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 polices 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.[1] Some may be considered as one-off effects which are induced

[1] 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.

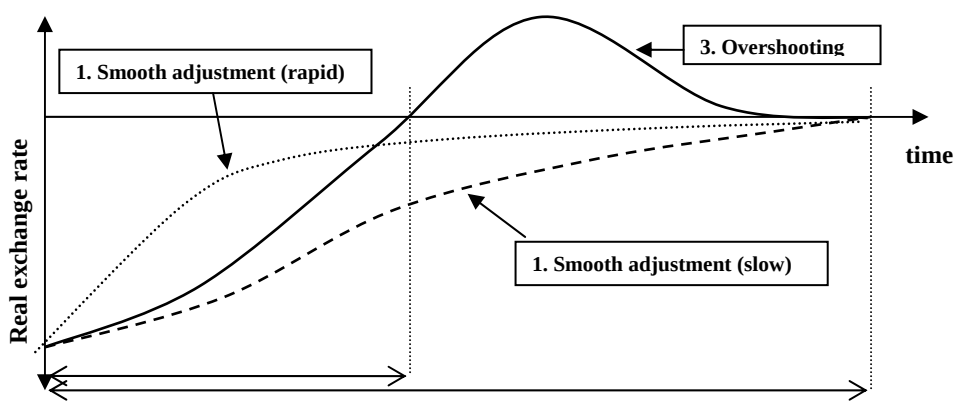
by entry into the monetary union, such as disequilibrium in initial exchange rate parities and the initial interest rate shock. Others may occur in the euro area, for example due to common external shocks with different effects in the Member States due to differences in industrial structure and sectoral specialisation;[2] 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).[3] 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.

Graph 2.1: Rapid and slow adjustment and overshooting



2.3 The DSGE model

2.3.1 Description of the model[4]

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.[5] Consistent with the empirical evidence, we have introduced a number of nominal and real rigidities.[6] This makes the model partly forward and partly backward

2 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.

3 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.

4 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).

5 See for instance Smets and Wouters (2003).

6 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,[7] which allows consideration of the effects of loosening credit constraints on the demand for housing.

[7] 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.

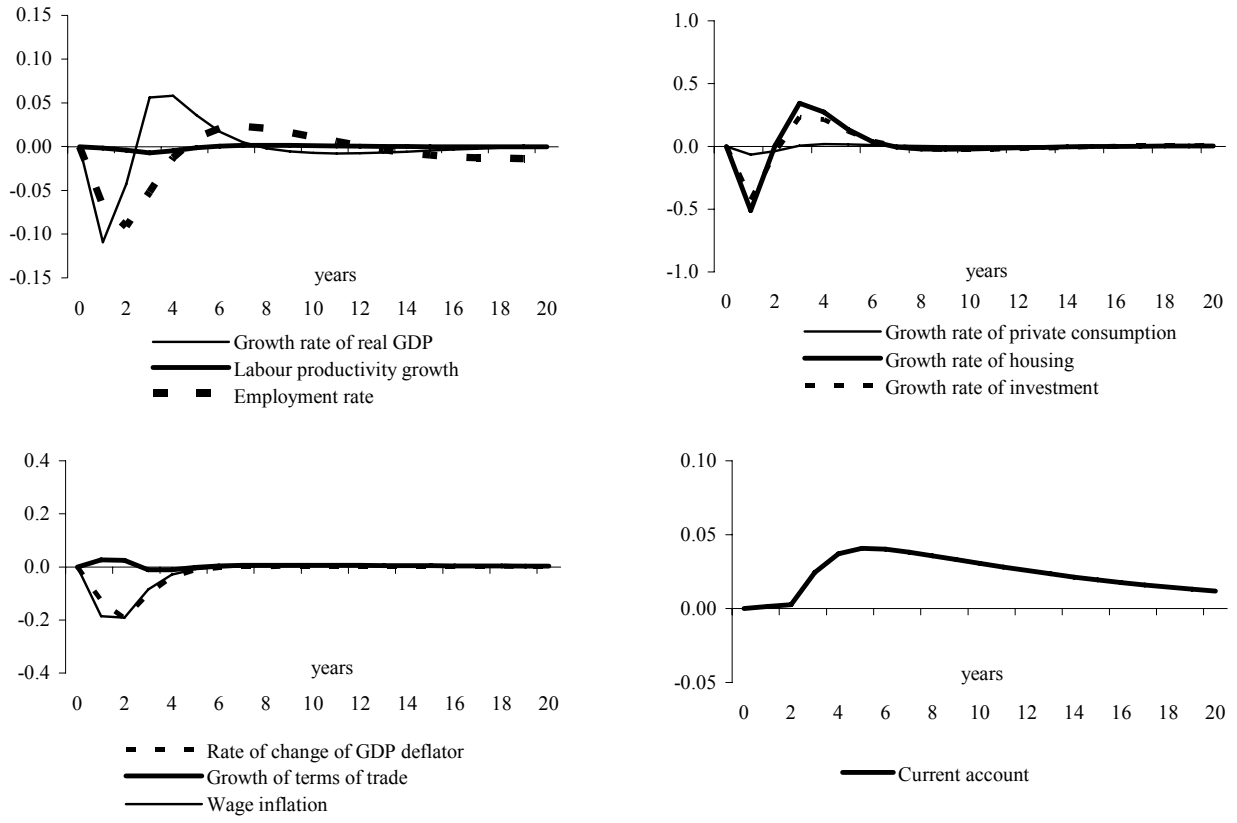
As a result of these assumptions the model predicts that investment in the non tradeable sector should respond more strongly to demand shocks than investment in the tradeable sector.

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[8]) 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).

8 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.

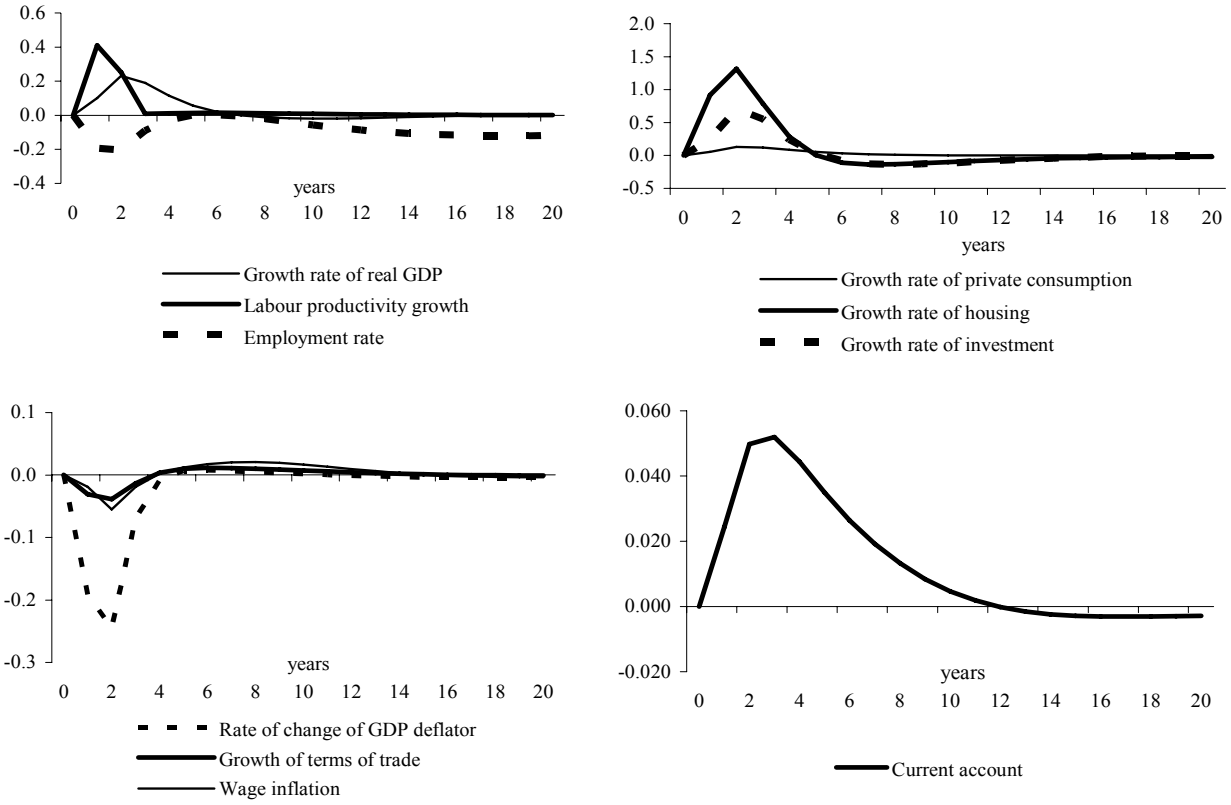
Source: Commission Services

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.[9] 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.

[9] 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.

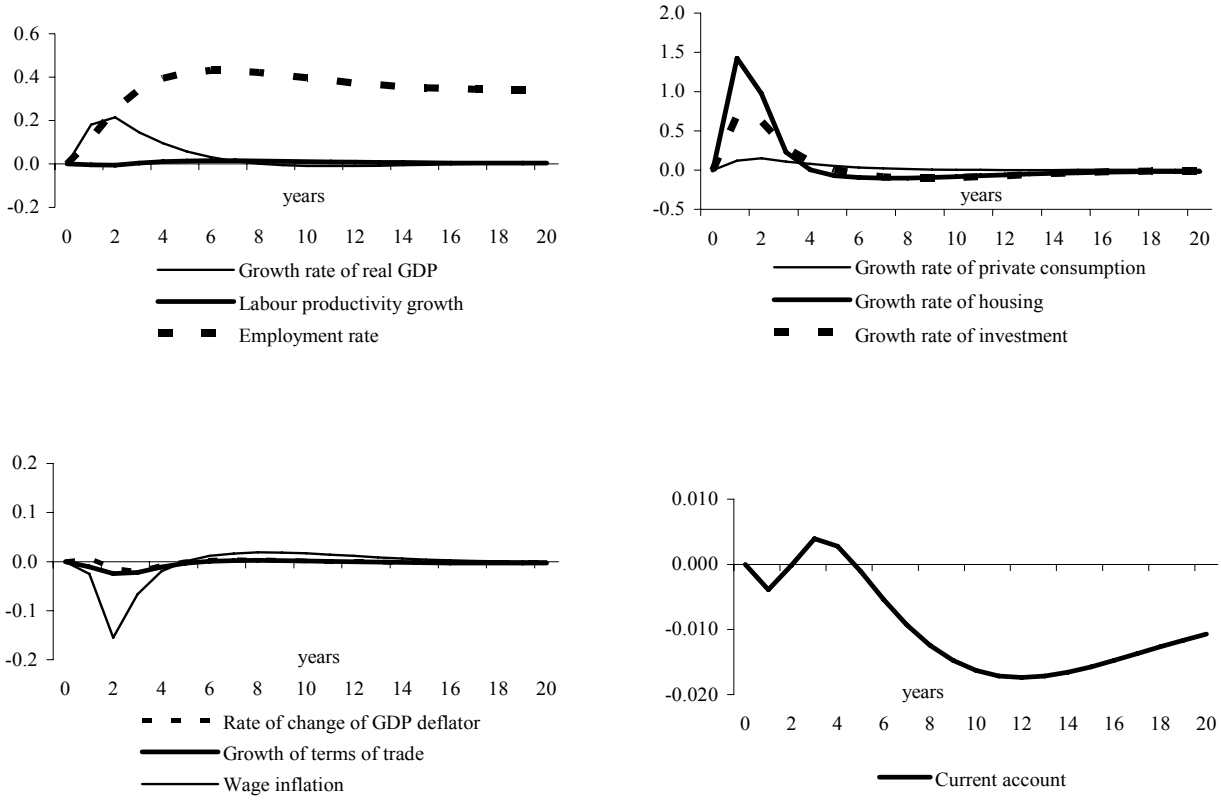
Graph 2.3: Increase of non-tradeable TFP by 1% in the first year



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

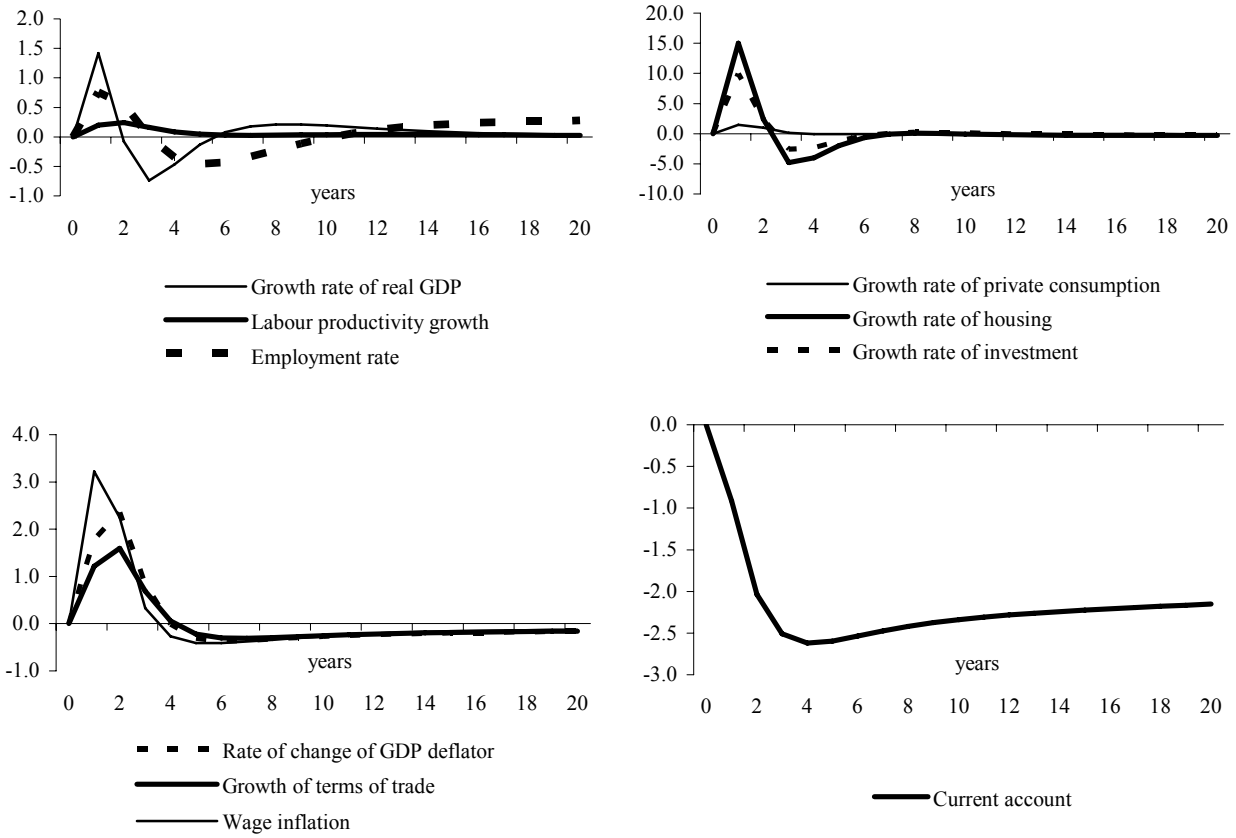


Note: All variables are expressed in terms of deviations from the baseline.

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).

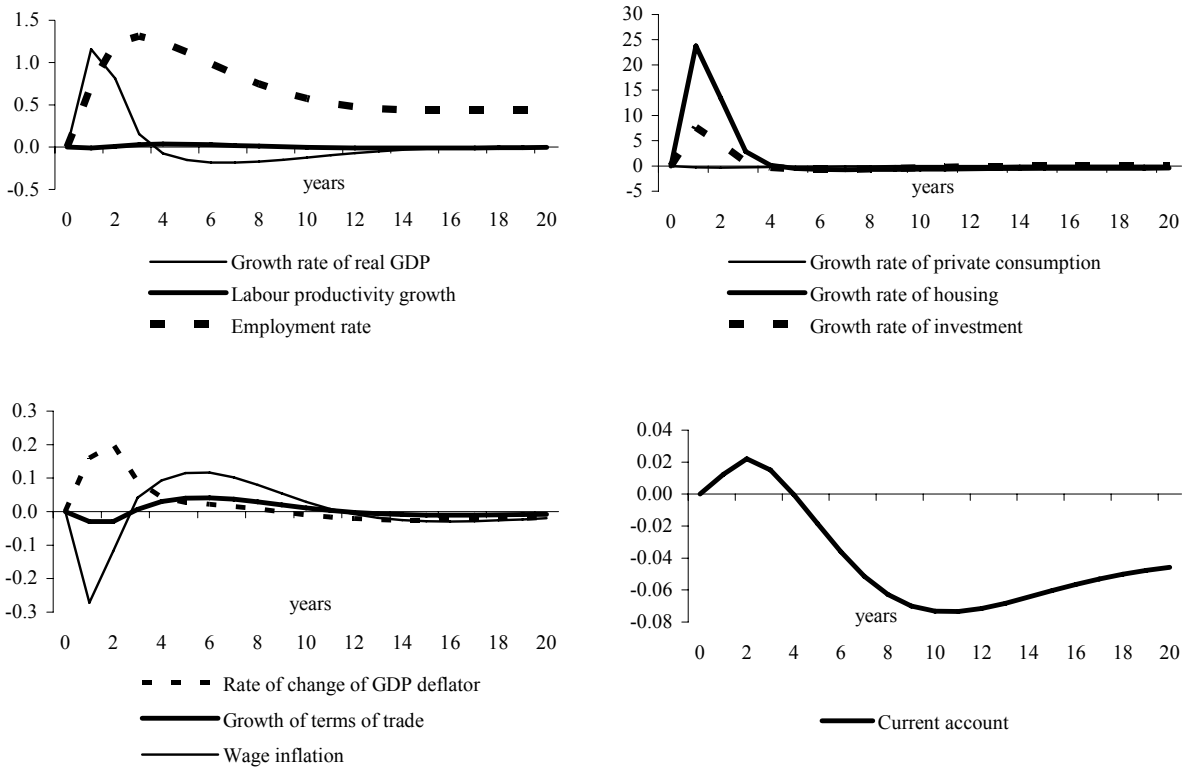
Graph 2.5: Risk premium reduction by 0.5 of a percentage point



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)

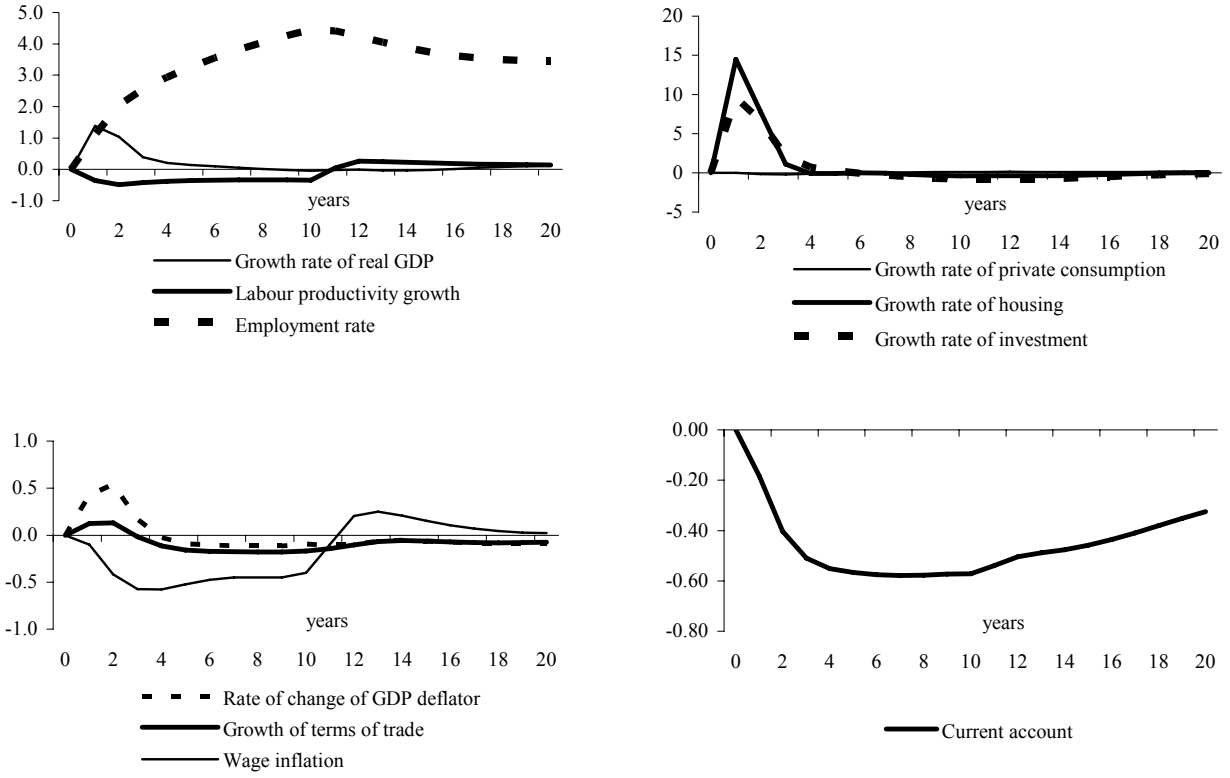


Note: All variables are expressed in terms of deviations from the baseline.
Source: Commission Services

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.

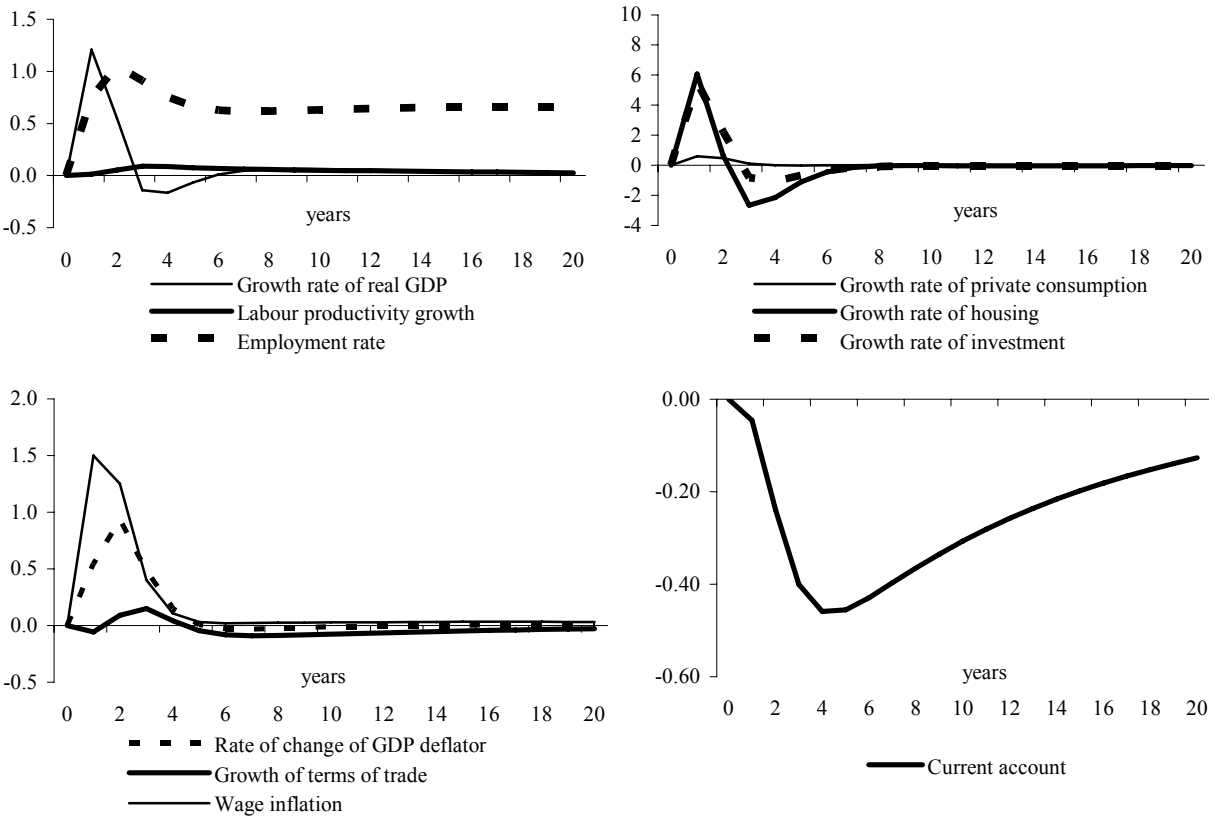
Graph 2.7: Population shock (10 years, anticipated, +1%)



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.

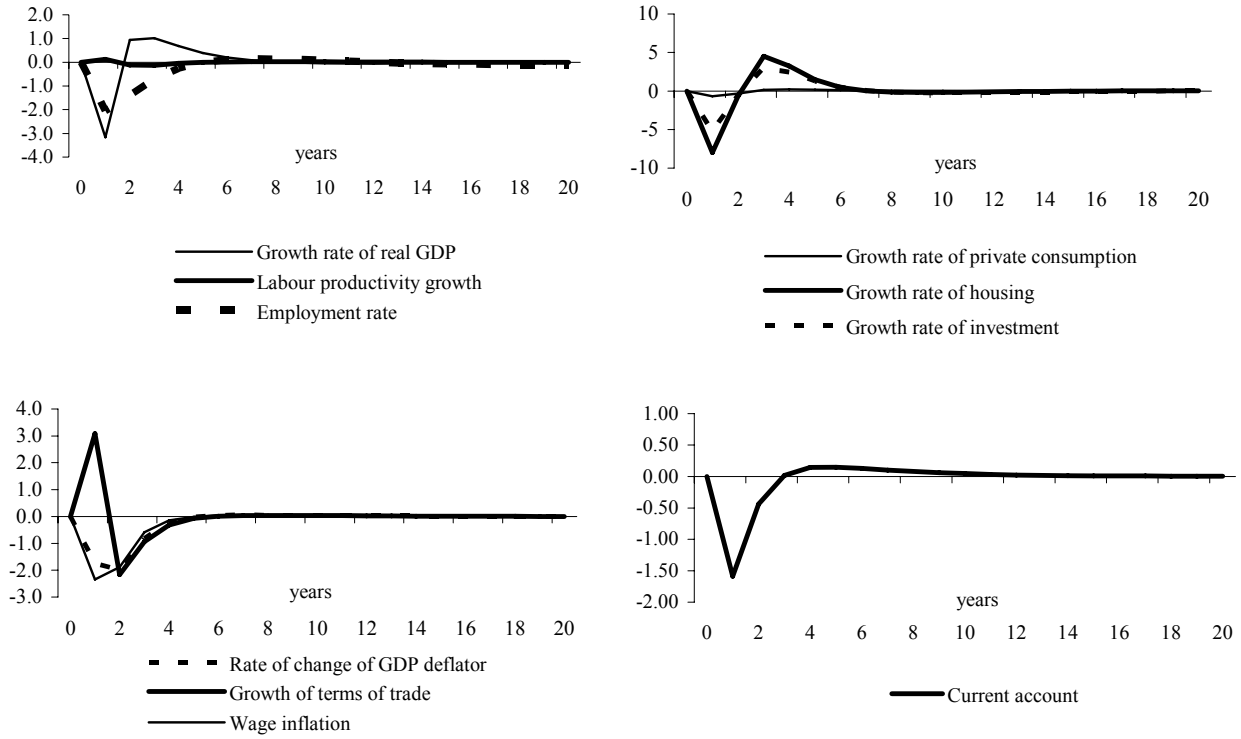
Graph 2.8: Reduction in mark-up due to openness



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%)

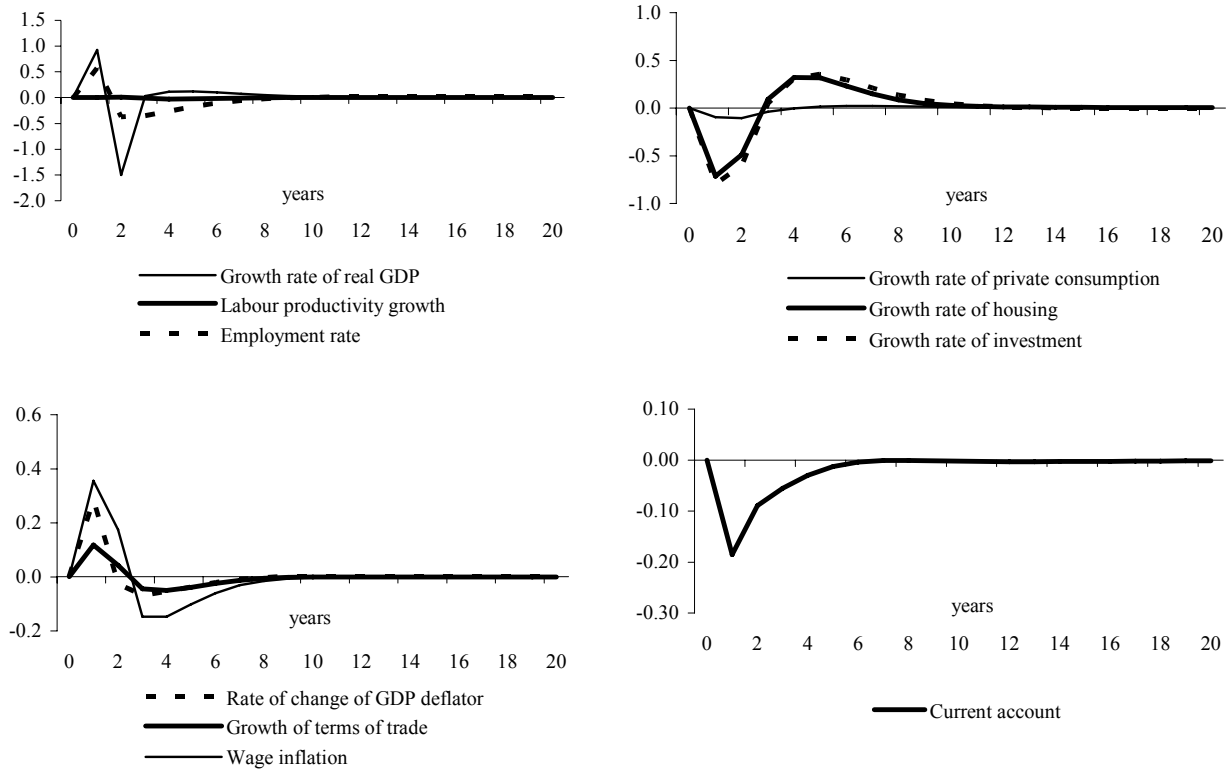


Note: All variables are expressed in terms of deviations from the baseline.

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

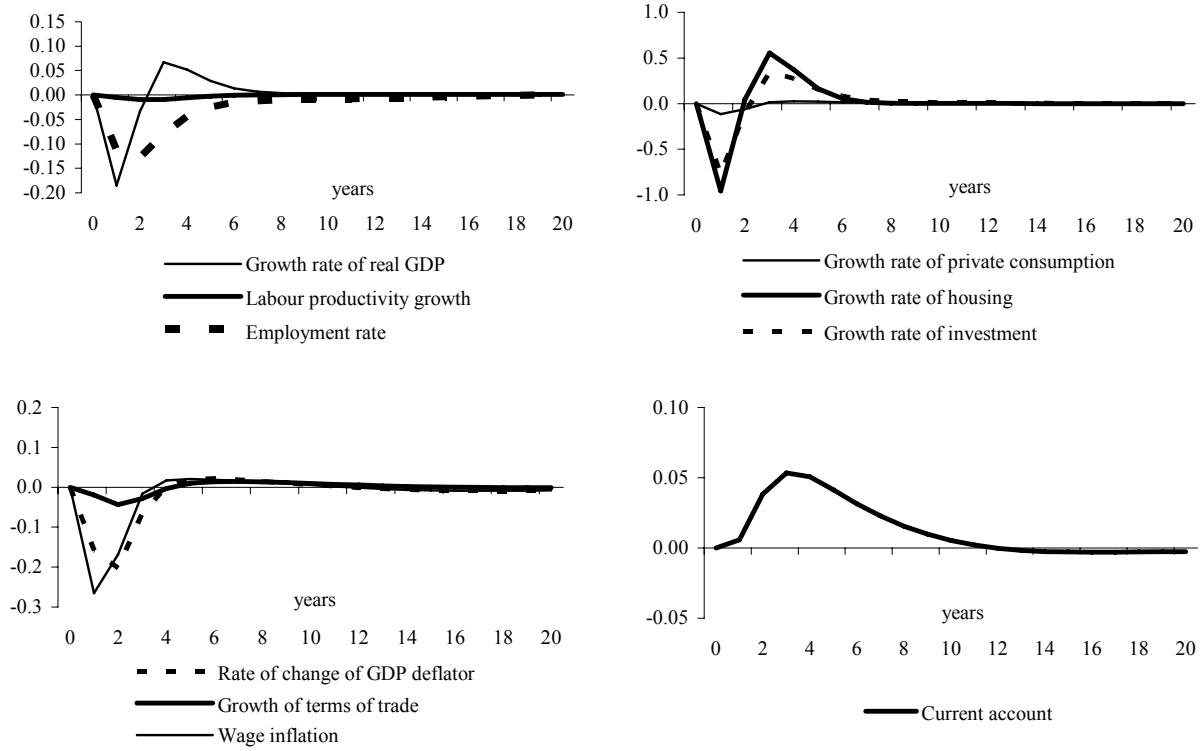
This experiment shows how the economy responds to a temporary increase in government expenditure in a single country within the euro area (Graph 2.10). The fiscal multiplier is positive in the first year and slightly below one. The increase in government demand also has a positive short run employment effect. In the short run the model shows a typical Keynesian response to a (temporary) demand shock.[10] 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.

[10] 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

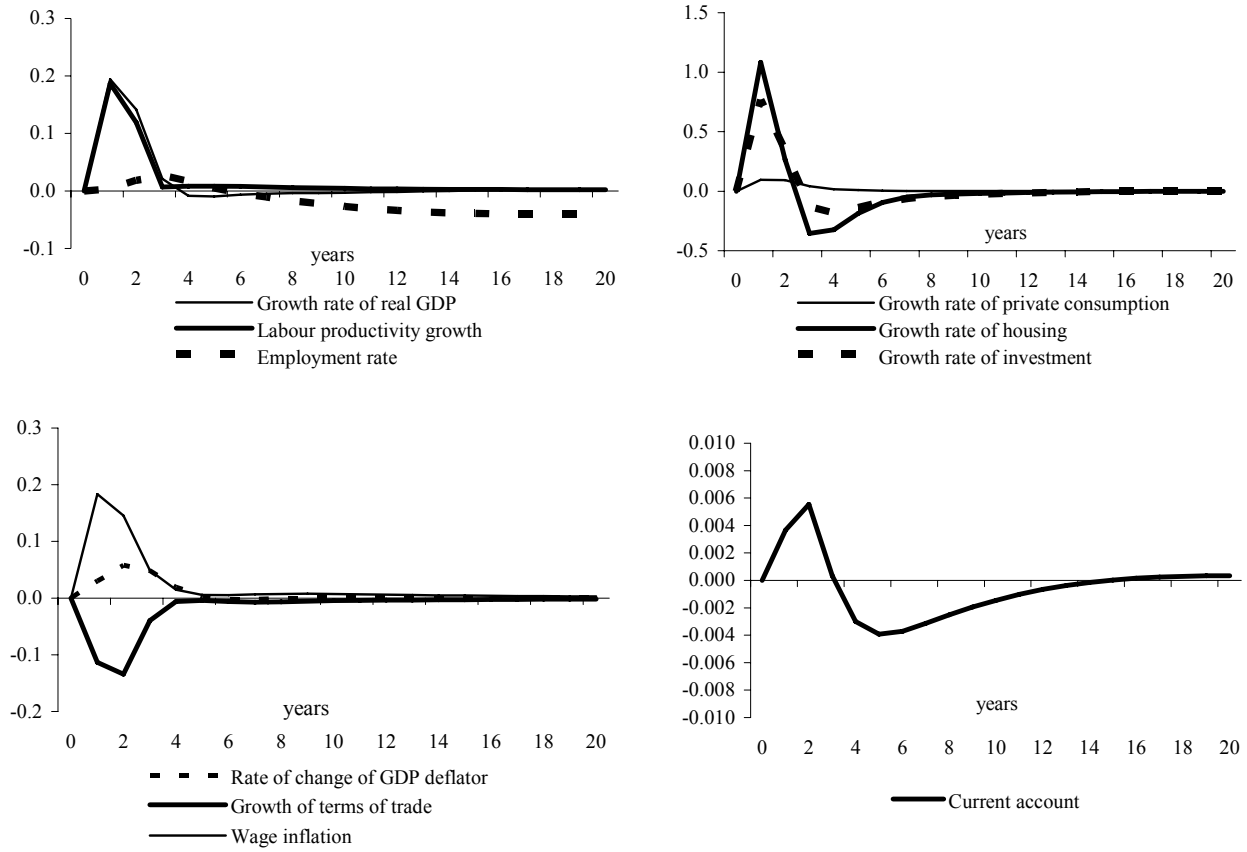


Note: All variables are expressed in terms of deviations from the baseline.

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

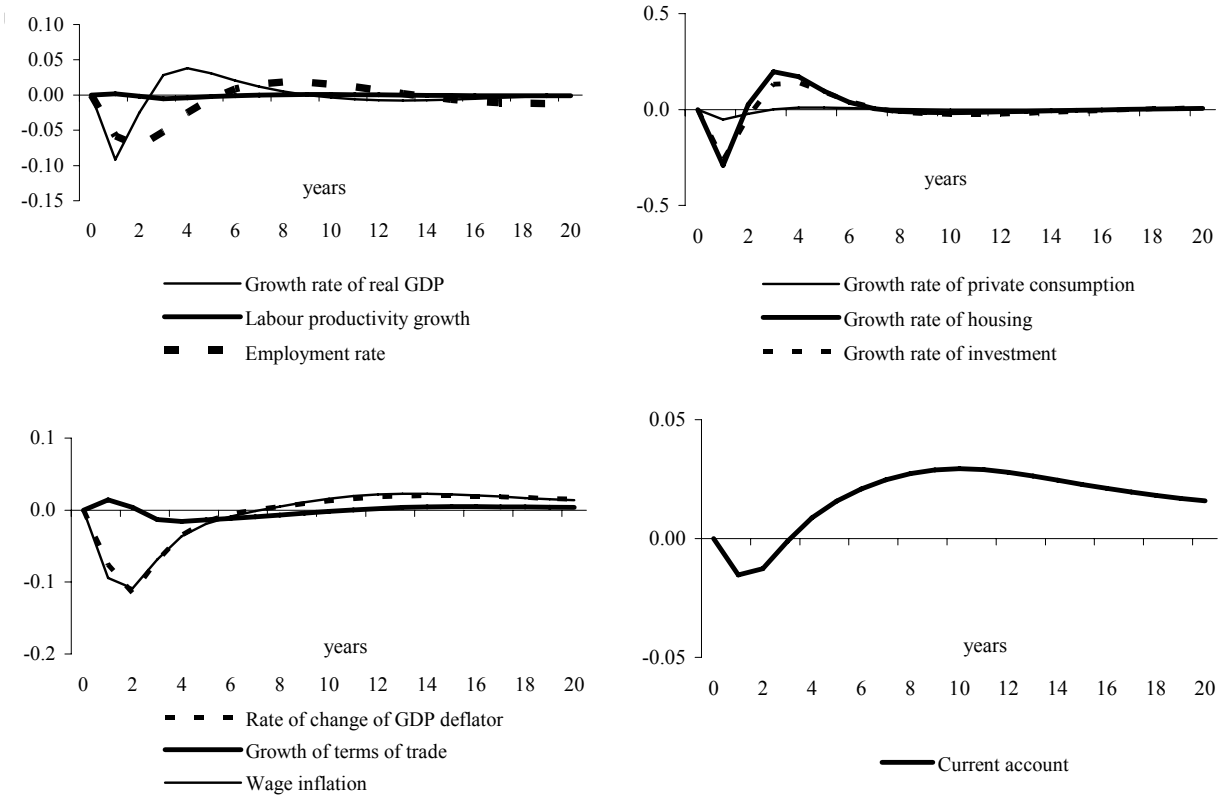


Note: All variables are expressed in terms of deviations from the baseline.

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
Euro area	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.

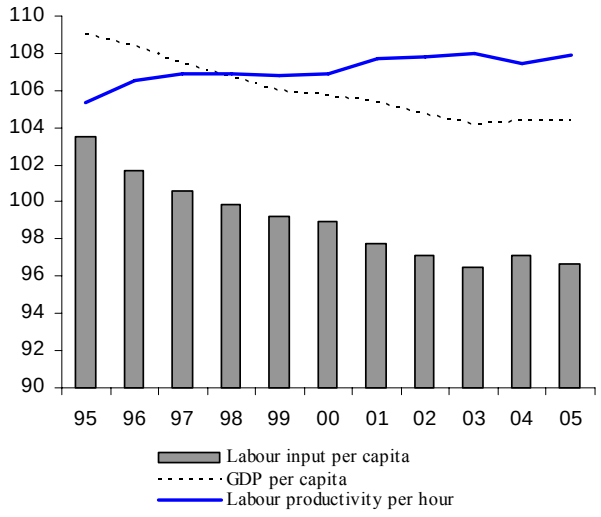
3.2.1 Macroeconomic scene setter

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). [11]

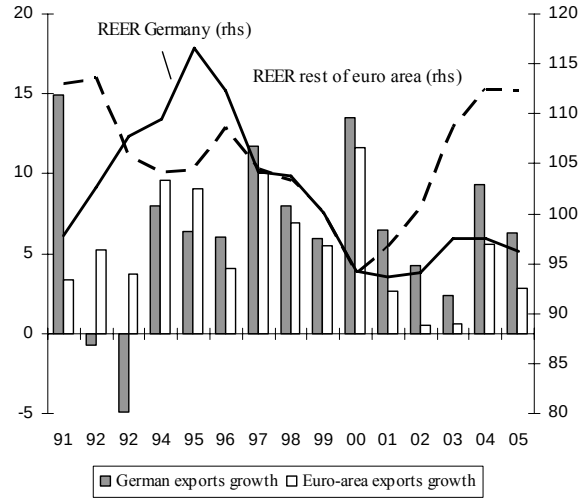
As a consequence of the strong real exchange rate appreciation, Germany steadily lost export market shares between 1992 and 1995.[12] The contribution of net exports to real GDP growth was strongly negative in 1992 and remained non-existent or just slightly negative until 1995, as a result of weak domestic 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.

Graph 3.1a: Decomposition of labour productivity - Germany relative to the euro area (euro area=100)



Source: Commission Services

Graph 3.1b: Real effective exchange rates and export growth in Germany and the rest of the euro area, 1992-2005



Note: Real effective exchange rates based on the basis of nominal unit labour costs; 1999=100. Exports of goods and services at 2000 prices.

Source: Commission Services

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

[11] For a more detailed analysis, see Jansen (2005).

[12] 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.[13] 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.[14] 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.[15]

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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13 See Jansen (2004).

14 See chapter V for a discussion of the issues associated with defining the real interest rate.

15 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.[16] 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.

[16] 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[17] 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.[18] 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.[19] 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.[20]

[17] 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%.

[18] 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.

[19] 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%.

[20] 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:

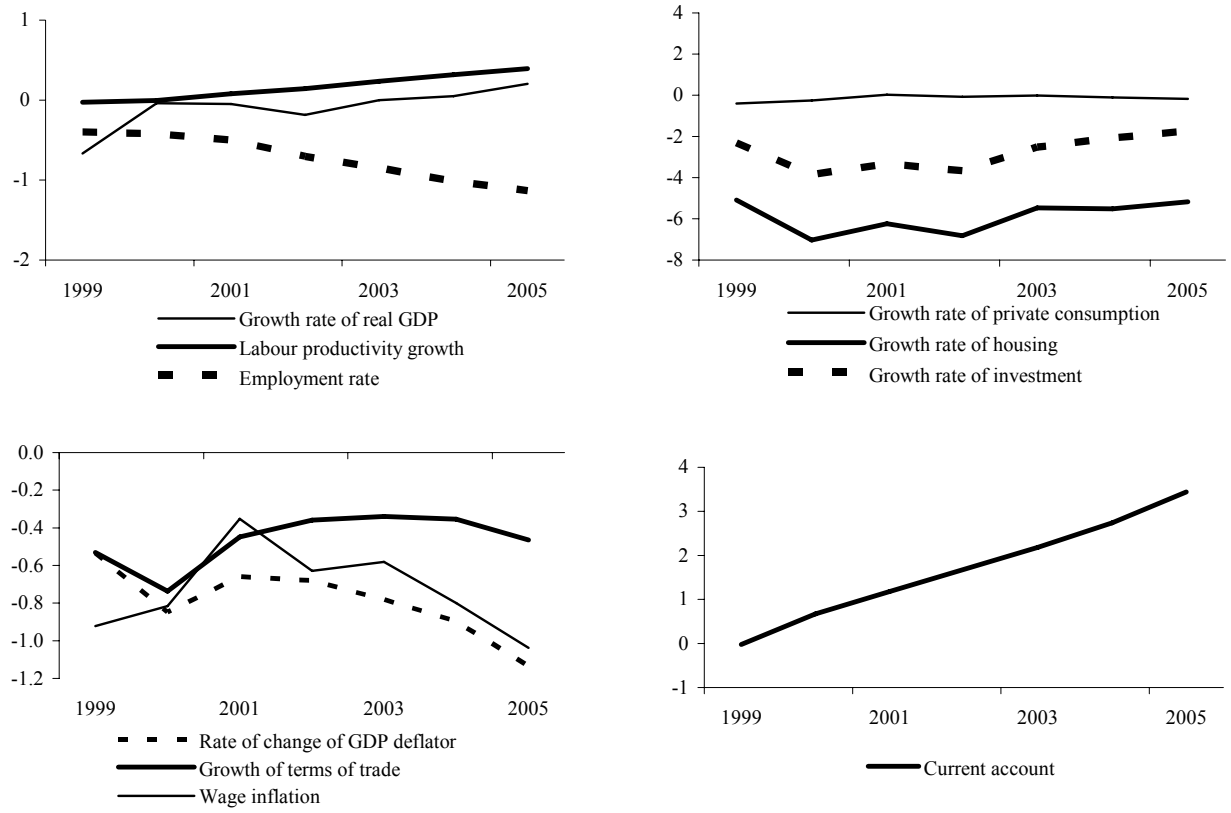
1) Shocks related to the creation of the euro area explain GDP and its components as well as inflation in the period 1999-2001. The convergence in the risk premium in other euro-area countries towards the German level also explains a lower permanent consumption level and a more permanent current account 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

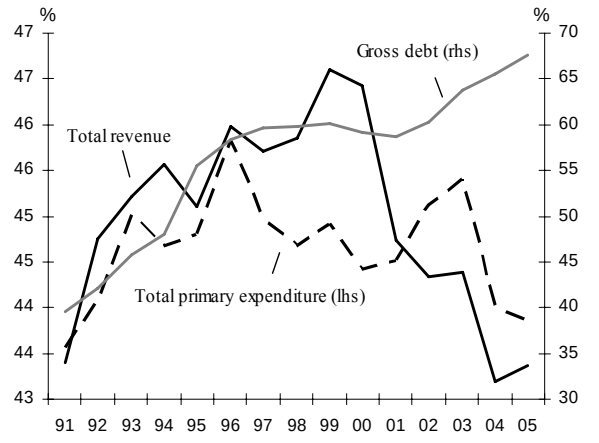
An assessment of the current situation of Germany is closely tied to two questions, both of which are influenced by the degree to which past and present reforms improve the functioning of the economy. The first question concerns whether the correction of the original misalignment of the German economy 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.[21] 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

[21] 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.

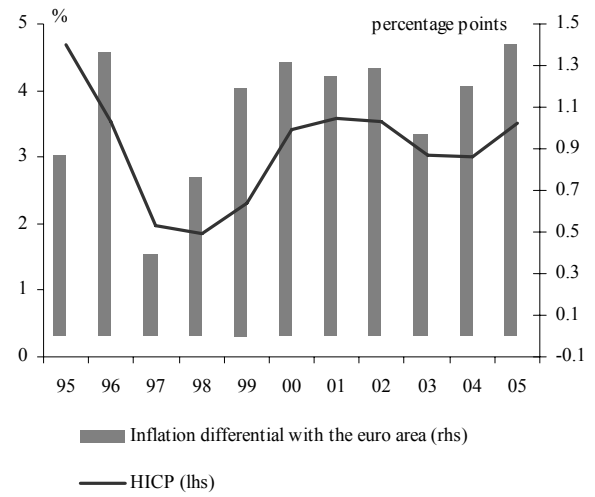
Since 1995 and during the run-up to the third stage of EMU, the Spanish authorities put in place a combination of economic policies aiming to converge in both nominal and real terms with the core countries of the euro area (namely Germany and France). The pillars of this strategy were monetary and fiscal 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[22], 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.

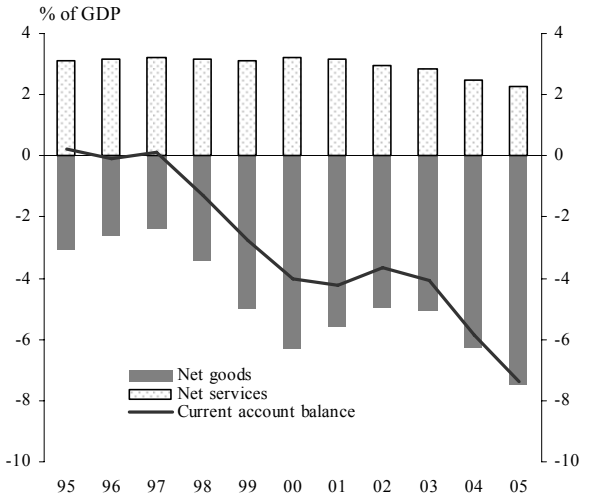
On the nominal front, the consistent pursuit of monetary and fiscal targets led to a gradual decline of inflation and interest rates. Lower inflationary pressures gave way to a sustained reduction of interest rates, which has been a main driver behind the present expansionary phase. The fulfilment of 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.

[22] For a more detailed description see Yaniz (2006).

Graph 3.3a: HICP inflation and differential versus the euro area, 1995-2005



Graph 3.3b: External accounts, 1995-2005



Source: Commission Services and Banco de España

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.[23] 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.[24] 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[25] (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)

[23] The third source has been implemented as a residual shock to the model in order to replicate the divergent housing trend in Spain.

[24] 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.

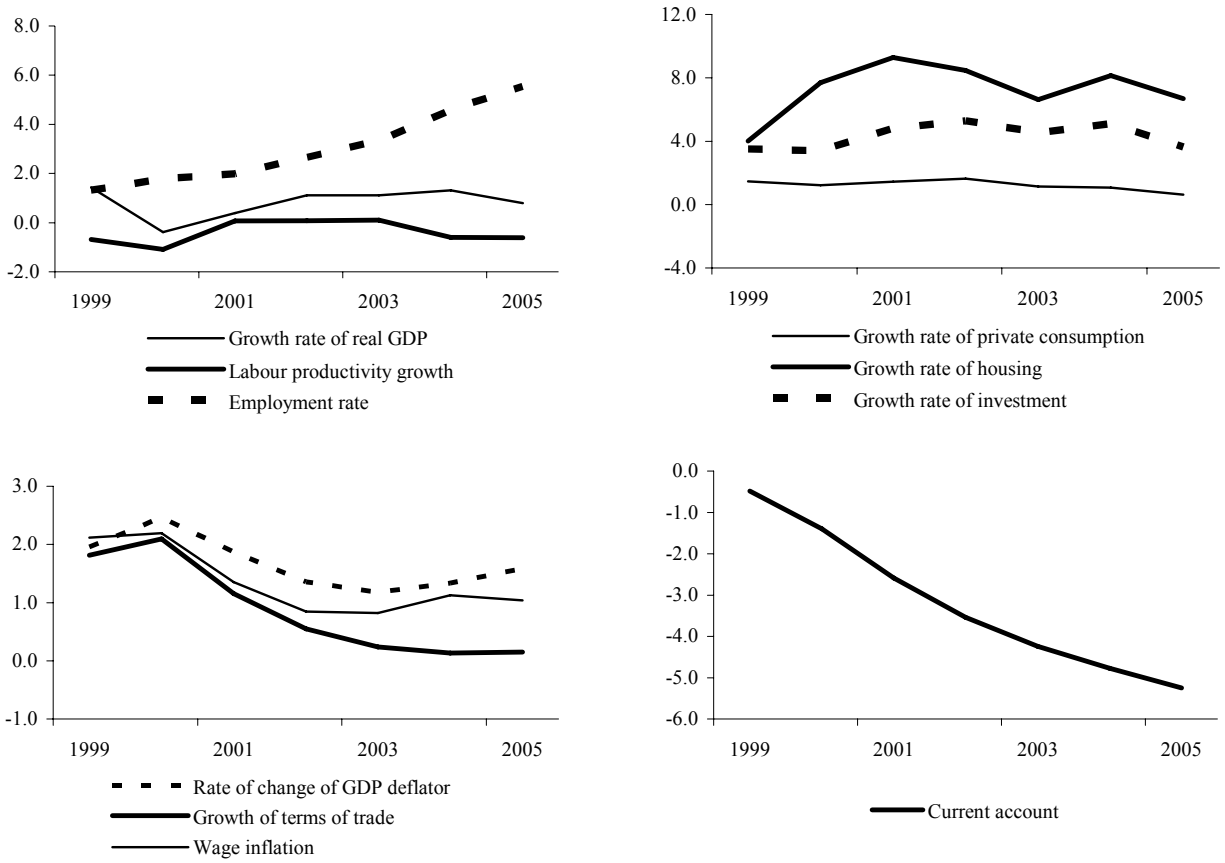
[25] An inflationary effect from increased competition in tradeables sounds counterintuitive. Indeed increased competition does not increase prices in the tradeable sector but it increases wages which in turn leads to higher inflation in the non tradeable sector.

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

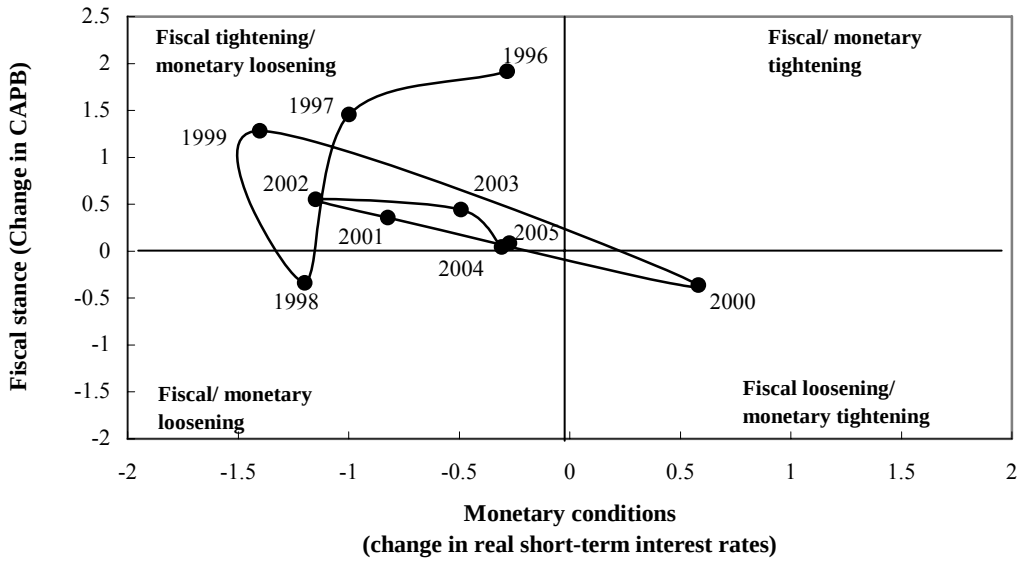
In the euro area, both monetary and exchange rate policies are beyond the direct control of Member States' authorities. This means that fiscal and structural policies are crucial in ensuring a smooth medium-term adjustment. Therefore, the question arises as to the consequences of this new policy framework 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.[26] 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,[27] 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.

[26] For a more detailed description of the tax elasticities linked to these phenomena in Spain, see box 2 in European Commission (2006d).

[27] 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.

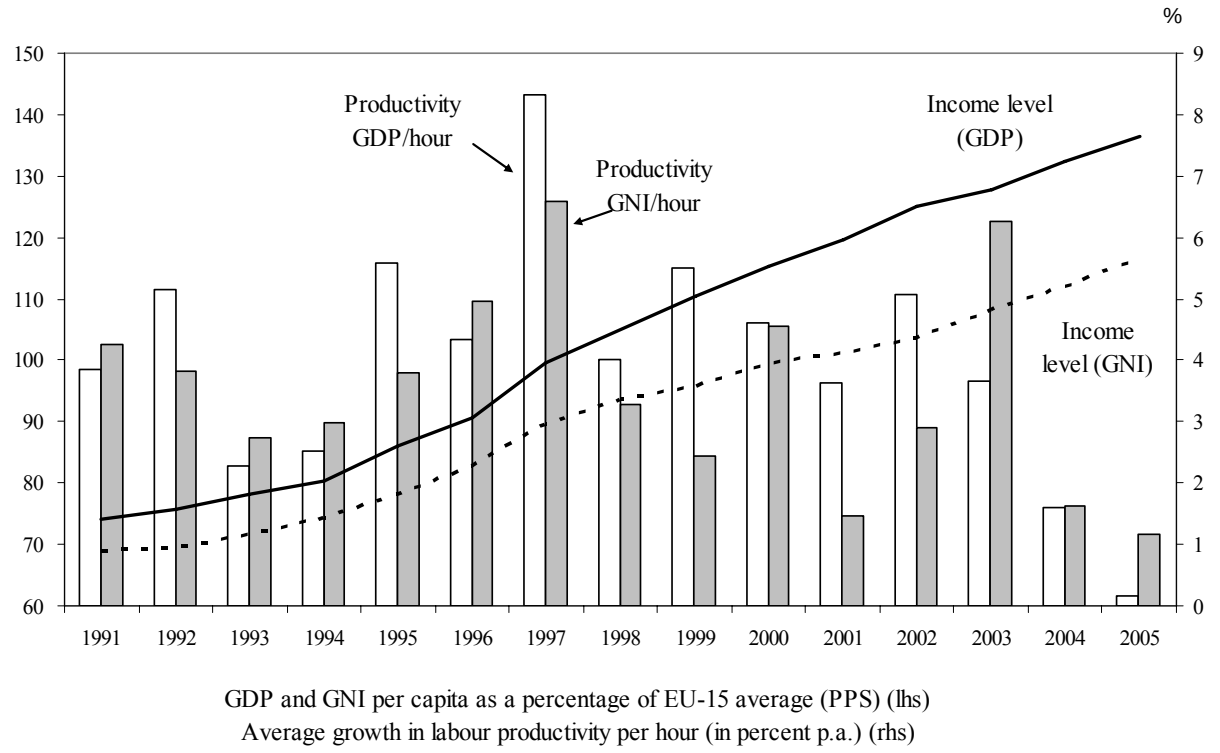
3.4 Ireland

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[28]. In recent years there have been some signs that the rate of technical progress is slowing down. However, other sectors of the

[28] 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-Samuelson 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.[29]

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

[29] 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[30] (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:

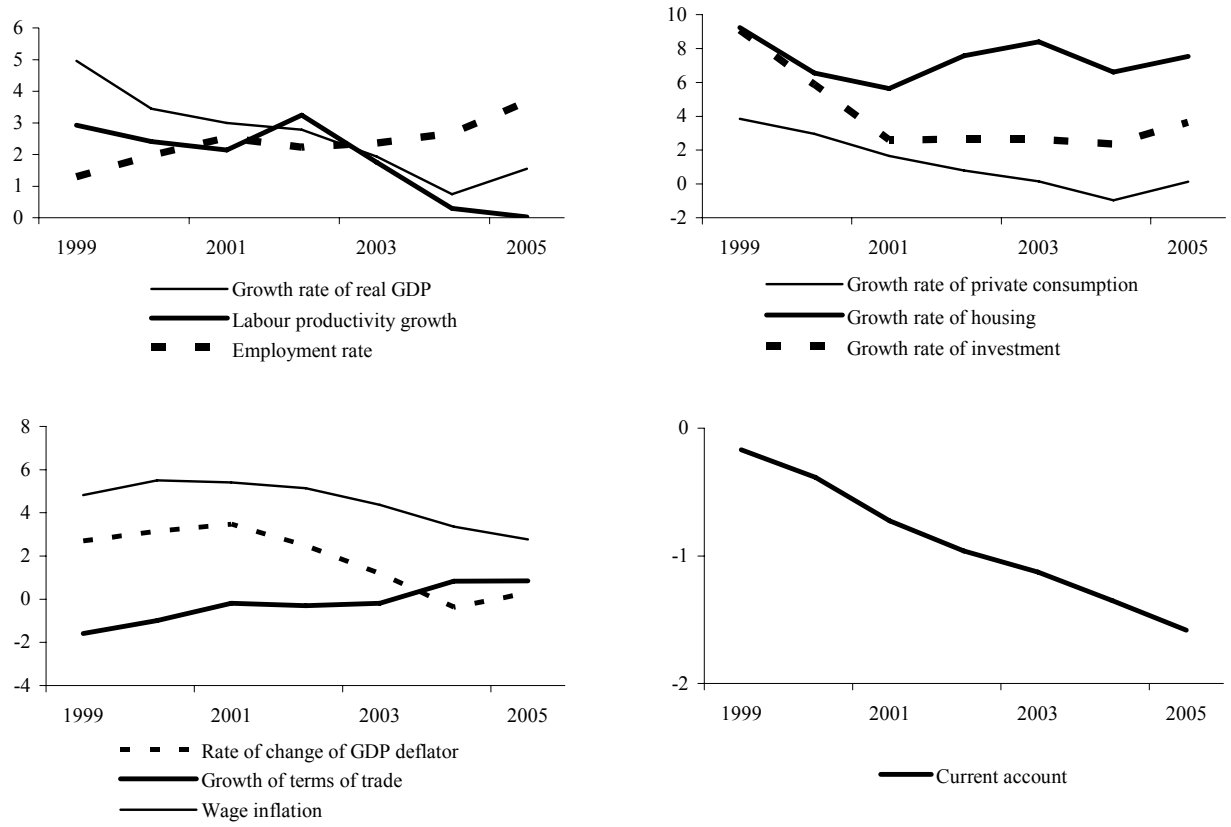
1) The model, including the shocks, accounts reasonably well for the decline in the growth rate of GDP (per capita) from around 5% in 1999 to about 1% in the last two years and a similar decline in productivity. The model also captures the evolution of employment.

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.[31]

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

[30] 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.

[31] 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.

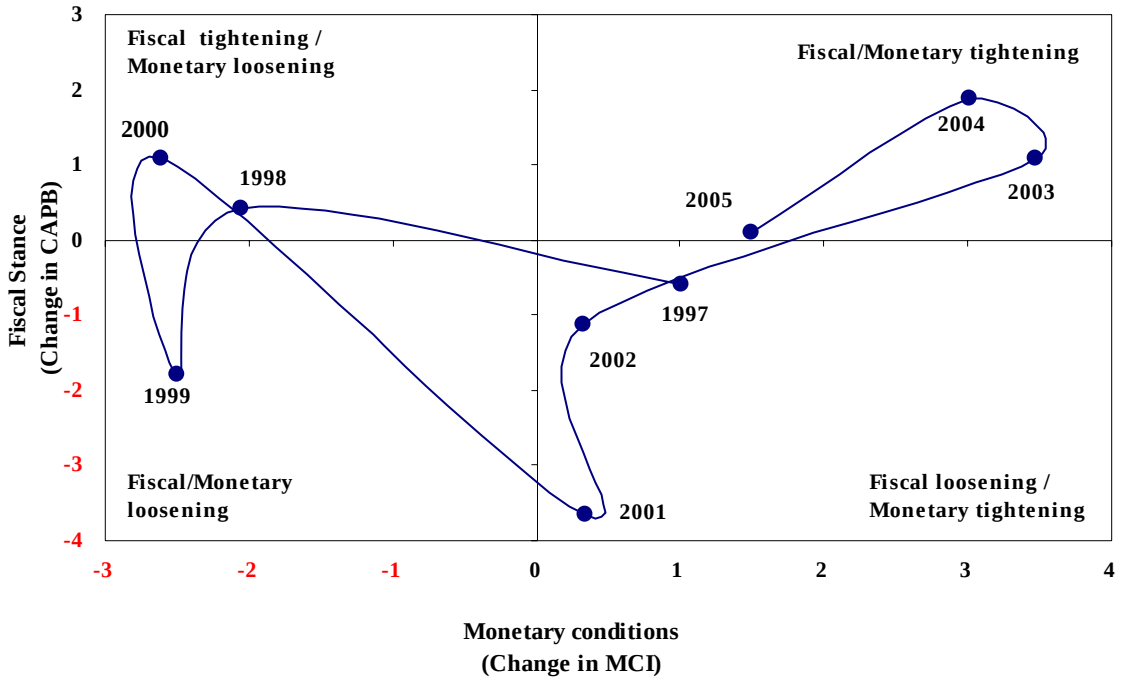
For Ireland, two types of disturbances affecting both the internal and external equilibrium of the economy and requiring adjustment within the euro area can be identified. First, the initial interest rate shock in the years 1998-2000 related to euro-area entry was combined for Ireland with a pro-cyclical fiscal loosening (see Graph 3.6).[32] 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.[33] 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.

[32] 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.

[33] 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).[34] 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[35] which would give some room for manoeuvre in the event of an economic downturn.

[34] See O'Malley and McCarthy (2005).

[35] 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

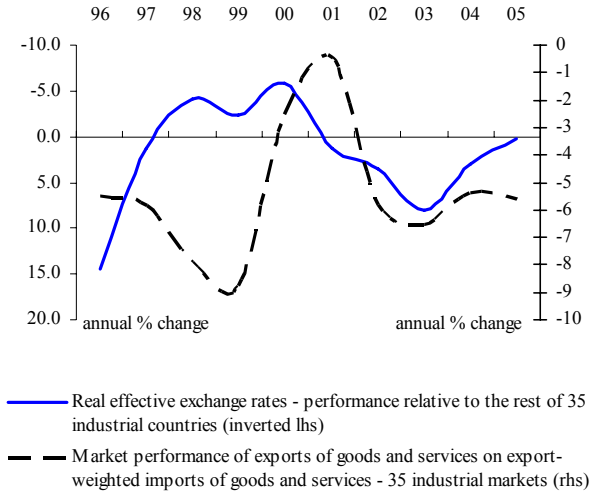
The pace of economic expansion of the Italian economy has experienced a visible slowdown, which has reversed real convergence with the euro area.[36] Specifically, economic growth in Italy has consistently underperformed the euro-area average since the mid-1990s. After achieving full economic convergence 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,[37] 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.

[36] 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).

[37] Italy's low potential growth is analysed in Larch (2004). See also Bassanetti et al. (2006).

Graph 3.7a: Real effective exchange rate and export performance



Graph 3.7b: Government gross debt and primary balance

Source: Commission Services

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[38] 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,[39] 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.

38 See for instance Banca d'Italia (2006).

39 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.[40] 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.

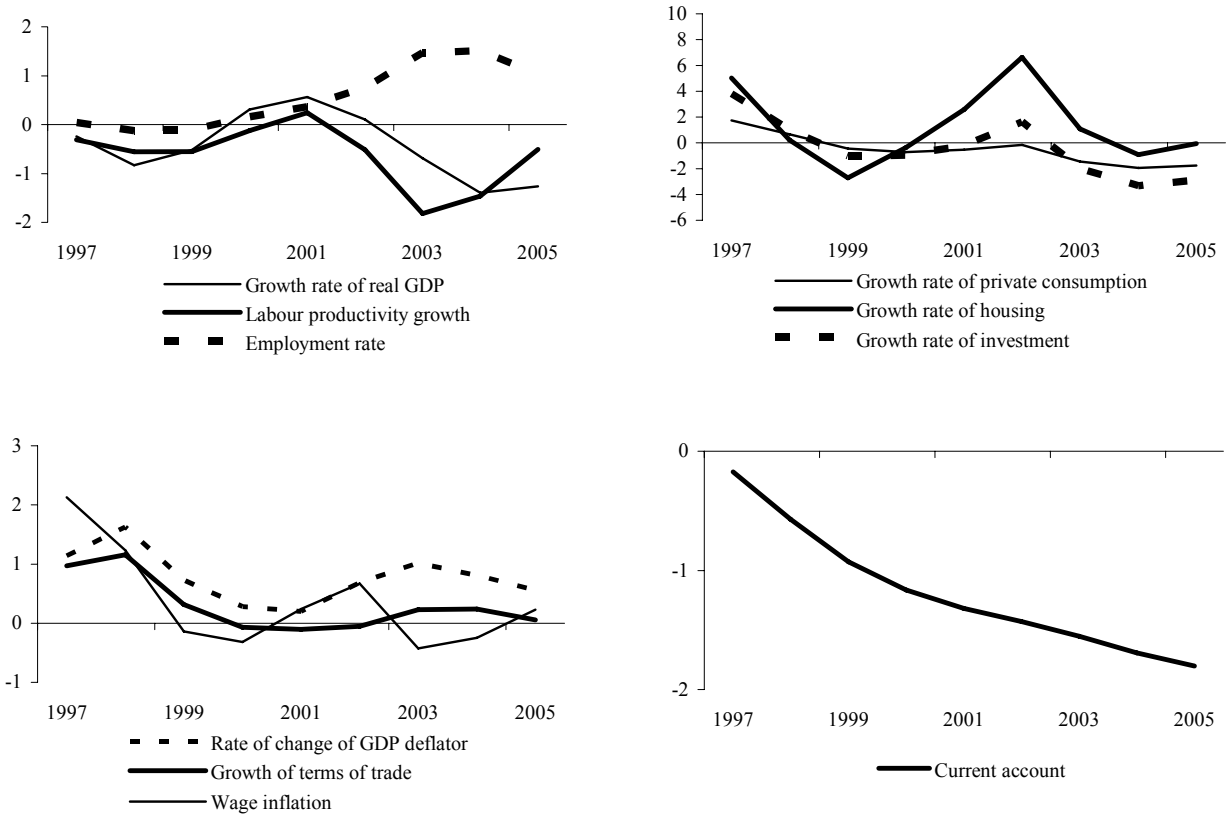
From 2000 onwards, the increase in the employment rate through labour market reforms largely countered the effects of negative population growth on the GDP growth rate. A shift in demand towards housing, together with loosening of lending constraints, allowed housing prices to rise despite the unfavourable economic developments and underpinned construction investment.

[40] 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 wage, 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.[41] 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.[42] As a result, household financial liabilities (as a percentage of GDP) in the Netherlands almost doubled since 1990.

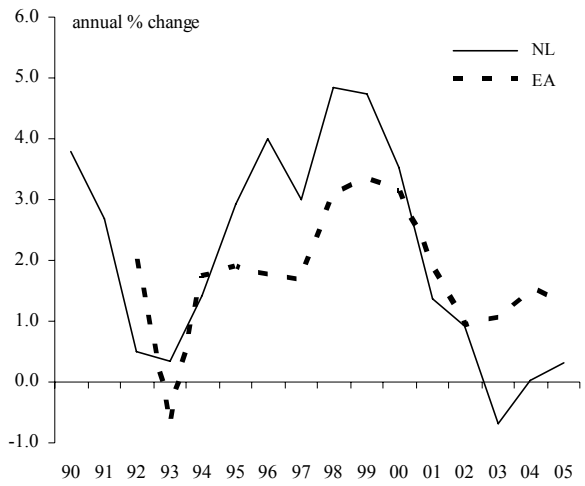
Booming equity markets around the world in the second half of the 1990s interacted pro-cyclically with the Dutch pension system. The high returns on stock market equities prompted several pension funds to lower – or not increase – contributions from employers and employees. Some pension funds even gave '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[43] 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).

41 See Bethuyne and Buitenkamp (2006).

42 See Van Els et al. (2005).

43 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 market 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. A shock to debt financing and a housing demand shock is 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.

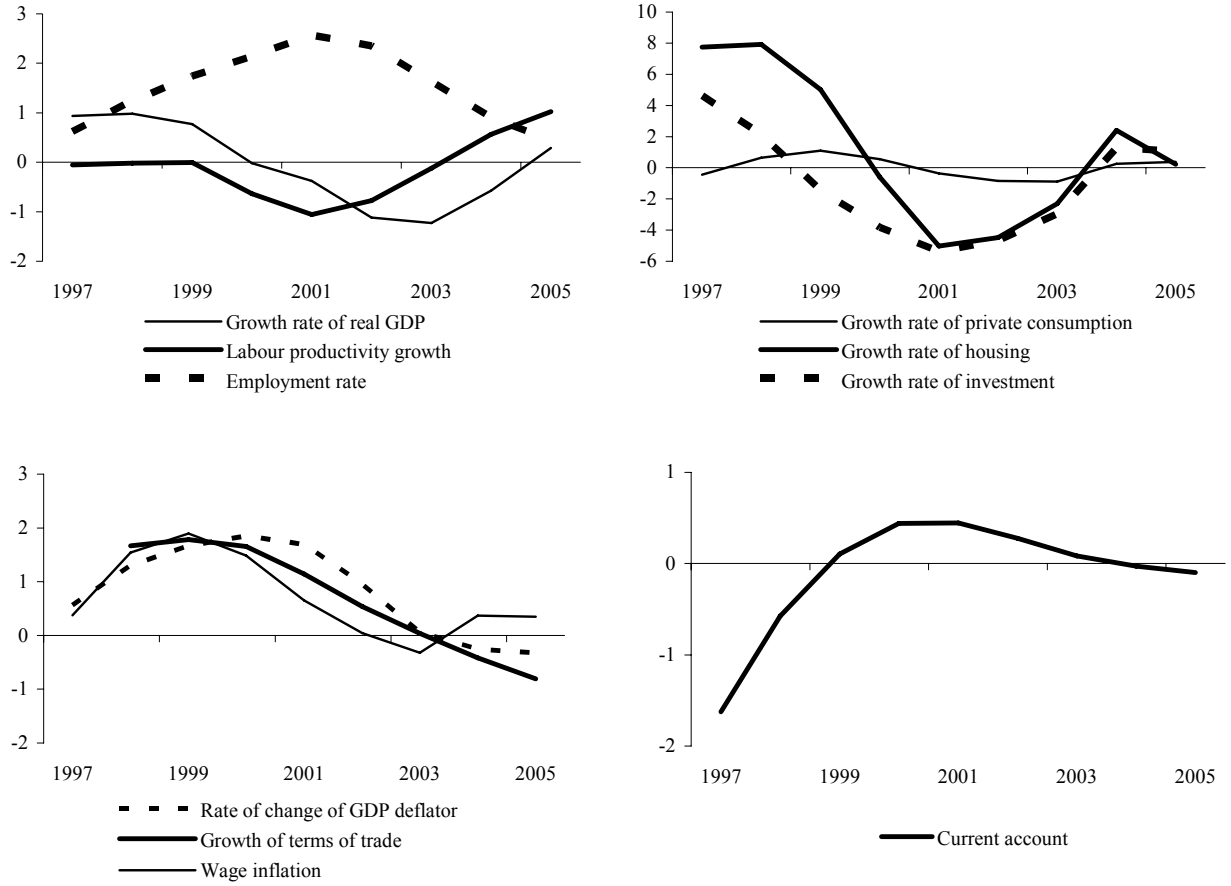
Summing up:

1) The prolonged period of wage moderation while the guilder was credibly linked to the DEM had lead 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 was called for. However, following the adoption of the euro, realignments were no longer possible and the Dutch guilder entered the euro area at a certain discount,[44] 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.

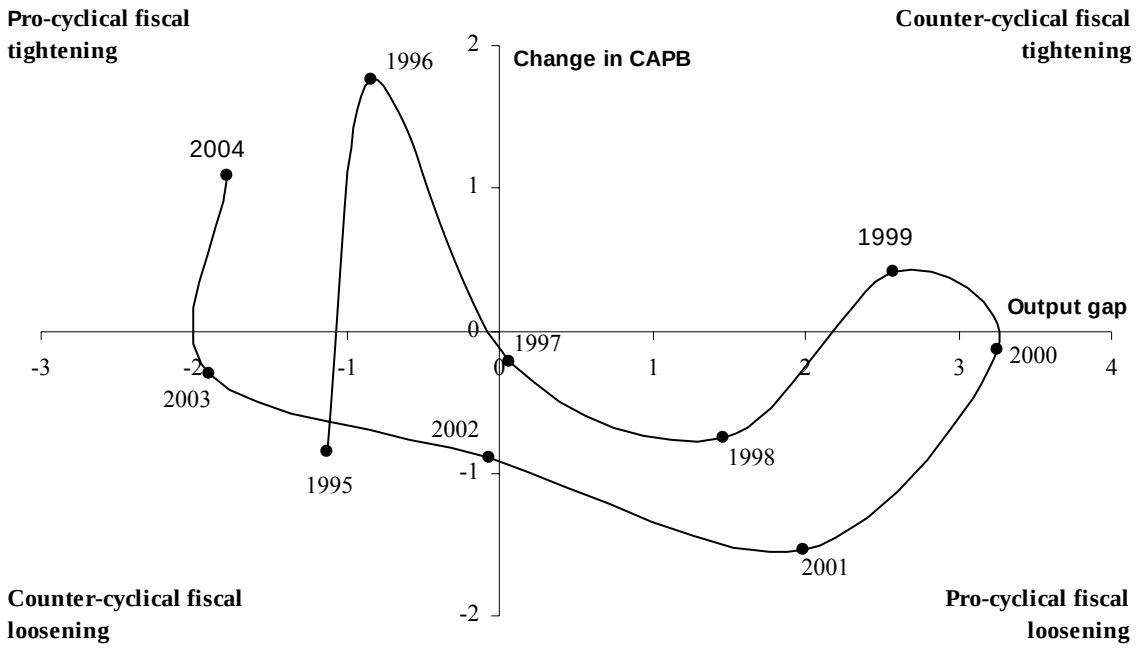
The consequence was that while cyclically-adjusted balances seemed very sound throughout the period, fiscal policy turned out to be pro-cyclical *ex post* (Graph 3.9). The fiscal rule in place at the time implied that only part of the higher-than-expected revenues was assigned to deficit reduction. It did not prevent the pro-cyclical bias during the boom period.

[44] 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, 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 currently 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

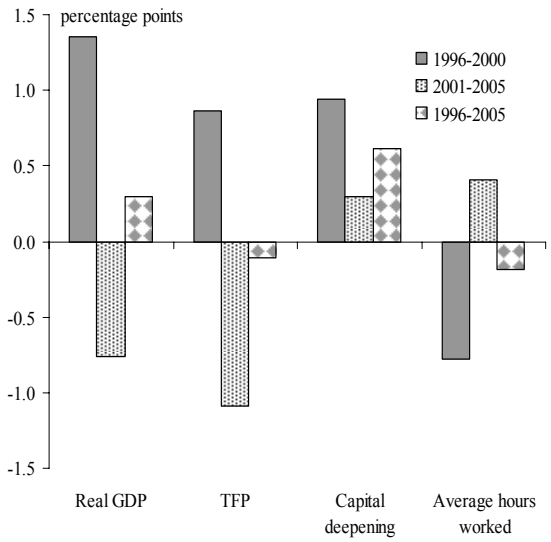
3.7 Portugal

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, at 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

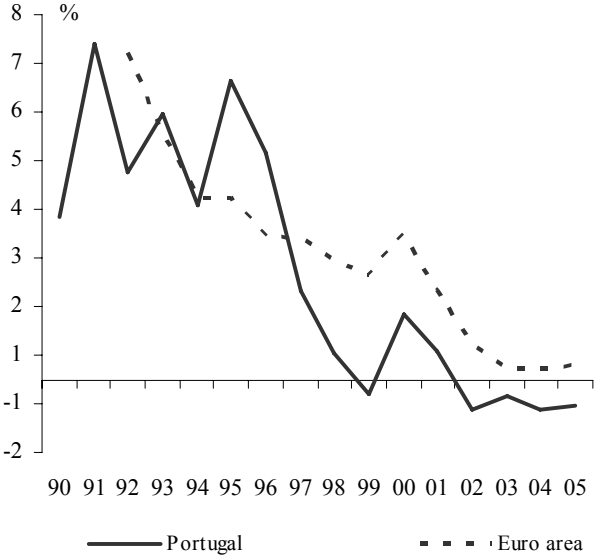
The Portuguese economy went through a boom in the run up to euro-area membership, which started soon after the mid 1990s. Until the end of the decade, annual GDP growth in Portugal exceeded 4% and was above that of the euro area, resulting in a catching up to the euro-area average. However, since around 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.[45]

Graph 3.10a: Differential growth rates of real GDP and some components relative to the euro-area average, 1996-2000, 2000-2005 and 1996-2005



Source: Commission Services

Graph 3.10b: Short-term real interest rates in Portugal and the euro area, 1990-2005



Note: The short-term real interest rate is defined as the short-term nominal rate less the rate of change of the GDP deflator.

Source: Commission Services

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.[46]

[45] A comprehensive analysis of the Portuguese economy is contained in European Commission (2004b).

[46] 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).[47] 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.[48]

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).[49] 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.

[47] For a more detailed analysis on Portuguese households over the last decade, see Cardoso (2005).

[48] 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.

[49] 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.[50]

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.

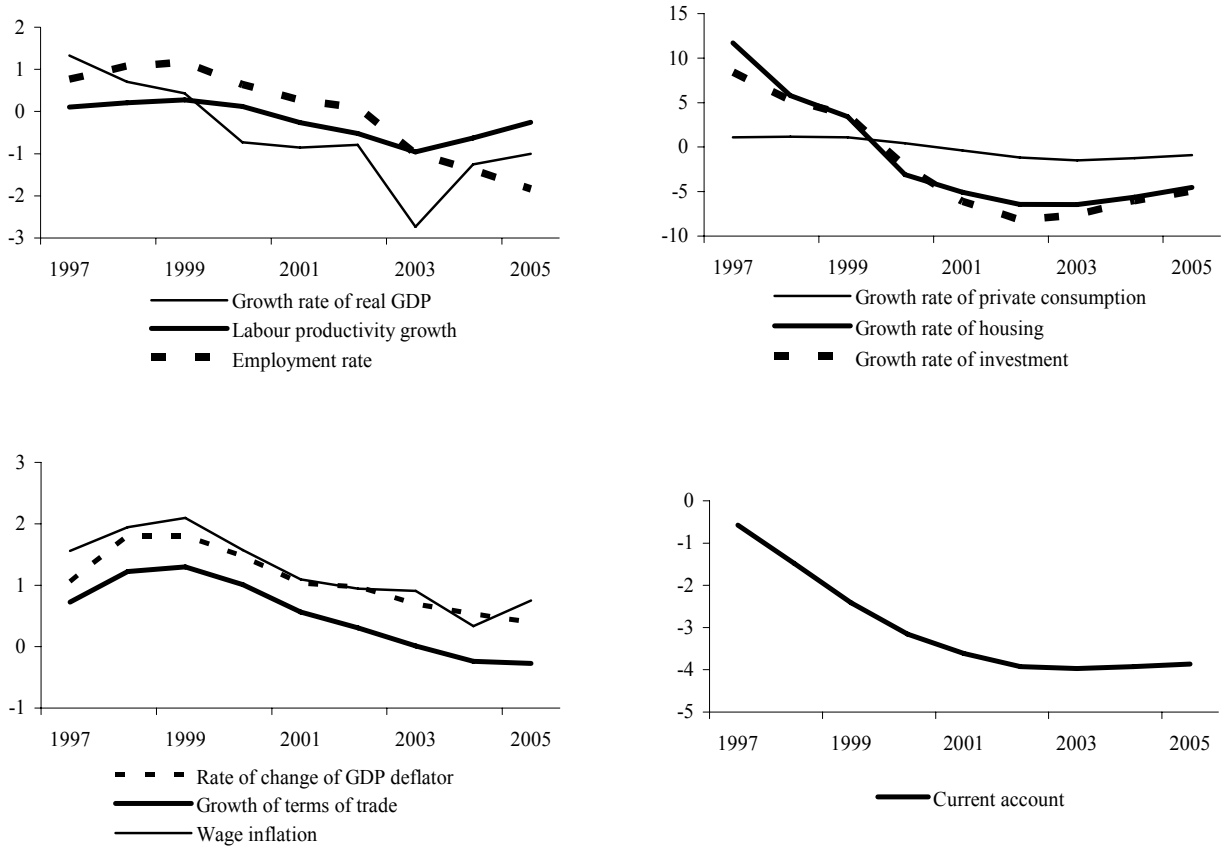
Summing up:

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:

[50] 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.

1) High growth of GDP and its components in the late1990s, followed by a sustained negative growth differential since 2000.
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)



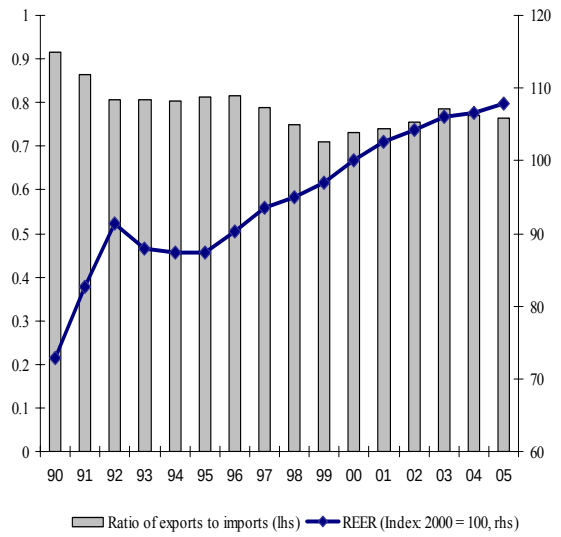
Note: All variables are expressed in terms of deviations from the baseline. The unit of measurement on the vertical axis is percentage points.
Source: Commission Services

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.

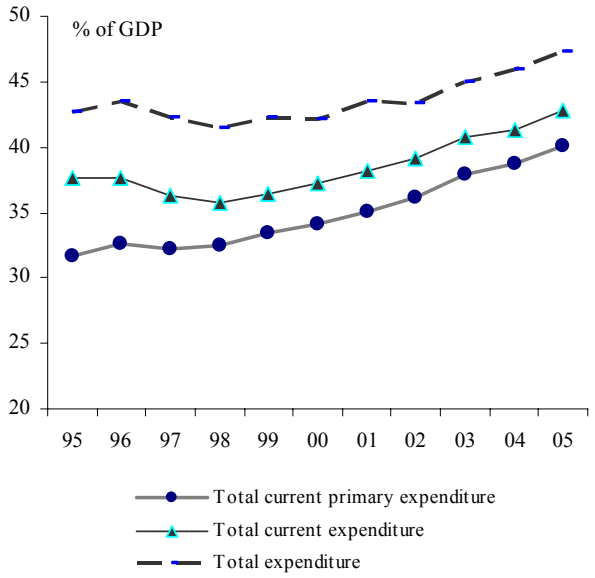
Graph 3.11a: Real effective exchange rate (versus EA11) and ratio of exports to imports of goods and services, 1990-2005



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

Source: Commission Services

Graph 3.11b: Public expenditure developments, 1995-2005



Source: Commission Services

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,[51] 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.

[51] See, for example, Deroose, Langedijk and Roeger (2004).

ANNEX: A TWO-COUNTRY-THREE-SECTOR DYNAMIC STOCHASTIC GENERAL EQUILIBRIUM (DSGE) MODEL[52]

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[53]

$$\text{(1a)} \qquad Y_t^{T,j} = \frac{1}{n^T}\left(\frac{P_t^{T,j}}{P_t^T}\right)^{-\frac{1}{\tau_t}}\left[\left(C_t^{TD} + G_t^D + I_t^{TD} + X_t\right)\right]$$

The demand function for non tradeables is given by:

$$\text{(1b)} \qquad Y_t^{N,l} = \frac{1}{n^N}\left(\frac{P_t^{N,l}}{P_t^N}\right)^{-\frac{1}{\tau_t}}\left[\left(C_t^N + G_t^N + I_t^{TN} + I_t^N + I_t^H\right)\right]$$

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:

$$\text{(2)} \qquad Y_t^s = (K_t^s U_t^s)^{1-\alpha}(N_t^s TFP_t^s)^{\alpha}, \text{ where } s = \{Tj, Nl\}$$

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52 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).

53 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:

$$(3) \qquad G_t^s = \frac{P_t^s}{P_t} Y_t^s - \frac{W_t}{P_t} N_t^s - i_t^T \frac{P_t^{CT}}{P_t} K_{t-1}^s - adj(P_t^s) - adj(N_t^s) - adj(U_t^s)$$

For adjustment costs, we use the following convex functional forms:

(4)

$$adj^L(N_t^s) = \frac{\gamma_N}{2} \Delta N_t^{s\,2}$$

$$adj^P(P_t^s) = \frac{\gamma_P}{2} \Delta \pi_t^{s\,2} \quad , with \quad \pi_t^s = P_t^s / P_{t-1}^s - 1$$

$adj^{CAP}(U_t^s) = K_t^s (a_1 (ucap_t^s - ucap^*) + a_2 (ucap_t^s - ucap^*)^2)$, 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:

$$(5a) \qquad \frac{\partial G_0^s}{\partial N_t^s} => \left(\alpha \frac{Y_t^s}{N_t^s} \eta_t^s + \frac{\gamma_L}{R_t} ({}_t N_{t+1}^s - N_t^s) - \gamma_N (N_t^s - N_{t-1}^s) \right) = \frac{W_t}{P_t^s}$$

$$(5b) \qquad \frac{\partial G_0^s}{\partial K_t^s} => \left((1-\alpha) \frac{Y_t^s}{K_t^s} \eta_t^s \right) = i_t^s \frac{P_t^{I,s}}{P_t^s}$$

$$(5c) \qquad \frac{\partial V_0^s}{\partial Y_t^j} => \eta_t^s = 1 - \tau^0 + \gamma_P \left[\beta_t \pi_{t+1}^s - \pi_t^s \right]$$

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:

$$(5c') \qquad \eta_t^s = 1 - \tau^0 + \gamma_P \left[\beta (sfp_t \pi_{t+1}^s + (1 - sfp) \pi_{t-1}^s) - \pi_t^s \right] \quad 0 \le sfp \le 1$$

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:

$$(6) \qquad I_t^{HO,h} = I_t^{HI,h\theta} U_t^H \quad \text{with } \theta \le 1$$

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) $$U(C_t^i) = \log((1+habc)C_t^i - habcC_{t-1})$$

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) $$C_t^i = \left[s_T^{\frac{1}{\rho}} C_t^{T,i(\frac{\rho-1}{\rho})} + (1-s_T)^{\frac{1}{\rho}} C_t^{N,i(\frac{\rho-1}{\rho})} \right]^{(\frac{\rho}{\rho-1})}$$

where ρ 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 ς.[54]:

(7c) $$C_t^{T,i} = \left[s_{TD}^{\frac{1}{\varsigma}} C_t^{TD,i(\frac{\varsigma-1}{\varsigma})} + (1-s_{TD})^{\frac{1}{\varsigma}} C_t^{TF,i(\frac{\varsigma-1}{\varsigma})} \right]^{(\frac{\varsigma}{\varsigma-1})}$$

Normalising the total time endowment of the household to one, then the utility from leisure is given by:

(8) $$V(1-N_t^i) = \frac{\omega + e_t^L}{1-\kappa}((1+habl)(1-N_t^i) - habl(1-N_{t-1}^i))^{1-\kappa} \quad \text{with } \kappa > 0,$$

where N_t^i is labour supplied by household *i*. Finally the household enjoys utility from the stock of housing (*HL*); the parameter φ 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) $$Z(HL_t^i) = (\varphi + e_t^H)\log((1+habh)(HL_t^i) - habh(1-HL_{t-1})) \quad \text{with } \kappa > 0,$$

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) $$HL_t^i = \left[s_H^{\frac{1}{\sigma}} H_t^{i(\frac{\sigma-1}{\sigma})} + s_L^{\frac{1}{\sigma}} L_t^{i(\frac{\sigma-1}{\sigma})} \right]^{(\frac{\sigma}{\sigma-1})}$$

[54] 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:

$$(10) \qquad I_t^{j,i} = J_t^{j,i}\left(1+\frac{\phi}{2}\left(\frac{J_t^{j,i}}{K_t^{j,i}}\right)\right) \text{ where } j=\{T,N,H\}$$

The Lagrangian of this maximisation problem is given by:

(11)

$$Max \quad U_0^i = E_0\sum_{t=0}^{\infty}\beta^t\left(U(C_t^i)+V(1-N_t^i)+Z(HL_t^i)\right)$$

$$-\sum_{t=0}^{\infty}\lambda_t\beta^t\left(\begin{array}{l}\frac{(1+t_t^c)P_t^C}{P_t}C_t^i+\frac{B_t^i}{P_t}+\frac{E_tB_t^{iF}}{P_t}+\frac{P_t^{CT}I_t^{T,i}}{P_t}+\frac{P_t^NI_t^{N,i}}{P_t}+\frac{\mathrm{P_t^H}I_t^{H,i}}{\mathrm{P_t}}+\frac{\mathrm{P_t^L}L_t^i}{\mathrm{P_t}}\\ -\frac{(1+i_{t-1})B_{t-1}^i}{P_t}-\frac{(1+i_{t-1}^F)(1-r(.))E_tB_{t-1}^{iF}}{P_t}-\frac{i_t^TP_t^{CT}KT_{t-1}^i}{P_t}-\frac{i_t^NP_t^NKN_{t-1}^i}{P_t}-\frac{\mathrm{P_t^L}L_{t-1}^i}{\mathrm{P_t}}-\frac{(1-t_t^w)W_t^i}{P_t}N_t^i\\ +\frac{\gamma_wN_t^i}{2}\left(\frac{\Delta w_t^i}{w_t}\right)^2+TAX_t^i\end{array}\right)$$

$$-\sum_{t=0}^{\infty}\xi_t\beta^t\left(K_t^{T,i}-J_t^{T,i}-(1-\delta)K_{t-1}^{T,i}\right)$$

$$-\sum_{t=0}^{\infty}\vartheta_t\beta^t\left(K_t^{N,i}-J_t^{N,i}-(1-\delta)KN_{t-1}^{N,i}\right)$$

$$-\sum_{t=0}^{\infty}\chi_t\beta^t\left(H_t-J_t^{H,i}-(1-\delta)H_{t-1}\right)$$

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:

$$(12a) \qquad \frac{\partial U_0}{\partial C_t^i} => U_{C,t}^i-\lambda_t\frac{(1+t_t^c)P_t^C}{P_t}=0$$

$$(12b) \qquad \frac{\partial U_0}{\partial B_t^i} => -\lambda_t+{}_t\lambda_{t+1}\beta(1+i_t)\frac{P_t}{{}_tP_{t+1}}=0$$

$$(12c) \qquad \frac{\partial U_0}{\partial B_t^{iF}} => -\lambda_t+{}_t\lambda_{t+1}\beta(1+i_t^F)(1+risk(\frac{BW_t}{GDP_t}))\frac{P_t}{{}_tP_{t+1}}\frac{{}_tE_{t+1}}{E_t}=0$$

$$(12d) \qquad \frac{\partial U_0}{\partial K_t^{T,i}} => -\xi_t+{}_t\xi_{t+1}\beta(1-\delta)+{}_t\lambda_{t+1}\beta i_t^T\frac{P_{t+1}^{CT}}{P_{t+1}}=0$$

(12e) $$\frac{\partial U_0}{\partial J_t^{T,i}} => -\lambda_t \frac{P_t^{CT}}{P_t}(1+\phi\left(\frac{I_t^{T,i}}{K_{t-1}^{T,i}}\right)) + \xi_t = 0$$

(12f) $$\frac{\partial U_0}{\partial K_t^{N,i}} => -\vartheta_t +_t \vartheta_{t+1}\beta(1-\delta) +_t \lambda_{t+1}\beta i_t^N \frac{P_{t+1}^N}{P_{t+1}} = 0$$

(12g) $$\frac{\partial U_0}{\partial J_t^{N,i}} => -\lambda_t \frac{P_t^N}{P_t}(1+\phi\left(\frac{I_t^{N,i}}{K_{t-1}^{N,i}}\right)) + \vartheta_t = 0$$

(12h) $$\frac{\partial U_0}{\partial H_t^i} => \varphi \frac{1}{HL_t^i} s_H{}^{\frac{1}{\sigma}} \left(\frac{HL_t^i}{H_t^i}\right)^{\frac{1}{\sigma}} - \xi_t + \xi_{t+1}\beta(1-\delta) = 0$$

(12i) $$\frac{\partial U_0}{\partial J_t^{H,i}} => \phi_t \frac{P_t^H}{P_t}\left(1+\theta\frac{J_t^{H,i}}{H_t^i}\right) = \xi_t$$

(12j) $$\frac{\partial U_0}{\partial L_t^i} => \varphi \frac{1}{HL_t^i} s_L{}^{\frac{1}{\sigma}} \left(\frac{HL_t^i}{L_t^i}\right)^{\frac{1}{\sigma}} - \phi_t \frac{P_t^L}{P_t} + \phi_{t+1}\frac{P_{t+1}^L}{P_{t+1}}\beta(1-\delta) = 0$$

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) $$\left(\frac{I_t^{T,i}}{K_{t-1}^{T,i}}\right) = \frac{1}{\theta}\left(q_t^T - 1\right) \text{ with } q_t^T = \frac{\xi_t}{\lambda_t}\frac{P_t}{P_t^{CT}}$$

where q_t^T is the present discounted value of the rental rate of return from investing in the tradeable sector.

(13b) $$q_t^T = q_{t+1}^T \frac{1}{(1+\delta+i_t-\pi_{t+1}^{CT})} + i_t^T$$

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) $$\left(\frac{I_t^{N,i}}{K_{t-1}^{N,i}}\right) = \frac{1}{\theta}\left(q_t^N - 1\right) \text{ with } q_t^N = \frac{\vartheta_t}{\lambda_t}\frac{P_t}{P_t^N}$$

where q_t^N is the present discounted value of the rental rate of return from investing in the tradeable sector.

(14b) $$q_t^N = q_{t+1}^N \frac{1}{(1+\delta+i_t-\pi_{t+1}^N)} + i_t^N$$

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) $$\left(\frac{I_t^{H,i}}{K_{t-1}^{H,i}}\right)=\frac{1}{\theta}\left(q_t^H-1\right) \text{ with } q_t^H=\frac{\xi_t}{\lambda_t}\frac{P_t}{P_t^H}$$

where q_t^H is the present discounted value of the shadow price of housing.

(15b) $$q_t^H=q_{t+1}^H\frac{1}{(1+\delta+i_t-\pi_{t+1}^H)}+(\rho+\varepsilon_t^H)s_H^{\frac{1}{\sigma}}\frac{C_t^iP_t^C}{H_t^iP_t^H}HL_t^{\frac{1}{\sigma}-1}$$

This expression shows that households aim at stabilising expenditure shares for consumption and housing (if σ 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) $$\frac{P_t^L}{P_t}=\frac{P_{t+1}^L}{P_{t+1}}\frac{1}{(1+\delta+i_t-\pi_{t+1})}+(\rho+\varepsilon_t^H)s_L^{\frac{1}{\sigma}}\frac{C_t^iP_t^C}{L_t^iP_t}HL_t^{\frac{1}{\sigma}-1}$$

The land price behaves like an asset price. Under the assumption that land is inelastically supplied, it 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)

$$Max \quad U_0^i=E_0\sum_{t=0}^{\infty}\beta^t\left(U(C_t^k)+V(1-N_t^k)+Z(HL_t^k)\right)$$

$$-\sum\phi_t\beta^t\left(\frac{P_t^L}{P_t}L_t^k+\frac{D_t^k}{P_t}-(1+r_{t-1}+\kappa(\frac{D_{t-1}^k}{V(K_{t-1}^{H,i})}))\frac{D_{t-1}^k}{P_{t-1}}-\frac{P_t^L}{P_t}L_{t-1}^k-\frac{P_t^C}{P_t}C_t^k-\frac{P_t^HI_t^{H,k}}{P_t}(1+\frac{\phi}{2}\left(\frac{I_t^{H,k}}{H_{t-1}}\right))+\frac{W_t}{P_t}\mathrm{N_t^k}\right)$$

$$-\sum\xi_t\beta^t\left(K_t^{H,k}-I_t^{H,k}-(1-\delta)H_{t-1}^{H,k}\right)$$

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) $$\frac{\partial L_t^i}{\partial W_t^i} = -\theta \left(\frac{W_t^i}{W_t} \right)^{-\theta} L_t^i \frac{1}{W_t^i} = -\theta \frac{L_t^i}{W_t^i}$$

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) $$\pi_t^w - \bar{\pi}^W = \frac{(\theta - 1)(1 + t_t^C) PC_t}{\gamma_w W_t} \left[\frac{-V_{L,t}}{U_{C,t}} (1 + mup^w) - \frac{(1 - t_t^w) W_t}{PC_t (1 + t_t^C)} \right] + \beta_{t\,t} (sfw \pi_{t+1}^w + (1 - sfw) \pi_{t-1}^w - \bar{\pi}^W)$$

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 $X_t = \int_0^1 X_t^h dh = (1 - slc) X_t^i + slc X_t^k$ since households within each group are identical. Hence aggregate consumption is given by:

(18) $$C_t = (1 - slc) C_t^i + slc C_t^k$$

Aggregate employment is given by:

(19)

$$N_t = (1 - slc) N_t^i + slc N_t^k$$

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:

$$\Delta t_t^w = b1\left(\frac{B_t}{GDP_t} - b^*\right) + b2\left(\Delta\frac{B_t}{GDP_t}\right) \tag{20}$$

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.

$$i_t = ilag * i_{t-1} + (1 - ilag) * (Ex.R + \pi^T + t^\pi(\pi_{t-1}^{EMU} - \pi^T) + t_M^Y(Y_t - YPOT_t^{EMU})) + e_t^M \tag{21}$$

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.

Table A-1: Parameter Values

β	Discount factor	0.99
habc	Consumption habit	0.8
slc	Share of credit constrained households	0.5
risk	Credit constraint	0.01
ρ	Elast. of subst. between *T* and *N*	0.4
ς	Elast. of subst. between *TD* and *TF*	5.0
κ	Inverse of labour supply elasticity	0.23
θ	Capital adjustment costs	42.0
α	Output elasticity of labour	0.6
γ_p	Adjustment costs (prices)	24.0
γ_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^π	Monetary policy response to inflation	1.5
t^y	Monetary policy response to YGAP	0.1