b>	<b>2.57</b>
IT - D_IT(-1)*LN(CONS_IT(-1))	<b>-0.002</b>	<b>-3.01</b>
PT - D_PT(-1)*LN(CONS_PT(-1))	<b>-0.003</b>	<b>-1.65</b>

*Note:* Figures in bold are significant at the 10% level at least  
*Source:* Commission Services

Table B3 presents country-specific long-run elasticities of consumption with respect to disposable income, wealth, the interest rate and the government budget deficit by relaxing in turn the restrictions on the dynamics linked to the error-correction term. In addition, the table also contains the results of the tests of whether structural breaks emerged also in the long-run dynamics of these variables before and after the creation of the euro area. Country-specific long-term dynamics between consumption and income is detected in Spain, Ireland, Netherlands and Portugal, while a euro-area participation effect on this relationship is present in the case of France and Finland (and perhaps Belgium). Country-specific effects of financial wealth on consumption are significant in Greece, France, Italy, Netherlands, Austria and Finland with support for a structural break in the relationship for the post-1998 period for Belgium, Spain and Ireland. Long-run dynamics between consumption and interest rates suggests a significant country-specific effect in most euro-area countries apart from Germany, France and Portugal. There is no evidence of a specific euro-area effect on this relationship. Finally, a positive long-run effect of the budget deficit on consumption is detected in Belgium, Germany, Spain and Italy and, for the period after 1999, in Belgium, Italy, Austria, Portugal and Finland.

**Table B3: Pooled mean group estimates – short-run dynamics (1989Q1 – 2004Q4)**

<i>Variable</i>	<i>Estimate</i>	<i>t-statistic</i>	<i>Variable</i>	<i>Estimate</i>	<i>t-statistic</i>
BE--LN(RDY_BE(-1))	0.0196	0.98	BE--LN(RW_BE(-1))	-0.0033	-0.44
DE--LN(RDY_DE(-1))	0.0174	0.56	DE--LN(RW_DE(-1))	0.0085	1.00
EL--LN(RDY_EL(-1))	0.0428	0.95	<b>EL--LN(RW_EL(-1))</b>	<b>0.0146</b>	<b>2.43</b>
<b>ES--LN(RDY_ES(-1))</b>	<b>0.0618</b>	<b>3.03</b>	ES--LN(RW_ES(-1))	0.0001	0.01
FR--LN(RDY_FR(-1))	0.0225	1.15	<b>FR--LN(RW_FR(-1))</b>	<b>-0.0152</b>	<b>-3.15</b>
<b>IE--LN(RDY_IE(-1))</b>	<b>0.0594</b>	<b>3.53</b>	IE--LN(RW_IE(-1))	0.0010	0.21
IT--LN(RDY_IT(-1))	0.0175	0.58	<b>IT--LN(RW_IT(-1))</b>	<b>0.0485</b>	<b>4.79</b>
<b>NL--LN(RDY_NL(-1))</b>	<b>0.0933</b>	<b>3.41</b>	<b>NL--LN(RW_NL(-1))</b>	<b>0.0130</b>	<b>2.31</b>
AT--LN(RDY_AT(-1))	0.0515	1.17	<b>AT--LN(RW_AT(-1))</b>	<b>-0.0177</b>	<b>-2.38</b>
<b>PT--LN(RDY_PT(-1))</b>	<b>0.0728</b>	<b>2.91</b>	PT--LN(RW_PT(-1))	0.0072	1.07
FN--LN(RDY_FN(-1))	0.0094	0.40	<b>FN--LN(RW_FN(-1))</b>	<b>0.0101</b>	<b>2.32</b>
<b>BE--D_BE(-1)*LN(RDY_BE(-1))</b>	<b>0.0011</b>	<b>1.60</b>	<b>BE--D_BE(-1)*LN(RW_BE(-1))</b>	<b>0.0010</b>	<b>1.91</b>
DE--D_DE(-1)*LN(RDY_DE(-1))	0.0005	0.88	DE--D_DE(-1)*LN(RW_DE(-1))	-0.0002	-0.29
EL--D_EL(-1)*LN(RDY_EL(-1))	0.0009	0.51	EL--D_EL(-1)*LN(RW_EL(-1))	0.0001	0.17
ES--D_ES(-1)*LN(RDY_ES(-1))	0.0002	0.23	<b>ES--D_ES(-1)*LN(RW_ES(-1))</b>	<b>0.0014</b>	<b>1.95</b>
<b>FR--D_FR(-1)*LN(RDY_FR(-1))</b>	<b>0.0010</b>	<b>1.79</b>	<b>FR--D_FR(-1)*LN(RW_FR(-1))</b>	<b>0.0016</b>	<b>3.06</b>
IE--D_IE(-1)*LN(RDY_IE(-1))	0.0005	0.95	<b>IE--D_IE(-1)*LN(RW_IE(-1))</b>	<b>0.0021</b>	<b>2.34</b>
IT--D_IT(-1)*LN(RDY_IT(-1))	-0.0002	-0.44	<b>IT--D_IT(-1)*LN(RW_IT(-1))</b>	<b>-0.0019</b>	<b>-3.25</b>
NL--D_NL(-1)*LN(RDY_NL(-1))	-0.0003	-1.06	NL--D_NL(-1)*LN(RW_NL(-1))	0.0009	1.57
AT--D_AT(-1)*LN(RDY_AT(-1))	0.0003	0.76	<b>AT--D_AT(-1)*LN(RW_AT(-1))</b>	<b>0.0013</b>	<b>2.24</b>
PT--D_PT(-1)*LN(RDY_PT(-1))	-0.0020	-1.27	PT--D_PT(-1)*LN(RW_PT(-1))	-0.0006	-1.07
<b>FN--D_FN(-1)*LN(RDY_FN(-1))</b>	<b>0.0006</b>	<b>1.77</b>	FN--D_FN(-1)*LN(RW_FN(-1))	-0.0005	-0.59
<i>Variable</i>	<i>Estimate</i>	<i>t-statistic</i>	<i>Variable</i>	<i>Estimate</i>	<i>t-statistic</i>
<b>BE--RR_BE(-1)</b>	<b>-0.0009</b>	<b>-3.00</b>	<b>BE--DEF_BE(-1)</b>	<b>0.0006</b>	<b>2.37</b>
DE--RR_DE(-1)	0.0003	0.45	<b>DE--DEF_DE(-1)</b>	<b>0.0013</b>	<b>1.63</b>
<b>EL--RR_EL(-1)</b>	<b>-0.0012</b>	<b>-2.55</b>	EL--DEF_EL(-1)	0.0006	1.44
<b>ES--RR_ES(-1)</b>	<b>-0.0013</b>	<b>-4.02</b>	<b>ES--DEF_ES(-1)</b>	<b>0.0008</b>	<b>1.78</b>
FR--RR_FR(-1)	0.0000	-0.01	FR--DEF_FR(-1)	0.0003	0.67
<b>IE--RR_IE(-1)</b>	<b>-0.0012</b>	<b>-3.47</b>	IE--DEF_IE(-1)	0.0002	0.20
<b>IT--RR_IT(-1)</b>	<b>-0.0018</b>	<b>-5.31</b>	<b>IT--DEF_IT(-1)</b>	<b>0.0013</b>	<b>4.98</b>
<b>NL--RR_NL(-1)</b>	<b>-0.0014</b>	<b>-3.21</b>	NL--DEF_NL(-1)	0.0010	1.40
<b>AT--RR_AT(-1)</b>	<b>-0.0017</b>	<b>-3.40</b>	AT--DEF_AT(-1)	0.0000	-0.07
PT--RR_PT(-1)	-0.0006	-1.27	PT--DEF_PT(-1)	0.0009	1.40
<b>FN--RR_FN(-1)</b>	<b>-0.0021</b>	<b>-5.63</b>	FN--DEF_FN(-1)	-0.0003	-0.84
BE--D_BE(-1)*RR_BE(-1)	-0.0002	-0.25	<b>BE--D_BE(-1)*DEF_BE(-1)</b>	<b>-0.0068</b>	<b>-2.40</b>
DE--D_DE(-1)*RR_DE(-1)	0.0007	0.91	DE--D_DE(-1)*DEF_DE(-1)	0.0006	0.81
EL--D_EL(-1)*RR_EL(-1)	0.0002	0.21	EL--D_EL(-1)*DEF_EL(-1)	0.0002	0.23
ES--D_ES(-1)*RR_ES(-1)	-0.0011	-0.71	ES--D_ES(-1)*DEF_ES(-1)	-0.0015	-0.70
FR--D_FR(-1)*RR_FR(-1)	0.0009	1.58	FR--D_FR(-1)*DEF_FR(-1)	0.0003	0.51
IE--D_IE(-1)*RR_IE(-1)	0.0003	0.19	IE--D_IE(-1)*DEF_IE(-1)	0.0010	0.86
IT--D_IT(-1)*RR_IT(-1)	0.0002	0.18	<b>IT--D_IT(-1)*DEF_IT(-1)</b>	<b>0.0023</b>	<b>3.65</b>
NL--D_NL(-1)*RR_NL(-1)	0.0027	1.50	NL--D_NL(-1)*DEF_NL(-1)	0.0001	0.11
AT--D_AT(-1)*RR_AT(-1)	0.0007	0.63	<b>AT--D_AT(-1)*DEF_AT(-1)</b>	<b>-0.0026</b>	<b>-1.84</b>
PT--D_PT(-1)*RR_PT(-1)	-0.0003	-0.17	<b>PT--D_PT(-1)*DEF_PT(-1)</b>	<b>0.0015</b>	<b>1.82</b>
FN--D_FN(-1)*RR_FN(-1)	-0.0005	-0.38	<b>FN--D_FN(-1)*DEF_FN(-1)</b>	<b>0.0009</b>	<b>1.78</b>

Note: Figures in bold are significant at the 10% level (at least).

Source: Commission Services

Table B4 shows the basic pooled mean group estimates (suffix M refers to mean), where we allow for a common error-correction and long-run relationship but introduce idiosyncratic terms in the short term dynamics. The coefficients of the long-run are not markedly changed compared to the original estimates shown in Table B1. The ECM values of -0.098 implies a broadly similar time-span for convergence and the long-term elasticity of consumption with respect to income, financial wealth, the interest rate and the budget deficit are almost the same.

Nevertheless, the short-term dynamic terms suggest significant differences in the dynamics of consumption across countries. Income differences are significant in Belgium, Germany, Greece, France, Ireland, Italy, the Netherlands, Austria and Finland. The size of the dynamic income term in particular varies markedly, from basically 0 in Spain and Portugal to 0.7 in Germany. As regards differences in real wealth, they appear to be significant in Spain, Portugal and Finland while Ireland, Italy, the Netherlands, Austria and Finland display the largest short-term Ricardian effects on consumption. Note that there is little evidence of structural breaks emerging in the above short-term dynamics for the period following the creation of the euro area. The only exceptions are represented: by Belgium and Spain as regards differential effects on consumption stemming from the short-term dynamic of income; by Ireland as regards house-prices dynamics; and Finland as far as the short-term impact of the government budget deficit is concerned.



**Table B4: Pooled mean group estimates: short-run dynamics (1989Q1 - 2004Q4)**

Variable	Estimate	t-statistic	Variables structural breaks	Estimate	t-statistic
C	0.1530	5.45	C	0.1661	5.01
LN(CONSM(-1))	-0.0986	-8.05	LN(CONSM(-1))	-0.1040	-6.88
LN(RDYM(-1))	0.0710	6.39	LN(RDYM(-1))	0.0736	5.15
LN(RWM(-1))	0.0052	2.87	LN(RWM(-1))	0.0062	2.97
RRM(-1)	-0.0010	-5.77	RRM(-1)	-0.0010	-5.45
DEFM(-1)	0.0007	4.39	DEFM(-1)	0.0008	4.25
BE--DLN(CONS_BE(-1))	0.1025	0.86	BE--D_BE(-1)*DLN(CONS_BE(-1))	0.3473	1.50
DE--DLN(CONS_DE(-1))	-0.0922	-1.48	<b>DE--D_DE(-1)*DLN(CONS_DE(-1))</b>	<b>0.2690</b>	<b>1.95</b>
EL--DLN(CONS_EL(-1))	-0.1453	-1.27	EL--D_EL(-1)*DLN(CONS_EL(-1))	-0.1309	-0.48
ES--DLN(CONS_ES(-1))	0.0578	0.49	ES--D_ES(-1)*DLN(CONS_ES(-1))	0.1143	0.48
<b>FR--DLN(CONS_FR(-1))</b>	<b>-0.4352</b>	<b>-4.98</b>	FR--D_FR(-1)*DLN(CONS_FR(-1))	0.0596	0.27
<b>IE--DLN(CONS_IE(-1))</b>	<b>-0.4367</b>	<b>-4.79</b>	IE--D_IE(-1)*DLN(CONS_IE(-1))	-0.2332	-0.94
<b>IT--DLN(CONS_IT(-1))</b>	<b>0.2199</b>	<b>2.31</b>	<b>IT--D_IT(-1)*DLN(CONS_IT(-1))</b>	<b>-0.4269</b>	<b>-2.09</b>
<b>NL--DLN(CONS_NL(-1))</b>	<b>-0.2486</b>	<b>-2.22</b>	<b>NL--D_NL(-1)*DLN(CONS_NL(-1))</b>	<b>0.5453</b>	<b>2.30</b>
<b>AT--DLN(CONS_AT(-1))</b>	<b>-0.2280</b>	<b>-2.63</b>	AT--D_AT(-1)*DLN(CONS_AT(-1))	0.4105	1.43
<b>PT--DLN(CONS_PT(-1))</b>	<b>-0.2126</b>	<b>-2.26</b>	PT--D_PT(-1)*DLN(CONS_PT(-1))	-0.1595	-0.71
FN--DLN(CONS_FN(-1))	-0.1309	-1.22	FN--D_FN(-1)*DLN(CONS_FN(-1))	-0.1747	-0.67
<b>BE--DLN(RDY_BE)</b>	<b>0.3586</b>	<b>2.38</b>	<b>BE--D_BE(-1)*DLN(RDY_BE)</b>	<b>-0.5422</b>	<b>-1.70</b>
<b>DE--DLN(RDY_DE)</b>	<b>0.6822</b>	<b>12.46</b>	DE--D_DE(-1)*DLN(RDY_DE)	-0.0771	-0.66
<b>EL--DLN(RDY_EL)</b>	<b>0.4287</b>	<b>2.73</b>	EL--D_EL(-1)*DLN(RDY_EL)	0.3931	1.10
ES--DLN(RDY_ES)	-0.0255	-0.27	<b>ES--D_ES(-1)*DLN(RDY_ES)</b>	<b>0.6119</b>	<b>2.00</b>
<b>FR--DLN(RDY_FR)</b>	<b>0.4254</b>	<b>3.26</b>	FR--D_FR(-1)*DLN(RDY_FR)	-0.1610	-0.66
<b>IE--DLN(RDY_IE)</b>	<b>0.1938</b>	<b>2.12</b>	IE--D_IE(-1)*DLN(RDY_IE)	-0.0287	-0.15
<b>IT--DLN(RDY_IT)</b>	<b>0.3164</b>	<b>3.36</b>	IT--D_IT(-1)*DLN(RDY_IT)	0.0747	0.37
<b>NL--DLN(RDY_NL)</b>	<b>0.2610</b>	<b>2.25</b>	NL--D_NL(-1)*DLN(RDY_NL)	-0.2150	-0.80
<b>AT--DLN(RDY_AT)</b>	<b>0.2188</b>	<b>2.66</b>	AT--D_AT(-1)*DLN(RDY_AT)	-0.0696	-0.24
PT--DLN(RDY_PT)	0.0906	0.76	PT--D_PT(-1)*DLN(RDY_PT)	-0.0199	-0.07
<b>FN--DLN(RDY_FN)</b>	<b>0.3196</b>	<b>4.14</b>	FN--D_FN(-1)*DLN(RDY_FN)	-0.0265	-0.09
<b>BE--DLN(RDY_BE(-3))</b>	<b>0.1841</b>	<b>1.63</b>	BE--D_BE(-1)*DLN(RDY_BE(-3))	-0.0449	-0.19
DE--DLN(RDY_DE(-3))	0.0452	0.88	DE--D_DE(-1)*DLN(RDY_DE(-3))	-0.1023	-0.88
EL--DLN(RDY_EL(-3))	0.0079	0.05	EL--D_EL(-1)*DLN(RDY_EL(-3))	-0.1264	-0.39
ES--DLN(RDY_ES(-3))	0.0731	0.83	ES--D_ES(-1)*DLN(RDY_ES(-3))	-0.0132	-0.05
<b>FR--DLN(RDY_FR(-3))</b>	<b>0.5121</b>	<b>3.79</b>	FR--D_FR(-1)*DLN(RDY_FR(-3))	-0.0038	-0.02
<b>IE--DLN(RDY_IE(-3))</b>	<b>0.2426</b>	<b>2.56</b>	IE--D_IE(-1)*DLN(RDY_IE(-3))	0.2390	1.31
IT--DLN(RDY_IT(-3))	-0.0313	-0.34	IT--D_IT(-1)*DLN(RDY_IT(-3))	0.2447	1.14
<b>NL--DLN(RDY_NL(-3))</b>	<b>0.2219</b>	<b>2.37</b>	NL--D_NL(-1)*DLN(RDY_NL(-3))	-0.2694	-1.28
<b>AT--DLN(RDY_AT(-3))</b>	<b>0.1475</b>	<b>2.99</b>	AT--D_AT(-1)*DLN(RDY_AT(-3))	-0.1382	-0.59
PT--DLN(RDY_PT(-3))	-0.1023	-1.12	PT--D_PT(-1)*DLN(RDY_PT(-3))	-0.0849	-0.39
FN--DLN(RDY_FN(-3))	-0.0239	-0.34	FN--D_FN(-1)*DLN(RDY_FN(-3))	0.1022	0.46
BE--DLN(RPH_BE)	-0.0507	-0.64	BE--D_BE(-1)*DLN(RPH_BE)	-0.0216	-0.14
DE--DLN(RPH_DE)	-0.0123	-0.10	DE--D_DE(-1)*DLN(RPH_DE)	0.3052	1.22
EL--DLN(RPH_EL)	-0.1200	-1.52	EL--D_EL(-1)*DLN(RPH_EL)	-0.0299	-0.20
<b>ES--DLN(RPH_ES)</b>	<b>0.0832</b>	<b>1.73</b>	ES--D_ES(-1)*DLN(RPH_ES)	-0.2491	-1.37
FR--DLN(RPH_FR)	0.0182	0.54	FR--D_FR(-1)*DLN(RPH_FR)	-0.0283	-0.35
IE--DLN(RPH_IE)	-0.0038	-0.09	<b>IE--D_IE(-1)*DLN(RPH_IE)</b>	<b>0.2208</b>	<b>2.39</b>
IT--DLN(RPH_IT)	0.0406	0.98	IT--D_IT(-1)*DLN(RPH_IT)	0.0728	0.60
NL--DLN(RPH_NL)	0.0058	0.10	NL--D_NL(-1)*DLN(RPH_NL)	0.1069	0.94
AT--DLN(RPH_AT)	0.0977	1.43	AT--D_AT(-1)*DLN(RPH_AT)	0.0111	0.07
<b>PT--DLN(RPH_PT)</b>	<b>0.3918</b>	<b>3.49</b>	PT--D_PT(-1)*DLN(RPH_PT)	-0.2346	-0.94
<b>FN--DLN(RPH_FN)</b>	<b>0.1292</b>	<b>4.10</b>	FN--D_FN(-1)*DLN(RPH_FN)	-0.0571	-0.54
BE--D(DEF_BE(-1))	-0.0022	-0.93	BE--D_BE(-1)*D(DEF_BE(-1))	0.0015	0.20
DE--D(DEF_DE(-1))	0.0004	0.29	DE--D_DE(-1)*D(DEF_DE(-1))	0.0040	1.28
EL--D(DEF_EL(-1))	0.0006	0.35	EL--D_EL(-1)*D(DEF_EL(-1))	-0.0006	-0.11
ES--D(DEF_ES(-1))	0.0015	0.74	ES--D_ES(-1)*D(DEF_ES(-1))	-0.0075	-1.35
FR--D(DEF_FR(-1))	-0.0025	-1.28	FR--D_FR(-1)*D(DEF_FR(-1))	0.0062	1.49
<b>IE--D(DEF_IE(-1))</b>	<b>0.0075</b>	<b>3.12</b>	IE--D_IE(-1)*D(DEF_IE(-1))	-0.0059	-0.93
<b>IT--D(DEF_IT(-1))</b>	<b>0.0036</b>	<b>2.68</b>	IT--D_IT(-1)*D(DEF_IT(-1))	0.0023	0.82
<b>NL--D(DEF_NL(-1))</b>	<b>0.0059</b>	<b>2.22</b>	NL--D_NL(-1)*D(DEF_NL(-1))	-0.0032	-0.47
<b>AT--D(DEF_AT(-1))</b>	<b>0.0047</b>	<b>1.73</b>	AT--D_AT(-1)*D(DEF_AT(-1))	-0.0015	-0.21
PT--D(DEF_PT(-1))	0.0004	0.29	PT--D_PT(-1)*D(DEF_PT(-1))	-0.0016	-0.35
<b>FN--D(DEF_FN(-1))</b>	<b>0.0029</b>	<b>2.41</b>	<b>FN--D_FN(-1)*D(DEF_FN(-1))</b>	<b>-0.0066</b>	<b>-2.35</b>

Note: Figures in bold are significant at the 10% level at least

Source: Commission Services

## Annex C: Analysis of investment expenditure – details of econometric results

The standard neoclassical growth model<sup>38</sup> determines a steady state relationship between gross investment (**I**), output (**y**) and the real cost of capital (**CK**) which depends on the real interest rate (**r**) and the relative price of capital (**PK**):

$$I = \alpha + Y - CK$$

The constant term  $\alpha$  is determined by the steady state growth rate, the rate of depreciation and the share of capital in production. This long-run relationship can be estimated and be incorporated in an error correction model in order to better capture the dynamic behaviour of investment spending:

$$\Delta \ln I_t = k + \gamma (\text{ECM}_{t-1}) + \sum_{i=0}^3 (\alpha_i \Delta \ln I_{t-i-1} + \lambda_i \Delta \ln Y_{t-i} + \chi_i \Delta r_{t-i-1}) + \varepsilon_t$$

in which the error-correction term (ECM) is the deviation from the long-run relationship. In the estimation of the dynamic equation, changes in the real effective exchange rate (**Q**) and the stock market (**S**) are also introduced, in order to capture, respectively, changes in competitiveness and expectations about the future. Given that construction investment, as discussed earlier, has contributed significantly to differences in investment growth among the euro-area Member States, we also investigate a model for total investment spending and a model of non-construction investment in order to assess the extent to which construction investment influences the results.

The data from Eurostat cover the period from first quarter of 1980 to the last quarter of 2005. However, for Ireland and Portugal, quarterly data are only available for a rather short period, in which case data from the OECD are used. In the case of Ireland, only data on housing investment are available from the OECD, whereas for Portugal no breakdown of investment into different types of capital is available. For Germany, data are only available from 1991 onwards. The series start earlier for most other countries, although stock market data or interest rate data are not always available for the entire sample period, in which case a truncated sample is investigated.

First the long-run equilibrium relationship is estimated after which the dynamic relationship is estimated, testing for structural breaks in the dynamic adjustment of investment following the creation of the euro area. In order to compare the results across Member States and test the robustness of the results obtained through the country estimations, a panel model of the eight countries is also estimated.

The evidence concerning the determination of a co-integrating relationship for total investment, is somewhat mixed (Table C1(a)). For Germany, France, Ireland and the Netherlands one co-integrating relationship was found, while for the other countries the hypothesis of no co-integration could not be rejected. Looking at the estimated long-run parameters, there are considerable differences across countries. The estimated interest rate coefficient has the wrong (positive) sign in the case of Germany, France, Spain and Finland, although for France and Finland it is insignificant. The problem of estimating the elasticity of investment with respect to the cost of capital is well known (see for example Schaller (2006) for a recent discussion).

Concerning the relationship between investment and output, there are also differences, with the strongest link in Spain and the weakest in Germany.

Looking at non-construction investment, a co-integrating relationship is obtained for all the countries except Italy. A negative coefficient on the real interest rate is found for all countries except France (Table C1(b)). Concerning the long-run link between non-construction investment and GDP, the coefficient is much higher for Germany, whereas for the other countries the coefficient appears similar to that found for total investment.

### **Key to abbreviations in tables below:**

D= the first difference operator

I= investment

Y= output

R= real interest rate

S= Stock market

Q= real effective exchange rate

Note: all variables are in natural logarithms except the real interest rate.

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<sup>38</sup> See for example, Pelgrin et. al. (2002).

<b>Table C1: Tests for co-integrating relationships</b>									
<b>1a: Total investment</b>									
	<b>DE</b>		<b>IT</b>		<b>ES</b>		<b>NL</b>		
	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	
Constant	19.69		10.55		11.34		-1.24		
Y	0.39	6.34	1.74	6.09	1.84	16.50	0.76	8.10	
R	0.02	5.16	-0.03	-2.08	0.03	2.93	-0.02	-3.68	
	<b>FR</b>		<b>IE</b>		<b>FI</b>		<b>PT</b>		
	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	
Constant	-9.11		1.41		-3.00		-5.35		
Y	1.59	11.97	0.76	8.96	1.12	14.19	1.34	34.59	
R	0.01	0.82	-0.06	-5.98	0.00	0.06	-0.01	-3.84	
<b>1b: Non-construction investment</b>									
	<b>DE</b>		<b>IT</b>		<b>ES</b>		<b>NL</b>		
	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	
Constant	-17.06		9.52		5.87		1.74		
Y	2.12	15.53	1.60	13.5	1.31	13.12	0.96	5.31	
R	-0.01	-1.25	-0.03	-3.87	-0.01	-1.39	-0.03	-2.92	
	<b>FR</b>		<b>IE</b>		<b>FI</b>				
	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>	<b>Estimate</b>	<b>t-statistic</b>			
Constant	-14.88		0.20		-1.46				
Y	1.99	77.75	0.81	20.92	0.90	10.56			
R	0.01	2.18	-0.03	-6.64	-0.02	-3.29			
<i>Source: Commission Services</i>									

Estimating the dynamic error-correction model for countries, the error-correction term is significant for most countries, with the strongest adjustment in Germany and the Netherlands, and smallest (and most insignificant) in Portugal and Ireland. Concerning the other dynamic patterns there are some differences, notably for Ireland a higher number of lags of investment growth is needed. Generally, changes in the interest rate are not significant, except for Germany (a positive coefficient and Ireland (a negative coefficient). Looking at the auxiliary variables, growth in the value of the stock market affects investment positively in Germany, Ireland and the Netherlands, and, somewhat strangely, negatively in Finland. Changes in competitiveness, as measured by changes in the real effective exchange rate, are only found to matter in the case of Finland, with the expected negative sign.

**Table C2a: Results of error-correction models – total investment – Germany , Italy, Spain and the Netherlands**

	DE		IT		ES		NL	
	Estimate	t-statistic	Estimate	t-statistic	Estimate	t-statistic	Estimate	t-statistic
Constant	-0.01	-2.08	-0.004	-2.24	-0.001	-0.20	-0.01	-2.97
ECM	-0.38	-3.27	-0.09	-2.70	-0.09	-2.54	-0.27	-3.33
DI(-1)	-0.56	-3.60			0.34	3.30	-0.36	-3.41
DI(-4)	0.11	1.19						
DY	1.16	4.86	0.91	4.17	1.16	4.71	1.95	3.92
DY(-1)	1.18	2.48					1.48	2.63
DY(-2)			0.67	3.23				
DR	0.01	2.52						
DS							0.06	2.01
DS(-4)	0.05	2.38						
DQ(-1)			0.15	2.88				
EMU*ECM	0.29	2.02	-0.20	-1.96				
EMU*DI(-1)	0.67	2.44						
EMU*DY			2.12	4.00				
EMU*DQ					0.37	2.77		
R <sup>2</sup>	0.51		0.47		0.55		0.59	
DW	1.82		2.01		2.11		1.99	

Source: Commission Services

	FR		IE		FI		PT	
	Estimate	t-statistic	Estimate	t-statistic	Estimate	t-statistic	Estimate	t-statistic
Constant	-0.004	-2.80	-0.01	-2.56	-0.002	-0.62	-0.01	-2.83
ECM	-0.07	-3.57	-0.05	-1.46	-0.10	-2.10	-0.03	-1.68
DI(-1)	0.20	2.97					0.63	7.12
DI(-2)	0.26	2.71						
DI(-4)	0.21	2.74	0.36	4.65	0.55	6.31		
DI(-5)			-0.26	-3.10				
DI(-6)			0.28	3.60				
DY	1.85	9.51	0.98	5.77	2.11	5.43	1.89	8.25
DY(-1)							-0.69	-2.38
DY(-2)	-0.70	-2.70	0.40	2.59				
DR(-4)			0.00	-2.45				
DS					-0.10	-3.18		
DS(-2)			0.08	2.64				
DQ(-3)					-0.30	-3.08		
EMU*ECM			-0.20	-2.56				
EMU*DI(-1)							-0.31	-2.40
EMU*DI(-2)	0.38	1.93						
EMU*DI(-4)	-0.36	-1.90			-0.52	-1.92		
EMU*DY					-1.26	-2.66		
EMU*DR(-1)	-0.01	-2.25						
EMU*DR(-3)					-0.02	-3.35		
EMU*DS					0.09	2.39		
R <sup>2</sup>	0.70		0.60		0.75		0.74	
DW	2.06		1.97		2.54		1.99	

*Source:* Commission Services

Once again, the results obtained by looking at non-construction investment (Table C3) are more homogenous across countries. The error-correction term is significant for most countries (except Ireland) with a somewhat larger adjustment in Italy and the Netherlands. A positive coefficient on changes in the interest rate is found for Germany, Italy, the Netherlands and Ireland, possibly reflecting the pro-cyclical pattern in interest rates. Changes in stock market valuations are found to increase growth in non-construction investment in Spain, the Netherlands and Ireland, but negatively in the case of Finland. Changes in competitiveness only matters in the case of Spain, with a positive coefficient, possibly reflecting a Balassa-Samuelsun type effect of a catching-up economy.

**Table C3a: Results of error-correction models – non-construction investment – Germany, Italy, Spain and the Netherlands**

	DE		IT		ES		NL	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Constant	-0.003	-1.47	-0.01	-2.62	-0.0004	-0.12	-0.28	-2.34
ECM	-0.12	-3.90	-0.18	-4.02	-0.05	-1.88	-0.16	-2.36
DI(-1)	0.18	1.87			0.34	3.65	-0.58	-5.97
DI(-2)	0.34	3.43						
DY	1.32	3.73	1.54	4.51	0.84	3.12		
DY(-2)			1.14	3.46				
DY(-3)							2.12	2.38
DR	0.01	1.95						
DR(-1)							0.01	2.17
DR(-3)			-0.004	-2.05				
DS							0.18	3.08
DS(-1)					0.08	3.39		
DS(-4)	0.06	2.47						
DQ					0.37	3.18		
EMU*DY			2.63	3.10				
EMU*DR	0.01	2.77						
R <sup>2</sup>	0.69		0.43		0.49		0.51	
DW	2.05		2.14		2.14		2.12	

Source: Commission Services

**Table C3b: Results of error-correction models – non-construction investment – France, Ireland and Finland**

	FR		IE		FI	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Constant	-0.003	-1.91	-0.01	-1.06	-0.005	-0.83
ECM	-0.09	-3.74	-0.06	-1.49	-0.14	-1.99
DI(-1)	0.16	2.23	0.85	5.61		
DI(-2)	0.55	6.18				
DI(-4)					0.20	1.91
DY	1.61	7.39			1.68	3.26
DY(-1)						
DY(-2)	-0.50	-2.00				
DR(-1)	-0.003	-2.18				
DR(-3)			0.005	1.63		
DS					-0.07	-2.43
DS(-2)			0.14	3.01		
EMU*ECM			-0.63	-4.13		
EMU1*DY			2.26	6.39		
EMU1*DY			0.96	2.85		
EMU1*DR			-0.01	-3.22		
EMU1*DI			-1.02	-5.52		
EMU1*DI(-4)			0.29	3.40		
R <sup>2</sup>	0.66		0.64		0.34	
DW	1.99		1.88		2.20	

Source: Commission Services

The estimated panel model, more or less confirms the results obtained from the individual country models (table C4). For total investment, there is overall evidence of co-integration, with a significant and negative coefficient on the error-correction term, with a significantly stronger error-correction mechanism in the case of the Netherlands and a slightly slower adjustment in Spain compared with the overall result. A positive long-run elasticity of investment to output is found (1.4), with a much higher coefficient for the Netherlands, and slightly higher for Italy, Spain, Ireland, Finland and Portugal.

As with the some of the individual country equations, a positive long-run coefficient between investment and the real interest rate is also found for the panel-model, with no significant differences found across countries. Stock-market valuations are found to support investment (with a two-quarter lag), while an appreciation of the real effective exchange rate dampens investment (with a lag of three quarters).

For non-construction investment there is also found to be evidence of co-integration, with a somewhat faster adjustment mechanism. The long-run elasticity of investment to output is estimated to be around 1.1, with a much lower coefficient for Germany and Italy (0.3) and slightly lower for Spain (0.7). The long-run elasticity of non-construction investment has the right sign, but is insignificant. However, for France, Italy and the Netherlands, a negative long-run elasticity (-0.03/-0.04) is found.

**Table C4a: Panel model results for total investment****Dependent Variable:** DI = First difference of log of total investment**Method:** Panel EGLS (Cross-section SUR)**Sample (adjusted):** 1992Q2 - 2005Q4**Cross-sections included:** 8**Total panel (unbalanced) observations:** 416

Variable	Estimate	Std. error	t-statistic	Probability
C	-0.69	0.16	-4.26	0.00
I(-1)	-0.10	0.02	-4.90	0.00
Y(-1)	0.14	0.03	4.76	0.00
R(-1)	-0.001	0.00	-2.36	0.02
DI(-1)	-0.04	0.05	-0.82	0.41
DI(-2)	0.09	0.04	2.31	0.02
DI(-4)	0.16	0.04	4.34	0.00
DY	1.41	0.11	13.09	0.00
DY(-1)	0.20	0.12	1.59	0.11
DR(-2)	0.002	0.00	3.06	0.00
DR(-4)	-0.003	0.00	-3.72	0.00
DS(-2)	0.02	0.01	3.46	0.00
DQ(-3)	-0.14	0.04	-3.85	0.00
ES*I(-1)	0.01	0.00	4.25	0.00
NL*I(-1)	-0.53	0.15	-3.58	0.00
IT*Y(-1)	0.002	0.00	3.30	0.00
NL*Y(-1)	0.46	0.13	3.62	0.00
IE*Y(-1)	0.01	0.00	3.83	0.00
FI*Y(-1)	0.01	0.00	3.61	0.00
PT*Y(-1)	0.01	0.00	4.37	0.00
DE*EMU*I(-1)	-0.001	0.00	-3.34	0.00
IT*EMU*I(-1)	-0.32	0.13	-2.52	0.01
NL*EMU*I(-1)	0.33	0.18	1.88	0.06
IE*EMU*I(-1)	-0.39	0.10	-3.87	0.00
PT*EMU*I(-1)	-0.001	0.00	-1.87	0.06
IT*EMU*Y(-1)	0.28	0.11	2.52	0.01
NL*EMU*Y(-1)	-0.28	0.15	-1.88	0.06
IE*EMU*Y(-1)	0.34	0.09	3.85	0.00
IE*EMU*R(-1)	0.01	0.00	2.53	0.01
<b>Weighted Statistics</b>				
R-squared	0.59	Mean dependent var		0.68
Adjusted R-squared	0.56	S.D. dependent var		1.50
S.E. of regression	0.95	Sum squared resid		351.53
F-statistic	20.11	Durbin-Watson stat		1.98
Prob(F-statistic)	0.00			
<b>Unweighted Statistics</b>				
R-squared	0.9998	Mean dependent var		0.01
Sum squared resid	0.1689	Durbin-Watson stat		1.99

Source: Commission Services



**Table C4b: Panel model results for non-construction investment****Dependent Variable:** DI = First difference of log of non-construction inv.**Method:** Panel EGLS (Cross-section SUR)**Sample (adjusted):** 1992Q2 - 2005Q4**Cross-sections included:** 7**Total panel (unbalanced) observations:** 380

Variable	Estimate	Std. error	t-statistic	Probability
C	-0.88	0.12	-7.58	0.00
I(-1)	-0.21	0.03	-6.58	0.00
Y(-1)	0.24	0.03	7.01	0.00
R(-1)	0.0004	0.00	0.38	0.71
DI(-1)	-0.13	0.05	-2.70	0.01
DI(-2)	0.06	0.05	1.22	0.22
DI(-3)	0.02	0.04	0.38	0.70
DI(-4)	0.11	0.04	2.54	0.01
DY	1.33	0.15	9.04	0.00
DY(-1)	0.51	0.16	3.15	0.00
DY(-2)	0.66	0.13	5.21	0.00
DY(-3)	0.76	0.17	4.39	0.00
DY(-4)	0.62	0.18	3.49	0.00
DR(-4)	-0.003	0.00	-2.10	0.04
DQ(-3)	-0.14	0.06	-2.47	0.01
DE*I(-1)	0.20	0.05	3.68	0.00
ES*I(-1)	0.11	0.03	3.54	0.00
NL*I(-1)	-0.29	0.09	-3.18	0.00
IE*I(-1)	0.003	0.00	2.35	0.02
DE*Y(-1)	-0.17	0.04	-3.79	0.00
IT*Y(-1)	0.002	0.00	2.51	0.01
ES*Y(-1)	-0.09	0.02	-3.52	0.00
NL*Y(-1)	0.23	0.07	3.19	0.00
FR*R(-1)	-0.01	0.00	-4.67	0.00
IT*R(-1)	-0.01	0.00	-4.60	0.00
NL*R(-1)	-0.01	0.00	-2.56	0.01
DE*EMU*I(-1)	-0.54	0.10	-5.35	0.00
IT*EMU*I(-1)	-0.35	0.14	-2.59	0.01
IE*EMU*I(-1)	-0.37	0.11	-3.30	0.00
DE*EMU*Y(-1)	0.44	0.08	5.36	0.00
FR*EMU*Y(-1)	0.001	0.00	2.10	0.04
IT*EMU*Y(-1)	0.29	0.11	2.57	0.01
IE*EMU*Y(-1)	0.31	0.09	3.31	0.00
DE*EMU*R(-1)	0.01	0.00	3.26	0.00
IT*EMU*R(-1)	0.02	0.01	2.93	0.00
NL*EMU*R(-1)	0.01	0.00	2.49	0.01
FI*EMU*R(-1)	-0.004	0.00	-1.85	0.07

**Weighted Statistics**

R-squared	0.55	Mean dependent var	0.47
Adjusted R-squared	0.51	S.D. dependent var	1.40
S.E. of regression	0.97	Sum squared resid	323.09
F-statistic	11.78	Durbin-Watson stat	2.04
Prob(F-statistic)	0.00		

**Unweighted Statistics**

R-squared	0.9995	Mean dependent var	0.01
Sum squared resid	0.3901	Durbin-Watson stat	2.05

Source: Commission Services

To investigate whether participation in the euro area has affected the behaviour of investment spending, two types of tests were used. First, the stability of parameters in the estimated dynamic error-correction model for individual countries was investigated using the so-called CUSUM and CUSUM of Squares tests. The tests find evidence of instability in the parameters of the estimated relationship, but generally such instability in equations appears to predate the introduction of the euro – in the mid-1990's or earlier, in particular for Ireland and Finland.

Second, changes in the coefficients in the dynamic equation were tested using a dummy variable, which takes a value zero before the first quarter of 1999 and one afterwards. For Germany and Italy, there is an indication of slower error-correction (more persistent investment) in the euro-area period in Germany, and faster in Italy and Ireland (Table C2a). However, these effects are not found for non-construction investment. In terms of changes to the dynamic adjustment to interest rate changes, there is evidence of some effect in France and Finland. Concerning the adjustment to stock market valuations or changes in external competitiveness, there was no overall evidence suggesting changes in the adjustment coefficients.

From the panel estimation for total investment, structural shifts in the error-correction mechanism are found for Germany, Italy, the Netherlands, Ireland and Portugal, with indications of much more rapid adjustment to equilibrium in the post-1998 period for Italy and Ireland, and much slower adjustment for the Netherlands (in fact the estimated coefficient indicates divergence from equilibrium). Concerning the long-run parameters, there is evidence that the elasticity of investment to output is higher after the introduction of the euro for Italy and Ireland, and lower for the Netherlands. The only country for which a significant change in the elasticity of investment to interest rates is Ireland, with a shift to a positive (albeit small) sign of the long-run elasticity of investment to the real interest rate.

For non-construction investment, there is little evidence overall from the individual country models of a change in the dynamic adjustment behaviour after 1998. A structural shift in the error-correction term is only found in the case of Ireland for which there is also some evidence of changes in some of the other short-run adjustment parameters, with in particular a stronger relationship between investment growth and output growth. From the panel model for non-construction investment, evidence of considerably faster adjustment to equilibrium in the post-1998 period is found for Germany, Italy and Ireland. Concerning the long-run parameters, the estimated elasticity of investment to output is somewhat lower for Germany, Italy and Ireland in the post-1998 period, whereas the elasticity with respect to interest rates is more positive for Germany, Italy and the Netherlands.



# IV. MARKET ADJUSTMENT: THE COMPETITIVENESS CHANNEL

## Summary

*In a monetary union, changes in competitiveness are the key adjustment channel because neither interest rates nor exchange rates are available as national policy instruments. In principle, a country that is "out of sync" with the euro-area business cycle experiences above-average demand that tends to push costs and prices resulting in an above-average inflation rate. The deterioration in the relative cost situation will worsen that country's cost and price competitiveness and slow the pace of economic activity towards the euro-area average. This chapter evaluates how such an adjustment takes place through the competitiveness channel, in particular by exploring how competitiveness within the euro area is achieved by relative productivity and wage developments or a combination of both (relative unit labour costs). The analysis takes into account the fact that it is not only cyclical factors that determine unit labour cost developments, but also catching-up (Balassa-Samuelson effect), idiosyncratic shocks and common shocks that impact differently across euro-area economies.*

*Evidence is presented on how in the first few euro-area years, different cyclical positions appear to have triggered an adjustment in real exchange rates. The initial decline in interest rates in the run-up to the third stage of EMU and possibly too low euro conversion rates are among the explanatory factors behind a strong expansion in some Member States, which resulted in relative wage and cost increases. After the positive stimulus had resulted in above-average inflation rates for a number of years, the evolving deterioration in price competitiveness – a cumulative process – should eventually dominate the process of economic adjustment in euro-area economies. The speed of adjustment is affected by such channels as the real-interest-rate channel, as well as by market flexibility. Relatively slow wage responses run the risk that movements in the intra-euro-area real effective exchange rate may be prolonged, and that adjustment may be inefficient. More specifically, country experiences in the first euro-area years suggest a certain asymmetry in the adjustment process. While during the expansionary path due to pro-cyclical low interest rates, higher inflation and deteriorating price competitiveness work relatively rapidly (3-5 years), the reverse process of regaining competitiveness through relative disinflation works much more slowly. The analysis also shows that countries with rigid employment protection legislation exhibit a stronger acceleration of wages following a positive shock to output.*

*Because of the heterogeneity in the cyclical response of unit labour costs within the euro area, temporary changes in relative prices risk being transformed into persistent differences in underlying price competitiveness trends, ultimately giving rise to persistent cyclical imbalances. This chapter also provides evidence that the working of the competitiveness channel may have been levelled off by the recent convergence in unit labour costs of euro-area countries. The fact that the convergence in unit labour costs was driven by the convergence in nominal wages may be harmful since it was not associated with an equivalent convergence in productivity levels.*

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# MARKET ADJUSTMENT: THE COMPETITIVENESS CHANNEL

## 1. Introduction

Analysis of the adjustment capacity of the euro area and the participating economies has been complicated by economic developments associated with the period of convergence and one-off effects at the start of the third stage of EMU. Studies on cross-border factor mobility have dealt with adjustment issues but such studies mostly focussed on the status quo and how to implement the freedoms of mobility for capital, labour, goods and services (Internal Market, labour mobility, financial market integration). Studies on the first few years of the euro area and the role of the single monetary policy highlighted the substantial decline in interest rates in some Member States at the start of the third stage and the impact on economic activity. Studies on inflation differentials across euro-area countries have tried to quantify structural components (Balassa-Samuelson effects) and have looked at inflation persistence, but for the most part the available data were insufficient to address empirically the question of inter-country adjustment. The longstanding focus on the *ex ante* optimality of EMU as a (optimal) currency area and the difficulty of distinguishing between convergence and adjustment issues have left several questions unanswered with respect to adjustment mechanisms within the euro area.

One of the key aims of this Review is to provide an in-depth-analysis of inter-country adjustment channels in order to assess the adjustment capacity of the euro area after the convergence process has almost come to an end. Accordingly, we look at market-based adjustment channels such as the competitiveness channel (this chapter) and the real interest rate channel (Chapter V), as well as policy-based adjustment (Chapter VI), which can impact on the operation of the market-based channels.

While monetary policy in the euro area is conducted by a central institution, fiscal policies fall under the responsibility of national governments (subject to common rules enshrined in the Stability and Growth Pact). This low degree of policy centralisation (compared to the US) attaches more weight to market flexibility and market channels of adjustment within the euro area. Two aspects of market adjustment command particular attention: the competitiveness of an economy relative to other euro-area economies; and differences in financing conditions across countries as reflected in real interest rates. The start of the third stage of EMU brought substantial changes to the market channels associated with competitiveness and real interest rates since exchange rates among euro-area economies ceased to exist and the ECB began to conduct the single monetary policy resulting in identical policy interest rates across the whole euro area. These changes deserve special attention in the evaluation of market channels. Other aspects of market channels of adjustment relate to financial markets and the role they play in smoothing income and consumption within the euro area.

Changes in competitiveness are the key channel of adjustment under monetary union at times when country-specific shocks cause cyclical conditions in one Member State to move out of line with those in the remainder of the euro area. As the national economy enters a boom phase relative to the euro area, for example: the pressure on resources causes costs to increase; the real effective exchange rate appreciates; and this in turn slows activity until cyclical conditions move back in line with the euro area average. The effectiveness of this competitiveness channel is thus a key influence determining how efficiently adjustment takes place. A core question, therefore, is how national costs respond to fluctuations in output gaps, ensuring smooth adjustment. Evidence presented here suggests that this responsiveness of costs is asymmetrical across the euro area, with a stronger response to cyclical conditions during booms than in downturns. That means that achieving timely real effective depreciation may be an inefficient aspect of inter-country adjustment. Moreover, the responsiveness of wages to cyclical slack varies considerably across countries, with quite weak responses in some cases. To address this would imply improving the working of the

labour market, and also enhancing productivity growth – which can facilitate efficient adjustment on the downside by reducing the need for nominal wage restraint. It is, however, difficult to disentangle these analytical strands in the data, because various other influences are at work. One of these is the broad tendency for wages and prices to converge across the area. Where such convergence is validated by productivity differentials, it is "competitiveness-neutral", and does not affect inter-country adjustment. But there are other forces at play in causing wage or price convergence, and these may evolve over time in ways that retard or accelerate movements needed for efficient adjustment among national economies.

Cross-country inflation differentials have built up in the first few euro-area years, together with substantial differences in price and cost competitiveness. Many observers have also drawn attention to the potential implications of persistent growth differences among the euro-area Member States for the smooth functioning of economic and monetary union. In particular, concerns have been expressed about the capacity of heterogeneous countries to put in place mechanisms that are able to cope with asymmetric shocks, or common shocks with asymmetric effects, given that control of national monetary policy has been relinquished and the nominal exchange rate is no longer available as a means of adjustment. With a single monetary policy, the competitiveness channel, i.e. adjustment of the real exchange rate, becomes the main mechanism to for bringing cyclical conditions in individual countries back into line with the euro-area average, following a shock. The effectiveness of the competitiveness channel determines how efficiently adjustment takes place in the euro area.

The question arises as to whether the observed patterns in price and cost competitiveness are in line with expectations, whether they are driven by one-off effects related to the start of the third stage of EMU (e.g. change in risk premia) or whether they reflect regular adjustment mechanisms in the euro area that can be expected to work in the same way as in the pre-1999 period. Answers to this question carry implications for the means of restoring competitiveness within the euro area, which implies achieving price and wage inflation below the euro-area average. An analysis of the issues must also take into account the fact that diminishing barriers to trade, global developments (e.g. globalisation) and labour market developments might have altered the mechanism of adjustment via the competitiveness channel. This chapter reviews the functioning of the competitiveness channel, bringing together the issues discussed in the economic literature with an analysis of the actual economic performance of the euro-area Member States. The real interest rate channel and the contributions of policy-based adjustment, including fiscal and structural policies, are evaluated in the next two chapters.

## **2. Price and cost competitiveness: short-term adjustment and long-term forces**

In monetary union, the need for real exchange rate adjustments remains. Countries with depressed cyclical conditions relative to those of their main trading partners should experience less inflationary pressures, eventually leading to a downward adjustment in their prices relative to those of their main partners in the area. In a frictionless economy, flexible aggregate wages obviate the need for output to respond temporary demand shocks. In contrast, aggregate wage rigidity increases short-term output fluctuations around the potential output growth path.

Changes in relative wages and prices of different sectors are also needed to absorb sectoral shocks. For example, in response to a demand shift toward non-tradeable goods in a specific country, the competitive position of its traded sector should deteriorate in order to reallocate resources away from this sector. Changes in wages and prices of the tradeable relative to the non-tradeable sector may contribute to the achievement of a new equilibrium<sup>1</sup> in the market of non-traded goods (Aizenman and Frenkel, 1988) and, through the economy's budget constraint, reduce trade imbalances (Dornbusch, 1974). In this case, the adjustment to shocks works mainly through changes in relative prices, with net exports and the supply of non-traded goods acting as factors contributing to the adjustment of divergences in GDP growth. Nevertheless, the long-term steady state of the economy will also depend on the trend in net foreign assets.

In the absence of the exchange rate instrument, movements in the real exchange rate, i.e. in relative prices, help to reducing cyclical imbalances. In practice, there are as many real exchange rate indicators as price and costs deflators, which may provide different pictures of the change in a country's balance of trade in goods and services (see Box on "Price and costs competitiveness indicators"). Yet a change in either internal or external relative prices and wages entails a temporary gain or loss in competitiveness, which does not necessarily indicate poor export performance but rather the need to correct existing cyclical disequilibria.<sup>2</sup>

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<sup>1</sup> Changes in the nominal exchange rate cannot yield the new equilibrium because changing relative prices and relative wages involves two targets, which cannot be addressed with only one instrument. A combination of exchange rate and fiscal policies can contribute to achieving a new equilibrium but only temporarily without a change in the long-term structure of relative wages.

<sup>2</sup> Changes in the ratio of foreign to domestic prices in a broad-based price indicator depend both on the ratio of tradeable to non-tradeable prices in the domestic and foreign economies and on the ratio of domestic to foreign prices of tradeable goods. In a highly integrated area, the price of domestic tradeable goods is set by international markets. Movements in the domestic to foreign prices of non-tradeable relative to tradeable goods account for the variations of the domestic to foreign price indices. This implies that competition in domestic product and labour markets influences price and wage formation mechanisms as well as domestic and foreign relative prices and wages. Deviations from

How rapidly temporary deviations from long term inflation differential are absorbed depends on the wage response to temporary shocks.<sup>3</sup> Asymmetries in nominal and real wages adjustment may influence trend inflation, amplify the output and consumption cycle<sup>4</sup>, and slowdown the adjustment of relative prices to asymmetric shocks, making unemployment and output more volatile and ultimately increasing the unemployment sacrifice ratio – i.e. the increase in unemployment needed to trigger a change in competitiveness (Blanchard, 2006).<sup>5</sup> Apart from the well-known effects on equilibrium unemployment, rigid real wages influence the stickiness of relative prices and reinforce the causes of nominal wage rigidity (Andersen, 1994, 2004). Moreover, nominal wage rigidities create further persistence of the shocks, in addition to the persistence accounted for by the exogenous shocks themselves, and generate price and inflation dispersion (Altissimo et al., 2004). Differences across countries in wage stickiness are a source of heterogeneous adjustment to both common and country-specific supply shocks, which affects output and inflation locally and union-wide.<sup>6</sup> Hence, an increase in all countries of real and nominal wage flexibility reduces the sensitivity of the euro-area output to common and country-specific shocks. Also, different responses of sectoral wages to real shocks are required when shocks are sector specific or workers are heterogeneous (Aizenman and Frenkel, 1986).

With a limited response to shocks at the intensive and extensive margins (i.e. in terms of hours worked and employment), the burden of adjustment is shifted entirely on price variables. Labour mobility across sectors increases the supply of non-traded goods and smooths the adjustment to shocks, reducing excess volatility in the terms of trade.

In addition to their role in rebalancing cyclical divergences, inflation differentials in prices and wages may respond to long-term trends towards convergence in labour costs across countries. There can be a tension between the need to adjust relative prices to correct short- to medium- term imbalances and the long-term pressures to reduce price and costs dispersion, which may lead to persistence and delay the adjustment of prices and costs over the cycle, making the functioning of the competitiveness channel less effective.

Three explanations have been given of the potential decline in labour costs dispersion: the Balassa-Samuelson (B-S) effect, migration (Williamson, O'Rourke and Hatton, 1993) and the "demonstration" or "fair" wage effect. Firstly, the B-S effect predicts that during a catch-up period, countries with high growth rates would experience a real exchange rate appreciation and an increase in "equilibrium" inflation.<sup>7</sup> Secondly, migration flows from low to high wage

the law of one price may occur when firms fix the price in the currency of the buyer in order to neutralise the volatility of the exchange rate (Engel, 2000). Although the volatility of the nominal exchange rate is eliminated in monetary union, fluctuations of the relative price of tradeable goods are still possible if the exportable sector uses non-tradeable inputs produced in domestic and foreign markets with different degrees of substitution. In this case deviation from PPP may derive from changes in the relative prices of non-tradeable goods. The existence of differentiated traded goods leads to a violation of the law of one price (Benigno and Thoenissen, 2003).

<sup>3</sup> The reduction in the risk premium that comes with participation in monetary union may lead to an economic boom and a rise in real wages (Hohohan and Lane, 2005). With sticky wages, the decline of the interest rate leads to overheating, destabilises the real interest channel, and makes wage growth unsustainable. Some have argued that in order to avoid a loss of competitiveness, wage growth should be adjusted downwards. However, others have claimed that, when the adjustment requires a reduction in external demand, inflation may accelerate the correction, while a more moderate wage growth might delay the adjustment needed, especially when structural unemployment is low (Blanchard, 2001). In both cases, the response depends on the flexibility of nominal wages.

<sup>4</sup> See Fagan, Gaspar and Pereira (2003). However the effect of wage stickiness is model dependent. For example, in Altissimo, Benigno and Rodriguez-Palenzuela (2004), wage stickiness does not necessarily dampen the effect of productivity shocks to the traded sector as it also slows down the response of the terms of trade, implying that the inflation-differential cycle moves around and ultimately over-shoots its long run-equilibrium.

<sup>5</sup> The response of wages to positive demand shocks may be greater than the response to negative shocks because of explicit contracts that set the length of labour contract (Gray (1978) and Taylor (1980)) and an asymmetric degree of indexation or because of implicit contracts and insider-outsider dynamics (Blanchard and Summers (1988)). Also, the coexistence of wage compression and hiring and retraining costs may lead firms to opt for firing less able workers during recession instead of cutting wages and running the risk of losing the more able workers.

<sup>6</sup> In an inter-temporal general equilibrium model of currency union, Andersen (2004) shows that shocks are transmitted via the current account, through changes in the terms of trade, and propagated differently across heterogeneous national labour markets. In response to common and country-specific shocks, more real and nominal wage flexibility make EU-wide aggregate output less sensitive to shocks. Also greater real and nominal wage flexibility leads to less variability of output, especially in the case of real wage flexibility when the initial flexibility is low. In the case of common shocks, more domestic and nominal wage flexibility has ambiguous effects because it increases the volatility of the terms of trade. Finally, in the case of country specific shock, more real flexibility in the domestic and foreign countries contributes to less domestic output variability. Greater nominal wage flexibility in the domestic country reduces output variability, while more nominal rigidity in the foreign country reduces output variability when the initial degree of rigidity is low. In contrast, it increases domestic output variability when the degree of rigidity is high.

<sup>7</sup> The Balassa-Samuelson effect requires very restrictive assumptions, namely perfectly competitive firms, perfectly mobile factors of production and the law of one price. This implies that the terms of trade are fixed, and any improvement in the productivity of the tradeable sector relative to the non-tradeable sector increases the wage paid to workers in the tradeable sector. Labour mobility across sectors equalises wages, increases the marginal costs in the non-tradeable sector, non-tradeable prices and the inflation differential. If traded goods are imperfect substitutes, favourable productivity or mark-up shocks in the traded sector reduce the price of home-produced goods and worsen the terms of trade, which in turn reduces the pressure on wages and prices of the non-tradeable sector to adjust (Benigno and Thoenissen (2003); Altissimo et al., (2005)). In contrast, productivity or mark-up shocks in the non-tradeable sector are the primary cause of price and inflation differentials in the domestic relative to the foreign non-traded sector, and are the main factor behind the cross-country variability of real wages. Within a currency area, when traded-goods are homogeneous, demand-side factors that change the relative (domestic to foreign)



countries may potentially be a source of declining dispersion in wage levels (i.e. a temporary increase in wage inflation). Thirdly, the run up to the third stage of EMU led to fundamental economic changes, including the reduction of risk premia, diminishing barriers to trade, and stronger competition that encouraged price and cost convergence. These changes would tend to produce convergence in nominal unit labour costs. Also, greater transparency in price and wage comparisons under the euro has added a more recent source of convergence due to a "fair" wage effect.

#### **Box: Price and cost competitiveness indicators**

Different competitiveness indicators provide different information about changes in relative prices. For example, an appreciation of the REER based on the unit labour costs of the whole economy relative to the unit-labour-costs-based REER for the traded sector signals the prevalence of inflationary pressures in sheltered sectors. To the extent that the prices of exportable goods are set by international markets, these pressures do not necessarily lead to an adjustment of the external exchange rate and to a deterioration in the external balance. Moreover, movements in the REER based on aggregate price indices provide an indication of the resource pulls in the economy, i.e. whether the incentives to shift resources from the traded to the non-traded sectors are comparatively stronger in the country than in its main trading partners.

Indicators of international competitiveness should be evaluated on the basis of their capacity to capture change in a country's trade balance (Lipschitz and McDonald, 1992; Marsh and Tokarick, 1994). Hence, changes in indicators should contain information on both imports and exports.

The "internal" relative price is defined as the ratio between domestic tradeable and non tradeable goods ( $q_1 = p_T/p_{NT}$ ). The "external" relative price is measured by the ratio of foreign to domestic values of some broad-based index such as CPI or GDP deflator ( $q_2 = p^*/p$ ). With Cobb-Douglas preferences, the domestic CPI is a geometric average of and non-tradeable goods:  $p = p_T \gamma p_{NT}^{1-\gamma}$ . A similar relation holds for the foreign CPI. If the weights of tradeable and non tradeable goods are the same across countries, the relationship between the external and internal relative price is given by  $\log q_2 = \gamma (\log q_1 - \log q_1^*) + \log p_T/p_T^*$ . Hence a change in  $q_2$  can be obtained through different combinations of changes in domestic and foreign internal prices and in the price of domestic relative to foreign tradeable goods (see Giovannini et al., 1993), which can contain different signals about the allocation of resources within sectors differently exposed to international competition, as well as about the effects on the trade balance.

In the model of Dornbusch (1974), a fall in the ratio between tradeable and non-tradeable prices provides information on the incentives to shift resources away from the tradeable sector. It also leads to an increase in the consumption of tradeable goods. Lower production and higher consumption of tradeable goods reduces the trade surplus, while the higher production and lower consumption of non-tradeable goods reduces any excess demand of non-tradeable goods.

If the prices of traded goods are linked through international competition, no intermediate inputs are used, capital stock is fixed and countries share the same technologies, the real exchange rate based on the unit labour costs in manufacturing provides an indication of the profitability of producing tradeable goods vis-à-vis the same sector of the country's main trading partners (Marsh and Tokarick, 1994).

The normalised unit labour cost in manufacturing is the ratio between the real exchange rate based on unit labour cost and an indicator based on valued-added prices. It corresponds to the labour costs per unit of value added in the domestic country relative to its main trading partners, i.e. the inverse of the labour share relative to that of foreign competitors. An increase in the share of labour costs in value added relative to the main trading partners suggests that costs conditions have not supported the increase in the production of traded goods relative to partner countries. Therefore, this indicator measures the profitability of producing traded goods (Lipschitz and McDonald, 1991).

Measures based on export unit values in manufacturing provide only a partial description of the competitive position of a country. Exports are expected to improve when the unit values of one country's exports fall relative to the foreign country. This change modifies the competitive position of exporters rather than the incentive to produce tradeable or non-tradeable goods. As unit values (i.e. averages) are involved, changes in these indices may reflect changes in the composition of exports rather than in the "true" export prices. In the case of "pricing to market", export unit values can temporarily fall below the costs of production.

Finally, the real exchange rate based on consumer prices comprises both tradeable and non-tradeable goods. Under the restrictive assumptions of homogeneous traded goods and identical domestic and foreign preferences with respect to these goods, this measure is a function of non-tradeable prices alone. In general, traded goods are not homogeneous, implying that the real exchange rate depends on tradeable and non-tradeable prices. Furthermore, this indicator does not capture the price of exportable intermediate goods.

### **3. Change in competitiveness and cyclical divergences: a comparison of pre- and post-1999 years**

The 1990s have been characterised by significant structural changes in the labour market (OECD, 2006) which were accompanied, with few exceptions, by a general slowdown in productivity growth. Also after unification, Germany underwent an adjustment of costs that, by gradually correcting the earlier overshooting, led to significant gains in its

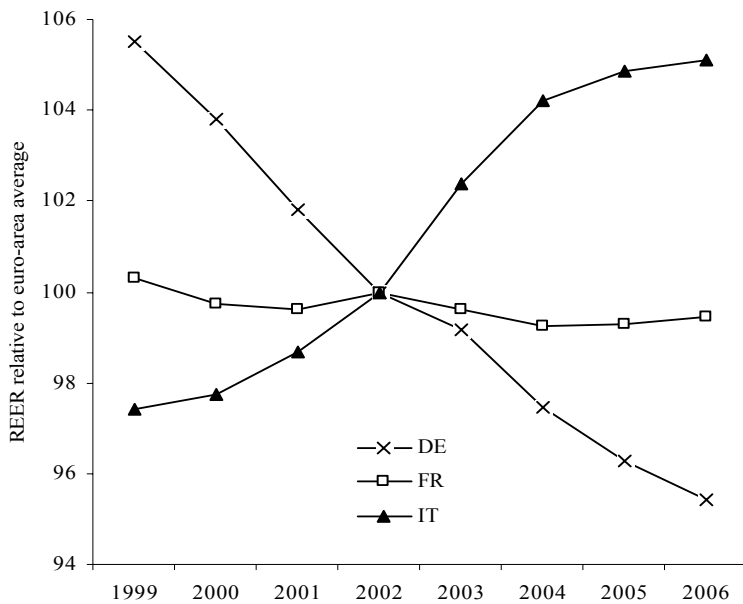
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productivity may generate inflation differentials consistent with the Balassa-Samuelson effect (Cova, 2004). With more realistic assumptions, the inflation differential depends on the interaction between competition in domestic and foreign markets, the share of traded-goods in domestic consumption and the elasticity of the supply of labour (Altissimo et al., 2004).

competitiveness in more recent years (see Graph 1). Although not strictly influenced by euro-area membership, these changes may have affected the stabilisation role of price and wage adjustment in the euro-area. This subsection presents evidence of the changes that have occurred between the pre- and post-1999 years.

Over the cycle, one would expect a positive relationship between price and wage adjustments and deviations of output from trend. As suggested by Graph 2, the response of relative unit labour costs to cyclical conditions before and after 1999 differs across countries. Countries such as Ireland, France and Spain, with comparatively positive output gaps during the euro-area years, experienced an increase in their relative wages. In Spain, productivity growth continued along the unfavourable trend established during the pre-1999 period. In contrast, in France and, especially, in Ireland, a comparatively higher growth of productivity contributed to the containment of costs pressures. On the other hand, countries with relatively lower cyclical pressures, such as Italy, the Netherlands and Portugal, were not able to contain their costs pressures. Within this group, Italy witnessed comparatively unfavourable productivity growth, while the Netherlands and Portugal experienced excessive wage growth, which had already taken place in Portugal in the pre-1999 years. Despite the relatively weak cyclical conditions of Greece, its relative unit labour costs grew as much as in Spain, mainly because of comparatively strong wage pressures. Finally, the competitiveness gains of Germany were driven by a significant downward adjustment in relative wages, while those of Austria were determined by a positive differential in productivity growth.

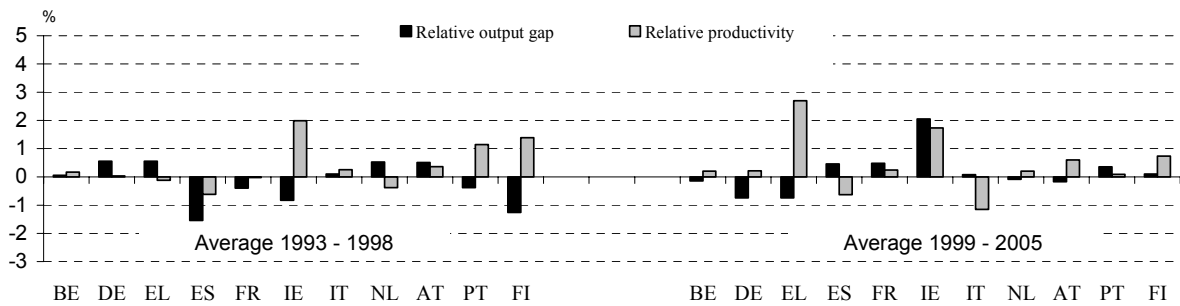
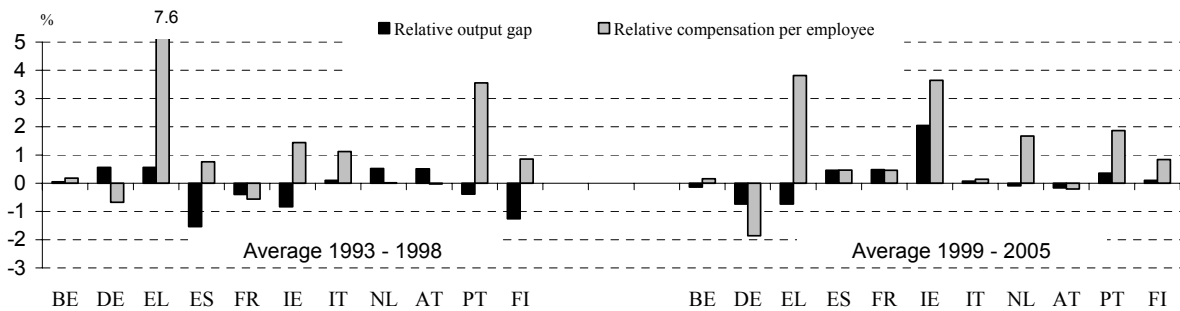
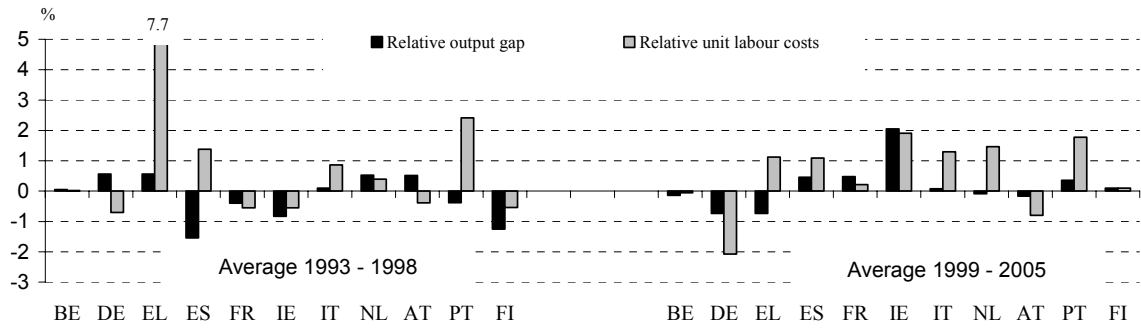
**Graph 1: Real effective exchange rate developments (index: 2002=100)**



Note: The real effective exchange rate index is based on unit labour costs.

Source: Commission Services

**Graph 2: Cyclical divergence and competitiveness in the euro area, 1993-98 and 1999-2005**



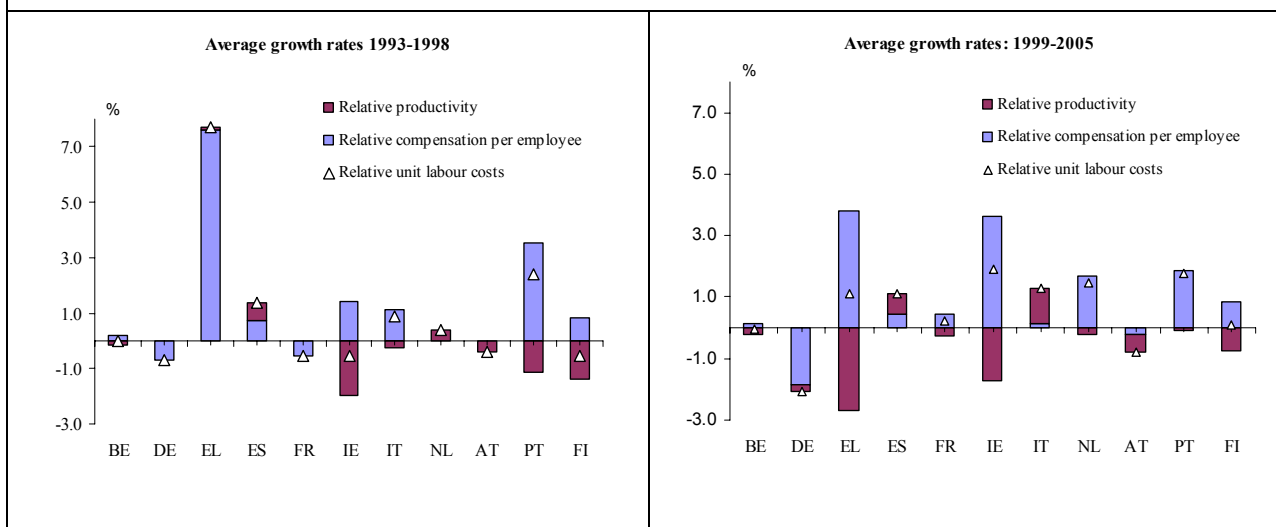
*Note:* All variable are normalised with respect to the weighted average of the remaining euro-area countries. Weights are based on bilateral trade against euro-area trading partners.

*Source:* Commission Services

Compared to the pre-1999 period, during the early years of monetary union there was a change in the contribution of relative wages and productivity to the dynamics of unit labour costs. Graph 3 presents the growth rates of relative wages and productivity for the sub-periods 1993-1998 and 1999-2005. Before the creation of the euro area, wage developments were the main source of the deterioration in cost competitiveness in Greece, Portugal, Spain and Italy. In addition, with Portugal as the only exception, the unfavourable productivity developments of these countries contributed to a worsening of their competitive position. Among those countries that gained in cost competitiveness in the pre-1999 years, Ireland and Finland benefited from a favourable differential in productivity growth, while wage disinflation prevailed in Germany and, to a lesser extent, in France.

Since the launch of the euro in 1999, Germany has experienced significant competitiveness gains that appear to be largely driven by wage growth, which continued to be relatively more restrained than in the other euro-area countries, especially in the more recent years. Indeed, between 2003 and 2005, Germany scored about 6% of the 10% gains in cost competitiveness observed in the post-1998 years. In countries where costs competitiveness worsened in the years before 1999, unit labour costs kept rising more than in the remaining euro-area countries. Within this group, the unfavourable productivity growth differential explains the deterioration of the competitiveness position of Italy and, to a lesser extent, of Spain. In contrast, the favourable developments of productivity in Greece were not sufficient to keep relative unit labour costs in check.

**Graph 3: Intra-euro-area competitiveness indicator – wage and productivity components, 1993-98 and 1999-2005**



Note: Data are presented in such a way that they sum up the total change in the relative unit labour costs. For each country, data are normalised using the weighted average of remaining euro-area countries with the double export weights used in the measure of the REERs.

Source: Commission Services

The evolution of the unit labour costs may be influenced by both short- and long-term country-specific labour market developments. In particular, widely documented structural changes in the labour market (e.g. OECD, 2004) have not been accompanied by similar improvements in total factor productivity. To gauge the role that long-term labour market trends may have had in the experience of the early years of the euro area, Table A1 and Table A2 (see annex) report for each country the deviation of the main variables relative to the euro-area aggregate. To focus on the adjustment that followed participation in the euro area, the observations are split into pre- and post-1999 periods. A significant change between the two periods identifies a country-specific change emerging after 1998.<sup>8</sup> The column "average" shows the average of countries' deviations from the euro-area aggregate. A large average deviation signals the prevalence of country-specific shocks.

Looking at the average, there is evidence of a favourable labour market shock, which is driven by positive long-term developments. Data also show that countries experiencing a positive increase in GDP growth between the two periods also achieved an increase in employment growth. This relationship is valid for both the actual and the potential variables. In this respect, the results in the table suggest that countries adapted differently to the creation of the euro area.

In Greece, the labour market was hit by an unfavourable shock, almost entirely structural in nature, which, compared to the pre-1999 years, kept cost pressures subdued; and the favourable trend in TFP growth contributed to the stronger-than-average increase in GDP growth between the two periods. The opposite is observed for Spain, namely, stronger GDP growth driven by labour market improvements partly due to structural changes and accompanied by only a small increase in TFP growth.<sup>9</sup>

Compared to the pre-1999 period, the Netherlands and Portugal witnessed a decline in GDP growth of the same size. Although there is no evidence of a statistically significant change in the unemployment rate in either country, in the Netherlands a positive employment and participation rate shock is detected which, despite the deterioration in the long-term trends, created cost pressures. In contrast, in Portugal, a negative labour demand shock, mainly structural in nature, dominated the fall in participation. The downward adjustment in relative wage inflation, although statistically significant, was insufficient to trigger a downward change in the relative ULC because of the weak developments in TFP between the two periods.

Other countries experienced asymmetric shocks limited to the labour market. Between the pre- and post-1999 years, a negative labour market shock can be identified in Germany and Austria, where the fall in the employment rate and

<sup>8</sup> The significance of this change is established on the basis of the standard deviation of the difference of each country-specific indicator vis-à-vis the euro-area aggregate. Given the relatively short-time span, a change larger than one standard deviation is considered to be statistically significant.

<sup>9</sup> In both countries, the labour market shocks take the form of a change in the same direction of the employment and participation rates, which imply that the unemployment rate increases/declines substantially.

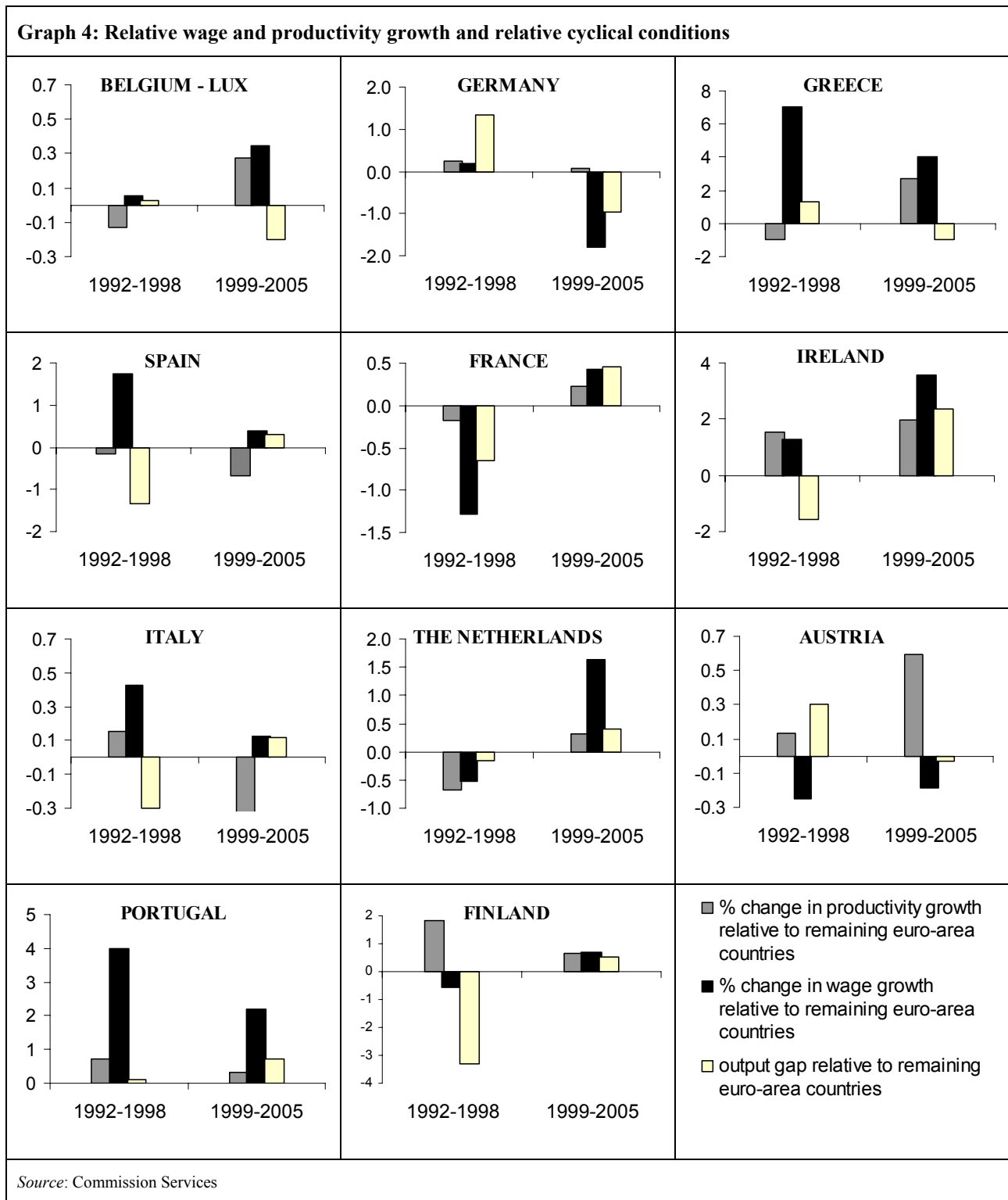
the increase in the unemployment rate is matched by changes of the same order of magnitude in the long-term trends. Finally, in France, an asymmetric shock hit both labour demand and labour supply, which explains the substantial stability of the unemployment rate (relative to the euro-area) before and after the introduction of the euro.

As far as the unit labour costs are concerned, the combination of relative low nominal wage growth and positive productivity growth allowed Germany and Greece to improve their cost competitiveness, measured by the ULC of either the total economy or the manufacturing sector.<sup>10</sup> This was not the case of countries such as Italy, France and the Netherlands where, especially in the manufacturing sector, growth in the nominal wage was higher than productivity growth.

The evidence above suggests that, in the early years of monetary union, the interaction between changes in the long-term trends and short-term developments in the labour market led countries (such as Germany, Greece, the Netherlands, Italy and Portugal) to experience a more positive unemployment gap (i.e. a slacker labour market with the unemployment rate relative to the EU average higher than the NAIRU relative to the EU average). This was accompanied by a downward adjustment in cost variables relative to the average only in a few countries, namely Germany and, to a less extent, Greece. Within the same group of countries, cost pressures mounted relative the EU average either because of the excessive wage growth, as in the case of the Netherlands or because of the insufficient downward adjustment of wages given the decline in productivity growth relative to the euro-area average (Graph 4).

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<sup>10</sup> However, for Greece, the improvements in the relative ULC for the manufacturing sector are not statistically significant.



#### 4. Developments in price and cost competitiveness indicators

Although members of the euro area have irrevocably set their nominal exchange rates against one another, their real effective exchange rates (REERs)<sup>11</sup> may vary over time, depending on the changes in the domestic prices and costs relative to their foreign counterparts. The indications provided by different REERs are not unambiguously linked to the change in a country's trade balance, as they refer to different behaviour of prices and costs. Accordingly, looking

<sup>11</sup> In a multilateral setting, a useful indicator is the real effective exchange rate measuring the competitiveness of a country against each main trading partner.

at several indicators provides a better indication of the changes in a country's competitiveness. The labour market plays a crucial role in the absorption of shocks.

The trends observed after the creation of the euro area have followed a pattern that started well before 1999 (Graph 43). Indeed, during the euro-area years, the main trends in the REER based on the unit labour costs – namely the competitive losses of Greece, Spain, Italy, Netherlands and Portugal and the competitive gains of Germany – had been in evidence already since 1995. Similarly, the favourable changes in the unit labour costs of France and Ireland for the whole economy and for the manufacturing sector alone, respectively, were underway since the early 1980s. However, in countries experiencing a deterioration of competitiveness (measured using the REER based on the unit labour costs for the total economy), the significant increase in competitive losses in manufacturing (namely in Italy and Portugal and in Greece and the Netherlands, but only since 2003 and 2004, respectively) are more recent. Similarly, it is in the euro-area years that the competitive position of the manufacturing sector strengthened in Austria, Ireland and, especially, Germany.

A comparison of real exchange rates based on aggregate output indices (based on the GDP deflator) with those based on unit labour costs reveals different pricing strategies pursued by domestic firms. Among countries with unfavourable labour cost developments, Greek and, especially, Italian firms have been passing on the increase in unit costs to prices, mainly in the manufacturing sector, thus maintaining their profit margin but at the expense of a drop in their exports shares.<sup>12</sup> In contrast, in countries such as the Netherlands, Portugal, and Spain, export prices after 1998 declined or grew less than unit labour costs, an indication that exporters squeezed their profit margins to keep their market shares in the remaining euro-area countries. In the German manufacturing sector, unit wage costs have been falling more than the export prices since 2002, implying a widening of the profit margins of firms exposed to international competition. This pattern contrasts with the dynamics of the REER based on the GDP deflator which follows the REER based on the unit labour costs of the total economy, implying an unchanged profitability of the non-traded relative to the traded sector. Finally, unit labour costs remained in check in France and Finland, where the price of exports declined at least since 1995, suggesting a squeeze in the profit margin of firms producing exportable goods.<sup>13</sup>

The presence of convergence in unit labour costs is shown in Graph 5, which shows each deflator normalised with the weighted average of the remaining euro-area countries with double export weights. In addition, the convergence in unit labour costs is faster for services than for manufacturing, which may be explained by the effects of the Internal Market and participation in the euro area on the degree of openness of the service sector and, consequently, on price and cost differentials among euro-area countries. This fall in the dispersion of unit labour costs in the euro area is confirmed by the evolution of the standard deviation, which diminished from 20% of the average in 1990 to 7% in 2005 for the total economy and from 29% to 22% for manufacturing over the same period. Therefore, countries with different labour costs experienced diverging growth rates. As suggested by Graph 6, the convergence in the unit labour costs is mainly driven by the convergence in nominal wages. The dispersion fell from 38% of the average in 1990 to 22% in 2005<sup>14</sup>, while for productivity it remained unchanged at 25% of the average.

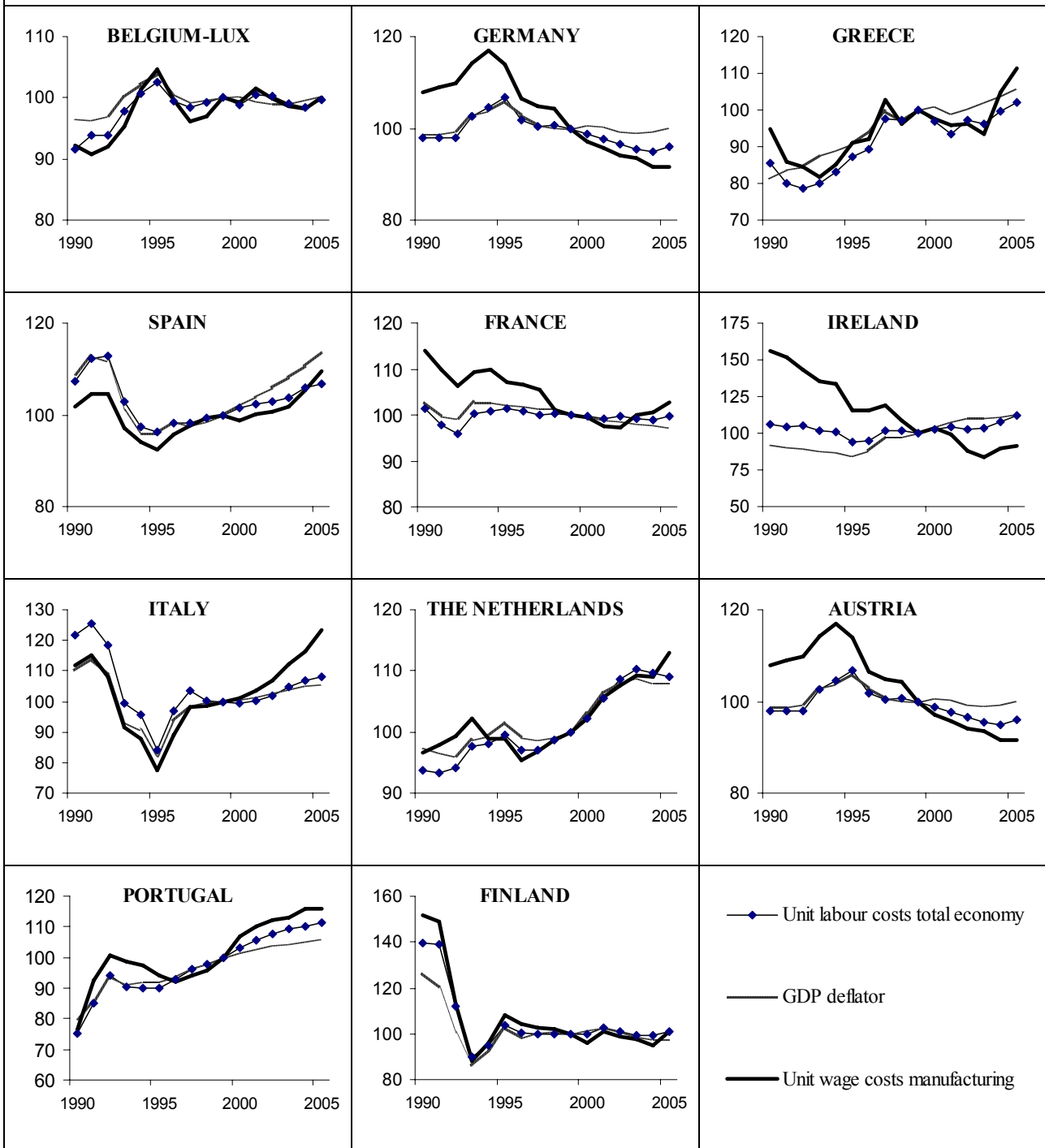
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<sup>12</sup> However, it cannot be excluded that these pricing strategies have selected the most competitive firms, while eliminating marginal firms with positive effects on the competitiveness of the export sectors.

<sup>13</sup> For the period 1999-2005, the elasticity of the REER based on export price with respect to the REER based on unit labour costs in manufacturing is 0.84 for Italy, while it is statistically insignificantly different from zero for France, the Netherlands, Portugal and Finland. For the whole sample period 1970-2005, this elasticity remains at 0.30 for Italy, 0.7 for France, 0.6 for the Netherlands, and 0.4 for both Portugal and Finland.

<sup>14</sup> When Germany is excluded, the standard deviation falls from 83% to 21% of the average.

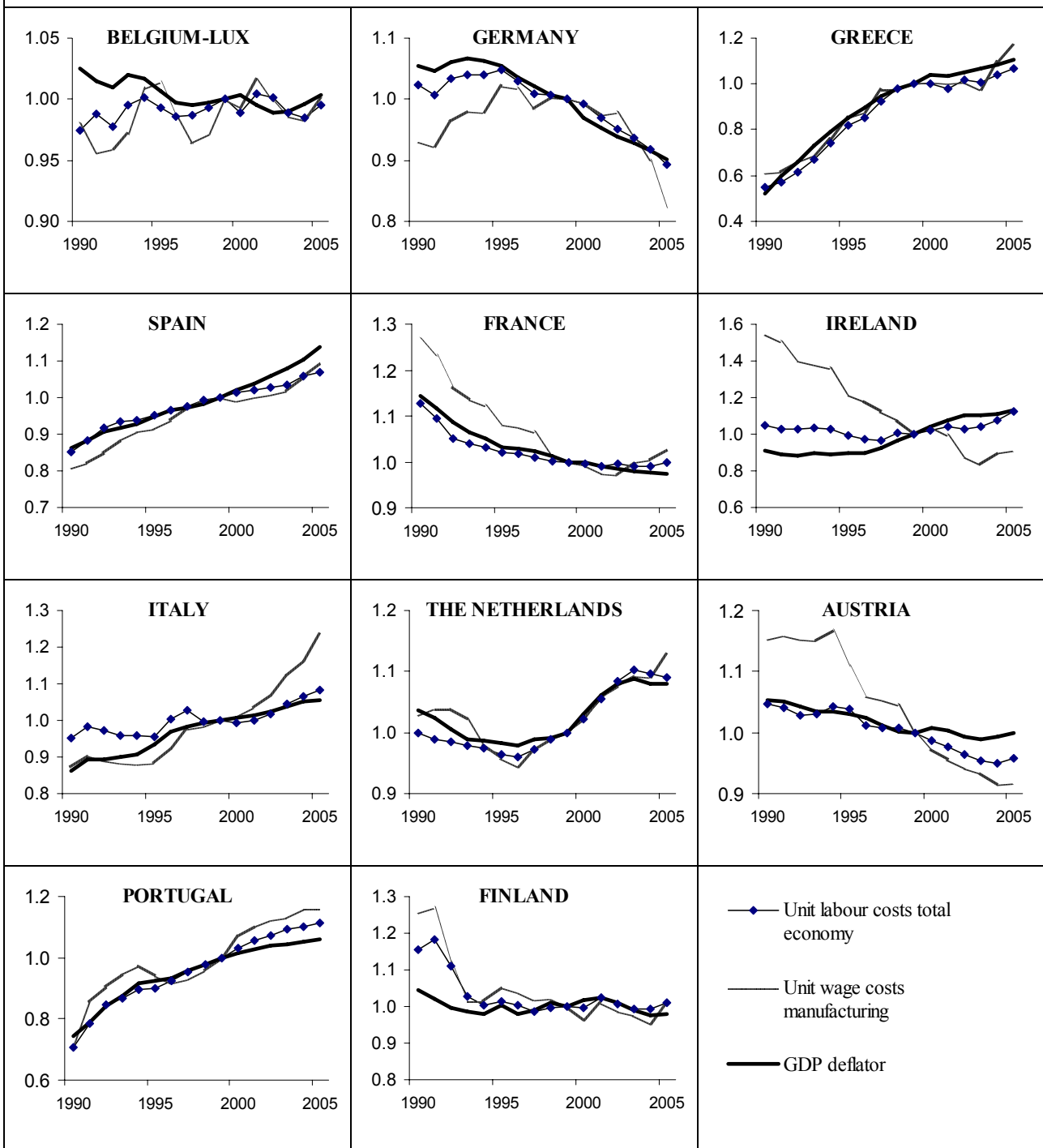
**Graph 5: Intra-euro-area real effective exchange rates (1999=100)**



Source: Commission Services

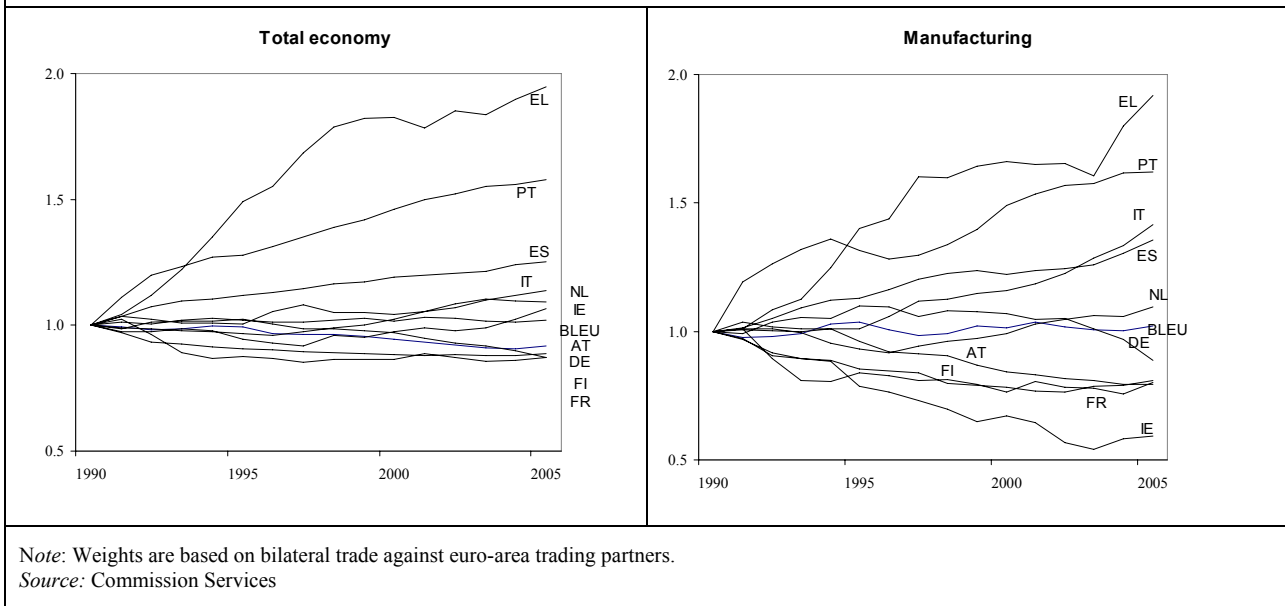


**Graph 6: Trade-weighted price and cost indices**



*Note:* Weights are based on bilateral trade against euro-area trading partners  
*Source:* Commission Services

**Graph 7: Trade-weighted relative unit labour costs in the euro area (index: 1990=1)**



## 5. Factors explaining the change in cost competitiveness

This section explores the effect of cyclical conditions, while controlling for convergence in relative unit labour costs. Thus, the analysis distinguishes between the change in competitiveness due to cyclical and long-term components. The model estimated is a panel regression based on annual data covering the period 1970-2005; it regresses the change in a country's competitiveness vis-à-vis the remaining euro-area countries on the relative output gap and the lagged value of the competitiveness indicator:

$$\Delta \text{comp}_{i,t} = \alpha + \beta_i + \gamma \text{comp}_{i,t-1} + \delta(Y\text{gap}_{i,t-1} - Y\text{gap}_{-i,t-1}) + \varepsilon_{i,t}$$

where:  $t$  refers to the time dimension;  $i$  refers to the country dimension;  $\beta_i$  is a cross-section fixed effect;  $\text{comp}$  is the (log of the) competitiveness indicator vis-à-vis the rest of the euro area;  $Y\text{gap}_{i,t}$  is the output gap of country  $i$  at time  $t$ ;  $Y\text{gap}_{-i,t}$  is the average output gap of the remaining countries weighted by the bilateral trade weights used in the calculation of the real effective exchange rate; and  $\varepsilon_{i,t}$  is an error term. Hence, a country's competitiveness indicator is hypothesised to vary in response to changes in its cyclical conditions relative to those of the remaining euro-area countries. In this way, our formulation therefore captures the effect of transitory asymmetric shocks.

Since the sample period of the regression covers years characterised by different monetary frameworks, we would expect the parameters of the catching-up term and of the output-gap elasticity to change over time. In particular, a reduction in transaction costs and more transparent price signals should make nominal unit labour costs converge faster even when productivity converges within the EU at a lower rate (i.e. it is the convergence in wages that drives the convergence in unit labour costs).<sup>15</sup> As regards the elasticity of relative unit labour costs to the output gap, a smoother adjustment to asymmetric shocks requires a more rapid response of relative costs in monetary union. Indeed, an increase of real and nominal wage flexibility in all countries reduces the sensitivity of the euro-area output to common and country-specific shocks. Moreover, to the extent that sectoral shocks become more prevalent than aggregate shocks in monetary union, a higher response of sectoral wages is needed. Finally, even assuming that nominal rigidities within the euro area are as high as outside, the absence of other adjustment mechanisms places the burden of adjustment mainly on wages.

As suggested by the literature, different indicators may provide conflicting signals of the change in competitiveness, which reflects different pricing and cost behaviours. This section presents several estimates using the same type of model, but with different price and cost competitiveness indicators.

Table 1 presents the results of the regression analysis when the competitiveness indicator is the REER based on different deflators (panel a) and various relative prices and costs (panel b). Whatever the indicator, the impact of its lagged value is always negative and statistically different from zero, suggesting that there is convergence across

<sup>15</sup> In symbols, given the  $\beta$ -convergence regression for wages and productivity:  $\Delta w = \alpha w_{-1} + \varepsilon$  and  $\Delta \pi = \beta \pi_{-1} + u$  and assuming uncorrelated disturbances  $u$  and  $\varepsilon$ , it can be shown that  $\Delta w - \Delta \pi = \alpha w_{-1} + (\alpha - \beta) \pi_{-1} + v$ , where  $w$  is white noise. Hence, the growth rate of unit labour costs is higher when wages converge at a faster rate than productivity (i.e.  $\alpha - \beta > 0$ ).

euro-area members in relative unit labour costs or prices. This implies that a country with costs and prices higher than the average gains in competitiveness relative to countries with lower relative prices and costs.

The output gap has a statistically significant positive effect on each competitiveness indicator. An increase in the output gap by 1 percentage point leads to an appreciation of the REER in a range of 0.8% to 1%, depending on the deflator used in the calculation of the REER. Thus, the estimates yield evidence that the competitiveness channel contributes to reducing cyclical divergences. It is worth noting that, abstracting from fluctuations in the nominal bilateral exchange rates, the cyclical response of the trade-weighted costs is lower compared to the REER. This difference is consistent with domestic firms trying to reduce over the cycle the variations of the export prices of home produced goods denominated in the foreign currency. Finally, when the same equation is estimated using wages (not reported for brevity), the elasticity of relative wages to the relative output gap is 0.42 for the total economy and 0.29 the manufacturing sector. Hence, in response to transitory asymmetric shocks, relative wages react less than the relative unit labour costs. This implies that for a country experiencing an increase in the output gap that is larger than the average – i.e. a positive transitory asymmetric shock – productivity grows by less than the average of the remaining euro-area countries; this is more evident in manufacturing than in services.<sup>16</sup> The opposite holds in the case of a negative transitory asymmetric shock.

<b>Table 1: Changes in the intra-euro-area competitiveness indicators – pooled estimates</b>						
<b>Panel a: real effective exchange rate based on:</b>						
	<b>Unit labour costs</b> Estimate (t-statistic)		<b>Unit wage costs</b> Estimate (t-statistic)		<b>GDP deflator</b> Estimate (t-statistic)	
Log (Comp (-1))	-10.7	(-6.1)	-6.6	(-4.3)	-9.0	(-6.4)
Output gap (-1)	1.1	(12.5)	1.2	(9.5)	0.8	(11.1)
R squared	0.38		0.26		0.36	
Standard error	1.0		1.0		1.0	
<b>Panel b: trade-weighted price and cost indices based on:</b>						
	<b>Unit labour costs</b> Estimate (t-statistic)		<b>Unit wage costs</b> Estimate (t-statistic)		<b>GDP deflator</b> Estimate (t-statistic)	
Log Comp (-1)	-2.4	(-5.4)	-1.97	(-2.6)	-1.89	(-4.3)
Output gap (-1)	0.71	(16.1)	0.83	(10.4)	0.4	(8.5)
R squared	0.65		0.43		0.60	
Standard error	1.02		1.02		1.0	
<i>Note:</i> Dependent variable is 100*Alog(comp). Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. Unit wage costs are for the manufacturing sector. Sample period: 1970-2005.						
<i>Source:</i> Commission Services						

### 5.1 Checks of robustness

The equation was estimated over the 1970-2005 period, which was characterised by a series of nominal and real shocks as well as by changes in the monetary regime. It is therefore of interest to verify whether the foregoing estimates are stable over time. Stability has been evaluated by re-estimating recursively the coefficients of the model starting from the 1970-1979 period and adding observations each time on a five years interval. Thus, it is possible to identify whether and when breaks occurred in the relationship linking changes in competitiveness with the catching-up term and the output-gap. The coefficients are plotted over time for the equations of the unit labour costs for the total economy and the manufacturing sector (Graph 8).

The coefficient of the lagged unit labour costs is not invariant over time. In the case of the total economy, in the

<sup>16</sup> It should be stressed that this response of relative productivity does not mean that productivity is anti-cyclical. It only means that productivity rises by less than in the remaining countries. However, the results of the pooled estimation conceal country-specific responses to asymmetric shocks.

1970s and the first half of 1980s, the forces that pushed unit labour costs to diverge prevailed over those that promoted convergence. It is only since the second half of the 1990s that national unit labour costs tend to share a common trend.<sup>17</sup> The response of unit labour costs over the cycle is relatively more stable, slightly higher in the 1970s than in more recent years. As expected, monetary union spurred convergence in unit labour costs. This convergence in unit labour costs appears to be driven by the wage component, which may harm overall competitiveness as long as the levels of productivity do not converge. In contrast, after 1998, there is no statistically significant change in the response of unit labour costs to asymmetric shocks.

**Graph 8: Stability over time of the catching-up and output-gap coefficients – recursive estimates**



*Note:* Dependent variable is  $100 \cdot \Delta \log(\text{comp})$ . Cross-section fixed effects are included; estimates are corrected for correlation and heteroskedastic residuals. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights.  
*Source:* Commission Services

## 5.2 Checking for asymmetries in the growth of unit labour costs over the cycle

Asymmetric responses of unit labour costs to positive and negative asymmetric shocks can delay the change in competitiveness required by the cyclical conditions, and can eventually give rise to periods of over-cooling or over-heating.<sup>18</sup> This asymmetry may generate persistent cross-country differences in GDP growth rates. To detect the presence of asymmetric responses in the labour costs, table 2 shows the outcome for the estimates over the period 1980-2005, distinguishing separately the effect of positive and negative output gaps.

The results suggest that, while the speed of convergence is not affected by the cyclical conditions, the growth in unit labour costs is more reactive over the cycle when the economy is running above rather than below potential. When the total economy is hit by a positive transitory shock, which brings GDP above trend by 1 percentage point, the growth rate of relative unit labour costs rises by 1 percentage point. In contrast, when the shocks fade away, the growth of relative unit labour costs falls by about 0.7 of a percentage point. This difference implies either that only 70% of the increase in the relative unit labour cost growth is reabsorbed within a year or that much more slack of the economy is needed to moderate such growth. As far as the manufacturing sector is concerned, the estimates provide

<sup>17</sup> In the case of the manufacturing sector, the catching up coefficient follows the same pattern as for the total economy and has a final estimate that is within the uncertainty of the estimate obtained for the total economy. Thus, it cannot be excluded that in the second half of the 1990s nominal unit labour costs of the manufacturing sector converged at the same rate as nominal unit labour costs for the whole economy.

<sup>18</sup> These effects can arise from downward wage stickiness (e.g. Taylor, 1980) or menu costs (e.g. Ball and Mankiw, 1994). Asymmetric responses in unit labour costs may result from output and employment asymmetries as in the sectoral-shifts model of Lillien (1982) or because hiring new workers is less costly than firing existing ones.

less support for the hypothesis of asymmetric behaviour in the unit labour costs.

	<b>Total economy</b>				<b>Manufacturing</b>			
	<b>Positive output gap</b>		<b>Negative output gap</b>		<b>Positive output gap</b>		<b>Negative output gap</b>	
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
Log Comp (-1)	-7.35	(-16.2)	-7.51	(-14.4)	-6.35	(-9.6)	-6.55	(-10.5)
Output gap(-1)	1.02	(16.1)	0.70	(13.6)	0.85	(8.7)	0.75	(7.8)
R squared	0.82		0.77		0.65		0.65	
Standard error	1.02		1.02		1.02		1.02	

*Note:* Dependent variable is 100\* $\Delta$ log(comp). Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. Sample period: 1980-2005.

*Source:* Commission Services

### 5.3 Investigating the role of hiring and firing restrictions

Among economists and policy makers, there is a large degree of consensus about the key importance of labour market institutions (LMI) in influencing labour market performances<sup>19</sup>, in particular equilibrium unemployment. Labour market institutions influence equilibrium unemployment through their effects on the reservation wage and on the bargaining powers of workers (see Nickell and Layard, 1991). However, labour market institutions also create asymmetries in the labour market response over the cycle and, ultimately, have an effect on equilibrium unemployment (Bentolila and Bertola, 1990; Ljungqvist and Sargent, 1998; Nunziata, 2001). It is well known that hiring and firing restrictions reduce the volatility of unemployment, while the effect on its average over the cycle is uncertain. Hence, we should expect that stricter employment protection rules would reduce the elasticity of employment during the phases of expansion and contraction. When the adjustment to shocks occurs at the extensive margins (i.e. where the quantity of employment adjusts), there is less need to adjust wages to re-establish the equilibrium.

The effect of hiring and firing restrictions is explored in table 3. The basic equation has been estimated after adding a third variable representing the interaction between the EPL and the output gap.<sup>20</sup> Employment protection legislation is expressed as a deviation from the (un-weighted) average as a percentage of the standard deviation. The EPL variable is zero when hiring and firing restrictions are identical to the average of the sample; it takes positive (negative) values when the degree of protection is higher (lower) than the average. Data on the employment protection are available from the OECD for three years only; we assumed unchanged employment protection for the intervening years.

The estimates appear quite stable across different specifications. As expected, countries with employment protection legislation tighter than the average are expected to have relative unit labour costs more volatile over the cycle than the average, especially in manufacturing. Compared to countries where employment protection is at the average level, an increase of 1 percentage point in the output gap implies a further increase in the relative unit labour costs growth of about 0.3 of a percentage point for the total economy and 0.4 of a percentage point for the manufacturing sector.

To check whether the estimated effect of EPL on unit labour costs growth is consistent with theoretical predictions, table 6 shows the result of estimates of an equation linking the change (in logs) in relative employment to the lagged employment level and the output gap. For each country, the employment variable is normalised with respect to the double-exports-weighted average of the remaining euro-area countries. The results for the estimate without including the EPL as explanatory variable with or without fixed effects are reported in columns (1) and (3), respectively. The EPL variable turns out to be highly correlated with the fixed effects (with a correlation of 0.6). This suggests that the differences across euro-area countries in the average employment growth are proportional to differences in

<sup>19</sup> See Blanchard (2005) and Buti et al. (1999). A review of the literature is presented in Arpaia and Mourre (2005).

<sup>20</sup> The idea behind this formulation is to assume that the effect of the output gap on the unit labour costs growth changes over time and over country depending on variability across time and countries in the employment protection legislation. In symbols the model estimated is  $\Delta \text{comp}_{i,t} = \alpha + \beta_i + \gamma_{i,t} \text{comp}_{i,t-1} + \delta (\text{Ygap}_{i,t-1} - \text{Ygap}_{i,t-1}) + \varepsilon_{i,t}$  where  $\gamma_{i,t} = \gamma_0 + \gamma_1 \text{EPL}_{i,t-1}$ . Substituting the expression for  $\gamma_{i,t}$  in the equation one obtains the model estimated.

employment protection. For this reason, the most reliable estimate is the one obtained without fixed effects (column 4 of table 4).<sup>21</sup> In this case, the estimate suggests that employment is over the cycle more stable in countries with tight employment protection legislation than in countries with loose hiring and firing restrictions.

	Total Economy				Manufacturing			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Comp (-1)	-9.9 (-14.0)	-9.2 (-13.3)	-10.1 (-21.5)	-9.9 (-19.6)	-5.8 (-5.5)	-6.4 (-8.8)	-0.3 (-1.0)	-0.8 (-1.7)
Output gap (-1)	0.66 (14.8)	0.75 (19.8)	0.68 (13.7)	0.79 (15.6)	0.75 (20.6)	0.98 (17.3)	0.86 (14.7)	1.08 (10.3)
(EPL*Output gap)(-1)		0.13 (11.4)		0.19 (4.4)		0.4 (8.4)		0.4 (4.9)
R squared	0.90	0.93	0.87	0.84	0.85	0.90	0.59	0.64
Standard error	1.03	1.03	1.0	1.0	1.04	1.03	1.0	1.0
Fixed effects	yes	yes	no	no	yes	yes	no	no

*Note:* Dependent variable is 100\* $\Delta\log(\text{comp})$ . Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals. Except for EPL, all variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. EPL is normalised to lie between -1 and 1. t-statistics in parentheses.

*Source:* Commission Services

	Total economy			
	(1)	(2)	(3)	(4)
Log(Employment(-1))	-10.2 (-3.1)	-9.9 (-2.96)	0.25 (-1.9)	-0.20 (-2.03)
Output gap (-1)	0.34 (2.7)	0.33 (2.6)		0.22 (2.72)
(EPL*Output gap)(-1)		0.04 (0.30)		-0.01 (-4.1)
R squared	0.23	0.23	0.03	0.17
Standard error	2.5	2.5	1.0	0.99
Fixed effects	yes	yes	no	no

*Note:* Dependent variable is 100\* $\Delta\log(\text{comp})$ . Sample 1991-2005 Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals in (4); in (1), (2) and (3) adjustment for heteroskedastic residuals is carried out. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. . t-statistics in parentheses.

*Source:* Commission Services

<sup>21</sup> For the unit labour costs equation, the correlation between the fixed effects and the EPL variable is not significant, an indication that the average growth in unit labour cost is not correlated with employment protection.

#### 5.4 Country-specific analysis

To detect country-specific responses of unit labour costs over the cycle, the model was re-estimated allowing for the coefficient of the output gap to vary across countries. Country-specific parameters are reported in the column (1) of table 5, while columns (3) and (5) show the output-gap elasticity when the economy is running, respectively, above and below potential (columns positive and negative output gap). Columns (2), (6), and (9) report the rank of the coefficients in the list of countries.

The results suggest that there is much more heterogeneity across countries in the cyclical behaviour of unit labour costs growth when GDP is below than when it is above potential. When no distinction is made for the state of GDP relative to potential, the difference between the largest and the lowest response (respectively, Italy and Portugal) is 0.8; this gap reaches 1.3 when the output gap is positive and 2.1 when it is negative. Also, the distribution across countries of the output-gap elasticity changes with the position of the cycle. When GDP is running above potential, the countries at the extremes of the distribution are Italy and France, respectively. In contrast, when GDP is below potential, the lowest response is estimated for Portugal (with an estimated elasticity statistically insignificantly different from zero) and the highest for Austria. The evidence of a difference in the extent of cross-countries heterogeneity in periods of positive and negative output-gap is formally confirmed by poolability tests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	estimate	t-stat	rank	estimate	t-stat	rank	estimate	t-stat	rank
Log ULC(-1)	-2.59	(-5.5)		-2.72	(-5.5)		-2.59	(-5.7)	
	Output gap(-1)			Output gap (-1)>0			Output gap (-1)<0		
Italy	1.18	(5.5)	1	2.00	(5.0)	1	1.08	2.5)	8
Austria	1.16	(5.1)	2	1.37	(3.9)	3	1.73	(3.0)	1
Netherlands	1.0	(5.0)	3	1.26	(3.9)	4	1.33	(3.5)	3
BLEU	0.93	(4.9)	4	1.25	(4.2)	5	1.36	(4.5)	2
Greece	0.93	(1.8)	5	1.18	(1.4)	6	0.65	(0.7)	9
Finland	0.80	(10.9)	6	1.52	(7.9)	2	1.19	(9.2)	6
Germany	0.79	(8.4)	7	0.83	(4.7)	9	1.32	(6.2)	4
Spain	0.78	(6.0)	8	1.04	(4.7)	7	1.30	(4.7)	5
Ireland	0.72	(4.5)	9	0.98	(3.3)	8	1.12	(3.9)	7
France	0.58	(3.7)	10	0.69	(2.7)	11	0.56	(1.8)	10
Portugal	0.38	(1.8)	11	0.79	(3.1)	10	-0.35	(-0.8)	11
R squared	0.65			0.61			0.63		
Std. error	1.00			1.00			0.99		
Average	0.84			1.17			1.03		
Max-Min	0.80			1.30			2.10		
Poolability tests	$F_{(10,363)} = 2.14^*$			$F_{(10,363)} = 1.38$			$F_{(10,363)} = 2.42^{**}$		
p-values	0.021			0.19			0.008		

*Note:* Dependent variable is  $100*\Delta\log(\text{comp})$ . Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. Countries are ranked in decreasing order of the effect of the output gap on growth of unit labour costs. The poolability test is a Chow test applied to disturbances that are transformed into spherical disturbances. \* indicates significance at the 5% level; \*\* indicates significance at the 1% level.

*Source:* Commission Services

In the equation with no asymmetric effects of the output gap (column 1, table 5), the null hypothesis of poolability (i.e. that all countries have the same elasticity of unit labour costs with respect to the output gap) is rejected at the 5% level of significance. However, it is not possible to reject the null hypothesis of poolability of the elasticity of relative unit labour costs to positive output gaps. It turns out that the overall heterogeneity observed, when no allowance is

done of the position of the cycle, derives from the differences across countries in the downward rigidity of the relative unit labour costs when GDP is running below potential.<sup>22</sup>

The cross-countries heterogeneity observed for the elasticity of unit labour costs with respect to the relative output gap reflects only partly the heterogeneity in the elasticity of wages. Table 6 reports the estimates of the elasticity of relative wages with respect to the relative output gap when symmetric cyclical behaviour is imposed (column (1)), in the cases, respectively, of positive and negative output gaps (columns (4) and (7)). Without any cyclical restrictions, the response of relative wages is statistically significant for few countries only (namely Germany, Spain, Ireland, Italy and Finland). In contrast, when GDP is running above potential, the elasticity of relative wages to the relative output gap is highest for Italy, the Netherlands, Spain and Germany and lowest for Austria, France and Greece. Similarly, the response is the highest when GDP is below potential in Germany, Spain, Ireland and Finland, while in the remaining countries wage rigidity prevails. This implies that in response to positive asymmetric shocks, nominal wages in one country grow more than in the other euro-area countries, but do not adjust downward when GDP falls below potential with harmful consequences for overall competitiveness.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	estimate	t-stat	rank	estimate	t-stat	rank	estimate	t-stat	rank
Log wages (-1)	-2.6	(6.0)		-2.5	(-6.5)		-2.49	(-5.3)	
	<b>Output gap (-1)</b>			<b>Output gap (-1)&gt;0</b>			<b>Output gap (-1)&lt;0</b>		
Germany	0.86	(4.3)	1	1.15	(4.1)	4	1.38	3.9	1
Spain	0.64	(4.3)	2	1.21	(5.2)	3	1.02	3.6	2
Ireland	0.54	(4.2)	3	0.77	(3.7)	8	0.71	2.7	3
Italy	0.49	(1.8)	4	1.98	(5.0)	1	-0.13	-0.3	8
Finland	0.42	(4.5)	5	0.85	(4.6)	7	0.59	4.2	4
Netherlands	0.32	(1.2)	6	1.37	(3.9)	2	-0.09	-0.2	7
Portugal	0.32	(1.5)	7	1.03	(4.7)	5	-0.68	-1.7	10
BLEU	0.26	(1.1)	8	0.88	(2.7)	6	-0.17	-0.4	9
France	0.18	(0.7)	9	0.08	(0.2)	10	-0.01	0.0	6
Austria	-0.13	(-0.6)	10	-0.30	(-1.0)	11	0.21	0.4	5
Greece	-0.22	(-0.4)	11	0.28	(0.4)	9	-0.72	-0.9	11
Average	0.3			0.85			0.2		
R-squared	0.55			0.66			0.53		
Std. error	1.00			1.00			1.00		
Poolability test	$F_{(10,363)} =$			$F_{(10,363)} =$			$F_{(10,363)} =$		
	1.32			0.68			1.96*		
p-value	0.22			0.74			0.04		

*Note:* Dependent variable is  $100 \cdot \Delta \log(\text{comp})$ . Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. Countries are ranked in decreasing order of the effect of the output gap on growth of unit labour costs. The poolability test is a Chow test applied to disturbances that have been transformed into spherical disturbances.

*Source:* Commission Services .

Turning to the manufacturing sector, because of the discipline imposed by the international goods markets, one should expect unit labour costs to be less asymmetric over the cycle in this sector. This prediction is only partially confirmed by the data (Table 7). Portugal and Greece still rank among the countries with more asymmetric behaviour of labour costs over the cycle. Compared with the results for the total economy, the degree of asymmetry for manufacturing is less accentuated in Italy and Finland and more important for the Netherlands and Spain. It is also worth mentioning that, when GDP is running above potential, unit labour costs are more volatile in manufacturing than in the total economy, with the exception of Austria and Portugal. When the GDP is below potential, a stronger response is estimated in the case of France, Italy and, to a lesser extent, Austria and Finland. Finally, the hypothesis

<sup>22</sup> The poolability test is an extension of the Chow test under general assumptions of non-spherical disturbances; It requires estimation of the model under the restrictions of common elasticity, as well as of the unrestricted model with heterogeneous elasticities. See Baltagi (2002).



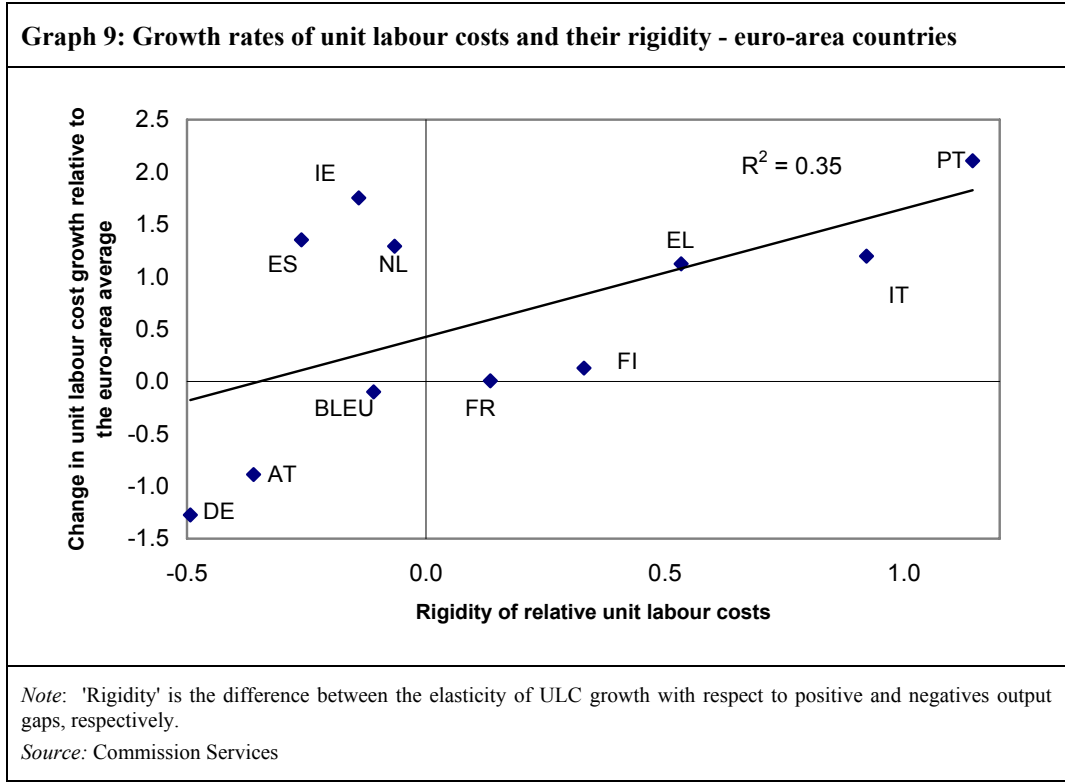
that the elasticity of unit labour costs in manufacturing is the same across countries is rejected when no allowance is made for positive and negative output gaps. However, it is not possible to reject the poolability hypothesis for the equations that distinguish the elasticity according to whether GDP is running above or below potential. The evidence that in periods of negative output gaps, there is a significant degree of heterogeneity across countries in the elasticity of unit labour costs for the total economy but homogeneity for the manufacturing sector suggests that the main sources of the asymmetric adjustment in ULC derive from the service sector.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<b>estimate</b>	<b>t-stat</b>	<b>rank</b>	<b>estimate</b>	<b>t-stat</b>	<b>rank</b>	<b>estimate</b>	<b>t-stat</b>	<b>rank</b>
Log UWC(-1)	-1.96	(-3.6)		-1.77	(-2.9)		-1.93	(-3.2)	
	<b>Output gap (-1)</b>			<b>Output gap (-1)&gt;0</b>			<b>Output gap (-1)&lt;0</b>		
Italy	1.82	(8.0)	1	2.66	(6.0)	1	2.32	(4.9)	1
France	1.31	(5.8)	2	1.81	(4.4)	3	1.60	(3.1)	3
Netherlands	1.23	(4.8)	3	1.97	(3.6)	2	1.06	(2.0)	8
Spain	1.15	(6.1)	4	1.64	(4.5)	4	1.24	(3.2)	5
Germany	1.07	(6.3)	5	0.98	(3.3)	9	1.15	(3.0)	6
Austria	1.05	(2.8)	6	1.16	(2.1)	7	1.94	(2.3)	2
Finland	1.01	(6.1)	7	1.49	(3.8)	6	1.43	(6.1)	4
Greece	0.63	(0.9)	8	1.54	(1.4)	5	1.11	(0.9)	7
Portugal	0.56	(2.0)	9	1.09	(3.0)	8	0.06	(0.1)	11
BLEU	0.10	(0.3)	10	-0.13	(-0.3)	10	0.71	(1.5)	9
Ireland	-0.05	(-0.1)	11	-0.44	(-0.8)	11	0.29	0.4	10
R squared	0.54			0.48			0.46		
Std. error	1.00			1.00			1.00		
Average	0.9			1.3			1.2		
Max-Min	1.9			3.1			2.3		
Poolability test	$F_{(10,363)} = 1.94^*$			$F_{(10,363)} = 1.33$			$F_{(10,363)} = 0.67$		
p-value	0.038			0.21			0.75		

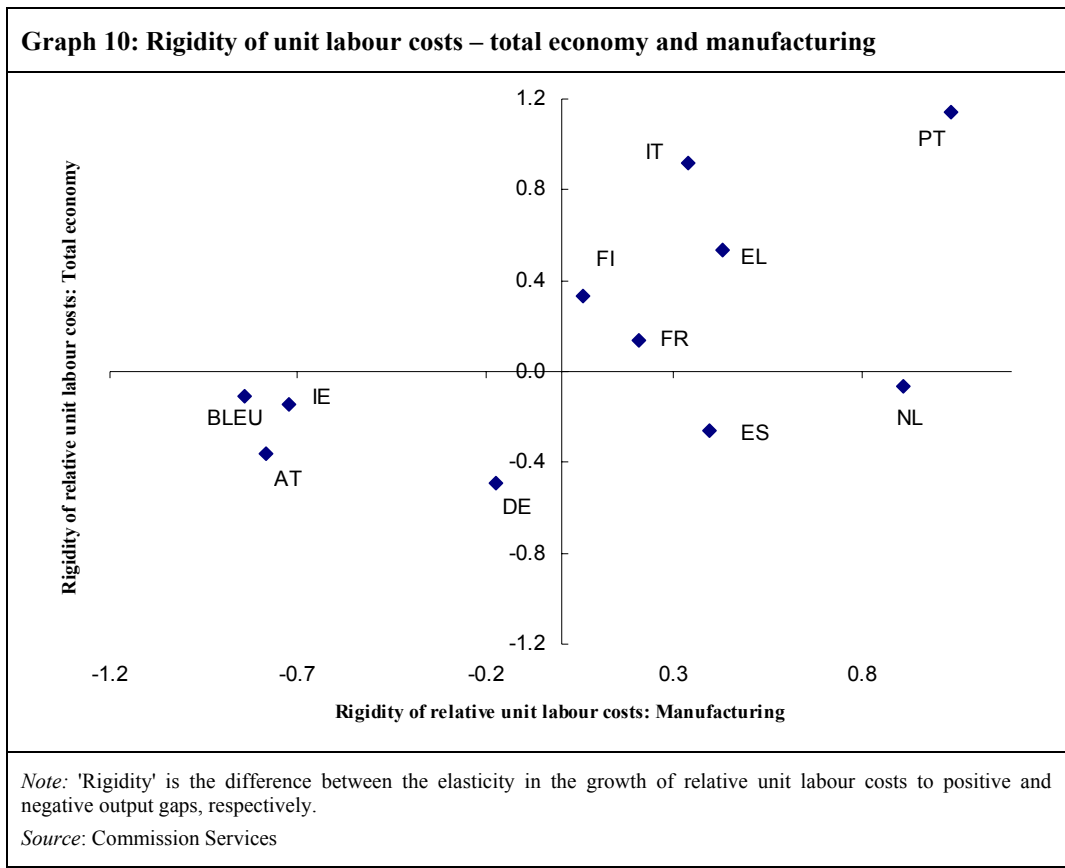
*Note:* Dependent variable is  $100 \cdot \Delta \log(\text{comp})$ . Cross-section fixed effects are included; estimates are corrected for contemporaneous correlation and heteroskedastic residuals. All variables are normalised with respect to the weighted average of remaining euro-area countries using bilateral trade weights. Countries are ranked in decreasing order of the effect of the output gap on the growth of unit labour costs.

*Source:* Commission Services

A significant difference between the output gap elasticity for different cyclical phases may delay the adjustment of relative unit labour costs and be a cause of diverging output-growth rates. It turns out that for the total economy this difference is highest for Portugal, Italy, Greece, and Finland and lowest for Austria and Germany. Graph 9 suggests that this rigidity in the adjustment led to divergent growth rates of relative unit labour costs in the early years of monetary union. This graph reports on the horizontal axis the difference of the output gap elasticity when GDP is above potential from the value estimated when it is below, while the vertical axis displays the average change in the unit labour costs relative to the EU average for the post-1998 years. The asymmetry in the cyclical behaviour of unit labour costs in countries, such as Italy and Portugal, implies a higher sacrifice ratio, i.e. the increase in unemployment needed to trigger a change in competitiveness.

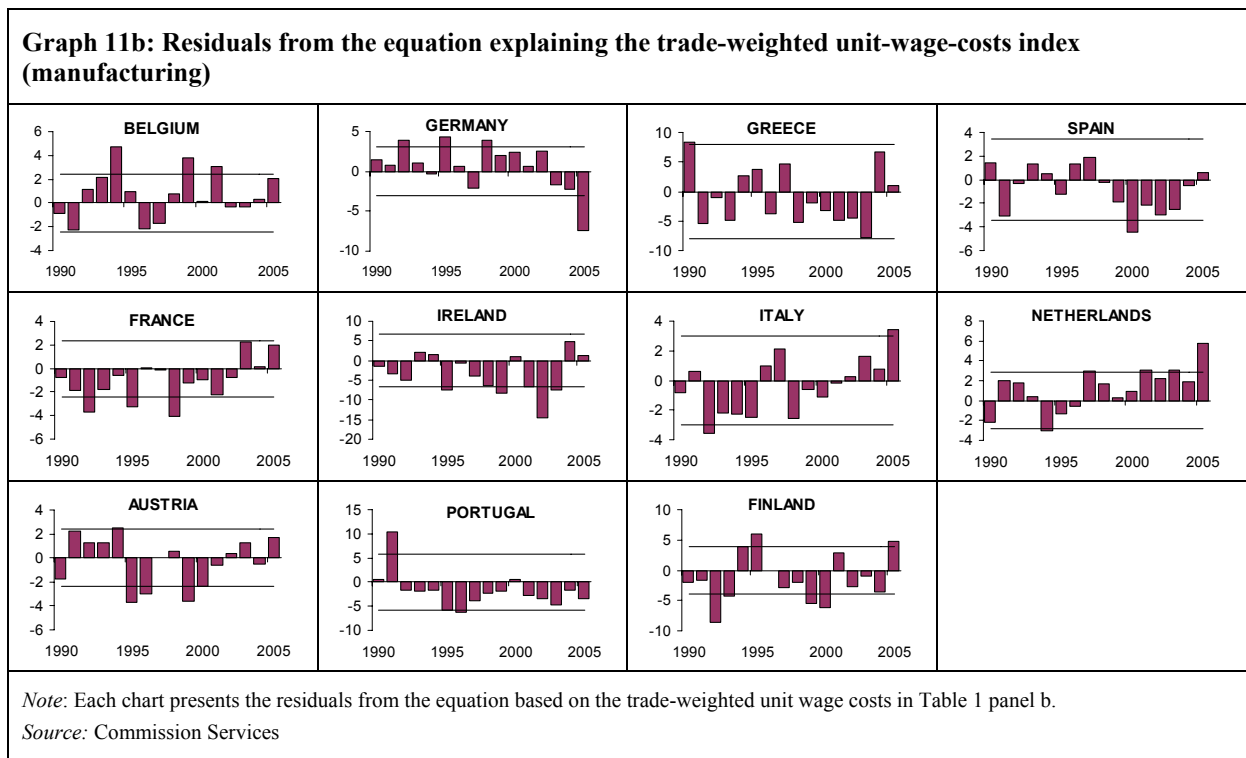
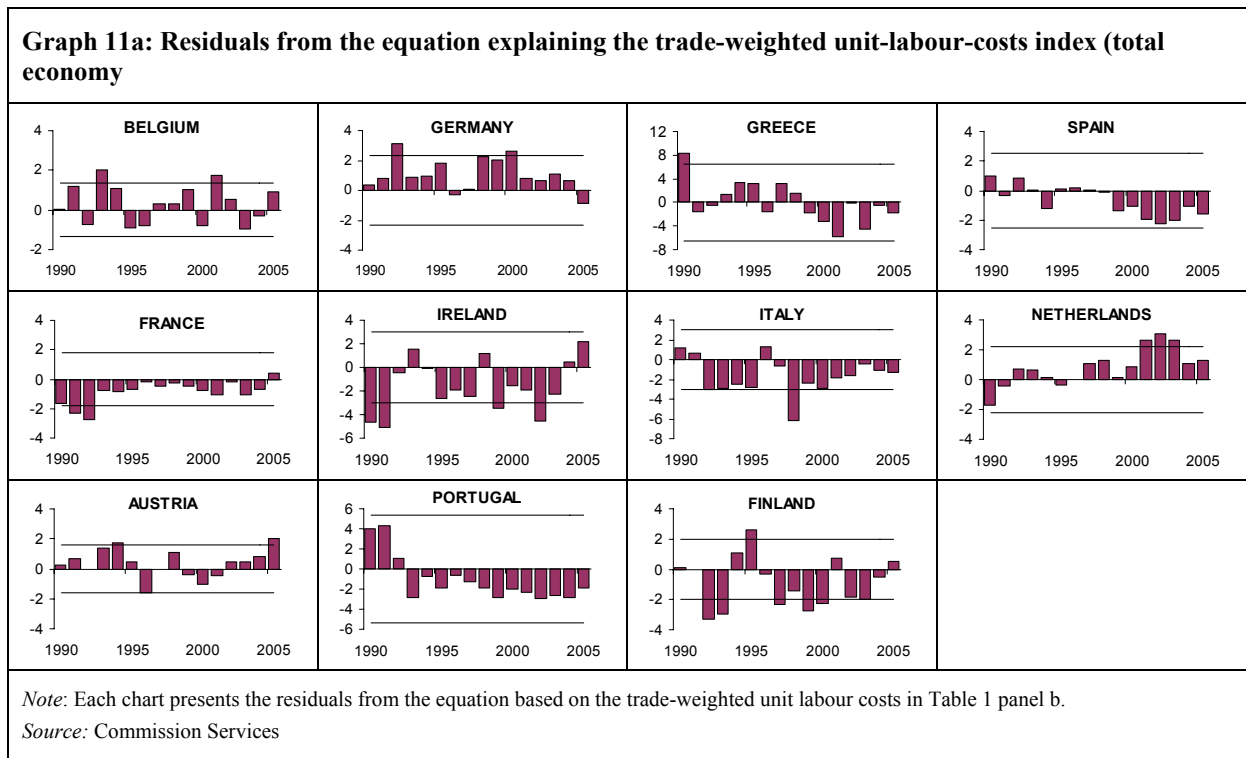


Graph 10 reports the difference between the elasticities of relative unit labour costs to positive and negative output gaps for both manufacturing and the total economy. This graph, which shows the differences between the coefficients in Tables 6 and 7, helps to identify countries where downward rigidity characterises both services and manufacturing from countries where this rigidity is found only for some or neither of the two sectors. On the basis of the degree of rigidity of unit labour costs for the total economy and the manufacturing sector, countries can be clustered in three groups. A first group is composed by countries such as Germany, Austria and Ireland, where the response of relative unit labour costs to the output-gap – both in manufacturing and services – is lower when the output gap is positive than when it is negative. A second group contains countries such as Portugal, Italy, Greece, France and Finland where the opposite occurs. In both manufacturing and the total economy, relative unit labour costs are more reactive over the cycle during expansions than during downturns. Finally, in the Netherlands and Spain, downward rigidity prevails only in manufacturing.



The equations for the unit labour costs of the total economy and of the manufacturing sector can be used to evaluate whether during the post-1998 years the growth rate of the unit labour costs deviates from the pattern explained by the convergence term and the cyclical conditions. Graphs 11a and 11b show, respectively, the residuals of the equation estimated for relative unit labour costs for the total economy and the manufacturing sector (i.e. the estimates in Table 1, panel b, columns 1 and 2). A positive residual means that actual labour cost growth is in excess relative to the value explained by the cycle and the convergence term. The opposite holds for a negative residual.

A positive deviation of the unit labour costs from the value predicted by the equation is observed only for the Netherlands between 2001 and 2003, and Austria in 2005. The cyclical conditions and the lagged dependent variable are sufficient to explain the pattern of unit labour costs growth observed in Germany in the post-1998 period (i.e. the residuals of the equation for the total economy are not statistically significantly different from zero). The opposite is found for manufacturing, where between 2004 and 2005 the growth rate of German unit labour costs fell about 8% below the value predicted by the output gap and the catching up-term. The recent gains in competitiveness reverse the unfavourable trend in costs of the 1990s and early 2000s, suggesting that an adjustment took place in the real exchange rate following competitive losses that had accumulated since unification. In contrast, actual unit labour costs of Netherlands and Italy were, respectively, about 3% and 6% higher than what would be expected on the basis of their output gaps and catching-up terms.



## 6. Conclusions

This chapter has reviewed how the competitiveness channel has worked in the years before and after 1999. The analysis suggests that the competitiveness channel has operated in the monetary union but that its functioning could be improved. A look at the data reveals important features of heterogeneity across countries in the contribution of wage and productivity developments to the change in the relative unit labour costs, which is used as the main measure of cost competitiveness. Before 1999, wage developments were the main source of deterioration in costs competitiveness in several countries. After the creation of the euro area, further losses in competitiveness were

observed in some countries, since unfavourable productivity growth differentials did not lead to an adjustment in relative wages. Hence, the productivity differential was not reflected in relative wages in both periods.

This chapter has shown that with the adoption of the single currency, no break occurred in the response of cost competitiveness over the cycle. However, the new monetary regime spurred convergence in nominal unit labour costs, which has contributed to cost differentials and levelled-off the working of the competitiveness channel. The fact that convergence in unit labour costs was driven by a more rapid convergence in nominal wages than in productivity may be harmful, especially for countries with low levels of productivity.

This chapter also provided evidence of a heterogeneous response of unit labour costs over the cycle within the euro area, which may transform temporary changes in relative prices into persistent differences in underlying price competitiveness trends, ultimately giving rise to persistent cyclical imbalances. Indeed, in several Member States the response of costs over the cycle, both for services and manufacturing, was asymmetric. When GDP is above potential, the rise in both relative unit labour costs and relative wages is not compensated by a reduction of the same amount in the opposite direction when GDP falls below potential. There is therefore a downward rigidity of relative unit labour costs that may delay the overall adjustment. In fact, countries with the highest growth of unit labour costs relative to the euro area between 1999 and 2005 are also those where downward rigidity of relative unit labour costs prevails.

In a monetary union, both price and wage flexibility and job mobility are required for efficient economic adjustment. It is found that tight hiring and firing restrictions go hand-in-hand with a greater response of relative unit labour costs over the cycle. Hence, when insurance against market risks is provided through regulations that protect employment in the firm rather than workers in the market, the burden of adjustment to asymmetric shocks falls more on price and wage variables, implying a high volatility in the terms of trade.

To improve the adjustment capacity of the euro-area economy, more rapid and symmetric changes in price and wage competitiveness would be clearly desirable in the case of the euro-area countries, especially where the wage response to firm- or sector- specific shocks is concerned. Bargaining structures should adapt to the new institutional setting by balancing wage coordination at the macro level with the need to make appropriate wage adjustment at the firm level. Assuming a recovery in long term productivity growth, a bargaining structure that is closer to where price and investment decisions are taken would contribute to restoring competitiveness in cases where this has been lost.

## Annex: Relative labour market performance and trends in euro-area countries, 1990-98 and 1999-2005

**Table A1: Country-specific performance relative to the euro area**

	Belgium	Germany	Greece	Spain	France	Ireland	Italy	Netherlands	Austria	Portugal	Finland	Luxembourg	Average
<b>GDP growth</b>													
1990-1998	-0.1	0.1	0.0	0.4	-0.2	4.5	-0.6	0.8	0.4	0.7	-0.7	2.9	0.7
1999-2005	0.1	-0.6	2.6	1.7	0.2	4.0	-0.7	-0.5	0.0	-0.6	0.9	2.4	0.8
Difference	0.2	-0.7	<b>2.6</b>	<b>1.3</b>	0.4	-0.5	0.0	<b>-1.3</b>	-0.4	<b>-1.3</b>	1.6	-0.5	0.1
S.D.	0.5	0.9	1.8	0.9	0.5	2.2	0.5	0.8	0.7	1.3	3.2	2.0	0.6
<b>TFP growth</b>													
1990-1998	-0.3	0.1	-0.5	-0.8	-0.2	2.7	-0.5	0.0	0.2	0.3	0.7	0.3	0.2
1999-2005	0.2	0.2	1.8	-0.3	0.5	1.5	-0.7	-0.4	0.0	-0.9	1.1	-0.1	0.2
Difference	0.5	0.1	<b>2.3</b>	0.5	<b>0.7</b>	-1.2	-0.2	-0.4	-0.2	-1.2	0.4	-0.4	0.1
S.D.	0.8	0.5	2.2	0.7	0.7	1.8	0.8	1.0	0.9	1.3	1.9	2.0	0.5
<b>Hours worked per employed (rate of growth)</b>													
1990-1998	0.3	0.1	0.3	0.5	0.2	-0.7	0.4	-0.1	-0.2	-0.3	0.9	0.1	0.1
1999-2005	0.3	0.0	0.6	-0.3	-0.4	-0.1	-0.1	0.7	0.6	0.2	0.2	-0.3	0.1
Difference	0.0	-0.1	0.3	<b>-0.8</b>	-0.6	0.6	-0.5	0.8	0.8	0.5	-0.7	-0.3	0.0
S.D.	0.8	0.7	1.4	0.7	0.8	1.2	0.6	1.3	1.3	2.0	1.1	1.1	0.4
<b>Employment growth</b>													
1990-1998	0.0	-0.2	0.4	0.7	-0.1	2.9	-0.5	1.5	0.1	0.0	-1.8	2.7	0.5
1999-2005	-0.2	-0.9	-0.1	2.2	-0.2	2.1	0.3	-0.6	-0.7	-0.4	0.1	2.6	0.3
Difference	-0.3	-0.6	-0.6	<b>1.6</b>	0.0	-0.8	<b>0.8</b>	<b>-2.1</b>	<b>-0.8</b>	-0.5	1.9	-0.1	-0.1
S.D.	0.6	0.7	1.9	1.3	0.5	1.8	0.7	1.2	0.7	0.7	2.6	0.7	0.4
<b>Employment rate</b>													
1990-1998	-3.7	6.5	-8.4	-9.3	-1.1	-5.9	-4.4	6.2	12.8	7.1	2.5	15.6	1.5
1999-2005	-4.3	4.7	-11.7	-4.3	-1.9	1.7	-4.5	9.7	10.1	5.9	2.1	29.9	3.1
Difference	-0.6	<b>-1.8</b>	<b>-3.3</b>	<b>5.0</b>	<b>-0.8</b>	<b>7.6</b>	-0.1	<b>3.6</b>	<b>-2.6</b>	<b>-1.2</b>	-0.4	<b>14.2</b>	<b>1.6</b>
S.D.	0.7	1.1	2.0	2.8	0.6	4.5	0.8	2.8	1.6	1.0	3.0	8.3	1.0

**Table A1 (continued): Country-specific performance relative to the euro area**

	Belgium	Germany	Greece	Spain	France	Ireland	Italy	Netherlands	Austria	Portugal	Finland	Luxembourg	Average
<b>Participation rate</b>													
1990-1998	-4.5	5.9	-9.5	-5.1	-0.1	-4.0	-4.1	4.0	9.5	5.1	4.9	11.4	1.1
1999-2005	-5.0	5.3	-11.2	-2.5	-1.2	-0.9	-4.4	6.6	7.6	4.2	3.1	27.4	2.4
Difference	-0.5	<b>-0.6</b>	<b>-1.7</b>	<b>2.7</b>	<b>-1.1</b>	<b>3.1</b>	-0.2	<b>2.5</b>	<b>-1.9</b>	<b>-0.9</b>	<b>-1.9</b>	<b>15.9</b>	<b>1.3</b>
S.D.	0.8	0.4	1.3	1.5	0.7	1.7	0.4	1.9	1.2	0.8	1.6	9.0	0.7
<b>Unemployment rate</b>													
1990-1998	-1.4	-2.3	-1.1	6.7	0.8	2.9	0.4	-4.2	-6.0	-4.0	2.2	-7.3	-1.1
1999-2005	-0.8	-0.2	2.1	2.6	0.8	-4.0	0.4	-5.1	-4.3	-3.1	0.6	-5.2	-1.3
Difference	<b>0.6</b>	<b>2.1</b>	<b>3.2</b>	<b>-4.1</b>	0.0	<b>-6.9</b>	0.0	-0.9	<b>1.6</b>	0.9	-1.6	<b>2.1</b>	-0.2
S.D.	0.4	1.2	1.7	2.6	0.3	4.3	0.8	1.2	1.1	1.0	2.3	1.4	1.1
<b>Wage inflation</b>													
1990-1998	0.0	1.3	7.3	1.7	-0.5	1.5	0.6	-0.4	0.2	4.3	-0.5	0.2	1.3
1999-2005	0.1	-0.6	3.8	0.7	0.1	3.5	0.5	1.6	-0.4	1.7	0.7	0.8	1.0
Difference	0.1	<b>-1.9</b>	<b>-3.5</b>	-1.0	0.6	<b>2.0</b>	-0.1	<b>2.0</b>	-0.6	<b>-2.7</b>	1.3	0.6	-0.3
S.D.	1.5	1.4	3.0	1.3	1.1	1.8	1.6	1.7	1.1	2.1	2.1	1.4	0.8
<b>Nominal unit labour costs rate of growth</b>													
1991-1998	0.0	0.0	8.1	1.7	-1.0	-0.3	0.2	0.0	-0.5	3.3	-2.4	0.3	0.8
1999-2005	-0.1	-1.3	1.1	1.4	0.0	1.8	1.2	1.3	-0.9	2.1	0.1	1.4	0.7
Difference	-0.1	<b>-1.2</b>	<b>-6.9</b>	-0.4	<b>1.0</b>	2.1	1.0	<b>1.3</b>	-0.4	-1.2	2.5	1.1	-0.1
S.D.	1.0	0.9	4.0	0.8	0.9	2.3	1.7	1.3	0.9	1.7	2.8	2.0	0.3
<b>Nominal unit labour costs rate of growth: Manufacturing</b>													
1991-1998	0.0	0.8	5.5	2.8	-2.3	-4.9	0.8	-0.5	-1.3	2.1	-3.3	-2.2	-0.7
1999-2005	0.1	-2.0	2.4	1.8	0.6	-1.3	3.1	1.7	-1.7	2.9	-1.5	1.6	0.6
Difference	0.1	<b>-2.8</b>	-3.1	-1.0	<b>3.0</b>	3.6	<b>2.3</b>	<b>2.2</b>	-0.4	0.7	1.8	<b>3.8</b>	<b>1.4</b>
S.D.	1.8	2.1	4.5	1.6	2.1	5.6	2.1	1.9	1.6	2.8	4.6	3.0	1.1

*Note:* The table follows the approach adopted by Wyplosz (2006). However, for each country the normalisation is with respect to the overall euro-area average and not with respect to the export-weighted average of the remaining countries. Each number is calculated as the difference between the variable of interest of a certain country and the euro-area average. The column average represents the un-weighted average of all countries. The standard deviation (SD) is calculated on the deviation from the euro-area average for the entire sample period. Figures in bold represent significant differences. For Greece, the first period is 1995-1998.

*Source:* Commission Services

**TableA2: Country-specific performance relative to the euro area – trend variables**

	Belgium	Germany	Greece	Spain	France	Ireland	Italy	Netherlands	Austria	Portugal	Finland	Luxembourg	Euro-area average country
<b>Potential GDP growth</b>													
1990-1998	-0.1	0.1	0.0	0.5	-0.3	4.5	-0.6	0.5	0.3	0.8	-0.7	3.0	0.7
1999-2005	0.1	-0.8	1.7	1.7	0.3	4.7	-0.7	0.1	0.2	-0.2	1.3	2.7	0.9
Difference	<b>0.1</b>	<b>-0.9</b>	<b>1.7</b>	<b>1.1</b>	<b>0.6</b>	0.2	0.0	<b>-0.4</b>	-0.1	<b>-1.0</b>	<b>1.9</b>	-0.3	0.2
S.D.	0.1	0.6	1.0	0.6	0.3	1.2	0.1	0.3	0.2	0.5	1.3	0.4	0.3
<b>TFP trend growth</b>													
1990-1998	-0.2	0.3	-0.4	-0.7	0.0	2.6	-0.4	-0.2	0.2	0.1	0.7	0.5	0.2
1999-2005	0.1	0.0	1.0	-0.5	0.3	2.0	-0.7	-0.2	0.1	-0.6	1.1	0.1	0.2
Difference	<b>0.3</b>	<b>-0.3</b>	<b>1.4</b>	<b>0.2</b>	<b>0.3</b>	<b>-0.7</b>	<b>-0.2</b>	0.0	<b>-0.1</b>	<b>-0.6</b>	<b>0.4</b>	<b>-0.3</b>	0.0
S.D.	0.2	0.2	0.9	0.1	0.2	0.5	0.1	0.0	0.1	0.3	0.3	0.3	0.1
<b>Potential employment growth</b>													
1990-1998	0.0	-0.1	0.0	1.1	-0.3	2.6	-0.5	1.3	-0.1	0.0	-1.6	2.7	0.4
1999-2005	-0.2	-0.9	-0.5	2.3	-0.1	2.7	-0.1	0.2	-0.4	-0.3	0.3	2.5	0.5
Difference	-0.1	<b>-0.8</b>	<b>-0.5</b>	<b>1.2</b>	<b>0.3</b>	0.1	<b>0.4</b>	<b>-1.1</b>	<b>-0.3</b>	<b>-0.3</b>	<b>1.9</b>	-0.1	0.1
S.D.	0.2	0.6	0.3	0.7	0.3	1.1	0.3	0.6	0.3	0.2	1.4	0.4	0.2
<b>NAIRU</b>													
1990-1998	-1.0	-2.2	-1.8	5.9	0.6	3.1	0.5	-4.0	-5.6	-4.4	1.7	-7.1	-1.2
1999-2005	-0.8	-0.4	1.0	3.0	1.1	-3.8	0.4	-5.4	-4.3	-3.0	0.5	-5.1	-1.4
Difference	0.2	<b>1.8</b>	<b>2.8</b>	<b>-2.9</b>	<b>0.6</b>	<b>-7.0</b>	-0.1	<b>-1.4</b>	<b>1.3</b>	<b>1.4</b>	-1.2	<b>2.0</b>	<b>-0.2</b>
S.D.	0.3	1.0	1.4	1.7	0.3	3.8	0.2	0.9	0.8	1.0	1.5	1.2	0.2
<b>Potential employment rate</b>													
1990-1998	-4.0	6.4	-7.9	-8.9	-1.0	-5.8	-4.5	5.8	12.3	7.1	3.3	15.4	1.5
1999-2005	-4.1	4.9	-10.9	-4.6	-2.2	1.3	-4.4	9.8	10.2	5.8	2.2	29.8	3.1
Difference	-0.1	<b>-1.5</b>	<b>-3.0</b>	<b>4.3</b>	<b>-1.2</b>	<b>7.1</b>	0.1	<b>4.0</b>	<b>-2.1</b>	<b>-1.4</b>	-1.1	<b>14.4</b>	<b>1.6</b>
S.D.	0.3	0.8	1.7	2.4	0.7	3.9	0.3	2.5	1.2	0.8	2.2	8.2	0.9

*Note:* The table follows the approach adopted by Wyplosz (2006). However, for each country the normalisation is with respect to the overall euro-area average and not with respect to the export-weighted average of the remaining countries. Each number is calculated as the difference between the variable of interest of a certain country and the euro-area average. The column average represents the un-weighted average of all countries. The standard deviation (SD) is calculated on the deviation from the euro-area average for the entire sample period. Figures in bold represent significant differences. For Greece, the first period is 1995-1998.

*Source:* Commission Services





# V. MARKET ADJUSTMENT: THE REAL INTEREST RATE CHANNEL

## Summary

*A popular argument is that in a monetary union the cyclically most advanced countries experience above-average inflation rates and thus below-average real interest rates that provide an additional unwarranted stimulus to economic growth. In order to assess the risk of destabilising real-interest rate effects, this chapter looks at the experiences in the euro area. Due to persistent inflation differentials (ex post), real interest rates have varied across countries, but cyclical differences are just one of the explanatory variables of inflation differentials. But ex ante real interest rates exhibit smaller cross-country differences, particularly at longer horizons when inflation expectations converge and several reasons are found why area-wide real interest rates are becoming more important over time. This observation is supported by the lack of a stable correlation between real interest rates and indicators of real activity at the Member State level. By contrast, a close correlation is observed between national real interest rates and credit developments. It is difficult, however, to distinguish the impact of the decline in real interest rates in the 1990s and their more recent developments.*

*All in all, the analysis of the real interest rate channel suggests that the subject is more complicated than some early statements might have suggested. Focussing exclusively on ex-post real interest rates could be misleading and exaggerate the risk of destabilising effects. The analysis of the causes of real interest rate differentials clearly hints at the role of non-cyclical factors implying that low interest rates could also emerge in slowly growing countries. Moreover, for some economic agents, particularly for companies, it appears likely that they attach more and more weight to area-wide considerations and thus to a common area-wide real interest rate. In addition, to the extent that inflation differences due to cyclical divergences should be perceived as temporary, the private sector may adjust its medium-term inflation expectations to the ECB's definition of price stability. This process will certainly be intensified by ongoing financial integration, which will also raise the role of income smoothing via risk sharing. As regards the relative importance of real interest rates, empirical investigations argue that the competitiveness channel is strong enough to offset any possible destabilising effects.*

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# MARKET ADJUSTMENT: THE REAL INTEREST RATE CHANNEL

## 1. Introduction

After almost eight years of existence, Economic and Monetary Union is widely considered as a success story. The euro-area economy has successfully coped with a number of adverse shocks including periods of large exchange rate moves, external demand shocks, sharp increases in oil prices and political tensions and uncertainties. With the introduction of the single currency tensions between European economies have lost one of their main propagation mechanisms, the exchange rate channel. However, differences across euro-area countries have persisted and the question of adjustment (channels) within the euro area has not lost its relevance. Differences in cyclical positions, inflation and economic growth have attracted a lot of attention. Among the key channels of adjustment discussed have been the aforementioned competitiveness channel (see Chapter IV) and the real interest rate channel (via real interest rate differences). Both channels are expected to work in opposite directions with the real interest rates channel being presumed to work pro-cyclically.

An above-average increase in costs and prices in a country that is "out of synch" with the euro-area business cycle will not only affect the competitiveness vis-à-vis other euro-area economies, but also lower the difference between the nominal interest rate and the inflation rate, i.e. the ex-post real interest rate. A lower real interest rate, however, makes it more attractive to advance investment and consumption and thereby stimulates economic activity almost instantaneously. This linkage has raised concerns about a possibly destabilising real-interest rate channel that provides additional stimuli to countries that are already in a boom and that slows economic activity in countries that are already lagging behind. Such an "automatic destabiliser" could indeed become an obstacle to inter-country adjustment and deserves therefore a careful evaluation. Questions relate to the relevance of real interest rates based on past inflation experience, to the time horizon of inter-temporal consumption and investment decisions and to the presumed national focus of decision-makers. As regards the experience in the early euro-area years, one might also wonder whether developments in costs and prices were closely associated with cyclical developments, to what extent structural factors played a role and whether a more homogeneous monetary transmission mechanism limited the role of national real interest rates. The latter could be related to the role of persisting nominal (non-policy) interest rate differentials across euro-area countries. Moreover, questions arise concerning counteracting channels that limit the relative importance of the real-interest rate channel. Lessons might also be drawn from empirical studies on US experiences. As for the competitiveness channel, the distribution of the effects over time appears to be crucial.

While the real interest rate channel is based on the assumption that decision-makers take decisions with a view to a national variable (real interest rate), other financial channels that might contribute to inter-country adjustment are based on the assumption of decisions taken with a view to developments in other euro-area countries. Cross-border borrowing and lending, portfolio diversification and cross-border ownership of productive capacity decouple domestic income and output. Such risk sharing helps to smooth income and consumption for a given country-specific shock, although it might also contribute to specialisation of productive capacity that amplifies idiosyncratic fluctuations. As regards the euro area, however, the question arises as to whether risk sharing is already as important as it has been shown to be for adjustment across the states of the US.

This section looks at the real interest rate channel in the euro area, discusses its relevance and presents a preliminary assessment after almost eight years of the euro area. It is organised as follows. Section 2 gives an overview of measurement aspects and developments of real interest rates in the euro area and euro-area Member States. Section 3 discusses the role of real interest rates in a monetary union. Section 4 investigates the determinants of real rate differentials with respect to possible implications for the information content of real interest rates and the functioning of the real rate channel. Section 5 presents evidence on the impact of real interest rates on the euro area as a whole

and on sectors therein. Taking into account other adjustment channels, Section 6 discusses the relative importance of adjustment via real interest rates. The final part concludes and tries to assess to what extent the concept of national real interest rates is an appropriate approach for the analysis of macroeconomic adjustment within the euro area.

## 2. Real interest rates in the euro area: A look at the data

This section provides an examination of the real interest rate developments in the euro area. The focus here is on documenting developments in real interest rates across Member States within the euro area. The section is organised as follows. It starts with some general considerations regarding the definition and measurement of real interest rates. The second part looks at developments in ex-ante and ex-post real interest rates prior to the start of the third stage of EMU, while the final part examines the euro-area years. Particular attention is paid in these sections to assess differences in developments due to the choice of the inflation measure. Specifically, for ex-post calculations, differences in the most commonly used measures of realised inflation: the GDP deflator, the private consumption deflator and the Harmonised Index of Consumer Prices (HICP) are considered. For ex-ante calculations, the difficult issue of measuring inflation expectations is explored, and evidence using survey results is examined.

### 2.1 Definitions and some general measurement issues

It has been argued that since euro-area Member States share the same nominal interest rates, realised real interest rates in each country should differ to the extent that national inflation rates diverge within the monetary union. As a preliminary step in analysing the role of real interest rates as an adjustment channel in monetary union, it is therefore important to establish a clear framework for thinking about real interest rates and their link to inflation developments. This is what is briefly done in this section, by providing a working definition of real interest rates, discussing the difficulties in measuring real interest rates and examining the degree to which developments vary across the most commonly used approaches.

The *real interest rate* is generally thought of as capturing the cost in terms of real resources (e.g. a consumption basket) of transferring income (funds) across time periods. For saving decisions, for instance, the real interest rate conveys information on how much goods which foregone consumption today would be worth at a future time period. Similarly, for investment decisions financed by borrowing, the real interest rate tells us how many goods one can expect to return at a future date in exchange for access to extra goods to be put in some productive activity in the current time period. In essence, then, the real interest rate may be thought of as the price in terms of real goods of transferring access to resources across time periods (i.e. the inter-temporal price of consumption goods). This stands in contrast with the notion of the *nominal interest rate*, which captures the cost in terms of *monetary units* of transferring nominal income (funds) across time periods.

These two notions are closely linked. In a monetary economy, where money is the unit of measurement of all prices, it is therefore the presence of inflation which makes the distinction between the two notions important. In such an economy it is the nominal interest rate which is readily observable. However, since households ultimately consume goods, not money, it is the real interest which matters for consumption/saving and investment decisions. More formally, following Fisher (1922), both notions are linked via the relationship:

$$(1 + r_t) = (1 + i_t) / (1 + \pi_t^e) \quad (1)$$

where  $r_t$  is the real interest rate for year  $t$  (by definition, then borrowing one basket of goods this period, requires in exchange to return the equivalent of  $1 + r_t$  in the following year),  $i_t$  is the nominal interest rate for year  $t$  (indicating similarly that borrowing  $i_t$  units of currency this year, requires a payment of  $1 + i_t$  units of currency next year) and  $\pi_t^e$  denotes the expected rate of inflation between this year and the next. Rearranging terms, and for relatively small rates, one gets the simpler approximation:

$$r_t \approx i_t - \pi_t^e \quad (1')$$

It is clear from expressions (1) and (1') that, conceptually, real interest rates are derived by adjusting nominal interest rates for the expected inflation rate over the relevant horizon. It is then also clear that computing real interest rates is not straightforward in practice. The computation involves substantial conceptual and practical difficulties.

The first difficulty is that the expected inflation rate is not an observable variable. Therefore, it has to be estimated in order to obtain the corresponding real interest rate. Several approaches to this estimation are possible, but there is no agreement on which one is more appropriate in general, with each possessing advantages and disadvantages. Another difficulty is due to the fact that economic agents are heterogeneous. This means that a given measure of the real interest rate might not be relevant for all economic agents. For instance, national interest rates might be relevant for firms operating nationally, but perhaps less relevant for firms operating on an international scale, with investment choices over several countries. Firms operating internationally may also look at inflation in their export markets to derive their real interest rates, even if they invest mostly at home.

While these expressions establish a clear link between real interest rates and inflation, it is worth bearing in mind factors other than inflation that may also influence interest rates (i.e. other than inflation differentials in a monetary

union). In particular, these factors include expectations about future growth prospects, market assessment about the sustainability of the governments' fiscal balances, liquidity and risk considerations, and the overall saving-investment position of the economy as well as tax considerations. In the case of the euro area, for example, there is a comprehensive discussion in the literature as to whether (and if not, why not) financial markets are pricing appropriately the public debt of Member States.<sup>1</sup> Given that the focus of the analysis here is intra-area adjustment in the short-to-medium term, the real interest rate channel is investigated by looking mainly at short-term rates.<sup>2</sup> Short-term nominal interest rates examined here correspond to the three-month money market interest rates, while the long-term nominal interest rates correspond to ten-year government bond yields.

#### *Ex-post and ex-ante real interest rates*

As mentioned earlier, measuring the real interest rate is not straightforward, as it involves estimating first the expected inflation rate. This is a demanding task, as both in theory and in practice it is not fully settled yet which expectation formation mechanism is best suited for deriving the relevant expected inflation rate.

Broadly, one can distinguish three approaches to deriving inflation expectations in practice. One approach consists of using statistical techniques or economic modelling to estimate the expected inflation rate. A second approach works with financial market instruments to derive estimates of inflation expectations. A third approach is to directly ask economic agents about their inflation expectations, this is the survey method. Every approach has its specific advantages and disadvantages. However, they all share, to varying degree, the drawback of having to introduce additional layers of assumptions for computing estimates of the expected inflation rate, which widens the scope for measurement error.

In practice, cross-country empirical studies usually work with real interest rates obtained by simply adjusting the appropriate nominal interest rates by some measure of realised inflation, such as the GDP deflator or a consumer price index like the HICP in the EU. That is, most studies work with *ex post* or realised real interest rates, rather than with *ex ante* real interest rates— i.e. adjusted by expected inflation.<sup>3</sup>

There is a full range of options for computing *ex post* real interest rates. Some studies report using a given headline deflator, others favour using a core version of the deflator (i.e. excluding some volatile items from the overall price index), yet others report using some type of moving average of a given deflator. A rationale for using either of the latter two is to abstract from the effect of transitory shocks to current inflation, which may cause current inflation to be a distorted measure of expected inflation.<sup>4</sup> It is also sometimes argued that depending on the issue of interest one should use a particular price index, for example, a CPI if one is interested in studying consumption and a producer price index for studying investment. Naturally, depending on the choice of the price index for doing the adjustment, the results can vary somewhat, which underscores the degree of uncertainty surrounding the measurement of real interest rates.

Other than its simplicity, a further rationale for working with such a proxy of inflation expectations is that inflation is typically a persistent process.<sup>5</sup> It can then be argued that domestic inflation expectations would tend to follow developments in measured inflation relatively closely, particularly at short-term horizons.<sup>6</sup>

#### *Selecting the appropriate price index*

How much variation can be expected due to differences in price indicators? There are several reasons why the broad price trends described by the three most commonly used price indicators (the GDP deflator, the private consumption deflator and the HICP) could be expected to be rather similar over the medium term, despite differences in coverage and statistical methodology. Indeed, the data examined in the chapter on inflation developments (Section III.2.3) shows that, for most euro-area countries, these price indicators have followed each other rather closely since the

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<sup>1</sup> See for example Faini (2006) and the references therein.

<sup>2</sup> However, it is worth noting that if the analysis were carried out with long-term interest rates, none of the findings reported next in this section would be altered in a significant way, as over the time period considered both short and long term interest rates showed similar trend movements.

<sup>3</sup> The use of *ex post* real interest rates can be understood and justified as using “the *ex ante* rate adjusted by unpredictable short-term fluctuations in inflation” (ECB, 2003d, p. 39).

<sup>4</sup> Note that when inflation is hit by a particularly sharp transitory shock, larger distortions could also arise even at short time horizons. A case where this problem seems less relevant is with averages over medium to long-term periods, as shocks to inflation tend to cancel each other out over time and also, from a conceptual perspective, since it seems implausible to assume that economic agents make systematic errors in predicting inflation for prolonged periods of time (over the medium-term systematic errors in inflation expectation would tend to be negligible).

<sup>5</sup> On the persistence of inflation in the euro area, see the wealth of recent research produced by the “Inflation persistence network (IPN)” of the Eurosystem. The results of this extensive research are summarised in Altissimo, Ehrmann and Smets (2006).

<sup>6</sup> In other words, the current realised level of inflation is assumed to be a good estimate of the inflation rate expected for the next period. See also Lane (2006), who makes a similar argument.

early 1990s. This means that real interest rates derived using any one of these price indicators should indicate broadly the same evolution over time, although not necessarily identical levels at any given point in time.

Given that the picture in terms of price developments and inflation dispersion is fairly close across the three indicators considered, this section focuses on real interest rates deflated using the HICP. This price indicator is chosen as it has the advantage of being the most comparable price measure in the EU, thus minimising the possible differences in inflation developments among countries due to cross-country variation in statistical methodology. Note also that, in addition to being an indicator that sums up all inflationary price developments in the economy, a consumer price index is also the best known price measure among private economic agents and, consequently, also the price indicator most often referred to in national nominal contracts (in product, labour and financial markets). Moreover, from a theoretical perspective, a CPI inflation indicator would be appropriate, as it is ultimately consumer welfare that concerns policy making. Nonetheless, it may be also argued that for looking specifically at firms, a producer price index (PPI) could be appropriate, as this indicator may better reflect entrepreneurial decisions.

For *ex ante* real interest rates, the approach taken here is to use the inflation expectations reported by Consensus Economics. This firm reports, on a monthly basis, survey results for key macroeconomic variables from prominent forecasters in several countries. Typically these are commercial banks, investment banks, central banks, research institutes and international organisations. The surveys feature individual and consensus (average) forecasts for 9-15 key economic indicators for G-7 economies (United States, Japan, Germany, France, United Kingdom, Italy and Canada). For a larger set of countries, the surveys include consensus forecasts for 3-4 variables each (GDP growth, consumer price inflation, industrial production and current account balances). The forecasts are for annual figures for the current and following year. Data on inflation forecasts (for the consumer price index) from this source are available since the early 1990s for most euro-area countries (all except Greece and Luxembourg, while data for Greece is available only from 1993).

The annual figures for *ex ante* short-term real interest rates used here were computed by deflating the annual average of 3 month money market rates by the annual average of the inflation forecasts from Consensus Economics for the current year. Since data on inflation forecasts for the euro area as a whole are only available since 2002, area wide figures for previous years were constructed by aggregating the national forecasts using the historical HICP country weights. Developments in the resulting *ex ante* real interest rates are discussed below.

## 2.2 *Developments in the run-up to the adoption of the euro*

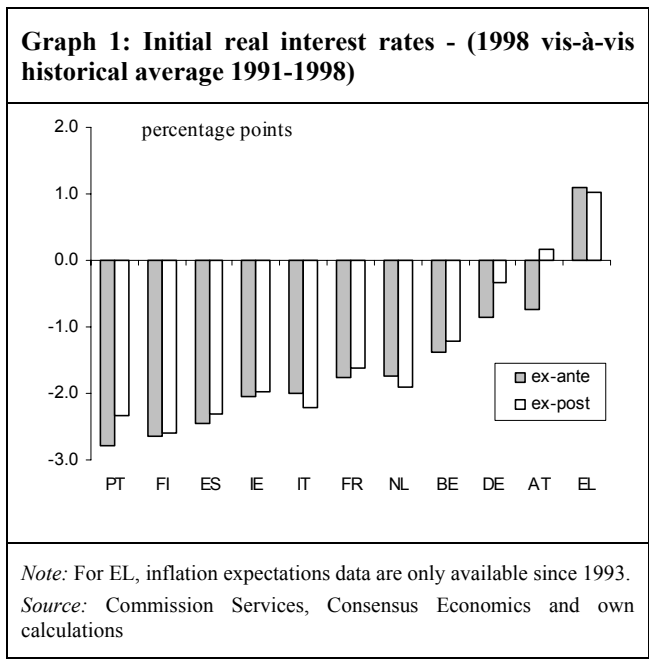
In the run-up to the creation of the euro area, substantial convergence towards lower real interest rates occurred, reflecting progress towards low and stable inflation and the vanishing currency risk premia. On an ex-post basis, real short-term interest rates for the area as a whole declined by some 300 basis points (basis points) from around 6% in the early 1990s to somewhat below 3% in 1998. On an ex-ante basis the decline was somewhat more pronounced, the area average real short-term interest rate fell by roughly 400 basis points, from close to 7% in the early 1990s to about 2½% in 1998. One year later, real interest rates, both *ex post* and *ex ante*, fell further to around 2%. Hence, at the beginning of the third stage of EMU, real short-term interest rates were in general at the lowest level of the decade. In fact, real interest rates stood in 1998 at a lower level than the average of the preceding seven years for all Member States, except Greece.<sup>7</sup> This can be seen as an important early feature of the efforts made to meet the Maastricht convergence criteria in order to participate in the third stage of EMU.

Indeed, among the important explanations for the observed convergence towards lower real interest rates in the run-up to the third stage of EMU is the increased credibility attached by markets to the commitment of Member States to a sustainable low inflation and irrevocably fixed exchange rate regime implied by participation in the monetary union. That is, the convergence was driven by the anticipation of the introduction of the single currency and the corresponding gradual elimination of intra-euro-area exchange rate risk premia. This convergence process was also helped by the substantial fiscal consolidation observed during the same time period.

Three further aspects about developments in real short-term interest rates during this period are worth noting. Firstly, it is also the case that this convergence took place with interest rates falling proportionally more in some of the countries that previously had high interest rates (Graph 1). Proportionally smaller declines were observed in countries that had a history of relatively low interest rates, perhaps linked to their respective track record of inflation performance. For example, the average decline in Spain, Ireland and Finland – economies that had among the highest real interest rates at the beginning of the 1990s – was around 480 basis points for *ex post* short-term rates and around 500 basis points for *ex ante* rates. For Germany, France and Austria – countries that had relatively low real interest rates at the beginning of the previous decade – the decline in short term rates was close to 300 basis points on an *ex post* basis and nearly 350 basis points on an *ex ante* basis. These figures suggest considerable differences in the monetary impetus on demand across Member States from the convergence process in the run-up to the third stage of EMU.

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<sup>7</sup> The experience of the latter country should be viewed in relation to its late entry into the euro area, on 1 January 2001.



Secondly, over the decade of the 1990s the relative positions of Member States in terms of real interest rates changed markedly. At the beginning of the third stage of EMU, Spain, Ireland, the Netherlands, Portugal and Finland had clearly below-average real interest rates (both *ex ante* and *ex post*). In contrast, in 1998, Germany, France and Austria had the highest real interest rates.

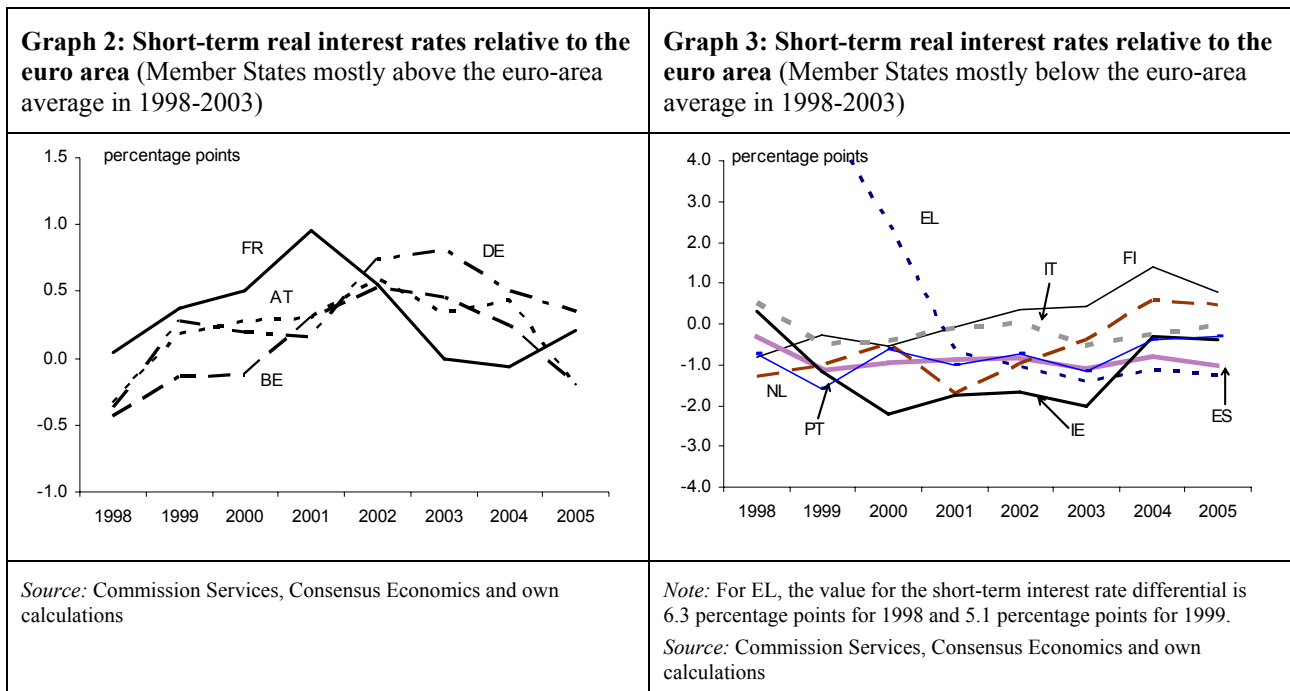
Finally, the data used here suggests that measures of real interest rate dispersion declined only since the mid-1990s and by similar magnitudes for both *ex post* and *ex ante* rates. The spread between the Member State with the highest and lowest real interest rates fell from around 10 percentage points in 1994 to 7½ percentage points in 1998, while the standard deviation declined from around 3 percentage points in 1994 to close to 2 percentage points in 1998.

**2.3 Real interest rates in the euro-area years**

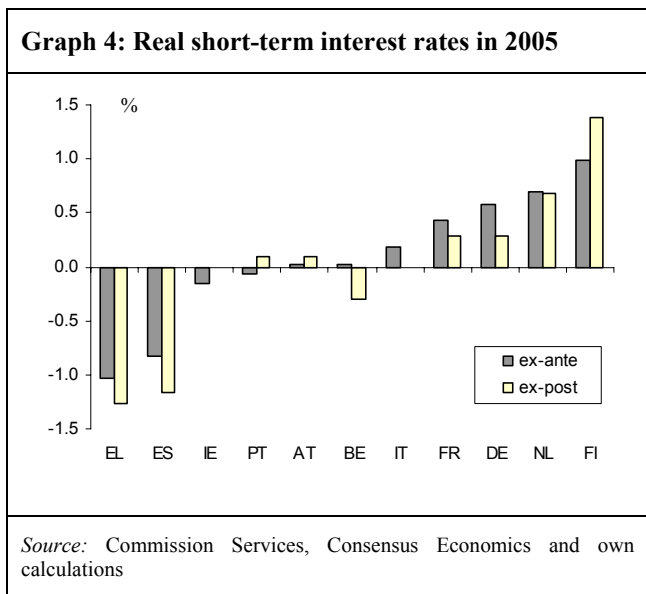
Turning to the developments since the creation of the euro area, the forces at play in the run-up period still seemed to be present to a certain extent. While real interest rates generally continued to decline across the board, some of the differences in the sharpness of the adjustment, which were apparent in the run-up period, continued after 1999. In particular, the largest declines in both *ex-post* and *ex-ante* short term real interest rates during the first seven years of the euro area were experienced in Greece, Ireland and Spain. More generally, as a result of the continuation of the downward trend, real interest rates in the euro area have reached values that are very low from an historical perspective.

In terms of their *relative positions* compared to the euro-area average, two groups of countries can be distinguished. A first group of four countries, which includes Germany, Austria, France and Belgium, registered mostly above-average real interest rates during the past seven years (Graph 2). A second larger group made up of mostly small countries, Ireland, Portugal, the Netherlands, and Greece, but also including Spain and Italy, recorded mostly below-average real interest rates (Graph 3). Of these countries, the Netherlands shifted to above-average short-term real interest rates since 2004. Finland is a country, which entered monetary union with below-average short-term interest rates and which began registering above-average real interest rates after three years of membership in the euro area.





The real interest rates observed in 2005, the last full year for which data are available, are shown in Graph 4. Comparing across Member States, the highest rates are found in Finland, the Netherlands, Germany and France. The lowest rates are found in Greece, Spain, Ireland and Portugal, where *ex ante* real interest rates are negative. Considered against the background of the divergent growth performance over the last few years, the developments highlighted here suggest that differences in real interest rates might indeed be closely associated with cyclical differences between euro-area Member States.



However, the graph also shows that using an explicitly forward-looking approach to compute real interest rates yields less dispersion than using an ex-post approach. Indeed, both the standard deviation and the spread between the Member State with the highest and lowest real interest rates have been lower every year since 1999 for *ex ante* rates. In addition, the decline in average dispersion between the periods prior and following the start of the third stage of EMU was more marked for *ex ante* real interest rates. The greater dispersion of *ex post* real interest rates suggests that the extent of the possibly destabilising effect of the real interest rate channel would tend to be overestimated by studies relying only on *ex post* measures.

A measurement issue in the context of analysing the real interest rate channel in the adjustment dynamics within a monetary union is whether one should look at developments in the short- or in the long-term rates.<sup>8</sup> Since the real interest rate can also be interpreted as the inter-temporal price of a given consumption basket,

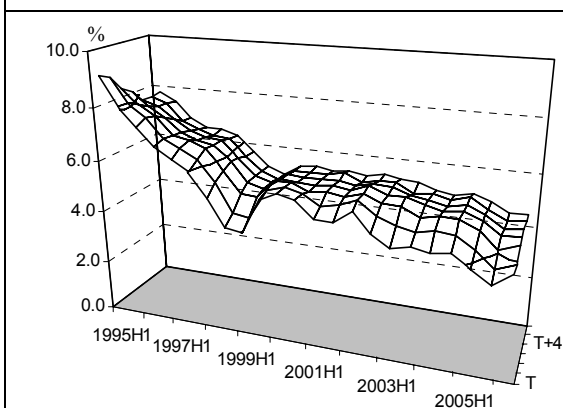
changes in short-term rates may also give rise to some adjustments in consumption/saving behaviour in the short-run. Conceptually, however, it is often argued that long-term interest rates are those that would matter most for investment decisions, since such decisions are generally taken for projects realized over a medium- or long-term horizon. Accordingly, we turn our attention next to developments in long-term interest rates.

Like in the case of short-term rates, some data are available for two components of ex-ante long-term interest rates: expectations for long-term interest rates and for consumer prices. The source used here is again Consensus

<sup>8</sup> Indeed, a further complication here is that, in principle, short- and long-term interest rates are linked via forward-looking expectations (for instance, according to the so called expectations hypothesis of the term structure).

Economics, which provides two data points each year for the largest euro-area economies and the euro area as a whole. Graph 5 displays expected average euro-area long-term interest rates at different horizons. The graph indicates that, alike for short-term maturities, the expected long-term rate has substantially declined since the mid-1990s reflecting interest rate convergence towards the levels prevailing in the economies with the largest degrees of price stability. Since the start of the third stage of EMU, the expected euro-area long-term interest rate has remained in a relatively narrow interval by historical standards reflecting the credibility of the price-stability oriented policy framework.

**Graph 5: Expected long-term interest rates in the euro area for different time horizons<sup>1</sup>**



Note: Time horizons are: 1, 2, 3, 4, 5, and 6-10 years. Calculated from Consensus Forecast data for five countries using relative HICP weights of the reporting years.

Source: Consensus Economics and own calculations

The relatively flat development of the expected long-term average interest rate hides some of the differences that can be found in the data on national expectations. Table 1 summarises the average differences between expectations in Germany and in the other euro-area countries for which data are available. The spreads appear to be relatively small and about of the same size as spreads between government bond yields. This interpretation is supported by the range of spreads that have been observed over time. For instance they show that the long-term rate expected by Spanish respondents was resulting in a positive average spread vis-à-vis German rates at all maturities, but that also for all maturities (except at the short-term) there were time periods in which Spanish yield expectations were below German expectations.

**Table 1: Average expected yield spreads vis-à-vis Germany at different time horizons (in basis points)**

	Time horizon (years)						
	T	T+1	T+2	T+3	T+4	T+5	[T+6;T+10]
<b>1999-2006</b>							
<b>Spain</b>	13 [0; 40]	11 [-10; 30]	13 [-30; 60]	9 [-40; 50]	14 [-60; 90]	21 [-50; 90]	21 [-30; 80]
<b>France</b>	9 [0; 20]	5 [-20; 20]	-8 [-50; 40]	-15 [-50; 30]	-8 [-70; 40]	-13 [-60; 40]	-15 [-60; 40]
<b>Italy</b>	18 [0; 30]	13 [0; 30]	10 [-50; 70]	3 [-40; 50]	-9 [-60; 40]	-16 [-80; 60]	-14 [-60; 50]
<b>The Netherlands</b>	8 [0; 20]	7 [-20; 30]	-2 [-70; 70]	-5 [-40; 40]	-5 [-90; 60]	-2 [-60; 60]	2 [-40; 60]

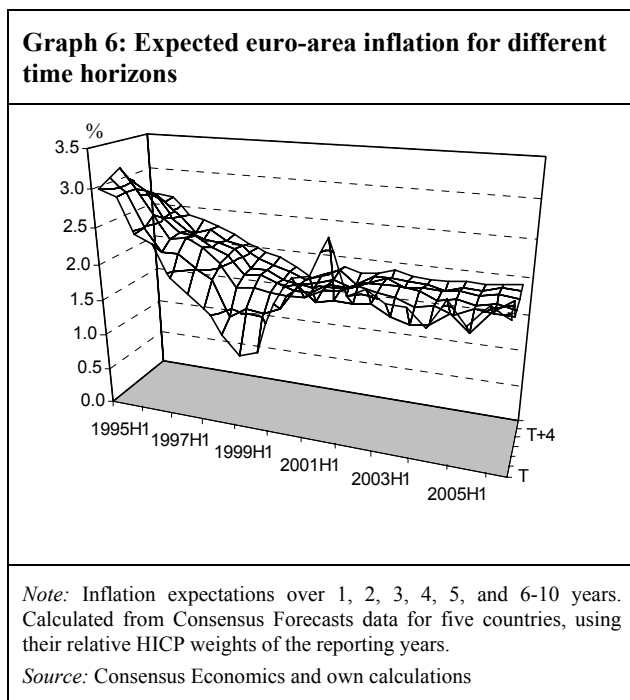
Note: Minimum and maximum spreads in square brackets. A negative figure indicates that citizens expected a lower interest rate than German recipients expected for Germany.

Source: Consensus Economics and own calculations

These findings for the nominal interest rate element in the calculation of real rates suggest that expectations with respect to long-term interest rates do not constitute a strong reason to reject persistent ex-ante real interest rate differentials. In that regard, the results for medium-to-long term expectations are in line with the findings for short-term interest rates, where an area wide nominal interest rate has emerged.

The second part of the analysis of long-term expectations of real interest rates has to deal with consumer price expectations. Data for different horizons are available for the four largest euro-area economies and the Netherlands. Graph 6 displays the development of the euro-area average calculated on national data. The decline in expected inflation rates until the late 1990s confirms the convergence towards area-wide price stability. The stickiness of

inflation expectations around two percent for all horizons reflects the credibility of the stability-oriented policy framework, particularly the credibility of the European Central Bank. Noteworthy in this regard are developments during the second half of 2001, when perceptions of the euro cash change-over resulted in upward adjustment of inflation expectations. As regards the horizon of expectations there have been only relatively small differences compared to the experience in the second half of the 1990s.



As in the case of long-term interest rate expectations, the euro-area average long-term inflation expectations hide national expectations that might differ. Table 2 summarises differences between expectations of consumer price inflation in the Member States and the euro-area average for different horizons. The figures suggest that French and German respondents had lower inflation expectations than the euro-area average at all horizons, whereas respondents in Spain and the Netherlands expected at all horizons a relatively high rate of consumer price inflation in their country (the range of differences is again displayed in brackets).

**Table 2: Average expected inflation differentials**

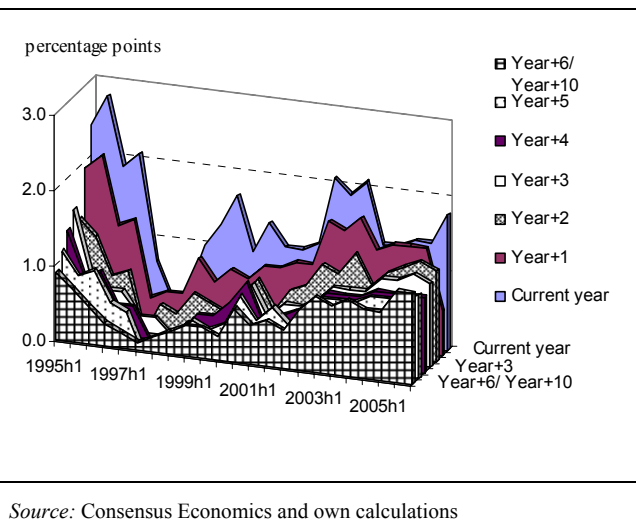
	Time horizon (years)						
	T	T+1	T+2	T+3	T+4	T+5	[T+6;T+10]
<b>1999-2006</b>							
<b>Germany</b>	-0.40 [-0.95; -0.08]	-0.26 [-0.65; 0.20]	-0.17 [-0.37; 0.14]	-0.14 [-0.36; 0.13]	-0.14 [-0.30; 0.06]	-0.14 [-0.39; 0.05]	-0.14 [-0.39; 0.07]
<b>Spain</b>	1.07 [0.78; 1.45]	0.86 [0.58; 1.17]	0.70 [0.37; 0.98]	0.62 [0.31; 0.85]	0.61 [0.36; 0.75]	0.60 [0.32; 0.76]	0.61 [0.24; 0.84]
<b>France</b>	-0.34 [-0.98; 0.10]	-0.28 [-0.54; -0.04]	-0.18 [-0.35; -0.02]	-0.16 [-0.33; 0.04]	-0.11 [-0.24; 0.02]	-0.14 [-0.35; 0.00]	-0.13 [-0.33; 0.04]
<b>Italy</b>	0.30 [0.01; 0.75]	0.14 [-0.20; 0.45]	0.01 [-0.26; 0.28]	0.00 [-0.17; 0.19]	-0.04 [-0.26; 0.16]	-0.03 [-0.28; 0.21]	-0.03 [-0.27; 0.21]
<b>The Netherlands</b>	0.46 [-0.80; -1.92]	0.30 [-0.63; 1.46]	0.17 [-0.33; 0.67]	0.15 [-0.26; 0.60]	0.17 [-0.30; 0.46]	0.23 [-0.20; 0.62]	0.16 [-0.16; 0.50]

*Note:* Figures in brackets show minimum and maximum differentials.

*Source:* Consensus Economics and own calculations

Significant differences in the euro-area aggregate terms of inflation expectations at all horizons result in larger inflation differentials between countries with above and below average expectations, such as for instance Germany and Spain. Against the background of rather similar expectations of long-term interest rates, the responses suggest that there are non-negligible differences in (expected) real interest rates at all horizons. Graph 7 displays the expected real interest rate differential between Germany and Spain.

**Graph 7: Expected real interest-rate differential, Spain and Germany**



The increasing sizes of the slices show that the expected real interest rate differential is larger for short horizons, suggesting that at short horizons *ex post* real interest rates might be quite similar to *ex ante* real interest rates, whereas at longer horizons *ex-post* real interest rates exceed *ex-ante* rates.<sup>9</sup> For longer-term horizons the expected differential is relatively small but it has increased to about one full percentage point (or 100 basis points) during the first seven euro-area years. This steady increase had been hidden behind the more moderate averages in tables 1 and 2. The V-shape of all slices indicates that convergence of long-term inflation expectations was only observed in the run-up to the third stage of EMU. For the more recent period the data suggest a substantial permanent real interest rate differential at all horizons. The argument that long-term inflation expectations converge towards the upper limit in the ECB's definition of price stability does not receive strong support from these findings.

### 3. The role of real interest rates in a monetary union

Real interest rates provide the link between the financial sector and economic activity, as mentioned in Section 2, via their impact on investment and consumption decisions of economic agents. This role might explain the large number of studies on real interest rates (for overviews see Bliss, 1999, Deutsche Bundesbank, 2001), their development over time (e.g. Driffill and Snell, 2003) and their impact on macroeconomic developments (see Taylor, 1999). Many studies have dealt with time series properties of real rates or with cross-country real interest rate linkages, particularly with cross-country real interest rate equalisation.

In principle all results that are obtained for closed or large open economies are also valid for a monetary union as a whole, i.e. a group of regions or countries with a single currency. In particular the role of real interest rates as a brake on cyclical developments remains intact. In an advanced cyclical position with above average inflation and/or inflation expectations, the monetary authority of the monetary union can lower demand by raising nominal rates and, with given inflation expectations, thereby also raise the real interest rate.

In a monetary union the monetary authority sets policy interest rates for the union as a whole and this implies that regional developments will necessarily have a smaller impact on area-wide decisions than they could have had on region-specific policy decisions (outside a monetary union). By tailoring monetary policy towards the needs of the whole entity ("one size fits all") there may be regions for which it looks as if a region-specific policy decision is more appropriate. The measure that is often used to assess the appropriateness of union-wide policy for regional economies is benchmark interest rates. Real interest rates are among the most often used benchmark variables. Heterogeneous developments in prices across regions result in differences between regional real interest rates that might not be in line with the warranted stance of monetary policy from the regional viewpoint.

A region in an advanced cyclical position or a country that has been subject to a positive demand shock might have witnessed or might expect an above-average inflation rate and would therefore have a lower-than expected real interest rate. With a lower real interest rate more investment projects would be profitable and the higher investment-GDP ratio would increase the capital stock and potential output. The additional demand induced by relatively low real interest rates could be expected to push demand further and to add to the divergence within the monetary union unless other channels are counteracting and/or other policy instruments are used to offset the impact. With reference to possible cyclical causes the real interest rate channel has been described as pro-cyclical and the overall effect has been assessed as possibly destabilising. It has been argued that the destabilising effect could also originate from heterogeneous structures that result in inflation differentials.

The description of the real interest rate channel as seen within a monetary union has a fairly wide relevance as it could be applied to all countries, particularly to those that have some federal structures with economic policy decisions at different levels of government.<sup>10</sup> However, it has attracted most attention from large monetary unions

<sup>9</sup> The ECB reports similar results based on short- and long-term *ex ante* and *ex post* real interest rates. See ECB (2004c), p. 34, and ECB (2000b), p. 69.

<sup>10</sup> The core of the real-interest rate argument can be seen as an equivalent to Wicksell's destabilising real interest rate response (Wicksell, 1907), which he found while examining the feasibility of a nominal interest rate peg where he noted the inherent instability in the face of inflationary

like the United States and the euro area. For the latter the more recent experience of national, though not necessarily independent monetary policy might have played a role.

An increase in inflation (expectations) lowers real interest rates and thereby raises the (real) wealth of households, in particular of houses. Increased wealth is a determinant of consumption growth. Thus, lower real interest rates provide an impulse to demand via the wealth effect, adding to the direct effect on expenditure decisions of households and firms.

The role of real interest rates in economic theory is forward looking, i.e. economic agents are expected to decide on the basis of expected developments. The time horizon of such expectations is linked to the type of decision. For instance, for an investment project a firm is assumed to take into account the expected real interest rate for the full time until the end of the project. Also households are usually assumed to base their decisions on consumer durables on multi-year expectations. The emphasis on the medium- to long-term implies that short-term inflation developments and past inflation patterns can be expected to have a minor role. This is reflected in the fact that real interest rates are generally understood as an *ex ante* variable.

Economic theory assumes that households and firms form their inflation expectations on the area that matters to them. For a household considering the purchase of a house this might be a regional area, for a firm that operates only nationally it might be the domestic economy and for an export-oriented firm it might be even a broader regional coverage. Therefore different real interest rates (region, country, monetary union) could be relevant for economic decisions. The distinction of regional, national and area-wide real interest rates is only relevant, however, as long as different inflation rates are expected for the regions and/or countries. In the short to medium term, inflation differences might persist for a number of reasons (e.g. changes in indirect taxes and administered prices, idiosyncratic shocks). In the long term, inflation differences might shrink as catching-up factors decline in importance, business cycles become more synchronised and financial integration decreases the role of national financing. This suggests that over time the role of regional and/or national real interest rates will become less and less important within a monetary union.

The two main channels of monetary policy transmission are the exchange rate channel and the interest rate channel. While nominal exchange and interest rates are the same for all citizens within a currency area, real exchange and interest rates may differ across regions thereby reflecting differences in the (price) deflator. Both real rates matter for adjustment within a monetary union, but they work quite differently. While the real interest rate channel may enforce divergent developments, the competitiveness channel supports adjustment as overheated economies face a deterioration of relative competitiveness slowing activity.

The aforementioned channels of monetary transmission and channels of adjustment are related to a monetary union. The situation can be expected to differ during a transition period after such a monetary union has been established. As regards adjustment channels, a young monetary union might still be subject to ongoing convergence processes that overshadow the regular adjustment mechanism. For instance, a substantial improvement in terms of price stability can come along with substantially lower nominal interest rates. Despite lower inflation rates this could result in a substantial decline in *ex post*- and *ex ante*- real interest rates, whereas countries that had smaller gains in terms of price stability would not face any substantial change in real interest rates. Therefore even identical real interest rates in these countries may have different effects on macroeconomic developments. This effect, however, is an initial one-off effect that is particularly relevant in the run-up to monetary union and the first years of its existence. As regards monetary transmission, initial differences across economies within a monetary union can be expected to remain relevant for some time, but to lose importance as integration progresses.

All in all, the role of national real interest rates in the regions and countries in a monetary union can be expected to be substantially smaller than for countries outside. Deviations might still exist in a newly created union, but enhanced economic and financial integration will reduce such deviations over time.

#### **4. Real interest-rate differentials in the euro area and their causes**

The presentation of measurement issues related to the calculation of real interest rates has already hinted on factors behind real interest rate differentials. While several factors could be considered as playing a role (e.g. transaction costs)<sup>11</sup>, inflation differentials appear to be the key driver of reported real rate differentials. This section starts with a closer look to inflation differentials in order to assess whether their causes can be expected to matter for the functioning of the real interest rate channel (Section 4.1) and whether their persistence also reasonably characterises real rate differentials (Section 4.2). The remainder of the section looks at commonly used equilibrium concepts for real rates and for inflation rates and asks about their link to actual developments in the euro area (Section 4.3).

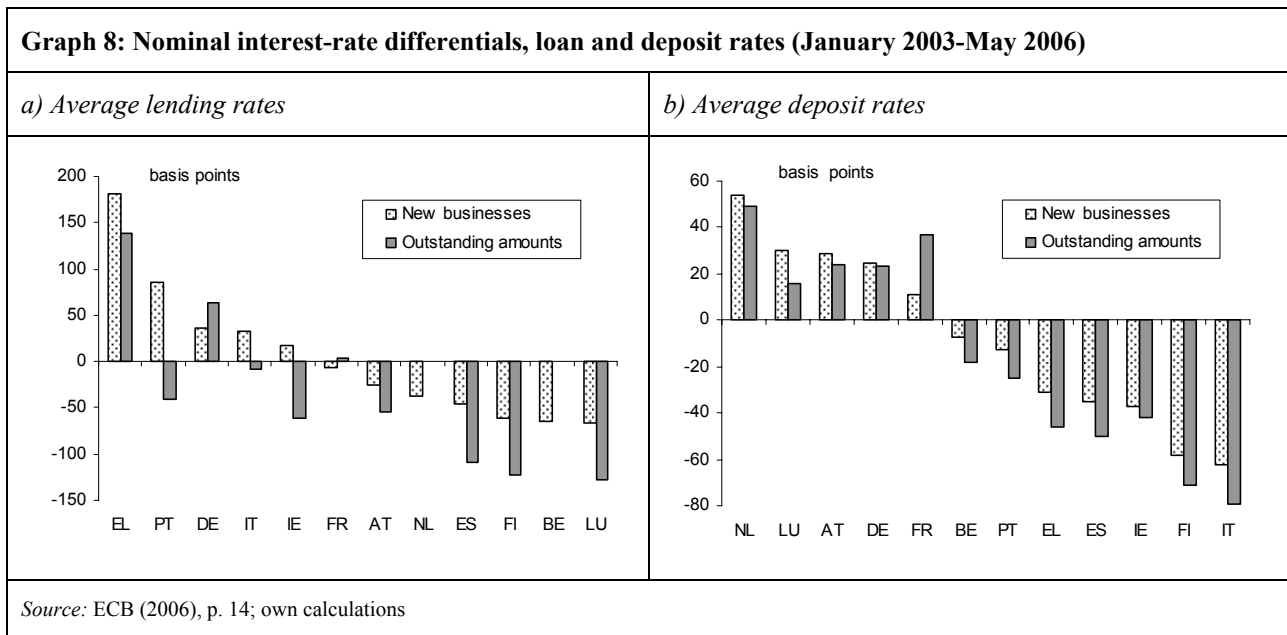
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shocks. With fixed nominal interest rates, an increase in inflation would cause real interest rates to fall, boosting demand, pushing up prices, and in turn causing real interest rates to fall further, and so on. He found that this mechanism will apply to economies facing deflation shocks when they have zero nominal interest rates and are constrained from cutting interest rates by the liquidity trap.

<sup>11</sup> Transaction costs have been shown to be too small to account for real interest rate differentials (Al-Awad and Grennes, 2002).

#### 4.1 Components of real interest-rate differentials

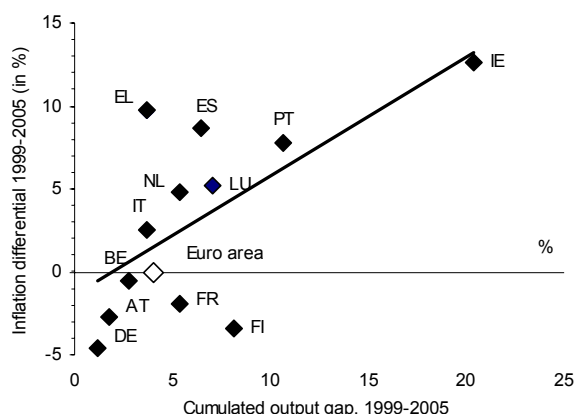
Real interest rates in the euro area have two components, a nominal interest rate and a term for the inflation expectations. In the short term the nominal market interest rate will be very close to the policy interest rate of the ECB (minimum bid rate of the main refinancing operations) and thus be almost identical in all euro-area economies. In the long term, (nominal) interest rates on similar assets can be expected to be similar across countries as is visible in long-term government bond yields. For some retail interest rates, however, there is evidence of differences across euro-area Member States (see ECB, 2006). Aggregate loan and deposit rates for new businesses and for outstanding amounts vary significantly and persistently across countries (see Graph 8). Such persistent nominal interest rate differentials matter for the calculation of real interest rate levels. Lending rates in Greece, Portugal and Italy exceed the euro-area average resulting in real interest rates that exceed those calculated on the basis of identical nominal euro-area interest rates. However, the pattern of differences does not coincide with that of the real interest rates presented in Section 2 as for instance Germany, a country with a relatively high real interest rate, exhibits above-average lending rates.



The size of nominal interest rate differentials, in particular those observed for deposit rates, is small compared to the size of real interest rate differentials. Having said this, it is obvious that most of the differences across countries relate to the inflation (expectations) component and thus to inflation differentials. As argued before, although inflation expectations are the more relevant ingredient to the calculation of real rates, for practical reasons very often ex-post inflation rates have been used for the calculation of real interest rates and this sheds light on observed inflation differentials across euro-area economies.

The latter have been the focus of empirical analysis since the start of the third stage of EMU. Differentials were initially (and are still sometimes) described as being similar to those in other monetary unions such as the United States (see Section 6.2). More recent contributions have reiterated this finding only with respect to the size of differentials but emphasised the much stronger persistence of deviations from the area-wide average. Euro-area countries with above average inflation in one period tended to exhibit the same type of deviation in subsequent years and vice versa. This observation has raised questions about the reasons and also about the impact (and possible policy implications). As a part of the latter, national real (*ex post*) interest rates attracted attention as they reflect euro-area inflation differentials.

**Graph 9: Inflation differentials and cyclical conditions**



Note: Figures for Greece are for the period of its participation in the third stage of EMU (2001-2005).

Source: Commission Services

- *Cyclical determinants.* The main line of reasoning in the real-interest argument rests on the assumption of a link between cyclically advanced positions and the occurrence of inflationary pressures. This means that inflation differentials across euro-area economies would reflect differences in output gaps, i.e. the difference between actual and potential output. The results, shown in Graph 9, suggest a positive relationship between the cumulated output gap and the (multi-year) inflation differential. Indeed for most countries the size of the inflation differential seems to be broadly in line with their cyclical position, i.e. countries with relatively large positive output gaps had above-average inflation.<sup>12</sup> However, at the same time it has to be acknowledged that in the short-term factors other than cyclical conditions played an important role for inflation differentials.<sup>13</sup>

- *Policy-induced determinants (e.g. indirect taxes and administered prices).* Some of the divergence of inflation rates can be attributed to national policies. Among the examples are the VAT and

energy tax increases in the Netherlands in 2001 that are estimated to have raised the inflation rate by about one full percentage point. Such increases in indirect taxes should only exert a temporary effect unless wage indexation schemes keep the effect alive. Thus, the decline in (*ex post*) real interest rates will also be of temporary nature and it appears questionable whether such a temporary decline will strongly affect decision making by households and firms.

- *Structural causes.* Euro-area Member States differ in terms of the economic, financial and institutional characteristics and these differences are related to inflation rate differentials and thereby to real interest rate differentials. For instance, the oil (or more generally energy) intensity of production varies across countries and so does the share of energy consumption on total expenditures (as is also visible in HICP weights). Different exposure to exchange rate moves results in different responses to large changes in the external value of the euro. Honohan and Lane (2003) found for the first three euro-area years (1999-2001) that much of euro-area differentials are attributable to the differential impact of exchange rate movements. In particular in the case of Ireland the euro depreciation in 1999 and 2000 had resulted in a larger inflationary impulse than in other countries reflecting Ireland's distinctive trade pattern. The level of economic integration can also play a role if Member States entered the euro area with different price levels. As integration proceeds price levels will converge and the accompanying increase in the rate of price changes will lower (*ex post*) real interest rates.

Inflation differentials caused by policy actions or structural differences affect (*ex post*) real interest rates, but they raise doubts as to what extent resulting real rate differences affect the decisions of economic agents as structural factors may become less important over time and policy measures might have a one-off impact on inflation.

Euro-area figures suggest that at least the HICP figures are strongly affected by non-cyclical factors such as changes in indirect taxes, administered prices on the domestic side and oil and other commodity prices on the external side. Moreover, the services sector is found to have contributed over-proportionally. These findings put a question mark behind the idea that there has been a clear link between above-average inflation rates and the cyclical position and in turn this means that above-average inflation rates were not only observed in strongly growing countries.

All in all, a closer look to the reasons for inflation differentials across euro-area countries suggests that it is rather unlikely that all discrepancies between national inflation rates (and inflation expectations) are caused by the same factors or that common factors will dominate in the near future.

<sup>12</sup> This finding is in line with the results of empirical studies reported by the ECB (2003d, pp. 35-39). Canzoneri et al. (2006) find that inflation differentials are positively correlated with growth differentials.

<sup>13</sup> Another approach to the analysis of real interest rates could relate output gaps and real interest rates, but due to the area-wide nominal interest rate results should qualitatively be similar. For the US the cyclical properties of real interest rates have been analysed in that way. Dotsey, Lantz and Scholl (2003) find that the real interest rate is contemporaneously positively correlated with GDP and with lagged cyclical output. They also present evidence that high real rates are associated with strong cyclical output one quarter into the future.

### Box: The role of services inflation in euro-area inflation differentials

By historical standards or in comparison to other monetary unions or regions within countries, euro-area inflation dispersion does not appear to be large. What is remarkable, however, is that, since 1999, a majority of euro-area Member States have recorded either persistently positive, or persistently negative, inflation differentials vis-à-vis the euro-area average. Taking a closer look, it can be seen that, since 1999, it is the core inflation sectors, and in particular services, that have contributed most to euro-area inflation dispersion.

Services inflation has a large impact on inflation developments in the euro area, both due to its large weight in the HICP basket (over 40% for the euro area) and the typically higher inflation rate in services than in goods. Since January 1999, euro-area services inflation has averaged 2.3% compared to 0.7% for non-energy industrial goods. In a number of Member States, high inflation rates are recorded in particular in financial services, transport services, health services, recreational services and housing services. Services inflation above 2% has been a feature of most Member States since the introduction of the euro.

Higher inflation in services than in goods is to an extent to be expected due to the higher labour intensity in production (and typically lower productivity growth) and limited international competition, reflecting the low degree of tradability of many services. Apart from this, sectoral and country-level analysis highlights a number of factors contributing to high inflation in services in euro-area Member States. These include notably long-term demand shifts towards services consumption, related to real convergence and to changes in life styles (particularly evident in recreational services). In some Member States, Balassa-Samuelson effects are also likely to have contributed to higher inflation in the non-tradable sector.

**Table B1: Inflation in the five main HICP categories, 1999:01-2006:07 (average annual change in %)**

Item	BE	DE	EL	ES	FR	IE	IT
Services	2.1	1.3	3.7	3.8	2.1	5.0	2.7
Non-energy industrial goods	0.9	0.1	2.0	1.6	0.4	0.0	1.6
Processed food including alcohol and tobacco	1.8	2.0	4.0	3.3	2.8	3.7	2.3
Energy	5.6	6.6	6.0	5.2	4.3	6.5	4.3
Unprocessed food	2.1	0.7	2.7	4.0	2.1	2.0	2.5
Item	LU	NL	AT	PT	FI	EA	Euro area
weight in 2006 (%)							
Services	2.7	3.1	2.2	4.0	2.5	2.3	39.8
Non-energy industrial goods	1.1	0.9	0.3	1.6	0.3	0.7	31.7
Processed food including alcohol and tobacco	3.8	1.9	1.6	2.7	0.7	2.4	12.1
Energy	7.2	7.6	4.5	5.0	4.7	5.5	8.6
Unprocessed food	2.7	2.0	1.5	2.3	1.3	2.2	7.8

Source: Commission Services

Temporary shocks such as increases in oil prices tend to affect services inflation in all countries, in particular via higher transport and housing services. Services prices also tend to be influenced by changes in administered prices, sometimes linked to policy reforms (for instance the health care reforms carried out in a number of Member States in recent years). Barring second-round effects, the impact of a rise in administered prices on inflation is in principle temporary. Beyond these benign or temporary factors, however, high services inflation also reflects shortcomings in market functioning (notably inefficiencies in regulation and lack of competition), that call for policy responses. In most Member States there are services sectors (not necessarily the same in all Member States) that operate in a regulatory environment not conducive to low inflation. Some examples are: professional services, where entry barriers and price regulations put upward pressure on prices; wholesale and retail trade, where factors partly related to non-economic considerations, such as shop-opening hours, zoning restrictions and restrictive labour regulation put a brake on productivity growth and competition; retail financial services, where EU integration is less advanced than in the wholesale financial sector and some domestic markets appear insufficiently competitive; and traditionally regulated sectors where the scope for liberalisation has not yet been exploited, such as railway transport or postal services.

The substantial declines in prices in the telecommunications sector demonstrate the success of the regulatory reform undertaken in the sector over the last decade, working together with a high rate of technological innovation. Even in this sector, however, there appears to be room for further enhancement of competition.

There seem to be four main areas of policy action to curb inflationary pressures in the services sector: i) stepping up efforts to implement EU single market initiatives like the Financial Services Action Plan; ii) removing regulatory distortions at state and local levels and increase competition, in particular, in sectors such as retail financial markets, network industries, retail trade, and professional services; iii) promoting wage flexibility, so as to better align wage developments with productivity growth; and iv) fostering the spread of new technologies, in particular ICT, would improve productivity in services sectors and thereby lower inflation.



## 4.2 Persistence of cross-country differences in real interest rates

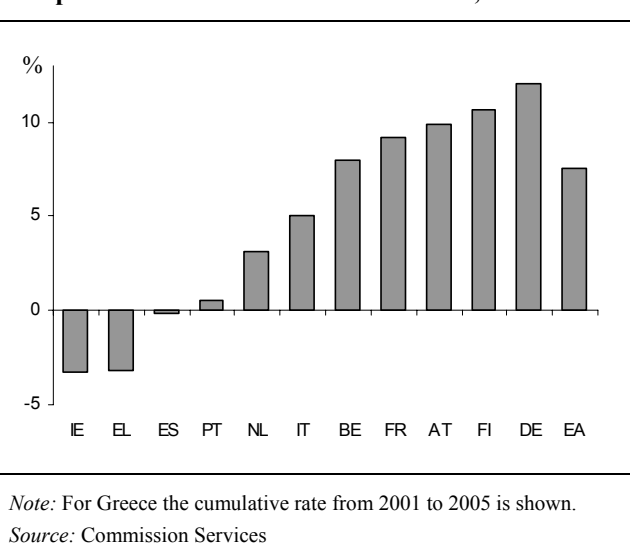
Inflation in the euro area has been found to be persistent. The Eurosystem's Inflation Persistence Network has evaluated some of the reasons (for a summary see Altissimo, Ehrmann and Smets, 2006). As regards the relevance of inflation differentials, Angeloni and Ehrmann (2004) conclude that inflation persistence is the single most relevant determinant of (persistent) differentials. By definition inflation persistence results in a more rigid development of real interest rates across euro-area economies. The correlation coefficients calculated for real interest rate differentials vis-à-vis the euro area in consecutive years (see Table 3) indicate such persistence of real rate differentials.

**Table 3: Persistence of real interest-rate differentials - (correlation coefficients, annual data, 1995-2005)**

Between ... and the following year	1999	2000	2001	2002	2003	2004
<b>All 12 countries</b>	0.83	0.18	0.83	0.89	0.64	0.89
<b>The largest 4 countries</b>	0.97	0.96	0.94	0.92	0.87	0.92

*Source: Own calculations*

**Graph 10: Cumulative real interest rates, 1999-2005**



At the level of the Member States, the counterpart to high correlation coefficients can be seen in persistent country differentials. Countries with below-average real interest rates in one period can be expected to exhibit below-average rates again in the successive period. This persistence implies that the response to changes in the cyclical position can be expected to be limited. Without persistence one might have expected countries to have relatively similar multi-year real interest rates (accumulated interest rates). As Graph 10 suggests this persistence has resulted in substantial overall changes in real rates in the first seven years of the euro area. The seven-year rate of real return in Spain and Portugal has been close to zero and negative in Ireland and Greece, where the figure refers to its five-year period of euro-area participation. The accumulated return in Austria, Finland and Germany has been at or above the ten percent level. The evidence found in favour of the hypothesis of the persistence of real interest rates suggests that differentials are only to a limited extent reflecting cyclical developments. This could suggest that the pro-cyclicality of the real interest rate channel is limited by the persistence of real rates.

## 4.3 Implications of equilibrium concepts for real interest rates

At the level of the euro area, there has been substantial research on equilibrium real interest rates, i.e. rates at which inflation rates are stable and output grows in accordance with potential. As the trend growth rate may vary over time, the equilibrium real rate will also move. In the short run, however, interest rates will move around the neutral rate as economies are subject to economic shocks that create risks to price stability. In monetary policy analysis the equilibrium real interest rate plays an important role as an element of the estimation of Taylor rates. Thus the estimates of an equilibrium or natural rate of interest have often been used for assessing the stance of monetary policy.

Several determinants of the equilibrium interest rate have been named in the economic literature. Among them are productivity and population growth, risk premia, fiscal policy, the time preference of consumers and the institutional set-up of financial markets (e.g. ECB, 2004a). These factors represent preferences, technology, demography and the institutional and macroeconomic policy framework and it is quite obvious that equilibrium rates might differ across euro-area countries. In addition, the list of factors strongly suggests that the equilibrium rate will change over time.

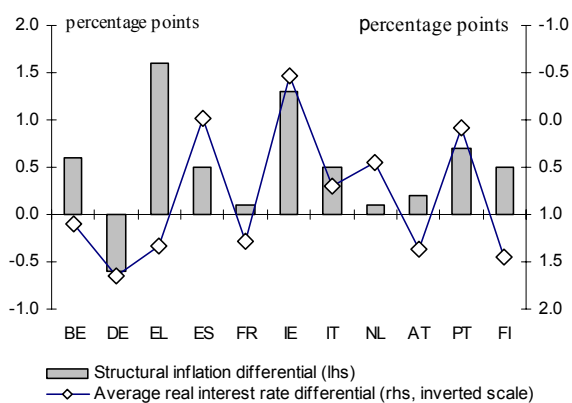
The role of the determinants of the equilibrium rate differs across euro-area countries suggesting the existence of different equilibrium rates. For the assessment of real interest rates this implies that the same real interest rate in two

countries can reflect different monetary and financial conditions for the countries (in terms of deviations from equilibrium real interest rates).

The argument on country-specific equilibrium real interest rates has a counterpart on the inflation side. Studies on structural factors of euro-area inflation rates often argued that there are good reasons for different inflation rates across euro-area economies. The different level of economic development was put to the fore claiming that such different equilibrium rates would have policy implications. The debate regularly leads to the call for a higher upper bound in the definition of price stability of the European Central Bank that would allow more advanced economies to derive a less strict "national" version of the definition of price stability. Several institutions (e.g. the IMF, the OECD) and academics (e.g. Sinn, De Grauwe) were among those arguing that the ECB definition bears deflationary risks for countries such as Germany.<sup>14</sup>

Studies of the Balassa-Samuelson hypothesis have produced estimates of inflation rates that would be implied by differences in national productivity trends (for an overview see ECB, 2003d, p. 32). Assuming that these estimates would be fully reflected in inflation expectations, different real interest rates across countries could result in long-lasting real interest rate differentials. Countries like Germany would be faced with long time spans with above-average real rates, while countries with a catching-up background such as Portugal and Greece would exhibit relatively low real interest rates. Graph 11 displays a comparison of the observed average annual real rate differential vis-à-vis the euro-area average (1999-2005) and the structural inflation differential vis-à-vis the euro-area average as implied by the average of estimates in selected studies on Balassa-Samuelson effects.

**Graph 11: Real interest-rate differentials and structural inflation differentials<sup>1</sup>**



Note: 1 - Average annual real interest rate differentials (1999-2005) calculated using ex-post short-term real interest rates. Structural inflation differentials are calculated using the average estimates on "equilibrium" inflation rates implied by Balassa-Samuelson effects as summarised in ECB (2003, p. 32).

Source: Commission Services

A comparison of both series indicates that in six of the eleven countries (no estimates were available for Luxembourg) the signs of the estimated structural inflation differential and the average real interest rates were the same and that for two more countries differences appeared to be rather small (France, Austria). In particular for Germany, Ireland and Portugal the structural inflation differentials and the observed real interest rate differentials almost coincided. These findings are compatible with the hypothesis that a non-negligible part of real interest rate differentials is related to structural factors and that the cyclical component contributes only partially to the explanation of real rate differentials. Empirical research has, however, raised doubts as sectoral price and productivity developments could not be reconciled with the Balassa-Samuelson hypothesis (e.g. Lopez-Salido, Restoy and Vallés, 2005).

Differences between actual and hypothetical real rate differentials could be explained by a number of reasons, particularly the weakness of the estimation method that is strongly backward oriented and rests on strong assumptions.

A number of different methods have been suggested for estimating an equilibrium real interest rate (for an overview see Lemmen, 2005). Most of these methods were first applied to US data:

- *Simple statistical approach.* The simplest approach is the calculation of trend real interest rates on the basis of historical data using standard econometric tools. This could for instance mean just averaging historical data (e.g. ECB, 2004b) or applying the Hodrick-Prescott filter. A problem closely related to this approach is the possible bias in times of substantial variation in output and inflation. In periods of falling inflation rates the approach tends to suggest that the real interest rate clearly exceeds the estimated equilibrium level.
- *Yield-spread based techniques.* Bomfim (2001) uses data from the yield curve of inflation-indexed government securities to derive the equilibrium real interest rate. In an earlier study (Bomfim, 1997) he had

<sup>14</sup> The ECB's mandate is to maintain area-wide price stability. At the ECB press conference on 8 June 2006, ECB President Trichet said: "The difference between the average euro area inflation level and the national inflation level is the responsibility of the national authorities. Again, at the level of the Eurosystem we can only ensure price stability and the credibility of price stability over time for the euro area as a whole, and that is very important. And of course we call on the national authorities to be fully conscious of their responsibility vis-à-vis their inflation differential with the average." But the ECB has also said to consider inflation differentials in its strategy, which "attributes a secondary role to inflation differentials when calibrating the safety margin for admissible inflation in the euro area" (ECB, 2003d, p.6)

used the Fed's MIP-Penn-SSRC model (MPS model) to estimate the equilibrium rate also emphasising the information that can be derived from yield spreads.

- *Time series models.* Several studies estimate equilibrium interest rates as an unobserved component in an IS equation relating the output gap to the difference between the real and the equilibrium real interest rate (e.g. Chen, 2001). Following the pioneering work by Laubach and Williams (2003) several studies have estimated simultaneously the trend output growth rate and the equilibrium rate by using a Kalman filter. The advantage of the method is that it strikes a compromise between a theoretically coherent dynamic stochastic general equilibrium model and ad-hoc statistical approaches.
- *Structural models.* The lack of structural foundations in the simple approaches and times series models can be overcome by constructing general equilibrium models on the basis of optimising behaviour of economic agents with nominal frictions. One of the advantages of the model is the ability to estimate time-varying equilibrium rates (see e.g. Giammarioli and Valla, 2003, and Smets and Wouters, 2003).

**Table 4: Selected studies on equilibrium real interest rates in the euro area**

<i>Study</i>	<i>Method</i>	<i>Result</i>
Giammarioli and Valla (2003)	Dynamic Stochastic General Equilibrium (DSGE) model	1973-2000: up to 6%; 1994-2000: 3.0-3.7; 2000: 2.75%.
Smets and Wouters (2003)	DSGE	-10% to +10%; 2000: about -2%.
Cuaresma et al. (2004)	Multivariate unobserved components model	1999-2002: slightly above 2%, Spring 2002: 1½-2%.
ECB (2004b)	Eclectic approach	Recent years: 2-3%.
Gerdesmeier and Roffia (2004)	Averaging with correction for the effects of specific shocks	1985-2002: 2.1-3.3%; 1993-2002: 1.8-2.9%.
Manrique and Marqués (2004)	Small scale macroeconomic model, Kalman filter	2001Q4: 2.5%.
Mésonnier and Renne (2004)	Laubach-Williams approach, Kalman filter	2002Q4: about 1%.
Amato (2005)	Latent variable model	
Browne and Everett (2005)	CCAPM estimates	2005Q1: about 1.5%.
Garnier and Wilhelmsen (2005)	Laubach-Williams methodology.	Gradual decline from 4% in the 1960s to slightly less than 2% in 2004.
Lemmen (2005)	Forward yield estimates of the level of the equilibrium real interest rate	April 2005: 2.1%.
Wintr, Guarda and Rouabah (2005)	Kalman filter	2004: close to 0.5%.
Catão and Mackenzie (2006)	Calculations mainly based on price-earning ratios.	2005: estimates for all euro-area countries except LU imply an arithmetic average of 2.9%.
Cour-Thimann, Pilegaard and Stracca (2006)	Extended Laubach-Williams approach based on the definition of the natural rate as the (unobservable) component of the real interest rate.	Significant fluctuation between about -1% in the 1970s and about 5% in the early 1990s, about 1½% in 2003.

*Source:* Aforementioned studies and Cuaresma et al. (2004), pp. 42-43.

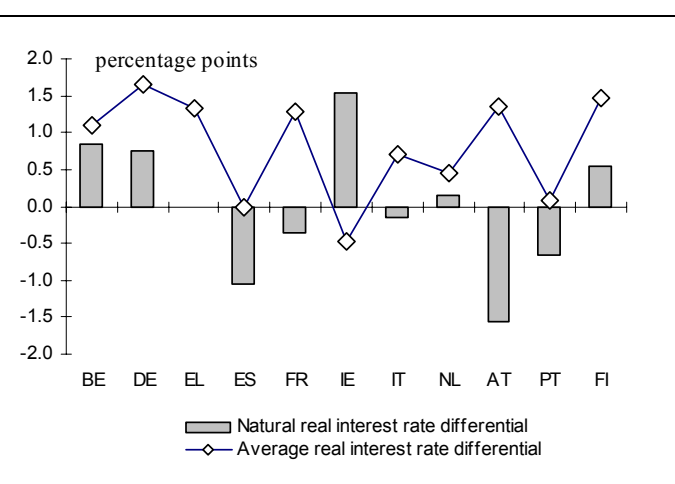
For the US, empirical studies suggest that equilibrium real interest rates have varied considerably over time. For example, Laubach and Williams (2003) found a decline from 4.5% in the mid-1960s to 2.5% in the mid-1970s. Wu (2005) reports on estimates of about 2% in the 1960s to about 6% in the early 1980s and 3% in the mid-1990s. Moreover, estimates vary considerably across studies, which can be partly related to difficulties in estimating the

output gap. For the latter the “one-sided filtering problem”, i.e. the need to have only data up to today available for an estimate of today’s output gap, has been shown to result in substantial revisions in later (two-sided) estimates. Data revisions and uncertainties about model specification add to these difficulties. A number of studies have also highlighted the difficulties in estimating the equilibrium real interest rate on the basis of contemporaneous data and concluded that such estimates would be difficult to use reliably in monetary policy making (e.g. Clark and Kozicki, 2005).

The US observations regarding the equilibrium rate in terms of variability over time and diversity across studies were shared by euro-area experience. The calculation of averages for the euro-area years until March 2004 results in an average short-term real interest rate of 1.4% in the euro area (ECB, 2004b, p. 62). By widening the observation period to 1994, the average rate moves up to 2.4%. This contrasts with a much higher rate for the period from 1981 to 1993 (5.2%) and a negative real rate of -0.7% in the period from 1973 to 1980. The ECB reports that other techniques resulted in equilibrium rates of between 2.1 and 3.2% using data from 1985 to 2002 (ECB 2004b, p. 65).

As for the US, the range of empirical estimates for the euro area can also be described as relatively wide (see below). However, almost all studies report a decline in euro-area equilibrium rates which is estimated for most recent periods centre around two percent.

**Graph 12: Observed and estimated equilibrium real interest-rate differentials<sup>1</sup>**



Note: 1 - Average annual real interest rate differentials (1999-2005) calculated using ex-post short-term real interest rates. Estimated real interest rate differentials are calculated using estimated implicit equilibrium interest rates (Catão and Mackenzie, 2006, p.17).

Source: Commission Services

The overwhelming interest in the use of equilibrium real rates for the assessment of monetary policy has shifted interest almost exclusively to euro-area wide analysis and only very few studies deal with single euro-area economies. A recent study by Catão and Mackenzie (2006) presents equilibrium real interest rates for a large group of industrialised countries comprising all euro-area economies except Greece and Luxembourg. The real interest rate differentials resulting from these estimates can be compared with average real interest rate differentials in the euro area (see Graph 12). It is clearly visible from the graph that actual rates differed markedly from equilibrium values and that deviations were found on both sides suggesting exerting strong caution in interpreting results. As regards the estimates of Catão and Mackenzie (2006), the largest differences (AT, IE) occur in countries with arbitrary assumptions on the equity risk premium.<sup>15</sup>

## 5. The impact of real interest rates in the euro area

The real interest rate channel-argument contains presumptions about the relation of real interest rates and macroeconomic indicators. This section starts with a look to selected correlations of real rates and indicators such as domestic demand and output gaps and continues with a closer look to the role of national real interest rates for the behaviour of economic agents (banks, households, firms).

### 5.1 Monetary transmission, real interest rates and economic activity

The analysis of monetary transmission in the euro area is dealing with the impact of changes in monetary policy, particularly in policy-controlled interest rates, on output and prices. Since changes in nominal policy rates come along with immediate changes in real rates findings on monetary transmission contain information on the impact of real interest rates on macroeconomic performance. Before investigating the relationship between real rates and key indicators it appears therefore useful to look at recent results on monetary transmission in the euro area.

<sup>15</sup> The equity risk premium is "set arbitrarily at 2.5" (Catão and Mackenzie, 2006, p. 17, fn. 17) for AT, IE and PT as time series are assessed as having insufficient length. With an equity risk premium of just 0.1 in DE, a difference of 2.4 percentage points between real interest rates in DE and AT can be explained by the assumption on the equity risk premium.

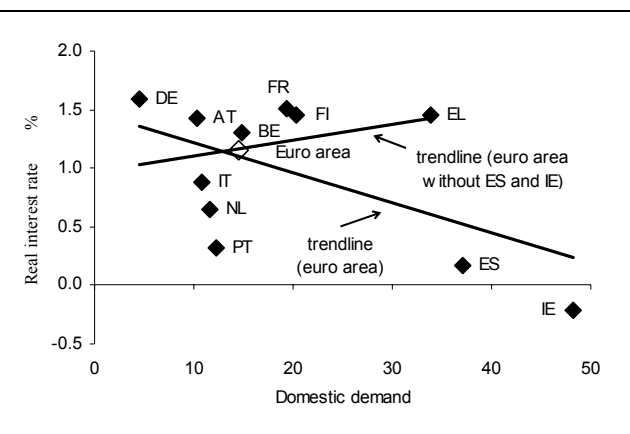
Several studies have found evidence on the heterogeneity of monetary policy transmission across EU Member States in the period before the start of the third stage of EMU (e.g. Angeloni and Ermann, 2003). Among the sources of heterogeneity were structural features (e.g. production structures, preferences, technologies, labour market characteristics, and incomplete capital mobility), policies (e.g. asymmetry within the European Monetary System, regulatory differences) and idiosyncratic shocks. Against the background of ongoing convergence and integration there were expectations that the introduction of the euro could reduce differences in monetary transmission and thus make area-wide monetary policy more effective. Changes in the monetary transmission mechanism were already identified in the run-up to the third stage of EMU (Ciccarelli and Rebucci, 2006). Studies covering the years after the creation of the euro area in 1999 did not find strong evidence in favour of robust differences in monetary transmission across euro-area economies (ECB, 2002: for a survey see Peersman, 2004). Van Els et al. (2003) found a qualitatively similar pattern of results following a monetary policy shock across different models, but also report heterogeneous results in quantitative terms.

Differences in the monetary transmission mechanism matter for the size of real interest rate differentials and for their impact on economic activity. A differentiated transmission across countries can add to inflation dispersion (ECB, 2005, p. 69), particularly in the presence of nominal rigidities. A more homogenous transmission mechanism could enhance transparency and reduce the persistence of (*ex ante*) real interest rate differentials. A specific question in that regard is to what extent differences in monetary transmission are related to differences in financial structures that will diminish as financial integration progresses. Several elements of the monetary transmission mechanism can be associated with the state of financial integration:

- *The substitution of consumption.* An increase in the real interest rate creates an incentive to delay consumption and increase saving and exerts thereby a negative impact on economic activity. The size of the impact will depend on the interest rate sensitivity of consumption. This sensitivity depends on the financial conditions (e.g. credit constraints), which can be expected to entail a local and/or national component.
- *The cost of capital and investment.* An increase in the real interest rate means a higher cost of capital that should lower the optimal capital-output ratio and slow investment. The size of this effect depends on the financial conditions of firms (e.g. credit constraints, maturity structure of debt) and on the economic structures as for such as the capital intensity of production (for a recent survey on industry effects of monetary policy see Peersman and Smets, 2005).
- *The wealth channel.* An increase in the real interest rate raises the borrowing costs and lowers thereby the discounted value of future payoffs of assets requiring a downward adjustment in households' net wealth. The impact of changes in real interest rates depends on the size of net wealth and the sensitivity of consumption to wealth.

These examples indicate that the state of financial integration is related to differences in monetary transmission across countries. It is difficult, however, to identify the importance of monetary transmission channels on the impact of real interest rates on economic activity. In order to bring together some pieces of evidence about the possible link between real interest rate differentials and economic activity at the aggregate country level it appears promising to start with a look to real interest rate levels and to continue the analysis later at the sectoral level (see subsequent parts).

**Graph 13: Real interest rates and domestic demand, 1999-2005**



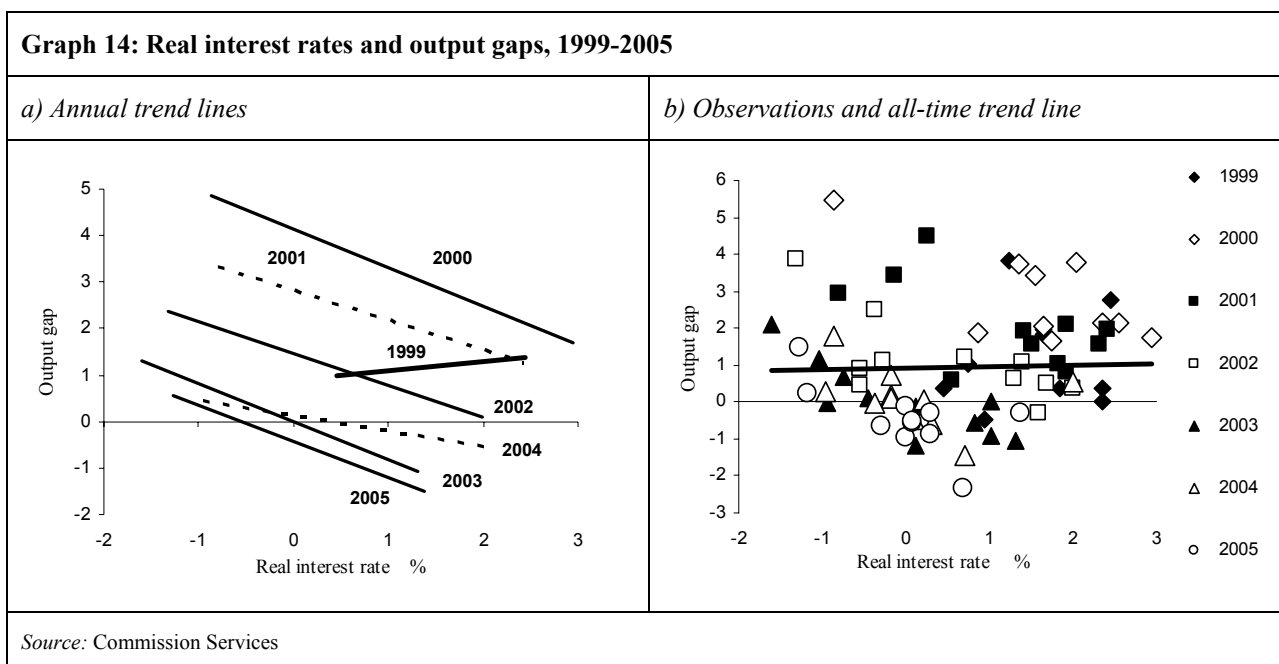
Note: Average short-term real interest rate in % (1999-2005); change in domestic demand (excluding inventory) in percent (1998-2005).

Source: Commission Services

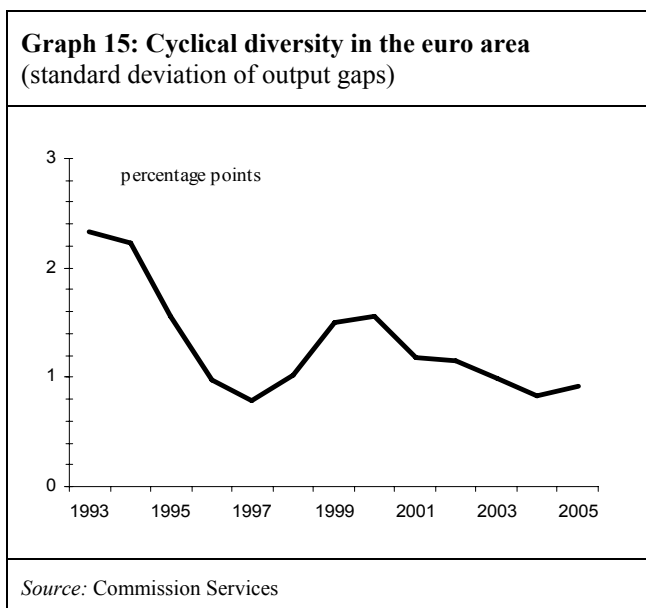
According to the real-interest rate argument, countries with low real interest rates would be those with strong growth of domestic demand reflecting good investment opportunities. The country evidence from the first seven euro-area years seems to support this presumption. As Graph 13 shows, the two countries with the lowest real interest rates (Spain and Ireland) recorded the strongest growth and the country with the highest real rate performed worst in terms of domestic demand growth. A negative correlation is also suggested by the trend line for the euro-area countries. A second look to the graph, however, raises some doubts. Three countries with relatively low real interest rates exhibited weak demand growth (Italy, the Netherlands and Portugal). At the same time countries with relatively high real rates experienced dynamic growth of domestic demand (e.g. France and Finland). Indeed, a low inflation rate can be due to weak demand, but may also result from above average productivity growth reflecting profitable investment opportunities (see ECB, 2005a, pp. 67-68). The lack of stability in the presumed relationship is also visible in the second trend line in Graph 13, which has

been calculated for all euro-area countries except Spain and Ireland and which is upward sloping. Therefore the observed correlations do not provide arguments in favour of the causal link suggested in the real interest rate reasoning.

Another implication of the real-interest-rate argument is that cyclically advanced countries (positive output gap) would exhibit relatively high inflation rates and would therefore face below-average real interest rates. This relation could be expected to show up in a close negative correlation between the real interest rate and the output gap. Graph 14 displays available evidence for the euro-area years. Trend lines drawn for the years 1999 to 2005 (panel a) tend to support the hypothesis of a negative correlation. A closer look to observations in single countries and years (panel b), however, again raises some doubts, as the combinations are not only widely spread, but the overall trend line also appears to be rather flat and even slightly upward sloping.



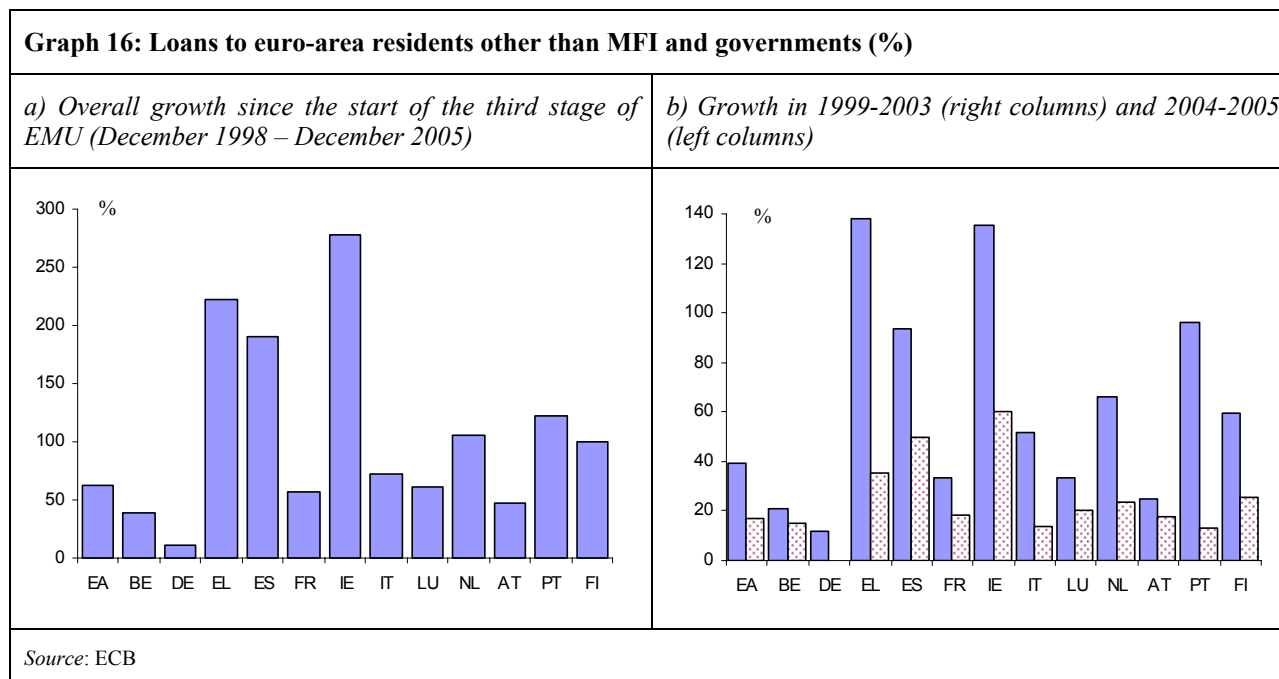
According to the real-interest argument real rate differentials across countries can be expected to enhance cyclical differences. The destabilising effect would increase cyclical differences across euro-area countries because advanced countries would get additional stimulus from below-average real interest rates. In that case the standard deviation of output gaps across euro-area economies should have increased in the first seven euro-area years. As Graph 15 shows there is little support for the hypothesis of increased diversity within the euro area. This suggests that either the impact of real interest rate differentials is negligible or that there are other factors at work that offset their impact.



These observations suggest that in several cases there have been correlations as formulated in the real-interest rate argument, but this could not be interpreted as a hint on a causal relationship and the counterexamples raised further doubts about the validity of the argument. In order to further explore the argument, a closer look to economic agents' behaviour looks promising.

## 5.2 Monetary and Financial Institutions, real interest rates and credit growth

Almost all calculations of real interest rates start from the market interest rate and in the case of cross-country analysis area-wide market rates are used. This appears reasonable in an integrated euro-area banking sector. But empirical studies of the interest-rate pass-through (from market rates to bank interest rates) point to differences in the pass-through possibly resulting in heterogeneous bank interest rates in euro-area countries.<sup>16</sup> The heterogeneity has two main components, the long-run equilibrium pass-through and the speed of adjustment to the long-run equilibrium. Among the explanatory factors are structural differences in the financial systems (e.g. competition, bank size) as well as the legal and regulatory system.<sup>17</sup> Closely related are studies on bank margins that also present evidence of cross-country differences.<sup>18</sup>



An indicator to consider lending activity is credit growth. Loans to euro-area households increased substantially in recent years in some of the strongly growing euro-area economies. Between the start of the third stage of EMU and March 2006 loans to the private sector (euro-area residents other than monetary and financial institutions and governments) increased by a total of 62% (equivalent to an average annual rate of about 7%). Across countries credit growth has been rather different. Among the initial euro-area countries the strongest credit growth was reported in Ireland, Spain, Portugal and the Netherlands (see Graph 16) and by far the slowest growth in Germany.

The profile of credit growth differed substantially across euro-area countries. Some of the countries with the fastest credit growth in the first few years of the third stage of EMU continued to exhibit strong growth while others displayed substantial declines. In 2005, loans increased by about 27% in Spain and Ireland, while rates growth had substantially slowed for instance in Italy (about 8%) and Portugal (about 7%) which joined Germany (0.3%) in the group of the three countries with the lowest rates of credit expansion. This change in profiles is visible in the right-hand panel of Graph 16 that compares average annual growth rates in the first five years of the euro area with those in 2004 and 2005. While credit expansion in Germany was only 13.5%, in half of the euro-area economies the volume of loans more than doubled (Ireland +297%; Greece +235%, Spain +208%, Portugal +125%, the Netherlands +108%, Finland +104%). These rates reflect the sharp decline in real interest rates in countries like Greece, Spain and Portugal during the convergence process up to the third stage of EMU. But beyond this initial impact there are hints for an ongoing loan growth. Between the end of 2003 and the end of March 2006 area-wide loan growth stood at 20.3% and with a substantial variation across countries. Loans to households other than MFI and government increased by 1.3% in Germany, but by more than 40% in Ireland (+68.6%), Spain (+59.0%) and Greece (+40.9%).

<sup>16</sup> According to calculations by Angeloni and Ehrmann (2003), for the years 1999-2002 the impact effect of money market rates on bank lending and deposit rates (within one month) varied between 0.387 in Germany and 0.621 in France with a euro-area average of 0.380 (p.476). In a more recent study, Sørensen, Kok and Werner (2006) find a sluggish and heterogeneous bank interest rate pass-through across euro-area countries using a harmonised set of data commencing in January 1999. They also summarise the approaches followed in other studies to which they provide references.

<sup>17</sup> See e.g. Sander and Kleimeier (2004).

<sup>18</sup> See e.g. Maudos and de Guevara (2004).

Given that real interest rate differentials were rather persistent over the last years, the differences in loan growth rates might suggest that the adjustment to the initial real rate fall has not yet come to an end.

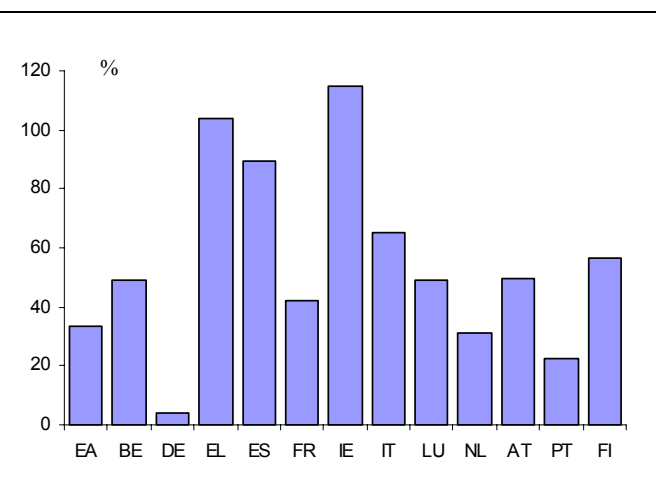
### 5.3 Private households and decisions on durables and house purchases

Private households optimise their behaviour by smoothing consumption over time unless frictions or market imperfections (e.g. borrowing and/or liquidity constraints) prevent them from doing so. The smoothing decision depends on the conditions in credit markets as households could borrow against future income or save money for future consumption. The relative price of a household's current consumption in terms of his future consumption is set by the real interest rate. A decline in the real interest rate makes it more attractive for a household to raise today's consumption as savings will give a smaller return in terms of future consumption. In the case of a real interest rate decline there will therefore be a positive substitution effect on consumption. This effect is complemented by a wealth effect. A lower interest rate implies that a household that has been a net debtor will pay less on the debt, which will reinforce the substitution effect. The contrary can be expected for a net creditor household.

As regards the euro area, the sharp decline in real interest rates in the run-up to the third stage of EMU can be expected to have contributed to a relatively strong increase in consumption which pushed domestic demand (see previous section and Graph 13). In addition, the initial decline in real interest rates should have pushed borrowing by private households. The strong growth of credit to private households in the euro area since 1999 provides supportive evidence of the link between real interest rates and household behaviour at the level of the euro area as a whole.

A separate issue is whether differences in real interest rates across countries are reflected in household behaviour in the euro-area Member States. A question that arises for households is whether their inflation expectations are identical to those of economic experts (professionals). The calculation of uniform real interest rates assumes that a key determinant of decisions is the same. This is in contrast to results of some recent empirical work on the formation of inflation expectations by households. Döpke et al. (2005) have – based on sticky information models – shown for Germany and Italy that household inflation expectations are less precise than experts' expectations, partly due to the lower speed of information updating. The evidence suggests that *perceived* real interest rates may lag behind actual values (the aforementioned study finds that households update their inflation expectations on average once a year). A slow response means that the impact of the initial decline in real interest rates at the start of the third stage of EMU has longer-lasting effects than often assumed (and suggested by rational expectation models). Arnold and Lemmen (2006) found that consumers' expectations as expressed in the European Commission's Consumer Survey depend more on past national inflation rates than on the ECB's definition of price stability and that convergence in inflation expectations is not more pronounced than that of actual inflation rates.

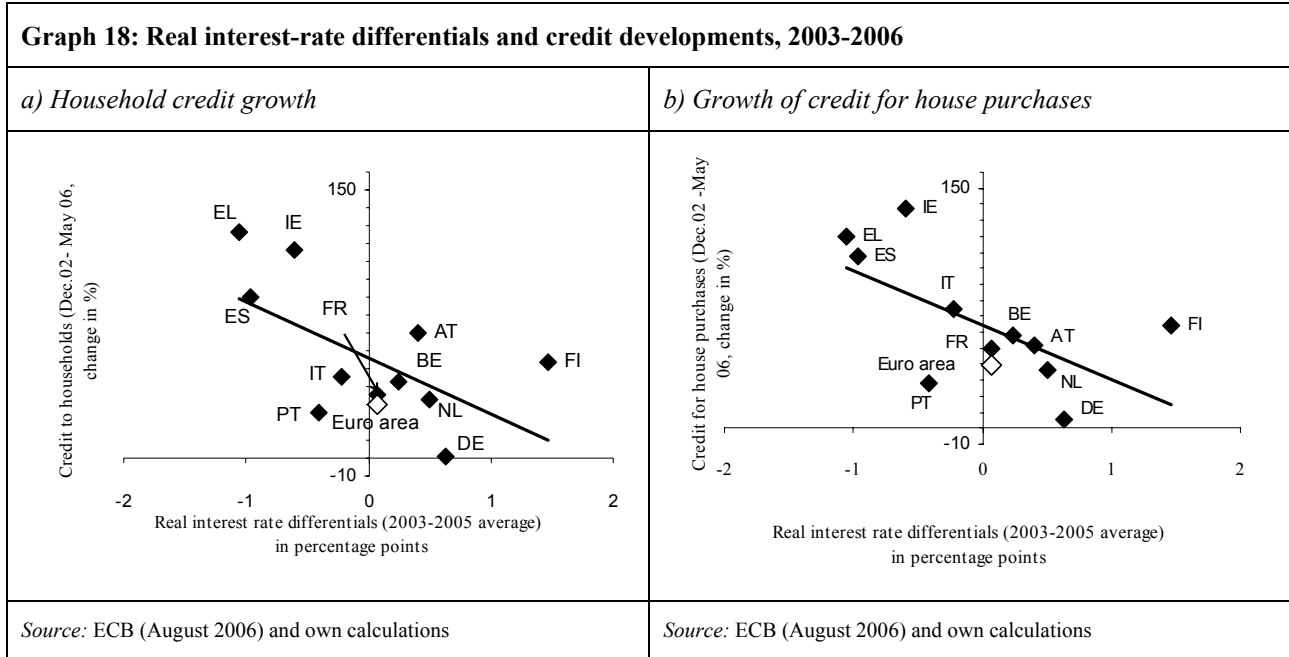
**Graph 17: Growth rates of lending for house purchases, 2003-2005 (%)**



Source: ECB

The comparison of pre-1999 real interest rates with those in the first few years of the euro area had shown that real interest rates declined almost everywhere, but in particular in countries of the periphery. Their improved credit accessibility resulted in strong growth of lending and strong house price dynamics. A substantial share of credit growth of households can be attributed to growth of loans for house purchases (see Graph 17). Against the background of historically low nominal and real interest rates strong increases were reported in most euro-area countries. The lowest rates were recorded for Germany, Portugal and the Netherlands.





The economic activity of private households can be expected to be based on information from a regional and/or national context. For house purchases the national house price index might convey less relevant information than a neighbourhood or local price index. In that regard households would focus more on national real rates than on area-wide real rates. Therefore, a relatively strong link can be expected between national real interest rates and loans to households. Graph 18 displays some evidence for the euro-area Member States. For both credit aggregates one observes that countries with high real rates had relatively slow credit growth. Credit growth volumes for house purchases grew most strongly in Ireland, Greece and Spain, i.e. in the three countries with the lowest real interest rates.

#### 5.4 Non-MFI firms and their investment decisions

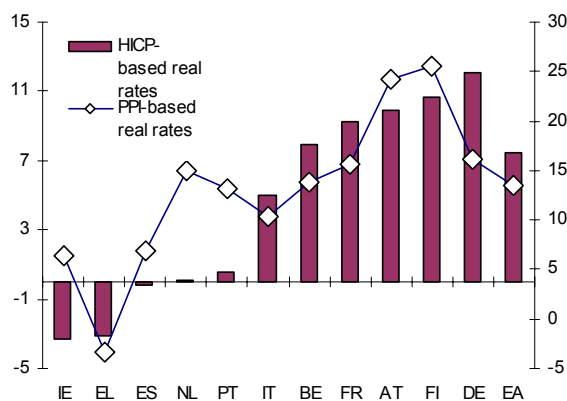
In order to assess the relevance of real interest rate differentials for investment decisions by firms both components, nominal market interest rates and inflation expectations have to be looked at. Relevant interest rates can be expected to have experienced a structural break at the occasion of the adoption of the single currency (changes in risk premia, more integrated financial markets), but to have been rather similar in the euro-area years. As regards inflation expectations, firms might not only look at consumer prices but also other indices. They might also take into consideration longer time horizons than other economic agents (e.g. households) and they might also put more weight on inflation developments in the euro area as a whole or in all their export markets inside and outside (hedged for exchange rate moves) the euro area.

The introduction of the euro had a substantial impact on risk premia and therefore a strong impact on financial conditions in the euro-area economies. At the corporate level empirical studies found an impact of the introduction of the euro on the cost of capital. Bris, Koskinen and Nilsson (2006) show that the euro has resulted in higher investment rates, which is consistent with positive valuation effects. According to Tobin's Q the market value of the company's capital divided by its replacement costs gives the investment opportunities (in the empirical literature usually proxied by the market-to-book ratio). Empirical studies have shown that Tobin's Q for firms in euro-area countries that had relatively weak currencies before 1998-99 (i.e. currencies that were in the centre of foreign exchange market turmoil in the 1990s) increased relative to that in other euro-area countries.<sup>19</sup> It could be argued that these firms had to cope with a significant currency risk premium before 1998 and thus a relatively high cost of capital. This could point to a reason that occurred in parallel to the initial impact of real interest rate differentials due to the fall of the interest rate in these countries in 1999. However, one has to take into account that exchange rate risks for countries from the former stable-currency countries ("core countries") also shrank to the extent that their companies had had significant exports to weak-currency countries. Bartram and Karolyi (2006) present evidence supporting this argument. In addition there is evidence in favour of the hypothesis that already ongoing financial integration lowered the cost of capital at the same time (see Hardouvelis, Malliaropoulos and Priestley, 2004).

<sup>19</sup> Bris, Koskinen and Nilsson (2006) report an increase of 8.7% on average (p.2).

Which time horizon matters for euro-area firms? Annual *ex post* real interest rates can hardly be expected to serve as the basis of calculations of rates of return for investment projects that last many years. As shown in the analysis of inflation expectations (Section 2.3), the longer the time horizon the closer inflation expectations are to the two-percent level. This means, however, that real interest rate differentials that matter for investment decisions are substantially smaller than the ones discussed for short-term horizons.

**Graph 19: Cumulative real interest rates, 1999-2005 (%)**



Note: Figures for EL and NL for 2001-2005 only. (EL: euro adoption in 2001; NL: PPI from 2001 onwards only).

Source: Commission Services

Which price index matters for firms' calculations of real interest rates? Most of the empirical analysis on real interest rate differentials is based on consumer price developments and/or expectations. Although consumer prices provide a standard yardstick for inflation, producer prices might contain the more relevant information for investment decisions. The importance of the distinction depends on differences resulting from calculations of real interest rates either with a consumer price index or a producer price index. Graph 19 displays the real interest rate differentials vis-à-vis the euro-area average based on both types of price indices in the format of a real rate of return for the first seven euro-area years. In most cases differentials have the same sign and very often they have similar relative size. But there are significant differences for some countries that display the lowest HICP-based real rates (Ireland, Portugal) and for Germany. While real rates for Portugal and Ireland are markedly higher than on the basis of consumer prices the opposite is observed for Germany suggesting that Germany does not have the highest real rates in the euro area and that the difference from the average is smaller than presumed on the basis of consumer prices.

Does the sectoral component of inflation matter? Empirical analysis of inflation differentials has shown that the diversity of inflation has a sectoral dimension. The dispersion of services price inflation has been higher than that observed for the overall HICP index (see ECB, 2005a, pp. 64-65). The dispersion might have been even lower in the non-services components, had the implementation of the Single Market and the introduction of the euro not contributed to price level convergence towards area-wide long-term levels. As regards future developments this could suggest a further decline in inflation differentials of non-service goods and thus of real-interest rates calculated on the basis of non-services inflation rates.

Which territorial inflation rate matter for euro-area firms? The argument on the real interest rate adjustment assumes that economic agents use national deflators to calculate real interest rates (or expectations thereof) and then base their decisions on them. It appears quite obvious that some agents might be more oriented to their country of residence than others. In an integrated market one can expect that the euro-area real interest rate is relevant for firms that sell to all euro-area markets and not just to their domestic (national) market. In a recent study on the implications of inflation differentials, von Hagen and Hofmann (2004) have estimated (backward-looking) IS curves for ten euro-area economies including both national and euro-area estimates. They concluded that the euro-area real interest rate may be more important for aggregate demand than the national real interest rates. Remsperger and Hofmann (2005) have extended the analysis by allowing for a forward-looking term and a direct spill-over across countries (via the output gap) in the IS curve of all euro-area economies (except Luxembourg) and their panel approach provide support for the importance of the euro-area real interest rate.<sup>20</sup>

## 6. The relative importance of the real-interest rate channel of adjustment

The discussion of the real interest rate adjustment channel has presented some evidence on the empirical relevance of the role of national real interest rates in the euro area. In practice the overall effect is unobservable, however, because other channels are operating at the same time and may be not only counteracting the real rate channel but more than offset it. This section starts with a closer look to counteracting channels in the euro area (Section 6.1). While a more conclusive answer can be expected from model simulations (see Chapter VII), for some preliminary hints

<sup>20</sup> It has been argued that these results contrast with the so-called Walters critique, which deals with a similar mechanism that matters in the case of entry into a fixed exchange rate system. It looks at the case where nominal interest rates in the joining country with relatively high inflation have to fall to the level prevailing in the system with implications for the relevance of national inflation rates for borrowers and lenders. Already the UK Treasury Study (five tests) had assessed the argument as "distinct" since it matters for adjustable pegs, but not for single currency. Nevertheless, it is reiterated in publications that stress the destabilising effect of real interest rate differentials.

experiences in the United States may be useful (Section 6.2). A brief review of empirical studies that have presented results on the overall importance of the real interest rate channel (Section 6.3) complements the analysis.

### **6.1 Counteracting adjustment channels in the euro area**

The impact of real interest rate differentials depends on the strength of other adjustment mechanisms that are related to the underlying inflation differentials across countries and on existence of further financial adjustment channels that could limit or counteract the impact of the real-interest rate channel. As regards the former the aforementioned competitiveness channel can be expected to play a key role. As regards the latter, portfolio diversification, cross-border lending and borrowing, and cross-border ownership (see also Section VIII.2.3) determine to what extent idiosyncratic shocks are smoothed across countries.

#### *Competitiveness channel*

Different developments of prices across euro-area countries result in changes in the relative price competitiveness vis-à-vis other euro-area economies. A country with below-average inflation, as for instance due to weak domestic demand, will gain in terms of price and cost competitiveness. The resulting push to demand (via foreign trade) can be expected to counteract the opposite (pro-cyclical) impact that might originate from the above-average real interest rate. This so-called competitiveness channel (see Chapter IV) can thereby offset the impact of the real-interest channel. For the assessment of the relative importance of the real-interest-rate channel the distribution of both effects over time is crucial. In principle, the interest rate effect can be expected to become effective without any delay, whereas the change in competitiveness might take a while (see Section 6.3).

#### *Risk sharing via portfolio diversification and cross-border ownership*

In the literature on currency unions the possibility of mitigating country-specific shocks by the means of portfolio diversification has been emphasised (see e.g. Mundell, 1973, pp. 120-2). As in the case of an individual who holds different financial assets in order to diversify risk, regions and/or countries can be understood as owners who diversify their risk of being subject to a country-specific shock by holding assets in other regions and/or countries. In a country with a more advanced cyclical position the cyclically-induced increase in the inflation rate lowers the domestic real interest rate and widens the real interest rate differential vis-à-vis other economies. With cross-border risk sharing, however, the additional stimulus is distributed across the countries of the monetary union as all countries hold claims on each other's output in the single currency<sup>21</sup>. The larger the monetary union and the wider the risk sharing, the smaller the impact of an asymmetric shock. In that respect the risk-sharing channel partially offsets the real-interest rate channel.<sup>22</sup>

Empirical studies in the last century, however, have found a surprisingly high correlation of domestic saving and investment that has been named the Feldstein-Horioka puzzle<sup>23</sup>. Among the factors that could possibly explain this observation were barriers to cross-border capital movements, a "home bias" for domestic assets reflecting investors' better knowledge about domestic investment opportunities, and exchange rate risks. More generally a lack of risk sharing is seen to be closely related to the state of international financial integration.

In EMU full capital mobility has been established, knowledge about investment opportunities has been enhanced and in the euro-area economies all intra-area exchange rate risks have ceased to exist. For these reasons, before the start of the third stage of EMU, it was expected that monetary union would increase risk sharing (e.g. Melitz and Zumer, 1999). Several more recent studies presented evidence of much broader risk sharing (e.g. Kalemli-Ozcan, Sørensen and Yosha, 2005, Sørensen, Wu, Yosha and Zhu, 2006). Although increased risk sharing can also be associated with globalisation, the introduction of the euro and ongoing financial market integration has certainly been one of the key determinants of increased risk sharing via portfolio diversification. At the same time a lack of financial integration in several fields (e.g. consumer credit, mortgage credit and insurance) could explain the relatively low level of risk sharing in the euro area.

### **6.2 Adjustment experiences: Are there lessons from the United States?**

In an attempt to benefit from experiences fully established several, old monetary unions research projects have aimed at deriving general conclusions and policy implications from evidence found in Canadian provinces, Japanese prefectures and U.S. states. Particularly the latter have attracted a lot of attention. In terms of adjustment a rich

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<sup>21</sup> It is for this argument that McKinnon (2004) concluded that Mundell had taken sides in favour of a rather large monetary union, whereas Mundell's early contribution on optimum currency areas "leans towards making currency areas smaller and more homogeneous – rather than larger and more heterogeneous" (McKinnon, 2004, p.689).

<sup>22</sup> Cross-border risk sharing might result in increased specialisation which could amplify the effect of country-specific shocks making it more difficult to assess the overall impact of increased risk sharing (see e.g. Kalemli-Ozcan, Sørensen and Yosha, 2001).

<sup>23</sup> For an overview, see Lewis (1999).

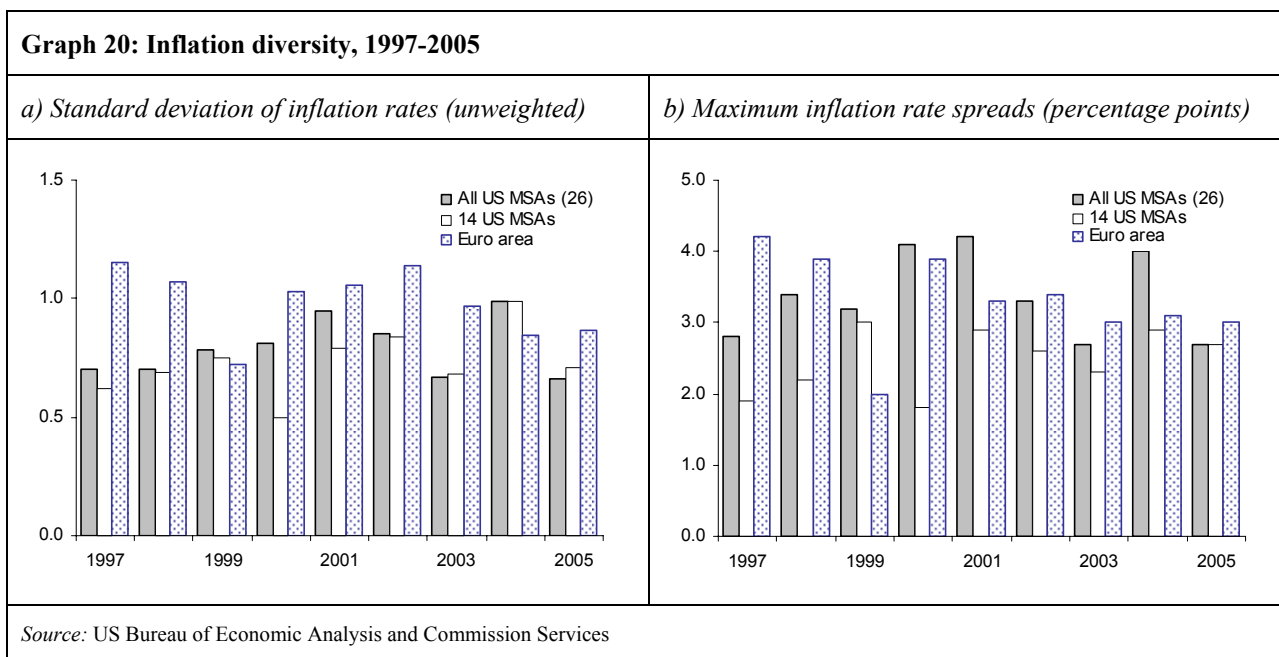
literature existed on risk sharing and cross-country burden sharing in case of state-specific shocks, but relatively little is found on the competitiveness channel and the real interest rate channel.

The great importance of risk sharing via cross-state ownership in the U.S. has been shown in a pioneering article by Asdrubali, Sørensen and Yosha (1996), who found that about 39% of the impact of idiosyncratic (state-specific) shocks to per-capita GDP of individual states was smoothed via cross-state ownership whereas only 13% were smoothed via the fiscal system. As this result appeared to be closely linked to the fully integrated U.S. capital market, advances in financial integration have been identified as a key element of cross-country adjustment in a monetary union.

In the 1990s, real interest rate differentials across euro-area countries were substantially wider than such differentials within the US, both for short- and long-term interest rates. Towards the end of the 1990s, and thus in the first years of the euro area, indicators of dispersion in the euro area have become more similar to those for the United States.<sup>24</sup> The emergence of similarities has raised the question whether there are also other US experiences that might contain lessons for the euro area. One of the areas under consideration has been adjustment channels. While an analysis of inflation differentials could help to assess similarities between the underlying factors, a broader analysis of US adjustment could help to assess the relative importance of cross-region differences in real interest rates for macroeconomic developments in the regions.

The analysis of real interest rate differentials in the euro area and within the US suffers from a limited availability of data. For the US, the US Bureau of Economic Analyses publishes consumer price inflation data for Metropolitan Statistical Areas (MSA), but not for the States, whereas the output data are available for the States. For 3 MSAs monthly data are published and for another 11 bimonthly data (7 in even months, 4 in odd months) are available, but for a total of 26 MSA's annual CPI data for at least 5 years are published. In response to this situation several studies derive conclusions on the basis of 14 out of the 27 MSA (e.g. ECB, 2003).

The diversity of annual inflation rates in the euro area has been more or less similar to that among Metropolitan Statistical Areas in the US. Spreads between regions with maximum and minimum inflation rates have been quite similar (see Graph 20), while standard deviations have been slightly higher in the euro area, with most of the difference due to Irish data.

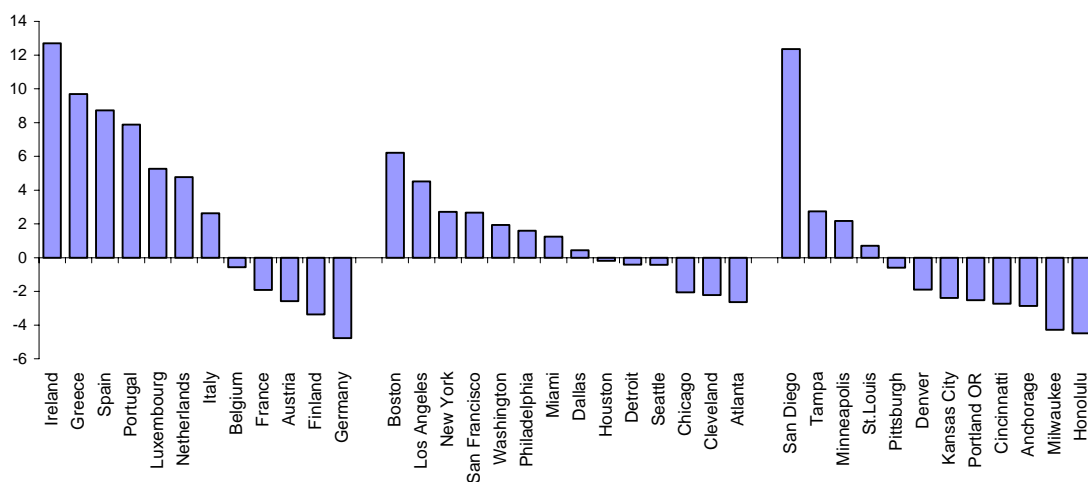


Often it has been argued that the main difference between euro-area countries and US regions is the stronger persistence of inflation differentials in the euro area. Observations support this view as some countries have accumulated a substantial positive inflation differential (e.g. Ireland, Greece, Spain, and Portugal) while others have accumulated a negative differential (e.g. Germany). The ECB has compared these figures with those obtained for a sample of 14 US MSA and concluded that persistence is weaker in the US (ECB, 2003, pp. 11-13). The difference between the euro area and the US is less clear when all US MSA are taken into consideration. In that case the

<sup>24</sup> See for instance Angeloni and Ehrmann (2003, p. 485), who derive this result on the basis of measures of interest rate cohesion using either 3-month interbank rates and 10-year government bond rates.

accumulated differentials of Ireland and San Diego (on the upper side) and of Germany and Milwaukee and Honolulu (on the lower side) appear to be quite similar (see Graph 21).

**Graph 21: Cumulative inflation differentials in the euro area and the US, 1999-2005**



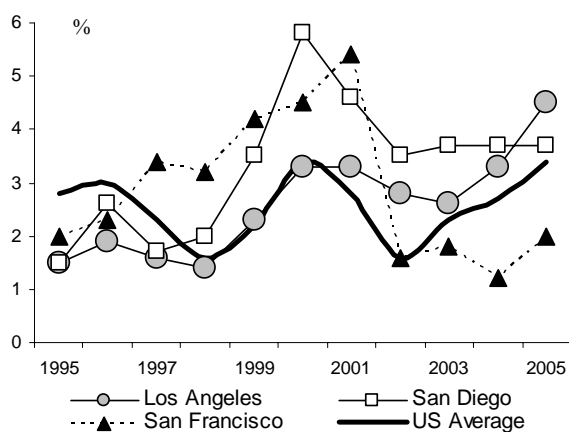
Note: Inflation differential vis-à-vis the euro-area HICP inflation rate and the US city average CPI inflation rate respectively. Names of the MSAs are abbreviations. The full names of the US Metropolitan Statistical Areas are shown on the website of the US BEA.

Source: US Bureau of Economic Analysis and Commission Services

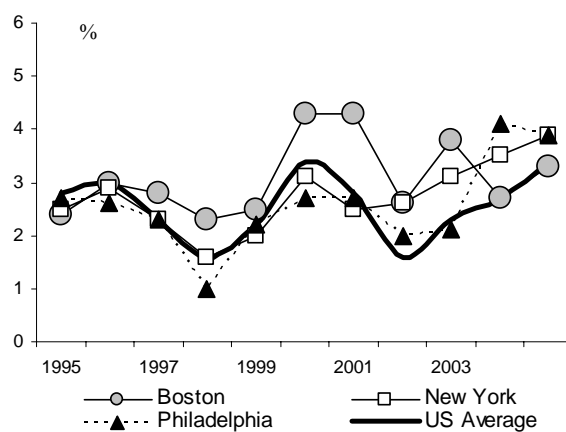
These observations suggest caution in deriving conclusions from a sub-sample of US Metropolitan Statistical Areas. The greater dispersion observed for the full sample of available annual inflation data could be expected to be related to a greater regional diversity with more diverse types of economic activity or other structural features (e.g. energy intensity). A closer look to adjacent MSAs (see Graph 22), however, suggests that vicinity does not necessarily imply more similar inflation patterns. While three Northeast MSAs display a quite similar inflation development, the three US MSAs in California show wide inflation dispersion.

**Graph 22: US city inflation diversity, 1997-2005**

a) Northeast (3 MSAs)



b) California (3 MSAs)



Source: US Bureau of Economic Analysis and Commission Services

Several studies have investigated the impact of macroeconomic differences in the US. Structural differences have been shown to result in a different regional impact of US economic policy. These studies have mainly looked at

production structures and output responses without taking inflation differentials into account.<sup>25</sup> One of the reasons for the negligence of inflation differentials and thus real interest rate differentials can be found in the aforementioned lack of inflation data at the State level. One option for circumventing the problem is the calculation of real Gross State Product (GSP) data by applying national deflators to output components. Developments in the relation of nominal and real GSP give then an idea of inflation differentials. Based on GSP data, Arnold and Kool (2004) have found that changes in real interest rates that are due to movements in regional inflation rates result in an expansionary effect on domestic demand that even temporarily exceeds the opposite effect of the competitiveness channel based on partial equilibrium analysis. They find that it takes 3-4 years until the overall effect is dominated by the competitiveness channel, i.e. they state that the pro-cyclical real interest rate channel dominates for some time in the case of the US. They also suggest that it takes 3 to 4 years until the real exchange rate effect (competitiveness channel) dominates the real interest rate effect.<sup>26</sup>

### **6.3 Assessing the overall importance of the real-interest-rate channel**

Adjustment within the euro area is just one mechanism that affects the development of euro-area economies. Responses to global imbalances, the country-specific impact of changes in the external value of the euro and long-term developments such as globalisation affect the economy in parallel. Therefore it is rather difficult to disentangle the relative importance of the real interest rate channel and results should be interpreted with caution.

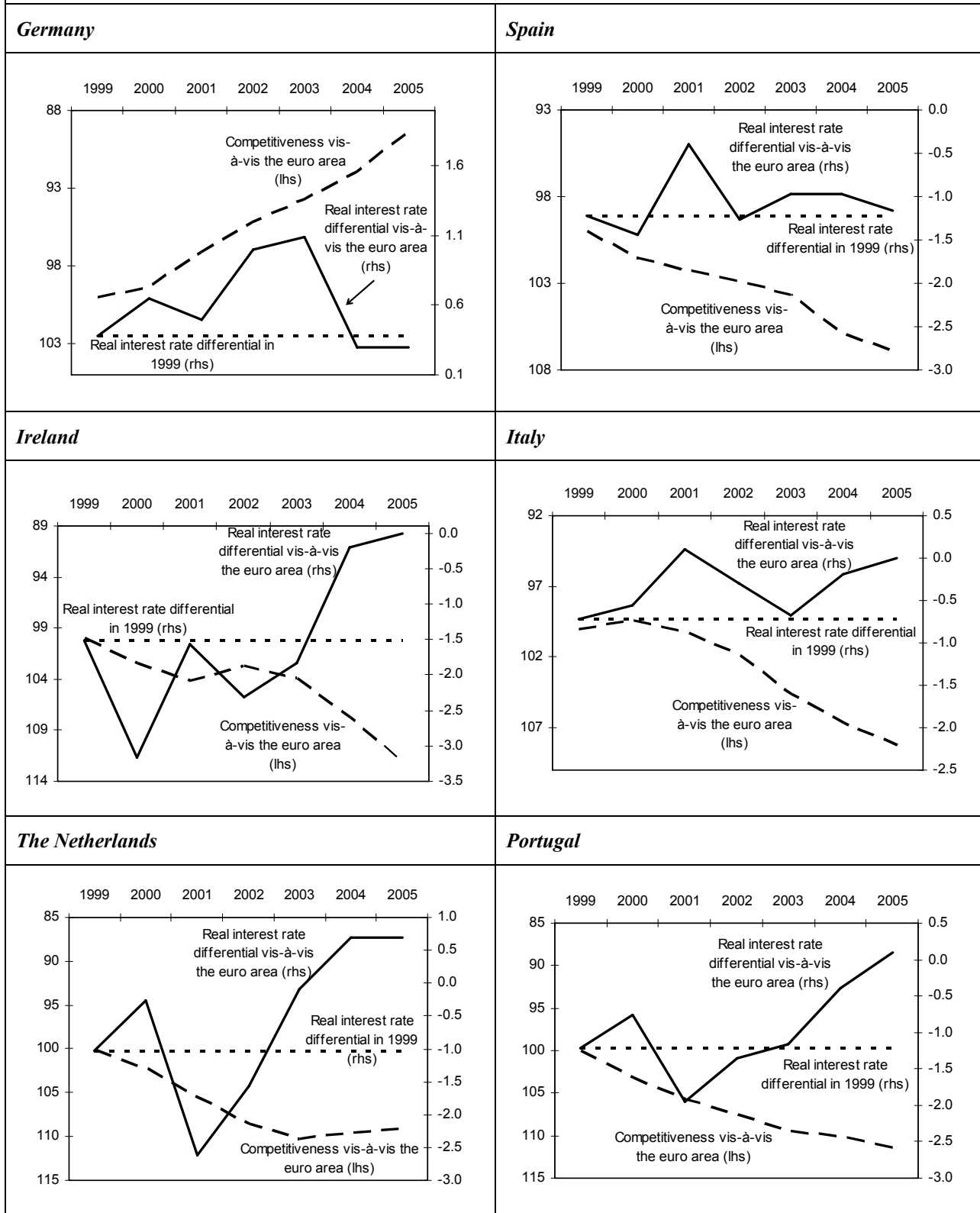
A first idea about the overall importance could be derived on the basis of the components for the overall effect, i.e. the real interest differential vis-à-vis the euro area on the one hand, and the country's competitiveness vis-à-vis the other euro-area economies on the other. Graph 23 displays these components for selected euro-area economies. It highlights developments since the first year of the euro area by displaying the real interest rate differential in comparison with the differential observed in 1999. The development of price and cost competitiveness is measured by the real effective exchange rate vis-à-vis the euro area based on nominal unit labour costs.

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<sup>25</sup> Carlino and DeFina (1998, 1999). More recently, Owyang and Wall (2006) have estimated regional VARs for the US States to evaluate the transmission of monetary policy.

<sup>26</sup> The ECB reports this evidence (ECB, 2003d). It has to be mentioned, however, that the results are obtained for inflation differentials among US States although no inflation statistics exist at the state level in the US. Instead, deflators calculated from GSP (Gross State Product) are used.

**Graph 23: Real interest-rate effect versus change in competitiveness in selected euro-area countries<sup>1</sup>**



Note: 1 - Competitiveness is measured by the real effective exchange rate based on nominal unit labour costs of the total economy as regularly published by the Commission Services. The real interest rate is an ex-post short-term rate as presented in Section 2.

Source: Commission Services

A first look at the country charts indicates a somewhat steady decline or increase in the competitiveness indicator while changes in the real interest rate differential appear more volatile. This pattern of behaviour over time can be

interpreted as suggesting a relatively slow response of goods prices whereas interest rate changes move the real exchange rate relatively often. This suggests that movements in the competitiveness indicator are highly persistent. Apart from these more general findings, the country graphs show a substantial amount of diversity.<sup>27</sup> Examples of different developments are for instance found in the cases of Germany and Spain:

- *Germany*. Due to a low inflation rate the real interest rate differential vis-à-vis the euro area was positive all the time. In the first euro-area years the differential even widened (up to 2003). At the same time Germany's price and cost competitiveness vis-à-vis the euro area improved.
- *Spain*. A relatively high inflation rate resulted in negative real interest rate differentials vis-à-vis the euro area in all years. During this period the Spanish price and cost competitiveness deteriorated continuously.

The negative correlation of real interest rate differentials and competitiveness changes is observed in all countries but with different profiles.

The deterioration of price and cost competitiveness creates a need for relatively small future increases in costs and thus wages. Such a wage moderation (or even nominal wage decreases) can be expected to have a deflationary impact. Lower inflation expectations will immediately raise (*ex ante*) real interest rates and lower thereby domestic demand.<sup>28</sup>

Several empirical studies have raised concerns that the real interest rate channel of adjustment could be destabilising in the euro area.<sup>29</sup> What matters for the overall assessment is the relative importance of the adjustment channel, i.e. its strength as compared to other counteracting channels of the adjustment process that are also related to the underlying inflation differentials.

Another question that arises concerns changes in adjustment over time. Have changes in real interest rates become more stabilising or more destabilising on average? Answers are not straightforward since one does not know how nominal interest rates would have differed in the case of an autonomous monetary policy. In addition, the removal of exchange rate risks has affected the size and the movements of real interest rates.

---

<sup>27</sup> The approach has common features with the calculation of Monetary Condition Indices (MCI), but it does not depend on strong assumptions about the relative weights and the absence of structural breaks therein. As for MCIs one could argue that other financial assets could be included.

<sup>28</sup> Blanchard (2006) has recently emphasised the role of this adjustment mechanism in the case of Portugal.

<sup>29</sup> Cecchetti, Mark and Sonora (2002) and Arnold and Kool (2004) pointed to that possibility.



**Table 5: Selected results on the relative importance of the real-interest-rate channel**

<i>Study</i>	<i>Subject and coverage</i>	<i>Results</i>
Angeloni and Ehrmann (2004)	Analysis of inflation and growth divergences with a stylised empirical model of EU-12.	The model embodies <u>real interest rate</u> differentials ("dis-equilibrating mechanism"), the <u>competitiveness</u> channel ("re-equilibrating mechanism", p.5) and stickiness features. "Inflation persistence, in one or more countries, is under plausible parameter values the factor that can propagate inflation differences most. Other explanations ... seem to count less." (p. 21).
Deroose, Langedijk, Roeger (2004)	Analysis of shocks in selected euro-area economies (DE, IR, PT)	Interaction of <u>real exchange rate</u> and <u>real interest channel</u> may contribute to periods of overheating and overcooling.
Hoeller, Giorno and de la Maisonneuve (2004)		"The initial weakening of demand is reinforced by the effect of higher real interest rates due to lower inflation. However, lower inflation also leads to <u>gains in competitiveness</u> that, over time, <u>become stronger than the effect of the higher real interest rates</u> " (p. 9)
Honohan and Leddin (2005)	Analysis of adjustment channels in Ireland.	"The (Irish) experience dramatically illustrates how the adoption of an exogenous nominal interest rate ... induced a pro-cyclical element because of the fact that, absent a policy response, a rise in inflation automatically generates a fall in <u>real interest rates</u> ."
López-Salido, Restoy and Vallés (2005)	Analysis for Spain.	For Spain the study finds that the competitiveness channel "does not have a quantitatively relevant stabilising effect" (p.25).
Remsperger and Hofmann (2005)	Panel analysis including all euro-area economies except LU.	"Even in the short run, the scope for an amplification of inflation differentials via corresponding <u>real interest rate differentials</u> is likely to be limited".  "The finding of a significant <u>real exchange rate effect</u> ... suggests that, over the longer term, inflation differentials will be self-correcting as the effects of inflation differentials on the real exchange rate accumulate over time."

If the pro-cyclical impulse dominates other channels, the amplitude of the business cycle in euro-area economies would be higher than in pre-1999 times (as Lane expects for Ireland). This reasoning depends on the assumption that prior to the third stage of EMU, central banks were able to conduct an independent monetary policy within the framework of the exchange rate mechanism of the EMS.

The pro-cyclical effect could be counteracted not only by other channels, but also by fiscal policy (if at hand). Using fiscal policy instruments for stabilisation policies, however, requires their availability and could end up in a departure from medium- to long-term budgetary targets.

A review of the literature and a look to some euro-area figures has shown that the assessment of the relative importance of the adjustment via real interest rates differs somewhat. While research for the US has emphasised the strong role of real rate adjustment, the relevant institution, the ECB, has said the opposite for the euro area.<sup>30</sup>

<sup>30</sup> The ECB claims that the competitiveness channel is by far more important than the real-interest rate channel. At the ECB press conference on 8 June 2006, ECB President Trichet said: "The level of inflation, which is closely correlated with the unit labour cost and the costs in general in the economy, functions in such a way that what one particular firm would theoretically gain out of a theoretical abstract computation of real interest rates is much more than offset by a loss in terms of cost competitiveness: what is lost when inflation is above the average is much greater than what you could theoretically gain with a lower level of real rates. This is very important."

In assessing the overall impact of asymmetric shocks some countries might look as if they had to cope with a situation that is just due to EMU. However, it should be noted that the evaluation is not looking at a benchmark case. In particular the argument cannot be understood as suggesting that things would have remained unchanged at the pre-1999 level, had a country refrained from joining EMU. For instance, in the case of Germany Hayo and Hofmann (2006) do some simulation exercises and conclude that the German rates might have been lower by up to one percentage point under a hypothetical Bundesbank regime after 1999, but they warn strongly that the long-term real interest rate is very imprecisely estimated under the ECB regime.

## 7. Summary and concluding remarks

While cross-country spreads between homogenous assets are relatively small in the euro area, differences between inflation rates have persisted and thus national real interest rates have varied across euro-area Member States. A popular argument is that in a monetary union the cyclically most advanced countries experience above-average inflation rates and thus below-average real interest rates that provide an additional unwarranted stimulus to economic growth. In order to assess the risk of destabilising real-interest rate effects this section has looked at the experiences in the euro-area years.

A look at the data (Section 2) started by addressing measurement issues, including the selection of an appropriate index of inflation and the distinction between *ex ante* and *ex post* real interest rate, since expenditure decisions are generally thought to be driven by expected real interest rates (*ex ante* real interest rates). Several conceptual and practical difficulties were mainly related to the fact that the expected inflation rate is not an observable variable. It needs to be estimated in order to obtain the corresponding real interest rate. Using a simple backward looking approach and a more forward-looking one, ex-post and ex-ante short term real interest rates were then calculated for all euro-area Member States for a period beginning in 1990. These data show considerable convergence towards low real interest rates in the run-up to the third stage of EMU and in the first euro-area years. This can be seen as an important benefit of the environment of low and stable inflation in EMU and the stability-oriented policy framework that underlies it. The data also show that the pre-1999 convergence process involved declines in real interest rates of different magnitude across Member States. The data analysed here indicate that, particularly for the period since 1999, dispersion in ex-ante real interest rates is lower than for *ex post* rates. In turn, this suggests that, although still present, differences in real interest rates may be overestimated by studies based solely on an ex-post approach. Ex-ante real interest rates, calculated on the basis of Consensus Forecast data, indicate that cross-country differentials persist, but that they are somewhat smaller at longer horizons. Using survey data, however, no strong support was found in favour of a full convergence of inflation expectations and thus real interest rates at longer horizons.

The role of real interest rates in a monetary union (Section 3) has recently been the subject of interest in economic theory, with studies shedding some light on the contribution of real interest rates to adjustment following idiosyncratic shocks. The aforementioned hypothesis of a pro-cyclical impact of the real interest rate channel has been in the centre of discussions. Studies on adjustment within a monetary union have also highlighted the (real) exchange rate channel as counteracting the (real) interest rate channel. The homogeneity of countries belonging to the monetary union has attracted a lot of attention. In general, monetary transmission and, thus, the interest rate channel are expected to become more similar across countries by the establishment of a monetary union.

An analysis of causes of real interest rate differentials (Section 4) began with a closer look to the factors underlying developments in real interest rates over time. *Ex post* real interest rates, calculated on the basis of HICP inflation rates, reflect the patterns of inflation differentials and therefore also share the characteristic of persistence. A closer examination of the causes of inflation differentials shows that cyclical factors are only one of a number of determinants with policy-induced and structural causes playing substantial roles. This variety of reasons reduces the relevance of the real interest rate argument that rests on linkages to the cyclical situation of countries. A second part of the analysis looked at the implications of equilibrium concepts, in particular whether estimates of equilibrium real interest rates could shed a new light on the interpretations of real interest rate differentials across countries. Structural inflation differentials as estimated in the literature on Balassa-Samuelson effects fit the pattern observed for real interest rate differentials fairly well suggesting that indeed a non-negligible part of the latter might be related to non-cyclical factors. Real equilibrium interest rates as estimated in the literature on monetary policy analysis depend strongly on the time period under consideration and on key assumptions, while adding relatively little to the analysis of real interest rate differentials.

The investigation of the impact of real interest rates (Section 5) started with a look to recent evidence about changes in the monetary transmission mechanism. Evidence was reported that Economic and Monetary Union had made transmission more similar and thus reduced the relevance of one of the causes of inflation differentials and thus real interest rate differentials. This suggested expecting a declining size in the impact of real interest rates. Data from the euro-area years provided some hints on a correlation between real interest rates and domestic demand and the cyclical situation. A closer look to different periods, however, raised doubts about the stability of the link and of the expected change over time. In response the analysis continued with a more detailed look to banks, households and firms in the euro area. Countries with relatively low real interest rates reported above-average credit growth, but it remained difficult to distinguish between the impact of the initial decline in real interest rates at the start of the third

stage and the impact of differentials observed in more recent years. Differences in the pass-through of interest rates suggested that differentials among real retail interest rates might at least slightly differ from those of real policy interest rates. Households' lending for house purchases was particularly strong in countries with below-average real interest rates. Both for households and for companies there was no conclusive evidence about the real interest rate they look at (e.g. in terms of territorial coverage and time horizon).

The final part of the analysis evaluated the relative importance of the real interest rate channel (Section 6). As the overall impact of real interest rate differentials depends on counteracting channels, the competitiveness channel had to be looked at. But also other financial market channels such as income and consumption smoothing via risk sharing (e.g. portfolio diversification, cross-border ownership) tend to mitigate the impact of country-specific shocks. Early evidence from the euro area suggests that one can expect an increasing role of risk sharing across euro-area Member States. While evidence from the US states hints on a key role of risk sharing via cross-state ownership for income and consumption smoothing, there is little empirical evidence on the real interest rate channel. A closer look to inflation differentials within the US indicated that dispersion is similar to that in the euro area, but this evidence is available for Metropolitan Statistical Regions and not for states, which might explain the lack of studies on real interest rate differentials in the US states. The final section summarised the results of empirical studies for the euro area. These studies mostly argue that the competitiveness channel is strong enough to offset possibly destabilising effects of the real interest rate channel.

All in all, the analysis of the real interest rate channel suggests that the subject is more complicated than some early statements might have suggested. Focussing exclusively on *ex-post* real interest rates could be misleading and exaggerate the risk of destabilising effects. The analysis of the causes of real interest rate differentials clearly hints at the role of non-cyclical factors implying that low interest rates could also emerge in slowly growing countries. Moreover, for some economic agents, particularly for companies, it appears likely that they attach more and more weight to area-wide considerations and thus to a common area-wide real interest rate. In addition, to the extent that inflation differences due to cyclical divergences should be perceived as temporary, the private sector may adjust its medium-term inflation expectations to the ECB's definition of price stability. This process will certainly be intensified by ongoing financial integration, which will also raise the role of income smoothing via risk sharing.

# VI. POLICY-BASED ADJUSTMENT

## Summary

*There is significant scope for national policies to influence the adjustment process through the fiscal stance and, over the medium-term, structural policies. Experience with these types of policy-based adjustment is the focus of this chapter. While in principle fiscal policy could play an important role in mitigating idiosyncratic shocks, the size of cross-country differences in general government expenditures limits the contribution to the smoothing of demand-driven differences in economic growth and inflation.*

*Structural policies can enhance the efficiency of adjustment in the medium-term. Evidence is presented on how structural policies initiated reforms in labour, product and financial markets, which improved the adjustment capacity of the euro area. But progress has varied across the different markets and it is acknowledged that additional structural reforms could improve the functioning of the euro area in the future. In the euro area as a whole, progress on labour market reforms remains steady but slow, with no noticeable acceleration since 1999. Large countries tend to undertake fewer reforms than small countries. There is little hard evidence that membership of the euro area alone has substantially hardened policy-makers' resolve to address the euro-area's labour market problems. While product market reforms can contribute to a smooth adjustment in the euro area, product markets in the euro area remain highly regulated, at least in comparison with major competitors such as the UK, the US and Japan. Moreover, there are significant differences between euro-area Member States. Nevertheless, in recent years visible progress has been made in reducing regulatory barriers. Over the period 1999-2006, a number of important Internal Market directives were adopted, but progress in terms of implementation has been somewhat disappointing. Data on price dispersion and trade integration seem to indicate that progress has indeed slowed down in comparison with the early 1990s. For the future, an effective implementation of the services directive would seem essential. Structural reform in the EU financial sector, which has intensified markedly since the creation of the euro area, has mainly taken the form of measures to facilitate cross-border integration. This focus on reform through integration reflects a two-step rationale whereby integration promotes financial development and financial development in turn enhances economic performance. The introduction of the euro has acted as a powerful catalyst to the process of financial integration by removing exchange rate risk on the bulk of financial flows within the EU and stimulating demand for cross-border financial services. The process of EU financial integration is well underway in a range of areas and particularly in wholesale markets. However, progress has varied across the different sectors of the financial system, with unsecured segments (where there is no transfer of collateral involved) very much in the lead.*

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# POLICY-BASED ADJUSTMENT

## 1. Introduction

The adjustment capacity of the euro area depends on market channels of adjustment (see Chapters IV and V), but also on policies conducted in the area as a whole and in the participating Member States. While the use of fiscal policy as a stabilisation tool has been in the focus of economic analysis for a long time, the interest in structural policies and their impact on the adjustment capacity has been less pronounced in the economic literature. The flexibility of labour and product markets are key to ensuring that the market channels of adjustment unfold in a smooth and timely manner. Integrated financial markets in the euro area facilitate the reallocation of resources during the adjustment process and form a basis of cross-border activities. Policies that form the basis of adjustment are fiscal and structural policies with the latter dealing with markets for labour, products and financial services.

Where fiscal policy is concerned, a substantial difference between the euro area and the US monetary union is the existence of a federal budget in the US. Through the latter, adjustment across states can be smoothened. In the absence of such a coercive power the question arises as to how rules for national fiscal policy can contribute to the smoothening within the euro area. Investigations into these issues begin with the measurement of fiscal positions. The impact and adjustment speed of automatic stabilisers might vary across countries reflecting frameworks that have been built up with different goals in mind. Discretionary stabilisation policy, however, might not be a substitute as it may be particularly prone to difficulties in identifying the actual cyclical situation and policy stance. In order to assess fiscal developments in the context of adjustment dynamics in the euro area, an analysis of cyclically-adjusted primary balances is of special interest. Beyond that, developments in revenues and expenditure could be related to adjustment as a balanced budget expenditure increase (decrease) could be expansionary (contractionary).

While fiscal policy deals with short-term disturbances, structural policies aim at reforming the structure of the EU economy. These policies have been on the agenda of policymakers at different levels for quite some time. They aim at maximising the productive potential and enabling the economy to cope with old and new challenges. Developments such as globalisation and demographic change have been identified as challenges that call for appropriate structural changes (e.g. in the framework of the Lisbon Agenda for growth and employment). Unsatisfactory results as indicated by a number of key indicators such as the unemployment rate have pointed to the urgency of structural reforms. As the proper functioning of markets is crucial for adequate responses to shocks hitting the economy, measures to raise flexibility have been high on the agenda. As challenges will continue to arise in the future the characteristics of optimal structures will change making the pursuit of structural policies a permanent task.

While contributions from structural importance are indispensable in all economies, in a monetary union the removal of one policy instrument, monetary policy at the Member State level, results in an even bigger role for structural policies, in particular to enhance the efficiency of economic adjustment in the medium-term. Moreover, flexibility is deemed to be essential for the functioning of monetary union as already enshrined in the initial contributions to the theory of optimal currency areas. As reforms create winners and losers, however, obstacles to reform can be expected to delay the process of reform and make structural policy a complicated task. Thus any assessment of the adjustment capacity of the euro-area economy has to look at both optimal structures in monetary union and the path towards that situation which depends on policy decisions and implementation.

Structural reforms concern labour, product and financial markets. *Labour market reform* is mainly a national matter in the euro area and as a result required and observed labour market reforms differ considerably across the euro-area economies. The role of labour markets in adjustment, however, has cross-border components. A country hit by an unfavourable shock can be expected to experience lower real wages that will make it more attractive for labour to work in other Member States and such cross-border flows would then also affect the labour market situation in the

other countries. Another cross-country dimension relates to area-wide monetary policy that guarantees price stability, lowers thereby inflation uncertainty and could deliver a contribution to wage moderation.

*Product market* reforms can help in improving the adjustment capacity by enhancing the integration, efficiency and flexibility of product markets. Areas such as Internal Market and competition policies, the liberalisation and regulation of network industries are among the best-known measures. To what extent reforms are initiated or even delayed by monetary union appears an open issue. Increased transparency in a single currency area is expected to increase competition and to lower the obstacles to successful reform, but at the same time lower risk premia in the euro area reduce the incentive to reform. This ambiguous result suggests distinguishing between different types of reform when evaluating the impact of product market reform on adjustment.

*Financial sector reforms* can facilitate cross-border integration, promote financial development and thereby enhance not only economic performance but also increase the adjustment capacity of euro-area economies. Structural reforms in the financial sector can therefore play an important role in overcoming the fragmentation of the sector as inherited from the pre-euro-area times. Increased cross-border borrowing and lending, more diversified portfolio structures and cross-border ownership of productive capacity are known as important elements of income and consumption smoothing. Financial sector reforms can strengthen these mechanisms. Particularly in the euro area, the removal of the exchange rate risk among participating economies has acted as a catalyst to the process of integration which has enhanced the capacity of inter-country adjustment. An evaluation of the impact of financial sector reform could distinguish between progresses in the completion of EMU (state of play) and the impact on inter-country adjustment.

This brief introduction of channels indicates that there are close links between policy-based adjustment channels. The impact of fiscal policies depends on the structure of the economy, which depends on progress with reforms that in turn affect the budgetary results in an economy. These linkages need to be taken into account in the evaluation of the contribution of policy-based adjustment and in the assessment of the relative importance of these channels for the adjustment capacity of the euro area.

This chapter looks at policy-based adjustment in the euro area, discusses its relevance and offers a preliminary assessment. It is organised as follows. Section 2 provides an overview of fiscal developments in the euro area in order to assess the fiscal stance and the adjustment dynamics in the revised framework for fiscal policies. Section 3 investigates the contribution of structural policies to the adjustment capacity of the euro area, in particular in labour markets (Section 3.1), product markets (Section 3.2), and the financial sector (Section 3.3). The chapter concludes with a section on possible spillovers and interactions, which bring together the issues discussed in this chapter with those covered in the previous two chapters.

## **2. Fiscal developments**

This section describes fiscal developments in the euro-area Member States in the context of adjustment dynamics in the euro area. Firstly, it looks at the change in the cyclically-adjusted primary balance which is a conventional measure of the fiscal stance. Following on from this, fiscal developments are decomposed into revenue and expenditure developments.

### ***2.1 The fiscal stance in the first few years of the euro area***

Table 1 shows the developments of the cyclically-adjusted primary balances (CAPB) in the euro-area Member States since 1999. On average, the CAPBs deteriorated by  $\frac{1}{2}$  percentage point in 2000, 2001 and 2002, after which it broadly stabilised. In 2005, the CAPBs improved by  $\frac{1}{2}$  percentage point on average, mainly due to unexpectedly high revenues.<sup>1</sup> Table 1 shows large differences in the development of the fiscal stance between Member States. Of the Member States that have experienced continuously high growth and inflation, Spain has gradually tightened its fiscal stance and improved its fiscal position, while Greece and Ireland have further fuelled their economy with fiscal impulses; Ireland in particular in 1999, 2001 and 2002 and Greece in 2000, 2001, 2003 and 2004.

Austria and Germany, which were characterised over the whole period by downward price and wage adjustment and improving current account positions, have had a different experience in terms of the CAPB. In Austria, it improved over the period as a whole, reflecting strong fiscal tightening in 2001 and subsequent loosening. In Germany, 2001 was marked by significant fiscal loosening. Over the remainder of the period, the fiscal stance seems to have been neutral, despite efforts to improve the budgetary position (see Box 1).

The Netherlands and Portugal, which were both characterised by a rather sharp downturn after a period of above average growth and inflation, experienced first a sharp deterioration of the CAPB as potential growth declined. Thereafter, budgetary consolidation was undertaken in Portugal between 2002 and 2004, and in the Netherlands from 2004.

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<sup>1</sup> See European Commission (2006b).

	1999	2000	2001	2002	2003	2004	2005
ES	0.4	-0.3	0.0	0.3	0.6	0.4	1.6
FI	-0.3	4.2	3.5	2.4	0.8	0.0	0.7
AT	-0.4	-0.4	2.1	1.7	0.8	0.9	0.6
NL	0.4	0.3	-1.3	-2.2	-2.5	-1.4	0.4
FR	0.0	-0.6	-0.5	-1.7	-2.2	-1.8	-0.7
<b>Euro area</b>	<b>0.0</b>	<b>-0.6</b>	<b>-1.4</b>	<b>-1.9</b>	<b>-2.0</b>	<b>-2.0</b>	<b>-1.5</b>
DE	0.3	-0.2	-2.0	-2.4	-2.1	-2.3	-1.9
BE	-0.7	-1.2	-0.4	-1.3	-1.1	-2.1	-1.9
PT	-0.4	-1.4	-2.4	-0.6	0.4	0.1	-2.3
IE	-1.8	-0.7	-4.4	-5.7	-4.4	-2.5	-2.4
IT	-0.4	-1.9	-3.3	-3.3	-3.8	-4.1	-4.3
LU	-1.2	0.0	1.1	-2.5	-3.3	-4.7	-5.6
EL	-0.1	-1.3	-4.1	-4.8	-6.6	-8.2	-6.2

*Source: Commission Services*

## 2.2 Expenditure and revenue developments decomposed

Conventional cyclically-adjusted (primary) balances do not indicate a clear pattern of fiscal withdrawal or stimulus in fast-growing or slow-growing Member States. However, looking at more disaggregated data, another picture emerges.

	1999	2000	2001	2002	2003	2004	2005	Increase 1999-2005
IE	14	7	18	12	7	8	13	111
LU	9	5	4	17	8	9	7	75
ES	4	8	7	8	6	9	7	60
EL	7	14	4	7	9	8	2	63
PT	11	7	9	4	5	5	5	56
NL	5	4	11	6	4	1	5	42
FI	2	2	4	5	4	4	4	28
FR	3	3	4	5	4	4	3	29
IT	1	1	9	2	5	2	4	26
<b>Euro area</b>	<b>4</b>	<b>1</b>	<b>7</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>29</b>
BE	3	4	3	5	5	2	3	28
AT	3	2	1	2	3	3	3	18
DE	2	-4	8	3	2	-1	1	11

*Note: Sale of UMTS licenses has been recorded as reduction in expenditures in 2000-2002. The increase in percentage points of GDP can be easily estimated by multiplying by the share of government expenditures in GDP, i.e. ranging from around 1/3 for Ireland to 1/2 for most other Member States.*

*Source: Commission Services*

An examination of the development of nominal expenditures (Table 2) clearly reveals the remarkable extent to which expenditures have grown faster in the Member States that have been characterised by upward price and wage adjustment. While in Germany, nominal expenditures have been virtually frozen since 1999 (with the exception of 2001), in Ireland they have grown by 111 percent. The difference between the laggards and the fast growing economies is equivalent to 30 to 40 percent of their 1999 GDP.

Differences in expenditure growth are largely reflected in the revenue growth (Table 3), with some exceptions. For example, the nominal expenditure growth rate in Portugal and the Netherlands remained high despite a sharp reduction in revenue growth. Similarly, in Luxemburg, the expenditure growth rate remains high, while revenue



growth has slowed down markedly since the late 1990s. It should be noted that the revenue developments in the table reflect economic developments as well as discretionary changes in tax structures and levels. This does not affect the general picture and trends.

	1999	2000	2001	2002	2003	2004	2005	Increase 1999-2005
IE	14	14	6	8	9	12	7	94
ES	9	9	8	8	7	8	8	73
EL	9	12	0	9	7	7	8	65
LU	9	13	5	5	4	5	5	56
PT	12	6	6	8	5	4	-2	45
NL	8	7	6	2	2	4	6	40
FI	3	12	1	3	0	4	3	29
BE	4	5	4	4	5	1	3	29
FR	5	4	3	2	2	5	4	28
<b>Euro area</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>28</b>
IT	4	3	4	3	4	2	2	24
AT	4	3	5	1	1	3	1	19
DE	4	2	-1	1	1	0	1	8

*Note:* Sale of UMTS licenses has been recorded as reduction in expenditures in 2000-2002. The increase in percentage points of GDP can be easily estimated by multiplying by the share of government expenditures in GDP, i.e. ranging from around 1/3 for Ireland to 1/2 for most other Member State. The changes in revenues may reflect economic developments as well as changes in tax rates and structures.

*Source:* Commission Services

Public spending increases have a larger expansionary impact on demand and the current account than the contractionary effect of equivalent revenue gains. Haavelmo's "balanced budget multiplier theorem" shows that an equal increase in government expenditure and revenues would lead to a net increase in output as the multiplier effect of government spending is greater than the fall in output implied by an equivalent increase in taxation. The reason is that government expenditure has a direct impact on aggregate demand, while only a proportion of the increase in revenues actually impacts aggregate demand (as the private sector saves as well). Moreover, government consumption and investment may tend to be tilted more towards domestic goods and services than private sector consumption and investment,<sup>2</sup> further strengthening the expansionary effect of the balanced budget multiplier theorem. Criticism of the balanced budget multiplier theorem mainly concerns the distortionary effect of tax increases on the consumption and investment demand of private agents. However, in the case at hand, the revenue increases are generally not accompanied by tax increases (rather reductions) but can be characterised as windfall gains.

In the context of adjustment, the large divergences in nominal expenditures growth – even if they are matched by increases in revenue growth – reflect an important difference with smoothing adjustment and output stabilisation amongst regions within a state with a centralised fiscal policy. In an economy with a centralised fiscal policy, the redistribution of central government revenue would not have allowed general government expenditure to deviate continuously and substantially across regions. Smaller differences in general government expenditure could have contributed to reducing demand-driven divergences in growth and inflation.

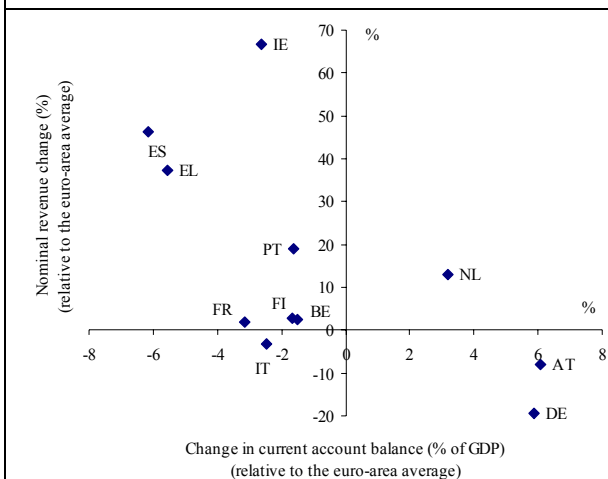
<sup>2</sup> Funke and Nickel (2006) for instance analyse the effects of public and private demand on the trade balance and find that the import content of government consumption is lower than the import content of other demand components.

### Box 1: Taking account of adjustment dynamics in the revised SGP

The 2005 revision of the Stability and Growth Pact<sup>3</sup> allows for increased room for judgement and enhanced economic rationale in EU economic surveillance. In the application of the rules and procedures, this allows for better weighting the budgetary risks associated with adjustment in the euro area. Broad economic assessment may indicate whether the past developments are likely to continue, or fade out in the case where adjustment is completed, or even reverse in the case of overshooting. The budgetary stance may then be assessed in the light of these risks. In the context of the reform of the SGP in 2005, it was agreed that fiscal surveillance should foster fiscal prudence in good times. This can be especially applied during periods of possible loss of competitiveness by promoting very cautious (potential) growth and revenue assumptions, allowing the risk of feeding overheating dynamics to be reduced, while at the same time creating more fiscal room for manoeuvre in circumstances where adjustment is completed and growth and inflation return to normality or in a case where downward adjustment would be required. It implies tough judgement in the SGP framework on fast-growing countries, with high inflation and a positive output gap. Attention should be focused on: high tax revenues (elasticities), which are not captured by the cyclical adjustment; and softer judgement on countries that are in a process of downward price adjustment. A balance needs to be struck between taking into account possible adjustment dynamics and the risks to sustainable budgetary developments in the medium- and long-term.

When assessing the soundness of the budgetary position, a key question concerns the extent to which the large and persistent differences in revenue growth are structural and the extent to which they also reflect cyclical effects and adjustment dynamics. In this respect, the sharp and continuous decline of revenue growth in Portugal, coming from high growth rates up to 2002, is striking. Also in the case of the Netherlands, the decline in nominal revenue growth between 1999 and 2003 is remarkable. Graphs 1 and 2 may provide some indication that the high revenue growth is at least to some extent related to adjustment in the euro area.

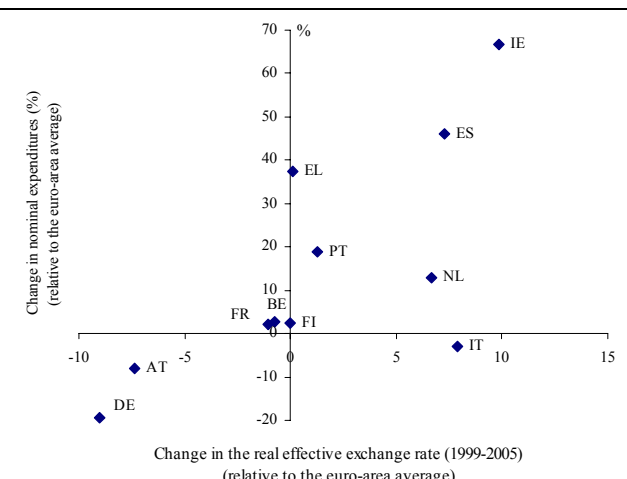
**Graph 1: Changes in nominal revenues versus changes in the current account balance,<sup>1</sup> percentage change 1998-2005**



*Note: 1 - Both underlying variables - current account and nominal revenues - are measured as deviations from the euro-area average.*

*Source: Commission Services*

**Graph 2: Changes in nominal revenues versus changes in the real effective exchange rate,<sup>1</sup> percentage change 1998-2005**



*Note: 1 - Both underlying variables - real effective exchange rate and nominal expenditures - are measured as deviations from the euro-area average. The real effective exchange rate index is based on unit labour costs.*

*Source: Commission Services*

High revenue growth has generally been accompanied by appreciating real exchange rates and deteriorating current account balances, while real depreciation and improving current account balances have been associated with low nominal revenue growth. This may to some extent be related to the effect of entry into the euro area, which in some of the Member States led to a decline in the exchange risk premium. In addition, some Member States may have entered at a somewhat under- or over- valued real exchange rate. As shown in Chapter VII, an initial shock to the foreign exchange risk premium – such as that related mostly to the euro – would lead to domestic demand growth and wage and price increases. Both the higher level of growth and its composition, tilted towards domestic demand (especially if it is fed by consumption), may have induced part of the high revenue growth. Domestic asset price developments, in particular housing may also have contributed to windfall revenues. This effect of growth

<sup>3</sup> The substance of the agreement on the revised SGP is laid down in Council of the European Union (2005). "Public Finances in EMU – 2006" (European Commission, 2006b) takes stock of experience on the revised Pact.

composition, high wage growth, price increases and booming asset prices on nominal revenue growth cannot be continued forever as the accompanying deterioration of the current account balances and the appreciation of the real effective exchange rate need to come to an end. At some point in time, expenditure growth rates will need to be adjusted downward. Experience with the Netherlands and Portugal shows that the response of expenditure growth to lower revenue growth may take some time.

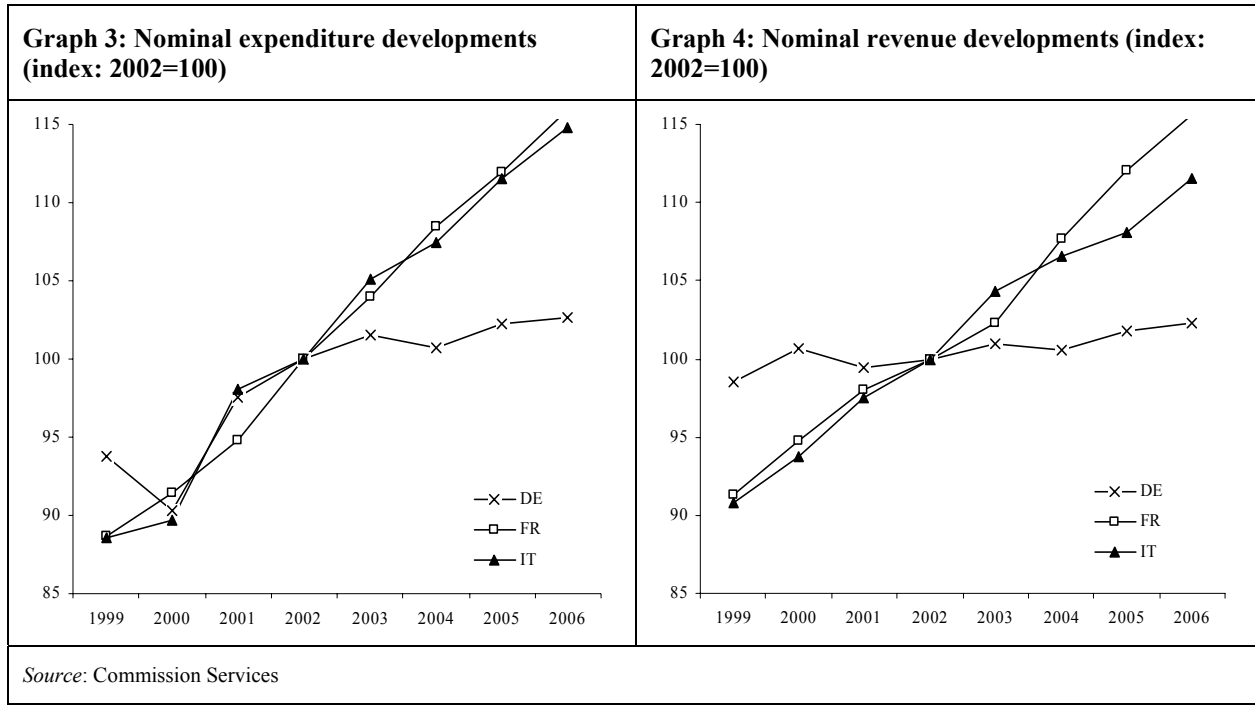
**Box 2: Fiscal consolidation efforts and real exchange rate developments in the large Member States**

The three largest Member States in the euro-area – France, Germany and Italy – have all experienced deteriorations in their budgetary positions resulting in deficits in excess of the 3 percent of GDP reference value of the Stability and Growth Pact.

In all three countries, fiscal consolidation was not successful in the years following the recording of a high deficit. While the aggregate development of the budget balances show similarities, the underlying developments of revenues, expenditures and the real exchange rate have been rather different.

Developments of the real exchange rate relative to euro-area competitors reflect sustained trends since the start of the third stage of EMU. Germany has gone through a competitive adjustment with prices and wages declining relative to the euro-area average, resulting in a substantial improvement of the real exchange rate vis-à-vis its euro-area competitors. In France, the real effective exchange rate remained broadly unchanged, while Italy was characterised by real exchange rate appreciation.

The period of real exchange rate adjustment in Germany was accompanied by high real interest rates, low nominal growth, lacklustre asset price developments, and lack of consumer demand and investment. Nominal expenditure growth was virtually frozen, responding to continuous downward revisions of nominal growth (which in early 2001 was still forecast to be in the same range as France (around 4% annual growth)) and thus revenues. On the revenue side, Germany has also taken measures that reduced the unit labour costs, contributing to competitive adjustment. Helped by a reduction in income taxes, the wage share declined from 52.6% in 2002 to 50.3% in 2005, despite very low nominal growth. It is set to decline further to 49.6% in 2007. At the same time, France has experienced steadily increasing revenue. In Italy revenue growth has slowed down since 2003, but remains much stronger than in Germany. Looking at the underlying fiscal effort – no effective constraint on expenditures in France and Italy is visible in the chart. In France and Italy, nominal expenditures have grown by 15% (over 7% of 2002 GDP) more than in Germany since 2002, when France and Germany both recorded an excessive deficit and the Italian general government budget deficit was also around 3% of GDP.



**3. Structural policies**

**3.1 The labour market and the welfare state**

The need for labour market reform was already widely acknowledged during the run up to the third stage of EMU. Increased economic ‘turbulence’, globalisation, skill-biased technological change and demographic developments called into question the design of existing labour market institutions. The main reason is poor overall labour market performance, as reflected in high unemployment and low employment. What membership of the euro area adds to these arguments is that there may be greater demand for adjustment capacity, since monetary instruments previously

used to cushion shocks are no longer available, while the creation of the euro area may increase the degree of competition and regional specialisation (and thus the frequency of asymmetric shocks).

With the loss of monetary autonomy a greater burden of the economic adjustment should fall on labour markets, which calls for an acceleration of the reform process. An issue widely discussed in the literature is whether membership of the euro area has led to a speeding up or slowing down of labour market reforms in euro-area countries (see Chapter II). Because of various institutional lock-ins that resist market pressures, this process is likely to be discontinuous, with stops and starts. This uneven reform pattern influences the transition toward a new configuration of labour market institutions and the adjustment capacity of the euro area.

The main issue is the extent to which membership of the euro area creates incentives to develop alternative adjustment mechanisms. In a fixed-but-adjustable exchange rate regime, mounting structural disequilibria culminate in an exchange rate crisis which highlights the need to reform.<sup>4</sup> In a monetary union, the exchange rate is no longer available to national governments as a tool to ease adjustment to country-specific shocks, allowing them to buy time and get temporary relief from country-specific structural disequilibria. Under the euro area, structural disequilibria tend to accumulate over time and reveal only gradually the need for radical reforms.

The first sub-section reviews the different, and sometime conflicting, views on the incentives to undertake labour market reforms in the euro area. The second sub-section presents some evidence on the path of reforms by contrasting the experience of seven years under the euro with experience in the period that just preceded the new monetary regime.

### *EMU and labour market reforms*

The prevalent view before 1999 was that: (i) the smooth operation of the euro area would require a more flexible labour market that could bear a larger share of the short-term adjustment burden to asymmetric shocks; and (ii) competitive forces unleashed by euro-area membership might well increase the pressure for reforms.

The optimal currency area literature identifies the market adjustment mechanisms needed to cope with idiosyncratic shocks.<sup>5</sup> A country hit by an unfavourable asymmetric shock should experience a decline in real wages and labour migration toward other regions, so that the adjustment costs are lower than when the adjustment takes the form of recession and unemployment (e.g., De Grauwe, 1997). The view that labour market adjustment takes on added importance under the euro area rests on the assumption that the exchange rates and national monetary policies were effective in smoothing or substituting for real adjustment and/or that the frequency of shocks was likely to increase as a result of participation in the euro area.<sup>6</sup> Although doubts were expressed on this, there was widespread consensus that increased labour market flexibility, in particular wage flexibility, would be needed to strengthen adjustment capacity under the euro.

As regards nominal wage flexibility, the predictions from the theory are uncertain. To the extent that the lack of stabilisation of asymmetric shocks increases the expected aggregate demand fluctuations, economic and monetary union would provide incentives to shorten the duration of contracts and the timing of wage negotiations (Calmfors, 1998). This implies less inertia through wage settlements and more stable cyclical unemployment. The incentive to shorten contract duration would be higher for larger than for smaller countries. However, the prevalence of a low (actual and expected) inflation environment also weakens the incentive to shorten contract lengths. Also, the presence of coordination failures in wage bargaining can make nominal flexibility an unfeasible objective (Calmfors, 1998).<sup>7</sup> Finally, the fact that monetary policy is set on the basis of the aggregate euro-area inflation makes

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<sup>4</sup> However, no guarantees exist that credible reforms will be implemented in the aftermath of the crisis. For example, already during the period of ERM membership, the Netherlands introduced important labour market reforms, while Italy started to reform (mildly) its labour market only when the prospects of euro-area membership became certain. Moreover, substantial reforms have also been introduced by countries outside of monetary union.

<sup>5</sup> Inter alia, these include having similar economic structure so that real symmetric shocks are more frequent than country-specific shocks, having economies that are closely linked by trade in goods and services, factor mobility (Krugman and Obstfeld, 2003), and flexible wages and prices.

<sup>6</sup> Doubts were expressed on the first point, while there were diverging views as to whether the frequency and scale of shocks (and consequently the demand for adjustment capacity within Member States), would increase or diminish. It may be argued that national monetary policies and exchange rates are of limited effectiveness except in the case of temporary shocks affecting the whole national territory. In the case of regional or sectoral shocks, they are blunt instruments, while in the case of permanent shocks they can at best slow or delay adjustment, not prevent it. Some argued that the frequency of asymmetric shocks would diminish in the euro area as economic integration led to a convergence in the sectoral composition of activity across Member States, and also due to policy convergence as national policy errors have been a major source of asymmetric shocks in the past. In contrast, others have argued that membership of the euro area and the process of economic integration in general are likely to lead to greater regional specialisation in production, which might leave sub-national regions more vulnerable to sector-specific shocks (e.g. Krugman, 1993).

<sup>7</sup> Each individual firm would prefer to reduce the length of their wage contracts only if the variability of its own demand rises. However, if others firms were to reduce the contract duration, the rest of the economy would benefit from higher flexibility, thus limiting the output volatility that would put pressure on each firm to change the contract length.

asymmetric shocks equivalent to local shocks within countries with a national monetary policy. This implies that national bargaining will internalise only partially the costs of wages fixed for long periods, depending on the influence of national wage on the area-wide inflation rate.

In contrast, many have expected real wage rigidities to be reduced. Along with economic integration in general, euro-area membership was expected to intensify the product market competition. Fiercer competition in the product market translates into an increase in the real wage elasticity of labour demand that squeeze labour market rents (Nickell, 1999) and add to pressures for reform. Furthermore, the increase in the real wage elasticity of labour demand weakens the bargaining power of unions and raises the cost of labour market distortions motivated by distributional concerns (Bertola and Boeri, 2002). Also, pressures to change bargaining institutions were expected to come from the *de-facto* reduced wage centralisation brought about by the creation of the euro area. The risk of loosening market shares for open economies reduces the advantage of centralised bargaining systems and push for a decentralisation of wage agreements (Calmfors, 1993).

The main issue is to what extent membership of the euro area creates incentives to overcome the institutional lock-in that resist market pressures to reform the labour markets. Some argued that euro-area participation in would remove the barriers to labour market reforms and create incentives to implement reforms that favour flexibility and efficiency (Bean, 1998b). This is the so-called "*There Is NO Alternative to reform (TINA)*" argument. Euro-area participation should encourage structural reforms on the grounds that it provides a precautionary motive to speed up labour and product market reforms at the country level as it makes the costs of non-reform more evident (Calmfors, 2001). Pressure for labour market reform could also stem from the greater mobility of capital and labour, which would in effect bring workers and welfare systems in different Member States more directly into competition with each other.

Others argued that the incentives to reform labour markets are weaker inside than outside the monetary union (e.g. Calmfors, 1998). Outside the euro area, reforms help to reduce both the inflation bias, which derives from the lack of credibility of anti-inflationary government policies (i.e. their time inconsistency), and the level of unemployment (IMF, 1999). With the euro area, the inflation bias vanishes and the incentives to undertake structural reforms are weakened. In EMU, "*there is no double dividend in labour market reforms*".

While there is broad agreement on the desirability of reforms, the directions such reforms might take appears to deserve a closer look, particularly whether they can be expected to enhance flexibility. Some argued that "more elastic microeconomic interactions" raise the labour market risks, leading to a demand for greater protection, even at the costs of efficiency (Bertola and Boeri, 2002). In a calibrated model, Bertolila and Saint Paul (2001) show that euro-area participation would affect the incentives to reform in directions that depend on the type of labour market distortions, public preferences and the strength of unions. For example, employment protection increases the volatility of real wages and prices and reduces that of employment. Within EMU, there is an incentive to reduce protection, except if society cares about employment. Moreover, the authors distinguish between reforms that improve the adjustment capacity to asymmetric shocks from reforms that reduce the natural rate of unemployment. In their calibrated model, it is shown that participation in the euro area may create incentives to introduce some reforms that increase the speed of adjustment to country-specific shocks - namely reduction of the EPL, while the effects on the real and nominal wage flexibility are more uncertain. When monetary policy cannot accommodate reforms undertaken in single countries, reforms that reduce the equilibrium unemployment engender a large deflationary shock.<sup>8</sup> This implies that large-scale reforms are less likely than more partial and gradual reforms.

#### *Describing the impact of euro-area participation on labour market reforms*

Labour market performance in the euro area began on a promising note as some Member States reaped the (lagged) benefits of reforms in labour and other markets. Employment growth, which had been traditionally low in most Member States, reached 1.1% on average in 1998-2001 in the euro area, raising the employment rate from 58% in 1996 to 63.4% in 2005. Despite the recent increase in the unemployment rate, the decline in overall unemployment during the second half of the 1990s appears to have been more than just a cyclical phenomenon. Commission services' estimates of the NAIRU<sup>9</sup> suggest a reduction in structural unemployment, which is reflected in the decline of long-term unemployment (over 12 months) and youth unemployment (under-25s). Also, the relatively muted response of unemployment and employment to the downturn, in comparison with previous cycles, provides support for the view that part of the improvement in labour market performance has been structural.

In spite of these improvements, the labour market performance of the euro area remains lacklustre, partly on account of macroeconomic developments. Low labour force participation prevails among certain groups, namely women and older working-age people. Unemployment remains a serious concern as suggested by the fact that about 45% of

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<sup>8</sup> If the reform reduces the equilibrium unemployment rate, while the initial level of unemployment remains high, the market mechanism will entail a downward adjustment of prices and wages that cannot be stabilised by the common monetary policy.

<sup>9</sup> See Denis et al. (2006) for an explanation of the methodology for calculating the NAIRU.

unemployed people have been out of work for one year or more, compared to less than 15% in the US.<sup>10</sup> There is a distinct geographical dimension to the problem in several countries, with severe disparities (in terms of both employment and unemployment) between leading and lagging regions.

Most discussions of the impact of euro-area membership on labour markets have tended to focus on wage bargaining. Despite the vast literature on labour market institutions and labour market performances, only few analyses have described the effects of euro-area membership on labour market institutions. Bertola and Boeri (2002), using information on reforms of non-employment benefits and employment protection collected by variety of sources, show an acceleration of reforms after 1998, which they assume being started when the framework for fiscal policy was set in 1997.<sup>11</sup> Driven by the increase in the number of marginal reforms, their orientation was towards relaxing the strictness of employment protection legislation, through looser regulation of atypical contracts, and increasing the rewards from work. Duval and Elmeskov (2006), using an indicator of the overall intensity of reforms developed as part of the assessment of the OECD Job Strategy, conclude that the advent of the third stage of EMU did not coincide with an acceleration of labour market reforms. Yet, compared to the OECD average, it is shown that a number of euro-area countries have pursued both far-reaching and comprehensive reform strategies while only few have confined themselves to either minor reforms or reforms covering only a number of areas.

The striking difference between the findings of these two studies highlights the importance of the methodology used to combine qualitative information which responds to different objectives. The OECD indicators have been developed to monitor progress in the implementation of the Job Strategy, while the data used by Bertola and Boeri (2002) categorise reforms according to their expected effects on labour market flexibility and/or their scope – i.e. marginal or radical. Other databases have been developed to evaluate the costs of regulation (World Bank *Doing Business* database), to measure *de facto* labour practices (*Global Labor Survey* by Chor and Freeman (2005)) or to systematically record and track reform measures over time (*LABREF* database). *LABREF*<sup>12</sup> was conceived as an instrument to provide information on the design of reforms and their broad characteristics – it does not provide information on the direction of the reforms.

Using the data on the scope and the direction of the reforms kindly provided by the Fondazione Rodolfo DeBenedetti (*FRDB*), this section explores whether the pace of labour market reforms has accelerated since the creation of the euro area. In doing so, it extends the analysis of Bertola and Boeri to more recent years. Finally, based on *LABREF*, the sub-section describes the main characteristics of the reform implemented in the 2004-2005 period.

Before reaching a definitive conclusion on the impact of euro-area membership on labour markets, it is important to bear in mind a series of caveats:

- Labour market reforms rarely come as one single event. They rather follow an evolutionary process with many measures predating the establishment of the euro area. While part of these reforms may have been implemented in anticipation of the monetary union, membership of the euro area is only one of several factors driving the policy debate on labour market reforms in the EU;
- It is not easy to judge the ‘appropriateness’ of labour market reforms. While there is fairly broad agreement among economists and policy-makers on the main EU labour markets problems, there is not a complete consensus on the measures required to improve performance. Those who question whether increased ‘flexibility’ (however defined) is the solution may perceive some tension between the aim of improving performance and the aim of improving adjustment capacity under the euro. On the other hand, while flexibility is not an end in itself, the literature has recently highlighted the importance of the interaction between shocks and institutions.<sup>13</sup> This literature suggests that institutions should be conducive to adjustment, or else the negative consequences of shocks may persist for a long time – a point which the EU experience of recent decades seems to corroborate. In this light, improving adjustment capacity appears perfectly consistent with the goal of improved labour market performance. As another example, in the *FRDB* database, an unemployment benefits reform is deemed to be radical if the replacement rate is reduced by at least 10%. However, it should be considered that in countries where the replacement rate for the average production worker is extremely low, a further reduction is not needed. Rather, an increase in the replacement rate might be required in the context of reforms that reduce the protection of workers on the job;
- The impact of policy reforms on labour market performance usually occurs with lags. In many cases, it may take several years before the benefits begin to show through. In addition, the interaction of a wide range of

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<sup>10</sup> The proportion has fallen in recent years, which may reflect efforts to activate long-term unemployed people.

<sup>11</sup> The time span of the analysis in their paper is 1987-1999.

<sup>12</sup> Together with the Labour Market Working Group attached to the Economic Policy Committee the Directorate General for Economic and Financial Affairs has established a database of those reform measures which are intended to modify relevant labour market institutions in the EU-25. The database can be freely accessed at: [http://europa.eu.int/comm/economy\\_finance/indicators/labref\\_en.htm](http://europa.eu.int/comm/economy_finance/indicators/labref_en.htm).

<sup>13</sup> For a review of the literature on labour market institutions and labour market performance, see Arpaia and Mourre (2005).

labour market policies and institutions also have a relevant bearing on the outcome, not to mention complementarities and interaction with policy changes in product and capital markets;

- In practice it is difficult to isolate the impact of euro-area membership from the effects of other ongoing economic trends such as globalisation or the effect of non-EMU related policy measures such as the single market programme. Moreover, economic agents may have anticipated the implications of euro-area membership: hence, one cannot simply consider the period 1999 to 2006 in isolation from earlier developments; and
- The FRDB database covers four policy areas (EPL, Non-employment benefits, Pensions and Migration). Therefore it gives only a partial description of the reform process.

#### *Reform efforts in the euro-area years*

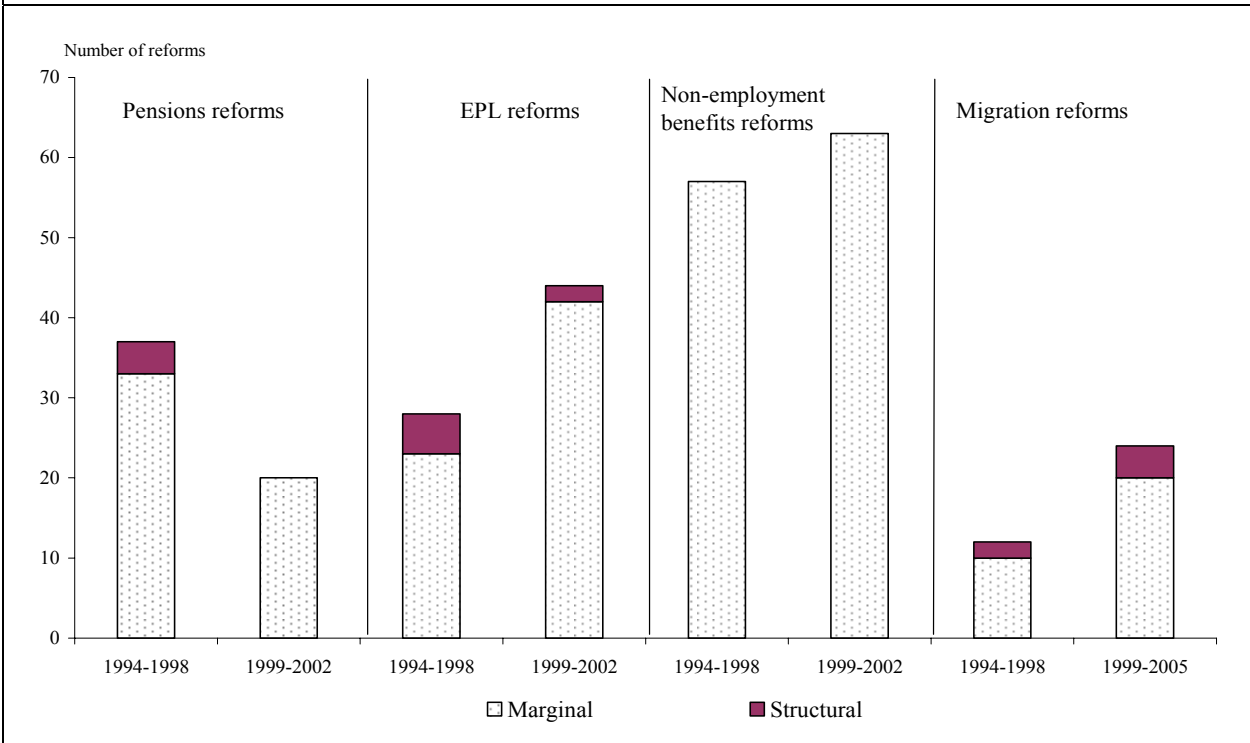
Data available from the FRDB allow for tracking over time the scope and the direction of labour market reforms. The FRDB database collects information on reforms implemented in four policy areas (pensions systems; unemployment and non-employment; employment protection legislation and migration policies) in the EU countries over the period 1987-2005. For each of these policy areas, reforms are categorised<sup>14</sup> as marginal or radical, as well as on the basis of their expected effects on: labour market distortions, reward to labour market participation, generosity of pension systems and immigration policies.

In the early years of monetary union there was an increase in the number of reforms implemented in all areas except pensions systems (Graph 5). However, the reform process was characterised by a sequence of modest reforms rather than by few radical changes, partly confirming the view that euro-area membership reduces the incentives for large-scale labour market reforms (Bentolila and Saint Paul, 2001). Indeed, the increase in the total number of reforms is to a large extent explained by the number of marginal reforms, while the number of structural measures rose only for migration policies. However, since marginal reforms prevailed also in the years before 1999, the change in the monetary regime did not represent a clear break with respect to the previous reform strategies.

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<sup>14</sup> Based the FRDB database, a subjective procedure was used to evaluate the marginal versus radical nature of reforms. The classification is based on a two-step approach. The first step entails a qualitative assessment of the scope of various reforms. The second step involves a consideration of the actual behaviour of the series that should be most affected by the reform: the qualitative assessment in the first step is confirmed only if there is a change in the underlying trend of the series in question. For further details of the procedure, see Boeri (2005).

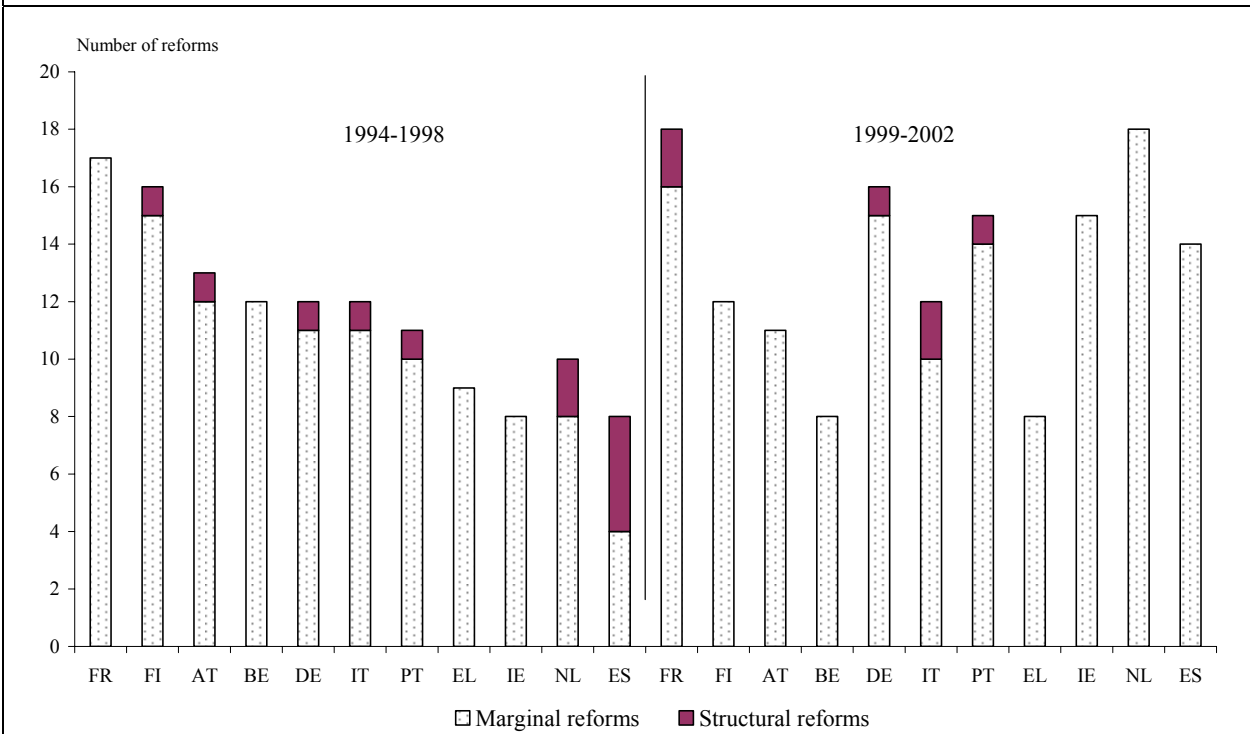
**Graph 5: Reforms in the euro area (number of marginal and structural reforms)**



Note: Calculations based on the Fondazione Rodolfo DeBenedetti (FRDB) Social Reforms Database.

Source: Commission Services

**Graph 6: Reforms in euro-area countries (number of marginal and structural reforms)**



Note: Countries are ranked in decreasing order of the number of marginal reforms. Calculations based on the FRDB Social Reforms Database.

Source: Commission Services

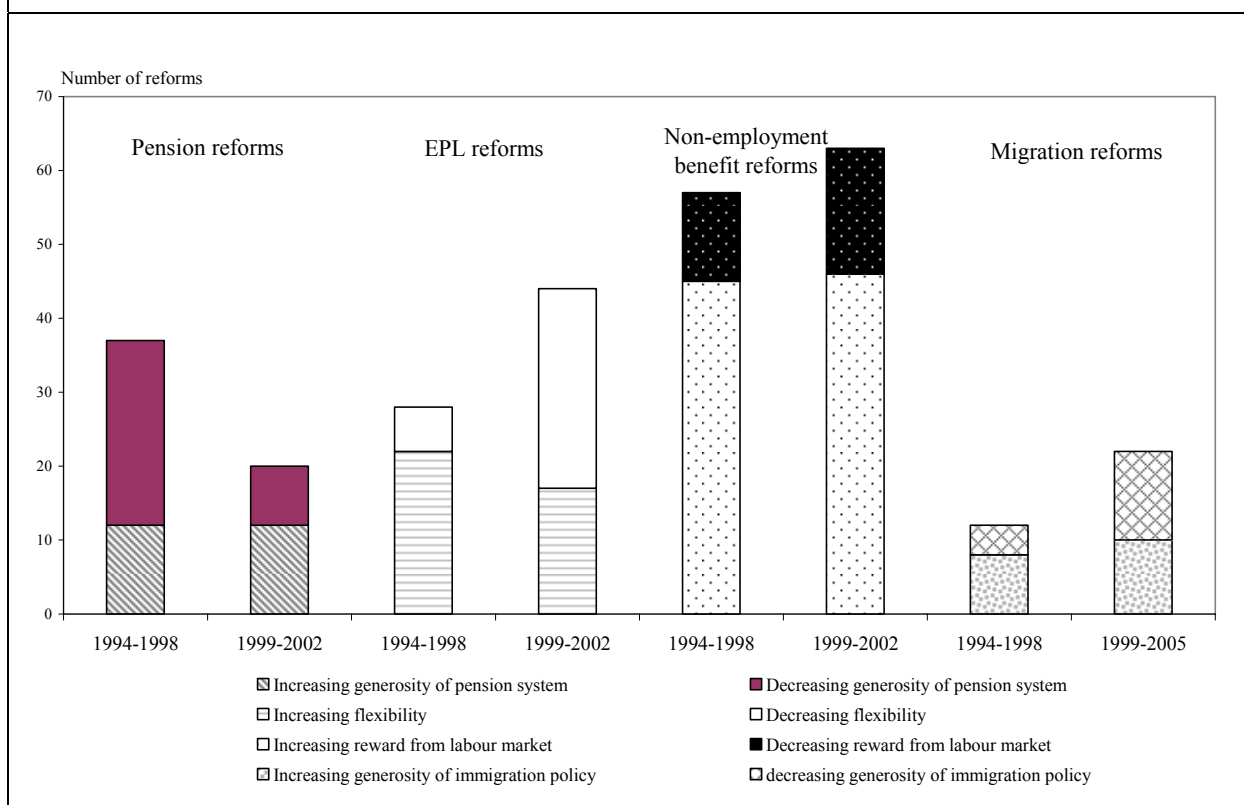


If any, an effect of euro-area membership can be seen in the cross-country distribution of the number of marginal reforms (Graph 6). If one excludes France, the country with the highest number of marginal reforms both in the pre- and post-1999 period, there is a negative relationship between the number of marginal reforms implemented by a country respectively in the periods 1994-1998 and 1999-2005. Hence, countries with a relatively low intensity of marginal reforms in the pre-1999 period were relatively more active during the euro-area years. It is worth mentioning that the smaller countries were those where less marginal reforms were implemented after the creation of the euro area, perhaps because, given the limited independence of their monetary policy in the years before 1999, they were forced to implement some reforms.

Turning to the broad orientation of labour market reforms, according to the TINA argument an acceleration of reforms improving the adjustment capacity of the labour market should be expected under the monetary union. Graph 7 displays the number of reforms according to their broad orientation for the euro area as a whole, while Graph 8 displays such information for individual Member States. It can immediately be seen that after the launch of the euro area, the direction of reforms did not take the path that one would have expected. Indeed, there is a significant increase in the number of reforms that reduce labour market flexibility and reforms that reduce the reward from working.. This does not, however, outweigh the overall positive shift toward reforms that reward the overall work effort.

Finally, reforms that reduce the generosity of the migration policies are more prevalent, which is suggestive of a policy shift from non-national to national working-age population. The increase in the tightness of employment protection legislation is to some extent driven by countries such as Portugal, Spain and France, where flexibility at the margin was facilitated by the extensive use of temporary employment (Graph 9a and Table 4).

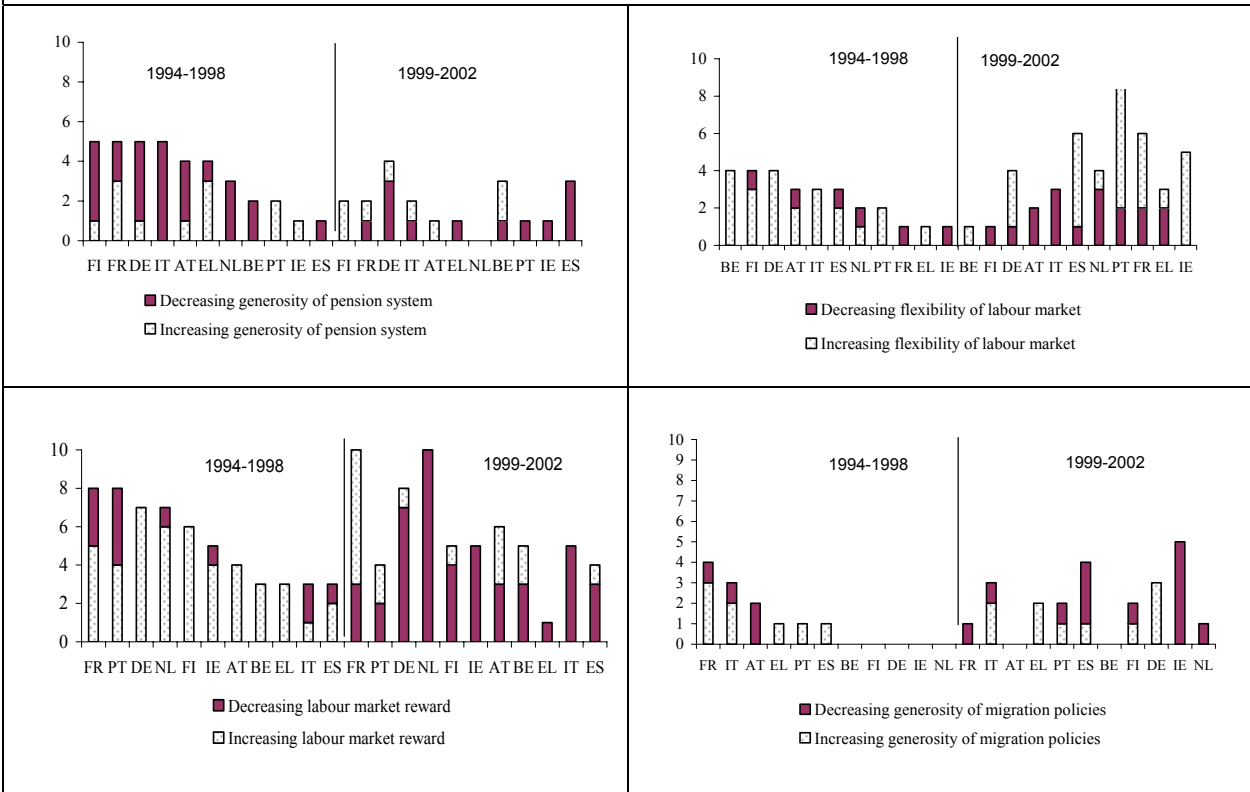
**Graph 7: Direction of labour market reforms in the euro area**



Note: Calculations based on the FRDB Social Reforms Database.

Source: Commission Services

**Graph 8: Direction of labour market reforms in individual euro-area countries**

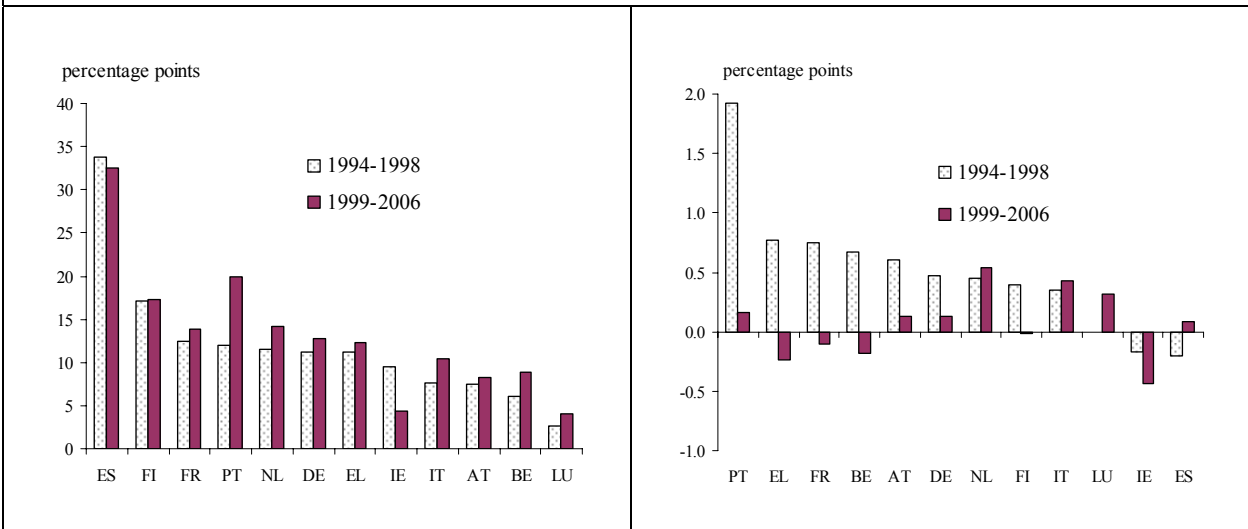


Note: Calculations based on FRDB Social Reforms Database.

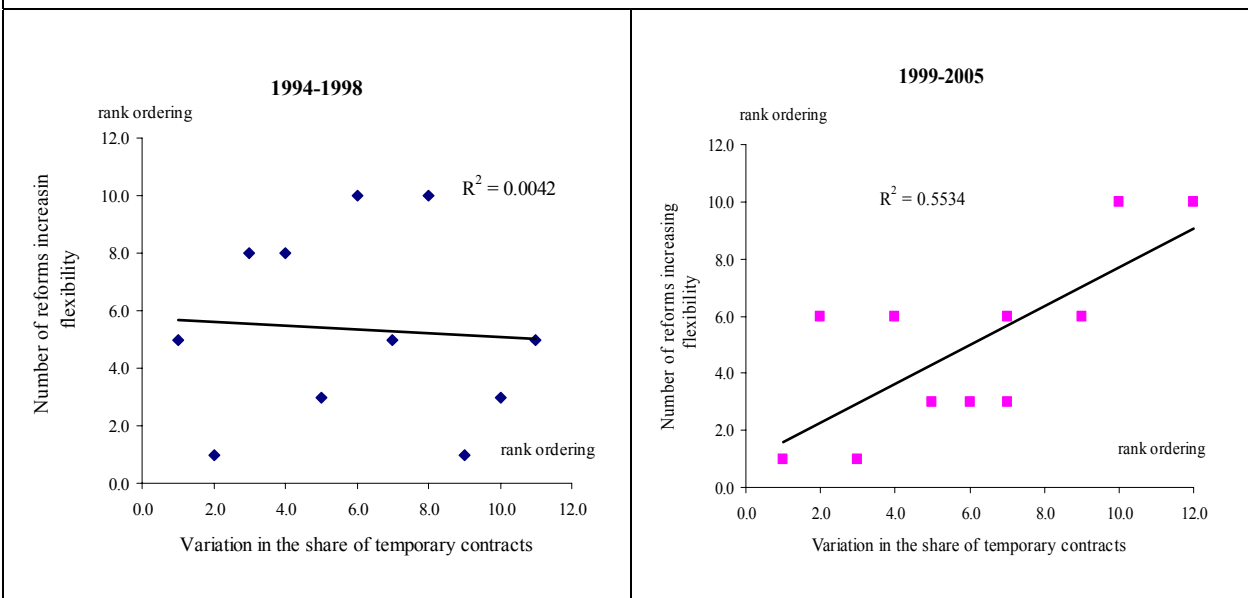
Source: Commission Services

**Graph 9: Temporary employment in euro-area Member States**

a) Shares (left graph) of temporary employment and variation in shares (right graph) of temporary employment



b) Ranking of shares (left graph) and variation in shares (right graph) of temporary employment



*Note:* Calculations based on FRDB Social Reforms Database.

*Source:* Commission Services

Table 4 provides a synopsis of reform efforts in the different areas based on the information available from the LABREF database for the years 2004 and 2005.

<b>Table 4: Structural reforms in euro-area labour markets, 2004-2005</b>	
<b>Policy area</b>	<b>Main developments in the euro area as a whole</b>
Active labour market policies	<ul style="list-style-type: none"> <li>- Gradual shift from passive to active policies</li> <li>- Redirection of active labour market policies towards more effective job search and early activation</li> <li>- More focus on targeted policies</li> </ul>
Welfare benefits	- Only limited action was undertaken in 2005 in the field of unemployment and welfare-related benefits (housing benefits, social assistance)
EPL	- Reforms continued to be lagging in many Member States, especially in those countries characterised by tight employment regulation and where the measures adopted during the pre-1999 years aimed at increasing flexibility at the margin of the employment contract with potentially detrimental segmentation effects on the labour market
Taxation	- Cuts of labour taxes targeted at low income to reduce inactivity and unemployment traps for low-income earners
Pensions	Not much focus on reforms of early-retirement, sickness, disability and old-age pension systems, for which substantial reform programmes were adopted in a number of Member States in previous years
Wage bargaining	- Only timid efforts, mainly in Germany and Spain, to keep wage moderation and to make wages more responsive to sectoral and local cyclical conditions
Working time	- Introduction of innovative working time arrangements, both to reconcile work and family life and to promote a more flexible work organisation at company level
Immigration and mobility	- some measures to improve the integration of third country nationals, to simplify the procedures for entry and regularisation or to develop a flexible employment permit system focused on the economy's skills and labour needs.
<i>Note:</i> Data from Labour Market Reform Database (LABREF). <i>Source:</i> Commission Services	

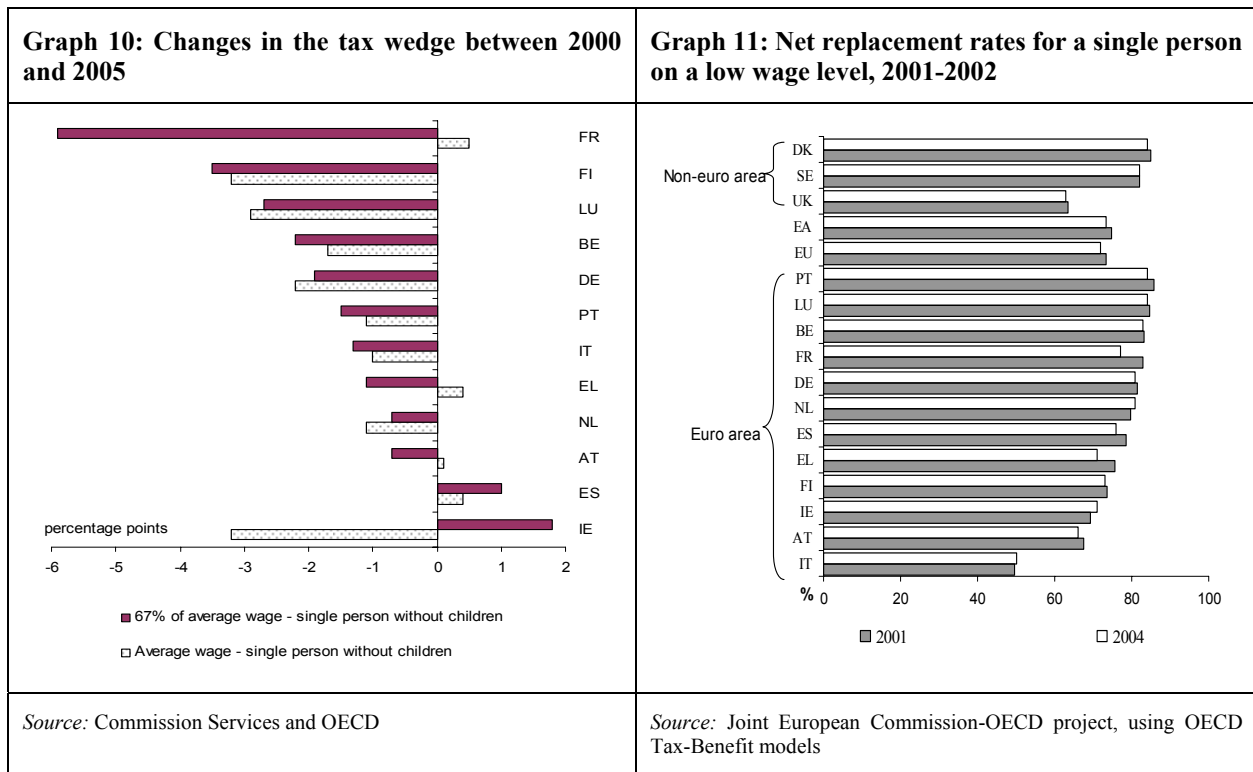
Despite these unfavourable developments, the last update (2004) of the OECD EPL indicator suggests a marginal loosening in the euro area as a whole (Table 5). However, in several cases, reforms have gone in the 'wrong' direction of tightening EPL for regular employment or collective dismissals, while liberalising temporary contracts or agency work, thereby aggravating problems of a "dual" labour market. Indeed, in the years since the creation of the euro area, the most active countries in executing reforms that increased labour market flexibility were also those with the highest increase in the share of temporary contracts (Graph 9b).

<b>Table 5: Reforms of EPL and temporary contracts, late 1990s to 2003</b>				
<b>OECD indicator of EPL stringency (version 2)</b>				
	Late 1990s	2003	Relaxed	Tightened
Belgium	2.5	2.5		
Denmark	1.8	1.8		
Germany	2.6	2.5	temp	collective
Greece	3.5	2.9	temp	regular
Spain	3.0	3.1		temp
France	2.8	2.9		regular
Ireland	1.2	1.3		temp
Italy	3.1	2.4	temp	
Luxembourg	-	-		
Netherlands	2.3	2.3		
Austria	2.5	2.3	regular	
Portugal	3.7	3.7		
Finland	2.2	2.1	regular	
Sweden	2.6	2.6		
Unite Kingdom	1.0	1.0	collective	temp, regular
European Union	2.5	2.3		
Euro Area	2.8	2.7		
<i>Note:</i> EU and Euro-area averages are weighted by employment.				
<i>Source:</i> OECD				

Such a broad overview conceals many country-specific details of course.<sup>15</sup> For the euro area as a whole, though, there is no doubt that progress over the seven years since 1999 has been disappointing. Where progress has continued, it has tended to be in somewhat ‘easier’ areas, such as selective tax cuts, reducing the tax burden on low-paid workers (Graph 10), active labour market policies and strategies for lifelong learning.<sup>16</sup> But in the politically more difficult areas highlighted in most empirical studies of labour market institutions as key influences on unemployment and employment – especially wage bargaining, benefit systems, employment protection legislation and unemployment benefits – there has been only little progress in reforms to improve the design of the instruments/measures and the interactions between them.

<sup>15</sup> For example, the reform of the unemployment benefit system introduced in the Netherlands in 2005 involved a sharp cut in the unemployment benefit maximum duration (from five years to 38 months), a new system of calculation of the duration of the unemployment benefit on the basis of actual employment history (one month's benefit for each year worked after the third month of unemployment) and more stringent employment-history requirements. The reform of the unemployment benefit system was accompanied by support measures aimed at preventing people from being discouraged to accept work because it could adversely affect their income. Similarly, a sort of "combi-wages" was introduced in Austria, in the form of in-work-benefits for long term unemployed younger than 25 and older than 45. In France reform of the employment placement services involved the abolition of the monopoly of the public employment services and the introduction of the possibility for the PES to create subsidiaries that will be able to charge employers for the service provided or to purchase a stake in other entities, as well as the possibility for temporary employment agencies to offer recruitment services for both fixed-term and open-ended contracts.

<sup>16</sup> According to the information available from the LABREF database (DG ECFIN), about 50% of all policy interventions in relevant areas for the labour market performance were implemented in the area of ALMPs, Taxation and Pensions systems.



Graph 11 provides the latest figures on net replacement rates (i.e. the ratio of net out-of-work income to net in-work income).<sup>17</sup> The data show little change between 2001 and 2004. Of course, net replacement rates are by no means the only relevant aspect of benefit systems – eligibility criteria, the duration of benefits and the enforcement of job-search requirements are also crucial, although as noted above, there has been only limited progress in these areas.<sup>18</sup>

So far, therefore, it must be concluded that the evidence of the effect of participation in the euro area on the pace of labour market reforms has been mixed. It had no noticeable impact on the ambition of labour market reforms. However, one should not be too pessimistic. The trend towards more flexible work organisation and the recognition of the need for education and training systems to foster adaptability are positive signs.

As noted earlier, there is evidence of moderate structural improvements throughout the second half of the 1990s, in particular due to wage moderation, perhaps partly in anticipation of euro-area membership. Moreover, one should not assume that all countries need to move in the same direction in a given policy area – this will depend on the mix of policies and institutions at national level.<sup>19</sup> For instance, although many would argue that net replacement rates are too high in the euro area as a whole (see Graph 11), this may not be the case in Italy. This in turn means that movements in EU or euro-area averages must also be interpreted with particular care.

### Conclusions

Expectations on the part of some commentators that participation in the euro area would prompt radical labour market reforms have not been realised. While the case for reforms is widely recognised, and euro-area participation may in some respects act as a further encouragement, there are countervailing forces. In particular, if euro-area participation increases the demand for economic adjustment, it (together with the acceleration of globalisation process) also increases the demand for protection against the risks associated with adjustment. Although this may not be a barrier to reforms, it does need to be taken into account in designing them.

In the euro area as a whole, progress on labour market reforms remains steady but slow, with no noticeable acceleration since 1999. Large countries tend to undertake fewer reforms than small countries. There is little hard evidence that membership of the euro area alone has substantially hardened policy-makers' resolve to address the euro-area's labour market problems.

Of course, it is difficult to identify any causal impact of membership of the euro area on the reform process. Perhaps recent developments merely reflect the paradox that periods of slow growth or even recessions often seem necessary

<sup>17</sup> These are derived from a joint Commission and OECD project; figures are not available for the earlier years.

<sup>18</sup> See also Hasselpflug (2005).

<sup>19</sup> The interaction between different policy institutions is discussed at length in European Commission (2003a, 2003b, 2006g).

to prompt reforms in the right direction, even though in theory these should be easier to undertake in an upturn.<sup>20</sup> On the other hand, it might be argued that it is precisely in a downturn that the implications of membership of the euro area for labour market functioning will be clearest to policy-makers, and so reforms in 2003-2005 may be due to a combination of these factors.

### 3.2 *Product markets*

Product market reforms cover a wide range of areas such as Internal Market and competition policies, the liberalisation and regulation of network industries, and measures aimed at creating a more business-friendly environment. The need for product market reforms in EU countries is generally acknowledged. As the third stage of EMU has deprived the national authorities in the participating countries of monetary and exchange rate instruments, it has increased the need for product market reforms to enhance market-based adjustment to shocks. Indeed, by improving integration, efficiency and flexibility of product markets, product market reforms can contribute to improving economic adjustment in the euro area.

However, in spite of progress made over the past ten to fifteen years, euro-area countries are rarely among the best performers in the EU in terms of the functioning of their goods and services markets. Therefore, one may get the impression that participation in the third stage of EMU has had a negative influence on the intensity and speed of structural reforms. In theory, monetary union has an ambiguous effect on structural reform efforts. On the one hand, by increasing price transparency, the single currency intensifies product market competition, which in turn reduces resistance to labour market reform. On the other hand, the gains from structural reform in terms of lowering risk premiums are lower in the euro area, which reduces the incentive to reform. Econometric investigations on the effects of structural reforms in the early euro-area years are non-conclusive (see Duval and Elmeskov, 2006).

This section provides some further arguments on this issue, focusing on product market reforms in particular. It reviews evidence on the measure of price flexibility and the degree of product market regulation in the euro area, as compared with its main competitors and describes the effort made to reform product markets in the euro-area countries. The section first defines product market reforms and identifies the channels through which these reforms can improve the adjustment capacity of the euro area. Following a (supply- or demand-side) shock, price adjustment comes before quantity adjustment, since it is the changes in price that generate the changes in quantity. This is why the second subsection focuses on analysing the degree of price flexibility in the euro area. A third subsection describes the evolution of product market regulation in the euro area since the second half of the 1990s. The section concludes with some illustrations of progress (or lack of progress) in important areas of product market reforms since the start of the third stage of EMU.

#### *Product market reforms and capacity of adjustment to shocks*

Product market reforms are defined as changes in product market regulation, i.e. the regulatory framework determining the functioning of goods and services markets. Product market regulation includes economic regulations, which affect the market behaviour of businesses and influence decisions on pricing, market entry and exit, investments, etc., as well as administrative regulation (or 'red tape') through which governments collect information in support of public policies.

Product market reforms can be divided into four main categories: measures to open up to competition goods and services markets previously sheltered from competition from abroad (the Single Market Programme, e.g.), measures to open up markets previously sheltered from competition from newcomers (liberalisation of network industries, in particular), measures to reduce the state's involvement in the economy (state aid control, e.g.) and regulatory reforms creating a more business-friendly environment.

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<sup>20</sup> Boeri (2001), using the Fondazione Rodolfo De Benedetti database on reforms, shows that slow growth does not prevent reforms and, moreover, in periods of slow growth it is more common to reduce generosity of pensions and unemployment benefits and to relax employment protection, whereas in periods of faster growth there seems to be more pressure to increase generosity and to tighten protection. The few radical reforms between 1986 and 1997, however, occurred mostly in periods of faster growth.

### **Box 3: Competition, mark-ups, price stickiness and productive efficiency**

This box describes some stylized facts regarding the impact of competition on mark-ups, price flexibility and productive efficiency.

*1. Product market regulations can create barriers to competition, allowing firms to charge customers a mark-up*

Product market regulations can create barriers to competition such as entry barriers and price controls. These barriers to competition give firms additional market power, allowing them to charge a mark-up over costs.

*2. An increase in competition encourages firms to reduce mark-ups*

The size of a mark-up, generally measured by the Lerner Index, depends positively on the degree of concentration in the market and negatively on perceived elasticity by firms of demand for their products. An increase in competition will reduce the degree of concentration since the number of competing firms should increase, and it will increase the elasticity of demand as the choices of consumers widen. Thus, the effect of an intensification of competition is to reduce the size of mark-ups.

*3. Price stickiness is greater on markets with imperfect competition*

In a static situation, the greater the degree of competition in markets the greater the likelihood that industry-wide cost savings, for example due to wage moderation or technology improvement, are more fully passed on to consumers. In less competitive markets, firms will rather appropriate a large share of the cost reduction and increase their profits. Similarly, an industry-wide increase in input prices is normally more completely passed through to downstream markets when the latter are more competitive. This is because the lower mark-ups in more competitive markets leave less room to absorb the cost increase.

*4. An increase in competition should reduce downward price stickiness*

An increase in competition will be reflected in an increase in the perceived elasticity of demand. As a result there are more benefits to be reaped from a reduction in prices. At the same time, there is a higher risk of losing market share if competitors reduce their prices. As a result, firms will lower prices more rapidly in response to a positive supply-shock or a negative demand-shock.

*5. Theoretically, an increase in competition has an ambiguous effect on upward price stickiness*

Increased competition reduces the capacity of firms to absorb the consequences of a negative supply-shock (an increase in production costs, e.g.) because mark-ups are lower. At the same time it will be more difficult for the firm to pass on the cost increase to its customers due to the higher demand elasticity associated with the increased competition. On the basis of these arguments one would conclude that stronger competition has an ambiguous effect on upward price stickiness. Therefore, the question needs to be resolved empirically.

*6. Monopoly and oligopoly are often characterised by considerable productive inefficiencies*

Productive efficiency is the capacity for any given firm to allocate its resources in such a way that makes it possible to reduce or eliminate the under-utilisation of its production factors, i.e. capital and labour. Productive or technical efficiency gains come from the introduction of new or better production methods within the firm, and this could lead to increased productivity. Competition puts continuous pressure on firms to contain or reduce their costs, while monopolies and oligopolies are often characterised by considerable productive inefficiency.

*7. An increase in competition should raise productive efficiency*

The increase in competition can provide incentives for firms to increase their efficiency via different channels. First, competition reduces information asymmetry and creates greater opportunities for comparing performance. This makes it easier for the shareholders to monitor managers and hence reduces slack. Second, in highly competitive markets where price elasticity of demand is high, cost-reducing productivity improvements are likely to generate large increases in market shares and profit. Third, the probability of bankruptcy is likely to be higher in a more competitive environment. Consequently, managers have an incentive to step up their efforts to avoid such a failure. Finally, competition may also influence the effort of workers, as they are likely to capture a part of product market rents in the form of higher wages.

Product market reforms may facilitate adjustment in the euro area because they contribute to the creation of better integrated and more competitive markets. Moreover, they have the effect of raising the benefits of labour market reforms.

First, the better integrated markets facilitate the reallocation of goods and services in the case of more permanent supply shocks (such as technology shocks). This reallocation of resources can take place within industries via a process of entry and exit and a shift in market shares towards most efficient firms. Alternatively it may occur via a process of industrial specialisation and geographic concentration according to competitive advantages (see Dierx, Ilzkovitz and Sekkat, 2004). More integrated markets also allow a more rapid dissipation of asymmetric shocks, as excess demand (or supply) for goods and services in one region within the euro area can be satisfied by supply (or demand) from another region.



Second, more competitive product markets ensure that companies adjust in the face of shocks by adapting mark-ups, prices and productive efficiency. Box 3 describes the effects of an increase in competition on mark-ups, price stickiness and productive efficiency. The implications of these effects for the adjustment mechanisms in the euro area are described below.

In the case of a positive supply-shock (technology improvement) or a negative demand-shock, prices will be forced down. An increase in competition pressures will speed up adjustment. If the pressures of competition are sufficient, domestic producers may react to these shocks by reducing their margins and their prices. If these pressures are insufficient, downwards price stickiness may result in employment losses. For example, if prices are flexible, productivity gains from technological progress will be translated into lower prices, which will then drive up demand and prevent the negative impact on employment in the short term. A recent paper by Marchetti and Nucci (2005) using firm level survey data for Italy has found evidence in favour of this argument. They find a negative impact of productivity shocks on employment for firms with stickier prices but this effect is weaker or not significant for firms with more flexible prices.

In the case of a negative supply-shock (increase in input prices) or a positive demand-shock, prices will be forced up. As explained in Box 3, the intensification of competition reduces mark-ups and thus increases the incentives of firms to pass on increases in input prices to consumers. However, the price elasticity of demand increases as well, raising the threat of a loss in market share. Firms may therefore decide to temporarily reduce their mark-ups and increase the effort to become more efficient in order to be able to restore their margins in the medium-term. There is indeed some evidence showing that, in the medium-term, EU companies adjust to the pressures of competition by increasing their productive efficiency (Sauner-Leroy, 2003).

Finally, product market reforms can contribute to amplifying the effects of wage moderation. An improvement in wage-setting behaviour in less regulated markets may generate fiercer competition for market share. In the process, output and employment increase more in these markets. In more regulated markets, softer competition pressures may lead existing firms to appropriate a larger share of the cost reduction in the form of higher profits (see Estevão, 2005).

#### *A measure of the degree of product market flexibility: price setting behaviour in the euro area*

The analysis above shows that product market reforms may contribute to increasing the responsiveness of domestic prices to shocks. It is thus interesting to shed some light on the dynamics of prices in the euro area. Recent surveys on price-setting behaviour in the euro area have been conducted by the Eurosystem of Central Banks (see ECB, 2005c and Fabiani et al., 2005). These surveys show that prices change infrequently in the euro area: on average, only 15% of consumer prices and 20% of producer prices change every month. In comparison with the US, patterns of price setting are similar for producer prices but different for consumer prices, with US consumer prices being more flexible. In the United States, 26% of consumer prices change every month and a typical consumer price changes on average every two quarters against every four to five quarters in the euro area.

There is much more heterogeneity regarding the frequency of price changes across sectors than across euro-area countries. The frequency of price changes is stronger in sectors where demand, supply or input costs substantially fluctuate, such as energy products (78% of consumer prices changing every month) and unprocessed foods (28%). At the other end of spectrum, prices of services change less frequently (6%). Price decreases constitute a large share of all recorded price changes: around 40% of both consumer and producer price changes are price reductions. This pattern is apparent in all sectors, with the exception of services where only 20% of price changes are price decreases.

These results, which seem to indicate that prices of services are less flexible downwards, are corroborated by recent work on the causes of inflation in services (see European Commission, 2006a). Services inflation in the euro area has generally been higher than headline inflation, and much higher than non-energy industrial goods inflation. Since 1999, services inflation in the euro area has averaged 2.3%, while inflation in non-energy industrial goods has averaged about 0.7%. Amongst euro-area Member States, services inflation has been highest in fast-growing or catching-up countries such as Ireland, Portugal, Spain and Greece, but it has also been well above average in Italy, Luxembourg and the Netherlands. While real convergence, long-term supply and demand changes for specific services, policy reforms (e.g. healthcare reforms) and changes in administered prices explain a sizeable part of the higher inflation in services compared to goods, it also appears that some services sectors, such as the network industries, retail trade, and professional services, suffer from regulatory distortions, downward price rigidities and insufficient competition.

The surveys on price-setting behaviour also show that euro-area firms do not yet set competitive prices and continue to price discriminate. First, mark-up pricing by firms is the dominant price setting behaviour adopted by firms in the euro area (54%) and the lower the level of competition, the more frequently this method is used. But prices of around 30% of euro-area firms are also shaped by the prices of their competitors. Second, price discrimination is a common practice among euro-area firms: around 80% of euro-area firms set their prices on a case-by-case basis or based on

the quantity of the product sold. One can regret that the survey does not allow one to determine whether price discrimination continues to take place across countries.

These surveys also investigated the reasons for price rigidities in the euro area. The most prominent factors preventing immediate price adjustments are the existence of implicit and explicit contracts with customers. This indicates that firms want to establish long-term relations with their customers in order to make their sales more predictable. Other reason relates to "cost-based pricing", which assumes that prices do not change unless the costs incurred by firms change, and to "competitors' prices", which implies that firms may prefer not to change their price unless one of their competitors moves first.

Finally, the surveys have provided some empirical evidence corroborating the assumption made above that an increase in competition should improve the price adjustment in the euro area. Survey results show that price dynamics are positively related to the degree of competition on product markets.<sup>21</sup> However, there appears to be an asymmetry in price adjustment to shocks, depending on the source of shock and the direction of adjustment.<sup>22</sup> Cost shocks (raw materials and labour costs) are more relevant in driving prices upwards than downwards, while shocks to market conditions (changes in demand and in competitors' prices) matter more for price decreases than for price increases. Firms in highly competitive markets are more likely to react more strongly to price-reducing and price-increasing shocks. However, this effect is stronger in the case of price-decreasing factors, especially those resulting from the demand side.

#### *Evolution in the intensity of product market regulation*

Despite the fact that the EU has initiated significant reforms over the past decade and a half, there remains a widespread perception that EU product markets are heavily regulated. In order to verify whether this is indeed the case and to assess recent changes in the intensity of product market regulation in the euro area, this section presents and analyses three main sources of information on regulatory reforms carried out in different countries (see Box 4 for the definition of these three sources of information).

#### **Box 4: Measurement of product-market regulation**

The degree of product market regulation is difficult to measure as it covers a wide range of policy measures. Therefore, summary indicators are generally used to measure the degree and the changes in product market regulation over time in different countries. Three types of summary indicators are used here:

- First, the indicator of general economic freedom and its different components as presented by the Fraser Institute. This indicator combines data summarising the degree of regulation of credit markets, labour markets and business with information on the strength of property rights, the state involvement in the economy, financial stability and freedom of trade. For a discussion of shock transmission mechanisms, the information on business regulation, state involvement in the economy and freedom of trade is particularly relevant. The indicator has been calculated every five years since 1970 and annually since 2000. However, the comparability over time of the indicator is limited and comparisons can only be made at a relatively disaggregated level.
- Second, the World Bank's database "Doing Business". This database includes indicators on the cost of doing business by identifying specific regulations that enhance or constrain business investment, productivity and growth. Annual data are available for the period 2003-2006.

Third, the product market regulation database constructed by the OECD. The information contained in this database is based on the answers provided by OECD Members to a questionnaire containing 805 questions in the following domains: general policies (antitrust, control, market access, etc.), regulatory and administrative policies, administrative requirements for business start-ups, regulation of professional services, regulation in transportation industries, and regulation in the retail distribution industry. Data have been collected for two years only: 1998 and 2003. Nevertheless, the data allow to indicators of product market regulation to be constructed at various levels of aggregation, using weighting techniques such as principal component analysis (see Nicoletti et al., 2000).

#### *Fraser index of general economic freedom*

According to the Fraser ranking of general economic freedom calculated for the year 2004 (the latest year for which data are available) the US is tied for third place. Ireland and the UK, which are tied for sixth place, are the highest

<sup>21</sup> For producer prices, the more competitive the environment, the more frequently prices change. For consumer prices, there is substantial evidence that the frequency of price changes depends on the outlet type and is higher in super/hyper markets than in traditional corner shops.

<sup>22</sup> Prices react more when costs increase than when they decrease. The development of labour and raw material costs may lead to price increases but financial costs are of relatively minor importance. Prices decrease more when demand falls than they increase when demand rises. Price decreases are mainly influenced by weakening demand and decreasing prices charged by competitors.

ranked EU Member States (see Gwartney, Lawson and Easterly, 2006). Large euro-area countries such as Germany (17), France (24) and Italy (45) take up lower positions.

The more specific Fraser index measuring business regulation is designed to identify the extent to which regulatory restraint and bureaucratic procedures limit competition and the operation of product markets. It consists of five components: (i) price controls; (ii) extent of administrative procedures; (iii) time spent with government bureaucracy; (iv) the difficulty of starting a new business; and (v) the need to make irregular payments. According to this index, the intensity of product market regulation in the euro area is higher than that in the US but slightly below that in the EU as a whole. The euro area has fewer price controls and irregular payments than the EU as a whole. A closer look at the different components shows that it is more difficult to start a new business in the euro area than in the EU as a whole and that the time spent with government bureaucracy is longer. Amongst euro-area Member States, Finland, Austria and Ireland are the least regulated with levels of regulation even below that of the US (see Table 6). Business regulation in countries such as Greece, Portugal and Spain and Italy, on the other hand, appears to be rather onerous, which serves to illustrate the large disparities between EU Member States in terms of product market regulation.

**Table 6: Fraser index of business regulation 2004<sup>1</sup>**

	United States	EU25	Euro area	Low level of regulation in euro area	High level of regulation in euro area
<b>Price controls</b>	6.0	5.8	5.7	Austria 9.0 Finland 9.0	Spain 3.0 Greece 5.0 Portugal 5.0
<b>Burden of Regulations</b>	4.3	3.1	3.0	Finland 5.8 Ireland 4.6 Spain 4.1	Italy 1.8 Belgium 2.0 Germany 2.8
<b>Time with government bureaucracy</b>	7.1	7.4	7.2	Finland 9.7 Luxemburg 8.6 Ireland 8.3	Portugal 4.6 Netherlands 5.8 Greece 6.5
<b>Starting a new business</b>	8.5	6.7	6.3	Finland 8.2 Netherlands 7.6 Luxemburg 7.0	Portugal 4.6 Spain 4.8 Greece 5.0
<b>Irregular payments</b>	8.5	8.1	8.1	Finland 9.1 Luxemburg 8.8 Austria 8.7	Greece 6.2 Belgium 7.3 Italy 7.5
<b>Business regulation in general</b>	6.9	6.2	6.1	Finland 8.4 Austria 7.2 Ireland 7.1	Greece 5.2 Portugal 5.3 Spain 5.4

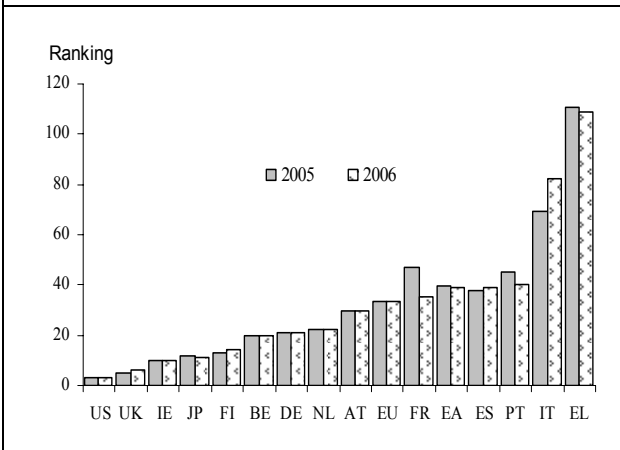
*Note:* 1- a low value indicates a high level of regulation. For EU25 and the euro area, the GDP-weighted average is shown. The EU25 and EA aggregates take account of the fact that no data are available in 1998 for CY, LT, LV, MT, and SI; and in 2000 for CY, LU, and MT.

*Source:* Gwartney, Lawson and Easterly (2006)

#### *World Bank measure of the ease of doing business*

The 'ease of doing business indicator' of the World Bank (2006) is based on information about how laws and regulations affect the ease of (i) starting a business; (ii) getting licences; (iii) hiring and firing workers; (iv) registering property; (v) getting credit; (vi) protecting investors; (vii) paying taxes; (viii) trading across borders; (ix) enforcing contracts; and (x) closing a business. It therefore covers a whole range of factors that reflect market regulation. According to this indicator (see Graph 12) most of the euro-area Member States do not perform particularly well, especially in comparison with major competitors such as the UK, the US and Japan. Amongst the euro-area Member States the situation in Italy and Greece appears most problematic, while Belgium, Germany, the Netherlands and especially Ireland and Finland appear to do a better job of facilitating business operations.

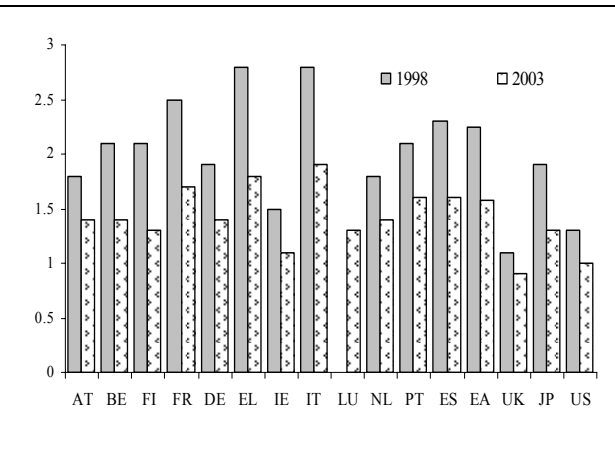
**Graph 12: Ease of doing business (ranking, 2005 and 2006)**



*Note:* For the EU25 and the euro area, the GDP-weighted average is shown.

*Source:* World Bank (2006)

**Graph 13: Product market regulation, 1998 and 2003**



*Note:* For the euro area, the GDP-weighted average is shown.

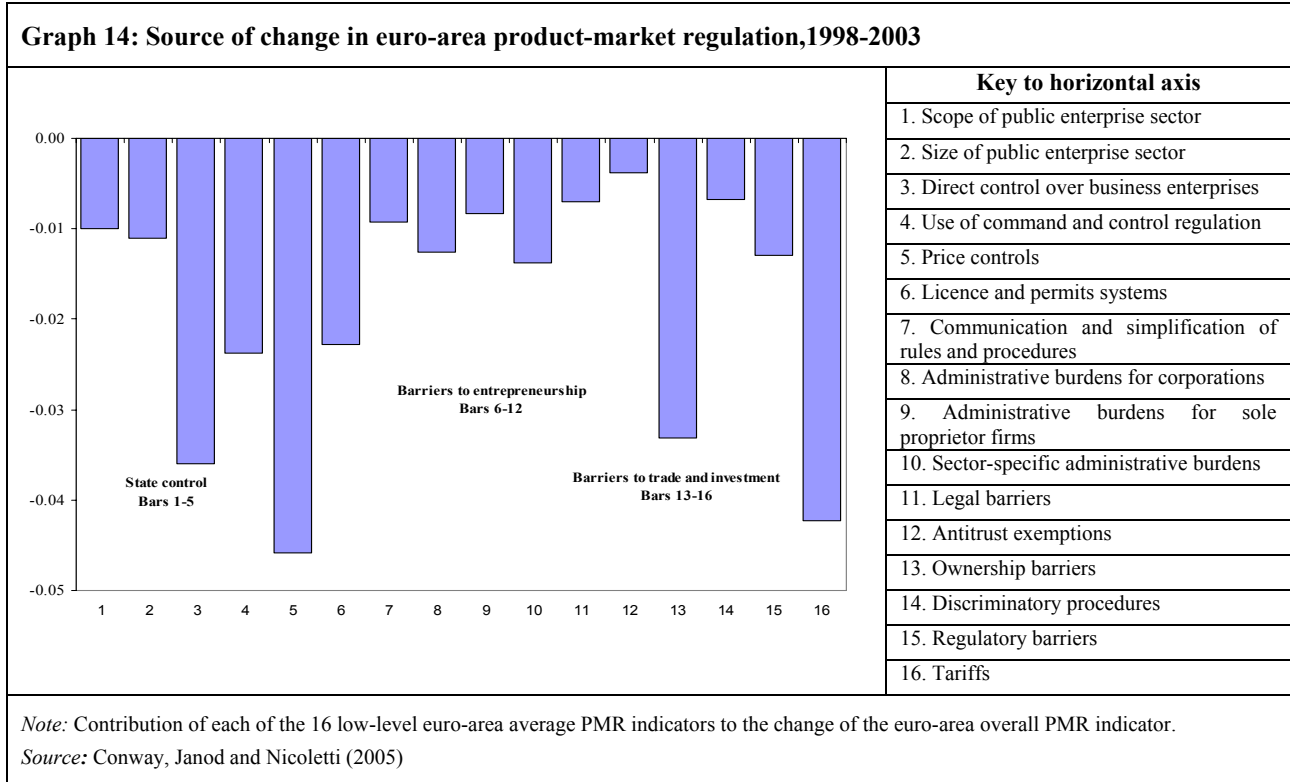
*Source:* Conway, Janod and Nicoletti (2005)

*OECD product market regulation database*

The OECD product market regulation database contains indicators of barriers to entrepreneurship, state control and barriers to trade and investment. Conway, Janod and Nicoletti (2005) describe the changes observed in product market regulation in OECD countries between 1998 and 2003. Graph 13 illustrates the visible progress that has been made in reducing the regulatory barriers in euro-area countries. It appears that on average those countries that had the highest level of product market regulation are those that have carried out the most substantial reforms.

The relative positions of the different euro-area Member States, however, have not changed much between 1998 and 2003. The regulatory regime in Spain appears to have become less restrictive, while Ireland has moved in the opposite direction. France, Italy and Greece consistently have the highest level of product market regulation. The OECD database also confirms the observation already made on the basis of indicators calculated by the Fraser Institute and the World Bank that product markets in the euro-area countries are generally more regulated than those in the UK and the US. The OECD associates this with higher levels of state control and greater barriers to entrepreneurship in the euro area, while the barriers to trade and investment are similar in the US and the euro area.

A comparison of regulatory change in different domains show that the overall decline in the level of product market regulation in euro-area countries over the period 1998-2003 is mostly due to a decline in state control (via a reduction in price controls and in direct government control over businesses) and to the elimination of barriers to trade and investment (via lower tariffs and fewer restrictions on foreign investment). Barriers to entrepreneurship have decreased less (see Graph 14). However, as indicated in the next section, the gap with the in terms of business start-up conditions has narrowed.

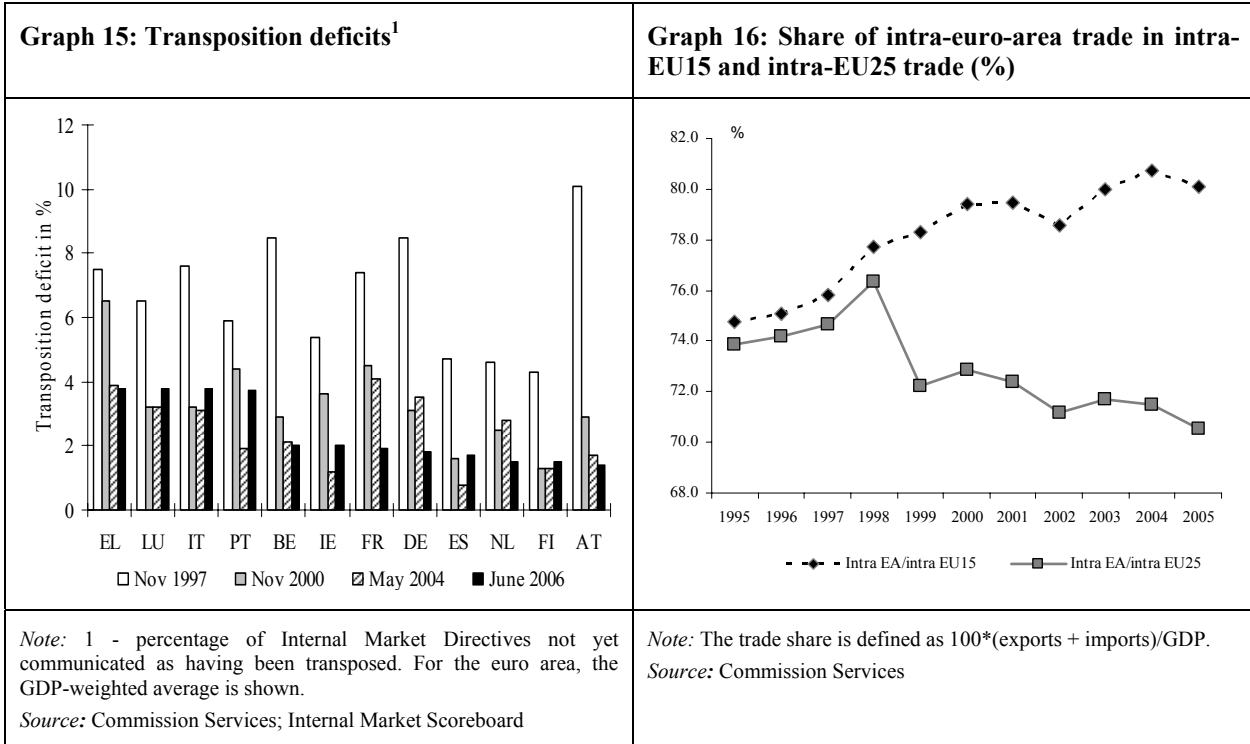


*Important product market reforms since 1999*

This section reviews the progress (or lack of progress) made in a number of important areas of product market reforms since the introduction of the euro in 1999. The focus will be on reforms that facilitate the adjustment to shocks in the euro area, as discussed above.

*Reinforcing the Internal Market*

A better functioning Internal Market allows a more rapid dissipation of asymmetric shocks, as excess demand (or supply) for goods and services in one region within the euro area can be satisfied by supply (or demand) from another region. Adoption and implementation of Internal Market Directives is the main policy tool specifically targeted at creating a better functioning Internal Market. Over the period 1999-2006, a number of important Directives have been proposed by the Commission, agreed with Council and Parliament, and started to be implemented by the Member States: the legal framework for electronic commerce (adopted in 2000); modernising legislation in public procurement (2004); consolidation and modernisation of rules regulating the recognition of professional qualifications (2005); and, political agreement within the Council for a draft services directive (2006). However, all these new Directives need to be implemented in order to be effective. The poor performance of many euro-area Member States in transposing and applying Internal Market legislation remains a source of concern. For example, only three euro-area countries (Netherlands, Austria and Finland) currently meet the 1.5% transposition deficit target. In four euro-area countries (Greece, Luxemburg, Italy and Portugal), the transposition deficit is particularly high (around 4%). Nevertheless, Graph 15 also shows significant progress made by Germany, France and the Netherlands.



In goods, increased use is made of the new approach to standardisation, which has served to reduce non-tariff barriers within the Internal Market. In areas where no common standards have been agreed, the principle of mutual recognition applies, which allows goods legally manufactured and/or sold in one country to be sold elsewhere without further formalities. In 2003, the Commission published a Communication clarifying this principle and aiming to help businesses and national administrations make it work better. The fact that the Commission saw the need to publish such a Communication illustrates the continued problems with the practical application of the mutual recognition principle. It also illustrates the need to make faster progress with standardisation. The new approach is an important step forward in this respect.

Progress in creating a more integrated market can also be assessed *ex post*, for example through investigation of developments in terms of intra-euro-area trade flows or price dispersion. Since 2000, the ratio of intra-euro-area trade (defined as the sum of exports and imports) to GDP has remained pretty much unchanged within the range of 26-28%, following a rather more rapid rise in the 1990s. The positive trade effect associated with the introduction of the euro<sup>23</sup> appears to have been offset by the dampening effects of the relatively subdued economic growth rates in the euro area. However, one can also observe an overall increasing trend in the share of intra-euro-area trade in total intra-EU15 trade, confirming the importance of the euro for the deepening of economic integration in the EU. The trade-boosting effect of the introduction of the euro has however been far less pronounced than the trade effects of enlargement, as illustrated by the decreasing ratio of intra-euro-area trade to intra-EU25 trade since 1998 (see Graph 16).

The dispersion of consumer prices within the euro area (11.6 in 2004, as measured by the coefficient of variation) is well below that of the European Union as a whole (27.7), indicating that the euro-area economies are relatively well integrated. Nevertheless, the speed of price convergence within the euro area has slowed down, in particular in comparison with the hey-day of the Single Market Programme in the early 1990s. This slowdown in price convergence should not come unexpected. Price levels are already much more harmonised than across the EU 25 and a large part of the remaining dispersion is structural and associated with differences in indirect taxation and transport costs. However, as shown above, price discrimination continues to be a common practice and barriers still hamper the tradability and market access in certain sectors, particularly in services.

#### *Liberalising network industries*

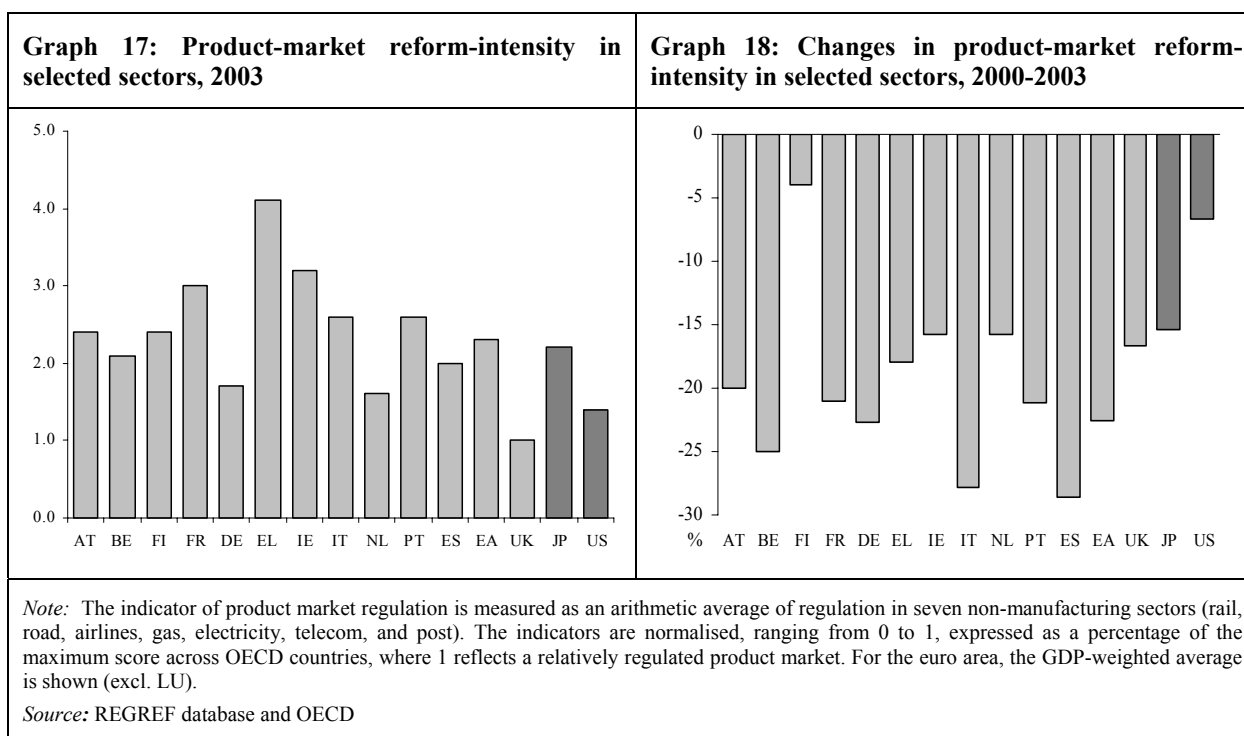
The on-going process of liberalisation in the network industries implies a stepwise opening up of the telecommunications, postal services, energy and transport sectors to competition. Disentangling the effects of liberalisation from those of other influences poses many problems. Nevertheless, one may argue that the transition

<sup>23</sup> Baldwin (2006) suggests that the introduction of the euro has raised intra-euro zone trade by between 5% and 10%.

from national monopolistic markets dominated by an incumbent supplier to more contestable markets with many players should speed up the adjustment to shocks. When a monopolist is exposed to a negative supply side shock implying, for example, an increase in production costs, there is no need for immediate adjustment as he will be able to absorb the shock through a reduction in his mark-up. In a more competitive market, however, suppliers do not have the means to wait as the threat of lower mark-ups requires an immediate response.

Progress with liberalisation varies significantly between sectors. While regulatory conditions have remained tight in rail transport, they have loosened up considerably in telecommunication and air transport. Looking at the different industries in turn, we find that in spite of progress made, the incumbents often still hold a very large share of the market in the fixed telecommunications segment. Nevertheless, the number of players is increasing and the market share of the incumbent is falling almost everywhere and in each market segment (local, long-distance and international). In mobile telephony, the market shares of the leading operators have continued to fall. In postal services, liberalisation has also fostered competition by gradually opening up the market for different product items. The 2002 amendment of the Postal Directive defined further steps in the liberalisation process. The electricity and gas directives of 2003 required full market opening by 1 July 2007 at the latest. Many Member States are ahead of this time schedule. In some Member States, market entry in the energy sector, notably by incumbents from neighbouring countries, has had an effect. Nevertheless, energy markets remain highly concentrated for both historical and technological reasons. Regulatory weaknesses also limit the degree of competition. Despite the ongoing opening of the rail sector (the second railways package adopted in 2004 foresees a full opening up of the freight sector by January 2007), the market share of new entrants is still rather low (around 10% on average).

The OECD has calculated an indicator to track regulatory conditions in seven network industries. This indicator is based on different industry characteristics including entry regulation, public ownership, market structure, vertical integration and price controls. It shows a relatively high level of regulation in France, Greece and Ireland and lower levels in Germany and the Netherlands (see Graph 17). While in 2003 network industries in the euro area were still more heavily regulated than in the US, the process of deregulation (over the period 2000-2003) was more rapid in the euro area. This process was particularly fast in Belgium, Italy and Spain (see Graph 18).



### Strengthening competition policy

As already mentioned, more competitive markets should lead to a more rapid adjustment to economic shocks. Stronger EU competition policy should therefore contribute to the capacity of the euro area to adjust. Over the past couple of years, the guidelines governing the three main elements of EU competition policy (anti-trust, merger and State aid policies) have been reconsidered in the light of economic principles.

The modernisation of the EU anti-trust enforcement system, which became effective on 1 May 2004: strengthened the Commission's powers to obtain information; allowed higher fines for anti-competitive behaviour; increased incentives for "whistle-blowers" in cartel cases; and improved coordination between national competition authorities

and the Commission. The sharing of work between Commission and national authorities was to be determined on the basis of which institution was best placed to investigate and prosecute a case. The new system also encouraged firms (and consumer groups) to make more use of the national courts for private enforcement of competition law. So far, little follow-up has been carried out on this latter initiative. Finally, the Commission has started to devote more resources to own-initiative investigations of problem markets, such as, for example, the still on-going inquiries into financial services and energy markets.

The new merger regulation, which entered into force in May 2004, clarified that the Commission and the national competition authorities had the power to investigate all types of harmful scenarios in a merger, ranging from dominance by a single firm to the effects stemming from a situation of oligopoly that might harm the interests of EU consumers. It also explicitly recognised the possibility of an efficiency defence to be used by the merging parties.

Finally, the June 2005 State Aid Action Plan outlined the guiding principles for a comprehensive reform of state aid rules over the next five years. In particular the document set out how the Commission intends to use EC Treaty state aid rules to encourage Member States to contribute to the Strategy for Growth and Jobs by reducing overall aid levels while focusing remaining aid on improving the competitiveness of EU industry, creating sustainable jobs, ensuring social and regional cohesion, and improving public services.

#### *Facilitating market entry and exit*

Economic adjustment in case of exposure to shocks can also be encouraged by measures that make it easier for firms to enter or leave the market. Within the context of the Lisbon strategy for growth and jobs Member States have taken various measures to facilitate market entry (by SMEs in particular): improved access to venture capital or other modes of financing; the setting-up of one-stop-shops to help reduce the time and costs required for setting up a new business; the easing of the regulatory burden on business start-ups, tax reform, etc. Some Member States have also launched initiatives aimed at reducing the costs associated with market exit (e.g. by changes in bankruptcy legislation or through labour market reform).

In spite of this, the performance of euro-area Member States in terms of facilitating market entry and exit leaves room for improvement. This point may be illustrated by the indicator measuring the difficulty of starting a new business as calculated by the Fraser Institute. While for most business regulation indicators differences between the euro area and the US are not particularly large, this is not the case for the "starting a new business" indicator (see Table 6). While the conditions for business start-ups in the best performing EU Member States (Finland, the UK and Sweden) are rather similar to those of the US, most other euro-area Member States tend to lag behind the best performers (see Table 7). This observation should be a cause for concern as market entry and exit are important not only as an instrument to speed up the adjustment process, but also as a key determinant of innovation and growth (see European Commission, 2006c).

Nevertheless, the measures recently taken to facilitate market entry are starting to be reflected in the Fraser index. While the value of the start-up indicator in the US has remained basically unchanged over the last decade, it has improved significantly in the euro area and even more so in the EU as a whole. France and Italy, in particular, have made a significant effort to improve business start-up conditions (see Table 7). This is an indication of an increased awareness of the importance of facilitating business start-ups.



**Table 7: Fraser index of business regulation "starting a new business"**

	United States	Japan	United Kingdom	EU25	Euro area	Most favourable value / Highest positive variation in the euro area	Most unfavourable value / Highest negative variation in the euro area
<b>2004</b>	8.5	6.3	8.0	6.7	6.3	Finland 8.2 Netherlands 7.6 Luxemburg 7.0	Portugal 4.6 Spain 4.8 Greece 5.0
<b>2000</b>	8.4	5.9	7.7	6.3	5.9	Finland 8.8 Netherlands 7.6 Ireland 6.9	Greece 4.1 Italy 5.1 France 5.2
<b>1995</b>	8.4	4.7	8.1	5.2	4.7	Finland 8.5 Ireland 7.6 Netherlands 7.5	France 3.4 Austria 3.7 Italy 4.1
<b>Change 2000 - 2004</b>	0.1	0.4	0.2	0.4	0.5	France 1.7 Italy 1.2 Austria 0.9	Portugal -1.1 Belgium -0.8 Spain -0.8
<b>Change 1995 - 2000</b>	0.0	1.1	-0.3	1.1	1.2	Belgium 1.8 France 1.7 Austria 1.7	Ireland -0.7 Greece -0.1

*Note:* Change over time is measured by the variation in the indicator. A positive (negative) value points to a decrease (an increase) in regulation over time. For EU25 and the euro area, the GDP-weighted average is shown. The EU25 and EA aggregates take into account the fact that no data are available in 1998 for CY, LT, LV, MT and SI; and in 2000 for CY, LU, and MT.

*Source:* Gwartney, Lawson and Easterly (2006)

### Conclusions

Product market reforms speed up adjustment in the euro area by increasing the incentives for firms to adapt prices and quantities to changing market conditions. A better functioning Internal Market facilitates the reallocation of goods and services across the EU territory and helps create a more competitive business environment. More competitive product markets also ensure that companies adjust to supply and demand shocks by adapting their prices. The degree of competition also matters in shaping price behaviour when it comes to the driving forces of price adjustment. In particular, prices are less sticky in more competitive markets. Firms in highly competitive markets are more likely to react more strongly to price-reducing and price-increasing shocks. However, surveys show that this effect is stronger in the case of price-decreasing factors, especially those resulting from the demand side. Finally, product market reforms can contribute to amplifying the effects of labour market reforms. In less competitive markets, firms may appropriate a large share of the cost reduction in the form of higher profits.

While product market reforms can contribute to a smooth adjustment in the euro area, product markets in the euro area remain highly regulated, at least in comparison with major competitors such as the UK, the US and Japan. Moreover, there are significant differences between euro-area Member States. Nevertheless, in recent years visible progress has been made in reducing regulatory barriers. Over the period 1999-2006, a number of important Internal Market directives were adopted, but progress in terms of implementation has been somewhat disappointing. Data on price dispersion and trade integration seem to indicate that progress has indeed slowed down in comparison with the early 1990s. For the future, an effective implementation of the services directive would seem essential. In network industries, the euro-area process of deregulation has been more rapid than that in the US, but according to the latest figures regulation levels in the euro area are still above those in the US. EU competition policy rules have been reviewed to better reflect the principles of economic theory. Member States have taken various measures to better facilitate market entry and exit. Nevertheless, it remains more relatively difficult to start a new business in the euro area. This is a cause for concern as market entry and exit are important not only as instruments to speed up the adjustment process but also as key determinants of innovation and growth. To end on a more positive note, it has to be signalled that the gap with the US has narrowed over recent years and the efforts of euro-area Member States to improve business start-up conditions are starting to be recognised.

### 3.3 The financial sector

#### *Reform through integration*

Structural reform in the EU financial sector, which has intensified markedly since the creation of the euro area, has mainly taken the form of measures to facilitate cross-border integration. This focus on reform through integration

reflects a two-step rationale whereby integration promotes financial development and financial development in turn enhances economic performance. The introduction of the euro has acted as a powerful catalyst to the process of financial integration by removing exchange rate risk on the bulk of financial flows within the EU and stimulating demand for cross-border financial services.

#### *Economic rationale for EU financial integration*

The financial sector plays a key role in the economy by allocating economic resources efficiently in time and space, thereby enabling real-sector activity to expand and develop optimally. In playing this role, a well-functioning financial sector must provide the means to:

- execute financial transactions on a cost-effective and safe basis through the appropriate mechanisms for trading, clearance and settlement;
- pool investor resources and subdivide shares in available investment opportunities, thereby overcoming issues of scale in the resource allocation process;
- price and manage effectively the risks related to financial transactions through providing liquidity;
- reflect available information efficiently in prices so as to overcome problems of co-ordination in decentralised decision making; and
- address possible incentive problems created by the existence of information asymmetries and the principal-agent relationship in the financial intermediation process.

To the extent that the financial sector is constrained in the performance of these various functions, there is a consequent cost in terms of sub-optimal economic performance and welfare loss.

Within the European Union, the financial sectors of the Member States have evolved to reflect specific national conditions and preferences. While these systems are generally efficient from a national perspective, they are much less so when viewed from the perspective of a progressively integrating EU economy. At the EU level, a divergence has emerged between the real sector which increasingly operates on a cross-border basis (see above) and a still highly fragmented financial sector. The degree of fragmentation is such that the EU financial sector cannot function efficiently and so acts as a drag on the overall performance of the EU economy. The costs and risks associated with cross-border financial transactions are unnecessarily high, thereby discouraging the conduct of financial activity on a pan-EU basis. The result is an inefficient allocation of economic resources due to unexploited scale/scope economies, sub-optimal risk management, inefficient pricing and reduced opportunities for investment/consumption smoothing. In light of these inefficiencies, financial integration has become an EU policy and now forms an integral part of the Lisbon strategy as a means to deliver a more productive use of capital and higher output potential.

#### *Blueprint for an integrated EU financial market*

The blueprint for an integrated EU financial sector is the Financial Services Action Plan (FSAP). The FSAP comprises 42 separate measures targeted at a wide range of financial activities. These measures relate to both wholesale and retail levels and can be related to the various financial-sector functions described above – for example, by improving the inter-operability of national clearing and settlement systems (Communications on clearing and settlement), establishing common rules for integrated securities and derivatives markets (the Market in Financial Instruments Directive), facilitating the raising of capital on an EU-wide basis (the Directive on Prospectuses), ensuring legal certainty in the cross-border use of collateral (the Directives on Settlement Finality and Financial Collateral Arrangements), setting common standards for financial reporting (the Regulation on International Accounting Standards), promoting investor confidence and market integrity (Directive on Market Manipulation) and facilitating cross-border retail payments. The FSAP is now fully implemented at EU level, while some of the legislative measures are still to be transposed into national law by Member States.

#### *Quantifying the economic benefits of EU financial integration*

It will be a considerable time before the impact of the euro and the FSAP on the functioning of the EU financial sector and broader economy can be assessed directly. Any assessment at this stage must rely on more indirect approaches using model-based estimations. In this context, the results of two independent studies undertaken on behalf of the Commission are of interest.

- A study by London Economics (2002; henceforth LE) adopts a macroeconomic approach to quantifying the economic effect of financial integration in the EU. The study focuses on the benefits of integrating the set of fragmented national systems into a pan-EU system by estimating the *static* efficiency gains from deeper and more liquid equity and bond markets. These gains are supplemented by improvements in the functioning of market infrastructure and greater competition between sources of direct and indirect financing. The study

concludes that fully integrated markets could – in the medium-to-long term – lower the cost of capital for EU companies by about 0.5 percentage points, and that this could bring about: (i) a rise in the level of GDP of 1.1% in the long run; (ii) a 6% increase in the level of investment; (iii) a 0.8% increase in the level of private consumption; and (iv) a rise of 0.5% in the level of employment. The authors suggest that introducing *dynamic* adjustments would greatly increase the output and employment gains. The study also presents the results of a survey of market participants, which is used to confirm the assumptions underlying the empirical analysis.

- The second study by a group of CEPR (Gianetti et al., 2002) researchers adopts a more microeconomic approach and focuses on the relationship between financial-market integration and corporate growth. A three-stage approach is used. First, the authors screen the available measures of financial development – related for instance to efficiency or the size of the financial system. Second, they examine the impact of financial integration on financial development, which is expected to be positive, both quantitatively (larger market and access to foreign markets and lenders) and qualitatively (importing better institutions, e.g. relating to creditor rights and investor protection). Third, an econometric analysis, at both industry sector and firm level, provides estimates of the output growth effects of greater financial development due to integration. In a scenario in which EU manufacturing companies would have the same access to finance as US companies, value-added growth in EU manufacturing is estimated to increase by 0.75–0.94 percent on a durable basis.

Quantifying the costs and benefits of financial integration is very difficult and is subject to significant data, statistical and model uncertainty. Accordingly, the results of these two studies can be considered only as indicative of the potential benefits of EU financial integration. In addition, exploiting these benefits fully will require flanking policies in the fields of competition, market transparency/integrity and financial stability. Nevertheless, the results of the studies tend to validate the rationale underlying the EU policy on financial integration

#### *State of play in EU financial integration*

The process of EU financial integration is well underway in a range of areas and particularly in wholesale markets. However, progress has varied across the different sectors of the financial system, with unsecured segments (where there is no transfer of collateral involved) very much in the lead.

- The euro-area derivatives market is highly integrated with a sharp expansion of euro interest swap activity and the rise of pan-European equity based index trading. As regards the integration of money markets, the market for interbank deposits is fully integrated, as witnessed by the acceptance of market participants of EONIA (Euro Overnight Index Average) and EURIBOR (Euro Inter-Bank Offered Rate) as uniform price references. On the other hand, various obstacles (i.e. technical, regulatory, fiscal and legal) related to the clearing and settlement are holding back the integration of the secured market segments, (e.g. commercial paper and treasury bills) which involve the exchange of liquidity against collateral.
- The launch of the euro created a much more homogenous EU bond market, with largely convergent prices among euro-area member states and evidence of cross-border portfolio diversification. A deeper and more liquid euro-denominated bond market has resulted in higher net and gross issuance volumes for the market as a whole, when compared to the combined issuance in the legacy currencies. Although a part of the rise in euro-denominated issuance has been accounted for by the public sector – where the euro sovereign debt market is beginning to rival the US Treasury market for issuers and investors - the introduction of the euro has also fostered a widening and deepening of the euro-area market for bonds issued by the private sector.
- In equity trading, the impact of the euro has so far been strongest at the level of the investor, with an overall reduction in “home bias” and a re-orientation of asset managers’ investment strategies towards a European-based approach. In consequence, a number of studies have found increased correlation among the performance of national stock markets. In contrast, with cross-border listings still exceptional, there is little evidence of a euro impact on the behaviour of issuers. Integration in the equity market is also particularly impeded by inefficiencies in the clearing and settlement process.
- There has been a significant amount of M&As in the banking sector – still the dominant sector in providing euro-area financing - although consolidation has mainly occurred along national lines due to a number of still existing legal and political barriers. The lack of cross-border banking integration is also reflected in the dispersion of national retail interest rates (for example for consumer credits or mortgages).
- Consolidation in euro-area market infrastructure can be witnessed in Europe’s stock exchanges, where notable examples would include the merger of exchanges in Amsterdam, Brussels, Paris, and Lisbon in Euronext, and the integrated Nordic-Baltic market, which includes the stock exchanges of Copenhagen, Stockholm, Helsinki, Tallinn, Riga and Vilnius. Some progress has been made in the integration of payment systems, such as through TARGET and in clearing and settlement systems.

### *Established priorities for EU financial integration*

The Commission White Paper on Financial Services Policy in 2005-2010 has set the agenda for EU-level financial-sector reform in the coming five years. The White Paper affords high priority to transposition issues, as well as to continuous ex-post evaluation of existing policies and rules. In addition to the focus of the full implementation of the FSAP, the Commission has outlined areas where there may be a need for further efforts:

- Clearing and settlement, where cross-border clearing and settlement transaction are far more costly than domestic transactions, due to technical, legal and fiscal obstacles. The Commission will now assist the clearing and settlement industry to establish a voluntary code of conduct, which will be designed to eliminate sources of inefficiency in cross-border activities.<sup>24</sup>
- A new Solvency Directive, which will overhaul EU regulation and supervision in the insurance area.
- EU supervisory arrangements, where greater clarity and transparency is needed from the perspective of financial-system efficiency and stability;
- Retail sector, where three initiatives are underway: (a) a white paper on mortgage credit based on extensive consultations with stakeholders will be published in 2007; (b) a modified consumer credit directive; and (c) a proposal on payment services directive to enhance the competition and to facilitate the creation of a single EU payment area (SEPA) by 2010.
- The investment fund industry is another area, where further work may be needed. Three industry reports that analyses the main challenge facing different segments of the EU investment fund industry focusing on retail investment funds (UCITS), hedge funds and private equity recommending improvements to EU investment fund framework were published in July 2006.
- Looking globally beyond the EU, is the need for international dialogues on financial markets and their regulation with the United States and Japan, but also with the growing new economies in China and India.
- The White Paper acknowledges the significance of horizontal and complementary policy issues, such as corporate governance and accounting reform and mentions as well the necessity to debate the political accountability of the global accounting standard-setting bodies, such as the International Accounting Standards Board, where a strengthening of public oversight is demanded. In order to ensure financial stability, the Commission underlines the need for strengthening financial-sector supervision through an evolutionary, bottom up approach.

## **4. Possible interactions and spillovers**

The analyses in this chapter and the previous two chapters have explored the working of three inter-country adjustment channels under monetary union. The workings of these channels cannot be viewed in isolation from one another. Indeed, interactions between them can potentially be important for the efficiency of the adjustment process. In the short to medium-term, it is helpful to focus on the adjustment process at the macroeconomic level, and in terms of mainly demand-side variables. It may be helpful to think of such adjustment channels in terms of a triangle:

- In the absence of a national monetary policy, shifts in the intra-euro-area real effective exchange rate are the equilibrating mechanism that brings a euro-area member back in line with area cyclical conditions and the stance of the common monetary policy.
- Real interest rate effects (while difficult to measure) can retard this adjustment to the extent that they behave pro-cyclically under country-specific shocks, and thus widen the amplitude of swings in the real exchange rate.
- National policies also affect the adjustment process: fiscal policy can influence cyclical conditions and the real exchange rate in the short to medium-term, while structural policies can enhance the efficiency of adjustment in the medium-term.

This raises several obvious – but quite complex – questions about adjustment experience and the scope for national policy action. One question is the degree and speed of dominance of the adjustment channel over the real interest rate channel. When one considers extended real exchange rate cycles and associated inflation divergences, do these result from the nature of economic shocks, or are they more accounted for by the perverse impact of real interest rates?

A second question concerns fiscal policy. Within the framework of the reformed Stability and Growth Pact, how far should national fiscal policy seek to contribute to necessary real exchange-rate adjustment. It is the obvious instrument to help guide the real exchange rate. Are the normal objections to fiscal activism less persuasive during

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<sup>24</sup> Lowering transactions cost by 7 to 18% and raising GDP on average by 0.2 to 0.6% in subsequent years.

extended adjustment cycles? Or should the concern just be to avoid imparting a pro-cyclical impulse in the adjustment process?

Third, regarding labour and product market policies, where do the priorities lie to foster more efficient adjustment? The evidence above suggests, for example, wide variation in the responsiveness of wages and unit labour costs to the level of output gaps – especially at times of cyclical slack. What priorities could help improve this responsiveness? There are also major differences in efficiency in terms of the respective contribution of wages and productivity in achieving real exchange rate changes. This matters greatly: reliance on slow nominal wage growth may be costly in terms of output sacrifice as price levels are corrected.

Finally, there is a question whether experience suggests significant spillovers across economies in the euro area. This could make the contribution of national policies – including the role of structural policies – a matter of urgent common concern.

To understand these questions better, it is helpful to try to model the relative impact of different shocks, as well as real interest rate effects. But it is also necessary to place the resulting insights into a country context, to explore the interactions of these developments with national policy choices. This is the challenge taken up in the next chapter.

# VII. COUNTRY ADJUSTMENT EXPERIENCE

## Summary

*Empirical analysis has provided evidence of several channels of adjustment in the euro area that interact with each other (competitiveness, real interest rates, policy-based channels) in determining the pattern of economic adjustment among economies in the euro area. Acknowledging the complexity of assessing such adjustment, this chapter extends the analysis of experience at the Member State level by linking a model-based exploration with country case studies. The model-based analysis uses a New Keynesian dynamic stochastic general equilibrium (DSGE) model that incorporates various features of the euro-area economy. In a first step, the model is used to explore the path of key variables in each country, and in particular their deviation from the euro-area average. Such deviations are used to identify so-called "shocks", which are considered to be exogenous to the model in order to replicate country-specific developments. The next step is to isolate, through simulations, the subset of shocks that can best reproduce the experience of the country in question. This provides an insight into key determinants of adjustment performance of individual economies. Six country case studies integrate this model-based analysis into a fully-fledged institutional and policy setting, exploring how such factors have interacted to influence adjustment performance in selected Member States whose experience was identified in Chapter III as particularly rich in this regard. A key conclusion is that the adjustment process among economies in the euro area is dynamically stable. When country economies move out of line with the average cyclical position in the area as a result of specific shocks, this situation corrects itself over time: inflation diverges, and losses or gains in competitiveness restore a cyclical position that is in line with common monetary conditions. Some overshooting of intra-area real exchange rates is not excluded, however, depending on policy responses and wage behaviour. As anticipated, national real interest rates shift in a perverse direction (e.g., declining in a boom). By contrast, country-specific shocks are found to be quite powerful in explaining prolonged current account imbalances and movements in intra-area real effective exchange rates. These shocks include, for example, the initial decline in risk premia in the run-up to euro adoption, an easing of credit constraints, shocks to productivity in the traded or non-traded goods sector, or other factors such as migration and demographics. In some cases such shocks interacted in a mutually-reinforcing manner – triggering, for instance, a strong shift of resources into the non-traded goods sector. More broadly, the case studies underscore that the inter-country adjustment process is dynamically complex. Where an economy moves into a country-specific boom, for example, policy and market factors can interact to heighten pro-cyclical effects. Wage-setters, financial market agents and national fiscal managers can quite easily overestimate potential output and underestimate the risk attached to particular income streams, in a way that is mutually reinforcing. The model also highlights the scope for some significant spillover effects across countries. This review of adjustment experience highlights a number of policy lessons, including the dangers of a too easy fiscal policy in "good times", the interaction of shocks and policies in a mutually reinforcing manner, the potential role of spillovers across economies, and the importance of structural reforms that facilitate adjustment when costs and prices move out of line. These insights thus lay an analytical basis for considering, in Chapter VIII, how policies could enhance the functioning of the euro area.*

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# COUNTRY ADJUSTMENT EXPERIENCE

## 1. Analytical framework and preview of results

This chapter encompasses: an overview of the methodology (model-based and case studies) used to investigate economic adjustment under the euro and an explanation of how the results shed light on cross-country developments (section 1); a non-technical elaboration of the two-country, three-sector, dynamic stochastic general equilibrium (DSGE) model (section 2); an analysis of six country cases studies (Germany, Spain, Ireland, Italy, the Netherlands and Portugal) (section 3); a concluding section drawing all of the analysis together (section 4); and an annex describing the DSGE model in greater detail.

### 1.1 *Economic model and country case studies*

The – model and case study – approach to the analysis of country adjustment experience in the euro area should be interpreted as a recognition of the complexity of the issues involved. A purely model-based exploration of adjustment at this early stage of the euro-area story, whilst informative, could be ultimately misleading given the understandably exploratory nature of the modelling effort and the dynamically complex features of the adjustment process itself. Given these realities, the provision of empirically focussed country case studies is essential to tease out not only the dynamics of the process itself but also to confront the simplified model pronouncements with the realities on the ground in the respective Member States.

The case studies explore how economic shocks and policies have interacted in influencing adjustment performance under monetary union. The countries (Germany, Spain, Ireland, Italy, the Netherlands and Portugal) were selected because they are particularly informative with regard to policy and adjustment experience, including through sizable deviations from the euro-area average in growth, inflation and the external current account balance. They also cover both large and small economies, and include real convergence experience that is relevant to new Member States. The approach in the case studies draws together empirical work, model-based analyses and surveillance experience. Each study first outlines the broad macroeconomic performance; then asks what light a model-based analysis can shed on this; and finally offers an assessment of how economic developments interacted with policies to shape the adjustment performance.

The fundamental aim of the adopted approach is to provide a unique combination of empirical and model-based analyses of the structural and policy-induced drivers (both EMU and non-EMU related) of euro-area divergences. In addition, given the often persistent nature of the growth and inflation rate divergences which are evident, an analysis of the lessons which can be learnt from the adjustment experiences of the euro-area's Member States is entirely warranted.

As the subsequent analysis will show, the multi-faceted analytical framework adopted has the potential to provide important insights into not only the origins of the divergences in economic performance but more importantly into the myriad of factors determining both the speed and nature of the adjustment process in the euro area.

Particular attention is placed on the inter-country adjustment channels such as competitiveness and real interest rate changes (already analysed in chapters IV and V) and on the nature of the adjustment interactions between policy and market forces, which can fundamentally shape a country's adjustment performance under monetary union. The objective is not to be definitive or prescriptive but rather to raise issues and provoke debate regarding the lessons to be learnt for future policy design and surveillance work.



## 1.2 General findings of the model analysis

The economic model is designed to explore interactions between each national economy and the remainder of the euro area. In particular, it analyses how the traded and non-traded goods sectors behave, and it identifies separately developments in residential investment. A brief description of the model and its methodology can be found in Box 1.

Several key developments and "shocks" in the early years of the euro area are highlighted in the model in order to explore how far they can account for developments in the country cases. These elements include, for example, elimination of currency risk premia; significant shifts in productivity patterns; and changes in labour and financial markets. This approach performs well since it produces model results which track actual economic developments in the respective countries. From an analysis of the results across the various cases, a number of stylised "lessons" emerge about the euro area's adjustment experience.

The first and most important "lesson" to emerge is that the adjustment process develops along expected lines and is dynamically stable. National economies are seen to move out of line with the average cyclical position in the area as a result of country-specific developments and shocks. But this situation corrects itself over time as inflation starts to diverge and the loss or gain in competitiveness acts to restore a cyclical position which is in line with the common monetary conditions. As this occurs, there is a period when national real interest rates shift in a perverse direction (e.g., declining in a boom). This effect, which is complex to measure, has somewhat less impact than anticipated in explaining prolonged imbalances or gradual adjustment. Nonetheless, some overshooting of intra-area real exchange rates is not excluded, depending on policy responses and wage behaviour.

### **Box 1: The New Keynesian DSGE model: methodology and simulations**

In recent years, the use of dynamic stochastic general equilibrium (DSGE) models has grown rapidly in both academic and policy circles. The New Keynesian DSGE models – of the type used in this year's EU Economy Review – have features that make them particularly useful to policy-makers as an analytical tool, and for policy simulations. These are features which bring them much closer to "real-world" conditions. Agents in these models optimise across time periods; and markets operate with price and wage rigidities. The models also address theoretical concerns of the Lucas critique type, which highlighted the fallacies in using earlier generations of models to simulate policy changes.

The model used in the Review (formally, a calibrated New-Keynesian DSGE model) is designed specifically to probe the nature of adjustment dynamics under monetary union. For this purpose it considers, in each simulation, one euro-area member vis-à-vis the rest of the euro area. The model is based on a stylized economy with three sectors (tradeable and non-tradeable, which in turn is divided into "construction" and "services") and it also distinguishes between "housing" and "non-housing" investment. Financial constraints facing the household sector are explicitly modelled, given the role played by interest rate convergence in a setting of integrating financial markets, and households also display persistent habits in consumption

As a preliminary step, the model is used to explore the path of key variables in each country, and in particular their deviation from the euro-area average. Such deviations are, in turn, used to identify so-called "shocks" that are considered to be exogenous to the model in order to replicate specific developments in each country that may have been key in influencing economic outcomes and adjustment paths. Once the shocks have been identified, the next step in the procedure is to isolate, through simulations, the subset of those particular shocks that can best reproduce the experience of the country in question. This provides an insight into what factors were important in shaping the country's adjustment performance.

Two words of caution are needed concerning terminology. First, "shock" here is a modelling term and it does not correspond to the meaning of "shock" in the general economic literature. Second, the set of potential shocks is broadly classified for convenience into "euro-entry" shocks and "other" shocks. Euro-entry shocks include convergence of the exchange rate risk premium, misalignment of the entry parity, further integration of financial markets and increased openness. "Other" shocks include such supply side/structural shocks as total factor productivity (TFP) shocks, population/immigration and related labour supply shocks and wage formation. This classification is useful in modelling developments. But of course, in a more complex interpretation of the world, we might view some "other shocks" as endogenous to the euro-area experience, at least in a deep sense (e.g. certain productivity shocks or inward migration as a result of excess demand for labour due to buoyant growth). Here, it is not necessary to achieve precision on how far shocks are truly related to euro-area membership: in the simulations we are concerned with the comprehensive set of adjustment factors under the euro.

Several other factors can be quite powerful in triggering shifts in current account positions and in intra-area real effective exchange rates. Some of these are highly country-specific – such as, the ongoing effects of German unification or the extent to which euro conversion occurred at rates implying some over- or under-valuation. Clearly, too, the elimination of exchange risk premia had widely differing effects: some economies received a strong impulse from falling interest rates – and this, in turn, was offset to varying degrees by a durable tightening of fiscal conditions.

The model identifies some significant spillover effects across countries. For example, an individual euro-area member will be quite strongly affected by a housing boom in the rest of the area, since other euro-area economies are both shifting demand towards non-tradeables and inducing a tighter monetary policy across the area as a whole.

One striking feature of the adjustment process is the way in which a number of factors combine to trigger a shift of resources into the non-traded goods sector and, more specifically, residential construction. These factors include, for example, the relaxation of credit constraints, population shifts, and interest rate declines. Such a pattern closely matches the empirical findings discussed earlier in the Review which highlighted non-residential investment as a key factor explaining divergences in overall performance.

More broadly, the cases underscore that the inter-country adjustment process is dynamically complex. Where an economy moves into an asymmetric boom, for example, policy and market factors can interact to heighten pro-cyclical effects. Wage-setters, financial market agents and national fiscal managers can quite easily overestimate potential output and underestimate the risk attached to particular income streams, in a way that is mutually reinforcing.

For policy, this underscores strongly the dangers of failing to accelerate fiscal consolidation when times are good and of losing momentum in the kind of structural reforms that facilitate adjustment when costs and prices move out of line.

### **1.3 Key features of the country case studies**

The case studies explore adjustment dynamics by integrating model simulations, empirical analysis and policy assessment. They should be seen as a point of departure for future surveillance explorations, not as a definitive judgement on shocks, interactions or policies. A few key findings will illustrate some interesting lines for further exploration which these analyses suggest.

- In **Germany**, the protracted real exchange rate cycle associated with unification is confirmed as a key element. The initial sluggishness in the response of wage-setting was a factor prolonging this cycle. In addition real interest rates, while historically low, reflected a level of inflation that was below the euro-area average; and risk premia had risen slightly in relative terms. The large structural deficit limited the fiscal room for manoeuvre. However, some important real restraint was achieved in the public spending arena and, starting in 2001, tax cuts were enacted. The earlier real exchange rate appreciation has now been reversed. The stage appears set for a sustained improvement in Germany's growth and fiscal performance although bold structural reforms are still undoubtedly needed.
- In **Spain**, the growth impulse from falling interest rates was initially balanced by fiscal consolidation. Several factors shifted demand towards non-traded goods, especially in the direction of housing investment: lower interest rates, easier credit for households, major migration flows, and the impact of tourism and of demographics. Inflation steadily increased and the decline in real interest rates added to demand pressures. The current account deficit has widened progressively. Adjustment can benefit from further measures to enhance productivity and competitiveness. Continuing fiscal prudence is also called for, with a clear need to fully discount the boom-related element in government revenues.
- In **Ireland**, the very strong productivity growth performance experienced over two decades, especially in tradeables, initially helped to forestall external adjustment strains, as well as fuelling rapid real convergence. Wage flexibility was insufficient but inward migration played a major role. More recently, productivity in tradeables slowed steeply but in non-tradeables it has remained relatively favourable. A strong housing boom, with high prices fuelled by heavy borrowing, has left adjustment vulnerabilities amongst many households – underlining the need for continued fiscal prudence.
- In **Italy**, the budgetary debt service savings accompanying euro adoption have been offset by spending increases and tax cuts, while a dramatic slowdown in total factor productivity has hampered potential growth – counteracting the positive effects of wage moderation. Key policy requirements now include expenditure-based fiscal consolidation, flanked by far-reaching structural reforms – including the fostering of a more dynamic financial sector. It is vital to boost productivity growth and to strengthen specialisation in high-value-added goods.
- In **the Netherlands**, strong wealth effects from the equity and housing markets played a significant role in the boom of the late 1990s. Wage pressures remained strong while parts of the economy were losing steam, and strong nominal developments masked the worsening of the public finances. For the future, vigilance will be required to avoid the kind of overshooting that occurred around 2000, while risks of pro-cyclical fiscal policy have not been entirely allayed.
- In **Portugal**, productivity growth has been disappointing. Fiscal policy around the time of euro adoption failed to assure consolidation during a strong and credit-fuelled boom, which was based heavily on the non-traded goods sector. This pattern of growth left private and public sector balance sheets simultaneously vulnerable to adjustment stresses. With labour and product markets also rather rigid, the process of economic catching-up has stalled. Bold structural reforms, coupled with fiscal consolidation, are needed to ease adjustment and restart progress with real convergence.

## **2. A model-based exploration of adjustment dynamics in the euro area**

### **2.1 Introduction**

Experience within euro-area countries since 1999 may provide some insights into the functioning of economic adjustment dynamics in the monetary union. Since the beginning of the third stage of EMU, economic developments in the euro area have differed markedly amongst Member States (as documented in Chapter III). In particular, growth and inflation differences have been persistent thus affecting competitiveness and monetary conditions in the Member States.

This chapter analyses adjustment dynamics in the euro area on the basis of a dynamic stochastic general equilibrium (DSGE) model (details of the model are provided in Box 1 and in an annex at the end of this chapter). This framework allows us to assess shocks that trigger adjustment dynamics and to pinpoint which factors determine the speed of adjustment and the risk of overshooting. The analysis applies to both adjustment in the euro area on entry and adjustment in the euro area in its steady state. In particular, at entry, countries with high nominal growth rates have to adjust to low interest rates and high capital inflows requiring an adjustment towards a new equilibrium through the rebalancing of domestic and external demand. In the steady state, similar dynamics may prevail, in response to asymmetric shocks and domestic developments.

Firstly, some stylised facts are identified in a selection of euro-area countries that have experienced significant deviations of key macroeconomic variables from euro-area aggregates. We then use these stylized facts to identify various shocks that are exogenous to the model. These include: entry-level shocks such as the convergence of exchange rate risk premia, the misalignment of entry parities and the further integration of financial markets; and such "steady-state" shocks as debt ceilings, the growth rate of the population (especially growth in the household formation age groups), productivity growth (especially TFP), shifts in the structural employment rate, and shifts in preferences from tradeable to non-tradeables (services, housing). On the basis of the identified shocks, the model simulates actual developments in the six selected Member States, thereby providing insights into adjustment dynamics in the euro area.

The countries that we consider are: Germany, Spain, Ireland, Italy, the Netherlands and Portugal. The Netherlands and Portugal, in particular, experienced high growth and overheating pressures towards the end of the 1990s and early 2000s. The subsequent slowdown was characterised by a drop in inflation, downward revisions of potential growth and a marked deterioration in the budgetary position. Other Member States have not seen a similar reversal in their economic fortunes. In Spain, economic growth and inflation continue to be above the euro-area average. These developments have been paralleled by high wage growth, booming asset prices and credit growth and deteriorating current account balances. The experience of Germany in the euro area has been characterised by a protracted period of slow growth. This period of slow growth and lacklustre domestic demand has been accompanied by low inflation and wage growth and the regaining of competitiveness. Italy can be considered the "odd man out" with a continuous loss in competitiveness coinciding with slow growth.

### **2.2 Analysing the characteristics of adjustment in the euro area**

#### **2.2.1. Origins of diverging economic developments**

The model simulations allow the possible origins of prolonged differences in inflation and growth developments in the euro area to be analysed systematically. Several possible sources of diverging developments are considered. They can be related to structural factors unrelated to EMU or be the result of one-off adjustment effects caused by adaptation to monetary union. Another possible source of divergence could be related to the internal dynamics operating in the monetary union at its steady state. Sustained differences in growth performance existed before the creation of the euro area and, to a large extent, they boil down to dissimilar supply conditions. As such, they do not hamper the smooth functioning of the monetary union. Secondly, labour supply can differ, for example due to the effects of ageing or immigration. Thirdly, productivity growth in a Member State can deviate substantially from the euro-area average due to catching-up effects, structural reforms, differences in market development, sectoral specialisation and flexibility, etc. As long as actual output in all of the Member States is close to potential, albeit at rather different levels, or if the output gap is similar in all Member States, the monetary stance will be more or less appropriate in all Member States. In these circumstances the different economic developments in the respective countries can be considered broadly unrelated to monetary union.

The degree to which shocks induce economic adjustment depends crucially on their impact on productivity, relative prices (terms of trade) and wages. These factors largely determine the internal economic equilibrium and competitiveness of a country vis-à-vis other Member States. Several causes of aggregate competitiveness disturbances requiring adjustment may be identified.<sup>1</sup> Some may be considered as one-off effects which are induced

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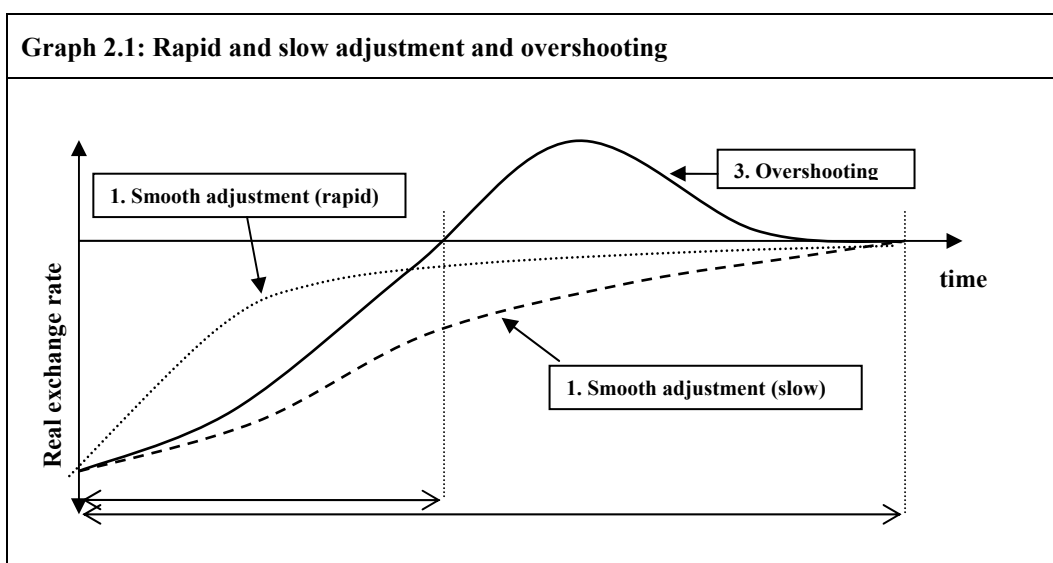
<sup>1</sup> See Deroose, Langedijk and Roeger (2004) for an analysis of the origins of asymmetric shocks in the euro area. European Economy (1999) also provides a thorough overview of the origins of idiosyncratic disturbances.

by entry into the monetary union, such as disequilibrium in initial exchange rate parities and the initial interest rate shock. Others may occur in the euro area, for example due to common external shocks with different effects in the Member States due to differences in industrial structure and sectoral specialisation;<sup>2</sup> or due to differences in the geographical composition of their trading partners. Movements in critical domestic variables may also lead to a need for adjustment in the euro area.

### 2.2.2 Factors determining the characteristics of adjustment

In a further step, the DSGE model is used to investigate the determinants of smooth adjustment. The adjustment of key macroeconomic variables to their 'equilibrium' levels can follow different patterns (Graph 2.1).<sup>3</sup> Three main questions can be addressed by the model. What determines the pace and amplitude of the adjustment process? Under what conditions is there a risk of overshooting of equilibrium levels, leading to increased volatility? How long might it take for the adjustment to work itself out?

In this context, the role of structural factors, such as the sensitivity of investment and consumption to the real interest rate and to relative price developments; the effects of market functioning (adjustment costs), fiscal policy and asset markets (housing), the myopic behaviour of economic agents (habit persistence), and financial constraints can all be assessed.



## 2.3 The DSGE model

### 2.3.1 Description of the model<sup>4</sup>

A two-country-three-sector model is used that distinguishes between tradeables and non-tradeables. The tradeable sector consists of agriculture and manufacturing, while the non-tradeable sector is composed of construction and services. The model is a so called New-Keynesian-DSGE model.<sup>5</sup> Consistent with the empirical evidence, we have introduced a number of nominal and real rigidities.<sup>6</sup> This makes the model partly forward and partly backward

<sup>2</sup> Differences in *industrial* structure may expose Member States differently to sectoral price and demand developments and to sectoral competition from inside or outside the monetary union. When the industrial structure deviates strongly between Member States and a Member State has a high degree of sectoral specialisation, the equilibrium real exchange rate may be affected if relative prices between sectors change. While real productivity is unaffected, the relative price change alters the nominal productivity of the sector. While each worker may produce the same output as before, the value of this output is reduced. As a result, equilibrium wages are reduced. Real wages have to decline to the new level of marginal value productivity while sectoral adjustment takes place. The effects depend on the (perceived) persistence of the price shock.

<sup>3</sup> The deviation from the equilibrium real exchange rate could represent for example entry of the euro area at an undervalued real exchange rate. It could also represent any idiosyncratic supply-type shock that changes the real exchange rate or the equilibrium real exchange rate, requiring adjustment. Several causes for aggregate competitiveness disturbances vis-à-vis euro-area competitors requiring adjustment may be identified: disequilibrium in initial parities; differences in industrial structure; world trade and currency developments in a context of differences in geographical compositions of the trading partners; and movements in critical domestic variables.

<sup>4</sup> This section gives a short description of the model. For a more elaborate presentation, see the annex at the end of this chapter and Langedijk and Roeger (2006).

<sup>5</sup> See for instance Smets and Wouters (2003).

<sup>6</sup> Parameter values are taken from a DSGE model that was estimated for the euro area by Ratto, Roeger and In't Veld (2006).

looking. The model can be calibrated to various country pairs. In the simulations below, one country is analysed while the second country represents the aggregate of the rest of the euro area. The model is calibrated so as to respect the relative sizes of the countries.

In the short run nominal rigidities are important in the model, while in the medium and long run prices and wages adjust. For each permanent and temporary shock the model reaches a long run equilibrium position that is consistent with external and internal balance. Internal balance is characterised by a constant employment rate and a constant ratio of consumption to GDP (savings rate), while external balance is characterised by a constant (not necessarily zero) ratio of net foreign assets to GDP and a constant real exchange rate.

Given the asymmetric house price developments in various Member States, the model has been extended further by disaggregating the non-tradeable sector into construction and "other" non-tradeables and by separating investment into housing and non-housing investment. In addition, in order to analyse structural changes in mortgage markets (possibly related to EMU), special emphasis has been devoted to modelling the financial constraints of the household sector. To this end, the household sector has been divided into credit and non credit-constrained parts,<sup>7</sup> which allows consideration of the effects of loosening credit constraints on the demand for housing.

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<sup>7</sup> In standard macro-econometric models (like QUEST, for example) households are usually divided into liquidity- and non-liquidity-constrained households. Liquidity constrained households do not borrow at all but only consume current income. Housing investment is not modelled as a decision of the household sector but is part of the corporate investment decision. In this model we derive a housing investment equation explicitly from a decision problem of the household sector. Also, we allow all households to be able to borrow but assume that a fraction of households are credit constrained in the sense that existing collateral, in the form of the stock of housing wealth, puts a limit on the amount of period  $t$  borrowing. The price of housing consists of the price of land and the price of the house construction.

### Box 2: Inflation differentials and investment in the DSGE model

In a monetary union, with interest rates targeted at the union's average economic conditions, investment in individual Member States could potentially respond strongly to domestic demand shocks. An increase in domestic inflation could boost domestic investment because of lower real interest rates. This mechanism could potentially transform temporary demand shocks into long investment induced cycles. An often used counterargument is that with a monetary union, the relevant real rate for investors is not necessarily the national rate but the union average real rate.

Here we describe how investment is modelled in the DSGE model. In the model, sectoral investment differs according to the degree to which sectors are exposed to foreign competition and to the mix of domestic and foreign capital used in their production. In other words, the investment decision is based on demand and cost factors and relative prices have different effects on both components entering the investment decision. While it is true that higher inflation can (under certain conditions, see below) lower capital costs for firms if the nominal interest rate stays constant, DSGE models also stress a demand (or competitiveness effect) for investment. Besides capital costs, in their investment decisions, profit maximising firms take into account the evolution of their own output price relative to those of their (foreign) competitors over the lifetime of the investment project, since this relative price determines current and expected demand. Since higher domestic inflation worsens the competitive condition of domestic firms, the demand effect works in the opposite direction to that of the cost effect. It can be a powerful stabilising force especially if the elasticity of substitution between domestic and foreign goods is high. Obviously, the demand effect is most effective in the tradeable sector while it is much weaker in the non tradeable sector (including housing). In the DSGE model used for this analysis the following distinction is made between the tradeable and non tradeable sectors concerning their exposure to foreign competition and to the composition of investment.

#### *Composition of investment (costs):*

It is assumed that investment in the non-tradeable sector is largely domestically produced. Housing investment is undertaken by a domestic construction sector. The tradeable sector uses both domestic and imported investment goods. Four factors determine the capital costs of a firm:

1. Physical rate of depreciation.
2. Corporate taxes.
3. Real interest rate: nominal interest rate minus the expected capital gain, expressed by the expected inflation rate of the capital aggregate used by the specific firm.
4. The price of the investment good relative to the producer price of the investing firm.

Suppose the composition of investment of a particular sector  $s$  in country  $c$  is made up of a composite good of the currency union with shares proportional to the size of the union members, then the relevant real interest rate would be the nominal interest rate minus the expected inflation rate of investment goods in the currency union. However, even in this particular case, domestic inflation would still lower real capital costs, because the firm when making an investment decision also looks at the price of its output relative to the price of the investment good. Thus, even if there is no home bias in investment and the real interest rate is fully determined by the currency union's average inflation rate, capital costs in the member state with higher inflation would still fall. In the model it is assumed that the tradeable sector uses both domestic and imported investment goods. However, there is a home bias in the composition of investment and therefore domestic inflation has a larger weight than inflation in the rest of the euro area (RoEA) in the inflation term used for the investment rule. For the non tradeable sector, it is assumed that all investment is domestic (in particular for housing). Therefore, the real interest rate for investment in the non tradeable sector is defined as the union-wide nominal rate minus the expected inflation in the non tradeable sector.

#### *Exposure to competition (demand):*

Domestic firms in the tradeable sector are exposed to competition from foreign firms in the tradeable sector. Here we assume a high elasticity of substitution (between 2.5 and 7.0) between domestic and foreign tradeables. The domestic tradeable sector is also exposed to competition from domestic non tradeables to the extent that domestic households and firms regard tradeable and non tradeable goods as substitutes. Following the literature, we impose a low elasticity of substitution of 0.4. As a mirror image, firms in the non tradeable sector are exposed to (weak) competition from the tradeable sector.

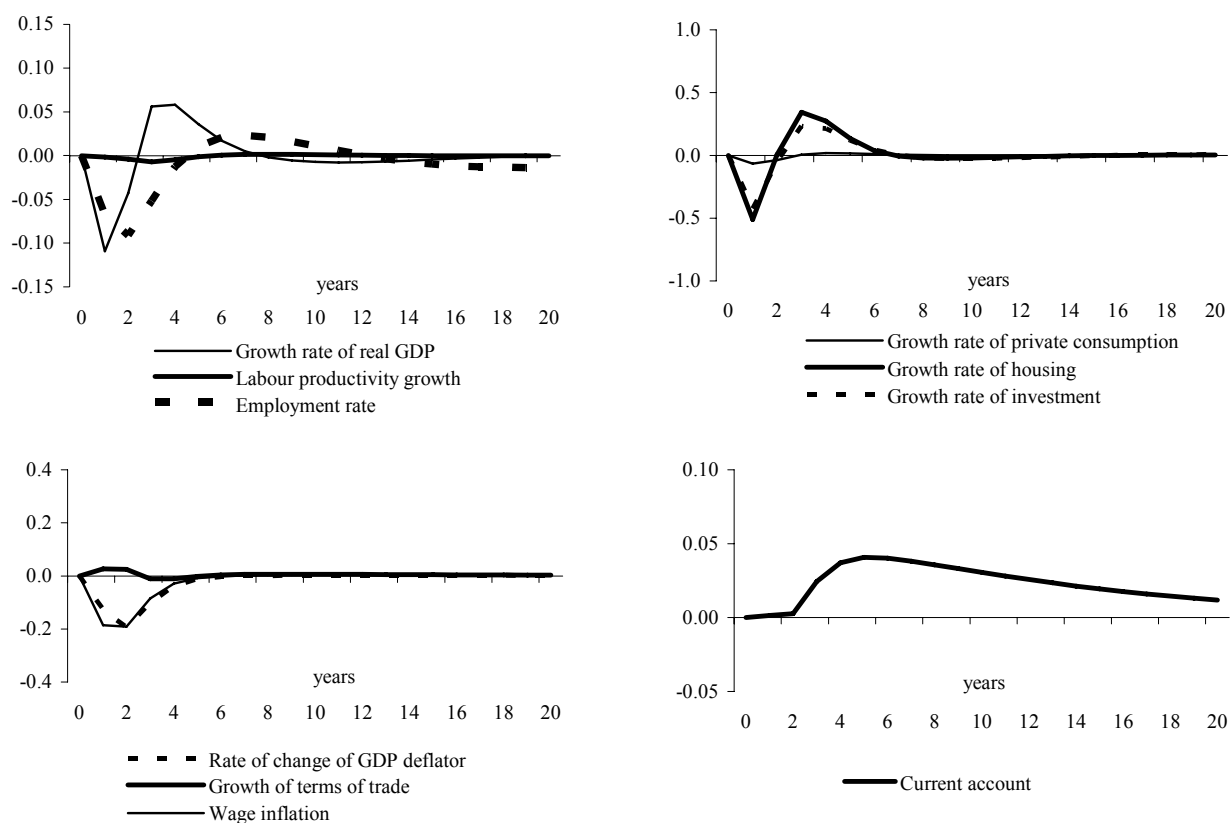
As a result of these assumptions the model predicts that investment in the non tradeable sector should respond more strongly to demand shocks than investment in the tradeable sector.

### 2.3.2 Standard simulations

This sub-section presents some standard simulation results for the type of exogenous shocks that have been important for the euro-area economies in recent years. Some of the idiosyncratic shocks are related to the establishment of the euro area, such as the elimination of currency risk premia (ES, PT, IT, DE<sup>8</sup>) and the further integration of financial markets, but also increased trade, which is likely to have enhanced competition in the tradeable sector. However, euro-area members were also exposed to other important idiosyncratic structural changes. Some countries in the euro area experienced idiosyncratic shocks to TFP in both the tradeable (IE, IT) and non-tradeable sectors (DE, ES, PT), population/immigration shocks (ES, IR), labour supply shocks (DE, ES, IE), investment shocks (DE) and shifts in the composition of demand (more demand for non tradeables) (ES, PT).

<sup>8</sup> Compared to other euro-area countries, Germany did not gain from the convergence of the risk premium.

**Graph 2.2: Increase of tradeable sector TFP by 1% (for one year)**



*Note:* All variables are expressed in terms of deviations from the baseline.

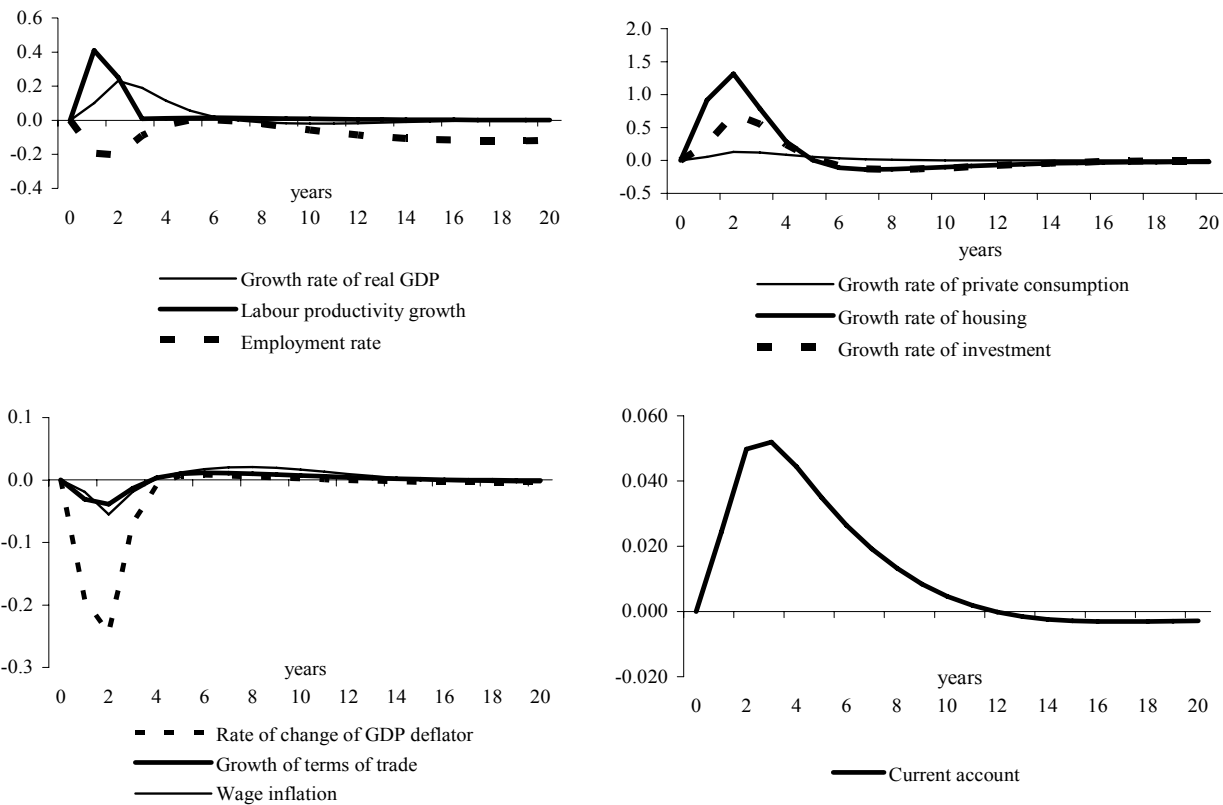
*Source:* Commission Services

Graph 2.2 shows the Balassa-Samuelson effect, namely the effect of an increase in the growth rate of TFP in the tradeable sector of 1% over one year, i.e. a permanent increase in the level of TFP in the tradeable sector.<sup>9</sup> A shock to technical progress has a GDP growth effect extending over 2 years. GDP growth returns to the baseline but investment growth falls below the baseline. The overshooting of investment is due to an interest rate effect. The increase in tradeable TFP growth increases inflation and lowers the real interest rate. Among the investment components, it is housing investment that responds most vigorously to the shock. This is because the real interest rate for housing investment declines most strongly. Why is inflation generated with a positive TFP shock? The TFP shock in the tradeable sector leads to lower costs and higher wages in the tradeable sector. Both effects roughly compensate for one another and there is no effect on tradeable prices. Labour mobility across sectors exerts upward pressure on wages in the non-tradeable sector, which leads to rising inflation for non tradeables. The inflation in the non tradeable sector is also the reason for an increase in non-tradeable (especially housing) investment.

Since the price of non-tradeables rises, overall inflation increases, but tradeable-goods inflation does not rise. Nevertheless, there is a small deterioration of the current account due to an income effect. Even a temporary shock has some persistent price effects. Both price and wage inflation diverge over a period of 4 years.

<sup>9</sup> A catching-up economy is hit by a sequence of positive TFP shocks. Showing a single shock should reveal the dynamic adjustment patterns more clearly.

**Graph 2.3: Increase of non-tradeable TFP by 1% in the first year**



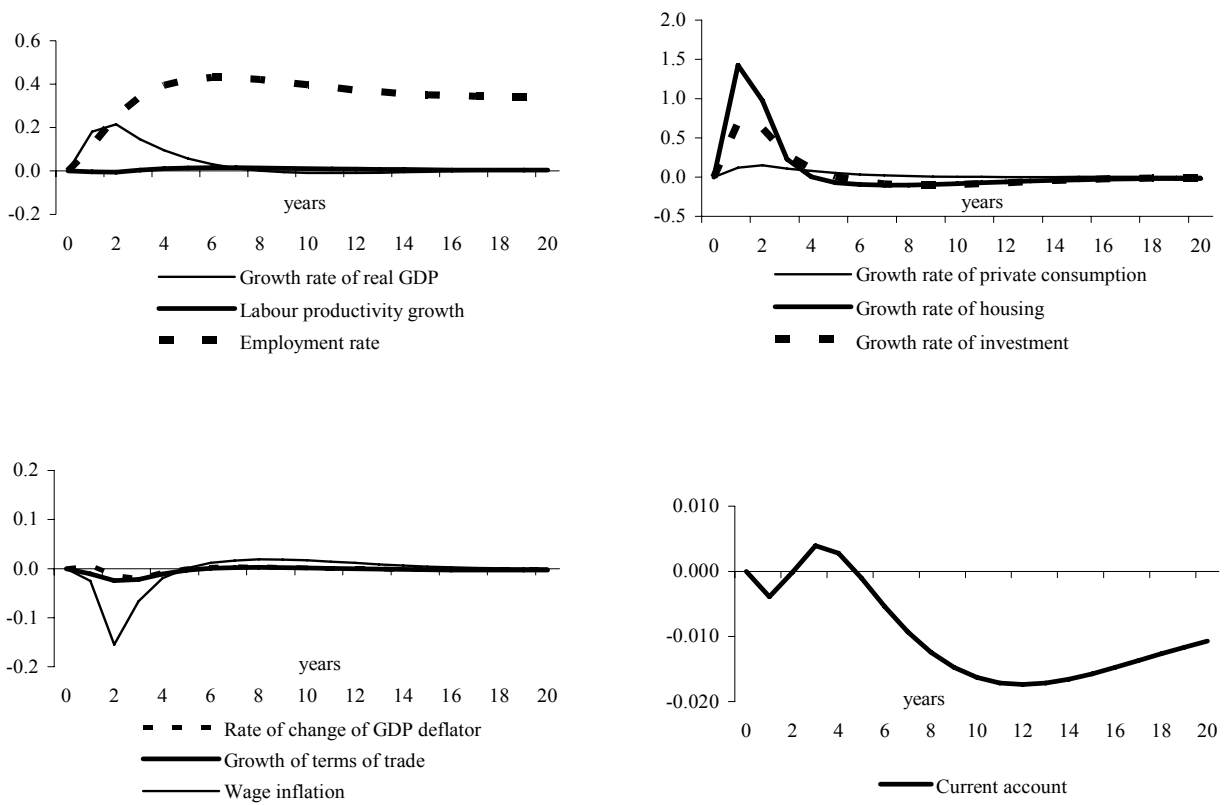
*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

The positive TFP shock in the non-tradeable sector increases GDP and investment growth over a period of 5 years. In contrast to the positive productivity shock in the tradeable sector, this shock is not inflationary. In fact, lower costs in non tradeables translate into lower prices (so that nominal wages remain unchanged). However, price stickiness in the non-tradeable sector prevents prices from falling sufficiently. This induces a lack of demand and firms respond to this by lowering employment which also prevents wages from rising. Both Portugal and Spain have shown below-average TFP growth in the non tradeable sector, which explains some of the inflation divergence.



**Graph 2.4: Labour supply permanent shock of +0.5 of a percentage point**

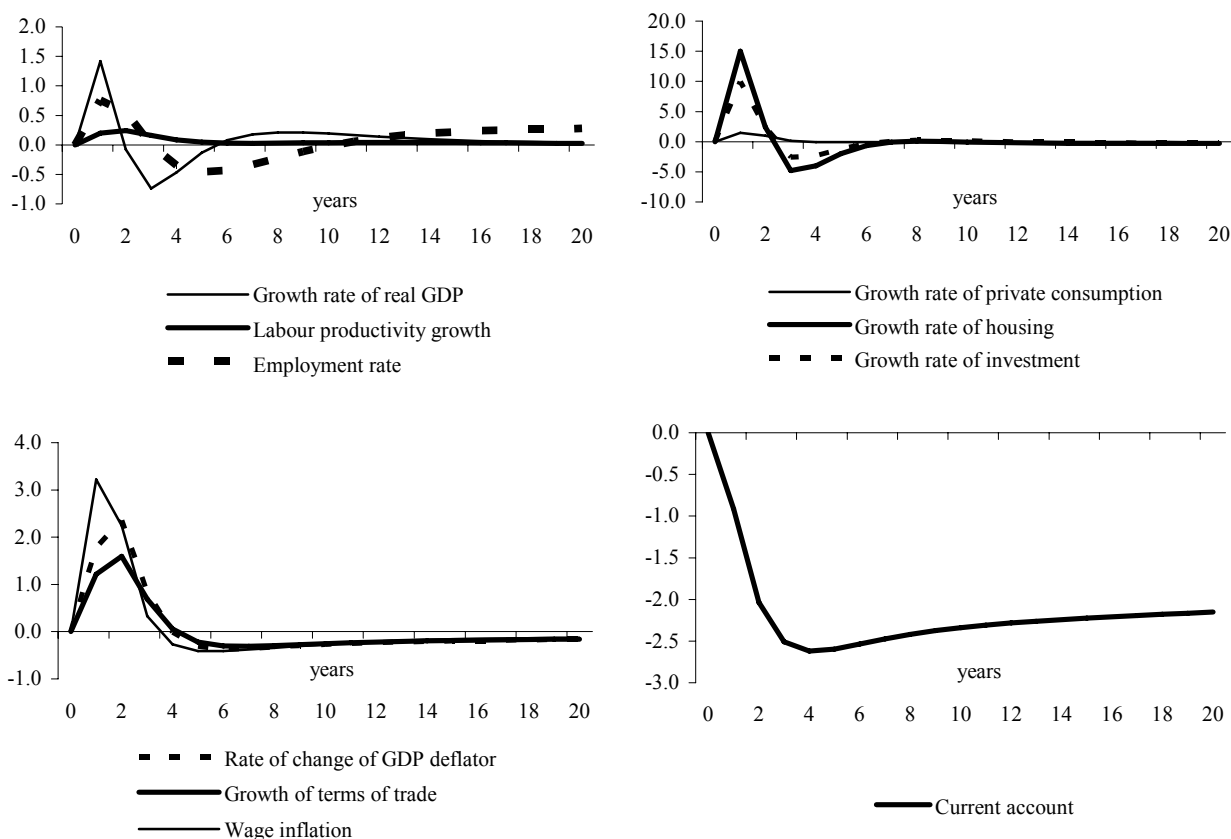


*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

There is a gradual decrease in wage inflation (nominal and real). However, this effect is only temporary and reverses after 5 years. But there is a permanent increase in employment. Both effects together lead to a permanent increase in wage income. Interestingly, this leads to a relatively strong increase in housing investment (notice that both ES and IE have a housing boom associated with a declining structural rate of unemployment, as measured by the NAIRU).

**Graph 2.5: Risk premium reduction by 0.5 of a percentage point**

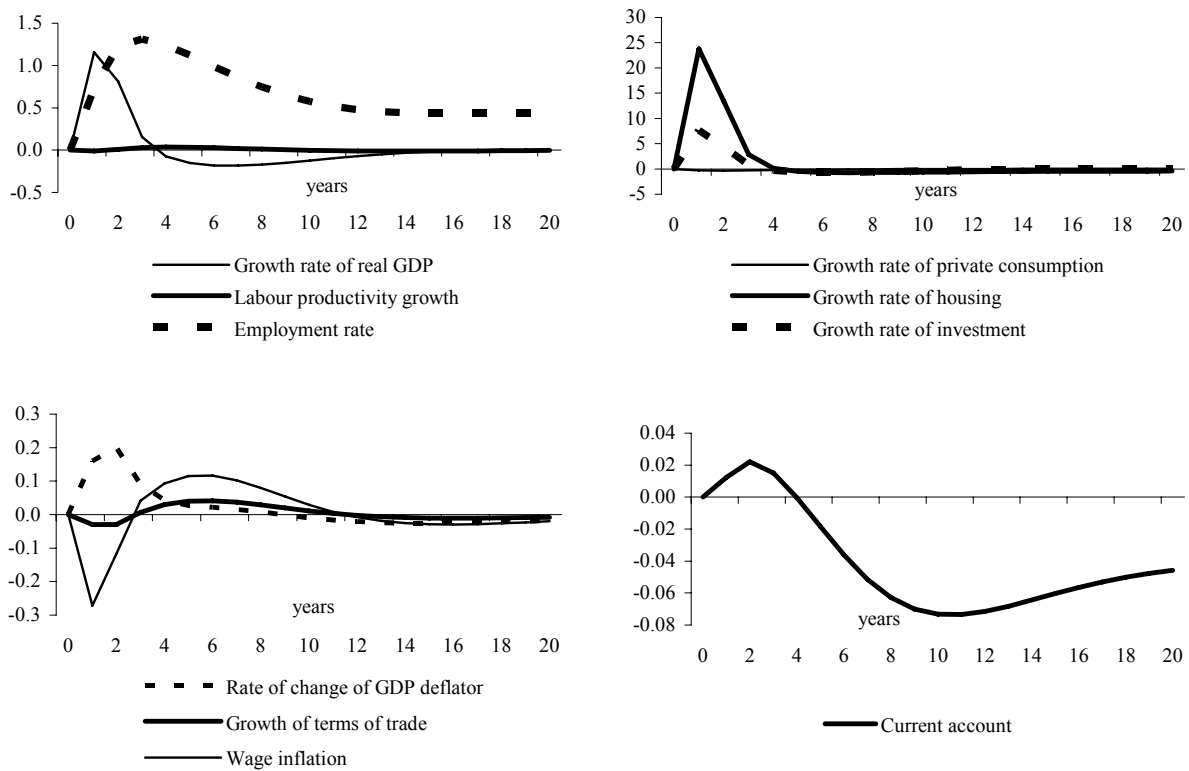


*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

One of the most important features associated with the entry into the euro area was the elimination of exchange rate risk premia of countries like Spain, Portugal and Ireland. Here this is modelled as a permanent reduction of the risk premium in one period (in reality, in the euro area, it was a gradual decline in the two to three years which preceded 1999). A reduction in the risk premium of the order of magnitude of 0.5 of a percentage point (Graph 2.5) has a rather strong effect on investment and especially on non-tradeable investment (housing). Another interesting feature is the strong increase in consumption. Notice also, in contrast to investment which shows a pattern of overshooting (positive growth rates followed by negative growth rates), the level of consumption stays high. It is especially this feature which induces long-lasting current account deterioration. Among the standard simulations, it is particularly the risk-premium shock that generates a strong movement in the current account. A change in the currency risk premium with entry into the euro is therefore a primary candidate for explaining why the current account deteriorated strongly in ES, IE, IT and PT and remained fairly constant in NL (no change in the risk premium).

**Graph 2.6: Increasing the demand for housing (10% increase in housing-share parameter)**



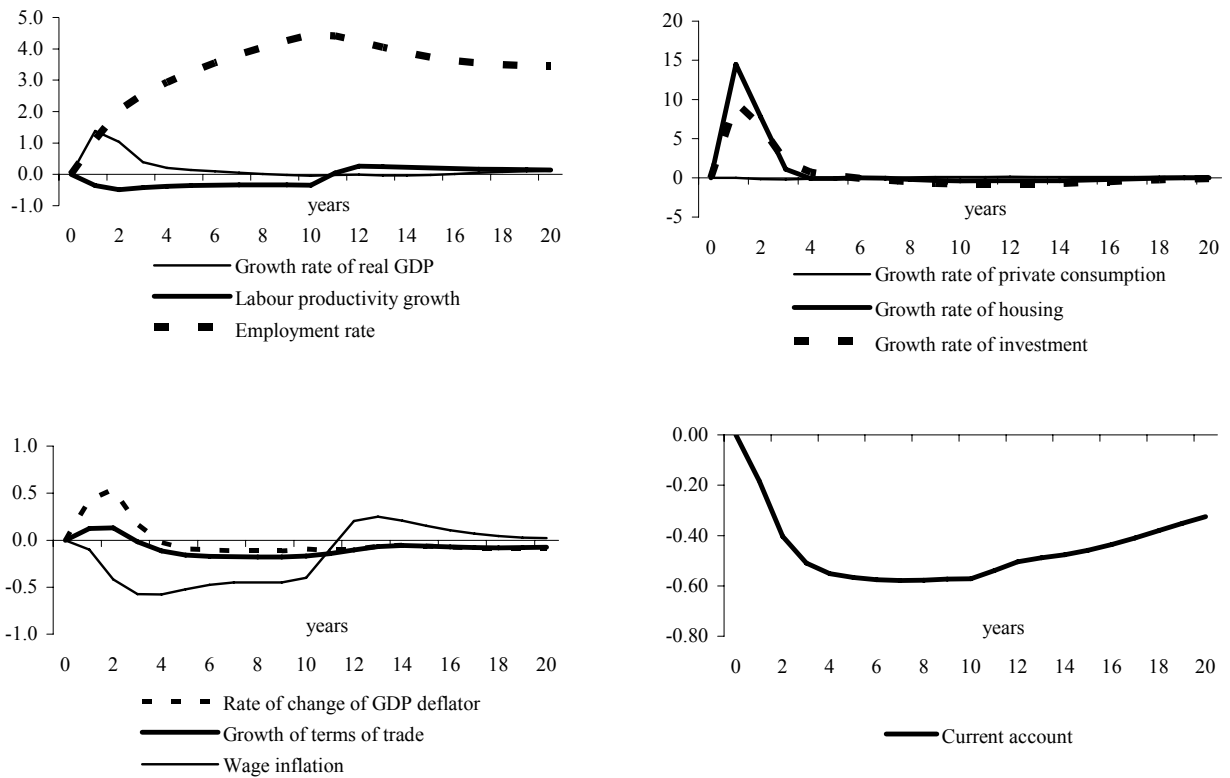
*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

A shift in the preference for housing (e.g. due to a change in the age composition of the population (or foreign purchases of houses (ES)) has a strong effect on housing investment and initially hardly any crowding-out effect on other types of investment (Graph 2.6). Since the demand shift generates inflation for houses and other non tradeables, the real interest rate declines and the housing boom are sustained for another two years. However, this is followed by a longer period of negative investment growth in housing and non-tradeables of the order of magnitude of 0.6% p.a.

Interestingly, the demand shift for housing is associated with a positive labour supply response. This is because the fall in consumption induces a rise in labour supply.

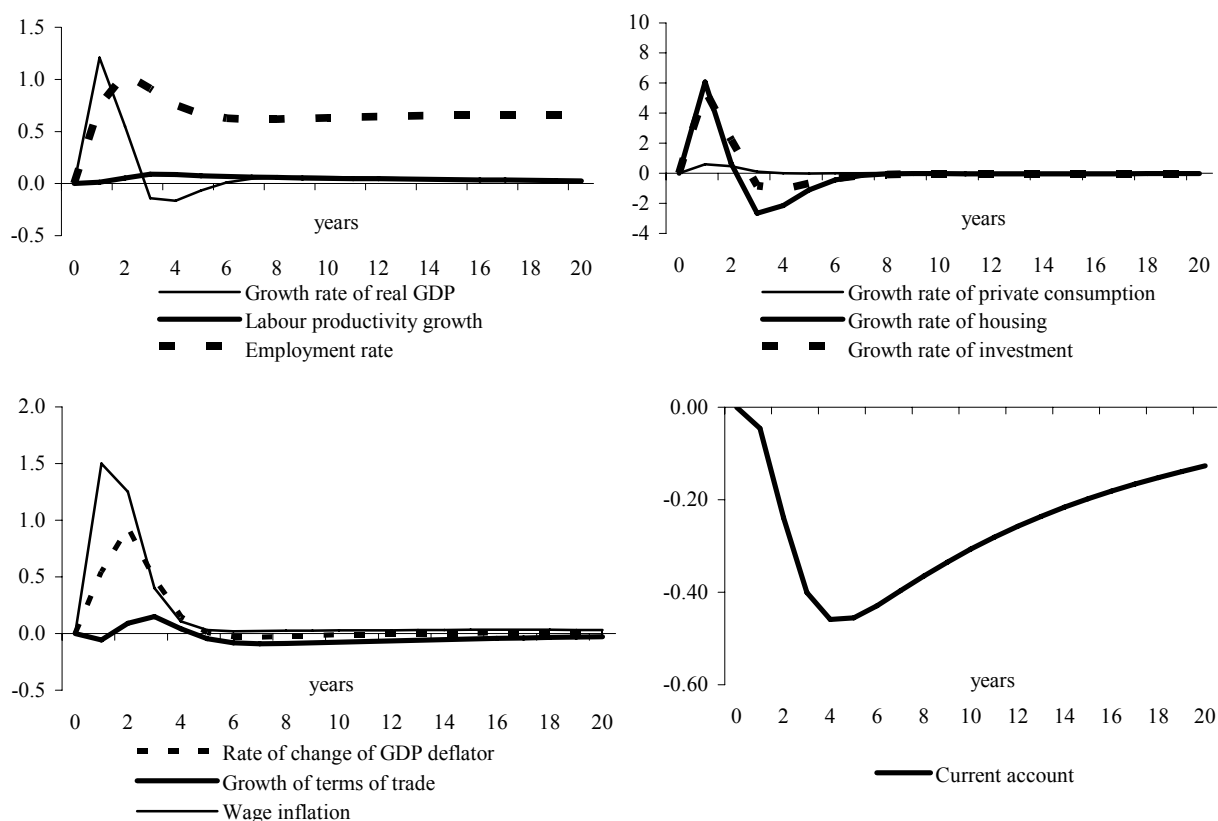
**Graph 2.7: Population shock (10 years, anticipated, +1%)**



*Note:* All variables are expressed in terms of deviations from the baseline.  
*Source:* Commission Services

A population/immigration shock – especially if anticipated – has a powerful effect on investment demand, in particular non-tradeable investment (housing) and in increases in house price inflation (Graph 2.7). The increase in housing demand takes place at the expense of other consumption. Immigration also raises the employment rate and, therefore, increases the growth rate of GDP per capita. Immigration is also associated with a decline in the current account.

**Graph 2.8: Reduction in mark-up due to openness**

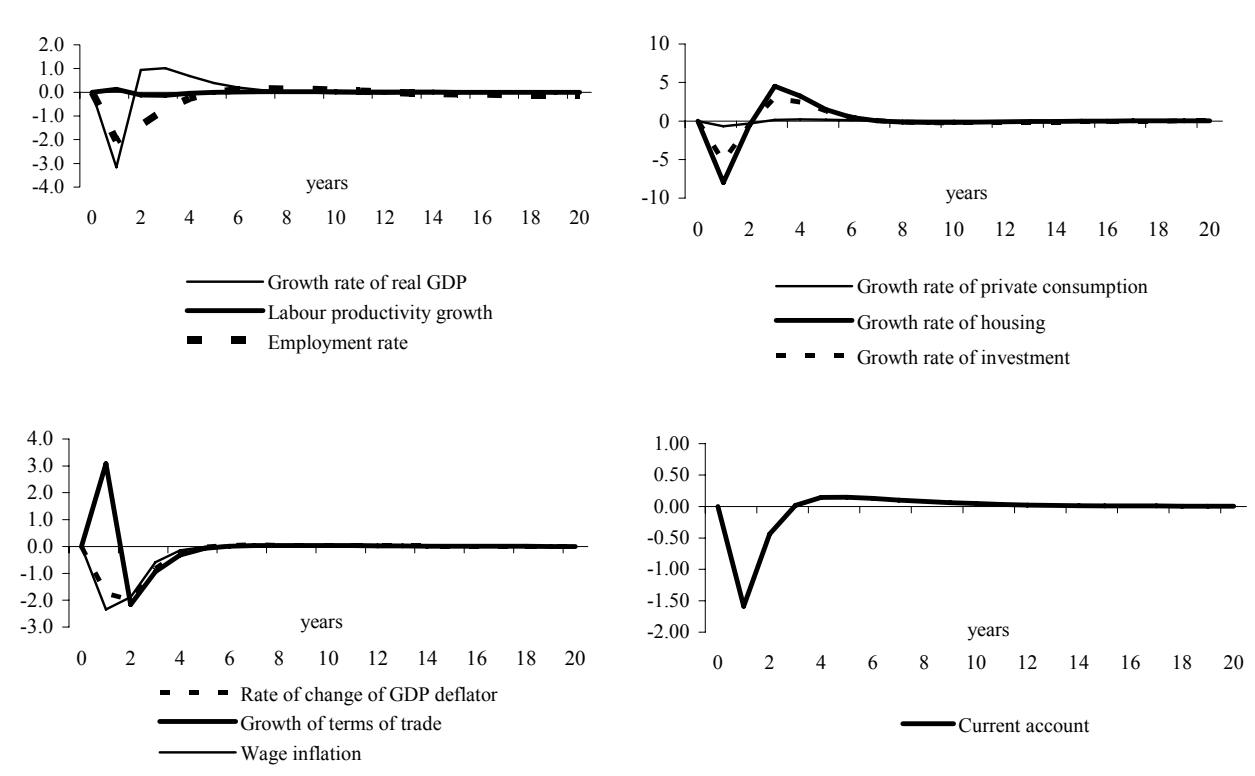


*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

In the trade literature, it is argued that monetary unions increase trade within participant countries. This in turn enhances competition, which leads to higher productivity and employment growth. The channel through which these effects are generated is via reductions in mark ups in the tradeable sector. Recent empirical work by Kee and Hoeckman (2003), Chen, Imbs and Scott (2004), and Badinger and Breuss (2005) suggests that an increase in the import share of 1 percentage point could lower mark ups in the tradeable sector by between 0.1% to 0.2%. Increased competition in the tradeable sector raises labour demand and investment, which drives up wage inflation in the non-tradeable sector. Inflation in non tradeables dominates the inflation-reducing effect in the tradeable sector (Graph 2.8).

**Graph 2.9: Entering the euro with an overvalued exchange rate (5%)**

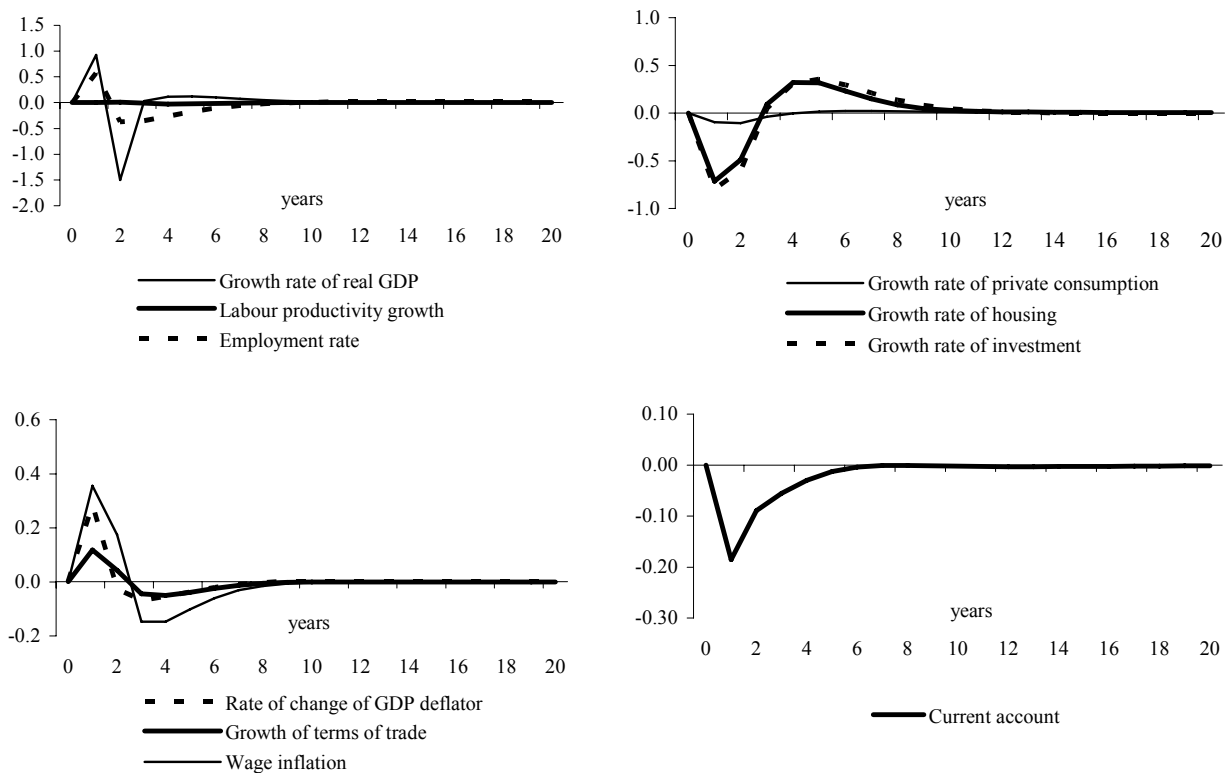


*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

In the model an overvaluation of 5% leads to an output loss of -3.3% in the first year, which is concentrated in the tradeable sector (Graph 2.9). Prices in the tradeable sector decline by 2.1% in the first year, by 1.6% in the second and by 0.4% in the third year. After three years, prices have adjusted sufficiently and the competitiveness loss from the overvaluation is eliminated. In the non tradeable sector, the price decline is slightly more sluggish. It is interesting to notice that the overvaluation shock has a strong negative effect on non tradeable investment because of the real interest rate effect, while the effect on tradeable investment is less strong.

**Graph 2.10: Increase in Government demand (1% of GDP for one year)**



*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

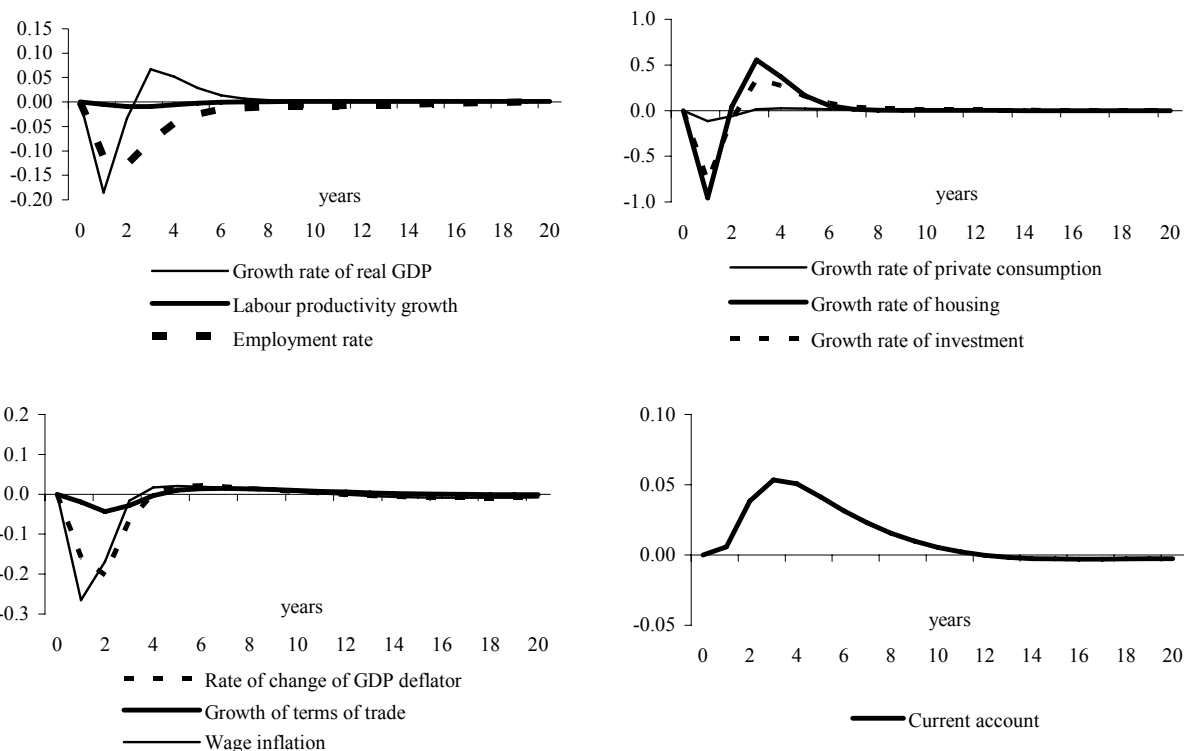
This experiment shows how the economy responds to a temporary increase in government expenditure in a single country within the euro area (Graph 2.10). The fiscal multiplier is positive in the first year and slightly below one. The increase in government demand also has a positive short run employment effect. In the short run the model shows a typical Keynesian response to a (temporary) demand shock.<sup>10</sup> The positive effect is mainly due to the sluggish adjustment of prices and the desire of consumers to smooth consumption. However, the increase in government expenditure reduces private demand, in particular investment. This suggests that there is a possibility for countercyclical fiscal interventions. However, there are clear inter-temporal trade-offs associated with fiscal policy: a positive effect in the first year is followed by a negative effect in the second year. This suggests that fiscal instruments should be used with caution, i.e. only in cases where a temporary demand shortfall has clearly been identified.

### 2.3.3 International spillover of shocks within a monetary union

One important issue within a monetary union is the transmission of shocks across Member States. There are various channels of shock transmission, namely an income channel, a competitiveness channel and an interest rate channel. In this section we will analyse how (asymmetric) inflationary shocks in the rest of the euro area affect a particular Member State (the home country), which is assumed to have a GDP share of 10% in the euro-area. The shocks considered are: a negative TFP shock to the non-tradeable sector, a positive TFP shock to tradeables, and an increase in housing demand. Graphs 2.11-2.13 below show how these particular shocks, which originate in the rest of the euro-area affect an individual member state that is not directly exposed to these shocks.

<sup>10</sup> For permanent fiscal shocks, the fiscal multiplier becomes smaller and can even turn negative.

**Graph 2.11: Reduction of TFP in the non-tradeable sector by 1% in the first year**



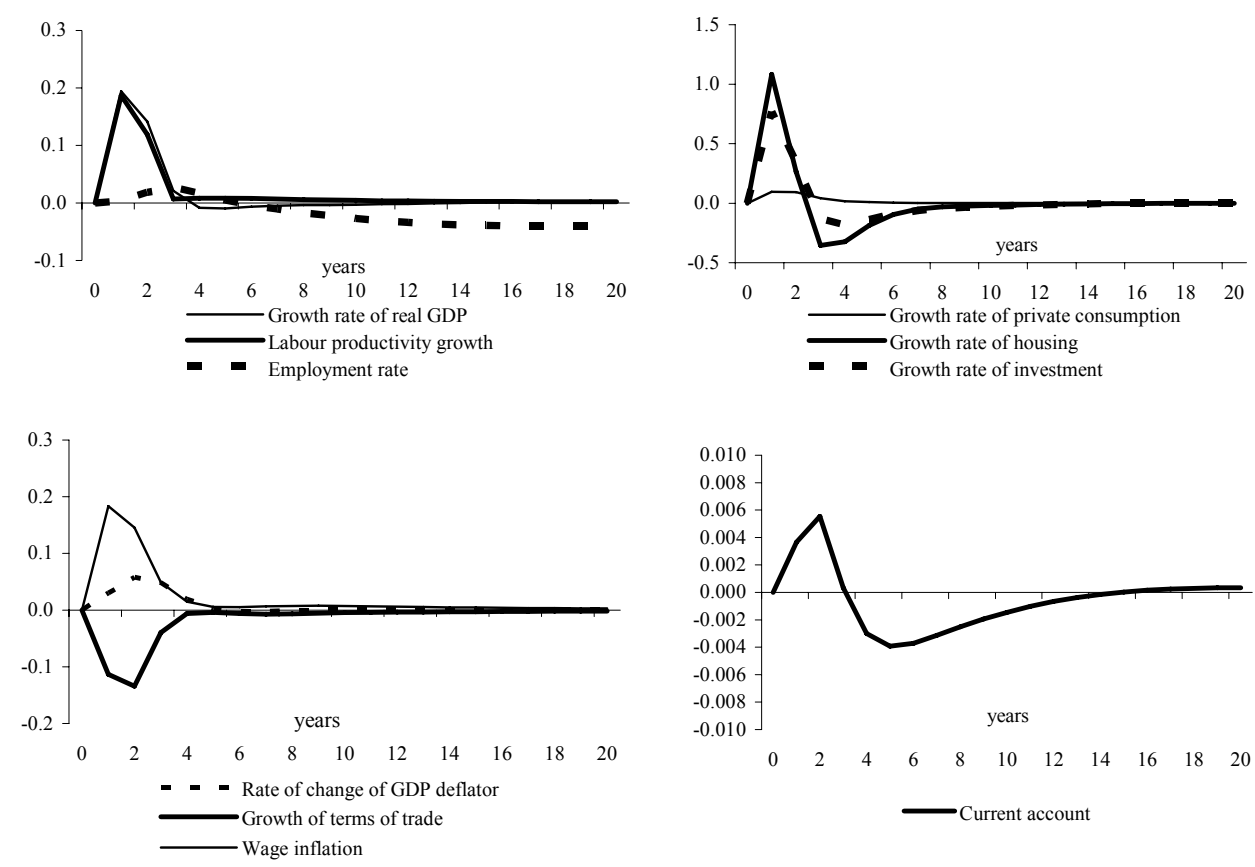
*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

The spillover effect of slower TFP growth in the rest of the euro area (RoEA) on the home country GDP is sizeable (-0.18 of a percentage point lower growth in the home country versus -0.33 of a percentage point lower growth in the RoEA), especially in the short run (i.e. the first two years). The main transmission channel is a monetary policy response. The central bank responds to the inflationary shock with an increase in interest rates. This dampens aggregate demand and inflation in the home country and leads to a temporary decline in growth. GDP in the home country starts to recover slowly, starting in the third year after the shock has occurred.



**Graph 2.12: Increase of TFP in the tradeable sector by 1% in the first year**

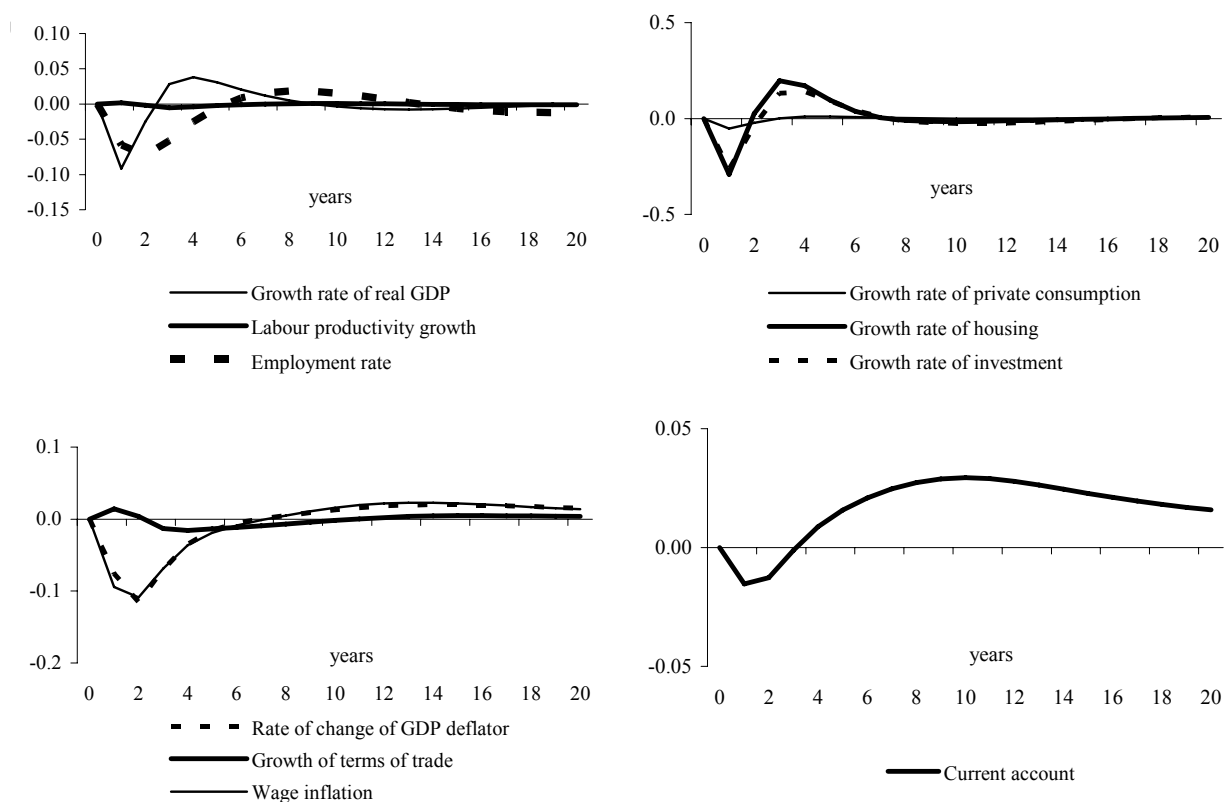


*Note:* All variables are expressed in terms of deviations from the baseline.

*Source:* Commission Services

The spillover effect of higher productivity growth in the tradeable sector is negative but small. While the effect on GDP growth in the RoEA in the first year is 0.18 of a percentage point of additional growth, the spillover effect is negative (-0.1 of a percentage point in the first year). The smaller size of the spillover effect is explained by two factors. First, the tradeable sector is smaller (only 50% of the size of the non-tradeable sector) and, second, the contractionary monetary response is accompanied by a positive income effect from an increase in demand in the faster growing RoEA.

**Graph 2.13: Increase of housing demand (plus 10 percentage points - permanent)**



Note: All variables are expressed in terms of deviations from the baseline.

Source: Commission Services

An increase in housing demand in the RoEA is negatively transmitted to the home country. A shock to housing demand increases GDP growth in the RoEA by 0.45 of a percentage point in the first year (and by 0.65 of a percentage point in the second year) but leads to reduced growth in the home country by about 0.1 of a percentage point in the first year (and by 0.03 of a percentage point in the second year). The relatively strong spillover comes from the fact that demand in the RoEA is shifting away from tradeables to non tradeables i.e. the home country not only suffers from a contractionary monetary policy response but also from a loss in demand for tradeables.

### 3. Country dynamics

#### 3.1 Introduction

This section presents and assesses the euro-area experience of Germany, Spain, Ireland, Italy, the Netherlands and Portugal, countries which have shown the largest deviation from the euro area in terms of growth, inflation and the current account. The aim of these case studies is to explore how developments and shocks in each country have interacted to shape the economic performance and to handle the adjustment stresses. The approach, building on earlier sections of this Review, is to integrate an empirical assessment of key trends in the economy, a model-based exploration of stylised "shocks" to performance, and, finally, an assessment of policy experience cast in a surveillance mode. The focus is on the inter-country aspects of adjustment rather than the response to common shocks that affected euro-area members similarly. The goal of the DSGE model simulations, the results of which are presented in a box in each country-specific section, is to see whether the model can approximately match the orders of magnitude of the deviations of important macro aggregates from the euro-area average as well as account for the duration of these deviations. It should be recalled that the intention of the simulations is not to fit the variables exactly. An exact fit is not possible since we base our analysis only on a very small set of exogenous shocks.

Table 1 below shows the country-specific developments on which we focus. Firstly, on the supply side, these are differences in TFP trends in the tradable and non tradable sectors. Secondly, related to the creation of the euro area, changes in the exchange risk premia could be an important factor explaining some of the country specific developments in the early years after 1998. Thirdly, on the demand side, one can observe some financial market

developments, especially changes in the credit ceilings for housing investment of private households. Special attention is devoted to housing investment. Apart from these standard features, we also take into account fiscal developments and some country-specific shocks which are explained in more detail in the respective country sections. The concluding section of each case study draws on the model-based characterisation of the adjustment experience in order to highlight certain features of the country experience within the general framework of adjustment processes under the euro area. Against this background, a surveillance-style assessment reviews how policies have contributed to economic performance and where the key challenges remain in assuring successful adjustment. This assessment creates a basis for the discussion, later in the chapter, about firstly the possible scope for spillovers between euro-area members and secondly the cross-country indications concerning policy management.

The analysis, as a whole, is designed to explore the nature of adjustment interactions under the euro and to provide an analysis which may help to identify issues for future policy design and surveillance work. It should not be interpreted as an attempt to form definitive judgements on country policies, and in particular it does not systematically review experience with the Treaty-based aspects of surveillance.

**Table 1: Exogenous driving forces, 1999-2003**

	Productivity – tradeables*	Productivity – non-tradeables**	Risk premium vs. Germany (basis points)***	Household debt ****
Germany	3.4	1.7	0	-2.0
Spain	1.8	0.1	90	23.8
Ireland	15.8	3.2	60	21.1
Italy	0.7	0.0	90	6.8
Netherlands	2.8	1.5	40	22.5
Portugal	2.0	0.5	140	24.8
<b>Euro area</b>	2.8	0.9		

*Note:* \* Primary production and manufacturing (average productivity growth p.a. 1999-2003 in percent); \*\* Private services (average productivity growth p.a. 1999-2003 in percent). \*\*\* Assumed values calculated over the period 1995-1998. Ex-post estimates from open arbitrage conditions give larger absolute values. However, these estimates are dominated by outliers and therefore likely to be biased upwards; \*\*\*\* Difference between 2005 and 1999 as a percentage of GDP.

*Source:* Groningen Growth and Development Centre sectoral data base, Commission Services

### 3.2 Germany

Germany's economic growth in recent years has been among the lowest in the OECD. Importantly, Germany had to cope with the consequences of unification and the subsequent appreciation of the DEM, which was exacerbated by strong wage increases above productivity growth in the early 1990s. Contributing factors are the economy's structural problems and the way in which these problems affect the adjustment to general and country specific shocks. Adjustments started in the mid-1990s but were not yet completed when Germany entered monetary union. As a consequence, the euro entry exchange rate was overvalued. The restoration of external competitiveness took the form of protracted wage moderation. The consequent sluggish demand was not fully counteracted by monetary conditions, which reflected the higher inflation and higher growth in the euro area as a whole. While real interest rates were low in historical terms, the low rate of inflation in Germany meant that German real interest rates were higher than the euro-area average. At the same time, a high structural government deficit limited the room for manoeuvre on the fiscal side. Among other factors, low domestic demand and the reaction to previous overinvestment in construction jointly led to a sharp fall in investment volumes starting in 2000. This fall further reduced the already low potential growth rate linked to Germany's structural rigidities to slightly above 1%. Problems in the real sector of the economy were reflected in the financial system, where bank profitability fell to low levels amid a sharp slowdown in the growth of private sector credit. The slow growth of credit seems to be attributable to both demand factors (low corporate and household investment expenditure) and supply factors (restructuring in the banking system and its relationships with corporate clients). Conversely, adverse feedback from the financial system to the real sector was to be found via wealth effects following the bursting of the global equity-market bubble in 2000 and, more specifically, the cataclysmic decline in the Neuer Markt index. A positive external contribution to growth since 1999 compensated partly for the decline in consumption and investment. However, the restoration of external competitiveness has not yet translated into higher investment and potential growth. The adjustment process and the

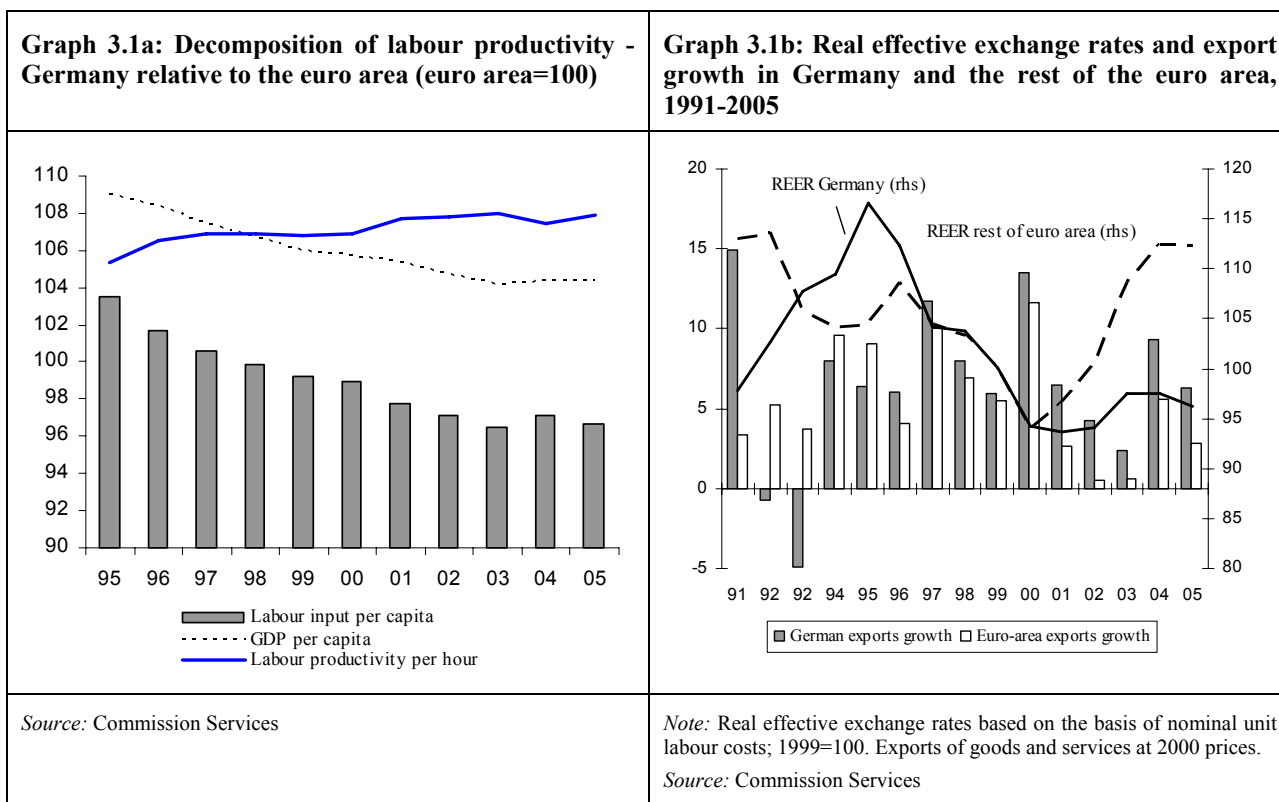
unsustainable starting position were clearly exacerbated by structural rigidities, some of which started to be addressed in recent years. However, bolder structural reforms are called for to enhance the adjustment capacity of the economy and contribute to higher potential growth.

### 3.2.1 Macroeconomic scene setter

Since the mid-1990s, Germany has been lagging behind other euro-area countries in terms of economic growth and employment. Recording slow economic growth in a period of strong global upswing, the country's economic problems are becoming entrenched as is evidenced by the dramatic decline of potential growth rates over the last 10 years from an average of above 2½% in 1985-1995 to less than half that rate in recent years. This compares with current potential growth rates of about 2% in the euro area as a whole. Developments over the past ten years are the joint result of adjustments to unification, structural rigidities and the fact that structural reforms did not fully match the needs of adjustment under monetary union.

The years immediately following unification were characterised by wage increases well in excess of productivity developments. At the same time Germany's external competitiveness suffered further, when pressures in the ERM in 1992, which were to some extent also the consequence of high German interest rates in the aftermath of unification, led to an appreciation of the DEM. In spite of the resulting recession in Europe and the currency appreciation, wage increases continued to erode German competitiveness until 1995, when the real effective exchange rate was some 20% higher than in 1991 (see Graph 3.1b).<sup>11</sup>

As a consequence of the strong real exchange rate appreciation, Germany steadily lost export market shares between 1992 and 1995.<sup>12</sup> The contribution of net exports to real GDP growth was strongly negative in 1992 and remained non-existent or just slightly negative until 1995, as a result of weak domestic demand and, hence, imports. By contrast, the other economies that later became members of the euro area experienced an 8% depreciation of their real effective exchange rate on average between 1992 and 1995 and their exports of goods and services grew at a faster pace than Germany's in this period.



The loss of competitiveness in the early nineties was accompanied by the disappearance of eastern Germany's manufacturing sector, rising 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

<sup>11</sup> For a more detailed analysis, see Jansen (2005).

<sup>12</sup> See Hansen and Roeger (2000).

wake of unification. Furthermore, massive transfer payments to Eastern Germany imposed a substantial burden on Western Germany while yielding only modest productive economic benefits in the East.<sup>13</sup> In its wake, public finances had become unsustainable and in need of consolidation. The time period since the mid-1990s is significantly shaped by a reversal of the misalignments of the early 1990s.

This most visible reversal occurred in the construction sector, which has been a drag on overall GDP growth for a decade, and which only now appears to have come to a halt. In this respect, Germany stands in sharp contrast to the rest of the euro area, which benefited greatly from a housing boom either directly through construction activity or indirectly as a result of increased consumer spending due to equity withdrawal or a wealth effect.

Economically even more significant was a turn-around in wage setting behaviour. Cost and price competitiveness started to recover from 1995 onwards. Wage moderation contributed substantially to this performance, with increases in nominal compensation per employee only slightly above or even below productivity gains. As a result, Germany's real effective exchange rate fell rapidly. By 2000, it had even fallen below its pre-unification level, when calculated on the basis of unit labour costs. The real effective exchange vis-à-vis other euro-area members is presently 6% below its 1989 level; it is 8% below its 1989 level vis-à-vis a broader group of 24 industrial countries. German export performance was in line with international market developments over 1996-2000 and the contribution of net exports to real GDP growth turned positive again.

Low wage increases, however, resulted in a weak development of private consumption. Spending was further curbed by higher taxes and social security contributions, rising uncertainty in the context of pension and labour market reforms, and not least due to rising unemployment. Beyond this, private households may have adjusted their income expectations to the slower pace of potential output growth and they might expect future increases in taxation to adjust the imbalances in public finances, also due to an ageing population. Private consumption mirrored these factors and increased by only 0.4% on average in 2001-2005. At the same time, public consumption was also retrenched, as the government deficit exceeded 3% of GDP since 2002.

Under these circumstances, wage moderation did not result in increased labour utilisation, which continued to fall amidst increasing structural unemployment. While unemployment increased partly as a result of low growth, Germany's structural unemployment rate also increased, against euro-area trends, by nearly 1½ percentage points since 1995, to reach almost 9% in 2005. Next to structural changes, the main reason was that low wage differentiation continued to make it difficult to match productivity with wages, except by reducing the labour force. Due to this labour shedding, Germany's productivity per working hour improved slightly relative to that of other euro-area countries over the period 1995-2005 (see Graph 3.1a). However, Germany's advantage in per-capita labour productivity diminished up to 2003 and has stabilised since then. A factor is that the pace of labour market reforms was slower over the second half of the 1990's compared with other euro-area countries, and the Hartz reforms of the first half of this decade have delivered the expected results only to a limited extent. Labour input has therefore contributed little to potential growth throughout the entire period since unification.

Important in explaining falling productivity increases is also the parallel decline in equipment investment since 2000, which took place in spite of the slow recovery in competitiveness and the build-up of a significant trade surplus. This reflects to some degree the classical cyclical link of low investment to sluggish domestic demand and overcapacities that were built up in the early 1990s. Moreover, the only partial recovery of competitiveness by the time of euro-area entry meant that the only way out was to have price increases below the already relatively modest inflation levels of other euro-area members. Another aspect is that German companies were no longer alone in benefiting from the high reputation and low interest rates of the Bundesbank. The run-up to monetary union resulted in significant reductions in nominal interest rates in other euro-area Member States. Measuring real interest rates in Germany over this period is rather complex because exporters faced very different real interest rates than other economic agents.<sup>14</sup> Between 1995 and 2000, Germany's real interest rate (defined as the difference between the nominal interest rate and the *ex post* HICP inflation rate) only decreased by 1.2 percentage points to 4.3%, whereas the average rate for the other euro-area countries fell by 3.6 percentage points to 2.3%. The real interest rate differential, which was still negative in 1995, reached its maximum of two percentage points in 2000. It then fell in 2001 and has since varied from 0.5 to 1 percentage point. Higher financing costs and the search for higher yields resulted in substantial capital outflows from Germany, while other euro-area countries, notably in Portugal, Spain and Ireland, benefited. The loss of the risk premium advantage was further amplified for German small and medium-sized companies as a result of the phase-out of government guarantees for the German public banking sector (Sparkassen). As a consequence of stricter borrowing rules, financing conditions appear to have tightened noticeably for the German Mittelstand.<sup>15</sup>

On the positive side, Germany's corporate sector underwent a substantial corporate restructuring, as companies became more profitable. In addition, the fact that Germany's exports developed more strongly than priced-based

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<sup>13</sup> See Jansen (2004).

<sup>14</sup> See chapter V for a discussion of the issues associated with defining the real interest rate.

<sup>15</sup> For more details, see the analysis in Chapter 4 of the forthcoming DG ECFIN country study on Germany (European Commission, 2006f).

indicators would have predicted, points to qualitative improvements.<sup>16</sup> The opening up of Central and Eastern European markets and the consequent redirection of investment flows and increased outsourcing also are likely to have affected Germany relatively more than other countries. For instance, the average of total imports and exports of goods as a share of GDP has increased from 23.7% in 1999 to 31.2% in 2005. This compares with a rather flat profile of this indicator during the same period for France and Italy. German companies engaged in large-scale foreign direct investments notably during 1998 and 2000, not only in Eastern Europe but in even larger amounts in Western Europe and the US.

Public finances constitute a separate aspect. Problems in the sphere of public finances had been accumulating for a long time and were accentuated by a further deterioration in the aftermath of the economic slowdown following the bust of the dotcom bubble (see Graph 3.2). Fiscal institutions already came under intense pressure after unification, when the existing tax, social security and transfer system was by and large maintained. The situation was aggravated by the continued decline of the growth potential, which limited the scope for consolidation through increased revenues. Moreover, as a consequence of a less tax favourable growth composition and several significant cuts in direct tax rates, revenue increases have lagged 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. This is in sharp contrast to developments in the rest of the euro area where stronger GDP growth may have dampened the decline in the revenue share. As regards public expenditure, over the past decade Germany has apparently shown more restraint in terms of primary spending growth than other euro-area member states. 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, 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.

### **Box 3: Model simulation for Germany**

#### *Stylised facts:*

Germany has shown a poor growth performance (in per-capita terms) in the first few years after the creation of the euro area. However, after a particularly weak performance in 1999, the growth rate gradually caught up with the euro-area average. In the last two years, Germany has slightly exceeded per-capita growth in the euro area. The slow growth performance in the first years of the euro area is somewhat surprising given the above average TFP growth, especially in the non-tradeable sector. Most observers of the German economy attribute the sluggish growth to weak domestic demand, especially investment and construction. Consistent with the hypothesis of weak demand, inflation has been persistently below the euro-area average by about 1 percentage point p.a. Rising current surpluses (reaching close to 4% of GDP in 2005) further support the view that Germany is facing a demand problem.

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<sup>16</sup> See Allard et al. (2005).

**Table DE: Economic developments – Germany (relative to the euro-area average)**

Variables	1999	2000	2001	2002	2003	2004	2005
Growth rate of real GDP	-0.69	-0.23	-0.20	-0.37	-0.17	0.51	0.04
Growth rate of private consumption	-0.13	-0.36	0.40	-0.94	-0.21	-0.06	-0.84
Growth rate of investment	-1.42	-1.99	-4.15	-4.61	-1.63	-2.48	-2.43
Labour productivity growth	-0.31	-0.10	0.44	0.34	0.40	-0.21	0.44
Employment rate	-0.15	-0.13	-0.51	-0.99	-1.40	-0.90	-1.17
Inflation (GDP deflator)	-0.51	-2.10	-1.18	-1.10	-0.98	-1.13	-1.29
Wage inflation	-1.45	-0.56	-1.04	-1.21	-0.79	-1.81	-1.71
Growth of terms of trade	0.55	-4.83	-0.13	2.11	1.02	-0.24	-1.52
Current account balance	-0.47	-0.91	0.69	2.95	2.82	4.44	4.66

*Note:* The growth rates of GDP and its components are in per-capita terms. The employment rate and the current account are expressed as deviations from their 1998 levels. The terms of trade are defined as export prices of the country relative to export prices of the rest of the euro area.

*Source:* Commission Services

#### *Shocks:*

In this sub-section, we explore how in the context of the model, specific demand and supply shocks hitting the German economy could have contributed to these growth and inflation trends. On the demand side there are various explanatory factors. Germany entered the euro at a slightly overvalued exchange rate<sup>17</sup> and, compared to other euro-area countries, was not a net gainer from the convergence of the risk premium. Although these developments may also partly explain weak demand, it is most likely that other more structural factors also play a role. Weak demand for housing was mainly due to a correction of overinvestment during the unification-induced construction boom in the mid 1990s. However, housing investment is not sufficient to explain the slowdown in investment: business investment has been particularly weak as well. A possible explanation advanced by Broadbent, Schumacher and Schels (2004) is the structural changes in the German banking system, which could have increased capital costs for firms by 200 basis points.<sup>18</sup> This estimate appears high. The DSGE model replicates the low investment rate with a 30-basis-point increase in capital costs. Low consumption growth is possibly due to precautionary savings. The observed high productivity growth in non tradeables could be a supply side explanation for low inflation.

#### *Simulation results: (see Graph DE)*

The overvaluation of the exchange rate parity on entry to the euro area can indeed explain some of the demand shortfall in the first two years after entry. However, this and other standard model factors, such as risk premia, do not explain the sustained weakness of consumption and the even more striking low investment growth. A more permanent shock to housing is required in order to replicate the low growth of investment.<sup>19</sup> The negative housing shock does indeed explain a significant part of low growth in Germany (without a negative housing demand shock, GDP growth in Germany would have been about 0.25 of a percentage point higher). But it only explains about 10 percentage points of the inflation differential vis-à-vis the euro area. Low housing investment is also insufficient to completely explain low total investment. According to the model, corporate investment should be boosted because of positive TFP trends. In order to account for a decline in corporate investment, a shock to the required rate of return in the tradeable sector is given (in the order of magnitude of 50 basis points). This has a powerful effect: it not only reduces investment but also helps to explain some of the weakness of consumption and subtracts another 0.25 of a percentage point from the inflation rate. An additional demand shock is generated by rising transfers, financed by distortionary labour taxes.<sup>20</sup>

<sup>17</sup> Real effective equilibrium exchange rate estimates suggest that most of the real appreciation had disappeared at the end of the 1990s. For example, the estimates provided by Hansen and Roeger (2000) suggest an overvaluation in effective terms of 2%.

<sup>18</sup> This point is also made in the German country study (European Commission, 2006f, forthcoming). Broadbent, Schumacher and Schels (2004) argue that German Banks have operated with relatively low margins in the past. However, financial market harmonisation since the creation of the euro area has made it easier to compare bank performance across countries in the euro area and Basel II is forcing German banks to reassess the risk of outstanding loans.

<sup>19</sup> According to the figures provided in Table DE, about two thirds of the deviation result from a decline in the investment rate in Germany, while one third is explained by an increase in the investment rate in the rest of the euro area. The investment shock decreases the value of housing relative to the value of consumption expenditure (excluding housing services) by about 5%.

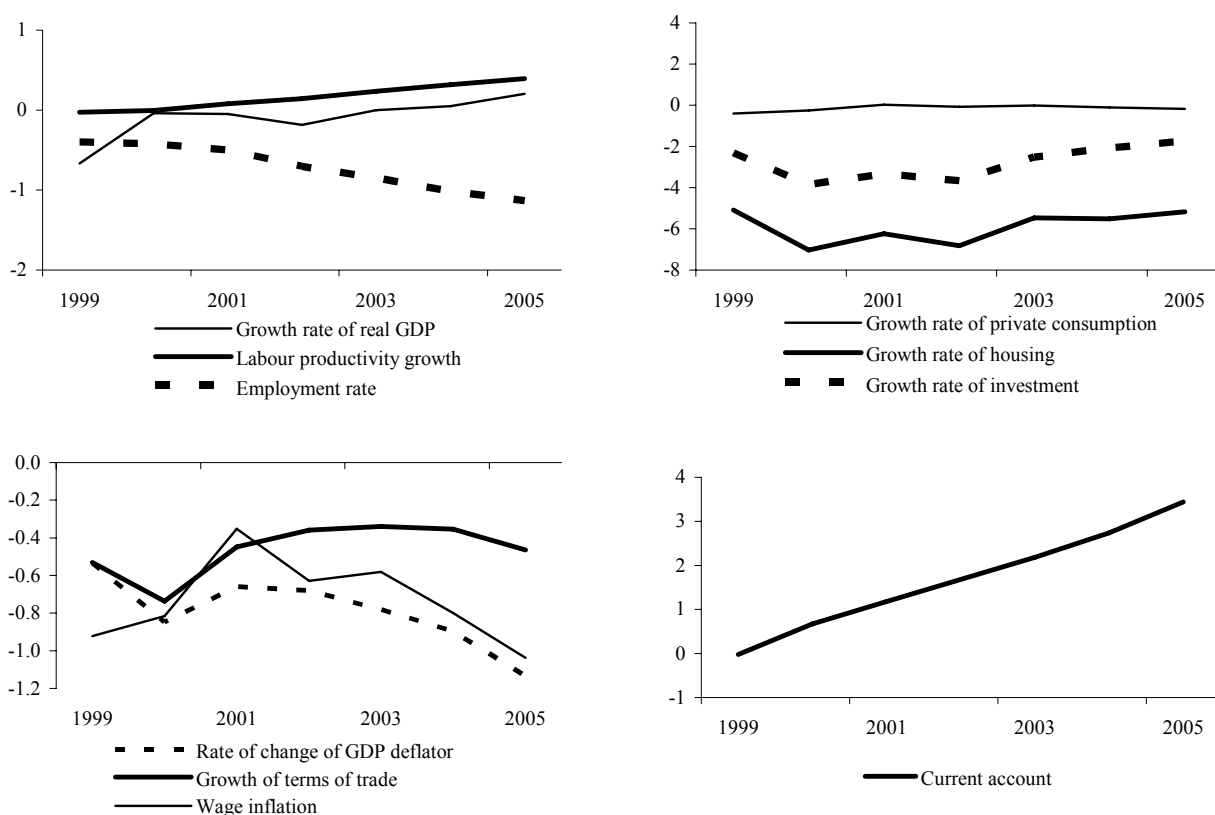
<sup>20</sup> While most euro-area countries have reduced the share of transfers in GDP, this share has risen by about 2 percentage points in Germany since the mid 1990s. In the simulation, an increase of 1 percentage point over the period 1999 to 2005 is assumed and a further increase by 2 percentage points over the next decade is projected. This is less than the observed rate of increase in the last two decades and is conservative given the demographic pressures in Germany.

The net effect on consumption growth is negative and subtracts another quarter of a percentage point from the inflation rate in Germany in the period 2002 to 2005. Finally, high productivity growth in non tradeables, explains a negative inflation differential of about 0.33 of a percentage point.

*Summing up:*

- 1) Shocks related to the creation of the euro area explain GDP and its components as well as inflation in the period 1999-2001. The convergence in the risk premium in other euro-area countries towards the German level also explains a lower permanent consumption level and a more permanent current account surplus (of about 0.6% of GDP)
- 2) In order to match the model simulations with the data in recent years (since 2002), specific demand shocks must be given (especially shocks to housing investment and corporate investment in the tradeable sector plus a fiscal shock to explain weak consumption growth). These demand shocks partially explain low inflation together with an increase in the current account surplus.
- 3) On the supply side, TFP growth of non tradeables is important for two features of the German data, namely a gradual recovery of German growth and low inflation.
- 4) Note that no particular shock is given to the labour market. The demand shocks, especially housing and corporate investment are sufficient to generate a decline in the employment rate of the same order of magnitude as observed in the data.

**Graph DE: DSGE results for Germany (deviation from the euro-area average)**



*Note:* All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.  
*Source:* Commission Services

**3.2.2 Policy assessment**

An assessment of the current situation of Germany is closely tied to two questions, both of which are influenced by the degree to which past and present reforms improve the functioning of the economy. The first question concerns whether the correction of the original misalignment of the German economy is still ongoing. One of the most striking aspects of the German post-unification period is the lengthy time span, which it took to correct for a situation that in hindsight was already visible in the early 1990s. The sluggishness of the response points to substantial challenges, in particular in a wage setting mechanism that ignored for too long that workers were priced out of the market. Wage restraints have substantially reduced the relative importance of this factor since the mid-nineties. However, given low aggregate wage growth, the problem remains of a still insufficient wage differentiation to fully allow matching productivity and wages. Fiscal policy as a stabilisation tool could only play a limited role. A more active role might

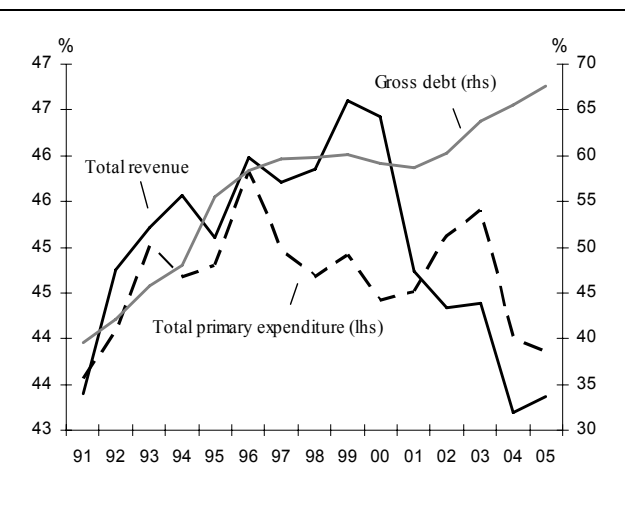


indeed have further drawn out the adjustment in terms of the economic restructuring process by easing the pressure on wages and companies, although it would have increased demand somewhat. The burden of public expenditure was reduced in this period, however, and by 2001, tax reforms were being implemented.

It now appears that competitiveness is back to where it used to be 15 years ago and, in relation to other euro-area Member States, Germany has even become more competitive than it was in the early 1990s.<sup>21</sup> 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. On the other hand, a current account surplus in the order of 3-5% of GDP is indicative of the degree of external adjustment that has already taken place. However, the adjustment process that has been ongoing for ten years will not automatically come to a halt. Conceivably, further competitiveness gains can lead to an overshooting relative to other euro-area countries.

A second question relates to the future development of Germany's growth potential. The need for wage restraint could have been substantially dampened, if Germany had succeeded in raising its productivity growth instead. Structural problems appear to play a role here. Regulations and Germany's relatively high nominal tax rates and complicated tax code may have hampered investment activity, apart from the possible tightening of investment financing conditions. Furthermore, ten years of low growth have led to rising structural unemployment, low investment and low productivity growth, suggesting a further decline in potential output.

**Graph 3.2: General government - revenue, primary expenditure and debt as a percentage of GDP**



Note: UMTS receipts in 2000 are excluded.  
Source: Commission Services

However, there are also very positive signs: the decline in the construction sector is finally coming to an end and machinery and equipment investment is picking up as the current upswing gains strength. At the same time, external competitiveness has clearly been restored, and the German economy is well-placed to cope with the effects of globalisation. This is evidenced by an accelerated increase since 2000 in the degree of economic openness. The stage is set for a virtuous circle of strengthening domestic demand and rising investment. Potential growth in the period ahead may well turn out to be stronger in the medium-term than has recently appeared likely. Even a substantial increase in domestic demand would not lead to external imbalances due to the country's high current account surplus. In this setting, wages should rise in line with productivity. To the extent that past and future labour market and product reforms are effective, structural unemployment can be expected to fall. This implies that Germany is not condemned to remain in a low growth trap. Obviously, higher growth and a more tax-friendly growth composition would also help to improve the sustainability of public finances.

### 3.3 Spain

The accession of Spain to the euro area was expected to provide a more stable macroeconomic framework characterised by lower and more stable inflation and nominal interest rates, as well as by sound public finances. It was also envisaged that participation in economic and monetary union would also provide the needed credible framework for economic policy and reduce financial and exchange rate uncertainty, thus allowing for a more efficient allocation of resources, which, in turn would put growth on a higher and more stable path. In the event, Spain's approach to euro-area membership was characterised by well-coordinated macroeconomic policies. Credible monetary policy ensured disinflation, while sustained fiscal consolidation helped to moderate the demand pressures that stemmed from declining interest rates. The economy also benefited from labour market reforms, which had begun some years before. In the early years of monetary union, several factors triggered a strong boom in residential construction: these included the lagged impact of declining interest rates, an easing of credit constraints on households, major migration flows, and the impact of tourism and of demographics. The dynamics of growth continued to rely heavily on the non-traded goods sector; and the current account deficit widened progressively. Inflation steadily increased, and a decline in real interest rates added to demand pressures. Product market reforms, meanwhile, had not advanced sufficiently rapidly; and as a result of these developments competitiveness

<sup>21</sup> Note that caution is warranted in drawing definitive conclusions from estimates of the real effective exchange rate, since they are subject to a margin of error, not least because they omit qualitative factors.

deteriorated. While the fiscal position has remained in approximate balance, revenue elasticity has benefited from the continuing financial boom and from the tax-rich composition of GDP – meaning that the underlying fiscal position may recently have been less favourable than it appeared. This highlights the adjustment priorities facing policy-makers: first, to continue with Lisbon-oriented actions that will enhance competitiveness, while enhancing the functioning of markets; and second to ensure that the underlying stance of fiscal policy is sufficiently prudent in the present strong boom phase.

### 3.3.1 Macroeconomic scene setter

Posting an annual average GDP growth rate of 3½% since 1995, the current expansionary phase of the Spanish economy has been accompanied by a strong process of nominal and real convergence with the euro area. Convergence has been decisively underpinned by the stability-oriented economic policy framework of economic and monetary union, which brought about a macroeconomic policy mix in Spain based on monetary and budgetary discipline. As a result, Spanish real GDP per capita rose from around 80% of the euro-area average in the mid-nineties to 90% in 2005.

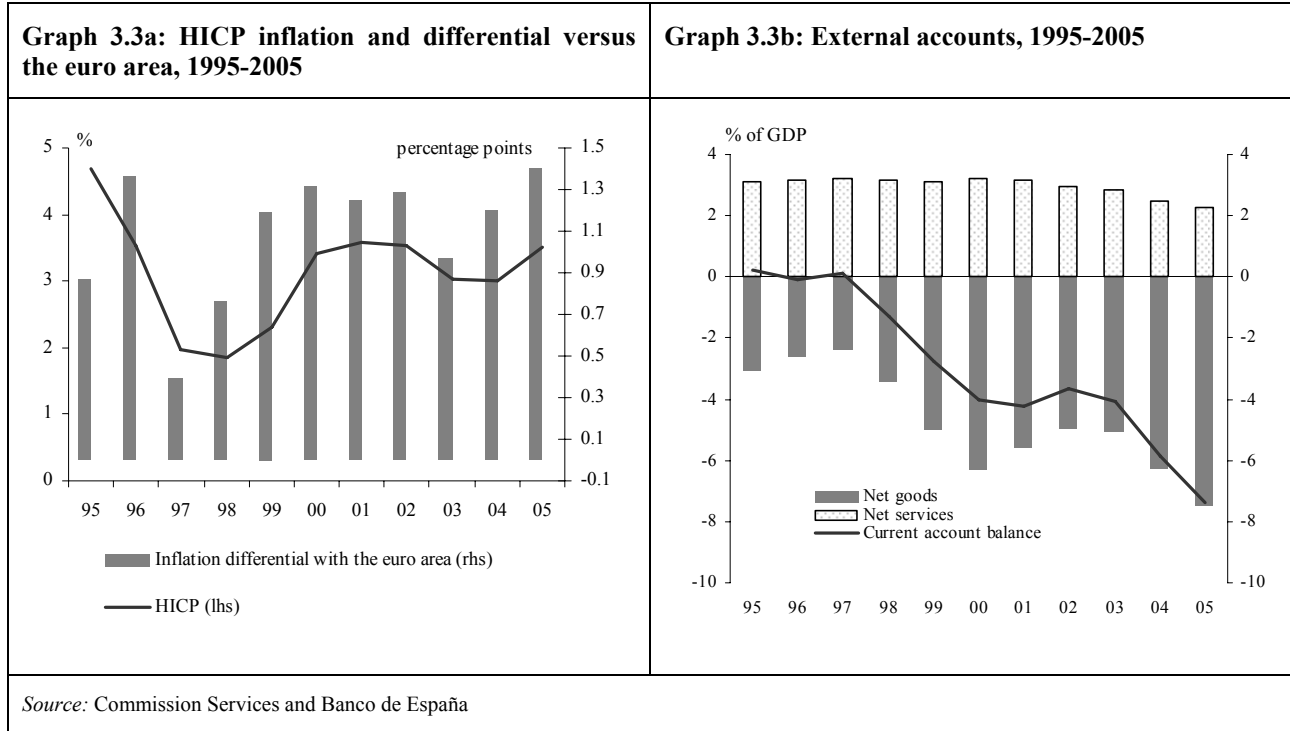
Since 1995 and during the run-up to the third stage of EMU, the Spanish authorities put in place a combination of economic policies aiming to converge in both nominal and real terms with the core countries of the euro area (namely Germany and France). The pillars of this strategy were monetary and fiscal policies, aiming at economic stability. Once the Banco de España became independent, the new monetary policy framework was based on inflation targets, and a strong anti-inflationary commitment. In parallel, an ambitious fiscal consolidation process allowed fiscal policy to become a stabilisation tool. Furthermore, a range of structural reforms, consisting of partial liberalisation of some product markets, including some recently privatised activities, as well as successive labour market reforms framed the new monetary and fiscal stance.

Although economic growth has been strong and sustained since the mid-nineties, its composition is raising economic imbalances. The contribution to GDP growth has been exclusively based on domestic demand, namely private and public consumption and investment in dwellings with a negative contribution to growth of net exports. This particular growth composition, based on labour intensive sectors, has boosted employment growth at strong and sustained rates of around 3% per year. Housing, a labour-intensive sector, the boom of which started in 1998, associated with easy financial conditions, already represents more than 30% of total investment<sup>22</sup>, while migration flows without precedent in Spanish history are having a strong impact on the total population, which has increased by more than 3 million people in the last five years, and thus on employment (especially in the construction and services sectors) and on consumption. The other side of the coin has been low productivity growth, which, at an average rate of around half a percent per year during the last decade, is far from the average rates of around 1% in the euro area.

On the nominal front, the consistent pursuit of monetary and fiscal targets led to a gradual decline of inflation and interest rates. Lower inflationary pressures gave way to a sustained reduction of interest rates, which has been a main driver behind the present expansionary phase. The fulfilment of the nominal targets, coupled with the agreements with the social partners in the mid-nineties, prompted a progressive deceleration of wages. Budgetary policy contributed by setting the example of wage moderation, as public salaries were frozen several times in the mid-nineties.

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<sup>22</sup> For a more detailed description see Yaniz (2006).



Inflation, although low in historical terms, is still above the euro-area average. In the run-up to the third stage of EMU, the inflation differential with the euro area narrowed and bottomed out at around ½ of a percentage point in 1997. However, the trend has reversed since 1999 (see Graph 3.3a). The widening of the inflation differential, which has continued recently and stood at 1½ percentage points in the first half of 2006, seems to be due not only to cyclical factors associated with the strong economic activity, but also to structural factors. Specifically, high inflation in Spain has its origin in sheltered sectors, especially utilities and some services, as a result of insufficient competition and a too rigid wage bargaining system, which fails to take due account of productivity differentials across sectors. The open sector is under pressure from wage developments and, in the absence of strong productivity growth, is forced to reduce mark-ups and/or employment.

Furthermore, as a result of such persistent inflation differentials, which, coupled with a low productivity growth, are deteriorating competitiveness, exports are growing at a lower pace than imports, boosted by a strong domestic demand. Consequently, the deficit in goods trade has widened and the surpluses in the services sector (mainly tourism) are on a declining path. Mirroring large FDI inflows in the past, the deficit on the primary incomes balance has increased, and the traditional surplus in the current transfers' account has entered red territory, largely due to the increase in migrants' current transfers abroad. As a result, the Spanish external deficit has been widening during the last decade. Specifically, from a balanced position in the mid-nineties, the current account attained a deficit of 7.5% of GDP in 2005 and already crossed the two-digit threshold in the first quarter of 2006

#### Box 4: Model simulation for Spain

##### *Stylised facts:*

In the run up phase to the creation of the euro area, the currency risk premium of Spain declined and disappeared at the beginning of 1999. Starting in the 1990s, the productivity performance in the non tradable sector worsened relative to the euro area. A number of features characterise the Spanish economy. First, the employment rate is still rising at an impressive pace. Since the beginning of the 1990s, the participation rate has increased by 10 percentage points and the structural unemployment rate which peaked at nearly 17% in the mid 1990s came down to 14% in 1999 and has now reached about 9%. The increase in the employment rate is accompanied by a strong increase in the working age population, mainly due to immigration. Second, the housing boom in Spain is persisting, possibly fuelled by high population growth, the age structure of the population and a boom in tourism (in particular an increasing number of holiday homes owned by foreigners). Because of high employment growth, GDP per capita has been consistently above the euro-area average, despite weak productivity growth. Investment growth has outpaced the euro-area average by roughly 4 percentage points each year since the end of the 1990s. This is mostly due to housing investment (growth rate exceeds euro-area average by about 9 percentage points). However corporate investment in equipment has also shown strong growth in recent years. Inflation has been permanently been high in Spain (about 2 percentage points above euro-area average). Wage inflation is however much more moderate with a differential below 1 percentage point to the euro area. High demand is also reflected in the current account balance. The current account deficit exceeded 6% of GDP in 2005.

**Table ES: Economic developments – Spain (relative to the euro-area average)**

Variables	1999	2000	2001	2002	2003	2004	2005
Growth rate of real GDP	1.41	0.49	0.71	0.58	1.01	-0.22	0.96
Growth rate of private consumption	1.55	1.11	0.34	0.79	0.24	1.56	1.92
Growth rate of investment	4.27	1.62	4.04	4.82	4.67	2.55	4.93
Labour productivity growth	-0.81	-1.46	-0.07	0.02	0.03	-0.98	-0.79
Employment rate	1.10	2.09	2.49	2.82	3.42	3.88	4.97
Inflation (GDP deflator)	1.77	2.03	1.79	1.88	1.93	2.16	2.69
Wage inflation	-0.45	0.35	0.96	0.74	1.06	1.18	0.25
Growth of terms of trade	-0.30	-2.95	2.15	3.13	1.29	0.19	0.79
Current account balance	-1.50	-2.85	-3.08	-2.50	-2.93	-4.68	-6.23

*Note:* The growth rates of GDP and its components are in per-capita terms. The employment rate and the current account are expressed as deviations from their 1998 levels. The terms of trade are defined as export prices of the country relative to export prices of the rest of the euro area.

*Source:* Commission Services

### *Shocks*

An important country specific shock in the case of Spain was the reduction of the exchange risk premium when entering the euro area. A conservative estimate based on deviations from interest parity between the peseta and the euro before 1999 suggests a risk premium of about 50 basis points was eliminated in the run up to the third stage of EMU. This provided a big stimulus to investment and consumption. Housing investment has also benefited from financial market liberalisation as shown, for example, by higher household debt (increase from 42.8% of GDP in 1999 to 64.5% in 2005). However, other factors related to demographics, immigration and tourism also play a major role. In the simulation exercise, all three sources of housing shocks have been taken into account.<sup>23</sup> Spain differs from the rest of the euro area where labour market trends are concerned. First, we allow for different population (of working age) trends and second we calculate negative shocks to the wage setting rule such that the model replicates the increase in the employment rate. Another interesting structural development in the case of Spain is increased openness to foreign trade. While in the 1980s Spain was the country with the lowest import penetration (import share of 16.8% in 1980 vs. 23.1% for France (second lowest) and EUR 29.0%); it has now overtaken France (30.6% for Spain vs. 27.5% for France, Euro area: 36.3%). Following the empirical trade literature, increased openness is likely to increase competition in the tradeable sector. In the simulations reported below this is captured by a reduction in mark ups in the tradeable sector. Finally, we consider deviations in productivity growth in the non tradeable sector.

*Simulation: (see Graph ES)*

The reduction in the risk premium has a powerful short run effect on investment and consumption. Consumption increased by about 3% in the first three years after 1998 and has stayed at a higher level. Against a background of low global interest rates, housing investment has responded vigorously to the reduction in the risk premium. Within the first two years it rose by about 8%: afterwards, however, housing investment gradually returns to baseline levels.<sup>24</sup> The risk premium can account for higher inflation of between 0.5 and 1 percentage point in the first 4 years after the creation of the euro area; however, after 4 years the contribution of a lower risk premium to inflation is insignificant. Due to the level shift in demand, the risk premium shock has a rather long lasting effect on the current account. It is the most important individual factor in explaining the current account deficit (and it also explains a deficit of 2.5% of GDP in 2005).

Other structural factors (including the lifting of credit ceilings) have a more long-lasting effect on housing demand and on inflation (+0.4% p.a. in recent years). Further significant contributions to inflation stem from supply side factors, namely low productivity growth in non tradeables and increased competition in tradeables<sup>25</sup> (the joint inflation effect is about 0.8 percentage points per year over the last three years).

*Summing up:*

1) Shocks related to the creation of the euro area explain the evolution of GDP and its components as well as inflation in the first 2 to 3 years after the creation of the euro area. The fall in the risk premium also explains a lower permanent consumption level and a more permanent current account deficit (of about 2.5% of GDP)

<sup>23</sup> The third source has been implemented as a residual shock to the model in order to replicate the divergent housing trend in Spain.

<sup>24</sup> The effect of a reduction in the risk premium is an increase in the desired housing capital stock of private households. This is realised by initially rising investment, followed by a period of higher investment levels and a gradual return to the baseline level of investment.

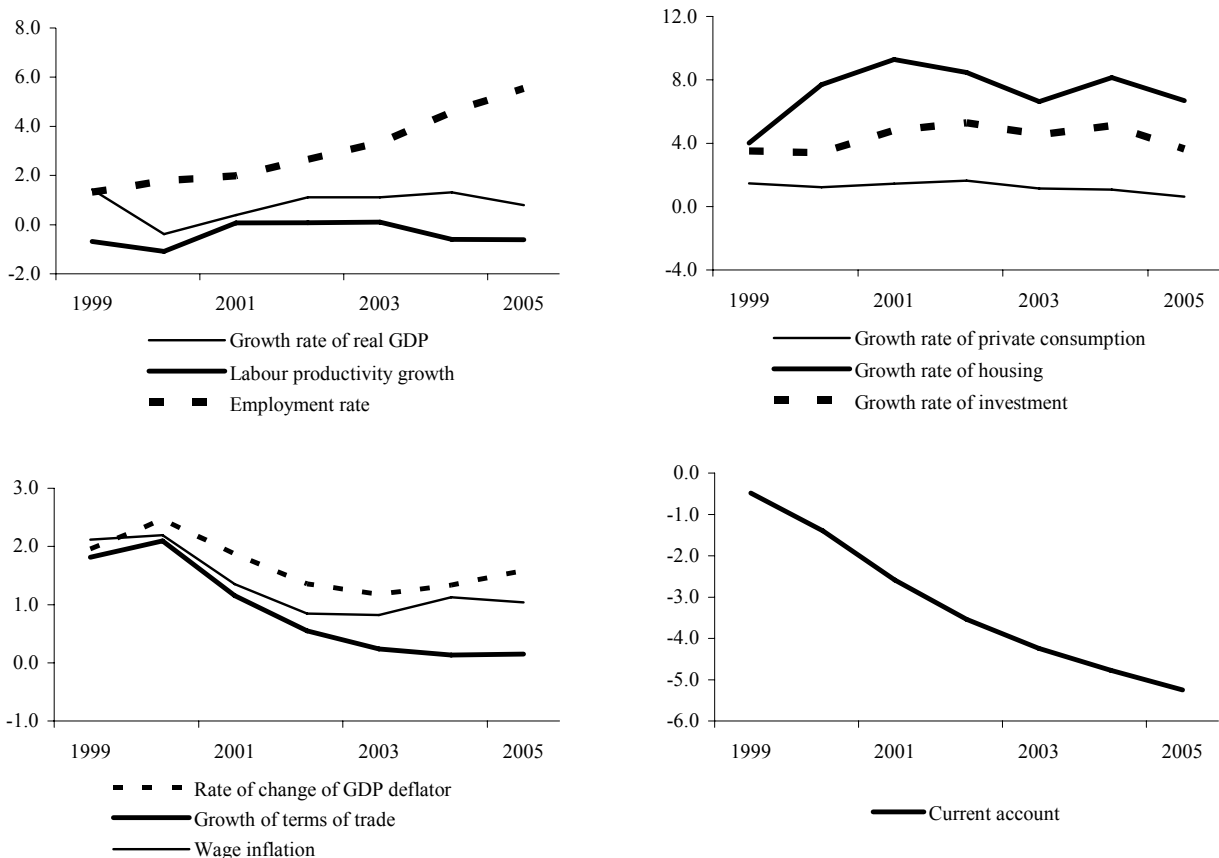
<sup>25</sup> An inflationary effect from increased competition in tradeables sounds counterintuitive. Indeed increased competition does not increase prices in the tradeable sector but it increases wages which in turn leads to higher inflation in the non tradeable sector.

2) The risk premium cannot explain sustained differences in the growth rate of housing investment. This can only be captured by assuming specific housing demand shocks. Increased housing demand can partially explain high inflation and a rising current account deficit in recent years.

3) On the supply side, low TFP growth of non tradeables and increased competition in tradeables are important explanatory factors for inflation and the external balance in the Spanish economy.

4) The increase in the employment rate is only to a limited extent explained by the shocks considered. Both the population increase and increased competition contribute positively to employment. However the bulk of the increase in the employment rate is generated by a shift in the wage setting rule consistent with the observed decline in structural unemployment. Increased employment in Spain contributes significantly to housing demand, investment and private consumption.

**Graph ES: DSGE results for Spain (deviation from the euro-area average)**



*Note:* All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.

*Source:* Commission Services

### 3.3.2 Policy assessment

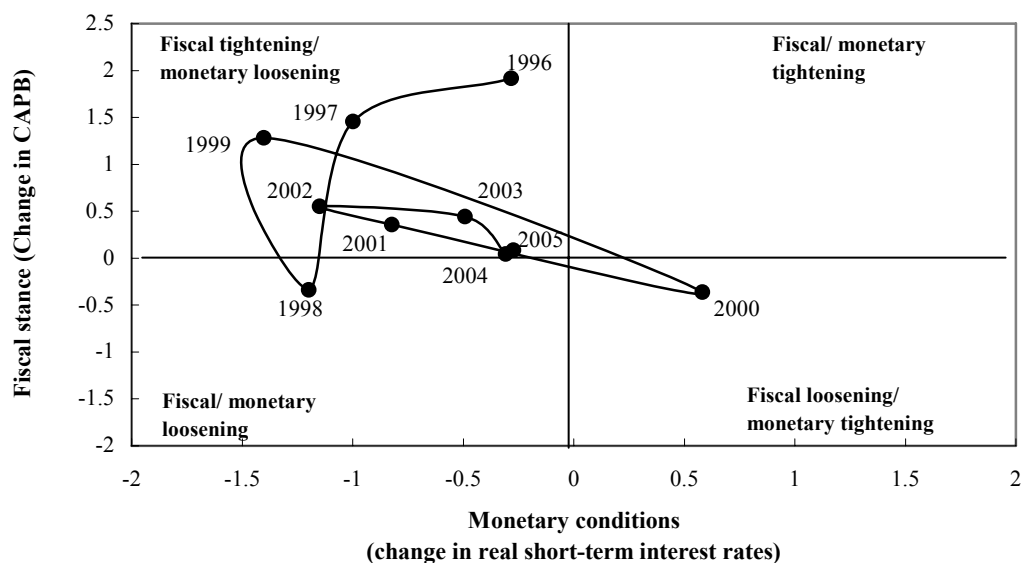
In the euro area, both monetary and exchange rate policies are beyond the direct control of Member States' authorities. This means that fiscal and structural policies are crucial in ensuring a smooth medium-term adjustment. Therefore, the question arises as to the consequences of this new policy framework in the presence of the above mentioned rising external imbalances.

No doubt the monetary conditions have contributed to strong domestic demand and, linked to the business cycle, to increasing the current account deficit. In this context, fiscal policy becomes a crucial domestic instrument in order to maintain macroeconomic stability. During the last decade, the fiscal consolidation process, which was based on a discretionary fiscal policy, aimed at satisfying the Maastricht criteria and at consolidating a close-to-balance position. In five years, between 1995 and 2000, a deficit of well above 6% was converted into a position of balance. The general government surplus reached about 1% in 2005. Fiscal consolidation was largely spending-based. Total government expenditures fell from 44¼% of GDP in 1995 to 38¾% in 2005. Furthermore, fiscal consolidation has also been supported by strong flows of revenues in the last few years, partially associated with the above-mentioned

housing and consumption booms, which are making tax revenues grow at rates significantly above historical elasticities.<sup>26</sup> As a result, during this period, the expansionary monetary policy has been somehow compensated by the tightening linked to the fiscal consolidation process. However, since the bulk of the consolidation process took place between 1995 and 2000, the policy mix has been characterised by an expansionary bias since the beginning of the current decade, as still negative real interest rates have been accompanied by a rather neutral fiscal stance (see Graph 3.4).

However, apart from the economic cycle, other factors seem to be behind the increase in the current account deficit. An apparently transitory factor associated with the rising energy bill is having a direct and substantial impact on a nominal increase of imports. Furthermore, the above mentioned structural factors associated to persistent inflation differentials between Spain and the euro area, coupled with low productivity growth, seem to be playing a relevant role in the deterioration of competitiveness and could explain in part why exports growth is below that of imports.

**Graph 3.4: Spain - policy mix,<sup>27</sup> 1996-2005**



Note: CAPB estimates using the Hodrick-Prescott filter.  
Source: Commission Services.

Therefore, although an adequate policy-mix should take into account the double nature of the problem, cyclical and structural, the accent should be put on the implementation of policies aiming at tackling the structural problems. A decisive anti-cyclical fiscal policy would of course help to cool down domestic demand pressures, which, in turn, would reduce the growth of imports. In particular, it will remain very important, when estimating the underlying fiscal position, to allow for the impact on revenues of the strong domestic boom. The challenge remains on the implementation of policies aiming at enhancing productivity growth or fostering competition in certain sectors such as utilities and services. A sustainable improvement of Spanish international competitiveness requires a shift towards more efficient specialisation patterns and product differentiation underpinned by higher productivity growth. Although certain structural measures, such as the above-mentioned market liberalisations, have already been undertaken during the last decade, the reforms have been partial since it was the fiscal consolidation process, which remained at the top of the political agenda.

<sup>26</sup> For a more detailed description of the tax elasticities linked to these phenomena in Spain, see box 2 in European Commission (2006d).

<sup>27</sup> In this graph, monetary conditions are measured by the change in real short-term interest rates. If the monetary stance is measured through the change in a monetary conditions index including the real effective exchange rate (REER), the conclusions remain broadly unchanged. However, depending on the relative weights attributed to real interest rate and to REER in the index, a more or less strong monetary tightening would have been observed in 2003, when the inflation differential between Spain and the euro area was at its peak. The monetary tightening would have lasted until 2004, while the monetary policy would have been neutral or even loose in 2005. However, such an apparent monetary tightening would not have had any significant impact on real activity, thus suggesting that the competitiveness channel is not working or is working only very slowly (see chapter V, and López-Salido, Restoy and Vallés (2005), among others).

Since 2005, the renewed Lisbon agenda, by putting the accent on structural factors that hamper productivity growth, should be the key milestone in the process of rebalancing the external sector. The Spanish National Reform Programme shows awareness of the needed structural reforms, and of the implementation of the announced measures.

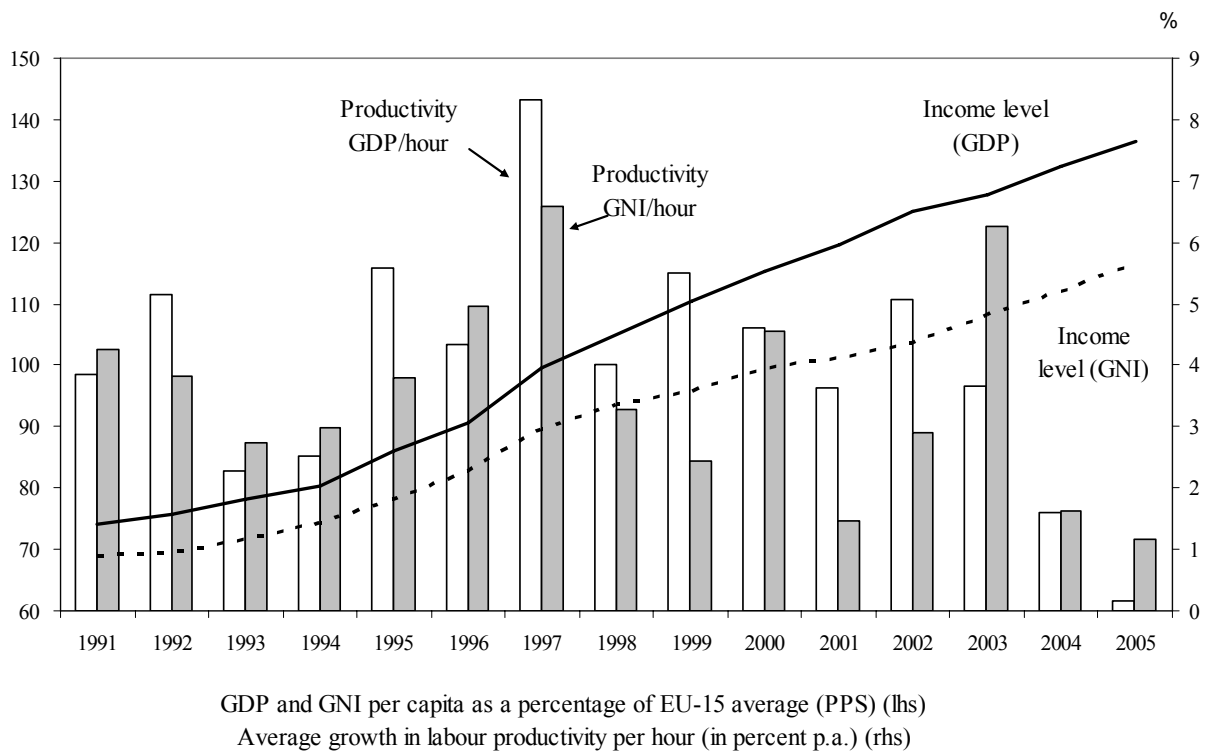
### **3.4 Ireland**

Ireland has been successfully transformed into a modern open economy over the last two decades. In the mid-1980s, Ireland was perceived as a lagging economy with sluggish growth and high unemployment. But in the 1990s, the Irish economy embarked on a sustained higher growth path that has led to rapid catching up with other euro-area economies. Indeed, the success story of the "Celtic Tiger" is reflected in per-capita income indices (both GDP and GNI) that have not only equalled but subsequently considerably exceeded the EU average (see Graph 3.5). Ireland's robust employment growth over the 1990s practically wiped out unemployment, which fell from 13½% in 1990 to around 4% in 2001. Over the same period, aggregate productivity helped by increases in manufacturing output rose to the levels of other industrialised countries. This very strong productivity growth over two decades, especially in tradeables, initially helped to forestall external adjustment stresses, as well as fuelling rapid real convergence. Wage flexibility was insufficient; but inward migration played a major role. Latterly, productivity in tradeables slowed steeply, but in non-tradeables it remains favourable. A strong housing boom, with high prices fuelled by heavy borrowing, has left adjustment vulnerabilities among households – one reason for continued fiscal prudence.

#### **3.4.1 Macroeconomic scene setter**

A wide array of both long- and short-term factors played a role in the impressive catch-up of the Irish economy in the 1990s (Čech and Macdonald, 2004). In this respect, a crucial element was the ability to exploit the opportunities offered by globalisation and the ICT boom, reflected in particular in the FDI inflow, as well as by the progress made in EU integration. In the 1990s, with strongly growing FDI inflows, international trade and inward migration, Ireland benefited from increased openness and the launch of the EU internal market. Ireland also scored high on wage competitiveness and most of the subjective indicators of institutional quality and political stability. The run-up to the third stage of EMU cemented the policies of opening the economy and facilitated the macro-stabilisation process and structural reforms. As a result, both long-term and short-term pro-growth factors meant that Ireland was ready to join the euro area at a time when the economy was booming. In addition, falling interest rates in the run up to the introduction of the euro gave Ireland an additional monetary stimulus.

**Graph 3.5: Per-capita income and productivity developments in Ireland, 1991-2005**



Source: Commission Services

Following the creation of the euro area in 1999, the Irish economy continued to grow at double-digit rates and was by a wide margin the fastest growing economy among the euro-area countries. The massive FDI inflow in the 1990s also pushed productivity towards EU-15 levels, thus creating room for a strong pick-up in nominal wages. The pace of economic growth was helped by an additional pro-cyclical loosening of monetary conditions in the first years of euro-area membership and the economy at times showed signs of overheating. Unemployment declined to record low levels and the tightness of the labour market led to upward wage pressures, while HICP inflation accelerated and remained well above the euro-area average. A particular feature of Ireland, while adjusting to the new regime of euro-area membership, was the relatively high responsiveness of inward migration flows to the buoyancy of the domestic economy.

The factors behind the extraordinary growth of the 1990s, including the favourable external environment, had largely disappeared by the early 2000s. Despite the international slowdown at that time, the Irish economy continued to expand at a healthy pace, with GDP growing by around 5% p.a. The fiscal position continued to be broadly sound, with the general government balance recording surpluses in most years following euro adoption and the debt ratio falling significantly (to under 30% of GDP in 2005). Economic activity became increasingly driven by buoyant domestic demand. In spite of the negative shock stemming from the international ICT downturn and a significant deterioration in wage competitiveness, the momentum in economic activity was supported by buoyant construction output, with residential housing boosted by fast-rising property prices.

**Box 5: Model simulation for Ireland**

*Stylised facts:*

Like no other country in the euro area, Ireland benefited from the ICT boom of the 1990s, which generated high rates of technical progress in the production of computers, semiconductors and telecom equipment. With a high ICT production share the Irish economy has exhibited very high growth rates of labour productivity. Productivity growth in the tradeable sector of the Irish economy exceeded that of the rest of the euro area by about 13 percentage points p. a. on average over the period 1999-2003<sup>28</sup>. In recent years there have been some signs that the rate of technical progress is slowing down. However, other sectors of the

<sup>28</sup> As pointed out by Čech and Macdonald (2004), this productivity boom is to a significant part due to FDI investment and therefore the productivity measure overstates the actual income gain in Ireland.



economy have also scored above average in terms of productivity growth. In the non-tradeable sector productivity growth has been 2 percentage points higher than the euro-area average over the same period. High productivity growth biased towards the tradeable sector could at least partly explain the above-average Irish inflation rates (Balassa-Samuelsong effect). The labour market may have been another factor adding to the persistence of inflation. The Irish employment rate increased throughout the 1990s. As the unemployment rate approached 4%, some wage pressure emerged eventually and the unemployment rate finally stabilised at a low level. On the demand side two characteristic features may be observed. First, there is strong housing demand with growth rates deviating from the euro-area average by about 10 percentage points p.a. and secondly government consumption (as a share of GDP) has increased at an above average speed between 2000 and 2005. Despite high domestic growth and inflation above the euro-area average, the external balance has remained remarkably stable, with the current account surplus deteriorating by about 2 percentage points since the late 1990s.

**Table IE: Economic developments – Ireland (relative to the euro-area average)**

Variables	1999	2000	2001	2002	2003	2004	2005
Growth rate of real GDP	5.97	3.49	2.30	3.33	2.31	0.84	1.27
Growth rate of private consumption	3.21	3.58	1.54	0.67	0.93	0.95	2.21
Growth rate of investment	8.67	2.54	-0.73	5.12	4.85	5.64	10.82
Labour productivity growth	3.25	2.95	2.72	3.98	2.03	-0.12	-0.75
Employment rate	1.59	1.91	1.64	1.22	1.40	2.04	3.40
Inflation (GDP deflator)	3.16	4.05	3.29	2.47	0.02	0.33	1.38
Wage inflation	1.99	5.57	4.83	2.47	3.32	3.42	3.21
Growth of terms of trade	-0.26	1.11	0.38	0.96	-1.07	-0.33	0.37
Current account balance	0.35	-0.36	-0.57	-0.99	0.00	-0.79	-1.04

*Note:* The growth rates of GDP and its components are in per-capita terms. The employment rate and the current account are expressed as deviations from their 1998 levels. The terms of trade are defined as export prices of the country relative to export prices of the rest of the euro area.

*Source:* Commission Services

In the last two years of our sample (2004 and 2005), the high growth of labour productivity came to an end in Ireland but employment growth has picked up once again. Also inflation has diminished very quickly in recent years, although wage inflation remains high. It is therefore somewhat puzzling that the employment rate and investment growth (both construction and equipment) has started to increase again.

*Shocks:*

In the model the productivity trends in Ireland are implemented as supply shocks to tradeables and non tradeables TFP such that the model replicates the productivity growth differential between Ireland and the rest of the euro area, as well as the productivity growth differential between the tradeable and non tradable sector in the Irish economy. After the year 2000 a negative wage shock is removed in order to replicate the end of wage moderation in Ireland. Some idiosyncratic demand shocks can also be identified. Between 2000 and 2005 the share of government consumption in GDP increased by 2 percentage points (compared to an increase below 1 percentage point in the euro area). There is also empirical evidence that liberalised mortgage markets facilitated rising household debt. As in the case of Spain the housing boom is to some extent an autonomous demand shock fuelled by demographics and catching up processes. Some attention is devoted to the last two years, where we can observe a decline in the growth rate of GDP and a fall of productivity growth below the euro-area average. Within the context of the model, a possible explanation for a simultaneous drop in productivity and inflation could be a decline in TFP growth in the tradeable sector. In order to make these two developments consistent with the absence of a fall in wage inflation, rising employment shares and continued investment growth (both construction and equipment), increased competition in the non tradeable sector must be assumed.<sup>29</sup>

*Simulations: (see Graph IE)*

According to the model simulations (Graph IE), the TFP shocks are the most important factors for explaining the productivity trend in Ireland and other stylised facts. Tradeable sector TFP growth explains a productivity differential of about 2.5 percentage points between 1999 and 2003. Productivity growth in the tradeable sector leads to inflation (GDP deflator) with a certain lag (see standard simulation) via second round effects through wages and prices in the non tradeable sector. Eventually the inflation differential exceeds the productivity differential by about 30 percentage points. Productivity growth in the non tradeable sector

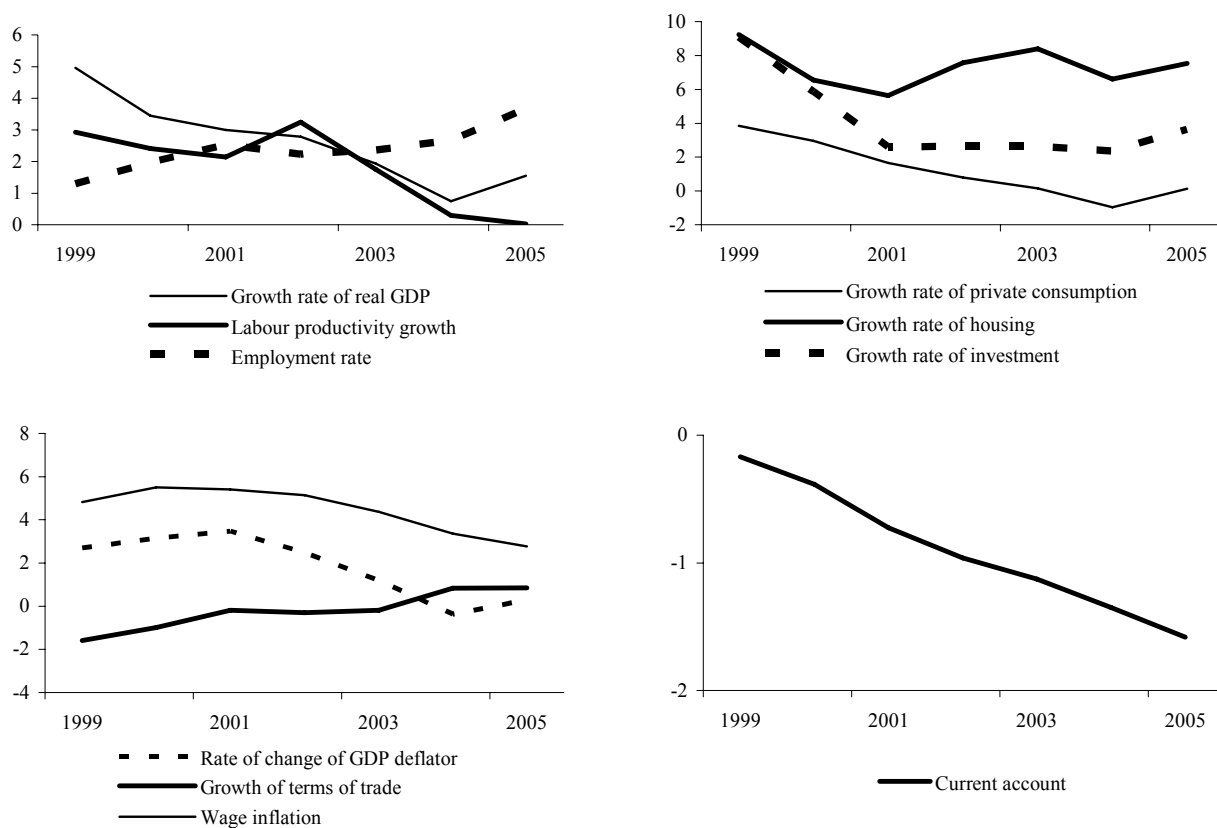
<sup>29</sup> Recent developments in manufacturing and services prices support this view. Manufacturing inflation has increased sharply since the beginning of 2004 while service sector inflation has declined from about 7% over the period 2000 to 2003 to about 3.5% over the period 2004-05 (see Central Bank and Financial Services Authority of Ireland, Quarterly Bulletin, 2006). The Irish central bank attributes the decline in service sector inflation at least in part to increased competition in home and transport insurance and the communications sector.

contributes to a reduction in inflation (GDP deflator). The stylised fact of falling inflation in recent years is generated by continued productivity gains in the non tradeable sector but falling productivity growth in tradeables. According to the simulation results, the effect of increased housing demand on inflation has been relatively small<sup>30</sup> (not exceeding 0.4 percentage points on average in terms of explaining the inflation differential). The relatively minor impact of house prices on inflation is not inconsistent with the fact that despite buoyant housing demand there has been a deceleration of inflation in recent years. Expansionary fiscal policy in Ireland helps to explain both the decline in the growth rate of investment and subdued growth in private consumption after 2000.

*Summing up:*

- 1) The model, including the shocks, accounts reasonably well for the decline in the growth rate of GDP (per capita) from around 5% in 1999 to about 1% in the last two years and a similar decline in productivity. The model also captures the evolution of employment.
- 2) Concerning prices and wages, the model explains the initially high inflation differential and the closing of the gap in recent years. The model is less successful in matching the terms of trade development, especially in recent years.<sup>31</sup>
- 3) Despite persistently high housing investment, the growth rate of Irish total investment has been declining from high levels in the late 1990s. This is roughly matched by the model. The model also generates a downward trend in consumption per capita, although it undershoots private consumption in the last two years.
- 4) The model also replicates the decline in the current account; however it fails to match the somewhat stronger increase of the current account deficit in the first years after the creation of the euro area.

**Graph IE: DSGE results for Ireland (deviation from the euro-area average)**



*Note:* All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.

*Source:* Commission Services

<sup>30</sup> In the model, increased housing demand mainly leads to an increase in land prices and has less of an impact on construction because of wage equalisation across sectors. There are also two offsetting effects. First, an increase in housing demand is partly compensated by lower demand for consumer goods. Second a shift in the preference for houses increases labour supply and therefore has a dampening effect on wages. Finally imputed rents are not considered.

<sup>31</sup> The increase in the terms of trade as generated by the model results from an assumed reduction in TFP growth in the tradeable sector.

### 3.4.2 Policy assessment

Ireland experienced exceptionally high growth in the second half of the 1990s, mainly due to the favourable external environment and a sizeable pool of available labour, which subsequently led to overheating pressures. Based on *ex ante* perceptions of EMU, one might have expected that competitiveness pressures, following buoyant demand conditions and changes in the international environment, would have worked through the wage adjustment channel. However, the Irish experience suggests that the adjustment process for wage competitiveness in the euro area was quite weak, while inward migration flows have represented the major form of labour market correction (Honohan and Leddin, 2005). These developments have been accompanied by high rates of residential property construction, booming credit (notably mortgages) and a continuing loss of wage competitiveness.

For Ireland, two types of disturbances affecting both the internal and external equilibrium of the economy and requiring adjustment within the euro area can be identified. First, the initial interest rate shock in the years 1998-2000 related to euro-area entry was combined for Ireland with a pro-cyclical fiscal loosening (see Graph 3.6).<sup>32</sup> As a result, an expansionary macroeconomic policy mix contributed to the overheating of the Irish economy in the early years of euro-area membership. Second, there were a number of country-specific shocks in the euro area due to differences in trading partners, industrial structure or sectoral specialisation. For instance, the highly open Irish economy with a significant ICT sector specialisation had to face the international slowdown following the burst of the 'technology bubble'. As regards price developments, euro-dollar exchange rate movements tend to have a larger effect on inflation in Ireland than in other euro-area countries, partly reflecting differences in geographical compositions of trading partners.

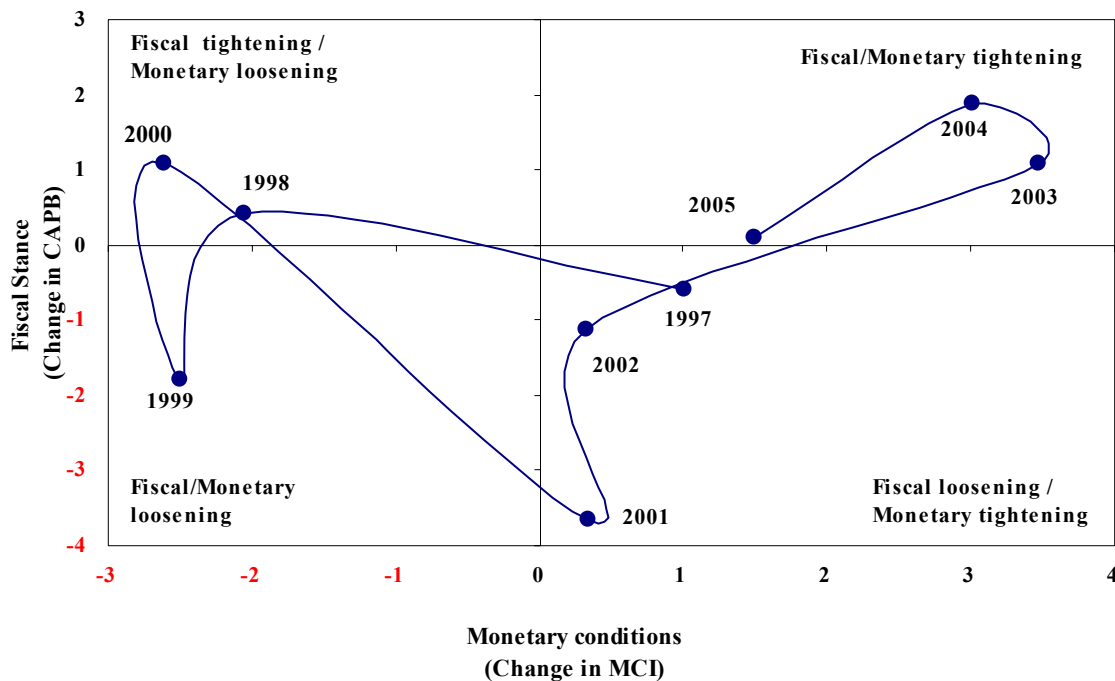
In Ireland, the shocks following euro adoption induced an adjustment process, notably through changes in wages, relative prices (terms of trade) and productivity. As the model simulations reveal, however, Ireland has – as compared to other euro-area countries – a relatively long adjustment process, keeping still a significant positive differential vis-à-vis the euro area in terms of economic growth and inflation. This specific feature of Ireland can be largely related to structural factors, in particular to a highly elastic labour supply, responding to the significant positive wage differential vis-à-vis other Member States. Indeed, the Irish labour market has benefited in recent years from inward migration, notably from the recently-acceded EU Member States. Given the deteriorating competitiveness, economic growth has become driven by domestic activity. Indeed, the pool of available labour facilitated the boom of the Irish residential construction sector, which has become extremely large by any measure.<sup>33</sup> The shift of resources into house-building and services, traditionally labour-intensive and with a limited scope for productivity improvements, has resulted in a decline in aggregate productivity growth.

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<sup>32</sup> However, it should be noted that estimates of potential growth in Ireland are subject to an unusual margin of uncertainty because of the difficulty in obtaining reliable estimates after the extraordinary growth performance and structural change over the last decade.

<sup>33</sup> The share of construction in GDP in 2005 was around 18%, with the residential subcomponent around 12% of GDP. Strong employment gains, averaging around 3.9% p.a. over the period 2004-2005, were largely driven by the developments in the construction sector. House prices inflation picked up again in 2005, after a temporary moderation in early years of the decade, with prices having risen almost fourfold since the mid-1990s.

**Graph 3.6: Ireland – policy mix, 1997-2005**



Note: CAPB estimates using the Hodrick-Prescott filter.

Source: Commission Services

The Irish experience of adjustment to exogenous shocks following euro-area membership has resulted in the composition of economic growth becoming somewhat imbalanced. The slowdown of the early 2000s was characterised by a downward revision of potential growth, but a significant positive growth differential vis-à-vis the euro area continued. HICP inflation has gradually declined since 2003, in line with the conclusions of the model simulations, but has remained slightly above the euro-area average. On the external side, competitiveness pressures exposed the economy's sensitivity to changes in the global economic environment. Moreover, the relatively high inflation in recent years has led to the price level in Ireland becoming the highest in the euro area. Continued wage moderation is therefore crucial to maintain competitiveness. Moreover, elimination of an infrastructural deficit (largely inherited from the past massive catch-up) and the elimination of obstacles to competition in some sectors of the economy are other essential elements to be addressed in this respect.

On the domestic side, the extended residential construction boom and accelerating house prices, coupled with the significant increases in household indebtedness, are noteworthy risks to the economy over the medium term. Ireland clearly stands out in international comparisons as a country with an extraordinarily buoyant residential construction sector. The construction-to-GDP ratio climbed to almost 20% of GDP in 2005, the highest in the euro area, while residential subcomponent accounted for around 13½% of GDP. As a result, concerns about the skewed nature of the strong Irish investment have been raised, as the accumulated assets do not always involve investment leading to higher future output (ESRI, 2006).<sup>34</sup> Moreover, a swift supply-side response to increasing demand pressures for property increased the residential building to overall output ratio to record levels, but failed to stop the upward movement in house prices. Given a number of factors (including demographics), a gradual tapering off in housing investment might be expected. Therefore, the extended residential activity might leave the whole economy exposed to a possible negative shock for some time. Policy should therefore lean towards a prudent budgetary stance<sup>35</sup> which would give some room for manoeuvre in the event of an economic downturn.

<sup>34</sup> See O'Malley and McCarthy (2005).

<sup>35</sup> See graph 3.6, depicting broadly neutral fiscal stance in recent years. However, tax revenues over recent years have become reliant to a large extent on the property market expansion.

### 3.5 Italy

The adoption of the euro was expected to lower and stabilise inflation and interest rates, which, in turn, would help consolidate public finances through the reduction of the risk premium paid on the service of the very high debt. The stability-oriented macroeconomic framework of economic and monetary union was expected to reduce uncertainty and enhance confidence, which should lead to a more efficient allocation of resources and, thus, to higher potential growth. Long-run growth would also benefit from the efficiency effects of enhanced intra-euro-area trade on the back of an increased transparency of relative prices across political borders brought about by the single currency. The challenge for Italy of participation in economic and monetary union was to move away from the traditional model of recovering competitiveness losses brought about by inconsistent wage behaviour through devaluation of the exchange rate. However, a dramatic slowdown in total factor productivity (TFP) has hampered potential growth, thus offsetting possible efficiency gains associated with the euro. As a matter of fact, Italy's international competitiveness has deteriorated markedly as low productivity growth has counteracted the positive effects of wage moderation. Moreover, the reduction in government interest expenditure has been offset by increases in primary spending and tax cuts, thus jeopardising the badly needed consolidation of public finances. The key priorities now should be expenditure-based fiscal consolidation, flanked by structural reforms that can help to boost productivity growth and specialisation in high-value-added goods. A more dynamic financial sector could play an important role.

#### 3.5.1 Macroeconomic scene setter

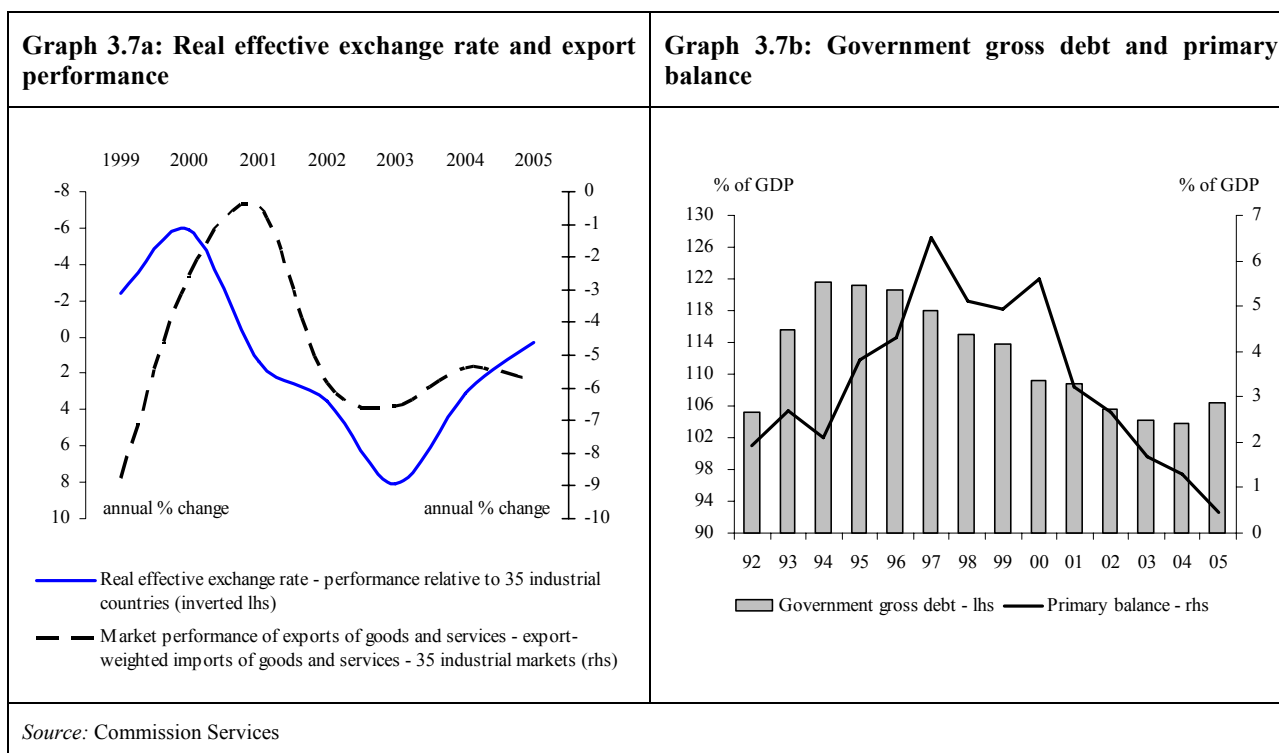
The pace of economic expansion of the Italian economy has experienced a visible slowdown, which has reversed real convergence with the euro area.<sup>36</sup> Specifically, economic growth in Italy has consistently underperformed the euro-area average since the mid-1990s. After achieving full economic convergence with the rest of the EU at the end of the 1970s, Italy's relative income position has been deteriorating since the peak reached in the late 1980s. From 107% of the euro-area average in 1988, income per capita, expressed in purchasing power standards, fell below the euro-area average in 2004, and diminished further in 2005 to around 98% of the average.

The growth slowdown is a reflection of the weakening of Italy's growth potential,<sup>37</sup> which occurred to a great extent before the run-up to euro-area membership. Long-run growth decreased from 2½% in the 1980s to 1½% in the 1990s and slid further to 1¼% in the 2000s. Although potential growth also declined in the euro area as a whole, the steady deceleration recorded in Italy during the 1980s and the early 1990s was particularly severe. Italy's growth potential had already fallen below the euro-area average at the end of the 1980s and the negative differential has remained stable at just below ¾ of a percentage point since the mid-1990s. The slowdown recorded in Italy does not stem from the dynamics of factor accumulation, but reflects the dismal performance of TFP growth. Over the last decade, on average, investment has grown at similar rates to the euro area and the contribution of capital to potential growth, which accounts for around half of overall potential growth, remained broadly stable at around ¾ of a percentage point. Although this is about ¼ of a percentage point lower than in the 1980s, the fall in the contribution of capital accumulation was gradually offset by the rise in the contribution of labour, which has exceeded ¼ of a percentage point since the late 1990s. This is an improvement on the slightly negative average contribution recorded in the first half of the 1990s and this in spite of a reduction in average hours worked. Such a large contribution of labour to potential growth, the highest since the first half the 1980s, seems to be the result of wage moderation, higher job subsidies and successive labour market liberalisation reforms. By changing relative input prices, these developments led to an increased use of labour and a deceleration of capital deepening. The number of persons in employment has been growing at an annual average rate of 1.1% since the mid-1990s, which compares with a negligible growth rate in the previous decade. Job creation during the last decade has been similar to that in the euro area and has even outperformed the latter since the turn of the century, despite the significantly lower growth. From above 11% in the 1990s, the unemployment rate fell below the euro-area average already in 2003 and reached 7.7% in 2005. The outlook is completely different for total factor productivity. Although other euro-area countries experienced a slowdown of TFP, this was particularly sharp in Italy. The contribution of TFP to potential growth plummeted from 1 percentage point in the first half of the 1990s to a meagre ½ a percentage point in the last decade.

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<sup>36</sup> For a detailed description of Italy's economic policies of the 1990s, see European Commission (1999). For an analysis of the determinants of slow growth also covering more recent years, see Faini and Sapir (2005).

<sup>37</sup> Italy's low potential growth is analysed in Larch (2004). See also Bassanetti et al. (2006).



A widespread view is that insufficient competition, especially in the service sector, low human capital accumulation, weak innovation and insufficient R&D expenditure are amongst the determinants of the marked slowdown<sup>38</sup> in TFP. The slight TFP growth and, to a lesser extent, the deceleration in capital deepening curbed labour productivity growth, which averaged half a percent per year over the last decade, as compared to the 2% recorded in the 1980s and the 1¼% annual increase currently registered in the euro area. In particular, labour productivity in the manufacturing industry has stagnated since the mid-1990s, resulting in a significant and persistent differential in terms of unit labour costs with respect to the euro area, and a concomitant deterioration of the Italian competitive position. Furthermore, low productivity growth in manufacturing reflects a productive specialisation in low-demand, low-technology sectors,<sup>39</sup> where Italian industry is faced with strong competition from emerging producers. As a consequence, Italy has experienced a loss of market share amounting to more than 40% in cumulative real terms since 1995.

Over the past decade, the external sector deducted 0.4 of a percentage point per year on average from real GDP growth; this contrasts with the slight positive average contribution recorded over the period 1986-1995 and by the euro area as a whole. On the domestic demand side, private consumption has been the main driver of growth over the 1990s, whereas since 2001 the contribution of the latter to real GDP growth has fallen to less than half a percentage point on average. A similar contribution was recorded by gross fixed capital formation, as the slowdown in equipment investment was partially offset by growth in construction investment, on the back of accelerating housing prices. As for public consumption, its contribution to real GDP growth has been consistently positive since 1998 and has averaged 0.4 of a percentage point since 2000.

The growth differential with the euro area is essentially explained by a weaker private consumption, while public consumption and gross capital formation grew at rates comparable to those of the euro area.

On the nominal front, high nominal unit labour costs and lack of effective competition in the services sector have kept consumer price inflation slightly above the euro-area average, in spite of weaker growth. Between 1999 and 2005, HICP inflation in Italy averaged 2.4%, 0.4 of a percentage point higher than the average for the euro area; although inflation converged to the euro-area level in 2005.

<sup>38</sup> See for instance Banca d'Italia (2006).

<sup>39</sup> See Larch (2005) and Monti (2005).

### Box 6: Model simulation for Italy

#### *Stylised facts:*

Persistently low growth of GDP per capita and moderate wage developments have not led to low inflation and improving competitiveness in Italy. On the contrary, unit labour costs and prices continued to increase faster in Italy than in competitor euro-area countries, resulting in a loss of competitiveness and export market shares. The current account gradually deteriorated over the whole period 1999-2005, in spite of weak domestic demand.

Since 1999, consumption growth has been lacklustre and broadly in line with slow GDP growth. Investment growth has been supported somewhat by construction demand in view of accelerating housing prices. In recent years, investment growth turned negative again, mainly driven by falling equipment investment. After a sharp improvement in the run-up to 1999, the government budget balance has worsened considerably.

On the supply side, slow or even negative total factor productivity growth in both the tradable and non-tradable sectors largely explains the slow growth. In particular, in the more recent years under review, labour productivity growth was particularly low since employment growth remained robust in spite of the negative cyclical conditions and TFP growth literally collapsed.

**Table IT: Economic developments – Italy (relative to the euro-area average)**

Variables	1997	1998	1999	2000	2001	2002	2003	2004	2005
Growth rate of real GDP	-0.20	0.97	-0.52	0.30	0.54	-0.08	-0.61	-1.22	-1.15
Growth rate of private consumption	1.95	0.83	-0.28	-0.22	-0.61	-0.22	0.01	-1.20	-1.02
Growth rate of investment	-1.06	-1.52	-2.61	1.36	2.00	5.46	-2.54	-0.15	-2.86
Labour productivity growth	-0.06	-0.45	-0.13	0.20	-0.58	-1.63	-1.82	-0.74	-0.91
Employment rate	-0.11	-0.48	-0.78	-0.84	-0.23	0.72	1.48	1.18	1.02
Inflation (GDP deflator)	1.19	1.06	0.47	0.60	0.61	0.82	1.04	1.02	0.34
Wage inflation	4.34	-2.43	-0.56	-0.20	0.31	-0.36	0.19	0.98	0.63
Growth of terms of trade	1.04	3.42	2.73	2.55	3.71	3.36	2.34	3.36	3.81
Current account balance	-0.19	-1.12	-2.03	-3.20	-2.77	-3.39	-3.96	-3.58	-4.13

*Note:* The growth rates of GDP and its components are in per-capita terms. The employment rate and the current account are expressed as deviations from their 1996 levels. The terms of trade are defined as export prices of the country relative to export prices of the rest of the euro area.

*Source:* Commission Services

#### *Shocks:*

Like other Member States with a history of devaluations and high and volatile inflation, Italy benefited from a reduction in the exchange risk premium on entering the euro area. A conservative estimate based on deviations from interest parity between the lira and the euro before 1999 suggests that a risk premium of about 50 basis points was eliminated in the phase running up to the creation of the euro area. This provided a stimulus to domestic demand. However, other factors played in the opposite direction and contributed to the lacklustre growth performance. Fiscal retrenchment to meet the Maastricht criteria implied a drag on growth, particularly as the composition of the adjustment – largely based on higher taxes on capital and labour – might have produced unfavourable economic effects.<sup>40</sup> The most important shock we consider in the case of Italy concerns the continuous and accelerating reduction in TFP growth, both in the tradable and non-tradable sectors. In addition, since 1992, the working-age population has been in decline in Italy, although this was offset in later years by rising participation rates.

#### *Simulation: (see Graph IT)*

The reduction in the risk premium had a strong positive effect on domestic demand in 1997 and 1998. The risk premium reduction did not, however, feed into higher GDP in this last phase of the run-up to 1999 as its effects were offset by the contractionary fiscal policy stance so that GDP growth remained lower than in the euro area. The contribution of fiscal policy to GDP growth turned positive in 1999-2001 as the fiscal stance became strongly expansionary. It remained slightly positive until 2003. Despite continued deterioration of the cyclically-adjusted primary balance, the net effect of fiscal policy moved into negative territory again from 2004, as the degree of crowding out of domestic demand generated in the model simulation exceeds the direct positive effect of net government demand.

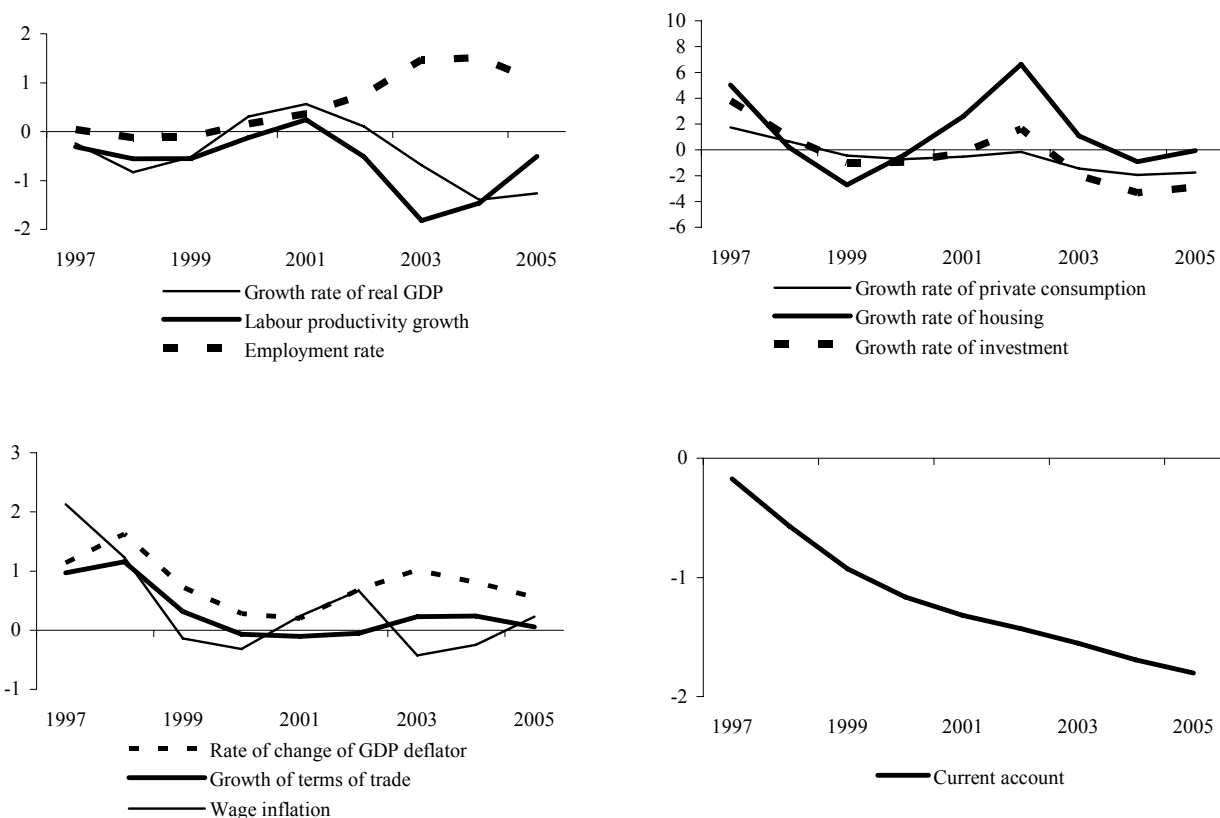
From 2000 onwards, the increase in the employment rate through labour market reforms largely countered the effects of negative population growth on the GDP growth rate. A shift in demand towards housing, together with loosening of lending constraints, allowed housing prices to rise despite the unfavourable economic developments and underpinned construction investment.

<sup>40</sup> See Larch (2004).

The shocks to TFP explain most of the low GDP growth and high inflation over the whole period considered. Especially from 2003 onwards, the cumulated effect of TFP shocks weighed heavily on consumption and investment and reduced GDP growth by more than 1 percentage point per year.

The deterioration in the current account over the past decade is largely explained by the effects on competitiveness of the negative TFP shocks, as well as the reduction in the risk premium in the last phase of the run up to euro-area participation.

**Graph IT: DSGE results for Italy (deviation from the euro-area average)**



*Note:* All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.

*Source:* Commission Services

*Summing up:*

1) Shocks related to the creation of the euro area explain neither the evolution of GDP and its components nor inflation developments in Italy. However, fluctuations in GDP growth reflect fiscal policy behaviour to some extent. From 2004 onwards, the crowding-out effect generated in the model simulation outweighs the direct expansionary effects of net government demand on GDP growth.

2) Structural weaknesses, feeding into negative total factor productivity shocks, are a major factor behind persistently low growth and above-average inflation, as well the deterioration of the current account over the past decade.

**3.5.2 Policy assessment**

The run-up to the creation of the euro area was characterised by an overall restrictive policy mix, which prompted an adjustment in terms of both fiscal consolidation and disinflation. The sharp loss of financial confidence that followed the 1992 ERM crisis highlighted the urgent need to abandon a growth model excessively relying on deficit spending, which had brought the government debt-to-GDP ratio above 100%. During the period 1992-1997, the cyclically-adjusted primary balance increased by almost 9 percentage points of GDP. This strong budgetary retrenchment allowed Italy to put its debt-to-GDP ratio on a downward path and to meet the Maastricht criterion on the fiscal front. Successive pension reforms contributed to enhance the sustainability of public finances. An extraordinary disinflation effort was achieved thanks to a restrictive monetary policy. The latter was supported by the wage moderation attained through an agreement reached with the social partners in the early 1990s, which effectively



interrupted a detrimental wage-price-spiral. The annual rate of HICP inflation fell from 6.2% in 1990 to 1.9% in 1997, slightly above the euro-area average.

The contractionary stance of macroeconomic policy on aggregate demand led some commentators to conclude that the slowdown in the economic activity experienced by Italy during the 1990s was temporary and that growth would resume after the fading out of the short-term negative effect of the adjustment. However, the structural factors behind Italy's sluggish growth became evident as the economic slowdown persisted despite the relaxation of both monetary and fiscal stances in the years that followed the adoption of the euro.

The cyclically-adjusted primary balance has steadily deteriorated since 1998. The fiscal retrenchment, which was largely revenue-based, has been reversed and the ratio of current primary expenditure to GDP has not ceased to increase since 2001. The general government deficit rose above the 3% of GDP Treaty reference value in 2001 and has remained above that threshold since 2003. In 2005, when real GDP stagnated, the deficit reached 4.1% of GDP and the primary surplus almost disappeared; it fell to 0.4% of GDP from above 5% of GDP at the end of the 1990s. As a result, the debt-to-GDP ratio increased for the first time in ten years, to 106.4%. A new pension reform adopted in 2004 further improved the sustainability of the Italian public finances. However, the high level of debt currently burdens public accounts with interest payments close to 5% of GDP. Within this framework, a fiscal consolidation which comes from the expenditure side could generate a positive effect on domestic demand. Flanked by liberalisation measures, the improving quality of public finances would help to boost potential growth through enhanced confidence among economic agents and a better allocation of resources.

As expected, the adoption of the euro indeed led to a considerable easing of monetary conditions, but it also brought about the loss of the exchange rate as an instrument for improving the contribution to growth of the external balance. In the absence of independent monetary and exchange rate policies, enhancing productivity growth is paramount for regaining international competitiveness without recurring to real-wage adjustment. In this context, the Lisbon strategy, by putting the emphasis on structural factors that hamper productivity growth, should be the cornerstone in the process of revamping Italy's competitiveness. At the end of June 2006, the Italian government adopted some measures that represent a first step towards the liberalisation of some services sectors. Some other initiatives, in particular concerning the energy and the local services sectors, are also underway. However, a number of factors are still putting a brake on productivity growth. The development of Italy's financial sector has lagged behind countries at a similar level of development. Credit to the private sector remains almost exclusively granted by banks, and the banking system, which until the 1990s was still largely state-owned, still suffers from lack of efficiency and competition. Financial markets are relatively small, also due to the interplay between an industrial structure centred on small firms and family ownership and weak legal institutions hindering the development of arm-length financing. The situation is gradually improving thanks to the privatisation and consolidation of Italian banks and progress with EU financial integration. However, cross-country comparisons show that there is still scope for increasing competition and efficiency in the Italian banking system and hence lowering the financial burden on companies and households. Moreover, there is a need to develop the access to those types of financing, such as venture capital, that appear particularly important to support the birth and growth of new firms and hence industrial restructuring. With a more horizontal dimension, low R&D spending, weak innovation and low human capital accumulation are also behind low productivity growth in Italy. As public spending on R&D and education is already in line with the euro-area average, adequate regulatory reforms should increase their efficiency, as well as step up the involvement of the private sector in knowledge and human capital accumulation. The Economic and Financial Planning Document for the years 2007-2011 shows awareness of the need for structural reforms in these fields.

With increasing competition from emerging markets, a shift towards an industrial specialisation profile oriented more towards high-value-added goods becomes compelling. The flexibility of the labour market is essential to facilitate the necessary re-allocation of resources. Despite the tight employment protection still requiring review, possibly by coupling increasing flexibility with an enhanced coverage and effectiveness of the unemployment benefit system, Italy has been moving in the right direction on labour market reforms: starting in the early 1990s a series of reform and policy initiatives has reduced rigidities. However, the bias in product specialisation also reflects the need to improve human capital.

### **3.6 The Netherlands**

The small, open Dutch economy had a *de facto* monetary union with its main trading partner, Germany for more than 15 years before 1999. Hence, by the time of euro adoption, the Netherlands had already long abandoned its exchange rate as a tool for adjustment. Furthermore, the relative openness of the Dutch economy also implied that the exposure to country-specific asymmetric shocks was relatively limited. Therefore, the costs of joining the euro area were relatively low. On the other hand, the gains from joining a monetary union could be expected to be significant. Participation in economic and monetary union was expected to bring increased price transparency across the euro area and a fall in transaction costs in international trade. This latter point was particularly important for the open Dutch economy as exports and imports combined exceed Dutch GDP. The Dutch economy experienced strong economic growth in the run-up to 1999. With the benefit of hindsight, it can be concluded that the economic boom

was the result of strong wealth effects from the equity and housing markets combined with an apparent undervaluation of the Dutch guilder vis-à-vis its main trading partners that had been built up since the early 1990s. In 2001, while parts of the economy were already losing steam, price developments peaked as a result of the tight labour market. Rising inflation at a time when nominal interest rates were relatively low acted as a further impetus to the Dutch economy through the fall in the real interest rate. The difficulty in identifying structural improvements added to the lag in recognising the rapidly worsening state of the underlying fiscal position. Nominal developments acted to improve government revenues temporarily. It will remain important in the period ahead to avoid the kind of overshooting of wages that occurred around 2000. In addition policy-makers need to ensure that risks of fiscal pro-cyclicality are fully addressed.

### 3.6.1 Macroeconomic scene setter

In the second half of the 1990s, the Dutch economy showed a much stronger performance than most euro-area countries.<sup>41</sup> Real GDP growth outperformed the euro-area average by 1 percentage point a year in the period 1996-2000 and the harmonised unemployment rate dropped from 6.6% in 1996 to 2.2% in 2001. The extended period of high growth fed the belief in a structurally higher growth path. However, the cyclical downturn that started in 2001 was relatively deep, resulting in the lowest growth performance among the euro-area countries in 2002.

The upswing in the second half of the 1990s was mainly driven by domestic demand. Although several factors interplayed to explain this development, wealth effects from the equity and housing markets played a crucial role. The Netherlands experienced a housing boom in the late 1990s that was accompanied by a massive increase in mortgage debt. The tax regime of deductibility of mortgage interest payments at the marginal rate, together with the liberalisation of the mortgage market and increased competition between mortgage providers, led to the introduction of new mortgage products that postpone loan redemption until maturity (concerns around 90% of mortgages extended since 1995). Additionally, dual income households became more prevalent in the 1990s, increasing the borrowing capacity of households. These developments, also fuelled by the falling nominal interest rates at the end of the 1990s, resulted in significant re-mortgaging and equity withdrawal that fed into private consumption expenditure (Graph 3.8). The *Nederlandsche Bank* estimates the annual spill-over effect of mortgage equity withdrawal on GDP growth via consumption expenditure at 0.5 to 1 percentage point in 1998–2000, turning to a negative contribution of around 0.5 of a percentage point in the period 2001-2003 as equity withdrawal lessened.<sup>42</sup> As a result, household financial liabilities (as a percentage of GDP) in the Netherlands almost doubled since 1990.

Booming equity markets around the world in the second half of the 1990s interacted pro-cyclically with the Dutch pension system. The high returns on stock market equities prompted several pension funds to lower – or not increase – contributions from employers and employees. Some pension funds even gave 'premium holidays' for several years. For employers this amounted to a reduction in wage costs, while for employees it boosted purchasing power even further. After stock market returns turned negative following the stock market crash in 2000, premiums were raised again. Furthermore, in the early years of this millennium, the pension funds' supervisor<sup>43</sup> strengthened supervision. This led to a (pro-cyclical) increase in pension premiums as pension funds tried to raise funding ratios to the required level. In 2004, pension premiums amounted to 4.5% of GDP, more than double the figure for 1997 when premiums were relatively low (2% of GDP).

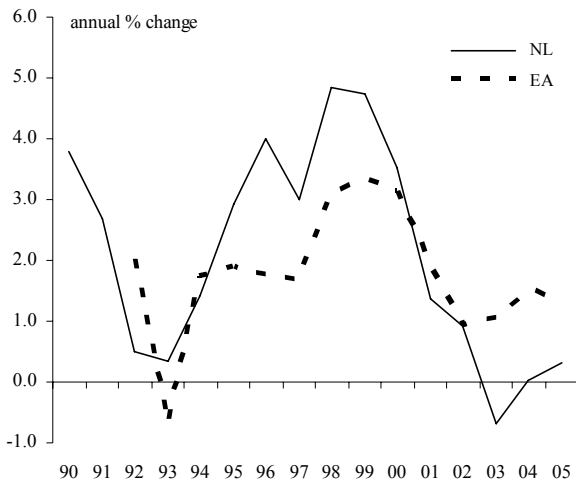
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<sup>41</sup> See Bethuine and Buitenkamp (2006).

<sup>42</sup> See Van Els et al. (2005).

<sup>43</sup> The Pensioen en Verzekeringskamer, PVK, which later merged with the Dutch central bank.

**Graph 3.8: Private consumption growth rates in the Netherlands and the euro area**



Source: Commission Services.

The strong Dutch economy in the second half of the 1990s resulted in vigorous labour demand growth. In full time equivalence terms, employment growth reached around 2½% per year. Although the increase in labour supply was significant, with female labour participation continuing its increase in the late 1990s, this did not prevent registered unemployment to fall from 6.6% in 1995 to 2.2% in 2000, around the level of friction unemployment. The increasing demand and price pressures and the tightening labour market exerted upward pressures on wages towards 2000. While wage increases during the upward phase of the cycle did not appear excessive compared to those in the main trading partners, they were so at the turn of the millennium, when the labour market was most tense. Amidst these symptoms of overheating, HICP inflation peaked at 5.1% in 2001, the highest rate among euro-area countries. This factor fuelled the economic boom further: given already low nominal interest rates, it implied a fall in the real interest rate that provided a boost to GDP by lowering the costs of gross fixed capital investment.

The cumulative increase in nominal unit labour costs between 1998 and 2003 was substantially higher than in

its main trading partners, which resulted in an accumulated loss in competitiveness. The widening gap with Germany seems especially relevant as 24% of all Dutch exports go to Germany which strongly improved its competitiveness in recent years. Dutch total exports remained fairly strong until 2003; the effect of the loss in competitiveness is somewhat masked by the relative strength of re-exports. In the period 1995 to 2004, re-exports increased around 10% per year, while domestically produced exports only grew by 3% per year, resulting in a significant drop in market share of domestically produced goods. The significant wage restraint that took place in recent years will be a start in recuperating the lost international competitiveness.

**Box 7: Model simulation for the Netherlands**

*Stylised facts:*

In the second half of the 1990s, the Dutch economy consistently grew faster than most other euro-area countries. Annual real GDP growth outpaced the euro-area average by 1 percentage point in the period 1996-2000. High growth rates were fed by strong consumption and investment growth, in particular construction. The strong growth period coincided with booming housing prices and a massive increase in mortgage debt. On the supply side, employment and the labour share grew rapidly. Amidst symptoms of overheating, inflation peaked in 2000 and 2001 at more than 2 percentage points above the euro-area average. In 2001, a period of below-average growth began in the Netherlands and inflation came down below the euro-area average in the later years of the period under review.

**Table NL: Economic developments – the Netherlands (relative to the euro-area average)**

Variables	1997	1998	1999	2000	2001	2002	2003	2004	2005
Growth rate of real GDP	1.10	1.20	0.71	-0.74	-0.82	-1.03	-0.72	-0.06	0.13
Growth rate of private consumption	1.13	1.47	1.05	0.03	-0.93	-0.16	-1.62	-1.23	-0.65
Growth rate of investment	3.95	1.57	1.62	-3.62	-0.27	-3.07	-4.41	0.60	0.01
Labour productivity growth	1.04	0.77	0.37	-0.22	-0.97	-0.70	0.09	1.71	0.79
Employment rate	1.53	1.99	2.41	2.25	2.51	2.29	1.66	0.37	-0.10
Inflation (GDP deflator)	0.66	0.19	0.70	2.52	2.84	1.27	0.51	-1.04	-0.17
Wage inflation	2.03	3.09	0.56	1.86	2.22	1.76	1.50	1.04	0.13
Growth of terms of trade	0.79	-1.39	-0.48	3.71	0.28	-1.82	0.22	-1.06	0.49
Current account balance	0.72	-2.33	-1.39	-0.54	-0.01	0.85	0.68	0.93	2.38

*Note:* The growth rates of GDP and its components are in per-capita terms. The employment rate and the current account are expressed as deviations from their 1996 levels. The terms of trade are defined as export prices of the country relative to export prices of the rest of the euro area.

*Source:* Commission Services

#### *Shocks:*

In the second half of the 1990s, the Dutch economy had an advantageous initial competitive position, reflected in an undervalued real exchange rate which contributed to and prolonged the period of strong economic growth in the second half of the 1990s. The effects of the undervalued exchange rate were reinforced by a sharp increase in household debt as debt ceilings were increased and mortgage repayment requirements loosened. Household debt increased by about 30% of GDP since the mid 1990s. The housing boom is to some extent an autonomous demand shock as dual income households became more prevalent in the 1990s, increasing the mortgage borrowing capacity of households. Shocks to debt financing and to housing demand are modelled to cover the increase in housing prices and indebtedness. Some fiscal shocks are given to reflect the fact that part of windfall revenues was used to finance structural expenditure in the later phases of the upturn in the belief that these windfalls reflected sustainable revenue growth. In addition, data suggest that the Netherlands suffered from negative total factor productivity shocks at the end of the economic boom, which were reversed in the period 2003 to 2005. As the Dutch guilder had been credibly linked to the DEM for over a decade and had already benefited from convergence to the low risk premium associated with the reputation of the DEM before entry into the euro area, the risk premium in the rest of the euro-area countries declined compared to the Dutch risk premium.

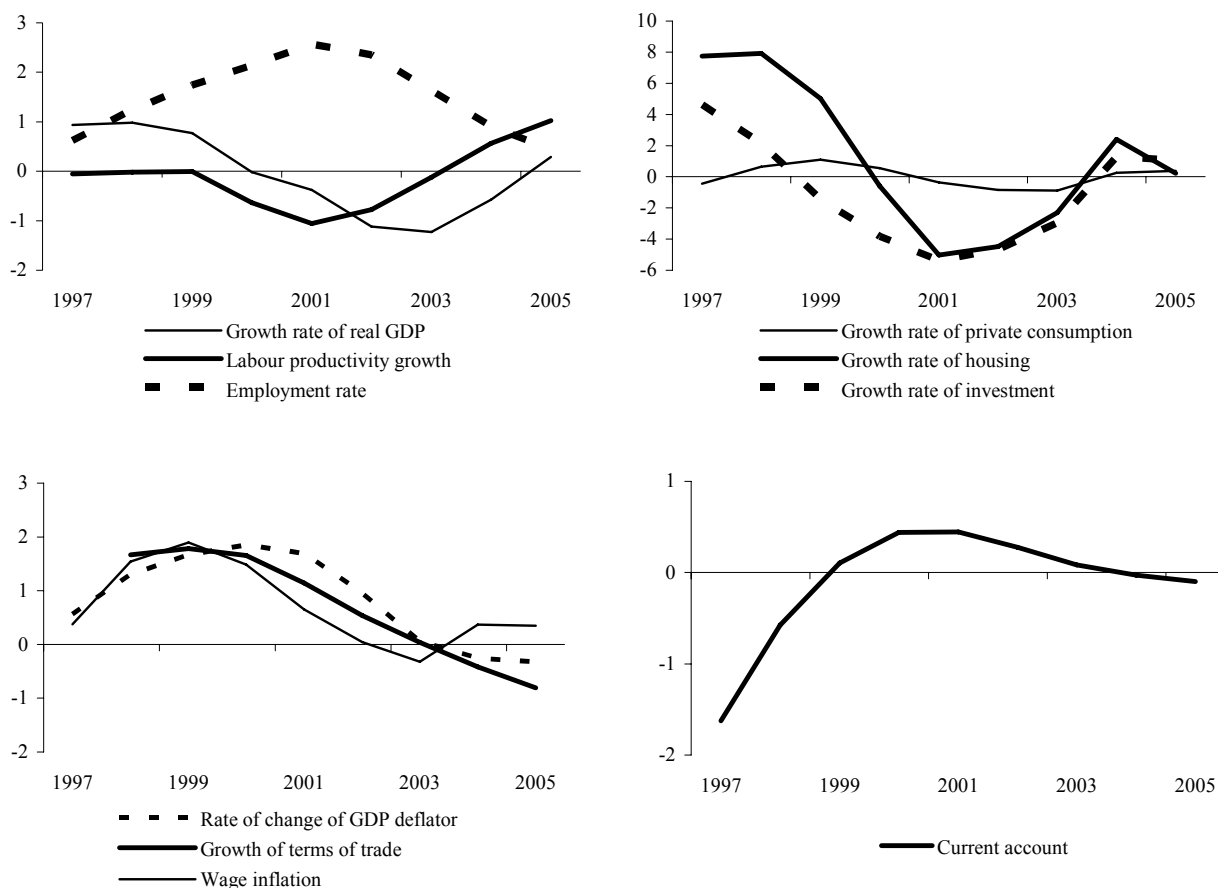
#### *Simulation: (see Graph NL)*

The real exchange rate undervaluation at the time of euro adoption can explain a large part of the high consumption and investment growth in the second half of the 1990s. The undervaluation led to increasing external and domestic demand which resulted in price pressures. It explains up to 2.5 percentage point of higher GDP level in the late 1990s. Its effect was somewhat dampened by the convergence of the risk premia in the other euro-area Member States towards that of Germany and the Netherlands. Since the late 1990s, prices and wages have grown faster in the Netherlands than in the euro area. The sharp increase in housing prices and wealth together with expansionary fiscal policy at the very end of the long-lasting economic boom induced some overshooting dynamics. As the effect of these shocks faded out, consumption and investment dropped back to their baseline levels and the rate of inflation dropped below the euro-area average.

#### *Summing up:*

- 1) The prolonged period of wage moderation while the guilder was credibly linked to the DEM had led to a significant undervaluation in the run-up to 1999, which explains GDP and its components as well as inflation in the first 2 to 3 years after the creation of the euro area.
- 2) The undervalued real exchange rate at entry into the euro area cannot explain the differences in the growth rate of housing investment.
- 3) The latter effect can be captured by assuming specific housing demand and debt financing shocks. Increased housing demand together with pro-cyclical fiscal policy can partially explain high inflation and growth in the latter phases of the upturn, leading to overshooting of equilibrium price and wage levels, some over-investment and strong employment growth which pushed the unemployment rate well below its equilibrium level. The booming housing market in particular stimulated consumer demand and further fuelled the build-up of imbalances. The reversal of the imbalances led to many related and mutually reinforcing developments. The rate of growth of net exports turned negative as Dutch exporters faced significant losses in market share in response to consistently high inflation and wage growth and the ensuing deterioration in competitiveness. As wage costs soared, while competitiveness worsened and financing conditions became tight, corporate investment fell sharply. The end to the fiscal impulses and the subsequent fiscal tightening exacerbated the downturn.

**Graph NL: DSGE results for the Netherlands (deviation from the euro-area average)**



*Note:* All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.  
*Source:* Commission Services

### 3.6.2 Policy assessment

As the Netherlands were already in a *de facto* monetary union, the formalisation of the monetary union could *prima facie* be expected to only come with benefits, for example from lower transaction costs and from a boost to trade. However, as several imbalances with respect to Germany had already begun to build up from the beginning of the 1990s onwards, it could be argued that there was a case for an adjustment of the real exchange rate of the Dutch guilder. But, following the adoption of the euro, realignments were no longer possible and the Dutch guilder entered the euro area at a certain discount,<sup>44</sup> which contributed to and prolonged the period of strong economic growth in the second half of the 1990s.

As high economic growth persisted, most estimates of Dutch structural economic growth were revised upwards. With the benefit of hindsight, it can be concluded that the economic boom period from 1996 onwards was not structural, but of a temporary nature. The overestimation of the structural strength of the economy also implied that a part of the improved government revenues were windfall revenues, which were subsequently used to finance structural expenditure in the upturn, in the belief that these windfalls were the result of sustainable revenue growth. The strong developments in both housing and equity markets (which were partly the result of the low real interest rate), resulted in increases in tax elasticities that were of a temporary nature and hence constituted further windfall government revenues.

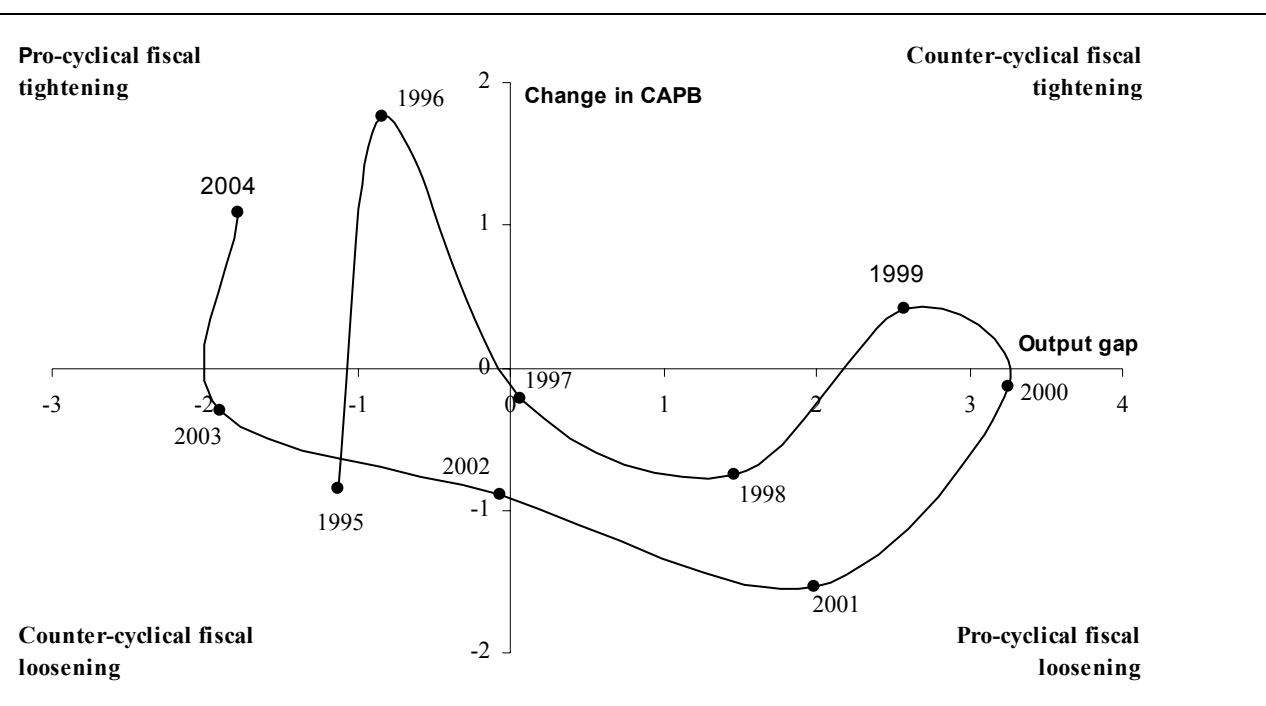
The consequence was that while cyclically-adjusted balances seemed very sound throughout the period, fiscal policy turned out to be pro-cyclical *ex post* (Graph 3.9). The fiscal rule in place at the time implied that only part of the higher-than-expected revenues was assigned to deficit reduction. It did not prevent the pro-cyclical bias during the boom period.

<sup>44</sup> In a newspaper interview (Parool, 30 April 2005), H. Brouwer (*De Nederlandsche Bank*) estimated that the Dutch guilder's euro-entry rate implied an undervaluation of 5 to 10%.

After the slowdown of the Dutch economy from 2001 onwards, it only gradually became apparent that the strength of the economy and of its public finances had been overestimated. The economic 'bust' in the period 2001-2003 eventually resulted in a deficit of 3.1% of GDP in 2003 and the Dutch government implemented a significant consolidation package in order to rectify the excessive deficit. As the fiscal consolidation had to be carried out during the economic slowdown, the Dutch public finances had a pro-cyclical impact.

One of the key factors that enable a monetary union to function efficiently is that the fiscal strategies of its member states allow automatic stabilisers to work freely and assume part of the policy flexibility that has been lost because monetary sovereignty was delegated to a supra-national body. In fact, since 2003, the national fiscal rules in the Netherlands have been strengthened and the functioning of automatic stabilisers has improved. Nevertheless, specific investments are not governed by these fiscal rules and are funded with a fixed share of the receipts from the sale of natural gas. This system of financing investment is under review. The recent increase in the prices of oil and natural gas has resulted in extra government revenues. Over half of the gas revenues go to debt amortization, the remainder is placed in the Economic Structure Enhancement Fund (FES). Projects in FES have different maturities and commitments are made for a period spanning up to or more than a full economic cycle.

**Graph 3.9: The Netherlands – policy mix, 1995-2004**



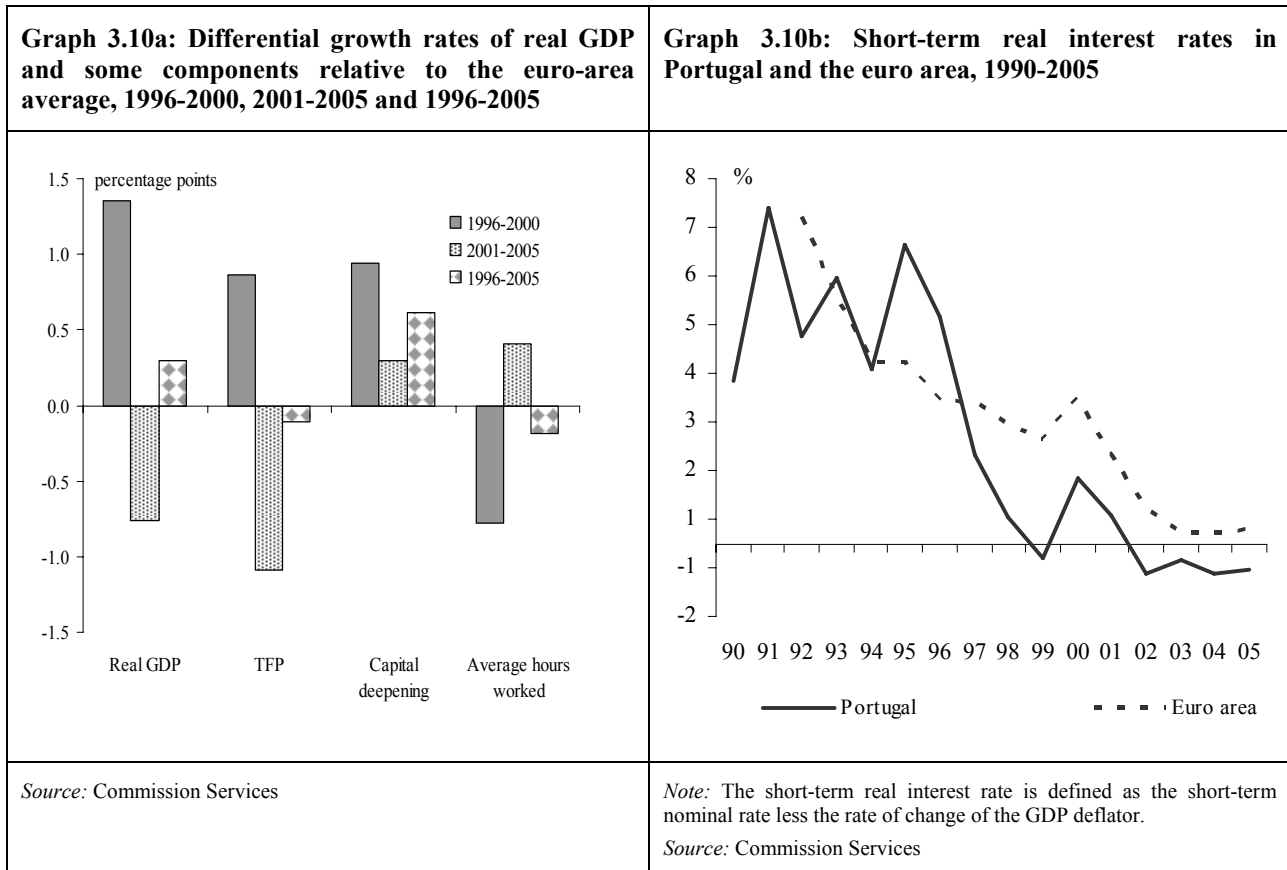
*Note:* CAPB estimates using the Hodrick-Prescott filter.  
*Source:* Commission Services

### 3.7 Portugal

Economic developments in Portugal have been uneven over the last decade. Over the second half of the 1990s, GDP growth clearly exceeded the EU average and thus allowed for a catching-up towards income and welfare levels of more advanced EU economies. However, after 2000 growth weakened and since 2002 GDP has increased at one of the slowest paces in the euro area and the EU. Such performance diverges from the ex-ante perceptions of monetary union. Indeed, euro-area membership was largely expected to have a significant positive level effect on economic welfare in Portugal, associated with the decline in interest rates and the effective elimination of liquidity constraints, which were expected to help in upgrading Portugal's productive capacity. Nevertheless, while the adoption of the euro gave a significant boost to consumption and investment, the adjustment on the supply side seems to have been insufficient to support more substantial improvements in productivity and competitiveness in such a way as to maintain the catching-up process in a more permanent way. At the same time, it appears that the loss of exchange rate freedom was not properly compensated by other adjustment or flexibility mechanisms to smooth out shocks to economic activity. In particular, fiscal policy failed to take advantage of "good times" in the late 1990s, leading to later pro-cyclical tightening. The key requirements now to restart real convergence and enhance adjustment capacity are sustained fiscal consolidation and strong structural reforms.

### 3.7.1 Macroeconomic scene setter

The Portuguese economy went through a boom in the run up to euro-area membership, which started soon after the mid 1990s. Until the end of the decade, annual GDP growth in Portugal exceeded 4% and was above that of the euro area, resulting in a catching up to the euro-area average. However, since around 2001 growth has dropped below average euro-area levels (see Graph 3.10a). The boom phase was also marked by the accumulation of macroeconomic imbalances. Internal demand was buoyant but the private sector debt level increased considerably while an expansionary fiscal policy fragilised the public finances position. Productivity improved but competitiveness was hurt by high wage growth and inflation, which, together with strong growth in imports, resulted in growth-dragging net external demand and high and rising current account deficits. From around the turn of the decade, Portugal entered a severe economic adjustment process to correct these three imbalances, which have not yet been remedied: household indebtedness continues on an upward path; the current account deficit remains high despite a cooled internal demand; and fiscal imbalances persist.<sup>45</sup>



After the mid 1990s, economic activity was supported by domestic demand, which was helped in turn by favourable monetary conditions. In the second half of the 1990s, Portuguese nominal interest rates declined rapidly in the run-up to euro-area accession. The fall in real interest rates was even steeper as price pressures did not decrease as fast as in the euro area (see Graph 3.10b). Against a backdrop of decreasing liquidity constraints made possible by the monetary union, credit to the private sector grew strongly resulting in rising debt levels, while at the same time saving rates declined. Additionally, the prospects of further integration and catching up with the euro area seem to have played a role in the formation of overly optimistic expectations on the part of consumers and enterprises. Overall, private consumption expanded considerably and investment growth rates were lifted considerably, with the boom spreading to all its components. At the same time, and unlike the experience of other countries (e.g., Ireland or the Netherlands), the expansion of credit to the private sector was not associated with large house price rises. In fact, the increases were among the lowest in the euro area; a significant supply response of housing and possibly excess supply from the first half of the 1990s onwards may have contributed to this outcome.<sup>46</sup>

<sup>45</sup> A comprehensive analysis of the Portuguese economy is contained in European Commission (2004b).

<sup>46</sup> Even so, the pace of construction investment was below the average of the total capital formation: in 2000, construction accounted for some 55% of total investment, down from a share of about 50% in 1995. Such pattern did not differ much from the one of the euro area as a whole.

Between 2000 and 2003, a downward adjustment of expenditure patterns occurred leading to GDP shrinkage of 1.1% in 2003 as consumption slowed down considerably and investment decreased sharply over the same years. Afterwards, household behaviour regained some momentum in 2004 with a further expansion of consumption and indebtedness (currently around 120% of disposable income).<sup>47</sup> This recovery, against a backdrop of favourable financing conditions with a persistently negative real interest rates (Graph 3.10b), seems to have taken place earlier than a consideration of fundamental variables affecting consumption would imply (see the simulation results presented in the box below). This suggests that the adjustment process in household balance sheets is not complete. Investment has either further declined or remained stagnant, with a strong contraction in construction investment.

Over the late nineties, the external demand contribution to GDP growth was systematically and persistently negative and therefore unable to support the economy's catching up process, which relied entirely on domestic demand over those years. Growth of imports was very strong in response to buoyant domestic demand but the performance of exports trailed behind external demand growth, implying significant export market share losses over those years.

Portugal's productivity gap with the euro area narrowed as output per worker increased from below 60% of the euro-area average in 1995 to some 65% in 2000. Nevertheless, cost competitiveness remained weak as the strong wage increases recorded in a tight labour market weighed on economic expansion (that was fuelled by a lively domestic demand) jeopardized improvements in unit labour costs relative to Portugal's main competitors. At the same time, the inflation differential to the euro area hurt price competitiveness further. Altogether, the external competitiveness position of Portugal suffered, with the real effective exchange rate (REER) increasing faster than in the rest of the euro area. Such an outcome came on top of the strong appreciation in the first half of the nineties – in fact one of the strongest among the group of future euro-area participants. Not surprisingly, such a loss of competitiveness switched international demand away from Portuguese exports during a period of buoyant world trade (see Graph 3.11a).

In the post-2000 phase and during a period of global slowdown, external demand was on average broadly neutral for GDP growth. Productivity growth in Portugal slowed down considerably, partly for cyclical reasons, such that despite slower wage growth, the unit labour cost position weakened vis-à-vis most trading partners. The REER appreciated sharply between 2000 and 2003. Against such a further deterioration in cost competitiveness, export performance could not recover in a lasting way even if the situation became more benign as the trend in export market shares bottomed out.

In addition to cost factors, other aspects seem to have also played a role in the weak performance of the external sector and their incapacity to foster GDP growth. FDI declined in importance on the back of disinvestments in manufacturing in the latter part of the 1990s, which represented a marked difference compared with the large inflows of the late 1980s and first half of the nineties. At the same time, export performance has been also constrained by structural or long-lasting features. Notably, exports have maintained reliance on a product mix with only moderate growth potential and where Portugal has lost comparative advantage – particularly in more labour-intensive sectors – to some emerging economies that are increasingly integrated into world trade. This may explain part of the rather poor export performance in late 2004 and early 2005.<sup>48</sup>

The external balance deteriorated significantly over the second half of the 1990s, also as result of strong import growth in response to lively internal demand: in 2000, the current-account deficit peaked at almost 11% of GDP (after some 3% of GDP around 1995).<sup>49</sup> Portugal experienced a narrowing of the external imbalance until 2003, with a pronounced containment of imports in the wake of weakening domestic demand. Nevertheless, the current account remained negative even when domestic demand was contracting. In 2004, the correction of the external imbalance was hampered by the recovery of domestic demand, while in 2005 with adverse terms of trade developments played an important role.

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<sup>47</sup> For a more detailed analysis on Portuguese households over the last decade, see Cardoso (2005).

<sup>48</sup> For instance, according to Cabral and Esteves (2006), the product mix accounted for an export market share loss of almost 5 percentage points out of a total loss of 16 percentage points between 2000 and 2005 in a sample of export markets representing 60% of Portuguese exports. The authors also found that in those markets where Portugal's share losses were the most significant, the biggest share gains were mostly achieved by developing Asian economies and by Central and Eastern Europe countries.

<sup>49</sup> Also the decline in the remittances surplus and the deterioration of the primary income deficit fed the external imbalance, adding to it an accumulated deterioration of some 3% of GDP between 1995 and 2000.



### Box 8: Model simulation for Portugal

#### *Stylised facts:*

The Portuguese economy went through a boom in the period running up to the third stage of EMU, starting soon after the mid 1990s. GDP per-capita growth exceeded that of the euro area until 1999. However, since 2000 growth dropped below euro-area average levels. High growth was accompanied by rising external imbalances. Somewhat surprisingly the current account deficit remains high despite the recent decline of GDP growth. The boom in the late 1990s was driven by extraordinary investment growth. Because of rising demand pressures, wage and price inflation exceeded the euro-area average by more than 5 and 2 percentage points p.a., respectively, in the 1990s. In the meantime, inflation differentials have come down but so far they have not disappeared completely.

**Table PT: Economic developments – Portugal (relative to the euro-area average)**

Variables	1997	1998	1999	2000	2001	2002	2003	2004	2005
Growth rate of real GDP	1.35	1.58	0.67	-0.21	-0.12	-0.39	-1.92	-0.94	-1.06
Growth rate of private consumption	1.61	1.86	1.52	0.29	-0.84	0.19	-1.03	0.88	0.65
Growth rate of investment	11.61	5.93	-0.01	-1.52	0.48	-2.01	-10.85	-1.44	-5.17
Labour productivity growth	0.94	1.12	1.06	0.73	-0.10	0.09	-1.12	-0.48	-0.37
Employment rate	0.30	0.71	0.56	0.05	0.11	-0.22	-0.81	-1.12	-1.60
Inflation (GDP deflator)	2.46	2.22	2.40	1.61	1.29	1.39	0.67	0.86	1.00
Wage inflation	5.94	4.62	2.84	4.25	2.74	1.80	0.82	0.35	0.99
Growth of terms of trade	1.56	1.95	0.68	0.37	-0.47	0.20	-0.74	-0.11	-0.30
Current account balance	-2.19	-3.24	-4.77	-6.61	-6.10	-4.06	-2.29	-3.65	-5.29

*Note:* The growth rates of GDP and its components are in per-capita terms. The employment rate and the current account are expressed as deviations from their 1996 levels. The terms of trade are defined as export prices of the country relative to export prices of the rest of the euro area.

*Source:* Commission Services

#### *Shocks:*

We model the Portuguese development since 1997 by imposing specific demand and supply shocks. On the demand side there was an EMU-related shock, namely the disappearance of the exchange risk premium at entry into the euro area (100 basis points). Portugal also experienced financial market liberalisation in the form of a reduction of credit constraints for housing investment. Finally one can observe a shift of demand from manufacturing to services. On the supply side a marked reduction in TFP growth in the non tradable sector since the end of the 1990s can be identified. NAIRU estimates also suggest that there has been an increase of structural unemployment from about 5% in the year 2000 to about 7% in 2005.<sup>50</sup>

#### *Simulation (see Graph PT):*

According to the model the reduction of the risk premium was instrumental for the investment boom and the level shift of private consumption (consistent with the permanent income hypothesis) and caused the current account to decline by about 5 percentage points between 1997 and 2000. Consistent with the data, investment grows strongly in 1997 and 1998. There is however some overshooting of investment. After three years of strong investment, investment growth falls below euro-area average from 2000 onwards. Between 2000 and 2002 investment growth was about 2 percentage points below the euro-area average. The fall in the risk premium does not explain inflation persistence beyond the year 2000. In order to explain above-average inflation after 2000, four shocks seem relevant: first the decline in non tradable TFP growth; second, a rising debt ceiling; third, an adverse wage shock; and, fourth, a shift of demand to non tradeables. Apart from being inflationary, the demand shocks also explain some other developments. The wage shock is important for capturing the trend reduction in the employment rate (relative to the euro area), which is however cushioned by the demand shift to non tradeables. Low TFP growth is the most important factor for low investment growth and also has a negative effect on employment. The reduction of the risk premium is the most important factor for explaining the persistent current account deficit. A non-negligible effect comes from a loosening of credit constraints. According to the model, increasing the debt ceiling for households has contributed about 0.5% of GDP to the current account deficit in the most recent years and is the second most important factor for explaining the current account deficit.

#### *Summing up:*

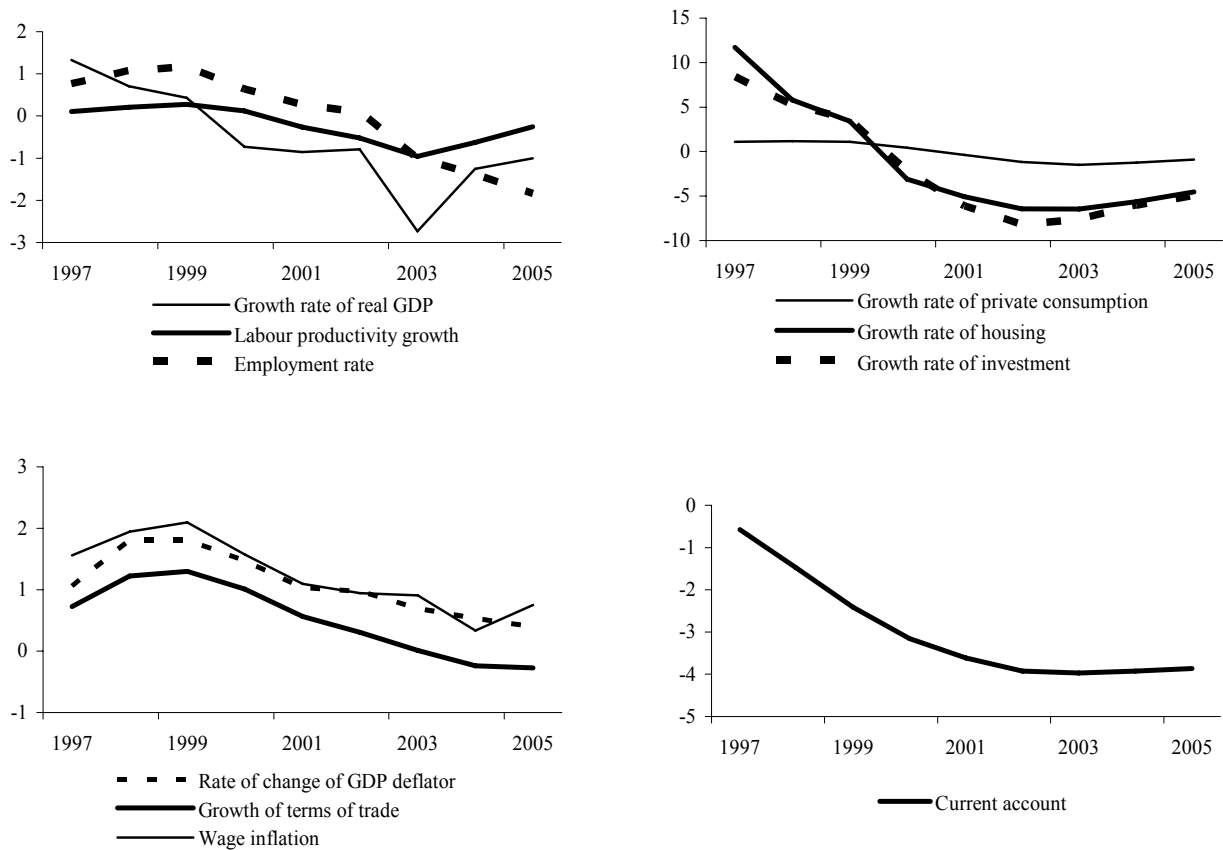
As can be seen from Graph PT, with these supply and demand shocks imposed, the model is capable of replicating some characteristic features of the Portuguese economic development since 1997, namely:

- 1) High growth of GDP and its components in the late 1990s, followed by a sustained negative growth differential since 2000.

<sup>50</sup> In order to capture the strong decline of GDP growth in 2003 we impose two additional shocks, namely negative TFP shock in the tradeable (primary) sector and a cut in government expenditures.

- 2) Persistently positive (but declining) inflation differentials relative to the euro area.
- 3) Initially rising and then falling terms of trade growth.
- 4) A rising current account deficit in the late 1990s which stabilised at high levels around 2000.
- 5) Below-average productivity growth starting around the year 2000.

**Graph PT: DSGE results for Portugal (deviation from the euro-area average)**



*Note:* All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.

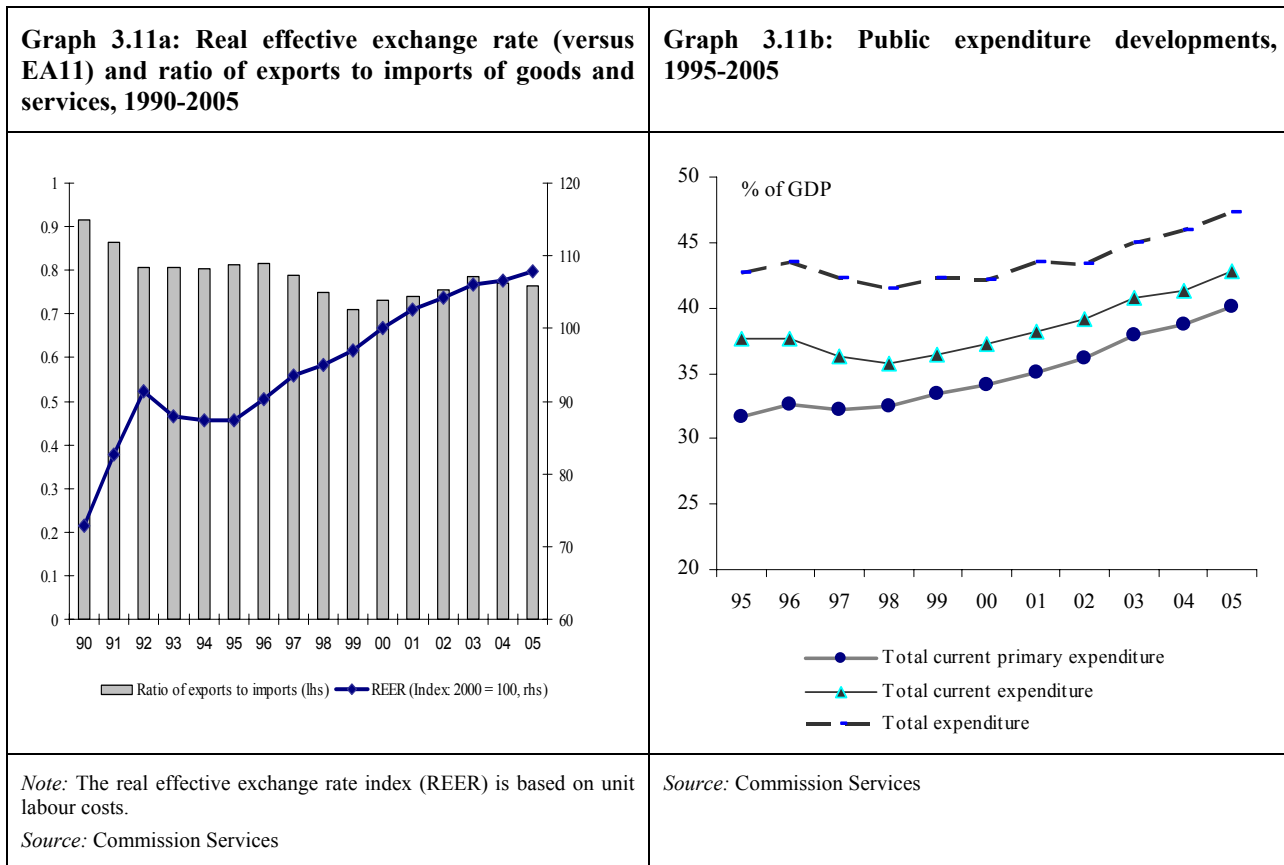
*Source:* Commission Services

### 3.7.2 Policy assessment

Portugal reaped substantial benefits in the run-up to monetary union, notably as real interest rates fell substantially and liquidity constraints were softened considerably. This offered a window for a strong consumption and investment expansion. Also public finances benefited from lower debt service obligations and higher revenue growth during the boom of the second half of the nineties. However, the progress in strengthening more permanent features of the economy was more modest. First, Portugal had limited success in substantially boosting productivity and competitiveness during the upswing and in adjusting to the loss of the exchange rate instrument that came with the single currency. Second, fiscal policy has not helped in smoothing out the cyclical fluctuations and public finances have been in a fragile situation for most of the last decade. These two facts are relevant to understanding the recent weak performance of the Portuguese economy.

The loss in external competitiveness came from wage increases in excess of productivity gains and was combined with strong import growth. While it is an issue of debate whether a sizeable current account deficit is a serious (short-term) problem within a monetary union, it is clear that the country needs to improve its competitiveness, which, beyond the cyclical problems, is also fundamentally constrained by structural or long-lasting features. Indeed, in recent years, total factor productivity growth has been well below the euro-area average (see Graph 3.10a). As employment and investment rates in Portugal have been above the EU average, boosting productivity is more essential to support a higher GDP growth path. In particular, productivity seems to have been hampered by slower gains in services than in other sectors. At the same time, some structural adjustment on the supply-side seems to be

taking place and the fact that the highest productivity gains have been achieved in tradeables, which more exposed to international competition, is a positive sign. Nonetheless, some exporting sectors have not yet completely adjusted to the challenges of increasing integration of emerging economies into world trade. In addition, the loss of the exchange rate mechanism as an adjustment tool appears to have hurt foreign competitiveness, particularly as price and wage behaviour do not appear to have adjusted quickly enough to the new context of monetary union. In this respect, the real wage flexibility of the Portuguese economy which had been observed in past times of high inflation, could be weaker in years of significantly lower price increases with adverse consequences for employment and output.



Portuguese fiscal policy was pro-cyclical over most of the last decade. In the second half of the nineties, in the wake of strong revenue growth resulting from buoyant domestic demand and thanks to falling interest expenditure the budget balance had improved sufficiently by 1998 to meet the Maastricht requirements on the debt and the deficit. After that, however, fiscal policy was loosened amidst the buoyant monetary and financial conditions of the time, eventually leading a gradual deterioration of the fiscal position. Current primary expenditure expanded considerably, mainly reflecting extended welfare benefits, higher health expenditures and higher personnel expenditures (see Graph 3.11b). The effects of such fiscal policy were also felt in the labour market, as the high growth of employment and wages in the government sector - often in excess of that in the private sector and particularly in the last few years of the decade - contributed to the tight labour market. The allocation of resources towards the general government sector, which resulted from that trend, had a negative impact on unit labour costs, leading to growth of unit labour costs. In all, fiscal policy reinforced the underlying imbalances first by magnifying the boom led by internal demand and later by limiting a possible response to the downturn.

If the buoyant growth of the late nineties allowed for a budgetary improvement to facilitate joining the euro from the outset, afterwards the economic downturn revealed a weak fiscal position. Portugal did not use the opportunity provided by those years to rein in its public expenditures. While some optimism over future economic developments may have played a role in the accumulation of the fiscal imbalance, the situation weakened considerably as government current primary expenditure grew systematically as a share of GDP (see Graph 3.10b). The loose stance became clearly visible in 2001 and, in reaction to that, fiscal policy was shifted in 2002, with a sharp slowdown in current expenditure growth against the background of weak economic activity. However, such corrective efforts had limited success: the expenditure ratio rose further, also because of a denominator effect, i.e., low GDP growth. In addition, one-off operations were implemented with a view to bringing the headline deficit below 3% of GDP in the short-term. However, even if substantial improvements in tax collection since, at least, 2004, have clearly mitigated the budgetary impact of the weak economic momentum, the fiscal position has remained fragile. In mid-2005, the

fiscal consolidation strategy was revised with a reinforced reliance on structural measures on both the revenue and expenditure sides over the medium-term. A successful correction of the budgetary imbalance will pave the way for sound public finances, which may then allow fiscal policy to play a stabilising role.

All in all, the challenge for Portugal is to simultaneously lift the economy's growth potential, narrow the competitiveness gap and consolidate public finances in a sustained and lasting way. Reinforcing productivity in a permanent way will crucially depend on structural measures at the micro level, including changes in product and labour markets, as well as upgrading investments in human and physical capital. At the same time, price and wage developments should be watched carefully in order not to damage competitiveness, all the more so since some permanent productivity-enhancing measures often require time to bear fruit. Addressing government expenditure growth and improving the quality of public spending – nearly half of Portugal's GDP – will be key for a lasting fiscal consolidation, as well as for supporting a higher productivity growth path, hence bolstering the Lisbon Agenda objectives of higher growth and employment.

#### **4. Summing up: adjustment dynamics, policy interactions and spillovers**

This analysis has drawn on modelling insights and surveillance assessments to explore a number of questions about adjustment in the euro area, which were raised in earlier chapters. There are hazards in deriving a few stylised findings from this complex material; and whatever is attempted here should be viewed as preliminary and tentative in nature. Certainly it does not seek to displace or modify existing surveillance assessments. But some emerging features of the adjustment process certainly seem worthy of attention – in terms of resolving puzzles about recent experience as well as highlighting adjustment and surveillance issues that the policy community might wish to explore in the future.

In this perspective, several possible conclusions about adjustment in the euro area are particularly striking:

- First, the competitiveness channel emerges as strongly dominant over the medium term, and it assures a process that is dynamically stable – although not exempt from overshooting.
- Second, there is evidence of perverse real interest rate effects, but effects are less powerful than suggested in some earlier assessments,<sup>51</sup> both absolutely and relative to other factors influencing adjustment.
- Third, country specific "shocks" – in the sense of disturbances in factors that affect output and prices – play a powerful role in explaining protracted divergences in growth and in real exchange rates.
- Fourth, such disturbances in a member's economy can be mutually reinforcing – for instance where factors such as risk premia, financing ease and migration swing resource allocation heavily to non-traded goods and specifically housing investment.
- Fifth, there can be wide variations in the responsiveness of wages and unit labour costs to changes in national output gaps – and in some cases, there was a weak response to the emergence of cyclical slack, which retarded adjustment.
- Sixth, the role of financial markets has been more prominent than featured in pre-euro literature: financial integration has unlocked potentially large gains in formerly credit constrained economies, but has also amplified perverse real interest rate effects.
- Seventh, there were marked differences in the way that policy and market developments in euro-area economies interacted to dampen or amplify fluctuations in output and prices.
- Eighth, the dynamics of catching up varied considerably: one key distinction was between cases where capital flowed mainly to non-traded goods, and specifically housing investment, as against a case (Ireland) where investment in the traded goods sector helped preserve competitiveness over an extended period.
- Ninth, spillover effects are found to be potentially important – as illustrated in the modelling example of a major housing boom in several euro-area economies that affects another member through both demand effects and monetary conditions.

These findings surface a number of policy issues that deserve exploration with a view to improving adjustment efficiency in the euro area. These concern the scope to enhance adjustment through structural reforms in labour and product markets; the role of fiscal policy in helping to assure efficient adjustment outcomes; and the ways in which financial flows interact with real sector adjustment in a setting of ever-closer market integration.

Indeed, understanding the dynamics of adjustment within the euro area means getting to grips with the interaction between market and policy developments within each economy, and then forming a judgement on spillover effects between euro-area members. The concluding chapter of the study turns to these issues.

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<sup>51</sup> See, for example, Deroose, Langedijk and Roeger (2004).

## ANNEX: A TWO-COUNTRY-THREE-SECTOR DYNAMIC STOCHASTIC GENERAL EQUILIBRIUM (DSGE) MODEL<sup>52</sup>

We consider two countries within a monetary union. There is a high degree of capital mobility within the monetary union. Production is distinguished in tradeables and non tradeables. The non tradeable sector is further disaggregated into construction and services. Labour is mobile between sectors but not between countries. The tradeable sector in each country produces a commodity which is an imperfect substitute for goods produced in the other country. Tradeables and non tradeables are themselves imperfect substitutes. In each sector there is a continuum of monopolistically competitive firms that set prices subject to convex adjustment costs. The household sector consists of a continuum of households  $h \in [0,1]$ . A share  $(1 - slc)$  of these households is not liquidity constrained and is indexed by  $i \in [0, 1 - slc)$ . Such households have full access to financial markets; they buy and sell domestic and foreign assets. The remaining share  $slc$  of households is credit constrained and indexed by  $k \in [1 - slc, 1]$ . These households only engage in credit markets to finance housing investment. They are constrained in the sense that financial intermediaries charge a risk premium, which depends on the value of the collateral. Both types of households sell labour and act as wage setters in monopolistically competitive labour markets. Nominal rigidity in wage setting is introduced by assuming that the household faces adjustment costs for changing wages. These adjustment costs are borne by the household. The government sector in each region makes spending decisions and collects taxes on labour, capital and consumption. Finally there is a central bank which sets nominal interest rates for the whole area according to a Taylor rule.

### Firms:

There are  $n^T$  firms producing tradeables indexed by  $j$  and  $n^N$  firms producing non tradeables indexed by  $l$ . Each firm produces a variety of the corresponding (domestic) good which is an imperfect substitute for varieties produced by other firms. Because of imperfect substitutability, firms are monopolistically competitive in the goods market and face a demand function for goods. Domestic firms sell to private domestic households, to other firms the government and to exporting firms. All demand sectors have identical preferences across varieties. The demand function for firm  $j$  depends on its relative price to other tradeables and the total demand for tradeables which is composed of the demand of households, the government and firms for tradeables plus exports<sup>53</sup>

$$(1a) \quad Y_t^{T,j} = \frac{1}{n^T} \left( \frac{P_t^{T,j}}{P_t^T} \right)^{-\frac{1}{\tau_t}} \left[ (C_t^{TD} + G_t^D + I_t^{TD} + X_t) \right]$$

The demand function for non tradeables is given by:

$$(1b) \quad Y_t^{N,l} = \frac{1}{n^N} \left( \frac{P_t^{N,l}}{P_t^N} \right)^{-\frac{1}{\tau_t}} \left[ (C_t^N + G_t^N + I_t^{TN} + I_t^N + I_t^H) \right]$$

Demand for an individual firm in the non tradeable sector depends on the relative price of the variety offered by the firm, aggregate household and government demand for non tradeables and investment demand of the tradeable the non tradeable sector and the construction sector.

In what follows it is assumed that firms influence the demand for varieties for tradeables and non tradeables with their pricing decision. However, they are small with respect to the total market and therefore take prices as given:  $P_t^T, P_t^N$ . Output in each sector is produced according to a Cobb-Douglas production function specification:

$$(2) \quad Y_t^s = (K_t^s U_t^s)^{1-\alpha} (N_t^s TFP_t^s)^\alpha, \text{ where } s = \{Tj, Nl\}$$

<sup>52</sup> The model is an extended version of a DSGE model for the euro area, which was developed and estimated jointly by the Directorate General for Economic and Financial Affairs and the Joint Research Centre of the Commission in Ispra. See Ratto et al. (2005) and Ratto, Roeger and In't Veld (2006).

<sup>53</sup> Here we assume that only firms operating in the tradeable sector invest in tradeables, while firms in the non tradeable sector invest entirely in non tradeables.

Firms rent capital and hire labour from the household sector. Labour input  $N_t^s$  is itself a CES aggregate of labour

supplied by individual households  $i$ ,  $N_t^s = \left[ \int_0^1 L_t^{i,s} \frac{\theta-1}{\theta} di \right]^{\frac{\theta}{\theta-1}}$  where the parameter  $\theta > 1$  determines the degree of

substitutability. The level of technology is given by  $TFP^s$ . The objective of the firm is to maximise profits:

$$(3) \quad G_t^s = \frac{P_t^s}{P_t} Y_t^s - \frac{W_t}{P_t} N_t^s - i_t^T \frac{P_t^{CT}}{P_t} K_{t-1}^s - adj(P_t^s) - adj(N_t^s) - adj(U_t^s)$$

For adjustment costs, we use the following convex functional forms:

(4)

$$adj^L(N_t^s) = \frac{\gamma_N}{2} \Delta N_t^{s2}$$

$$adj^P(P_t^s) = \frac{\gamma_P}{2} \Delta \pi_t^{s2}, \text{ with } \pi_t^s = P_t^s / P_{t-1}^s - 1$$

$$adj^{CAP}(U_t^s) = K_t^s (a_1 (ucap_t^s - ucap^*) + a_2 (ucap_t^s - ucap^*)^2), \text{ with } ucap^* = 1$$

The firm determines the labour input, the capital stock and prices optimally in each period given the technological and administrative constraints as well as demand conditions. The first order conditions are given by:

$$(5a) \quad \frac{\partial G_0^s}{\partial N_t^s} \Rightarrow \left( \alpha \frac{Y_t^s}{N_t^s} \eta_t^s + \frac{\gamma_L}{R_t} ({}_t N_{t+1}^s - N_t^s) - \gamma_N (N_t^s - N_{t-1}^s) \right) = \frac{W_t}{P_t^s}$$

$$(5b) \quad \frac{\partial G_0^s}{\partial K_t^s} \Rightarrow \left( (1 - \alpha) \frac{Y_t^s}{K_t^s} \eta_t^s \right) = i_t^s \frac{P_t^{I,s}}{P_t^s}$$

$$(5c) \quad \frac{\partial V_0^s}{\partial Y_t^j} \Rightarrow \eta_t^s = 1 - \tau^0 + \gamma_P [\beta_t \pi_{t+1}^s - \pi_t^s]$$

Firms equate the marginal product of labour, net of adjustment costs, to wage costs. As can be seen from the left hand side of equation (5a), the convex part of the adjustment cost function penalises in cost terms accelerations and decelerations of changes in employment. Equation (5b) determines the optimal capital stock by equating the marginal value product of capital to the rental price. Equation (12c) defines the mark-up factor as a function of the elasticity of substitution and changes in inflation. We follow Smets and Wouters (2003) and allow for additional backward looking elements by assuming that a fraction ( $1-sfp$ ) of firms keep prices fixed at the t-1 level. This leads to the following specification:

$$(5c') \quad \eta_t^s = 1 - \tau^0 + \gamma_P [\beta (sfp)_t \pi_{t+1}^s + (1 - (sfp)_t) \pi_{t-1}^s - \pi_t^s] \quad 0 \leq (sfp)_t \leq 1$$

There are  $n^H$  firms  $n^H$  (indexed by  $h$ ) in the construction sector. The construction sector simply transforms non-tradeable inputs ( $I_t^{HI}$ ) into buildings ( $I_t^{HO}$ ) using a decreasing returns to scale technology:

$$(6) \quad I_t^{HO,h} = I_t^{HI,h\theta} U_t^H \quad \text{with } \theta \leq 1$$

Firms in the construction sector also operate under monopolistic competition and adjust prices sluggishly.

## Households:

### *Non-liquidity constrained households*

Non-liquidity-constrained households can hold five types of assets: domestic and foreign nominal bonds ( $B, B^F$ ), stocks of domestic companies operating in the tradeable and non-tradeable sectors ( $K^T, K^N$ ), housing ( $H$ ) and cash balances ( $M$ ). Each household owns land ( $L$ ) which is inelastically supplied and traded among households. The household receives income from labour, nominal bonds and rental income from lending capital to the tradeable and the non-tradeable sectors.

The utility function is additively separable in consumption, leisure and the stock of housing. And the stock of housing is composed of buildings and land. For the model economy to reach a steady state, we assume log utility functions for total consumption ( $C_t^i$ ) and housing (HL) and a CES utility function for leisure. In addition we allow for habit persistence.

$$(7a) \quad U(C_t^i) = \log((1 + habc)C_t^i - habcC_{t-1}^i)$$

Consumption is an aggregate of varieties of tradeable and non-tradeable goods. The tradeables are nested into domestic and foreign varieties.  $C_t^i$  is a composite of tradeable  $C_t^{T,i}$  and non-tradeable consumption  $C_t^{N,i}$ .

$$(7b) \quad C_t^i = \left[ s_T \frac{1}{\rho} C_t^{T,i(\frac{\rho-1}{\rho})} + (1 - s_T) \frac{1}{\rho} C_t^{N,i(\frac{\rho-1}{\rho})} \right]^{\left(\frac{\rho}{\rho-1}\right)}$$

where  $\rho$  denotes the elasticity of substitution between tradeables and non tradeables. For tradeables, households have a choice between domestic and foreign varieties, with an elasticity of substitution given by  $\zeta$ .<sup>54</sup>:

$$(7c) \quad C_t^{T,i} = \left[ s_{TD} \frac{1}{\zeta} C_t^{TD,i(\frac{\zeta-1}{\zeta})} + (1 - s_{TD}) \frac{1}{\zeta} C_t^{TF,i(\frac{\zeta-1}{\zeta})} \right]^{\left(\frac{\zeta}{\zeta-1}\right)}$$

Normalising the total time endowment of the household to one, then the utility from leisure is given by:

$$(8) \quad V(1 - N_t^i) = \frac{\omega + e_t^L}{1 - \kappa} ((1 + habl)(1 - N_t^i) - habl(1 - N_{t-1}^i))^{1-\kappa} \quad \text{with } \kappa > 0,$$

where  $N_t^i$  is labour supplied by household  $i$ . Finally the household enjoys utility from the stock of housing (HL); the parameter  $\varphi$  determines how the household distributes expenditure between consumption and housing. Due to demographic and other changes, this parameter is subject to exogenous shocks denoted by  $e_t^H$ .

$$(9a) \quad Z(HL_t^i) = (\varphi + e_t^H) \log((1 + habh)(HL_t^i) - habh(1 - HL_{t-1}^i)) \quad \text{with } \kappa > 0,$$

Housing is itself an aggregate of buildings (H) and land (L). The utility that the household receives from both components is given by a CES utility function:

$$(9b) \quad HL_t^i = \left[ s_H \frac{1}{\sigma} H_t^i \left(\frac{\sigma-1}{\sigma}\right) + s_L \frac{1}{\sigma} L_t^i \left(\frac{\sigma-1}{\sigma}\right) \right]^{\left(\frac{\sigma}{\sigma-1}\right)}$$

<sup>54</sup> It is assumed that households and the government have identical preferences over domestic and foreign varieties in order to facilitate aggregation.

The investment decisions w.r.t. real capital are subject to convex adjustment costs. Therefore we make a distinction between real investment expenditure ( $I$ ) and physical investment ( $J$ ). Investment expenditure of households including adjustment costs is given by:

$$(10) \quad I_t^{j,i} = J_t^{j,i} \left( 1 + \frac{\phi}{2} \left( \frac{J_t^{j,i}}{K_t^{j,i}} \right) \right) \quad \text{where } j = \{T, N, H\}$$

The Lagrangian of this maximisation problem is given by:

(11)

$$\begin{aligned} \text{Max} \quad U_0^i = E_0 \sum_{t=0}^{\infty} \beta^t & \left( U(C_t^i) + V(1 - N_t^i) + Z(HL_t^i) \right) \\ & - \sum_{t=0}^{\infty} \lambda_t \beta^t \left( \frac{(1+t_t^c)P_t^C}{P_t} C_t^i + \frac{B_t^i}{P_t} + \frac{E_t B_t^{iF}}{P_t} + \frac{P_t^{CT} I_t^{T,i}}{P_t} + \frac{P_t^N I_t^{N,i}}{P_t} + \frac{P_t^H I_t^{H,i}}{P_t} + \frac{P_t^L L_t^i}{P_t} \right. \\ & \left. - \frac{(1+i_{t-1})B_{t-1}^i}{P_t} - \frac{(1+i_{t-1}^F)(1-r(\cdot))E_t B_{t-1}^{iF}}{P_t} - \frac{i_t^T P_t^{CT} K T_{t-1}^i}{P_t} - \frac{i_t^N P_t^N K N_{t-1}^i}{P_t} - \frac{P_t^L L_{t-1}^i}{P_t} - \frac{(1-t_t^w)W_t^i}{P_t} N_t^i \right. \\ & \left. + \frac{\gamma_w N_t^i}{2} \left( \frac{\Delta w_t^i}{w_t} \right)^2 + TAX_t^i \right) \\ & - \sum_{t=0}^{\infty} \xi_t \beta^t (K_t^{T,i} - J_t^{T,i} - (1-\delta)K_{t-1}^{T,i}) \\ & - \sum_{t=0}^{\infty} \vartheta_t \beta^t (K_t^{N,i} - J_t^{N,i} - (1-\delta)K N_{t-1}^{N,i}) \\ & - \sum_{t=0}^{\infty} \chi_t \beta^t (H_t - J_t^{H,i} - (1-\delta)H_{t-1}) \end{aligned}$$

The budget constraint is written in real terms and all prices are expressed relative to the GDP deflator ( $P$ ). Investment in the tradeable sector is a composite of domestic and foreign tradeables (manufacturing), while we regard investment in non tradeables as largely non tradeable (construction). The first order conditions of the household (FOCs) with respect to consumption and financial wealth are given by the following equations:

$$(12a) \quad \frac{\partial U_0}{\partial C_t^i} \Rightarrow U_{C_t^i}^i - \lambda_t \frac{(1+t_t^c)P_t^C}{P_t} = 0$$

$$(12b) \quad \frac{\partial U_0}{\partial B_t^i} \Rightarrow -\lambda_t + \lambda_{t+1} \beta (1+i_t) \frac{P_t}{P_{t+1}} = 0$$

$$(12c) \quad \frac{\partial U_0}{\partial B_t^{iF}} \Rightarrow -\lambda_t + \lambda_{t+1} \beta (1+i_t^F) (1 + risk(\frac{B W_t}{GDP_t})) \frac{P_t}{P_{t+1}} \frac{E_{t+1}}{E_t} = 0$$

$$(12d) \quad \frac{\partial U_0}{\partial K_t^{T,i}} \Rightarrow -\xi_t + \xi_{t+1} \beta (1-\delta) + \lambda_{t+1} \beta i_t^T \frac{P_{t+1}^{CT}}{P_{t+1}} = 0$$



$$(12e) \quad \frac{\partial U_0}{\partial J_t^{T,i}} \Rightarrow -\lambda_t \frac{P_t^{CT}}{P_t} \left(1 + \phi \left(\frac{I_t^{T,i}}{K_{t-1}^{T,i}}\right)\right) + \xi_t = 0$$

$$(12f) \quad \frac{\partial U_0}{\partial K_t^{N,i}} \Rightarrow -\mathcal{G}_t + \mathcal{G}_{t+1} \beta (1 - \delta) + \lambda_{t+1} \beta i_t^N \frac{P_{t+1}^N}{P_{t+1}} = 0$$

$$(12g) \quad \frac{\partial U_0}{\partial J_t^{N,i}} \Rightarrow -\lambda_t \frac{P_t^N}{P_t} \left(1 + \phi \left(\frac{I_t^{N,i}}{K_{t-1}^{N,i}}\right)\right) + \mathcal{G}_t = 0$$

$$(12h) \quad \frac{\partial U_0}{\partial H_t^i} \Rightarrow \varphi \frac{1}{HL_t^i} s_H^{\frac{1}{\sigma}} \left(\frac{HL_t^i}{H_t^i}\right)^{\frac{1}{\sigma}} - \xi_t + \xi_{t+1} \beta (1 - \delta) = 0$$

$$(12i) \quad \frac{\partial U_0}{\partial J_t^{H,i}} \Rightarrow \phi_t \frac{P_t^H}{P_t} \left(1 + \theta \frac{J_t^{H,i}}{H_t^i}\right) = \xi_t$$

$$(12j) \quad \frac{\partial U_0}{\partial L_t^i} \Rightarrow \varphi \frac{1}{HL_t^i} s_L^{\frac{1}{\sigma}} \left(\frac{HL_t^i}{L_t^i}\right)^{\frac{1}{\sigma}} - \phi_t \frac{P_t^L}{P_t} + \phi_{t+1} \frac{P_{t+1}^L}{P_{t+1}} \beta (1 - \delta) = 0$$

All arbitrage conditions are standard, except for a trading friction on foreign bonds, which is modelled as a function of the ratio of net foreign assets ( $BW$ ) to GDP.

Using the arbitrage conditions, investment in the tradeable and non tradeable sector is given by:

$$(13a) \quad \left(\frac{I_t^{T,i}}{K_{t-1}^{T,i}}\right) = \frac{1}{\theta} (q_t^T - 1) \quad \text{with} \quad q_t^T = \frac{\xi_t}{\lambda_t} \frac{P_t}{P_t^{CT}}$$

where  $q_t^T$  is the present discounted value of the rental rate of return from investing in the tradeable sector.

$$(13b) \quad q_t^T = q_{t+1}^T \frac{1}{(1 + \delta + i_t - \pi_{t+1}^{CT})} + i_t^T$$

Notice that the relevant discount factor for the investor in the tradeable sector is the nominal interest rate minus the expected rate of inflation of tradeables. This is because investment in the tradeable sector is assumed to be a composite of domestic and foreign tradeables and an increase in tradeable inflation constitutes a capital gain for the investor and lowers capital costs.

Similarly, for the non tradeable sector, investment is given by:

$$(14a) \quad \left(\frac{I_t^{N,i}}{K_{t-1}^{N,i}}\right) = \frac{1}{\theta} (q_t^N - 1) \quad \text{with} \quad q_t^N = \frac{\mathcal{G}_t}{\lambda_t} \frac{P_t}{P_t^N}$$

where  $q_t^N$  is the present discounted value of the rental rate of return from investing in the tradeable sector.

$$(14b) \quad q_t^N = q_{t+1}^N \frac{1}{(1 + \delta + i_t - \pi_{t+1}^N)} + i_t^N$$

In the case of non tradeables, the relevant discount factor for the investor is the nominal interest rate minus expected rate of inflation of non tradeables because investment in the non tradeable sector is assumed to be a composite of domestic non tradeables only.

Housing investment (buildings) is given by:

$$(15a) \quad \left( \frac{I_t^{H,i}}{K_{t-1}^{H,i}} \right) = \frac{1}{\theta} (q_t^H - 1) \quad \text{with} \quad q_t^H = \frac{\xi_t P_t}{\lambda_t P_t^H}$$

where  $q_t^H$  is the present discounted value of the shadow price of housing.

$$(15b) \quad q_t^H = q_{t+1}^H \frac{1}{(1 + \delta + i_t - \pi_{t+1}^H)} + (\rho + \varepsilon_t^H) s_H^{\frac{1}{\sigma}} \frac{C_t^i P_t^C}{H_t^i P_t^H} HL_t^{\frac{1}{\sigma} - 1}$$

This expression shows that households aim at stabilising expenditure shares for consumption and housing (if  $\sigma$  is close to one), which is implied by the log specification of the utility function. Investment is large if the stock of housing (relative to its equilibrium level) is low and vice versa. The present discounted value of the ratio of the marginal utility of housing to the marginal utility of consumption is discounted by the nominal interest rate minus the expected inflation rate for buildings. The discount rate again reflects the impact of capital gains on housing investment decisions.

Finally, households make decisions about the acquisition of land. Demand for land crucially depends on expected changes in land prices. Since at the aggregate level, land is fixed, the arbitrage equation determines the relative price of land:

$$(15c) \quad \frac{P_t^L}{P_t} = \frac{P_{t+1}^L}{P_{t+1}} \frac{1}{(1 + \delta + i_t - \pi_{t+1})} + (\rho + \varepsilon_t^H) s_L^{\frac{1}{\sigma}} \frac{C_t^i P_t^C}{L_t^i P_t} HL_t^{\frac{1}{\sigma} - 1}$$

The land price behaves like an asset price. Under the assumption that land is inelastically supplied, if the price of land rises if there is a positive expectation about future consumption and a positive expectation about  $HL$ , the house-land aggregate in the standard case where land and buildings are complements ( $\sigma < 1$ ). In the model, it is especially the price of land which drives housing price inflation.

### **Credit-constrained households ( $k$ )**

Credit-constrained households have identical preferences to unconstrained households. However, they do not participate in asset markets except for the mortgage market. Household  $k$  spends his income either on consumption goods or invests in housing. Housing investment is subject to a credit constraint. While the household can borrow, the borrowing cost depends on the ratio of outstanding debt ( $D$ ) to the value of the housing stock ( $V(K^H)$ ).

(16)

$$\begin{aligned} \text{Max} \quad U_0^i &= E_0 \sum_{t=0}^{\infty} \beta^t (U(C_t^k) + V(1 - N_t^k) + Z(HL_t^k)) \\ &- \sum \phi_t \beta^t \left( \frac{P_t^L}{P_t} L_t^k + \frac{D_t^k}{P_t} - (1 + r_{t-1} + \kappa \left( \frac{D_{t-1}^k}{V(K_{t-1}^{H,i})} \right)) \frac{D_{t-1}^k}{P_{t-1}} - \frac{P_t^L}{P_t} L_{t-1}^k - \frac{P_{t-1}^C}{P_t} C_t^k - \frac{P_t^H I_t^{H,k}}{P_t} \left( 1 + \frac{\phi}{2} \left( \frac{I_t^{H,k}}{H_{t-1}} \right) \right) + \frac{W_t}{P_t} N_t^k \right) \\ &- \sum \xi_t \beta^t (K_t^{H,k} - I_t^{H,k} - (1 - \delta) H_{t-1}^{H,k}) \end{aligned}$$

where  $(1 + r_{t-1}) = (1 + i_{t-1}) / (1 + \pi_t)$

The first order conditions of credit-constrained households for consumption, buildings and land are similar to those of unconstrained households, except for a risk premium on household debt.

### ***Wage setting***

Workers from each household have market power in the labour market, because they offer services, which are imperfect substitutes to services offered by other workers. There is a continuum of monopolistically competitive unions indexed over the same range as households  $h \in [0,1]$ , which act as wage setters for the differentiated labour services. In a monopolistic labour market, the elasticity of substitution between different types of labour determines the mark-up of wages over the equilibrium wage. This elasticity is defined by:

$$(17a) \quad \frac{\partial L_t^i}{\partial W_t^i} = -\theta \left( \frac{W_t^i}{W_t} \right)^{-\theta} L_t^i \frac{1}{W_t^i} = -\theta \frac{L_t^i}{W_t^i}$$

Now the wage setting rule can be derived taking derivatives of the Lagrangian w.r.t. wages. Using symmetry:  $W_t^i = W_t$  and neglecting second order terms allows us to write:

$$(17b) \quad \pi_t^w - \bar{\pi}^w = \frac{(\theta-1)(1+t_t^C)PC_t}{\gamma_w W_t} \left[ \frac{-V_{L,t}}{U_{C,t}} (1+mup^w) - \frac{(1-t_t^w)W_t}{PC_t(1+t_t^C)} \right] + \beta_{t,t} (sfw \pi_{t+1}^w + (1-sfw) \pi_{t-1}^w - \bar{\pi}^w)$$

with a wage mark-up term  $mup^w = \frac{1}{\theta}$ , which goes to zero as the substitutability between different types of labour goes to infinity. Households are setting the real net consumption wage as a mark up over the value of leisure, which is defined as the marginal utility of leisure divided by the marginal utility of consumption. This means the real (consumption) wage is a positive function of employment and a negative function of consumption. The latter can be interpreted as an income effect since consumption is proportional to the permanent income of the household sector. This formulation generalises the neoclassical labour supply model along two dimensions. First, because of imperfect substitutability between different types of labour, households can set a consumption wage that is above the reservation wage as determined by the value of leisure. The magnitude of the wage mark-up depends on the degree of substitutability between varieties of labour. Second, by introducing convex wage adjustment costs ( $\gamma_w > 0$ ), workers wish to smooth wage adjustments, taking into account current and future expected labour market conditions.

### ***Aggregation***

The aggregate of any household specific variable  $X_t^h$  is given by  $X_t = \int_0^1 X_t^h dh = (1-slc)X_t^i + slcX_t^k$  since households within each group are identical. Hence aggregate consumption is given by:

$$(18) \quad C_t = (1-slc)C_t^i + slcC_t^k$$

Aggregate employment is given by:

$$(19)$$

$$N_t = (1-slc)N_t^i + slcN_t^k$$

Liquidity constrained households do not own financial assets.

## Policy

### Fiscal Policy

Local governments dispose of the following fiscal instruments: on the revenue side, capital, labour and consumption taxes; and on the expenditure side, government consumption and government transfers. The government is subject to an inter-temporal budget constraint. The inter-temporal budget constraint is guaranteed to be satisfied via a debt rule, i.e. the government adjusts labour taxes according to the following rule:

$$(20) \quad \Delta t_t^w = b1\left(\frac{B_t}{GDP_t} - b^*\right) + b2\left(\Delta \frac{B_t}{GDP_t}\right)$$

### 3.2 Central bank policy rule (interest rate rule):

Monetary policy in the euro area is modelled by a Taylor rule, which targets an aggregate euro-area output gap and the inflation rate. It also allows for some smoothness of the interest rate response to inflation and the output gap.

$$(21) \quad i_t = ilag * i_{t-1} + (1 - ilag) * (Ex.R + \pi^T + t^\pi (\pi_{t-1}^{EMU} - \pi^T) + t_M^Y (Y_t - YPOT_t^{EMU})) + e_t^M$$

## Calibration

The parameter values for the model are taken from the estimated euro-area model (Ratto et al. (2005) and Ratto, Roeger and In't Veld (2006)). We follow the trade literature in setting the trade elasticities. Accordingly, we set the elasticity of substitution between tradeables and non-tradeables to 0.4 and the elasticity between domestic and foreign tradeables to 5. This is at the higher end of the range given existing estimates. However, we think this is justified by the fact that we are looking at trade among countries in the euro area.

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**Table A-1: Parameter Values**

$\beta$	Discount factor	0.99
$h_{abc}$	Consumption habit	0.8
$slc$	Share of credit constrained households	0.5
$risk$	Credit constraint	0.01
$\rho$	Elast. of subst. between $T$ and $N$	0.4
$\zeta$	Elast. of subst. between $TD$ and $TF$	5.0
$\kappa$	Inverse of labour supply elasticity	0.23
$\theta$	Capital adjustment costs	42.0
$\alpha$	Output elasticity of labour	0.6
$\gamma_p$	Adjustment costs (prices)	24.0
$\gamma_w$	Adjustment costs (wages)	17.0
$sfp$	Share of fwd looking price setters	0.75
$sfpw$	Share of fwd looking wage setters	0.83
$t^\pi$	Monetary policy response to inflation	1.5
$t^y$	Monetary policy response to YGAP	0.1

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# VIII. ADJUSTMENT AND SURVEILLANCE ISSUES

## Summary

*Recent adjustment experience sheds light on policy priorities that can enhance the functioning of the euro area. With the competitiveness channel emerging as a key to efficient adjustment, one set of issues concerns structural reforms and wage determination. Labour and product market reforms have contributed to wage moderation and lower structural unemployment, but challenges seem to remain in terms of the responsiveness of wages to cyclical conditions, especially in some economies. There is a need to provide high quality and forward-looking information to social partners about the evolving euro-area adjustment setting, and perhaps to re-examine wage-setting mechanisms in some cases. Continuing labour and product market reforms can enhance the responsiveness of markets, and by promoting faster productivity growth they can improve the efficiency of adjustment. Fiscal policy, too, can contribute importantly. A core concern is to ensure sufficient consolidation during "good times" – thus avoiding any amplification of country-specific booms, and assuring greater resilience during downswings. This requires a deeper analysis of underlying fiscal positions during booms, when revenues may be swollen by transient factors not captured in cyclical adjustment calculations. Moreover, interactions between the fiscal stance, wages and financial market trends emerge as potentially important. This means that the fiscal stance needs to be assessed carefully in light of the inter-country adjustment context, including any risks of overshooting in the real effective exchange rate. Recent euro-area experience underscores also the role of financial markets – both in opening new opportunities for investment and growth and, at times, in complicating the adjustment process. But the benefits of financial integration are only just starting to be tapped. Growing cross-border asset holdings can make a major contribution to smoothing incomes during adjustment episodes, and market integration can dampen local credit shocks. In a monetary union with a small budget at the EU level and low labour mobility, these financial market mechanisms hold particularly important potential.*

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# ADJUSTMENT AND SURVEILLANCE ISSUES

## 1. Enhancing adjustment dynamics

Previous chapters have described and analysed the nature of economic adjustment in the euro area and have uncovered opportunities and challenges for policy-makers in order to improve the functioning of the euro area. This chapter elaborates on policy challenges in the areas of structural reforms and wage determination, fiscal policy, and financial market integration, and discusses some possible issues related to surveillance.

### *1.1 Structural reforms and wage determination*

Wages are the crucial factor in equilibrating demand and supply on the labour market. Wage setting mechanisms strongly contribute to determining the level of equilibrium unemployment in an economy; they are decisive for an efficient allocation of labour resources across economic activities; and, obviously, the wage formation process plays a key role in absorbing macroeconomic shocks and cyclical disturbances in a smooth way. It is a widely held belief among both pundits and policy-makers that EU wage formation systems suffer from significant shortcomings in almost all of these respects which, in consequence, could seriously impair the efficient working of the euro area.

Conceptually, two different dimensions of wage adjustment mechanisms need to be distinguished: (i) nominal wage and price flexibility is key in responding to country-specific aggregate demand shocks that alter real equilibrium exchange rates: flexible money wages, if combined with flexible prices, should impact on the cyclical sensitivity of output and employment, bringing about the required changes in real effective exchange rates and allowing for equilibrating current account dynamics; and (ii) real wage flexibility to bring wages in line with productivity developments at the regional, sectoral and occupational level; flexible real wages will allow for a smooth reallocation of labour resources across economic activities in the event of industry-specific or supply-side shocks, thus lowering equilibrium unemployment.

Obviously, in the EMU framework, it is even more important than in the past for wage developments to be in line with both the macroeconomic framework set at the Community level and the individual country-specific requirements. Overall nominal wage developments must be consistent with the goal of price stability. Excessive nominal wage increases triggering inflationary risks for the euro-zone as a whole – as will hold true, in particular, in the case of larger countries – will inevitably provoke a tightening of monetary conditions with adverse effects on growth and employment in the entire monetary union. Moreover, while inflationary wage pressure may not significantly affect overall euro-area inflation when confined to one – smaller – country or region alone, it will sooner or later, via its effect on relative unit labour costs, depress competitiveness and employment in this country or region.

Thus, in economic and monetary union, nominal wage flexibility becomes even more significant because there is a need for alternative adjustment mechanisms to substitute for domestic monetary policy. The argument rests on either the risk of asymmetric demand shocks or the risk that a common monetary policy could affect the various economies differently. With nominal exchange rate devaluation no longer an option, any substantial error in wage setting would ultimately translate into a deterioration in labour market conditions and painful adjustment thereafter. While this may have provided some incentives for more bargaining co-ordination to promote nominal wage flexibility, it has also been argued that inherent in the integration process are forces such as non-benign wage convergence mechanisms, for example wage imitation effects, which could actually increase nominal rigidity. This implies that more protracted



output adjustment may follow, even though the equilibrium level of employment may increase and structural unemployment may be lower.

Indeed, a second dimension of the wage formation mechanisms concerns the impact of economic and monetary union on equilibrium real wages (measured in labour efficiency units), and thus on equilibrium unemployment, or more loosely speaking on the average levels of real wages and unemployment over the business cycle. It has been widely held that, in general, EMU should provide improved framework conditions for employment-compatible wage bargaining. Indeed, with all the elements of the Marshall-Hicks rule of labour demand likely to operate, the wage-elasticity of labour demand can be expected to rise and, thus, the link between wage and employment trends becomes more evident and stringent. Increased product market competition results in fewer rents that could be distributed in wage bargaining. Moreover, trade unions that recognise the impact of higher goods market competition on the elasticity of labour demand are likely to reduce the claimed mark-up of effective wages over the competitive wage outcome. And, last but not least, many structural labour market reform efforts work precisely in the same direction.

Obviously, real wage moderation, in the sense of reducing the mark-up of effective wages over competitive wages, helps to increase employment and lower structural unemployment over the medium term, without necessarily compromising domestic demand in the economy. This assertion is not only solidly backed by standard economic theory, but also by the factual experience of many euro-area countries, in particular in the second half of the 1990s. However, it is important to bear in mind that the relationship between real wage moderation and observed wage and productivity developments is anything but straightforward. The textbook dynamic adjustment path following an employment-friendly shift of the wage-setting curve, for example, implies an initial fall in real efficiency wages followed by a period of real wages rising faster than trend productivity until equilibrium is restored. It should also be noted in this context that aggregate real wage moderation is a fairly poor substitute for wage differentiation when it comes to helping to price the low-skilled back into jobs.

From a bird's eye perspective, structural wage pressures have been subdued in the early years of the euro area. Indeed, the most recent assessment by the Directorate General for Economic and Financial Affairs indicates a decline of the NAIRU for the euro area by about 1½ percentage points, suggesting therefore that about half of the improvement in actual unemployment could be considered structural in nature. By and large, other international bodies such as the OECD and the IMF have arrived at pretty similar conclusions. In terms of having a better understanding of the nature of the observed wage discipline as reflected in the fall of the NAIRU, the second half of the 1990s has indeed witnessed relatively widespread product and labour market reforms in most euro-area countries, spurring competition in goods and services markets and cracking down on insider-outsider divisions in the labour markets. As a result, the potential for rent-sharing behaviour between workers and firms tends to be strongly reduced, an effect equivalent – in the context of the Calmfors-Driffill hypothesis (Calmfors and Driffill, 1988) – to a forced decentralisation of wage bargaining, thus flattening out the 'hump'.

While it is certainly difficult to establish precisely the contribution of the various reform efforts, there can be little doubt that they have left their traces in a reduction of the NAIRU by helping to keep a lid on wage demands. However, it must also be acknowledged that reform progress has been fairly uneven across countries – with all the major economies of the euro area still plagued by relatively high structural unemployment – and rather piecemeal in nature. Moreover, rising concerns about the slow working of the competitiveness channel as a critical adjustment mechanism in economic and monetary union suggest a need to take a fresh look at the role and the evolution of wage bargaining systems in the euro area.

The evolution of wage bargaining systems in the early years of the euro area has been characterised by, at first sight, somewhat contradictory, tendencies. Firstly, the trend towards de-unionisation has continued with wage bargaining being gradually decentralised to the firm level, but often these changes have occurred through opening clauses in sector-specific agreements rather than through the complete abandonment of such structures. Notwithstanding this trend towards decentralisation, there was also an increase in national level bargaining beginning in the 1990s with the renaissance of social pacts, particularly in the run-up to the launch of economic and monetary union. While such incomes policies are not structural reforms per se, they can have an important role to play in encouraging wage restraint. Moreover, trade unions have made efforts to co-ordinate wage agreements across countries, in order to avoid “races to the bottom” in wage bargaining in the context of monetary union, but these have been mostly informal and seem to have only had a limited impact.

As argued above, in the euro area, there are indeed some clear incentives working in the direction of co-ordinated bargaining, since substituting nominal wage flexibility for monetary policy autonomy – which may be required to smoothly absorb asymmetric shocks – may be easier under such conditions. However, experience suggests that a number of other conditions must also be met to uphold such bargaining arrangements. Among these, trading tax cuts

for wage restraint have figured prominently, but flanking policy measures to increase labour supply availability and some degree of in-built wage differentiation flexibility appear to be crucial as well.<sup>1</sup>

It is worth noting in this context that co-ordinated bargaining did not necessarily run counter to delivering fairly differentiated wage outcomes across sectors, regions and qualifications. Moreover, recent years have seen a move towards "organised decentralisation" in wage bargaining in several countries, for example, in the form of so-called opening clauses allowing for some degree of firm-level differentiation. With labour market policies geared to mobilise the labour force potential, overall wage pressures may indeed remain subdued and, thus, the infant years of the euro area may well see sustained wage moderation supported by co-ordinated wage bargaining at national level.

However, wage bargaining co-ordination and social pacts face a fundamental problem of time consistency, making it difficult to lock in the bargain since there are strong incentives for the individual actors to deviate ex-post from prior agreements. Moreover, governments may find it increasingly difficult to design supportive policies deemed acceptable by the main actors in wage bargaining. Thus, given an inherent fragility of social pacts over the medium to long term, and against the background of strong trends towards more decentralisation of bargaining to firm and local levels, wage bargaining co-ordination efforts may ultimately fail. Unfortunately, it cannot be ruled out that such a failure may result, at least temporarily, in wage bargaining outcomes that tend to be less employment-friendly. Indeed, it is by no means straightforward to see how wage determination mechanisms could deliver the necessary degree of wage flexibility and differentiation at the disaggregated level, while at the same time ensuring that overall wage developments are consistent with intra-euro-area real equilibrium exchange rate requirements.

Obviously, from the perspective of intra-area realignments of real effective exchange rates, which may be required to adjust to asymmetric shocks and/or to correct for unsustainable relative competitive conditions that may have gradually built up over time, nominal wage flexibility is crucial. The available empirical estimates suggest that nominal wage flexibility in the euro area as a whole is fairly similar to that in the US. However, given the much weaker other adjustment mechanisms, such as labour mobility and fiscal transfers, the necessary degree of nominal wage flexibility in euro-area countries may actually be significantly higher. It is unclear whether wage bargaining systems can be expected to deliver such an outcome, except perhaps in a situation of obvious and deep crisis. The alternative/complementary route to realign real equilibrium exchange rates via supply-side measures is, while indispensable, admittedly cumbersome and in addition only works slowly. Consequently, there is a real risk that the correction of intra-area imbalances in competitive positions will imply protracted periods of adjustment with fairly high costs in terms of output losses and unemployment.

Against that background, the first-best policy option is of course to avoid any substantial errors in wage setting in the first place. As the responsibility for well-adapted wage-setting – closely reflecting productivity developments – continues to fall primarily into the domain of the social partners, it appears essential to strengthen the social dialogue at all the appropriate levels and to ensure that the actors in the wage bargaining process have the necessary information about adjustment challenges and the implications of different lines of action. It seems particularly important to analyse whether current wage and price developments are benign in terms of adjustment needs in order to avoid any significant overshooting in intra-euro-area real effective exchange rates. This can be illustrated by the example of an economy returning towards equilibrium after a shock that had caused a country-specific boom and a phase of appreciation. Once the phase of depreciation begins, wage adjustment that lagged significantly behind cyclical developments could result in the real effective exchange rate continuing to depreciate beyond the point needed to bring the relative output gap in the national economy back in line with common monetary conditions.

More flexible wage-setting mechanisms, however, need to be supplemented by an appropriate degree of price flexibility. The creation of more integrated and competitive product markets helps raise the speed with which prices within the euro area adjust to economic shocks. Sufficiently strong competition in euro-area product markets also helps ensure that wage moderation and productivity gains are reflected in lower price levels. With rigid prices, on the other hand, stronger nominal wage rigidities are likely to emerge as flexible money wages would result in larger real wage losses and will not translate into lower adjustment costs in terms of output and employment.

Since the establishment of the euro area, a number of reforms aimed at opening up product markets to competition have been introduced and competition rules have been modernised. Nevertheless, sectoral enquiries show that in spite of measures taken effective competition in network industries and other services sectors is still limited. A more effective implementation of agreed reform measures and a more ambitious reform programme are therefore essential to reduce inflation inertia, particularly in services. Thus, ensuring competitive product markets, including services, does not only foster the medium-term growth potential, but it is also an indispensable element of any strategy to reduce the welfare cost of cyclical adjustment processes.

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<sup>1</sup> In the past few years formal or informal agreements on wage policy have (again) been reached in several euro-area countries, typically committing the actors in collective bargaining to some form of wage discipline in order to meet EMU stability goals and to improve competitiveness. Government involvement may take various forms, for example trading tax cuts and/or specific labour market policy measures against wage restraint, as has been the case in Finland and Ireland.

## 1.2 Fiscal challenges

Macroeconomic developments and asset market fluctuations which are related to competitiveness and adjustment processes in the euro area affect fiscal developments, as well as the indicators for measuring consolidation efforts and the underlying fiscal position. The Stability and Growth Pact (SGP), which was revised in 2005, allows this knowledge to be taken into account in order to set appropriate budgetary targets and assess compliance with the letter and spirit of its requirements. The increasing experience with economic developments and adjustment within the euro area allow for developing knowledge and understanding. This may provide useful information to improve fiscal policy behaviour and minimise the risks of erroneous fiscal policies and contribute to enhancing fiscal surveillance in the context of the SGP framework.

This section discusses fiscal policy and the EU fiscal framework in the context of adjustment in monetary union. It discusses in particular, peculiarities of fiscal stabilisation with possible protracted adjustment dynamics and the effects on the budget balances. Firstly, it looks at the desirability of fiscal stabilisation in the context of such adjustment dynamics. Secondly, as the safety margins of the SGP are based on the assumption of normal cyclical developments, it discusses the budgetary effects of automatic stabilisers considering adjustment dynamics. Thirdly, it looks at successful and unsuccessful fiscal consolidation under adjustment dynamics. Fourthly, it raises challenges for fiscal surveillance stemming from difficulties to measure fiscal consolidation efforts and to assess the soundness of the fiscal position. And finally, it discusses how the revised SGP can be implemented to ensure effective fiscal surveillance in this context.

### 1.2.1 Some theoretical considerations on the effectiveness and desirability of fiscal stabilisation in EMU

Theory suggests that short-run fiscal multipliers should increase when countries participate in economic and monetary union. The effectiveness of fiscal policy is higher under a fixed exchange rate regime or in a monetary union due to reduced crowding out via the interest rate channel. In the longer run, as the extent of real crowding out grows through increasing trade integration in monetary union, the size of the fiscal multipliers gradually decreases again.

Fiscal policy impacts directly on current income, under one or more of the following assumptions: sluggish price or wage adjustment, slack productive capacity, and myopic or liquidity-constrained firms and households. If prices are flexible, fiscal action is relatively ineffective at demand management, but also less likely to be desirable because output would generally be close to its potential. Similarly, if economic agents are forward-looking the effects will generally be muted as the future tax implications of fiscal policy are taken into account in their decisions. The effect of fiscal policy on aggregate demand also depends on the fiscal instrument used. In general, stabilisation on the expenditure side is more effective than on the revenue side.

The strength of the automatic stabilisers depends on: the size of the government; the progressiveness of the tax system; the generosity of the benefit system; the sensitivity of employment to output fluctuations; and the composition of government revenues (share of cyclically-sensitive tax bases). Automatic stabilisers can be strengthened by adjusting these elements. However, ways to strengthen the stabilisers can have a negative impact on economic efficiency or undesired distributional effects. Distributional and economic efficiency based arguments for the taxation and government expenditure structure are likely to be generally considered more important than some increase in the automatic stabilisation effect. The room for manoeuvre to increase their strength is therefore limited.

As the automatic stabilisers do not distinguish between the sources of shocks, nor whether they are permanent or temporary, a very persistent adverse shock could lead to systematic, unsustainable budget movements that can only be offset with a discretionary fiscal change.

Blanchard (2001), using a standard static (Mundell-Fleming type) framework, analyses the need for fiscal policy stabilisation in the euro area in the cases of Spain and Ireland. In both cases, if the economy is let to run its course unhindered, inflation leads to a real appreciation such that demand eventually falls to the level of equilibrium output. What differs is the real exchange rate and thus the composition of demand, *internal* versus *external*. The more use of fiscal contraction, the smaller the real appreciation and the more favourable the external balance. The desirability of fiscal policy stabilisation in an overheating phase depends on the source of overheating: internal or external demand. In the case of overheating caused by internal demand (Spain), fiscal stabilisation may be more desirable than in the case of overheating caused by external demand (Ireland).

Such analysis on the basis of simple macro-models is useful to improve understanding of fiscal policy stabilisation in the context of adjustment in the euro area. However, the simplifying assumptions underlying the model should be kept in mind when assessing the desirability of fiscal policy stabilisation. Firstly, a balanced current account may not be the right objective or benchmark when assessing the need for external or internal adjustment. Substantial current-account deficits may be sustained and desirable to allow for efficient inter-country and inter-temporal allocation of consumption and investment, especially in the context of catching-up dynamics. Secondly, when considering the desirability of fiscal policy stabilisation, the initial budgetary position matters as budgetary sustainability and continuity should be preserved. Thirdly, the desirable role of fiscal policy depends on the type of shock: real

exchange rate adjustment may be a slow and painful process, sometimes more requiring structural reform than fiscal adjustment, in particular when a real depreciation is required.

Taking account of adjustment dynamics and price and wage rigidities, a trade-off arises when assessing the desirability of fiscal stabilisation. Considering for example the case of downward price and wage adjustment, countercyclical fiscal policy or automatic stabilisation would reduce the depth of the output effect associated with the adjustment by dampening demand fluctuations at the expense of lengthening the adjustment process. At the same time, the inflation effect is dampened. There may be a trade-off in this case between minimising either the depth or the length of the ensuing output fluctuations, as fiscal stabilisation slows down the pace of adjustment leading to a more protracted but shallower growth slowdown. The overall cost in terms of output and inflation, with and without fiscal stabilisation, will depend on the degree of price and wage responsiveness to negative output gaps of different sizes. When the social welfare implications are considered, not only the difference in the overall loss of output needs to be taken into account, but also the social preferences as regards the depth and length of slowdown. Moreover, and maybe more importantly, the initial fiscal position may play a role, as the budgetary position may deteriorate towards apparently unsustainable levels. In such case, the intention to reduce the depth of the output fluctuations by fiscal policy stabilisation may not reach its objective as, eventually, pro-cyclical discretionary fiscal policy may be required to maintain sustainability.

### **1.2.2 Automatic fiscal stabilisation considering budgetary risks and uncertainty**

#### *Discretionary measures and automatic stabilisation*

Academic researchers have been sceptical for a long time about aggregate demand management on the ground that fiscal fine-tuning does not work due to decision and implementation lags, and irreversibility, as well as uncertainty about the real-time and future state of the economy.<sup>2</sup> This is reflected in the EU budgetary policy framework that envisages achievement of medium-term budgetary objectives in cyclically-adjusted terms, which are to be maintained over the cycle. It then relies on the (full) working of the automatic stabilisers for budgetary stabilisation. It should be recognised that automatic stabilisers are also subject to criticism, including: the lack of an optimal degree of smoothing; their belated effect not preventing a downswing; destabilising effect in the event of a supply shock; and possible change of sign of the stabilisers beyond a certain tax threshold.<sup>3</sup> Box 1 describes the concept of the minimal benchmarks in the fiscal stabilisation philosophy of the EU fiscal framework.

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<sup>2</sup> See, for instance, European Commission (2002a).

<sup>3</sup> Given large tax and welfare systems, free operation of automatic stabilisers would ensure sizeable cyclical smoothing at the national level. For estimates on the smoothing power of automatic stabilisers with various shocks, see Brunila, Buti and In't Veld (2003).

### Box 1: The philosophy of budgetary stabilisation in the EU fiscal framework

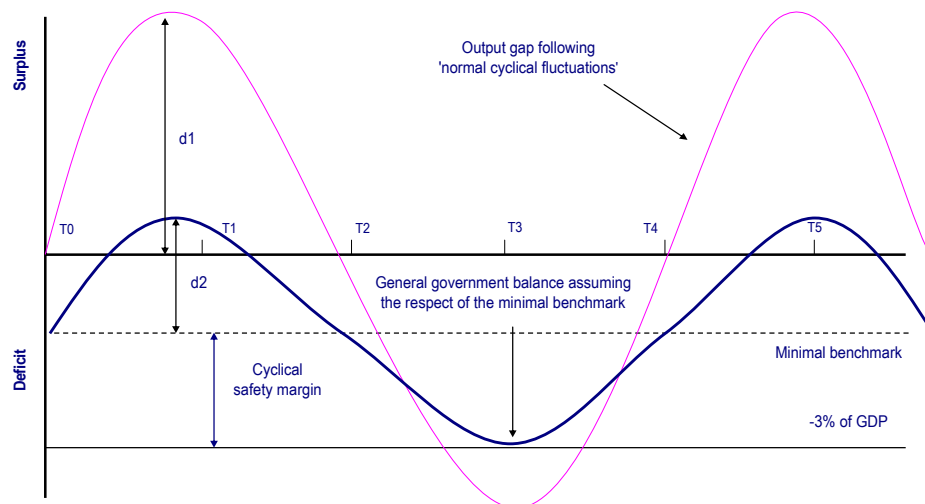
Under the rules of the EU fiscal framework, Member States are required to achieve medium-term budgetary positions which are intended to provide a sufficient safety margin towards the 3% of GDP reference value for the nominal budget balance and to ensure a rapid decline in the government debt-to-GDP ratio in order to prepare for the upcoming challenge of ageing populations. The medium-term budgetary positions are measured in cyclically-adjusted terms. Nominal budget balances are allowed to fluctuate around the medium-term objectives by letting the automatic fiscal stabilisers play fully as long as they do not risk breaching the 3% of GDP reference value.

With a view to providing Member States with an indication on the minimal structural budgetary position that should be attained in order to avoid reliance on pro-cyclical policies in bad cyclical times, the Commission introduced in 2000 the concept of 'minimal benchmark'. This indicator corresponds to the 'structural' general government budget balance (i.e. the budget balance adjusted for the cycle and other elements having a temporary influence on the budget balance such as one-off measures) which allows a country to let automatic stabilisers work freely with little risk of requiring pro-cyclical fiscal tightening to avoid breaching the 3% of GDP reference value under normal cyclical circumstances. Note that for most Member States, the medium-term budgetary objectives are more ambitious than the minimal benchmarks as they also need to ensure a rapid decline in the government debt-to-GDP ratio.

The minimal benchmark is calculated taking into account, for each Member State, the size of the cyclical safety margin needed to withstand business cycle fluctuations without infringing the 3% of GDP deficit limit. The size of the safety margin depends on two elements: First, the magnitude of cyclical fluctuations; Member States with pronounced cyclical fluctuations, i.e. typically reaching high and low output gaps values over a cycle, will need to achieve a more demanding structural budgetary position in order to ensure that the 3% ceiling is not breached in the low phases of the cycle. Second, the sensitivity of the budget balance to cyclical fluctuations; this sensitivity will tend to be larger in Member States with a large general government sector. It will also tend to be more pronounced in Member States where tax revenues react strongly to cyclical developments, e.g. in Member States with a large share of progressive taxes.

Graph 1 illustrates the concept of minimal benchmark. The bold line shows developments in the general government balance of a country maintaining its underlying budgetary position at the minimal benchmark and letting automatic stabilisers play fully over the cycle. For such a Member State, the deterioration in the general government balance in bad cyclical times (period T3) does not trigger a breach of the 3% reference value. In the graph, d1 and d2 provide measures of the amplitude of 'normal' cyclical fluctuations for, respectively, the economic activity and the fiscal balance. The reaction of the budget balance to the cycle, i.e. the budgetary sensitivity to the cycle, is measured by the ratio  $d2/d1$ .

**Graph 1: Minimum benchmarks – an illustration**



Source: Commission Services

The concept of the minimum benchmark relies strongly on what can be considered as "normal cyclical fluctuations". This qualification depends on the measurement of the cyclical element of economic developments and in particular the output gap. In case of adjustment in the euro area, it is possible that "cyclical" developments may be longer lasting and may therefore be mistaken for structural. The output gap could be underestimated in the case that part of the cyclical developments is attributed to have a structural nature. As a consequence, the required safety margin calculated on the basis of conventional output gap measures may not provide an adequate safety margin to let the automatic stabilisers play fully in the context of (real exchange rate) adjustment in the euro area.

In the context of adjustment dynamics in economic and monetary union, some deviations from the principle of full reliance on automatic stabilisers could be contemplated. Discretionary fiscal tightening on top of the automatic

stabilisers may be called for especially if an economic boom is being fed by perverse local effects from low real interest rates. In particular, when a Member State enters the euro area or is in the convergence process towards entering the euro area and some of the monetary and financial impulses can be anticipated, discretionary fiscal restrictions can be put in place well in advance. In this case, some arguments against fiscal fine tuning do not hold. It should also be considered that if the entering Member State experiences a decline in the exchange-rate risk premium, growth may be more domestic-led for some period, with a deteriorating current account position, implying revenue-rich growth. In such case, the headline and structural budget balances may improve considerably, without tightening the fiscal stance. Allowing and pursuing improvement in the fiscal balances and surpluses in good times will help in reducing the risk of overheating, while at the same time improving the budgetary position to deal with possible downward adjustment or normalisation of revenue growth. A challenge in this context may be to preserve fiscal surpluses and continue a countercyclical policy when the budgetary position exceeds the medium-term budgetary objective.

The desirability of the full working of the automatic stabilisers during a prolonged downswing in a context of downward price and wage adjustment is not always straightforward. Fiscal stabilisation could slow down the price and wage adjustment and lengthen the downswing. The desirability of full fiscal stabilisation in this context boils down to a social-welfare question: are protracted but shallow downturns to be preferred over short but deep downturns? In the event of persistent shocks, a high degree of fiscal stabilisation, by keeping output at around the old potential level, is actually destabilising. It should also be considered that the possibility of a more protracted downturn puts the budgetary position at risk of deteriorating sharply. In case the budgetary deterioration leads to deficit levels which can be perceived as being unsustainable go beyond the reference value of the SGP, some pro-cyclical tightening is required.

There is uncertainty about whether a country is in a phase of building up of imbalances or converging towards equilibrium. The equilibrium real effective exchange rate, which is a central variable in the euro-area adjustment process, is notoriously hard to estimate. In addition, it is moving with developments in world trade (demand and prices) and euro-exchange rate developments, due to differences in geographical and sectoral specialisation in the Member States. Another difficulty caused by this uncertainty is that adjustment processes in economic and monetary union may lead to biased and pro-cyclical potential growth estimates (see also section 2.3.4.). Consequently, ex-ante and in real time, fiscal policy may seem to be countercyclical or a-cyclical, while ex-post, fiscal policy turns out to have been pro-cyclical (e.g. case of the Netherlands or Portugal in the late 1990s). Therefore, when output and prices increase more than the euro-average, a prudent fiscal stance needs to be considered.

#### *Budgetary risks of protracted periods of downward adjustment*

Economies in a monetary union hit by asymmetric shocks may be exposed to periods of exceptional output and asset price developments.<sup>4</sup> In such an event the sensitivity of the budget may undergo important changes which, if not taken into account, may exacerbate the cyclical developments. One of the findings of Chapter VII on country adjustment experience is that the current account balance plays an important role when countries are adjusting to a change in the exchange risk premium. Countries in which the risk premium declines (e.g. Spain, Portugal, Ireland and Greece) experienced sharp deteriorations in their current account balance, while other countries like Germany saw their current account balance improve drastically. The adjustment of the current account is rather long-lived. During the adjustment, the composition of demand is tilted towards either revenue-rich domestic demand in the first group of countries or revenue-poor external demand in the second group.

Taking account of these dynamics, protracted periods of downward adjustment may require more room for budgetary manoeuvre than provided by the current minimal benchmarks in order to avoid breach of the reference value or the need to rely on pro-cyclical fiscal tightening. Not only the length of downward adjustment, but also its relation to tax elasticities should be considered. As long as the current account position deteriorates (improves), tax-to-GDP elasticities will be generally high (low). To the extent that the fiscal stance is assessed and budgetary policy is designed on the basis of 'normal' elasticities, such a temporary change in revenues may be considered permanent, leading to undesirable fiscal behaviour. As growth composition changes during downward adjustment periods, and windfall revenues – especially from assets and corporate profits – may fade, the budget balance may deteriorate significantly more than would be estimated by applying estimated budget sensitivities to the cyclical fluctuations and the estimated output gap. In this regard, full automatic stabilisation does probably not imply an unchanged cyclically-adjusted balance. This implies that a larger margin may be required than that provided by the current minimum benchmarks in case of overheating in a context of adjustment dynamics in order to avoid excessive deficits in the adjustment phase thereafter. Countries should in good times (with high tax elasticities, high inflation and high growth) achieve and maintain significant surpluses. Possibly, the “minimal benchmarks” which are currently on

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<sup>4</sup> The tax structure and ownership of housing is likely to affect the relation between asset prices and tax revenue. Moreover, financial market institutions that enhance the ability to turn paper wealth into consumption determine the size of the wealth effect. The presence of international companies and the diversification of their activities and assets across countries may affect the volatility of fiscal variables.

average at a deficit of around 1½% of GDP (varying from 0.5% to 2%) could be reconsidered taking account of the effect of adjustment dynamics on the measurement of potential growth and the output gap and of possibly anticipated developments of tax elasticities. Alternatively, considering the uncertainty around the identification of adjustment dynamics and its budgetary risks and the ensuing difficulty to develop a different calculus for the minimum benchmark that would capture such risks, they could be applied as true "benchmarks" requiring judgement in their assessment. The budgetary targets could consequently be set more ambitiously when a Member State experiences (idiosyncratic) good economic times. Careful consideration of the extent to which the budgetary position benefits from real exchange rate appreciation and low real interest rates may contribute to avoiding a sharp deterioration of budget balance towards excessive deficit levels.

### 1.2.3 Fiscal consolidation in a context of adjustment dynamics

#### *Indicators for consolidation efforts and underlying fiscal positions*

The cyclically-adjusted balances (CAB) net of one-off and temporary measures (structural balance) and the change therein are the core indicators of the fiscal analyses of the SGP. In particular:

- Changes in the structural balance measure annual compliance with the adjustment path in the excessive deficit procedure or towards the medium-term budgetary objective<sup>5</sup>;
- The deviation of the structural balance from the medium-term objective determines the need for fiscal adjustment in the medium-run in order to secure a sustainable debt development and provide an adequate safety margin to the 3% of GDP reference value;
- The structural balance is also a major factor in the assessments of long-term sustainability as its position is extrapolated into the future to determine the projections for debt developments when the costs of ageing are incorporated.

The structural balance is the key indicator to identify an appropriate fiscal position or consolidation path. The change in the structural balance provides the main indicator to assess the fiscal effort or lack of it. Its accuracy relies crucially on the potential growth and output gap estimates. In this context, uncertainty about the current and future state of the economy is a major challenge for fiscal surveillance. The effectiveness and appropriateness of fiscal policy measures and hence, the length or amplitude of economic adjustment depends, *inter alia*, on the reliability of real time data and diagnostic methods on which the policy decisions are based. Section 1.2.4 below discusses the issue of potential growth and output-gap measures and their importance for fiscal policy.

#### *Fiscal consolidation and the real exchange rate in the context of adjustment in the euro area*

A glance at recent successful and unsuccessful fiscal consolidation episodes in EU Member States seems to indicate some correlation between the occurrence of real exchange rate appreciation and successful consolidation (e.g. Spain, Ireland, Netherlands) and depreciation with difficulties in achieving necessary fiscal consolidation (e.g. Germany). As the real exchange rate is one of the main elements in the adjustment process in the euro area, it is notable that economic literature confirms the importance of real exchange rate developments for the success of fiscal consolidation.<sup>6</sup>

These findings seem to indicate that the changes and the level of the real exchange rate determine to a significant extent the future development of budget deficits and the likely success of budgetary consolidation efforts. It also indicates that deviations from real exchange rate equilibrium affect the underlying budgetary position. In a world of perfect knowledge and foresight, taking account of deviations of the real exchange rate from its equilibrium could enhance fiscal policy making and fiscal surveillance importantly.

The importance of adjustment and (real) exchange rate dynamics for fiscal consolidation can be illustrated with an example. Consider the case that a euro-area Member State has benefited from a prolonged period of high growth and

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<sup>5</sup> The excessive deficit procedure is initiated when a nominal budget deficit rises above – or is planned to rise above - the reference value of 3% percent of GDP. It may also be initiated if the debt-to-GDP ratio exceeds 60% and is not declining at a satisfactory pace. The objective of the procedure is to correct the excessive deficit promptly. The medium-term budgetary objective is set by the Member States to ensure sufficient safety margin towards 3% of GDP and to ensure medium and long term sustainability of public finances. It is measured in "structural terms", i.e. cyclically-adjusted, net of one-off and temporary measures.

<sup>6</sup> See for example Lambertini and Tavares (2003) on the link between (real) exchange rate developments and fiscal adjustments. They find that successful fiscal adjustments are preceded by large exchange rate depreciations, whereas unsuccessful adjustments are preceded by appreciations. Depreciation before fiscal consolidation is a significant and quantitatively important predictor of the success of fiscal adjustment. Other authors also pointed to the potential role of (real and nominal) exchange rate developments before and during fiscal adjustments. Giavazzi and Pagano (1990), when investigating the role of expectations of future policy (non-Keynesian effects) find that disentangling the effects of wage moderation and the effects of fiscal variables on the supply side and the cost of firms, versus the effect of the exchange rate is crucial.

high inflation vis-à-vis euro-area competitors, for example in the context of adjustment towards its equilibrium real exchange rate in case of an initial undervaluation. Without changing fiscal policy, the measured *structural budget balance*, which is the main indicator of fiscal effort and the fiscal position in the revised SGP, may be significantly affected as the adjustment effects are not fully captured in the measures of cyclical adjustment. In periods of an adjustment characterised by a prolonged period of high growth and inflation, measures will generally overestimate potential growth, because potential growth estimates are partly determined by actual growth outcomes. The assumptions made about the length of cycles in the filtering of cyclical effects from structural effects determine the size and risk of such measurement errors (see next section). Ex-post downward revisions in potential growth estimates put continuous downward pressure on the measure for the structural budget balance, as growth declines towards and below its true potential. Portugal suffered from such downward revisions of potential growth after the boom in the run-up to euro-area entry. Currently, Spain may possibly be at risk of similar dynamics when the domestically-led boom comes to an end. In case the prolonged period of high growth and inflation has led to some degree of overheating and overshooting of key economic variables (e.g. equilibrium real exchange rate), the mis-measurement of the fiscal position would be more pronounced. The country would require a period of downward relative price and wage adjustment and unwinding of imbalances with repercussions on domestic growth and possibly asset prices. In such an adjustment period, the nominal growth rate and revenue growth could drop considerably more, further hampering effective fiscal consolidation. The German experience since 1999 illustrates these dynamics. While in Germany, nominal expenditures were virtually frozen since 1999 (with the exception of 2001), headline and structural budget balances continued to deteriorate.<sup>7</sup>

#### 1.2.4 Uncertainty and measurement issues in the fiscal framework

##### *Uncertainty about the state of the economy and the origin and nature of shocks*

In theory, knowledge about adjustment dynamics could be taken into account to improve fiscal surveillance and fiscal policy. These considerations assume that policy makers have detailed a priori knowledge about the length of the adjustment process and/or the origin (supply or demand) of the country-specific shock. However, as a practical matter, economic shocks do not come with a label and different shocks may hit the economy at the same time. Systematic assessment of past real exchange rate developments and real interest rates may give an indication as to how much Member States' budgetary indicators have benefited or suffered from effects related to adjustment dynamics in the euro area as described above. Projecting future risks and trends is more difficult. Equilibrium real exchange rates are notoriously hard to estimate and there is a very large degree of uncertainty as to the existence and the extent of internal and external imbalances related to competitiveness adjustment (real exchange rate overvaluation and overheating). Often, only *ex post* their existence can be determined with some degree of certainty. Complementary systematic analysis and consideration of a wider set of economic indicators may improve fiscal surveillance.

Consider for example the case of a Member State which has benefited from high growth and high inflation (and booming asset prices) for a prolonged period (e.g. Netherlands 1993-2000 and Spain 1997-now). Similarly, a country which has experienced a prolonged period of low growth and depreciating real effective exchange rate could be considered (e.g. Germany 1995-2005). Looking forward, several paths for growth and the real effective exchange rate are possible. First, the trend is sustained into the future, either temporarily if the real effective exchange rate is still converging to its equilibrium, or over a longer period of time, if other effects put the equilibrium real exchange rate vis-à-vis euro-area competitors on a trend increasing/decreasing path (Balassa-Samuelson effects, quality improvements or trend shifts in preferences). Even in case of a sustainable increasing trend real effective exchange rate, a Member State is susceptible to overheating pressures, as nominal growth is permanently significantly higher than nominal interest rates, leading to capital inflows (investment opportunities). If financial markets channelling is not efficient, overheating pressures may arise and capital flows are for example largely finding their way to housing/dwelling investment.

Second, the trend will end and inflation and wage developments will converge to the euro-area average, in case external and domestic imbalances have resolved and the real exchange rate has converged to its (steady) equilibrium. This would still imply a growth and inflation slowdown, associated with a deteriorating budgetary position.

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<sup>7</sup> Similarly, the effect of an overvalued real exchange rate and adjustment dynamics on the debt-to-GDP ratio can be considered. These effects can be disentangled as follows. Firstly the numerator, nominal debt is affected by the impact of adjustment dynamics on the structural and nominal budget balance (and thus net lending) as discussed above. Secondly the denominator, nominal GDP deviates from potential (nominal) GDP and will need to adjust downwardly, as both real GDP and the price level is above its potential. The deviation of prices from the equilibrium price level is reflected by the overvaluation of the real exchange rate. The downward adjustment process decreases the denominator and increases the nominator, leading to a higher debt to GDP ratio when imbalances have been unwound. In fact the direct effect of downward real exchange rate adjustment on public finances can be considered similar to the nominal depreciation of a currency in a country with largely foreign denominated debt. Instantaneous adjustment of the imbalances would lead to an increase of the debt-level to that level. Ironically, this could be considered a best case scenario which would occur if prices were fully flexible.



Third, the trend will reverse (temporarily), in case the equilibrium real exchange rate (and domestically the price and wage level) have overshoot their equilibrium. This would occur if the past years should be characterised as overheating/overcooling. The reversal would imply a sharp growth and inflation slowdown (similar to the development in the Netherlands that build up imbalances in the second half of the 1990s), associated with a sharp deterioration in the budgetary position.

The number of possibilities is large, more so as there is no stable trend and the Member States are subject to shocks and a continuously changing (external) environment. The remarkable growth performance of Spain, for example, is unlikely to exclusively mark a long period of overheating vis-à-vis its growth potential. Catching-up effects, immigration and other structural processes are likely to have lifted the 'speed limit' of the Spanish economy for a prolonged period which in turn may allow an increase in discretionary expenditure without compromising the long-term sustainability of public finances. On the other hand, the bias of private investment towards housing may not bode well for TFP and potential growth. A clear quantification of the structural vis-à-vis the cyclical component, which would be key for policy purposes, remains difficult. Similarly, yet with a different sign, the protracted slowdown of economic growth in Germany and Italy is unlikely to be solely the result of temporary country-specific shocks or entry conditions into the euro area requiring one-off adjustment, with no effect on the long-term growth potential of the countries. In fact, there has been a broad consensus that the dismal growth performance of Germany and Italy to a large extent reflects structural problems. On the other hand, the restructuring of "corporate Germany" and the strong recovery in competitiveness in the last several years may be the prelude to higher potential growth rates. A careful analysis of these phenomena should be factored in policy surveillance at EU level.

#### *Origins of uncertainty about potential growth and the output gap*

The uncertainty that policy makers are confronted with is also related to difficulties related to the measurement of current and past economic developments, which affect the ability to forecast. Measurement issues are typically not addressed in economic analysis. The current state of the economy, in particular, potential output and the output gap are assumed to be given and the appropriate policy recommendations are easily identified. In practice, however, both potential output and the output gap are unobserved variables the measurement of which is subject to a considerable degree of uncertainty. The difference between real time estimates and estimates for the same period derived later is generally significant. Hence, there is a considerable risk of implementing the wrong policies or to apply the wrong dosage thereby affecting the economic dynamic. The uncertainty originates in three different sources: (i) statistical revisions of data, (ii) inherent uncertainty about the future course of the economy, (ii) uncertainty about the model of the economy.<sup>8</sup>

The issue can be illustrated as follows. Estimates of the output gap are typically obtained by extracting an unobserved trend or potential GDP from real GDP. While different methodologies generally yield different estimates the most popular methods, such as the Hodrick-Prescott (HP) filter, share a common and arguably sensible feature: trend or potential GDP reflect some kind of weighted moving average of past and forecast real GDP. This means that periods of low or high economic growth will work its way into detrended output and hence the output gap. The responsiveness of trend or potential GDP with respect to actual GDP depends on the technical specificities of the method and should explicitly or implicitly reflect our understanding of the typical length of the business cycle and more generally, the underlying model of the economy. In case economic development is thought to be determined by temporary shocks around a stable trend the responsiveness should be relatively low. By contrast, if economic development is largely determined by permanent shocks the responsiveness should be higher.

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<sup>8</sup> In the field of monetary policy, the implications of those uncertainties for the assessment of the state of the economy have been examined by Orphanides (2003) and Orphanides and van Norden (2002). More recently, similar work has been carried out in the field of fiscal policy for instance by Forni and Momigliano (2004) and Larch and Salto (2005).

**Box 2: What is the degree of uncertainty in real time output gap estimates?**

Table 1 reports some summary statistics concerning the reliability of the output gap estimates produced by the Commission services and the OECD for the euro-area countries in 2000-2005. Using the latest available estimate of the output gap as a benchmark, the statistics refer to the size of the revisions with respect to real time estimates, in particular with respect to the forecast of the output gap in year t produced in the preceding year and the estimate of the output gap for year t produced in autumn of the same year.

**Table 1: Revisions of Commission Services' output gap estimates, 2000-2005**

Summary statistics									
Country	Mean			SD			MIN		
	Latest	Real time	Forecast	Latest	Real time	Forecast	Latest	Real time	Forecast
<b>BE</b>	0.2	-0.4	-0.5	1.0	0.6	0.2	-0.8	-0.8	-0.8
<b>DE</b>	-0.1	-1.0	-1.0	1.0	0.4	0.6	-1.1	-1.6	-1.5
<b>EL</b>	0.6	1.3	1.3	1.3	0.8	0.6	-1.2	-0.2	0.7
<b>ES</b>	1.2	0.2	-1.2	1.1	1.2	1.1	0.0	-1.3	-2.7
<b>FR</b>	0.7	-0.2	-0.3	1.2	0.4	0.4	-0.5	-0.7	-1.1
<b>IE</b>	1.9	1.1	0.2	2.4	2.3	2.3	-1.6	-1.6	-1.9
<b>IT</b>	0.3	-1.1	-1.0	1.3	0.5	0.3	-1.5	-1.5	-1.3
<b>NL</b>	0.1	-1.0	-1.1	2.2	1.3	1.4	-2.2	-2.2	-3.0
<b>AT</b>	0.2	-0.6	-0.4	1.1	0.4	0.3	-0.8	-1.1	-0.8
<b>PT</b>	0.4	-1.4	-1.6	2.2	1.4	1.6	-2.0	-2.9	-3.4
<b>Overall</b>	<b>0.6</b>	<b>-0.3</b>	<b>-0.6</b>	<b>1.6</b>	<b>1.4</b>	<b>1.3</b>	<b>-2.2</b>	<b>-2.9</b>	<b>-3.4</b>
MAX									
COR									
OPSIGN									
	Latest	Real time	Forecast	Latest	Real time	Forecast	Latest	Real time	Forecast
<b>BE</b>	1.8	0.8	-0.1	1.0	0.7	0.5			
<b>DE</b>	1.1	-0.5	0.0	1.0	0.8	0.7			
<b>EL</b>	2.0	2.0	2.0	1.0	0.7	0.9			
<b>ES</b>	2.5	2.2	0.2	1.0	-0.1	0.7			
<b>FR</b>	2.3	0.3	0.0	1.0	0.9	0.7			
<b>IE</b>	4.9	4.0	3.3	1.0	0.9	0.9			
<b>IT</b>	1.8	-0.3	-0.5	1.0	0.9	0.2			
<b>NL</b>	3.3	0.6	0.4	1.0	1.0	0.9			
<b>AT</b>	2.1	0.0	0.1	1.0	0.8	0.5			
<b>PT</b>	3.0	0.5	0.4	1.0	0.9	0.9			
<b>Overall</b>	<b>4.9</b>	<b>4.0</b>	<b>3.3</b>	<b>1.0</b>	<b>0.7</b>	<b>0.6</b>	<b>0.0%</b>	<b>34.5%</b>	<b>37.9%</b>

*Note:* The statistics shown are: MEAN the mean, SD the standard deviation, MIN and MAX the minimum and maximum values, COR the correlation with the latest estimate (Autumn 2005) of the output gap. OPSIGN denotes the percentage of cases in which the estimate has changed sign with respect to the latest estimate.

*Source:* Commission Services

**Table 2: Revisions of the OECD output gap estimates, 2000-2005**

Summary statistics									
Country	Mean			SD			MIN		
	Latest	Real time	Forecast	Latest	Real time	Forecast	Latest	Real time	Forecast
<b>BE</b>	-0.2	-1.0	-1.1	1.3	0.7	0.7	-1.5	-1.9	-2.1
<b>DE</b>	-0.6	-2.0	-1.8	1.7	1.0	1.2	-2.4	-3.3	-3.5
<b>EL</b>	0.6	0.4	0.6	0.5	0.6	0.5	-0.1	-0.8	-0.2
<b>ES</b>	-0.1	-0.6	-0.4	0.8	0.3	0.7	-0.8	-0.8	-1.0
<b>FR</b>	-0.7	-1.0	-0.8	1.4	1.2	1.3	-2.1	-2.4	-2.8
<b>IE</b>	2.0	2.4	2.0	2.6	2.3	2.7	-0.6	-0.6	-0.6
<b>IT</b>	0.2	-1.6	-1.8	1.3	0.5	0.9	-2.0	-2.0	-2.8
<b>NL</b>	-0.4	-1.5	-1.1	3.2	2.1	2.3	-4.0	-4.0	-3.7
<b>AT</b>	0.0	-1.2	-0.8	2.2	1.0	1.2	-2.2	-2.2	-1.9
<b>PT</b>	-1.2	-2.2	-1.8	3.1	1.9	1.6	-4.4	-4.4	-3.5
<b>Overall</b>	<b>0.0</b>	<b>-0.8</b>	<b>-0.7</b>	<b>2.0</b>	<b>1.7</b>	<b>1.8</b>	<b>-4.4</b>	<b>-4.4</b>	<b>-3.7</b>
	MAX			COR			OPSIGN		
	Latest	Real time	Forecast	Latest	Real time	Forecast	Latest	Real time	Forecast
<b>BE</b>	1.7	-0.1	-0.2	1.0	0.7	0.7			
<b>DE</b>	1.6	-0.7	0.1	1.0	0.9	0.8			
<b>EL</b>	1.4	1.1	1.3	1.0	0.9	0.9			
<b>ES</b>	1.0	-0.1	0.7	1.0	0.9	0.9			
<b>FR</b>	1.0	0.4	1.0	1.0	1.0	0.8			
<b>IE</b>	5.4	5.5	5.5	1.0	0.9	0.8			
<b>IT</b>	1.6	-0.6	-0.4	1.0	0.0	-0.7			
<b>NL</b>	4.0	1.6	2.0	1.0	0.9	1.0			
<b>AT</b>	3.3	0.3	0.8	1.0	0.9	1.0			
<b>PT</b>	3.1	0.1	0.2	1.0	1.0	1.0			
<b>Overall</b>	<b>5.4</b>	<b>5.5</b>	<b>5.5</b>	<b>1.0</b>	<b>0.8</b>	<b>0.8</b>	<b>0.0%</b>	<b>27.3%</b>	<b>25.8%</b>

*Note:* The statistics shown are: MEAN the mean, SD the standard deviation, MIN and MAX the minimum and maximum values, COR the correlation with the latest estimate (Autumn 2005) of the output gap. OPSIGN denotes the % of cases in which the estimate has changed sign with respect to the latest estimate.

*Source:* Commission Services

In line with expectations, the figures reported in Table 1 and Table 2 highlight a relatively high degree of uncertainty concerning the level of the output gap estimates of both the Commission services and the OECD. The average difference between the forecast of the output gap and the output gap derived from the latest available information is slightly higher than 1 percentage point for the Commission services' estimates and around  $\frac{3}{4}$  of a percent for the OECD estimates. Second, in a relatively large number of cases the algebraic sign of the output gap estimate changes as additional information becomes available. There also seems to be a clear pattern concerning the direction of the revisions. The cyclical conditions seem to have turned out systematically better or less unfavourable than expected. This pattern is broadly consistent across all euro-area countries. The degree of (un)reliability does not change significantly if attention is focussed on the estimated change in the output gap instead of the level.

While it cannot be excluded that the relatively short time dimension of our sample may somewhat affect our results (especially in view of the fact that the years after 2000 were characterised by a series of negative growth surprises in a number of euro-area countries), the statistics in Table 1 and Table 2 are broadly in line with the empirical evidence in the literature (see for instance Orphanides and van Norden (2002) for the US and Rünstler (2002), European Commission (2006b) for the euro area.

### *The role of tax elasticities and changes in the cyclical sensitivity over time*

The current state of the economy as measured by output gap estimates is only one key element in the assessment of the underlying budgetary position. The other key elements are the budgetary elasticities gauging the link between the economic cycle and the nominal budget. For instance, the cyclical sensitivity of the budget varies with the composition of economic growth depending on whether it is stronger in tax rich (poor) components such as private consumption (exports) or whether it goes along with a marked or shallow movement of asset prices. It may also vary due to the behaviour of tax payers which within the limits provided by the tax code may choose to distribute tax payments or to claim tax credit across time in different ways. Like in the case of the output gap, the measurement of budgetary elasticities is subject to uncertainties which impact on the assessment and formulation of fiscal policy and in turn affect the economic dynamics. All these elements are difficult to predict or to assess from an *ex ante* point of view, in particular in the planning phase of the budget. For instance, underestimating the sensitivity of government revenues during an economic upswing may lead to an overoptimistic assessment of the underlying budgetary position and induce policy makers to enact tax cuts or expenditure increases producing a pro-cyclical impulse. Conversely, in the subsequent economic downturn fiscal policy may then be forced to increase taxes or reduce expenditure again thereby deepening or lengthening the adjustment dynamics. The experience of the Netherlands since the second half of the 1990s provides an example of such revenue dynamics. The empirical relevance of such patterns and their implications for economic dynamics is reported in Jaeger and Schuknecht (2004) and OECD (2004). In particular, both works show that during the ITC-boom at the end of the 1990s in some euro-area countries extra revenues linked to pronounced asset-price cycles were perceived to be permanent and went along with tax cuts and/or expenditure increases.

#### **1.2.5 Fiscal policy and fiscal surveillance**

These considerations highlight the need for a very careful judgement of the underlying stance of fiscal policy when economies in the euro area are responding to country-specific shocks. The stance of policy is particularly important in this adjustment context because of its influence on the real effective exchange rate within the euro area. Where there are risks of overshooting in the real exchange rate at turning points in the adjustment process, the fiscal stance can play a role in dampening such overshooting by offsetting trends in the private sector saving-investment balance. The analysis of adjustment experience in Chapter VII, moreover, underscored that fiscal, financial market and wage developments can interact in a mutually-reinforcing manner, and fiscal policy is the only one of these channels under the direct control of the authorities. Thus a careful management of fiscal policy in this context can benefit the efficiency of adjustment in the economy, and can also contain negative spillovers to other members of the monetary union.

The revised SGP allows taking better account of economic developments. In particular, the report of the European Council of 20 March 2005, which lays out the foundations of the reformed SGP, refers to the need to improve the *ex post* assessment of the fiscal position net of cyclical factors. In particular, the report stresses that policy errors should be clearly distinguished from forecast errors in the implementation of the excessive deficit procedure.

Consideration and anticipation of adjustment dynamics could enhance the economic rationale in fiscal surveillance and policy recommendations within the SGP framework. In particular, in case a Member State has experienced a prolonged period of high growth with inflation significantly above the average of its competitors and a deteriorating current account balance, a structural balance at the medium-term objective would not necessarily provide a sufficient safety margin towards breach of the 3% reference value. Also the debt developments in the medium and long-run could be less positive than projected. In case of downward adjustment, even if consolidation measures are fully implemented, the improvement in the cyclically adjusted balances observed *ex post* could fall short of plans due to the downward revisions of potential growth, low inflation, increasing interest payments and low tax-to-GDP elasticities. For example, Germany demonstrated a remarkable degree of nominal expenditure restraint since 2002 in an effort to improve the budgetary position, while the budget balances, both nominal and structural, did not improve.

Fostering fiscal prudence in good times and during periods of loss of competitiveness and, using very cautious (potential) growth assumptions in the design of budget laws helps in reducing the risk of feeding overheating dynamics building-up of imbalances, while at the same time creating more fiscal room for manoeuvre when growth and inflation return to normality or in case downward adjustment would be required. This implies tough judgement on countries growing fast with high inflation. Attention should be focused on high tax revenues (elasticities) that go beyond the normal cyclical sensitivity of the budget. As regards countries which are experiencing a process of economic adjustment characterised by adverse economic conditions, a balance needs to be struck between taking into account possible adjustment dynamics and the risks to sustainable budgetary developments in the medium and long-term.

As the existence and the extent of domestic and external imbalances are hard to estimate, systematic consideration of a broad set of indicators can enhance fiscal surveillance and the assessment of the fiscal position and fiscal efforts. This allows determining whether - and to what extent - the budgetary position has benefited from appreciation or

suffered from depreciation. Looking ahead, such broad assessments may indicate whether the past developments are likely to continue, fade out in the case adjustment is completed, or even reverse in the case of overshooting. The budgetary stance may then be assessed in the light of these risks.

A broad set of fiscal indicators could be considered. In the revised SGP regulations, tax elasticities are explicitly mentioned in the context of economic good times. Changes in tax elasticities cause major fluctuations in the structural balances. The growth composition changes during the adjustment process. Periods of downward price and wage adjustment are *ceteris paribus* characterised by export-intensive growth and low/disappointing tax elasticities, while upward price and wage adjustment and overheating are characterised by high tax elasticities. Not only the growth composition affects the tax revenues, but also country-specific items related in particular to asset price taxes (including related to housing, pension fund and general wealth and capital gains). Tax elasticities should be regarded closely with the other indicators. Systematic assessment of the changes in the cyclically-adjusted primary balances in high debt countries in addition to the structural budget balances provides additional information on the underlying budgetary developments, especially in a period of overheating in which the level of nominal GDP is above its potential. Macroeconomic indicators of external and internal imbalances should be considered together with the fiscal indicators to assess the risk of a reversal of economic fortunes in a context of adjustment dynamics.

In order to enhance fiscal surveillance in the context of the SGP, budgetary surveillance is continuously evolving. Many innovations and improvements to the assessments and policy recommendations have already been incorporated in ongoing practice. A careful analysis of adjustment-related phenomena is being factored into policy surveillance at the EU level. For example, the Commission's technical assessments of the Stability and Convergence Programmes now include a systematic analysis of tax elasticities. Moreover, the macro-economic scenarios in the latest vintages of the Stability and Convergence Programmes reflected more prudence than earlier versions.

### **1.3 Financial market integration**

Earlier chapters in this study: reviewed financial developments under monetary union; discussed progress with financial market reforms; and highlighted the significant role that financial flows have played in adjustment dynamics. The financial market dimension of the adjustment process emerges as more prominent than foreseen in the run-up to monetary union – both in creating favourable opportunities for investment and, in some cases, amplifying problematic real interest rate developments.

To complete these assessments it is important to consider the potential – so far not fully realised – for deep financial integration to enhance the working of monetary union through income smoothing and other risk-sharing effects. Experience in the United States illustrates that monetary union can precede financial union by a long period. But, as financial integration catches up over time, it can bring major gains not only to growth but to the adjustment process as well. Cross-border asset holdings, and the integration and securitization of mortgage markets, exemplify mechanisms that can play a powerful stabilising role in the face of asymmetric shocks.

In this forward-looking perspective, it is valuable to explore the role that deeper financial integration can play in enhancing the adjustment process. It is also important to review the challenges that ongoing integration can pose, including the possibility that the changed nature of adjustment mechanisms, in tandem with deeper integration, may subtly change the nature of systemic risk. Finally, there is the question of implications for policy, if the full benefits of financial integration are to be reaped.

#### **1.3.1 The contribution of financial integration**

There is a wide literature on links between the financial sector, economic growth, and the sustainability of imbalances. Although difficult to measure quantitatively, the benefits of a well-developed financial system and financial integration are well documented,<sup>9</sup> and in particular it is recognised that the deepening of financial systems and economic development go hand in hand. Moreover, recent years have seen heightened attention to some aspects of the financial sector's role in monetary unions – including the contribution of risk-sharing and income-smoothing across national borders or state lines. This literature suggests that there is scope for the financial sector to play an even greater role in the future in enhancing adjustment processes under the euro, both by dampening shocks and by fostering economic regeneration.

As noted earlier in this study, euro-area financial markets have responded robustly to *common shocks* that ranged from the dotcom bubble: to the events of September 11, 2001; to the recent increase in oil prices; and to the

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<sup>9</sup> Articles in the Handbook of Economic Growth provide the basic argumentation; for evidence and references, see Levine (2004). See also box III.1 in European Commission (2004a). Financial market integration in particular is expected to yield a range of economic benefits. This are surveyed for example by Agenor (2001). For example, foreign direct investment leads to a rationalisation of production as firms aim to exploit their firm-specific technological advantages internationally. Financial market integration is expected to lower the cost of capital, thus enhancing economic growth. On the other hand, financial integration may strengthen domestic financial imbalances, as discussed in this report.

emergence of wide global imbalances. Under monetary union, the market volatility and nominal exchange rate shocks experienced among the currencies of participating countries in earlier decades are precluded. Moreover, financial market confidence in the euro has remained strong.

Also key to the successful functioning of the euro area, however, is the resilience of the adjustment process within the area in the presence of country-specific shocks. Further financial market integration has the potential to support this through several routes.

Firstly, adjusting well to shocks means having a financial system that helps to reallocate resources efficiently across sectors and firms. When euro-area members experience country-specific shocks, the financial sector is crucial in assuring a rapid regeneration of productive capacity and growth. In the euro area, with low labour mobility across countries, adjustment to country-specific shocks relies heavily on wage and price adjustments, in the context of skill availability. It is critical that capital moves fluidly to take advantages of such shifts, creating new businesses and new jobs. The benefits of risk-sharing are important here: by insuring incomes against asymmetric shocks it raises the willingness of agents to commit to specialisation. This can be a strong force helping to reshape the industrial and commercial landscape of the euro area.

Second, diversification in the financial system also plays an important role in assuring resilience. The diversification of portfolios disperses claims more widely, so that risks are better spread. The expansion of hedging mechanisms has also been key in ensuring that the system is robust in the face of shocks. Moreover, the expansion of derivative markets has increased the depth of information on market expectations, providing a richer feedback to policy-makers as they seek to embed economic and financial stability. In addition, a diverse institutional structure in financial markets is potentially more robust than one resting on a few pillars. Alternative intermediation channels can avoid the risk that stress in one part of the financial system starves firms or sectors of funds at a time of adjustment stress. In this respect, financial developments in the EU, such as corporate bond market boom and growth of equity financing in the euro area, have not yet led to a significant shift of corporate financing from the traditional bank-based structure to a more market-based structure. This is mainly because loan financing has grown as well. At the same time, non-bank financial intermediaries have grown in importance in Europe, often by firms with close cooperation or owned by banks. Interestingly Hartmann, Maddaloni and Manganelli (2003) argue that financial structures across euro-area countries have been diverging during the second half of the 1990s, with the notable exception of the bond sector.

Third, financial integration can dampen the negative effects of localised financial shocks, through market integration on the side of suppliers of capital. Some recent research at the IMF suggests that securitisation of the U.S. national mortgage market may have halved the amplitude of local real estate cycles by diluting “credit crunch” effects in local downswings.<sup>10</sup>

A fourth potential contribution lies in income smoothing through cross-border asset diversification: the scope for this to serve as a stabilising mechanism across the euro area deserves special consideration. Risk sharing and income smoothing through the cross-border ownership of assets is of great potential importance for the working of a monetary union. It is an aspect of the adjustment process in the face of asymmetric shocks that so far has been given relatively little attention, by comparison with the role of fiscal transfers and of labour mobility. To a degree, this was because the literature on currency unions developed in a setting where capital flows were still restricted.

The theoretical basis of income and consumption smoothing through risk sharing is well-established. Capital markets and thus the holding of financial assets allow individuals to separate production and consumption decisions. If an individual is the subject of a shock such as loss of employment and labour income, he or she may draw on financial assets (or borrow) to maintain consumption. In addition, income from asset holdings serves as a buffer or insurance in the face of disturbances.

The same argument can be extended to hold for a region or a country. Through financial market diversification and integration across borders, regions and countries can separate production and consumption. Capital markets thus provide a mechanism for risk spreading or “macroeconomic insurance” by achieving international income insurance and thus also increased consumption smoothing over time. Improved international portfolio diversification and decreased home bias help countries to attain higher welfare by smoothing consumption in the face of asymmetric or country-specific shocks. For example the increased cross-border asset ownership can curtail changes in income surprisingly well. Aghion et al. find that a lower degree of financial development predicts a higher sensitivity of both the composition of investment and mean growth to exogenous shocks, as well as a stronger negative effect of volatility on growth.<sup>11</sup>

Financial market liberalisation has indeed led to a more international investment strategy on the part of institutional as well as individual investors. Inside as well as outside the euro area, foreign ownership of assets – including bank

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<sup>10</sup> See Schnure (2005).

<sup>11</sup> See Aghion et al. (2005).

deposits, bonds and equities – is increasing steadily. Recent research indicates that financial integration in Europe has begun to have a clear impact on macroeconomic risk sharing (Box 3). Home bias is declining. However, this process is relatively recent: these effects should become more pronounced in the future.

Financial markets can be compared with other institutional channels as a route for risk sharing. A more familiar route is the fiscal system, operating through taxes and transfers. In the United States, the role of private risk sharing has been compared to that of fiscal transfers, and according to some estimates has an even greater impact. Plausibly, some two-fifths of real shocks are smoothed through cross-border asset holdings, and less than one-third through fiscal channels. At this stage it is difficult to assess the quantitative importance of this type of adjustment, in particular when comparing it with other types of adjustment processes. As the EU budget is much smaller than the federal budget in the United States, and does not respond to cyclical swings, it is logical to assume that risk-sharing through financial asset holdings could play by far the predominant role as financial market integration continues. More broadly, it is clear that risk-sharing and resource reallocation through financial markets can play a critically important role in a monetary union where labour mobility is low and there is not a large federal budget.

In sum, many of the benefits of financial integration are indirect and hard to quantify. This is inherent in the kind of channels involved – for example: cross-border risk sharing; the impact of capital inflows on domestic investment and growth; and an increased efficiency, as well as greater stability, of the domestic financial system associated with diversification and cross-border banking.<sup>12</sup>

Indeed, summarizing literature related to financial globalisation, Kose et al. (2006) conclude that "main benefits to successful financial globalization are probably catalytic and indirect rather than simply enhanced access to financing for domestic investment". They argue that more important than direct growth effects of access to more capital is how capital flows generate what they call "potential collateral benefits" of financial integration. The argument of Kose et al (2006) extends beyond the channels of benefit discussed in this report, into other areas that are intangible but also relevant to adjustment in the euro area. They cite broad support in the literature for the thesis that "financial openness can promote development of the domestic financial sector, impose discipline on macroeconomic policies, generate efficiency gains among domestic firms by exposing them to competition of foreign entrants, and unleash forces that result in better government and corporate governance."<sup>13</sup>

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<sup>12</sup> See Agenor (2003).

<sup>13</sup> See Kose et al. (2006).

### **Box 3: Evolving patterns in risk-sharing and income smoothing**

Several recent studies have examined to what extent growing financial integration in Europe – including cross-border financial claims and corporate ownership – has contributed to risk sharing and income smoothing.

The progressive emergence of risk-sharing and income smoothing in EU economies was confirmed by Kalemli-Ozcan, Sørensen and Yosha (2005), in one of the first studies of these developments in the EU. Their analysis is based on net factor income flows between countries, derived as the difference between GDP (aggregate production within a country) and GNP (aggregate production owned by its residents). They find that in recent years financial integration across EU Member States has begun to play a role in buffering asymmetric shocks that follows the pattern reported for the United States. Risk-sharing in the EU is far less pronounced, but has increased and appears set to rise further in the future. Kalemli-Ozcan, Sørensen and Yosha recommend measures to foster financial integration, improve risk insurance, and thus facilitate adjustment to country-specific shocks.

The question whether the monetary union in Europe has had an impact on cross-border risk-sharing within the euro area is explored by Balli and Sørensen (2006), who consider the period 1970-2003. They start from the literature on optimum currency areas, more specifically from the discussion on the endogeneity of a monetary union. Once the euro has been established, we should expect it to foster capital market integration in the euro area through a number of channels. This pattern has been documented by many studies. In a number of empirical analyses, Balli and Sørensen conclude that income smoothing via cross-border factor flows has risen sharply in the euro area.

The role of financial integration in stimulating cross-border risk-sharing in Europe and elsewhere is examined by Artis and Hoffmann (2006), who confirm a rising role for risk sharing internationally in the 1990s. They note that this process has been stronger in Europe than elsewhere, suggesting that this is due to increased financial integration in the 1990s in the future euro area member countries, and specifically to capital income flows. They argue that the elimination of exchange rate risks within the euro area since 1999 has further changed the environment for risk sharing. Investors now tend to hold foreign assets longer than before. Before the introduction of the euro, valuation effects tended to be important, fostering portfolio rearrangements and thus driving the purchases and sale of foreign assets. Once the foreign exchange rate risk was eliminated by the euro, the character of international portfolio holdings may change – being based more on risk sharing via income flows from equity and bond holdings, and less on capital gains from market transactions. Whether or not this expectation is entirely confirmed, it is clear that risk sharing is on its rise in the euro area, but is currently far less advanced than between states in the United States.

A further implication of rising risk-sharing, identified in the literature, is that home bias would diminish and imbalances across economies will increase. Artis and Hoffmann (2006) argue that their findings have a bearing on the literature on home bias originating from the seminal contribution by Feldstein and Horioka (1980). The latter examined the correlations between domestic saving and investments, where low correlations were regarded as a sign of high international capital mobility and high correlations as the outcome of a financially closed economy. In a similar vein, Blanchard and Giavazzi (2002) document a decline in the correlation of savings and investment in Europe and in particular in the euro area. This evidence appears consistent with the view that the euro has increased risk sharing. Kalemli-Ozcan, Sørensen and Yosha (2005) reveal a close link between international risk sharing and home bias. They show that home bias in bond and equity holdings has been falling recently while international risk sharing has been rising.

When commenting on policy conclusions, authors of the reports above recommend measures to foster financial integration within the EU. Such measures will lead to improved macroeconomic insurance, thus facilitating adjustment to country-specific shocks in the EU, thus proving welfare enhancing. Financial market integration has already yielded significant benefits in terms of higher productivity and more effective international risk diversification. Further gains will be realised in the years to come, as private individuals, companies, investors and pension funds continue to adjust to the reality of international capital mobility.

### **1.3.2 Challenges in financial integration**

The integration of financial markets under monetary union has some strong "risk-reducing" features. Monetary union has accelerated the integration of wholesale financial markets. Moreover, the euro-denominated government bond market provides a uniform yield curve throughout the area as well as a base of liquid assets for the creation of new, tradeable financial products. Equity issuance and venture capital should also benefit from deep and integrated markets. The advent of the euro has also promoted area-wide markets in hedging products. Through these channels, monetary union tends: to facilitate a geographic and issuer-based diversification of portfolios; to enhance the area-wide risk capital base; and to promote the hedging of risks. Such trends may influence favourably the level and management of financial risk in the system. But, as evidenced in earlier chapters, financial integration brings risks as well as benefits in terms of an efficient and stable adjustment process.

One important issue is the changed nature of market discipline over policies. The response of financial markets to policy is significantly different under monetary union. The key aspects of this are the elimination of exchange risk and the ease of financing imbalances in highly integrated markets. In this environment, and a global setting of low risk premia, signals from financial markets to policy-makers may be very muted, for example, when fiscal policy moves off track. Moreover, the fact that public and private sector imbalances are easier to finance is only an advantage if foreign savings are well-used.

A second issue is that deep and integrated financial markets will tend to amplify both favourable events and distortions. If real estate borrowing is tax deductible, for example, there are risks of distorting resource allocation on



a major scale. Moreover, as monetary union accelerates financial integration in converging economies – including through a relaxation of credit constraints on households – there are potential risks as well as gains. Experience confirms that rising housing investment is one likely result. But if weak institutional structures or governance inhibit lending to firms, or the investment climate and human resources are not sufficient to attract resources to the traded goods sector, then growth may be unbalanced and external competitiveness impaired.

A third issue is whether there have been subtle changes in the nature of systemic risk in the euro area as a result of changed adjustment mechanisms that accompany membership of monetary union. While financial market integration can influence adjustment, causality does not run in one direction only. The nature of real sector adjustment under the euro area can also have important feedbacks to financial markets. In terms of growth and inflation divergences, adjustment to asymmetric shocks under the euro area is proving to be a gradual process. Realignments of intra-euro real effective exchange rates through relative price changes may occur over a protracted period. This contrasts with earlier experience in which acute pressures for adjustment could develop in the exchange or public debt markets. In this respect, for countries in the euro area, risks of an exchange or public debt market crisis have, in a sense, been transformed into risks of a “growth crisis.” The impact of changed adjustment dynamics means that banks and their clients will experience a different type of adjustment cycle, including possibly some overshooting at the turning points.

Under monetary union, furthermore, asymmetric shocks affecting national credit and asset markets are no longer met with a domestic interest rate response. Hence swings in these financial markets may be wider and more prolonged, possibly contributing to amplified cycles in economic activity and the real exchange rate. However, as noted above, the income effects of shocks will over time be diluted by financial integration, with the growth in holdings of cross-border financial assets and access to wider and deeper loan markets. And the securitisation of mortgage markets, for example, may dampen possible “credit crunch effects” in the downswing of local asset price cycles.

It seems too early to form a definitive assessment of how far such factors will alter the nature of systemic risks in ways to which financial institutions and supervisors need to respond. Recent experience is complicated by exogenous developments in financial markets, whose effects cannot fully be disentangled from euro-specific changes. These exogenous developments include: the balance sheet adjustments underway in the euro area in the aftermath of the 1990s investment boom; a prolonged period of very low risk premia in global markets; and a rapid development of credit derivatives and complex capital market instruments. This latter change is part of a broader growth in risk transfer instruments that has been spreading risk more widely, but has made ultimate repositories more opaque.

Thus the management of financial risk has become more important, since problems in the financial system could have wider consequences, while risks have become more complex to monitor. On the supervisory front, meanwhile, the introduction of Basel II/CRD III – partly in response to market trends – is itself a factor that may affect market behaviour in a range of ways.

In other words, there have been many changes underway in the global financial system during the early years of monetary union. Nonetheless, it is useful to highlight possible implications of specifically euro-related factors, to assess feedbacks between the adjustment process and financial markets. In this respect, a dominant leitmotif runs through the risk factors identified above. It is that financial market behaviour might become more pro-cyclical following country-specific shocks, at least during a learning period. Strong and protracted asymmetric booms could lead markets to underestimate the build-up of lending risks, which might then crystallise in an extended downturn. Asset market movements could be pronounced at times of “negative local real interest rates, possibly giving rise to a financial accelerator based on rising collateral values, followed by a protracted downturn. Easy deficit financing and weaker market discipline could allow sizable imbalances to accumulate. These elements could increase the amplitude and length of adjustment cycles, and heighten systemic risk.

### **1.3.3 Policies to tap the full gains of financial integration**

Experience with financial integration in the early years of monetary union suggest that, in essence, it “raises the stakes” for good policies, effective policy co-ordination, and sound institutions. The financial sector has a capacity to: respond to news; articulate expectations; transmit, buffer or amplify shocks; with an order of magnitude that is faster than other markets. This argues for policy frameworks that will steer expectations successfully and pre-empt stress. In the context of adjustment within the euro area, there is scope for each of the main branches of policy to contribute.

Policies towards the financial sector need to press integration forward, including fostering efficient adjustment. The integration gains from introduction of the euro are well-documented. But progress has been uneven across different markets and market segments. There has been major progress in the single markets for wholesale financial services but very little in the EU retail financial markets. Short term money markets are considered fully integrated, and in bond and equity markets integration is also deep. In financial market infrastructure, like settlement and payment

systems, there is still a lot to be done and retail banking integration is creeping much more slowly.<sup>14</sup> Moreover, taking into account the scale of capital flows in the euro area, it is surprising how little this development has touched financial institutions. It seems that the benefits of a wider and more efficient financial system in Europe are not acknowledged widely enough.

Accelerated progress with integration involves action on a broad front. It means implementing the Financial Services Action Plan through national legislative measures. But it also includes supervisory convergence, and giving assurance to market users through investor and consumer protection. Competition policy plays an important role too. Moreover, achieving full integration requires important national efforts that go beyond the immediate sphere of financial products, venturing into areas of national private law, an arduous long-term task. International dialogues on financial markets will also be important, while parallel progress in areas such as governance and accounting can make a key contribution.

More specifically, as detailed in Chapter VI, the Commission has outlined areas where there may be a need for further efforts to promote market integration, in addition to full FSAP implementation. Among key priorities are: clearing and settlement systems; a new Solvency Directive to overhaul insurance regulation and supervision; three key initiatives in the retail sector – relating to mortgage credit, consumer credit and payment services; further work, potentially, in the investment fund sector; and EU supervisory arrangements, with the goal of fostering further increases in financial-system efficiency and stability.

As markets in the euro area continue to integrate, challenges will continue to arise for supervision. Supervisors need to take due account of changes in systemic risk as they evaluate institutions' control systems and financial soundness, buttressed by steps to strengthen market discipline. An important issue in integrating euro-area markets is to ensure that supervision and liquidity support keep pace with ever more complex linkages across functions and borders. The spread of area-wide financial institutions will pose new challenges to supervisors.

This is not to suggest using supervision as a surrogate for the national monetary policy, but to internalise adequately the changed adjustment process and its impact on credit and market risks. A concrete way of addressing these issues is to ask what instruments in the conventional supervisory armoury may be relevant. One possibility might be techniques that help capture risks emerging over extended credit and asset price cycles. Such techniques may include: stress-tests for credit and market risks; surveillance of loan-to-value ratios in real estate lending; and use of counter-cyclical techniques such as provisioning over the course of the cycle – while noting tax and accounting concerns (see Box 4).

Structural policies are important if resource allocation is to benefit from more integrated financial markets. These policies interact with financial integration in several ways. Both favourable and unfavourable structural features may be amplified by integration, so distortions need to be addressed, including in the microeconomic side of fiscal policy. Flexible labour and product markets will help ensure that shocks to euro-area members trigger timely adjustment through shifts in competitiveness, swiftly dominating any perverse effects in real interest rates and asset markets.

Sound fiscal policy also is crucial to maintain discipline in the face of changed market responses, in line with the reformed SGP. When Member States experience a strong financial boom, it will be especially important to be vigilant that the underlying strength of the fiscal position is not over-estimated. As highlighted above, experience in the early years of monetary union underlines the risk of allowing the fiscal stance to ease inadvertently as a result of: transient revenues from asset market gains; a tax-rich composition of GDP (with strong consumption and lower net exports); and a tendency to upgrade estimates of potential growth pro-cyclically. Also, if stresses emerge in the financial system or real economy, budgets must be well-placed to underpin stability.

If there were increased pro-cyclicality in financial market behaviour, that would be very relevant to the adjustment issues discussed earlier. It would reinforce the message that policy-makers need to guard against actions that could amplify, or fail to internalise, such trends – e.g., in setting nominal fiscal goals. It may be wise, also, for market participants and supervisors to pay special attention to heightened risks of pro-cyclicality. Concerted policy strategies incorporating these elements can help shape financial market expectations and ensure that these markets do not exacerbate adjustment stress – either through a market crisis or through the impact on growth of balance sheet pressures. In such a policy setting, markets can play a balanced role in facilitating adjustment under the euro area.

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<sup>14</sup> The available evidence suggests that the degree of integration varies greatly depending on the market segment. The unsecured money market has been fully integrated since shortly after the introduction of the euro. The repo market is highly integrated albeit to a lower extent. Government bond markets were significantly integrated even before the start of the third stage of EMU, although some yield differentials remain. The indicators for the corporate bond market, which has grown considerably since the advent of the single currency, point to a high degree of integration. Progress has also been made in the integration of euro area equity markets, where equity returns are increasingly determined by common factors. Banking markets are generally much less integrated ECB (2005b).

#### **Box 4: Supervisory tools and possible shifts in the pattern of systemic risk**

Traditionally, supervisors have a microeconomic approach, and have given limited attention to macro-financial stability. However, the need to improve safeguards against instability, in a financial system that is larger and more interconnected, is increasingly recognised. Some tools in the conventional arsenal, as various adjustments to Basel II that addressed concerns about procyclicality, highlight an increased attention to macrofinancial stability - although supervisors have encountered some hurdles (for instance opposition of accountants and tax authorities to dynamic provisioning, seeing an income smoothing mechanism that would leave too much leeway for discretion and arbitrage). A number of supervisory approaches may help pre-empt the potential systemic risks the euro area faces.

- Testing the sensitivity of capital ratios to changes in the economic environment. Under Pillar 2 of Basel II/CRD, national supervisors can request banks to comply with higher than minimum capital requirements when deemed necessary. Supervisors may wish to do so to address the procyclicality of capital ratios or if stress tests reveal the inadequacy of capital ratios against macroeconomic shocks. Under Basel II/CRD, banks are required to conduct stress tests for their major positions. The stress tests are a tool for them to gauge the sensitivity of the capital ratios to changes in the economic environment. They also enable supervisors to assess the overall adequacy of banks' capital in relation to the totality of their actual and potential risks and can serve to assess the size of the capital "buffer" that banks should maintain in excess of regulatory minimums in order to enable them to weather economic downturns. To contain systemic risk, two sources of vulnerability deserve special attention: the effect of fluctuations in real estate valuations (both directly and as collateral); and the risk of loss of liquidity on large interbank exposures.
- Ensuring that loan loss provisions are built up over the cycle. In some countries, supervisors have gone one step further by adopting statistical provisioning. Against current accounting rules which permit provisioning only for realized losses - which leads to a concentration of provisions at the low point of the cycle and thus amplifies the financial cycle - banks are called on to anticipate and assign provisions for expected but not yet realized losses. In this context, the Spanish statistical (or dynamic) loan loss provisioning has attracted considerable attention. It is designed to acknowledge the latent risk in loan portfolios, counterbalance the cyclical behaviour of traditional loan loss provisions, and correct the excessive cyclical bias in profits which could distort profitability and solvency. Though it is compulsory only in Spain and Portugal, some sort of forward looking provisioning is used in a number of international banks.
- Use of conservative adjustments in loan-to-value ratios. Arrangements vary across countries as regards norms for loan-to-value ratios in real estate lending. Basel II/CRD leaves the prudential criteria for real estate (including loan to value ratios) to be determined by national regulators, and supervisors are entitled to increased risk weighting for real estate loans if data warrant. There should be scope through normal supervisory assessments to verify that banks are adopting prudent approaches - or else to require higher capital cover. This was used in Denmark as a discretionary tool, but apparently financial system diversification has made this less effective in the present cycle.
- Liquidity monitoring. The critical concern (illustrated in Portugal) is that short-term cross-border interbank borrowing is perceived to carry an implicit host country guarantee. Hence, if deficit funding becomes more relaxed, strong supervisory attention is needed to ensure that it does not become a subsidized source of funding for domestic credit expansion, resulting in vulnerability.

Use of these instruments does not imply seeking to adjust them in a counter-cyclical fashion, on a discretionary basis. Some economists have proposed that supplementary capital required under Pillar 2 could serve as an explicit countercyclical instrument. Others have also proposed that, without changing the methods used to calculate capital requirements, the result should be adjusted down during periods of recession in order to improve access to credit and stimulate a rebound in economic activity. Such countercyclical action, however, presents major drawbacks, in particular: (i) how to deal with banks that operate across national boundaries or may be specialised in some markets or sectors and therefore have different exposures, raising level-playing fields concerns; (ii) imposing standards that are tougher than those demanded by the market which might simply encourage innovative ways to avoid them; and (iii) it may not be advisable that supervisors become excessively involved in the management of risk of individual institutions. Discretionary adjustments in supervisory instruments in response to changes in the business cycle or system-wide risk are also difficult to implement and should not occur on a regular basis.

Further progress could be made also in terms of dialogue and co-operation. For instance, the dialogue with central banks could be reinforced as analysis by central banks of financial stability highlight, for instance, how the credit risk inherent in loans to certain sectors can increase as a function of market or macroeconomic trends. Practice in advanced economies is beginning to hint toward regular coordination meetings among the key official actors to discuss stability developments, and more generally, supervisors may have scope to internalise more fully the risks pertaining to absence of a national monetary policy. In a euro area context, the cross-border dimension of such dialogues could also be very important.

## **2. Economic catching-up within the euro area**

Are there unique features or special lessons in the experience of euro-area members that relate specifically to the process of catching-up? This is an important question for the future, since a majority of the Member States (and candidate countries) that are committed to adopt the euro in due course are engaged in an extended process of catching-up. It is helpful at this point to highlight some of the lessons about adjustment and policy management under the euro that may be especially relevant to future euro-area members.

Several of the present euro-area members have been experiencing economic catching-up in terms of GDP per capita. Among the members specifically focused on in this report, these are Ireland, Portugal and Spain. In previous chapters, their adjustment performance was explored in terms of: trends in consumption, investment and financial markets; the competitiveness and real interest rate channels; and interactions between shocks and policy initiatives. But the specific catching-up dimension that is common to their experience has not been systematically considered so far.<sup>15</sup>

To set this issue in perspective it is helpful to address in turn three aspects:

- The first aspect concerns the general inter-country adjustment process under monetary union, which applies in these three catching-up cases as in others.
- The second aspect relates to initial conditions in each of these three Member States at the time they adopted the euro. These conditions – such as changes in risk premia, or productivity disturbances – varied across present euro-area members (along lines unrelated to income level), and may vary across future area members.
- The third aspect is whether, or how far, the process of catching-up in these three countries implied, of itself, policy challenges that are special in kind or degree under the euro.

Together, the first two aspects may go far to explain adjustment experience in all euro-area members, particularly when feedbacks from policy responses are taken into account. It will thus be easier to isolate the catching-up element in Ireland, Portugal and Spain, if we first explore how their experience maps to the general dynamics of euro-area adjustment and their own initial conditions.

Of course, the state of market integration and flexibility in the early years of the euro area is not yet that of a mature monetary union, and any lessons from national experience in recent years need to be qualified strongly in these respects. Moreover, recent developments must be seen against the background of globally low real interest rates and risk premia, a context that has been evolving in the recent past and may not be a good guide to the future.

## ***2.1 Adjustment dynamics in the euro area and initial conditions on euro adoption***

For the present discussion it is helpful to concentrate on the general features that differentiate the adjustment process under monetary union from adjustment with a national monetary policy. Each of these features, derived from modelling and empirical work in previous sections of the report, helps to explain the adjustment experience in the "catching-up" area members, among others.

First, the absence of exchange rate risk clearly facilitated deficit financing by the public and private sectors; and market signals may have been more muted in cases where imbalances become problematic. Clearly, all three economies drew heavily on foreign savings, and there is evidence earlier in the paper that a release of credit constraints is a relevant shock. Only Portugal ran a fiscal policy of the kind that market signals might conceivably have checked (with an adjustable exchange rate); but, given the lags with which markets have traditionally responded to such developments, it is not clear whether this is a realistic counterfactual.

Second, at times when the common interest rate did not match cyclical conditions in these three economies, adjustment has taken place mainly through shifts in competitiveness. An asymmetric boom, for example, has led to real appreciation, and then – with lags – to a slowing of activity until the output gap again matches the euro-area average and hence the stance of the common monetary policy. Where a catching-up economy moves out of equilibrium, this competitiveness channel of adjustment emerges as dominant and stabilising over the medium term, though in the short run there may be some wide swings in real exchange rates. This process was evident over a period of a relatively few years in Portugal – in part because it was amplified by pro-cyclical fiscal policy. After a long period of equilibrium growth, a slowing along these lines – through the competitiveness channel – now seems to be taking place in Ireland. In Spain, competitiveness has been shifting in a direction consistent with slower growth at some point in the future.

Third, national real interest rate developments have potentially complicated this process in the short run. During an asymmetric boom, prices have risen more rapidly than area-wide inflation, and national real interest rates have to some degree fallen – potentially prolonging the boom in a pro-cyclical fashion. Asset prices may have reinforced this effect. The impact of this is difficult to measure and assess (since it depends in part on asset portfolios, time horizons, and expectations), and will erode significantly as trade and financial integration progress. There are signs

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<sup>15</sup> In this section, the term "catching-up" is used here rather than "convergence" because the latter can easily be confused with *nominal* convergence to meet the Maastricht criteria. Here, the focus will be on catching-up in real income levels and also in the depth of the financial sector. Financial system change is particularly relevant in so far as some Member States joined the euro area with financial sectors that were still relatively small and undiversified. Catching-up in this sector can be a key source of opportunities but also of challenges for policy: it deserves special attention when exploring implications about the monetary framework.

in all three economies under reference that this transitional mismatch of monetary conditions at times contributed to the sustained strength of domestic demand, and latterly in Portugal to its weakness. In Spain, asset price gains were an additional transmission channel, while in Portugal a strong supply response in housing dampened such effects.

It is possible that these transitional real interest rate effects may have affected resource allocation in euro-area members, including the catching-up members – because of country-specific booms but also in some cases because of "initial conditions" in their economies. During periods of cyclically "low" rates, allocation may have been skewed to consumption and real estate, and low rate-of-return projects more generally may not have been screened out. If so, that could impair potential growth and the smoothness of future adjustment (since productivity gains might play a lesser role in correcting unit labour costs, leaving the brunt to be borne by wages). This is a plausible story for Portugal and Spain, given trends in resource allocation. But the analysis earlier in this paper shows other influences also (e.g., shocks to risk premia) that would have triggered a shift of resources into the non-traded sector and notably to residential construction. The allocative role of real interest rates over the adjustment period is not fully clear.

It is worth noting, in addition, that extended booms may have complicated fiscal measurement during the catching-up process as in other cases – although this issue can arise during an extended boom under any monetary regime. There is some evidence in Portugal, for example, that the transient impact of the boom on revenues and growth may have been misunderstood, and that this contributed to policy errors. In Spain, estimates of fiscal elasticities and potential growth are currently receiving heightened attention.

These key factors in the general process of inter-country adjustment appear relevant in all three catching-up economies specifically studied in this review – Ireland, Portugal and Spain. Consistently with findings in earlier sections, they explain a good deal of the adjustment experience in these economies.

In these three countries, as in others, opportunities and challenges for catching-up under monetary union depended in part on the set of "initial conditions" at the time they embarked on the final push to euro adoption. This report has reviewed what theory and experience tell us about the impact such initial conditions in some Member States. These conditions varied greatly, and in ways that did not map systematically to levels of income levels or financial development.

Among the shocks considered in Chapter VII, the pure example of initial conditions that do not derive from catching-up lies in the decline in risk premia in the run-up to euro adoption. This depended on past monetary and fiscal credibility, and thus nominal convergence paths. It varied significantly across euro-area members in a manner not systematically related to income level. Among others, the three catching-up economies featured in this study all experienced declining risk premia – with Portugal having the largest positive impulse to activity and Ireland the lowest (as discussed in Chapter VII).

The other country-specific factors identified in Chapter VII are not entirely independent of catching-up. The potential impact of easier constraints on household borrowing was in some sense greater in cases where credit was initially small relative to GDP. Again, the scope for positive productivity shocks was presumably higher in these catching-up cases. But the scale of these effects is, empirically, not very different in some of the "steady state" economies. For example, the scale of credit constraint easing in the Netherlands is within (very high) range experienced in the three catching-up cases. Productivity shocks in Germany or Netherlands were of the same order of magnitude as in Spain or Portugal, with the differential between traded and non-traded goods being in the same direction.

In seeking to identify effects that are specific to catching-up under the euro, these are important caveats to bear in mind.

## ***2.2 The specific dimension of economic and financial catching-up***

To set in perspective any "specialness" of the catching-up condition, a useful step is to identify the counterfactual, based on the discussion of general adjustment processes and initial conditions set out above. The counterfactual – that developments can be explained independently of catching-up – can be illustrated in terms of the factors that stalled convergence in Portugal soon after euro adoption. Suppose that this stalling was due entirely to initial conditions that could prevail in any euro-area candidate, irrespective of income level or stage of financial development, and to the impact of poor national policy choices, under the euro-area adjustment process. How would the story run?

It would be that Portugal experienced a steep fall in risk premia, which stimulated the economy and led to a widening current account deficit. Credit conditions eased as a result of lower interest rates and abolition of exchange risk (which allowed substantial interbank borrowing to be channelled to households that otherwise could not have hedged externally-sourced borrowings). With a strong supply response in housing, there was no asset price bubble. But fiscal policy, at a critical juncture, became pro-cyclical. This contributed to accelerating credit and an appreciating real exchange rate, while wage and employment decisions in the public sector also hampered adjustment in the real economy. Overall, there were negative productivity shocks; and action was not taken initially to improve the working of the labour market. Wage persistence pushed up unit labour costs to an unwarranted degree in both the traded and

the non-traded sectors. Taken together, these factors preordained the profile of the adjustment that would set in (triggered in the event by an export shock). They meant that real adjustment under the euro was bound to be sluggish in terms of both wage and productivity contributions; and that all sectors of the economy would be trying to de-leverage simultaneously.

Elements in this story are well-supported by the earlier analysis. And it has clear lessons for any euro-area member, including those catching-up. Indeed, it highlights rather precisely several of the points suggested above about adjustment and initial conditions. But the story, in this truncated form, has apparently little to do with catching-up as such. Moreover, Ireland experienced no major problems with catching-up during this period – although it must be acknowledged at once that it benefited from productivity and labour market developments that would be hard to replicate.

Nonetheless, there are analytical reasons to suspect a “specialness” of the catching-up process under monetary union, and that such factors played a role in Portugal. And one *prima facie* reason to probe this issue further lies in the steep widening of Spain’s current account deficit in recent years: this has prompted many diagnostic questions, but it emerged in a fiscal and structural policy setting far more benign than in Portugal. Under what circumstances could such a widening imbalance propose policy challenges, and are there clues to this in the nature of the catching-up process?

There are three factors that could imply special opportunities or challenges during the catching-up of real incomes and financial sector development under the euro:

- High rates of return will attract foreign savings, and net capital inflows are potentially very favourable for growth in the under-capitalised environment that is characteristic of catching-up economies. One concern is volatility, notably in a global market setting of volatile risk premia. Adoption of the euro (abstracting from hazards in the run-up to membership) does protect against nominal currency fluctuations. This is important, given the proneness of catching-up economies (including specifically in Eastern Europe) to unhedged currency borrowing. But if the allocation of capital inflows should be distorted (for example, by procyclicality in risk premia), then the real adjustment costs could be felt over a protracted period. It is an example of exchanging market risk for growth risk, and of diminished market feedback. The trade-offs involved in terms of output loss will vary case-by-case: if real sector markets are rigid, then the absence of exchange rate flexibility as a route for adjustment is likely to be damaging to growth; but if there are large unhedged foreign currency exposures in the economy, then use of the exchange rate for adjustment may turn out to have a very serious impact on growth through balance sheet routes..
- Catching-up in real income levels is usually accompanied by rapid expansion and maturation of the financial sector. Here, supervision and regulation in EU Member States provide a framework based on the *acquis communautaire* and grounded in international standards and codes (which is not to deny that implementation issues may remain). Assessing risks to financial stability is, however, even more difficult than usual in a catching-up environment, since indicators such as credit, asset prices, and the real exchange rate will anyway be undergoing steep equilibrium shifts. Moreover, financial systems that are still developing are typically dominated by banks, and, where external lenders are highly concentrated, risks of contagion and/or a credit crunch need to be borne in mind (with high foreign bank ownership not necessarily eliminating this concern). There may also be a question how far home-host supervisory contacts capture or address issues such as sectoral concentration and risk in systemically-important local establishments that are foreign-owned.
- During economic catching-up, returns to capital are systematically high. But under a fixed exchange rate or monetary union, average national consumer price rises will be more rapid than inflation in the euro area. Thus national real base interest rates will be relatively lower than the euro area – not for reasons to do with temporary asymmetric shocks (as in the earlier discussion of real interest rate effects) but because of long-run productivity trends. In such a setting of very low or negative real interest rates, it may be hard for banks to price credit efficiently, and resources may be biased, for example, towards consumption or real estate. Sustained real appreciation makes it, in turn, critically important that resources are well allocated, so that a growingly negative net international investment position is serviced at satisfactory future rates of growth in domestic incomes. To say the least, the allocation stakes are high and the price environment quite complex. There is a question of whether, combined with the real interest rate effects discussed above, there could be a bias to real estate and consumption during boom periods, including an extended convergence boom. Looking forward, clues to the presence of such an allocation effect from real interest rates could be looked for in the composition of GDP, investment, credit, and the counterparts and financing of the external current account.

One way of interpreting these three issues is to recognise, in the first place, that they arise in the context of unique opportunities for catching-up in the policy environment of EU membership. In terms of political-economics, this membership embeds some degree of pooled economic sovereignty, as well as strong opportunities for trade and

investment integration: it thus strikingly different from the environment of concerns about policy and financial autonomy that have contributed to large net exports of savings exports in other regions of catching-up economies.

This said, the joint influence of the three factors identified above can be thought of as increasing to some degree boom-bust risks – or more accurately the risks of a boom and then a protracted period of slow or negative output growth.

There is nothing inherently troubling about a strong catching-up boom that is followed by a measured slowdown. This is a reasonable outcome of policy under any monetary regime. We also know that under any monetary regimes it can prove hazardous, due to inherent challenges in the catching-up process. The question here is more specific: what are the particular ways in which the inherent policy risks of catching-up are channelled, heightened or mitigated under monetary union, and how can national policy improve the chances of good outcomes?

The key issue here is that the opportunities and risks of catching-up need to be faced in a policy context where one instrument, national monetary policy, is unavailable. Of course, in a catching-up economy, monetary autonomy is always circumscribed, and in hard peg countries it will have been given up at an earlier stage. But the absence of a national policy still raises the stakes for other instruments – including fiscal and all structural policies. And it does so in a financial sector setting that is still maturing.<sup>16</sup>

A core challenge is to achieve a pattern of resource allocation in the economy that validates the protracted real appreciation and "deteriorating" net international investment position that correspond to sustained imports of foreign savings. This needs to be consistent with a soft landing from a catching-up boom. If there is misallocation of resources, then this will dampen productivity growth. That would be bad for catching-up, of course, but it would also hamper future adjustment. And it would mean that there is a smaller domestic pie from which to service a potentially large negative net international investment position. This is, to some degree, the story of Ireland versus Portugal – without suggesting that there were no sustainable gains in Portugal or that all dynamic problems have been forestalled in Ireland. For clarity it may be helpful to juxtapose the sectoral aspect of the three country cases (see box 5).

The key issue is not just that allocation matters for sustained catching-up, but that any distortions disturbing this pattern may be amplified by accelerated financial dynamics during catching-up. Under the euro, the elimination of exchange risk, and the related decline in interest rate premia, can contribute to an acceleration of financial dynamics during catching-up. This is reflected, *inter alia*, in the scope to import foreign savings at a more rapid pace over a longer period. This financial acceleration can have very favourable effects if the institutional framework is strong, including competitive domestic markets and an effective judicial and prudential system. But if there is misallocation then this too will be amplified. It is also very plausible that a low level of real interest rates, which is likely to prevail during catching-up under monetary union, in itself heightens risks to resource allocation.

One way of summarising this is to say that the process of economic catching-up has some inherent risks, which heighten the challenges for policy under any monetary regime. Monetary union influences the form that such challenges are likely to take. In particular, under monetary union the financial processes that accompany catching-up are likely to be accelerated, and this will amplify positive as well as the negative influences in the resource allocation environment. If the results turn out to be problematic, then the national interest rate will not be available to cut short the process. The results of misallocation may lead to a protracted adjustment process.

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<sup>16</sup> In assessing these outcomes it is interesting to ask how developments would have played out under a floating exchange rate. Essentially, higher interest rates could have cut short a problematic boom, avoiding a potentially lengthy period of misallocation. On the other hand, inflows might well have given rise to significant unhedged foreign exchange risk in the non-bank sectors (including the government). Monetary union eliminates this balance sheet exposure during catching-up, just as it eliminated the interest rate flexibility, the exchange rate safety valve, and market signals related to it. To that degree, it substitutes risks of a "growth crisis" for risks of a "market crisis that could damage growth."

### Box 5: Catching-up, productivity and the sectoral allocation of resources

Among the euro-area members selected for case studies in this Review, Ireland, Portugal and Spain are instances of economic catching-up, and the analysis in Chapter VII, in particular, sheds light on this experience under the euro. Based on the model simulations and surveillance analyses, the experience in Ireland illustrates catching-up (under monetary union) in the classic sense of high productivity growth in tradeables. Capital was attracted into Ireland in the first instance by, of course, high rates of return: these reflected predominantly the availability of human skills (which underpinned the ICT boom). Over an extended period, this pattern of productivity growth sustained competitiveness and generated resources to service Ireland's growingly negative net international investment position. One ripple effect of this process - with a lag - was a housing boom, which then developed its own dynamic. The case studies of Spain and Portugal, by contrast, highlight the fact that productivity growth in tradeables was not high. Inflation in Spain reflects a Balassa-Samuelson productivity differential, but this is because productivity in non-traded goods was relatively low. Again, capital flowed into Portugal and Spain, of course, because of high rates of return. But these were to a significant degree returns on residential housing. Allocation was quite different from Ireland, and this helps to explain why competitiveness deteriorated. The model simulations clarify that the drivers of housing activity also differed as between Portugal and Spain. In both cases the decline in risk premia and easing of borrowing constraints were major drivers of the initial housing boom. But the model suggests that this effect should have tapered off after about 3 years - as it did in Portugal. However, the sustained nature of the housing boom in Spain reflects the additional impact of a migration shock, tourism and demographics, which have contributed to the continuing demand for housing. Drawing together strands from these case studies, it is notable that, except in the immediate aftermath of the EMU-related decline in risk premia, the allocation of resources as between traded goods and residential housing in these three cases was not mainly driven by interest rate effects but by real shocks and resource endowments. To some degree this finding may however, reflect the structure of the model, and a stronger effect from the level of real interest rates cannot be excluded.

### 2.3 Policy management during catching-up

The discussion so far suggests that the catching-up process can be seen as heightening certain policy opportunities and challenges among those that face all euro-area members. It may be useful, therefore, to review in conclusion some of the possible "lessons for policy" that have emerged during the course of this report and to identify those that may be especially relevant in the setting of economic catching-up.

A first challenge is in the *domain of analysis*. A key message of this report has been the importance of *diagnosing accurately* the nature of the economic processes underway in a national economy and how they relate to inter-country adjustment dynamics. These analytical challenges are if anything more pronounced during catching-up. Risks to allocation and stability may be difficult to assess in a setting of trend rises in credit, asset prices and the real exchange rate, and these trends may also make it hard to diagnose whether aggregate wage and price developments are on an equilibrium path.

A second challenge relates to *underlying fiscal developments*, which may also be more difficult to evaluate in a catching-up environment. It will be especially important to avoid measurement errors that impart an inadvertently pro-cyclical bias to fiscal policy. (These factors are not caused by euro adoption, but they take on special importance in this setting.) First, revenues may improve transiently during a higher inflation upswing, as a result of a local asset price boom and/or buoyant consumption (versus exports, which are lightly taxed); and they may deteriorate all the more steeply in the correction. Second, there may be risks of overestimating potential growth, including if resource allocation strongly favours residential investment.

In calibrating fiscal policy, it will be important to bear in mind the dynamics of the inter-country adjustment process. Fiscal policy is a key instrument that can influence the real exchange rate in the short run. If there are risks of overshooting in the real exchange rate following an asymmetric shock, then it will be crucial to have assured full room for automatic stabilisers to operate. If asymmetric adjustment cycles prove to be deeper as well as more protracted than typical business cycles, then the room for stabilisers to operate under the SGP may need to be greater than in conventional cyclical calculations. In an asymmetric boom, moreover, it will be important not to cap the improvement in the fiscal balance by discretionary action, since that will exacerbate any real exchange rate overshooting. Whether discretionary action to lean against the wind could be effective is more debatable, given customary concerns about assessment and lags.

In many cases, a key initial "shock" during the move to euro adoption was a decline of risk premia relating to exchange rate/inflation risk. This decline influenced supply conditions in the economy, but the related fall in interest rates also resulted in a powerful demand stimulus. In some cases (e.g., Spain) the demand impact was counterbalanced by action to strengthen the structural fiscal position (i.e., improving the cyclically-adjusted primary balance). Since the cost of debt was falling, there was also the opportunity to further improve the nominal fiscal balance. Such actions moderated the demand boost from nominal convergence, and affected its composition: public expenditure played a lower role, and the extent of real exchange rate appreciation was more limited. In other cases, by contrast, policy was not tightened as risk premia fell, or initial tightening was later reversed (e.g., Portugal).



A third challenge relates to the implementation of *structural policies*. A crucial implication for national policy in the short run is that the flexible working of labour and product markets is essential not only for strong growth but also to ensure a smooth and rapid economic adjustment process in the absence of an exchange rate safety valve. This, of course, remains key during the catching-up process.

What takes on special importance is to ensure that the institutional setting for resource allocation is developed as effectively as possible, to realise the full opportunities (and avoid the risks) of accelerated financial development. The prudential approaches discussed earlier in this section will also be very important in reducing the risks of market tensions or distress as a result of excessive financial exuberance.

In sum, catching-up economies under monetary union will benefit particularly strongly where policy-makers are able to: improve flexibility in the real sector; caution about risky behaviour during financial booms; enhance the environment for lending decisions; and avoid a pro-cyclical fiscal stance.

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