

CONVERGENCE

Are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?

The assessment of convergence is key to the overall assessment of the five economic tests. It was the most critical test in 1997 and there is strong evidence that the 1997 assessment was right to conclude that settled and sustainable convergence had not been achieved due to the lack of both cyclical and structural convergence.

Key points:

- There has been significant progress on cyclical convergence since 1997. But robust growth in consumer spending has continued to provide substantial support to GDP growth in the UK, supported by a buoyant housing market. UK short-term interest rates remain $1\frac{1}{4}$ percentage points above those in the euro area and have consistently been above euro area rates since 1999. With interest rates higher in the UK and with the sterling-euro exchange rate remaining above sustainable levels throughout this period, inflation, measured on a harmonised basis, has averaged $\frac{3}{4}$ percentage point less in the UK than in the euro area. Financial markets and the forecasts by international organisations suggest that monetary conditions need to remain tighter in the UK than in the euro area into the medium term. However, the UK now exhibits a greater degree of cyclical convergence than some EMU members demonstrated in the run-up to the start of EMU in 1999 and while some EMU countries still demonstrate substantially more cyclical convergence than the UK, some demonstrate substantially less. The lack of cyclical convergence with the euro area constitutes a risk factor, particularly given the considerable degree of global uncertainty at present.
- On past performance, UK business cycles have been much less compatible with the euro area average than has been the case in other countries such as Germany and France. There is some evidence that compatibility may have increased in recent years, reflecting greater macroeconomic stability in the UK and increased convergence between the business cycles of all the advanced economies. Over the last five years, the UK output gap cycle has been more highly correlated with the German cycle than that in the US, although the UK has fluctuated around a higher growth trend. France, Germany and Italy have experienced output gaps on average close to the euro area aggregate, at an average absolute deviation of between $\frac{1}{4}$ and $\frac{3}{4}$ per cent of GDP over the last decade. The average UK deviation is larger at almost 1 per cent of GDP, but not as large as some of the existing euro area countries and not out of line with the sort of regional deviations seen within countries. However, the UK's history of divergence remains a risk factor.
- Certain structural differences between the UK and the euro area are risk factors for the achievement of settled and sustainable convergence. Differences in the UK and euro area housing markets are high risk, differences in investment linkages and financial structures are low to medium risk and sectoral and trade differences are lower risk. In terms of industrial specialisation the UK is quite similar at the aggregate level to other large EU countries.
- Distinct supply and demand features of the UK housing market mean that both the relationship between house prices and household consumption, and the underlying rate of real house price growth, are stronger in the UK than in the euro area. The structure of the UK mortgage market is such that UK households are more sensitive to interest rates, which has implications for the transmission of monetary policy.
- Analysis of monetary transmission suggests that the UK may be more sensitive to monetary policy through some channels, and less sensitive through others: the pass-through of interest rate changes from official rates to bank lending rates is faster in the UK; the household sector in the UK may react more strongly to interest rate changes than in euro area countries; the UK is potentially more sensitive to monetary policy through its impact on the exchange rate; but there is little to suggest that the corporate sector in the UK will react more strongly than in the euro area. The UK's relatively low levels of nominal wage rigidity will tend to reduce the impact of monetary policy on output.

- The process by which membership of EMU encourages convergence gives grounds for optimism about the future compatibility of UK structures, including housing. However, these effects are only likely to be realised over time and so will not compensate for current short to medium-term cyclical and structural differences between the UK and the euro area economies.
- If the UK were to enter EMU now, other things equal, a transitional shock of a 1¼ percentage point cut in interest rates (the differential between the UK and the euro area), could have a destabilising effect, working in particular through the UK housing market and consumption. It is too early to judge the paths of growth and inflation resulting from the recent sharp movements in the euro-US dollar and sterling-euro exchange rate. In addition, there are significant future uncertainties in the current economic and political climate, for example, trends in global financial markets, in the US dollar and euro and in the relative growth paths of the UK and the euro area. All these suggest that there are clear risks associated with transition to EMU membership at the present time and emphasise the importance of sustainable and durable convergence and increasing the flexibility of the economy through the measures the Government is setting out.
- Alongside settled and sustainable convergence, there needs to be sufficient flexibility to ensure that the economy can respond and adjust quickly to divergences which emerge, minimising the adverse impact on growth, stability and employment. The question of whether convergence and flexibility together provide the necessary degree of sustainable and durable convergence is answered after the assessment of the flexibility test.

The overall conclusion of the convergence test is:

- There has been significant progress on convergence since 1997, which marks a break with the UK's past history of divergence and reflects greater stability of the UK economy and global trends towards integration. Indeed, the UK now exhibits a greater degree of cyclical convergence than some EMU members demonstrated in the run-up to the start of EMU in 1999 and remains more convergent than a number of EMU countries today. The UK meets the EC Treaty convergence criteria for inflation, long-term interest rates and government deficits and debt. But there remain structural differences with the euro area, some of which are significant, such as in the housing market. Because of the risks these factors pose, and the fact that any dynamic changes would take time to come through, we cannot yet be confident that UK business cycles are sufficiently compatible with those of the euro area to allow the UK to live comfortably with euro area interest rates on a permanent basis. Overall, at the present time, while the extent of convergence with the euro area has significantly increased, the convergence test is not met. The Government is committed to building on the platform of stability and has announced a wide-ranging forward-looking policy agenda to deliver high levels of output and employment. This will help to make the economy more convergent with the euro area for the future.

Policy requirements:

- In terms of macroeconomic policy, the Government's announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will improve the quality of the UK inflation target and will also help ensure inflation expectations in the UK remain in line with those of the euro area.
- To deliver a more settled platform of stability in the future and a higher degree of convergence, the Government is committed to a comprehensive programme to improve the functioning of the housing market. Building on the reforms to deliver a step change in planning policy, the Government is undertaking further significant changes in the planning system, supply of housing and housing finance to tackle market failures, increase the responsiveness of supply to demand and reduce national and regional price volatility. These measures are beneficial in their own right to improve the stability and flexibility of the UK housing market and wider economy, but will also increase the housing market's compatibility with the euro area, encouraging greater convergence over time.
- This means implementing quickly and decisively past reforms to housing supply and going further to address both supply and demand in the housing market and macroeconomic stabilisation more generally:
 - on the supply side, the Government is requiring new Regional Spatial Strategies to take account of volatility in the housing market and promote macroeconomic stability as part of delivering

sustainable development; tough and credible measures, including intervention, where local authorities are not delivering housing numbers in high demand areas; and exploring whether, in the medium term, achieving the Government’s objectives will require a system of binding local plans. The Government has also commissioned a review of issues affecting the elasticity of supply in the UK in particular to look at the role of competition, capacity and the financing of the house building industry and possible fiscal instruments, and the interaction of these with the planning system and sustainable development objectives;

- on the demand side, through a review of the UK mortgage market to establish why the share of fixed rate mortgages is so low in the UK compared to many other EU countries and to identify ways of encouraging the market for longer-term fixed rate mortgages; and
- at the macroeconomic level, given that housing is identified as a significant risk factor to the achievement of sustainable and durable convergence and in the context of the Treasury discussion paper *Fiscal stabilisation and EMU*, to consider what additional reforms and measures might help deliver wider stability in the economy, including with reference to the housing market, to create the right conditions for convergence within EMU. The Government’s announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will help ensure inflation expectations in the UK remain in line with those of the euro area.

THE IMPORTANCE OF CONVERGENCE

The convergence test... **1.1** Membership of Economic and Monetary Union (EMU) entails having a permanently fixed nominal exchange rate with the euro area and a common monetary policy (a single interest rate across all members of the euro area). The convergence test addresses the issue of whether a single interest rate will be suitable for all euro area members over time:

Are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?

1.2 As the Introduction has highlighted, both the convergence test and the flexibility test are concerned with economic structures which determine the likelihood of economic disturbances or ‘shocks’ and their possible impact, and what this implies for the cyclical behaviour of the economy in terms of output, inflation and other key indicators.

...requires that convergence is settled and sustainable **1.3** Importantly, the convergence test does not require complete convergence at all times. That would be an impossible standard, and one not met in existing and successful monetary unions. But UK and euro area business cycles and economic structures must be compatible. Convergence must be settled and sustainable. It is not enough to have achieved convergence at a particular point in time. There must be a past track record of achieving convergence and a high degree of confidence that this performance will be sustained into the future.

1.4 In 1997, the convergence test was the “most critical” test¹ and it remains very important. Many of the lessons from re-evaluation of the 1997 assessment described in the Introduction are key themes for the assessment of the convergence test.

1.5 The assessment of the convergence and flexibility tests together determines whether sustainable and durable convergence has been achieved. This is the basis for assessing, including as part of the fifth test, whether UK economic stability – one of the central objectives of Government policy, providing the platform for delivering high levels of growth and employment – could be maintained if the UK were to join EMU.

Understanding convergence **1.6** Convergence is best understood by its implications for membership of a monetary union, as described in the EMU study *The five tests framework*:

¹ The Chancellor of the Exchequer’s October 1997 statement to Parliament.

- prospective candidates for a monetary union are convergent if they have similar economic structures, so will respond to the same shocks in a similar way, and are unlikely to be hit by a large number of country-specific shocks; and
- they are non-convergent if they have different structures which imply differing responses to common shocks, greater vulnerability to asymmetric shocks, or that the monetary policy stance suited to one country or region does not suit the others.

**Structure of I.7
the test**

The assessment of the convergence test is structured as follows:

- **Cyclical convergence** answers the question: **Is there more cyclical convergence than in the past?**

Analysis of the current economic conjuncture in the UK and the euro area provides the evidence base for the assessment of the current state of cyclical convergence, relative to the past, with a particular focus on developments since 1997.

- **Historical convergence** answers the question: **What does past history demonstrate about the extent of convergence?**

The history of cyclical behaviour and the nature and correlation of shocks in the UK and the euro area (as well as within the US and UK) is analysed, drawing on the EMU studies *Analysis of European and UK business cycles and shocks* by Professor Michael Artis and *The United States as a monetary union* by HM Treasury.

- **Structural convergence** answers the question: **Which differences in structures are important?**

Economic structures in the UK and the euro area are compared and the implications in terms of shocks and their impact are assessed, with a particular focus on the risks which differences in structures carry for the achievement of settled and sustainable convergence. This section draws on the analysis in the EMU studies *EMU and business sectors*, *EMU and the monetary transmission mechanism* and *Housing, consumption and EMU*.

- **Endogenous convergence** answers the question: **How strong are endogenous convergence effects likely to be and how rapidly could they occur?**

Endogenous convergence describes the convergence that may occur as a result of joining EMU. The analysis is forward looking, considering whether membership of a single currency may in itself result in the pattern of shocks and their impact becoming more similar, and lead to greater integration of economic structures. The discussion is informed by the analysis in the EMU studies *EMU and trade*, *EMU and business sectors* and *The exchange rate and macroeconomic adjustment*.

- **The transition to sustainable convergence and the exchange rate** answers the question: **How important are transitional issues at present?**

The transition to EMU entry and the sustainability of convergence thereafter are assessed, based on the analysis in the EMU studies *The exchange rate and macroeconomic adjustment* by HM Treasury, *Modelling the transition to EMU* by Dr Peter Westaway and *Estimates of equilibrium exchange rates for sterling against the euro* by Professor Simon Wren-Lewis.

- The **Conclusions** assess all the evidence on different forms of convergence to answer the question: **How much convergence is there, and is it sufficient in terms of compatibility of cycles and structures for the convergence test to be met?**

This paves the way for the overall assessment of the sustainability and durability of convergence, which depends on – and is therefore presented after – the conclusion to the assessment of the flexibility test.

CYCLICAL CONVERGENCE

1.8 This section addresses the question of whether there is more convergence in economic cycles than in the past. A lack of cyclical convergence on entry to EMU would put an even greater premium on a high degree of flexibility, in particular on adjustment in UK wages and prices. As the ‘what if’ analysis in the Introduction demonstrates, this could well be disruptive to the economy depending on the extent of divergence and subsequent adjustment needed. These issues are returned to in the assessment of transition later in this chapter.

1.9 The Budget 2003 forecasts used in the analysis of cyclical convergence and throughout the assessment assume that the UK remains outside EMU. They provide a baseline for assessing the short-term impact that EMU membership could have on the UK economy. Moreover, because the analysis of cyclical convergence is forward looking, there are inherent uncertainties – as with any forecasting exercise – and the implications of these are emphasised. These uncertainties are particularly marked in the current climate of global uncertainty.

1.10 The following key economic indicators are examined, with a particular focus on changes since 1997:

- **official short-term interest rates** – the main monetary policy variable for the monetary authorities in both the UK and the euro area. Differences in short-term interest rates indicate disparities in either inflation targets or perceived inflationary pressures;
- **real short-term interest rates** – the nominal rate of interest adjusted for inflation;
- **GDP growth** – used widely as a basic indicator of cyclical convergence;
- **the output gap** – the difference between actual and potential output. This is a more sophisticated measure of the cycle, providing the most commonly used indicator of how inflationary pressures vary over time. It is an important analytical tool for forward-looking monetary policy;
- **components of GDP** – focusing on consumption. The output gap is an aggregate measure and so may hide imbalances between different sectors of the economy;
- **labour market conditions** – labour market indicators also usefully supplement aggregate indicators of demand pressures in the economy;
- **inflation** – divergences of inflation from target will influence monetary policy decisions. But inflation divergences within EMU may reflect the requirements of adjustment within EMU, as discussed later in this chapter in terms of the transition to sustainable convergence and also in the flexibility test;

- **long-term interest rates and inflation expectations** – indicate the success and credibility of monetary policy and macroeconomic policy more generally; and
- **the exchange rate** – a further important indicator of the current state of the economy.

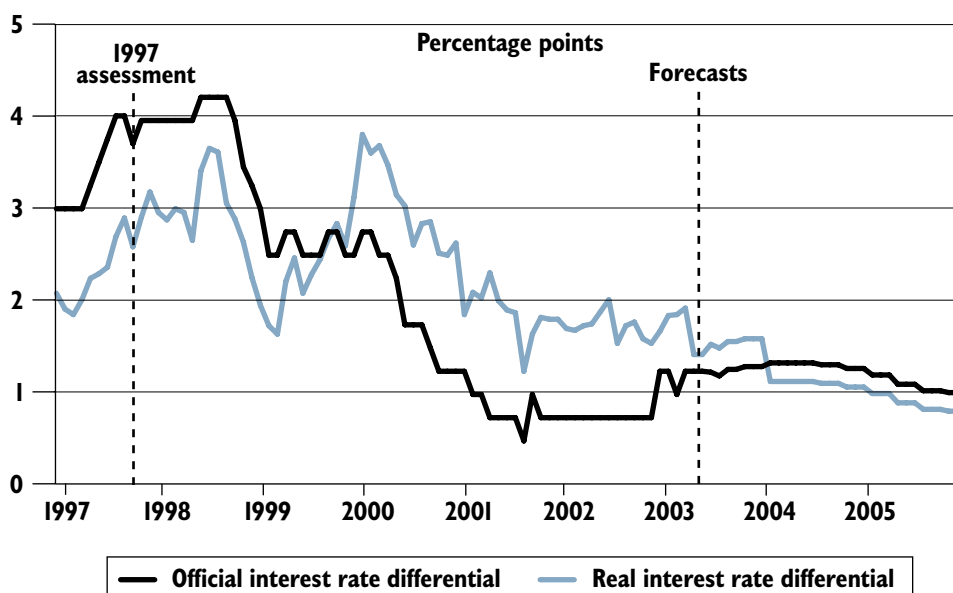
I.11 Another perspective on cyclical convergence is provided by Treasury calculations using a ‘Taylor rule’; a commonly used technique for assessing the extent of cyclical convergence, but one which – as with any other single indicator – has limitations and gives only a partial picture. It combines inflation and output gap indicators into a composite measure – an approximate estimate of the appropriate interest rate for a country given prevailing economic conditions.

I.12 The EC Treaty’s convergence criteria are also examined to enable as complete a picture of the current state of cyclical convergence to be built up as possible.

Cyclical convergence: key current indicators

Interest rates I.13 The differential between UK and euro area short-term interest rates has narrowed substantially since the October 1997 assessment. Official base rates in May 2003 were 3¾ per cent in the UK and 2½ per cent in the euro area, a difference of 1¼ percentage points (Chart 1.1). This is much lower than the differential of almost 4 percentage points between UK and German short-term interest rates prevailing at the time of the 1997 assessment. Information from financial markets implies that, consistent with outside economic forecasts, the differential will be sustained at just over 1 percentage point over the next two years. This points to a structural difference in UK and euro area monetary conditions, reflecting underlying differences which are revisited and analysed throughout the assessment of the convergence test.

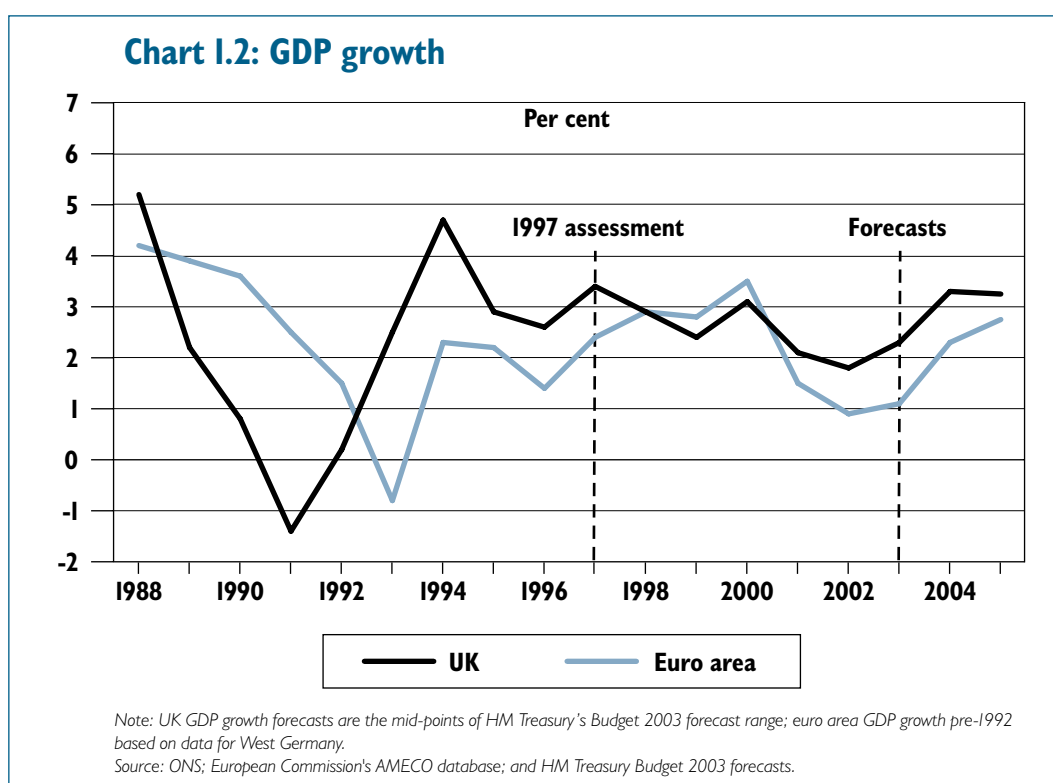
Chart 1.1: Differentials between the UK and euro area official nominal interest rate and real interest rate



Note: ECB official interest rates are proxied by German official rates pre-1999; real interest rates are 3-month money market rates minus annual HICP inflation; forecasts are based on 3-month interest rate futures and Budget forecasts for HICP inflation in 4th quarter. Source: Bank of England; ECB; ONS; Eurostat; Bloomberg; and HM Treasury Budget 2003 forecasts.

I.14 Chart 1.1 also shows the differential between UK and euro area real short-term interest rates. There has been a high degree of convergence since early 2000, consistent with the achievement of price stability in the UK by the Bank of England's Monetary Policy Committee (MPC) and in the euro area by the ECB. Real interest rate differentials are expected to remain at around 1 percentage point over the next two years.

GDP growth I.15 GDP growth is a simple measure of the business cycle. Chart 1.2 shows the Treasury's Budget 2003 GDP growth forecasts. UK growth is expected to exceed growth in the euro area as a whole in 2003, 2004 and 2005. As shown in Chart 1.4, UK growth is also expected to exceed that in Germany, France and Italy. The difference between the UK and euro area GDP growth rates in 2003 and 2004 is forecast to be around 1 percentage point, similar to the growth differential seen in 2002 and during the mid 1990s. The uncertainties surrounding these projections are particularly acute at the present time because of the high degree of global uncertainty, manifesting itself in a range of upside and downside risks to the forecasts.

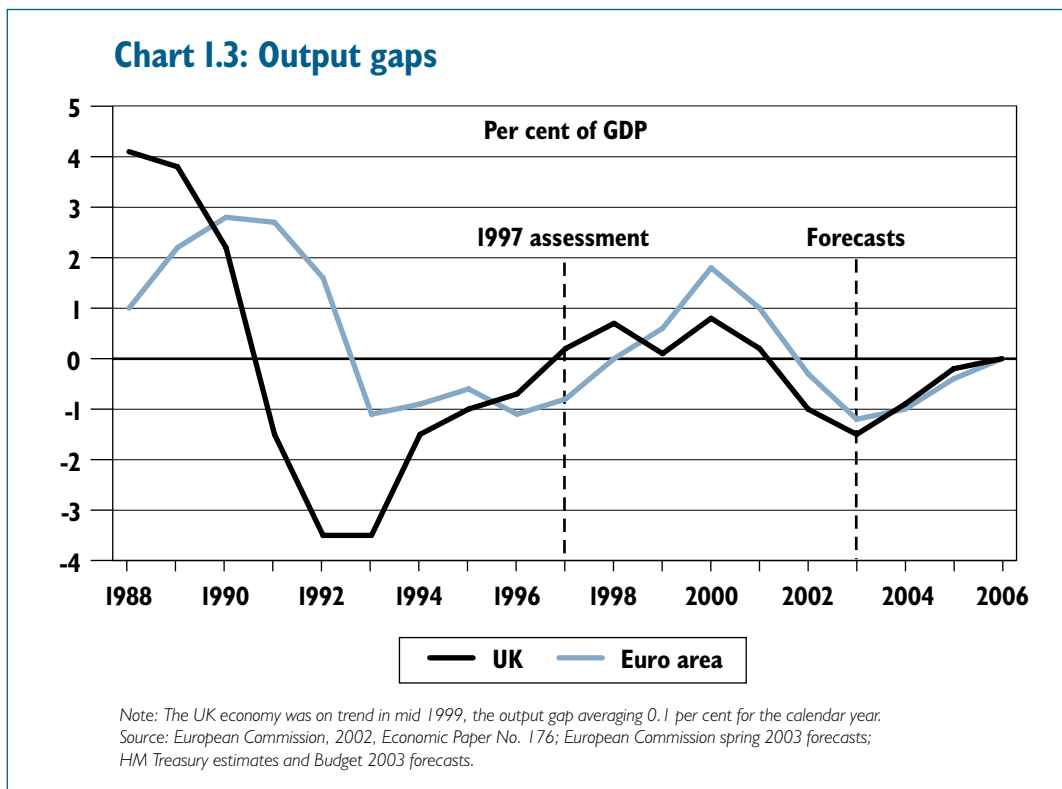


The output gap I.16 Growth rate comparisons do not distinguish between movements in output caused by short-term factors and movements in output caused by changes in the long-term productive potential of the economy. Shocks may lead to a gap opening up between the actual output of the economy and the long-run level of potential output: the output gap.² From a monetary policy perspective, the output gap is a more relevant measure of inflationary pressure in the economy than the rate of GDP growth alone. It is also more relevant to the analysis of cyclical convergence.

² The rationale for particular emphasis on the output gap is set out in the EMU study *The five tests framework*.

I.17 Chart 1.3 indicates that the difference between the UK and the euro area output gap has narrowed since 1997. Both UK and euro area output was below trend in 2002 as growth slowed, significantly so in the euro area. A further year of below trend growth is forecast in both the UK and the euro area for 2003, causing both output gaps to widen. Within the euro area aggregate there are some differences; for example, Germany's output gap is slightly more negative than that of the euro area as a whole. Above-trend growth in the UK and the euro area in 2004, as forecast in Budget 2003, would imply the negative output gaps narrowing to around 1 per cent in each case. Both output gaps are forecast to close in the medium term, in line with the general forecasting convention of economies returning to trend. However, as noted above, the uncertainties surrounding these projections imply large risks to the forecasts, particularly as far out as 2006.

I.18 The view that output gaps are expected to diminish and converge implies nothing about the appropriateness, or otherwise, of the level of trend output at which the output gap is eliminated. Greater structural rigidities in some countries mean that a zero output gap is associated with higher unemployment than in the UK. These issues are discussed further in the flexibility test. At the same time, it is not the case that levels of trend output must converge in a monetary union, because they are largely independent from the monetary policy stance.

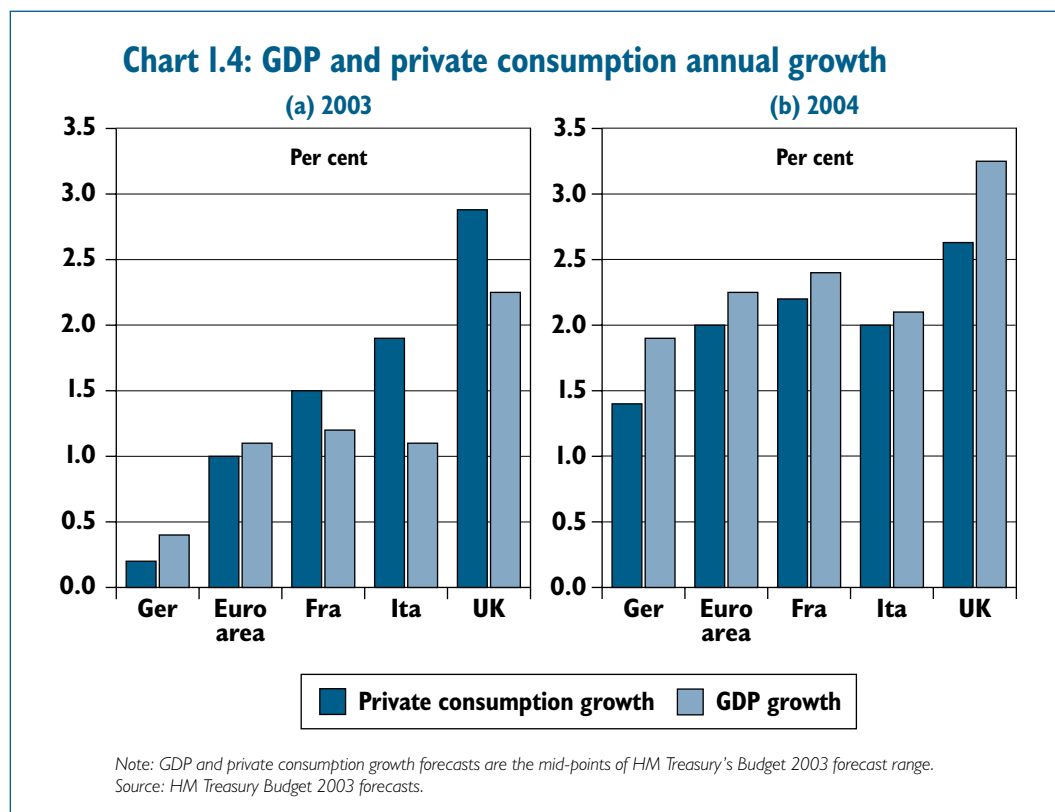


GDP components show greater differences...

I.19 GDP growth and the output gap are aggregate measures. The sectoral composition of output growth could potentially be very different across countries. Some sectoral differences may be desirable, acting as a valuable mechanism for sharing risk across sectors or countries, as discussed in the assessment of the flexibility test. But larger differences will increase the probability of a single monetary policy being inappropriate for some members of the monetary union, imposing a greater potential cost.

...particularly in consumption...

I.20 The main factor behind stronger growth in the UK economy relative to the euro area in 2001 and 2002 was the resilience of UK consumption. Against the background of underlying global weakness, affecting prospects for investment and trade, robust growth in consumer spending continued to provide support to UK GDP growth. As Chart 1.4 illustrates, this trend is forecast to continue in 2003, though to a lesser extent, as growth in the UK becomes more balanced. UK GDP growth is forecast to exceed euro area growth in 2003 and 2004.



...reflecting the buoyancy of the UK housing market

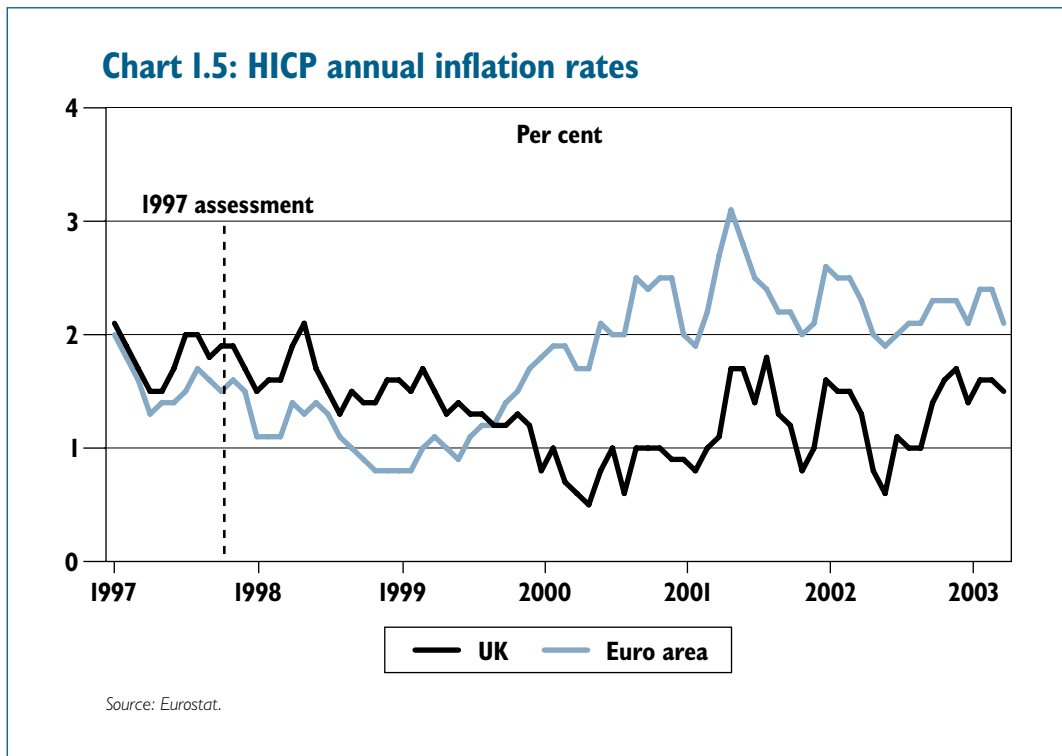
I.21 The buoyancy of the UK housing market is key to explaining strong consumption growth in the UK. The influence of housing market structures on consumption in the UK and the euro area, and the implications for convergence, are considered further in the assessment of structural convergence and also in detail in the EMU study *Housing, consumption and EMU*.

I.22 Although sharp falls in the global stock market since 2000 have adversely affected UK households' net financial wealth, house prices in the UK have continued to rise strongly and are currently well above their long-run average relative to earnings. Sharp house price increases may to some extent be a consequence of investors switching from equities into housing assets in search of higher returns, but house prices have also been supported by other fundamentals, including a marked rise in the employment rate and historically low interest rates. Strong house price growth has increased homeowners' housing equity, which they have accessed through the mortgage market to help support consumption.

Labour market conditions **I.23** Labour market conditions provide additional information on an economy’s cyclical position. But for the purpose of assessing convergence it is important to focus on the right indicators. Much is made of differences in overall unemployment rates between the UK and the euro area, but the focus should be on the unemployment gap – the difference between actual unemployment and the sustainable rate of unemployment or NAIRU³ – as an indicator of the degree of spare capacity in the labour market and thus inflationary pressure. Latest data suggest that UK unemployment is close to OECD estimates of the NAIRU, and the same is true for the euro area. Other things being equal, this implies increases in labour demand are likely to generate similar wage pressures in the UK and the euro area.

Inflation **I.24** As measured by the Harmonised Index of Consumer Prices (HICP), inflation was 0.6 percentage points lower in the UK than in the euro area in April 2003 (see Chart 1.5). A key reason for the divergence in UK and euro area inflation rates since late 1999 has been the relative weakness of the euro against both sterling and the US dollar, which has kept import prices low in the UK and pushed them up in the euro area.

Inflation divergences **I.25** With interest rates higher in the UK and with the sterling-euro exchange rate remaining above sustainable levels throughout the period since EMU started, inflation, measured on a harmonised basis, has averaged ³/₄ percentage point less in the UK than in the euro area since 1999. With HICP inflation at 1.5 per cent in April 2003, the UK is currently towards the bottom of the range of inflation rates across the EU. Ireland had the highest inflation rate in April 2003 at 4.6 per cent while Germany had the lowest at 1.0 per cent (and German inflation could fall further in the short term). Divergence of inflation rates is to be expected within EMU because inflation is a key adjustment mechanism, as discussed in the assessment of the flexibility test.



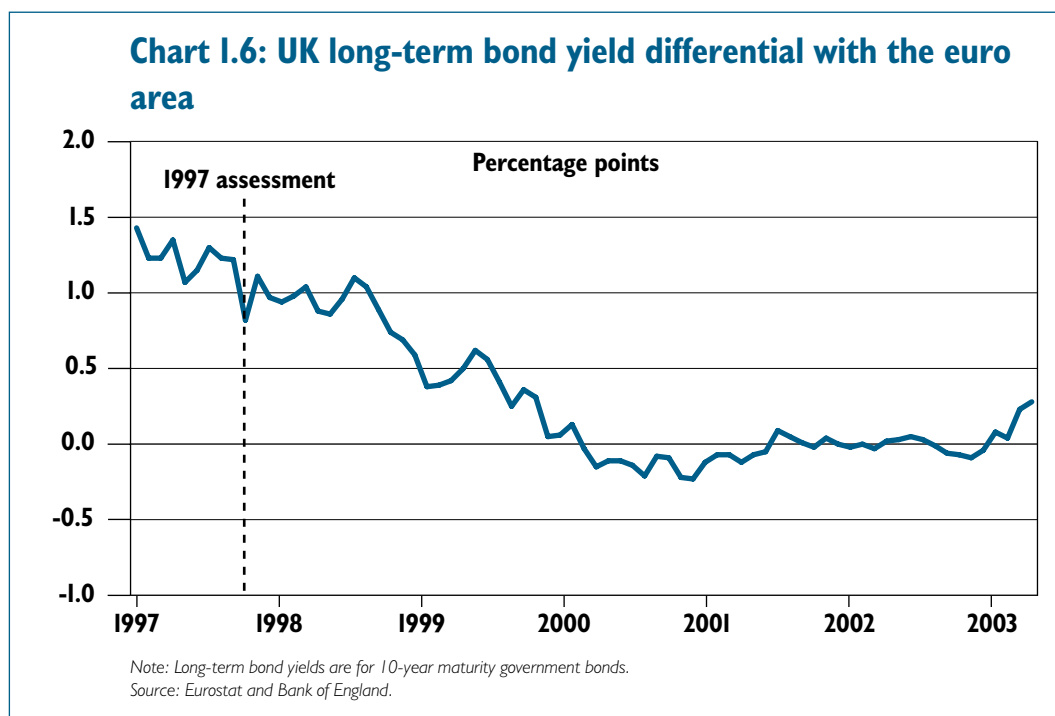
³ The non-accelerating inflation rate of unemployment, as shown in Chart 2.3 in Chapter 2.

I.26 In practice, HICP inflation is typically lower than inflation as measured by the Retail Prices Index excluding mortgage payments (RPIX) in the UK. Differences in the basket of goods and services included in each measure and the way that individual prices are weighted together in the aggregate mean that, over the long term, RPIX inflation exceeds HICP inflation by around 1/2 percentage point.

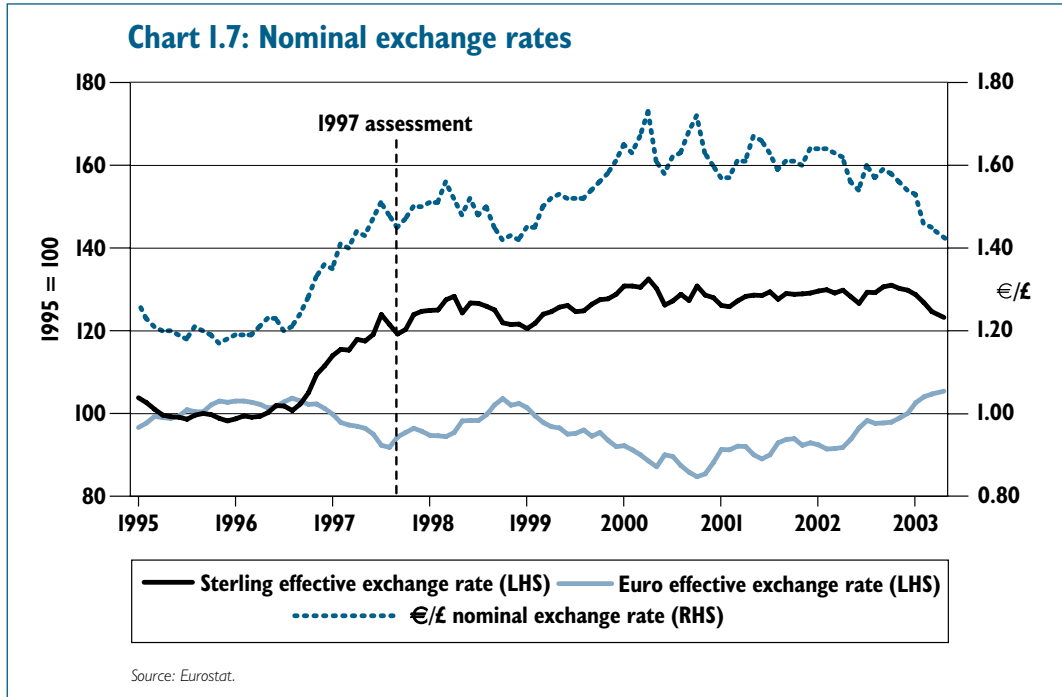
Policy requirements: inflation target **I.27** In terms of macroeconomic policy, the Government’s announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will improve the quality of the UK inflation target and will also help ensure inflation expectations in the UK remain in line with those of the euro area.

Long-term bond yields **I.28** Long-term (10-year) bond yields in the UK and the euro area have converged since the 1997 assessment, with the gap closing to within 1/4 percentage point by mid 1999 (Chart 1.6). Analysis in the investment test and the EMU study *EMU and the cost of capital* shows that long-term bond yields between the UK and euro area countries have converged across a range of maturities. This reflects the UK’s improved inflation performance and outlook.

Inflation expectations **I.29** Inflation expectations can be calculated using ‘break-even inflation rates’ which measure the difference between yields on nominal and index-linked bonds. UK inflation expectations have fallen by almost 2 percentage points since early 1997 and have been firmly anchored around the 2 1/2 per cent RPIX inflation target in recent years. Similarly, French inflation expectations are anchored by the ECB’s medium-term price stability objective and have moved between 1 and 2 per cent on the HICP measure in the period since 1999. The ECB’s latest (April 2003) survey of inflation expectations in the euro area puts them at 2.0 per cent in 2003, 1.7 per cent in 2004 and 1.9 per cent in the longer term.



Exchange rates I.30 Sterling has strengthened significantly relative to the euro since late 1996. This partly reflects the weakness of the euro against the US dollar, although sterling has also been stronger in terms of effective exchange rates, as shown in Chart 1.7. Since late 1996, sterling has been above estimates of the medium-term exchange rate consistent with sustainable convergence.



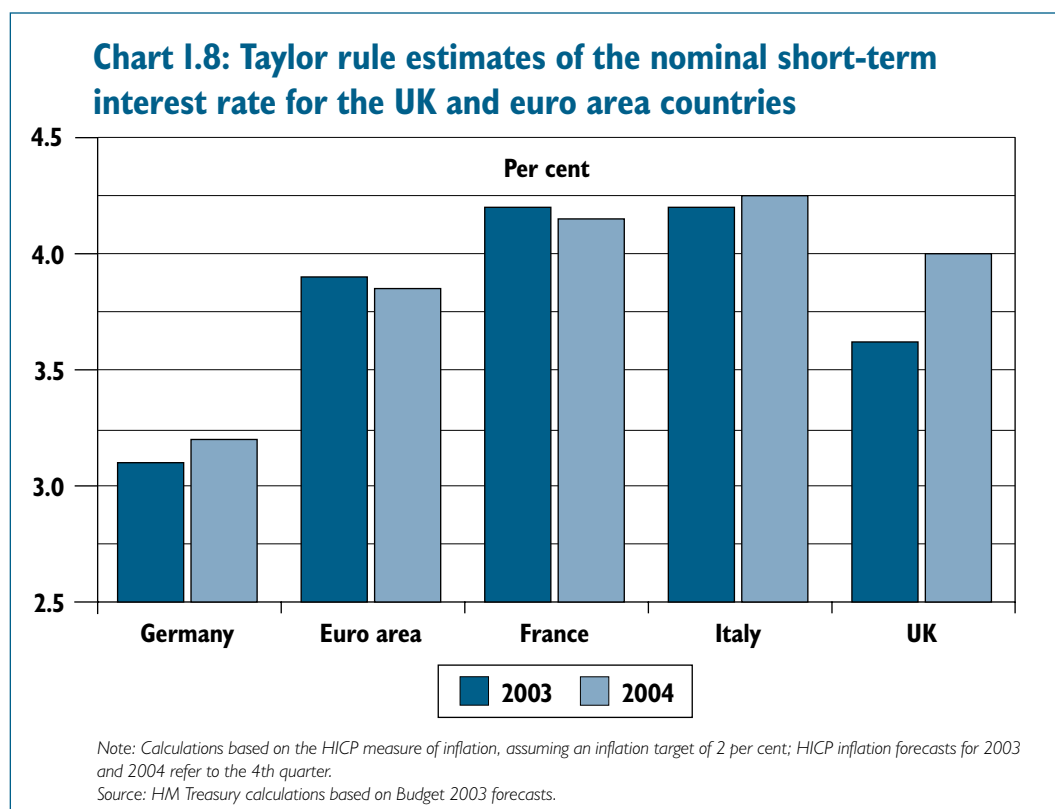
I.31 The nominal exchange rate provides information about the current state of the economy and the extent of convergence in the short to medium term. The strengthening of sterling since late 1996 is therefore, to some extent, the counterpart to the relative strength of UK consumption and domestic demand already described. The implications of this are assessed in the section on the transition to sustainable convergence.

Financial market indicators I.32 Information on expectations of UK convergence with the euro area can also be extracted from financial market indicators. The key indicators generally analysed are exchange rate movements, currency correlations and forward interest rate differentials between the UK and the euro area interest-rate swap-market curves. Where relevant, these indicators are utilised in the analysis of convergence over the short term, but may add little independent information to the overall assessment of convergence. This is because they will implicitly reflect the probability attached by financial markets to UK EMU entry.

Cyclical convergence: the ‘Taylor rule’

I.33 The ‘Taylor rule’ provides a simple rule of thumb for estimating the appropriate short-term nominal interest rate for the prevailing output and inflation conditions at a given point in time. As such it is a commonly used summary measure of cyclical convergence.⁴

I.34 Chart 1.8 shows Taylor rule estimates produced by the Treasury for the UK and the euro area economies in 2003 and 2004 on the basis of certain simplifying assumptions.⁵ The UK and euro area interest rates projected by the Taylor rule are broadly similar. Germany is projected to require lower interest rates than average, reflecting the extent of the negative output gap and low inflation forecast. But simple estimates of this sort may not provide an accurate estimate of the appropriate level of UK and euro area interest rates and in no sense are the estimates presented here any kind of forecast of UK interest rates as set by the Bank of England’s MPC. The MPC has set UK base rates at 3³/₄ per cent in May 2003, whereas these Taylor rule projections are slightly lower on average for 2003 as a whole. The ECB’s setting of euro area base rates at 2¹/₂ per cent is somewhat lower than the simple Taylor rule suggests. The ECB judge that the weakness of domestic demand in the euro area warrants a lower interest rate in the euro area than the Taylor rule calculations suggest.



⁴ The basic form of the original Taylor rule is given by: $i = r + \pi^* + \frac{1}{2}(\pi - \pi^*) + \frac{1}{2}(y - y^*)$ where i is the nominal interest rate, r is the neutral (equilibrium) real interest rate, π^* is the inflation target, $(\pi - \pi^*)$ is the deviation of actual inflation from target and $(y - y^*)$ is the deviation of actual output from trend (the output gap). The weights on output and inflation can be varied according to the monetary authority’s preferences. The EMU study *Policy frameworks in the UK and EMU* provides more detail.

⁵ The equilibrium real interest rate is assumed to be 2¹/₂ per cent and the inflation target is assumed to be 2 per cent on the HICP measure for all countries.

I.35 However, the UK now exhibits a greater degree of cyclical convergence than some EMU members demonstrated in the run-up to the start of EMU in 1999 and while some countries still demonstrate substantially more cyclical convergence than the UK, some demonstrate substantially less.

I.36 While Taylor rule estimates are currently similar for the UK and the euro area, this must be considered against the experience of recent years when interest rates set by the MPC for the UK have been consistently higher than those set by the ECB for the euro area, largely on the basis of cyclical conditions. The degree of cyclical convergence is not therefore as high as the simple Taylor rule estimates imply.

I.37 Ultimately, Taylor rule calculations are based on a set of stylised and simplified assumptions about how monetary policy is conducted. In particular, they rely on estimates of equilibrium real interest rates and output gaps which are inherently uncertain. This is particularly true at present, given the current high degree of uncertainty about global economic prospects.

The EC Treaty convergence criteria

I.38 Some of the cyclical indicators analysed in this section are the focus of the EC Treaty convergence criteria. The criteria are a key input into the process at the EU level whereby the Council decides whether countries have met the *'necessary conditions'* to join EMU. Box 1.1 summarises the UK's current performance against the criteria for inflation, long-term interest rates and government deficits and debt, and shows that the UK meets these criteria. Exchange rate stability is also one of the Treaty criteria. As Box 1.1 indicates, the Government believes that the exchange rate should be seen as the outcome of all other economic policies.

Box 1.1: The EC Treaty convergence criteria

The convergence criteria, set out in the EC Treaty,^a are concerned with nominal convergence and refer to inflation, long-term interest rates, the exchange rate and government deficits and debt.

With higher short-term official interest rates, the UK has been able to fulfil the convergence criterion on price stability. On the HICP measure, inflation in the UK over the past year has been well within the reference range set by the inflation levels of the three lowest inflation countries in EMU.

The UK also fulfils the convergence criterion on durability of convergence. Long-term bond yields between the UK and the euro area have continued to converge since the 1997 assessment and are well within the reference range set by the long-term interest rates of the three lowest inflation countries in EMU.

Budget 2003 projections for the fiscal balances meet the convergence criteria reference values of 3 per cent of GDP for the general government financial deficit and 60 per cent of GDP for general government gross debt. The UK's cyclically-adjusted Treaty deficit remains below 3 per cent throughout the forecast horizon and general government gross debt is projected to remain low, ensuring that the public finances remain sound and sustainable. This is consistent with a prudent interpretation of the Stability and Growth Pact (SGP), which takes into account the economic cycle, sustainability and the important role of public investment (see Chapter 5 for discussion of the SGP).

Exchange rate stability is also one of the convergence criteria. The Government believes that exchange rate stability can only be achieved on the basis of sound economic fundamentals, in particular low and stable inflation, steady and sustainable growth and sound public finances. The exchange rate should therefore be seen as the outcome of all other economic policies.

^a European Commission, 1999, Article 121 (ex Article 109j) of the Treaty establishing the European Community.

Conclusion: is there more cyclical convergence than in the past?

I.39 There has been significant progress on cyclical convergence since 1997. But robust growth in consumer spending has continued to provide substantial support to GDP growth in the UK, supported by a buoyant housing market. UK short-term interest rates remain 1¼ percentage points above those in the euro area and have consistently been above euro area rates since 1999. With interest rates higher in the UK and with the sterling-euro exchange rate remaining above sustainable levels throughout this period, inflation, measured on a harmonised basis, has averaged ¾ percentage point less in the UK than in the euro area. Financial markets and the forecasts by international organisations suggest that monetary conditions need to remain tighter in the UK than in the euro area into the medium term. However, the UK now exhibits a greater degree of cyclical convergence than some EMU members demonstrated in the run-up to the start of EMU in 1999 and while some EMU countries still demonstrate substantially more cyclical convergence than the UK, some demonstrate substantially less. The lack of cyclical convergence with the euro area constitutes a risk factor, particularly given the considerable degree of global uncertainty at present.

Policy requirement: inflation target

I.40 In terms of macroeconomic policy, the Government's announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will improve the quality of the UK inflation target and will also help ensure inflation expectations in the UK remain in line with those of the euro area.

HISTORICAL CONVERGENCE

I.41 Historical evidence is important for establishing the long-term track record of convergence between the UK and the euro area, putting the current state of cyclical convergence into perspective. The degree of convergence within the US and UK monetary unions provides further context. This section answers the question – what does past history demonstrate about the extent of convergence?

Historical convergence: business cycles and shocks

Correlations of cycles...

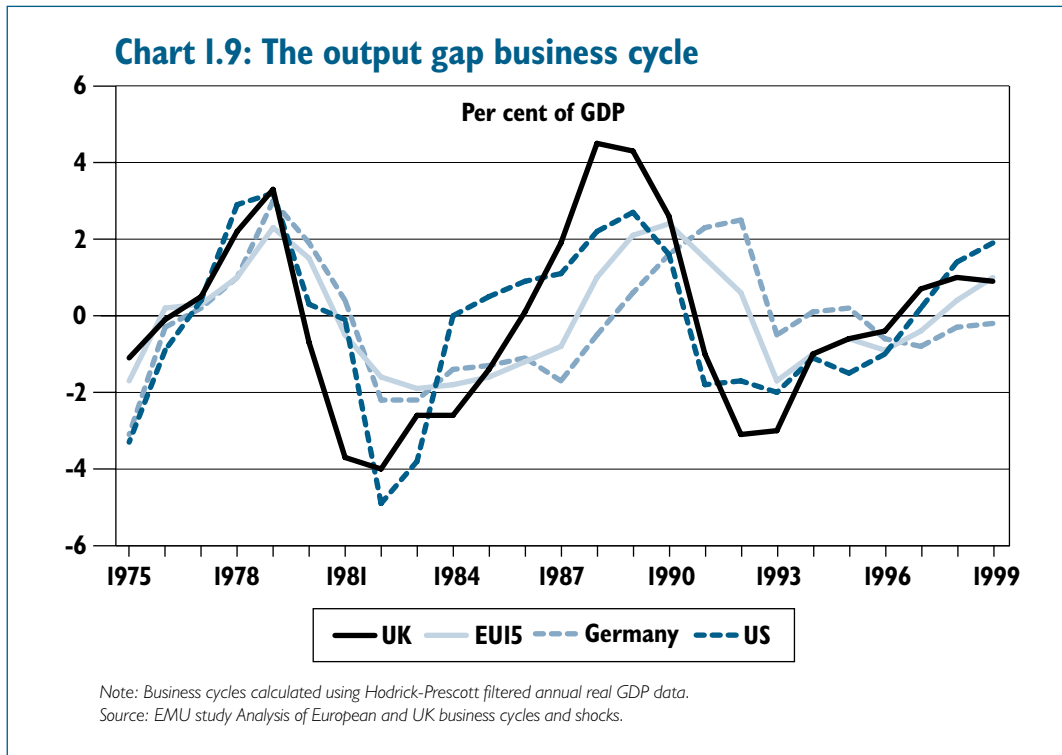
I.42 The EMU study *Analysis of European and UK business cycles and shocks* surveys the existing literature on comparative business cycle experiences and updates key findings.

I.43 Chart 1.9 shows the output gap business cycle for the UK, EU15, Germany and the US.⁶ The basic story about the UK's cyclical history is as reported in the 1997 assessment:

- the UK cycle has been relatively volatile. The boom in the late 1980s was particularly strong and the recessions in the early 1980s and early 1990s were relatively deep, reflecting UK specific factors such as financial liberalisation and the behaviour of the housing market, compounded by serious macroeconomic and microeconomic policy mistakes;

⁶ The EMU study *Analysis of European and UK business cycles and shocks* by Professor Michael Artis discusses the methodological issues associated with identifying business cycles and also the rationale for comparison with the EU15 aggregate, as the proxy for the appropriate cycle for monetary policy to respond to if the UK were in EMU. Professor Artis' estimates of the output gap differ from those shown in Chart 1.3.

- the UK cycle has not been highly synchronised with that of the EU15. The UK moved out of step with the EU15 over the 1980s and in the early 1990s. This was related to UK specific factors and specific features of other EU economies linked, for example, to the effects of German reunification; and
- by contrast, the UK has maintained a generally consistent and stronger co-movement with the US over the 1980s and much of the 1990s, though again this might be exaggerated by the similar timing of one-off events such as financial liberalisation and policy decisions.



I.44 Measuring the degree of similarity between business cycles by calculating simple correlation coefficients has become a widely-used measure of co-movement or ‘sympathy’ between cycles in different countries, and such comparisons were included in the 1997 assessment. A limitation of using correlation coefficients is that it is possible for two countries to appear perfectly correlated if they fluctuate together around trend, even if the amplitude of one cycle is significantly different from the other. So it is important to distinguish between correlation and volatility. Correlation measures the degree of synchronisation of the timing of cycles. Volatility measures the variation or amplitude of cycles around the trend.

...over long time periods...

I.45 Table 1.1 shows that over the period 1970 to 2002, the UK business cycle correlation with the EU15 cycle has been reasonably high at 0.66, but the correlation with the euro area cycle is lower at 0.45 and the correlation with Germany has been much lower. By comparison, the UK and US cycles have been highly correlated over the period 1970 to 2002, with a coefficient of 0.78.⁷

⁷ A correlation coefficient of 1.00 would represent a perfect degree of correlation.

...and over shorter time frames **I.46** Correlations calculated over a long period can mask both large fluctuations in the degree of correlation and improvements in correlations towards the end of the sample period. Table 1.1 also indicates how correlations have changed over time:

- over the sub-periods 1976-86 and 1997-2002, the correlations between the UK and euro area output gap cycles have been higher than over the whole period;
- the very low correlation between the UK and the euro area and the negative correlation between the UK and Germany during the period 1986-97 is in part explained by exceptional country-specific shocks such as financial liberalisation in the UK and German reunification effects in Europe; and
- over the last five years, the UK output gap cycle has been more highly correlated with the German cycle than that in the US, although the UK has fluctuated around a higher growth trend.

Table 1.1: Correlations of business cycles over time

Correlation coefficients	UK/EU15	UK/euro area	UK/Ger	UK/US	Ger/euro area
1970-2002	0.66	0.45	0.12	0.78	0.84
Sub-periods					
1976-1986	0.77	0.61	0.62	0.78	0.98
1986-1997	0.43	0.11	-0.58	0.93	0.72
1997-2002	0.66	0.64	0.79	0.73	0.96

Note: Business cycles calculated using Hodrick-Prescott filtered annual real GDP data. Source: European Commission's AMECO database and HM Treasury calculations.

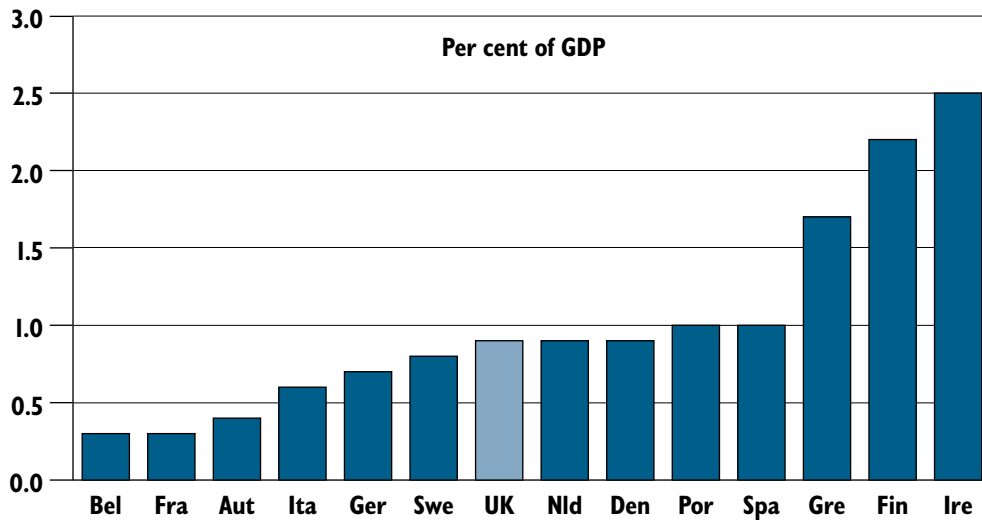
Correlations of shocks **I.47** Research into the co-movement of shocks attempts to identify the main sources of shocks to economies and then consider how far they are correlated. This recognises that monetary policy is most suited to dealing with demand shocks. If demand shocks are relatively unimportant, or if they are highly correlated with euro area countries, the costs to the UK of giving up an independent monetary policy and a flexible nominal exchange rate against the euro would be correspondingly lower.

I.48 The EMU study *Analysis of European and UK business cycles and shocks* calculates updated demand shock correlations for the UK with euro area countries and the US. Professor Artis finds substantial variation in UK shock correlations over time, with a general decline to negative values during the late 1980s indicating a strong idiosyncratic divergence of the UK cycle during these years. The correlation with the EU15 falls considerably in the late 1990s, despite the higher correlation with Germany over the last decade.

Output gap deviations **I.49** Analysis of absolute output gap deviations as in Chart 1.10 usefully supplements these other approaches and does not suffer from some of their limitations.⁸ In particular, it provides a measure of the amplitude of the cycle. France, Germany and Italy have experienced output gaps on average closer to the euro area aggregate than the UK, with an average absolute deviation of between $\frac{1}{4}$ and $\frac{3}{4}$ per cent of GDP over the last decade. The average UK deviation is larger at almost 1 per cent of GDP, but not as large as for some of the existing euro area countries and not out of line with the sort of regional deviations seen within countries. This is partly a reflection of relative size, which matters because the ECB's remit relates to the average performance for the euro area as a whole.

⁸ The EMU study *Modelling shocks and adjustment mechanisms in EMU* discusses the limitations of various techniques in identifying shocks.

Chart I.10: Output gaps, absolute deviations from the euro area aggregate, 1993-2002



Source: European Commission and HM Treasury calculations.

The core and the periphery

1.50 Early studies of convergence were conducted when it appeared that EMU would start with a small membership. The notion of a small ‘core’ of countries centred around Germany, with the other countries falling into some kind of ‘periphery’, became popular. Now that a larger EMU has been achieved, it makes more sense to assess the convergence of the UK against the euro area as a whole, as in this assessment.

The UK idiosyncrasy

1.51 The finding of the assessment supports the conclusions of most analyses of convergence, which place the UK outside the core of countries in the euro area. In his EMU study, Professor Artis describes this as the ‘UK idiosyncrasy’.

Limitations of measures of business cycle convergence

1.52 However, as Professor Artis acknowledges, all empirical work on shocks and cycles can be criticised for being backward looking. The past may not be a good guide to the future because:

- shocks in the historical sample period may be one-offs. For example, financial liberalisation in the US and the UK in the 1980s and German reunification after 1989;
- equally, there could be shocks specific to the UK or the euro area in the future, which could contribute to renewed divergence;
- for at least part of the sample period, monetary policy in the euro area operated independently and fiscal policies were not coordinated. Membership of the Exchange Rate Mechanism (ERM) could have affected the degree of convergence of some EU economies, while UK history until the post-ERM period reflects a failure of macroeconomic policies to contain cycles of ‘boom and bust’; and

- since 1999 there has been an important regime change for euro area countries, and obviously the UK regime would change again if the UK entered the single currency. Apart from a change in policy responses, EMU membership might also cause a change in private sector behaviour.⁹

I.53 These issues are considered further in the assessment of endogenous convergence later in this chapter.

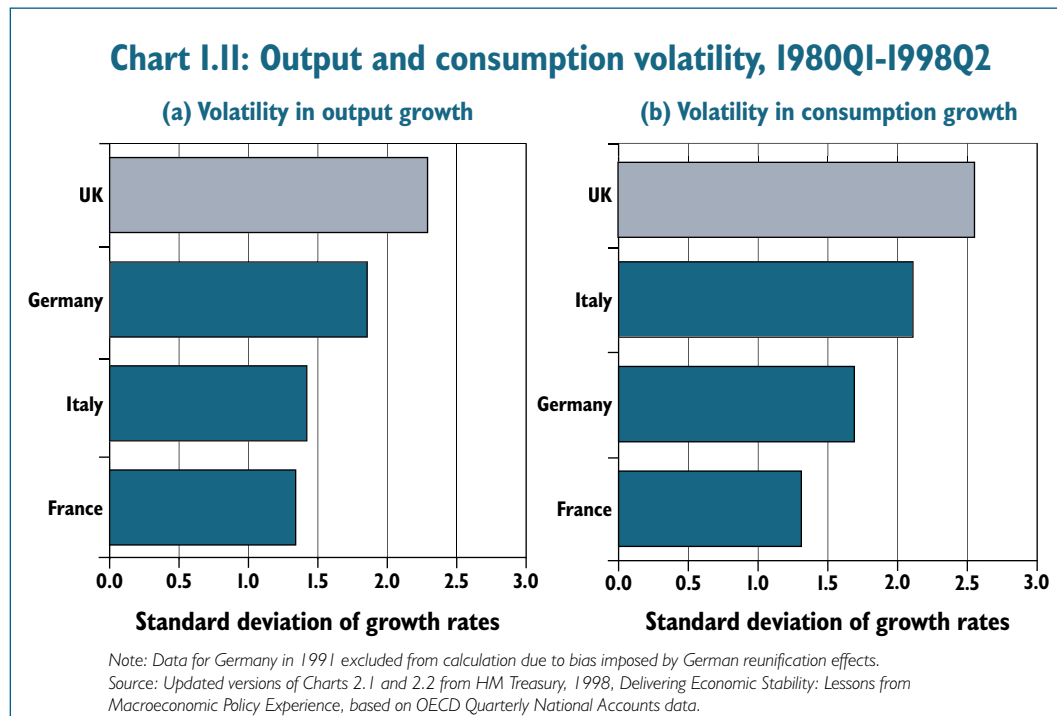
Historical convergence: output and consumption volatility

The UK had the most volatile output...

I.54 Features specific to the UK cycle have affected cyclical convergence with the euro area. The UK's past growth performance has been poor compared with other industrialised countries and both output and inflation have been highly volatile. This high volatility was identified in the 1998 Treasury paper *Delivering Economic Stability: Lessons from Macroeconomic Policy Experience*, which showed that over the period 1980-1998 the UK exhibited the highest degree of output volatility of any of the large EU countries (see Chart 1.11, replicated on latest data for the original period). The EMU study *Analysis of European and UK business cycles and shocks* provides further evidence that the UK has experienced significantly more volatile output cycles than the other major EU economies.

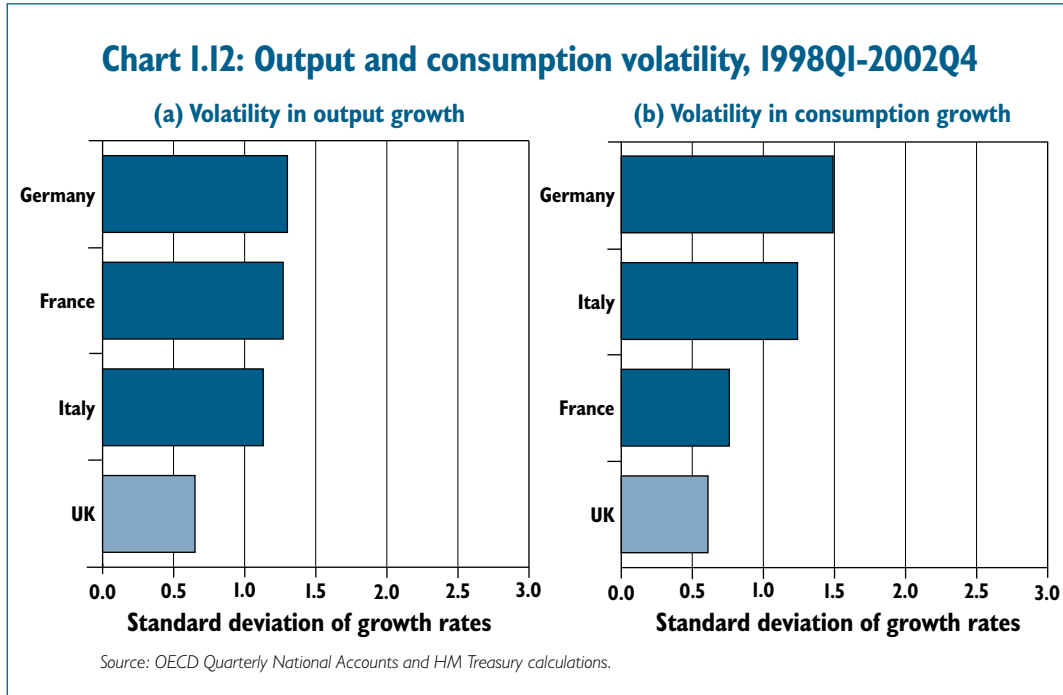
...with consumption as the key driver...

I.55 Consumption is the largest component of GDP and changes in consumption therefore have a significant impact on GDP. Chart 1.11 also updates the earlier work on consumption volatility and shows that UK private consumption growth exhibited the highest volatility among major EU economies between 1980 and 1998.



⁹ The essence of the ‘Lucas critique’ of econometrically-estimated models is that private sector responses will be conditioned by their expectation of the policy reactions. It is difficult to say with any precision how data generated in the past under a certain regime will change when the new regime of monetary union is fully established.

...and policy errors a key cause **I.56** In the past, the failure of macroeconomic policy to be sufficiently forward looking and transparent has often contributed to increased volatility in the UK. Policy responses typically came too late, exacerbating the original problems and then requiring excessive corrective action. Chart 1.12 shows that since the Government implemented a new macroeconomic framework to create a platform of stability, the UK has enjoyed the lowest level of volatility of the major EU economies, albeit in a period when volatility generally has been lower than in previous periods.

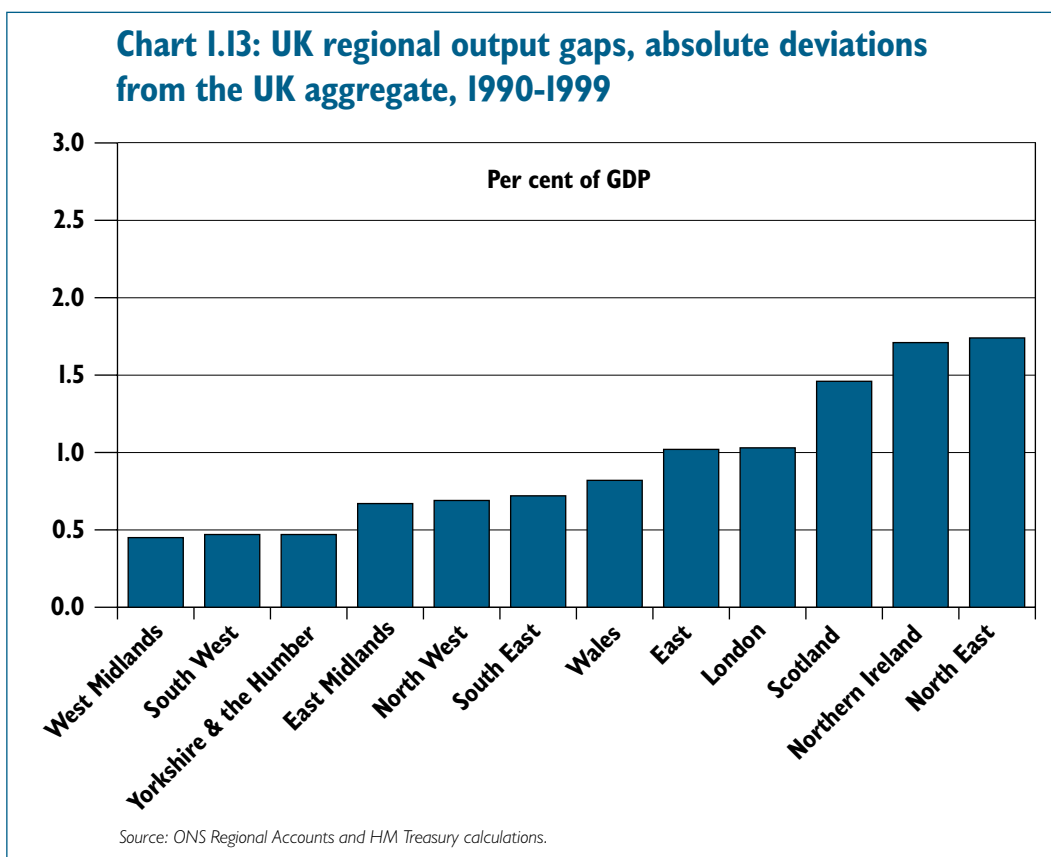


I.57 The new macroeconomic framework has played a particularly important role in reducing inflation expectations and encouraging less volatility in UK consumption and output. As foreshadowed in the 1997 assessment, achieving greater stability has provided an essential platform for closer convergence of the UK and the euro area economies. The growth, stability and employment test assesses the role of macroeconomic frameworks in the UK and the euro area in safeguarding economic stability.

Historical convergence: lessons from the US and UK regions

I.58 There is nothing in the theory underlying the analysis of correlations of shocks and cycles to establish what is a satisfactory degree of convergence – what Professor Artis terms the problem of ‘sufficiency’ of convergence. How well correlated do business cycles and shocks need to be before they are compatible? The viability demonstrated by existing currency unions – for example, regions within the UK and the US – can provide some guidance, though they exist in very different institutional and historical settings.

UK regional convergence **I.59** Evidence suggests that the majority of UK regions have been well correlated with the UK aggregate over the last decade, although Chart 1.13 shows that differences between regional output gaps and the output gap for the UK as a whole have been higher on average in the North East, Scotland and Northern Ireland.¹⁰ The variation across regions reflects an increasing regional divergence in output growth rates, in part due to variation in the sectoral mix of regional output. London, the East and South East are relatively more specialised in service sector activities which have grown relatively quickly over the last decade, while the North East and Wales rely more heavily on manufacturing.



I.60 The limited academic research undertaken on regional convergence concludes that correlations in UK regional cycles are greater than correlations in EU country cycles, which are in turn greater than correlations between UK regions and EU countries. It has also been estimated that correlations in demand and supply shocks have been far higher between UK regions than between EU countries.

The US as a monetary union **I.61** The US example shows how a large, industrialised economy successfully functions with a single currency, and how different regions, quite disparate in terms of geography, climate, industry and heritage, develop within a monetary union.

I.62 The EMU study *The United States as a monetary union* analyses the extent to which regions within the US are subject to region-specific shocks. The key conclusions are that:

- supply and demand shocks have varied widely in their incidence and impact on the regions of the US. Similarly, analysis of business cycles suggests that some regions have displayed highly idiosyncratic business cycles;

¹⁰ The general issues relating to estimating output gaps are compounded by poor availability of regional data in this exercise. Regional output gaps are estimated using nominal regional GDP deflated by the national GDP deflator and are Hodrick-Prescott filtered.

- this implies that a monetary union can prosper with quite varied regional business cycles and in the presence of asymmetric shocks; but
- the degree of divergence between US regions is, on average, smaller than that which tends to be exhibited between countries of the EU. This may represent evidence of endogeneity – monetary union may have increased regional convergence in the US.

I.63 Various adjustment mechanisms play a key part in helping US regions to adjust smoothly and these are discussed in the assessment of the flexibility test. But a direct comparison between the US (or the UK) and the euro area is difficult because of the way in which the institutions and policy frameworks of each monetary union have evolved and because the political context is very different, as discussed in the assessment of the growth, stability and employment test.

Euro area experience

I.64 The evidence of the first four years of EMU provides another standard. There have been divergences since the start of monetary union, which are considered both in the analysis of the transition to sustainable convergence and further in the flexibility test. But there are reasons for thinking that this backward-looking analysis taken in isolation might be an unreliable guide to the future and must be complemented by a forward-looking dynamic analysis.

Conclusion: what does past history demonstrate about the extent of convergence?

I.65 On past performance, UK business cycles have been much less compatible with the euro area average than has been the case in other countries such as Germany and France. There is some evidence that compatibility may have increased in recent years, reflecting greater macroeconomic stability in the UK and increased convergence between the business cycles of all the advanced economies. Over the last five years, the UK output gap cycle has been more highly correlated with the German cycle than that in the US, although the UK has fluctuated around a higher growth trend. France, Germany and Italy have experienced output gaps on average close to the euro area aggregate, at an average absolute deviation of between $\frac{1}{4}$ and $\frac{3}{4}$ per cent of GDP over the last decade. The average UK deviation is larger at almost 1 per cent of GDP, but not as large as some of the existing euro area countries and not out of line with the sort of regional deviations seen within countries. However, the UK's history of divergence remains a risk factor.

STRUCTURAL CONVERGENCE

I.66 Even if cyclical convergence were assessed to be achieved at a particular point in time, the structure of the UK and euro area economies could mean there would be country-specific developments causing divergence with the euro area in the future. This is because differences in structures could make the UK more vulnerable to shocks that do not affect the rest of the euro area (for example, volatility in house prices) and the UK could react differently to changes in economic circumstances that affect the whole of the monetary union (for example, changes in interest rates). This highlights the importance of achieving settled and sustainable convergence through having UK structures which are compatible with the euro area over time. Compatibility of structures will limit the extent of divergences, either from country-specific shocks or responses to such shocks. This section addresses the question of which differences in structures are important.

Potential for different structures **I.67** Both shocks and responses are conditioned by the structural features of the economy such as sectoral composition, trade patterns, investment linkages and financial structures, and housing markets. The assessment of structural convergence considers particular features of the UK economy that might cause the UK to:

- experience different shocks;
- have a different response to a shock that affects both the UK and the euro area; or
- have a different response to ECB monetary policy changes.

I.68 All of these could lead to future divergence between the UK and euro area business cycles. Much of the literature focuses on different shocks, but different responses to a shock are also important.¹¹ In particular, in the context of EMU, if ECB monetary policy affected the UK economy in a different way from other euro area economies, this could generate a different cyclical path for the UK relative to the rest of the euro area and greater volatility of output and inflation.

Structural convergence: sectors

I.69 The UK's composition of output determines how shocks affecting particular sectors¹² might affect the UK relative to other euro area countries and whether this would imply divergent behaviour in the future. The EMU study *EMU and business sectors* analyses the distribution of output and employment across sectors and also specialisation measures to compare industrial structures of countries.

Sectoral share of output **I.70** The UK's sectoral structure is similar in many respects to that of the euro area as a whole. Table 1.2 summarises the composition of output in the UK, Germany, France and Italy. In the UK, 74 per cent of output is accounted for by the services sector. This is comparable to France but slightly larger than for Germany and Italy, where the service sector accounts for around 70 per cent of total output. Germany has the largest manufacturing, mining and utilities sector, accounting for around a quarter of total output.

Table 1.2: Sectoral share of output, 2002

Per cent of total output	UK	Germany	France	Italy
Agriculture, hunting, forestry, fishing	0.9	1.1	2.8	2.6
Manufacturing, mining, utilities	19.9	24.2	20.1	22.4
Construction	5.5	4.4	4.7	4.9
Distribution, hotels, transport, communications	22.9	18.6	19.3	23.7
Finance, real estate, other business activities	27.9	30.1	30.1	26.8
Public admin, social security, education, health, defence	22.8	21.6	23.1	19.6
<i>Services total</i>	<i>73.6</i>	<i>70.2</i>	<i>72.4</i>	<i>70.1</i>

Note: Output measured by gross value added. French data for 2001. Figures may not sum due to rounding. Source: Eurostat.

¹¹ Shocks are discussed in the contributions of Professor Barry Eichengreen and Professor Jeffrey Frankel to the EMU study *Submissions on EMU from leading academics*. In the same study, the contribution of Professor Andrew Hughes Hallett focuses on the transmission of shocks. The literature is considered in detail in the EMU study *The five tests framework*.

¹² For example, the agricultural sector can be subject to severe supply disturbances (such as adverse weather conditions) that result in volatile prices.

I.71 As with output, the composition of employment by sector reveals broad similarities and some national differences. The EMU study *EMU and business sectors* highlights the smaller share of agricultural employment in the UK and the significantly larger share of employment in the German manufacturing sector compared to France and the UK. The UK has a greater share of employment in the services industry, particularly in finance and business activities, though differences are not great.

Industrial specialisation I.72 Measures of industrial specialisation indicate how specialised an economy is in certain sectors, relative to other countries. The main findings of the EMU study *EMU and business sectors* on specialisation are:

- the UK is closest in terms of industrial structure to France;
- the UK is less specialised than most of its EU counterparts, implying the UK is relatively well placed to withstand sector-specific shocks because it has a diversified industrial structure; and
- Germany is more exposed than the UK to interest rate sensitive sectors – possibly reflecting its capital goods orientation. But the UK is more exposed to exchange rate sensitive sectors than France or Germany.¹³

I.73 This analysis confirms that in terms of industrial specialisation the UK is quite similar at the aggregate level to other large EU countries, an issue returned to in the assessment of endogenous convergence.

Oil and financial services I.74 Greater differences are apparent at a more disaggregated level:

- within production industries, mining and quarrying of energy-producing materials accounts for 2.7 per cent of UK output, compared to less than 0.5 per cent in the major euro area countries, largely due to production of oil and natural gas. The UK and Denmark are the only net oil exporting countries in the EU; and
- the UK has a relatively large financial services sector, as discussed in the assessment of the financial services test.

I.75 Both oil and financial services can be subject to shocks of significant magnitude and so have the potential to affect the whole economy, despite their relatively small share of total output. However, the analysis in Box 1.2 – based on a simulation exercise using the NiGEM macroeconomic model¹⁴ – confirms that it would take an extremely large oil price shock to generate a significant difference in output between the UK and the euro area at the aggregate level.

¹³ The contribution by Professor Wendy Carlin and Dr Andrew Glyn to the EMU study *Submissions on EMU from leading academics* finds that UK exports are relatively cost sensitive compared to other EU countries.

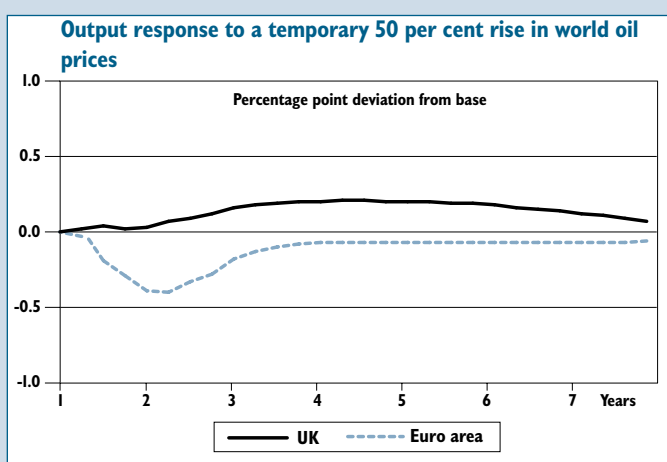
¹⁴ NiGEM is a model of the world economy maintained and developed by the National Institute for Economic and Social Research. NiGEM is described in greater detail in Annex A.

Box 1.2: The potential differential impact of an oil price shock

The UK and Denmark are the only two net oil exporters among the 15 EU Member States. This means that changes in oil prices can have different effects on the current account balance in the UK compared to the euro area.

The decline in real oil prices since the 1970s has reduced the share of oil output in GDP. The oil production sector in the UK accounts for only 2¾ per cent of total output, and so a rise in oil prices will affect the majority of UK businesses and consumers in the same way as those in the euro area, for example through increased costs of production and higher petrol and domestic heating fuel costs.

The NiGEM model has been used to simulate the effects on the UK and the euro area economies of a 50 per cent rise in world oil prices for one year. The UK is assumed to experience the same monetary policy and exchange rate responses as the euro area – in order to isolate the effects from any structural differences.

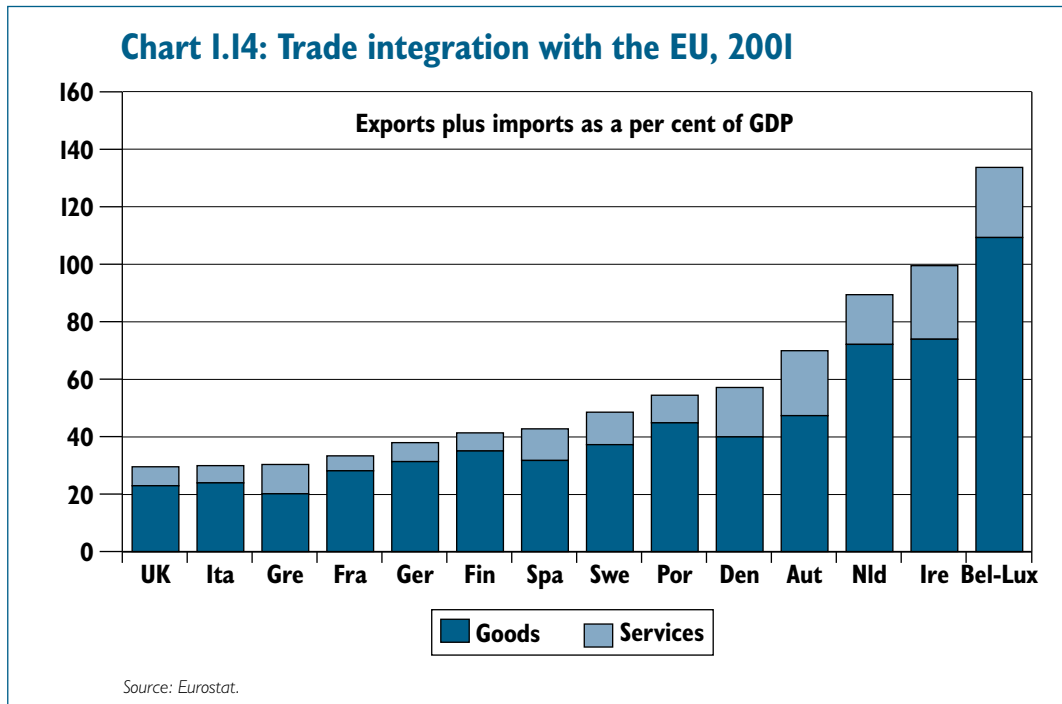


The chart shows the impact of the oil price shock on output levels in the UK and the euro area. The UK response is different to that in the euro area, reflecting the UK's different structure. But a very large shock to oil prices only results in a short-lived divergence between the UK and the euro area output responses relative to base of less than ½ percentage point.

Structural convergence: trade exposure

1.76 The UK's relative patterns of trade and the degree of openness to trade have an important role in determining how global shocks might affect the UK relative to euro area countries. Exports are driven by demand conditions in the rest of the world and any change in exports will have a direct effect on a country's GDP. Imports will be primarily determined by conditions in the domestic economy, so they are not likely to be a first line source of shocks to the domestic economy. However, factors such as changing capacity constraints in an exporting country will affect the price and availability of imports. Patterns of trade can change over time and the act of joining EMU could stimulate increased trade linkages (see the EMU study *EMU and trade*). Whether this is likely to promote convergence is discussed in the section on endogenous convergence.

Trade integration 1.77 Chart 1.14 shows trade integration with the EU as a percentage of GDP. UK trade in goods and services (exports plus imports) with the EU is equal to nearly 30 per cent of UK GDP. This is in line with Italy but slightly lower than in Germany and France.



Patterns of trade 1.78 Table 1.3 shows the geographical breakdown of current account trade. The UK appears to be more exposed to trade shocks from North America and Asia than the large euro area economies. Germany has a much larger exposure to trade with non-EU European economies.

Table 1.3: Geographical breakdown of current account trade¹: goods and services, 1999-2001

Per cent of GDP	EU15	Other Europe ²	Asia	NAFTA ³
UK	29.4	2.2	8.6	10.1
Germany	36.3	7.3	7.6	7.2
France	33.6	2.3	5.3	5.8
Italy	29.5	4.6	5.6	5.2
EU15	42.0	4.6	7.5	8.1

¹ Credits plus debits.

² Non-EU or EFTA Europe.

³ North American Free Trade Agreement.

Source: Eurostat.

Shocks to trade 1.79 As with the shock to the oil sector already considered, the scale of trade shocks will determine whether differences in trade exposures can generate cyclical divergences. The largest negative trade shocks to imports into the NAFTA region were experienced in 1985 and 2001 – on each occasion import growth fell by around 15 percentage points. Another significant trade shock was experienced in 1998 when growth of imports into Asia fell by a similar magnitude. Box 1.3 illustrates the differential impact on the UK and the euro area of a temporary fall in US imports of 15 per cent, based on the same type of simulation exercise as in Box 1.2. The results confirm that while there are differences between the UK and the euro area in patterns of trade, it would take an extremely large shock in the US economy to be the source of a significant cyclical divergence between the UK and the euro area economies. Overall, trade structures, like sectoral structures, are a lower risk factor to the achievement of settled and sustainable convergence.

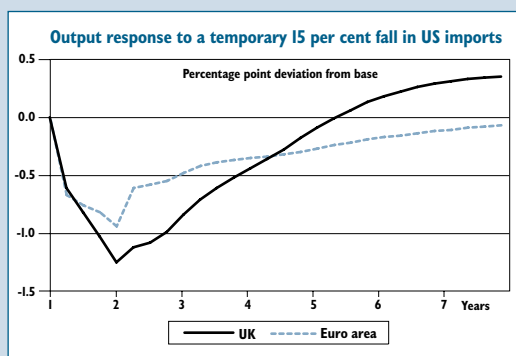
Box 1.3: The potential differential impact of a trade shock

A worked example illustrates the scale of potential differential impacts from a trade shock:

- the UK’s goods and services export exposure^a to the NAFTA region is 5.3 per cent of GDP and so the direct impact of a negative shock to trade of 15 per cent could be expected to reduce UK GDP by around 0.8 per cent. Germany’s export exposure to NAFTA is 4.2 per cent and so the same negative shock would cause German GDP to fall by around 0.6 per cent; and
- similarly, a 15 per cent negative shock from the Asia region would reduce UK GDP by 0.6 per cent and German GDP by 0.5 per cent.

The differentials between the effects of a significant trade shock on the UK and Germany are not great, at most 1/4 per cent of GDP.

This basic analysis is complemented by a more sophisticated simulation of a trade shock using the NiGEM model. This allows for the inclusion of second round effects, for example the impact of a fall in US demand on German output and hence German demand for UK exports. A temporary fall in US imports (goods and services) of 15 per cent is simulated for one year. The chart below illustrates the effects on output in the UK and the euro area (assuming the UK has the same monetary and exchange rate responses as the euro area).



The chart shows that the initial output response in the UK is greater than in the euro area, as predicted in the simple worked example. UK output falls by 1 1/4 percentage points after one year and euro area output by almost 1 percentage point. A large shock to US imports only results in a short-lived divergence between the UK and the euro area output responses of at most 1/2 percentage point.

^a Table 1.3 shows trade exposure, i.e., imports plus exports.

Structural convergence: non-housing financial structures

1.80 Investment and financial market linkages are an important channel by which regional shocks are transmitted globally. These links have grown stronger in recent years along with increasing asset market interdependence through cross-border asset diversification. While trade linkages are increasingly important for the real economy, investment and financial linkages also play a role in explaining close business cycle correlations among industrialised economies. For example, an economy with a higher exposure to US foreign direct investment (FDI) might be more affected by US growth prospects.

1.81 Financial structures also determine how external shocks affect the domestic economy and the transmission of monetary policy. For example, economic disturbances that affect world equity prices will have a greater impact on countries with larger equity markets.

Foreign portfolio assets and FDI **I.82** The UK's pattern of financial market and investment linkages is distinct from that of the euro area in some respects but less so in others:

- the UK has higher levels of foreign assets and liabilities, relative to GDP, than the large euro area countries. However, UK foreign asset and liability positions largely reflect intermediation by the banking sector, a consequence of London's position as a large international banking centre, and most may net out in the financial system and not impact on the real economy;
- Table 1.4 shows differences between the UK and the large euro area countries in cross-border flows of FDI (discussed in more detail in the assessment of the investment test). The UK has a higher level of FDI flows as a percentage of GDP than the large euro area economies and more of these flows are with North America than is the case for the EU; and
- with increasing cross-border merger and acquisition activity and expansion of existing overseas operations, there is increasing economic interdependence between businesses. External shocks can affect firms' revenues from foreign affiliates. UK firms are not exceptional compared with those in other large EU countries in terms of their share of sales from foreign affiliates. International Monetary Fund (IMF) research shows that on average over 1995-2000, revenue of listed companies from foreign sales was almost equivalent to that from domestic sales in the UK, slightly less in Germany and Italy and significantly more in France.¹⁵

Table 1.4: Geographical breakdown of FDI flows¹, 1997-2001

Per cent of GDP	EU15	Other Europe ²	Asia	NAFTA ³	Total
UK	7.6	0.3	0.4	5.4	14.8
Germany	4.9	0.3	0.3	1.5	7.3
France	6.7	0.2	0.3	2.0	9.9
Italy	1.7	0.1	0.0	0.3	2.3
EU15	7.5	0.3	0.3	2.7	12.0

¹ Inward flows plus flows abroad.

² Non-EU or EFTA Europe.

³ North American Free Trade Agreement.

Note: German data for 1997-2000; Italian data for 1999-2001.

Source: Eurostat.

Stock market movements **I.83** Stock market movements are particularly relevant to the UK. The UK has one of the largest equity market capitalisations in the EU as a percentage of GDP. Correlations between stock market movements indicate how domestic shocks to equity prices are likely to be transmitted to other economies. IMF research¹⁶ shows that UK equity price movements appear to be most closely correlated with the US, but correlations with the major euro area economies are also high.

I.84 Financial structures in the household and corporate sectors determine how equity price movements affect the real economy via their impact on household income or wealth and the cost of capital. The EMU study *EMU and the monetary transmission mechanism* reviews household and corporate financial structures.

¹⁵ IMF World Economic Outlook, October 2001.

¹⁶ IMF World Economic Outlook, May 2000.

Household sector assets **I.85** The EMU study shows that the UK household sector has a high level of net financial assets relative to the large euro area countries. However, the proportion of assets that are sensitive to short-term interest rate changes are similar across countries, so the impact of monetary policy changes on interest income and thus household consumption are likely to be broadly the same. Equity holdings are higher in the UK than in Germany and Italy. This implies that UK consumers are more sensitive to variations in financial asset prices and world equity price movements. But UK households hold a high share of their equity wealth indirectly in life assurance and pension funds rather than through direct ownership.

I.86 Household spending in the UK has not, to date, reacted strongly to changes in the value of life and pension fund assets, as individuals may earmark it as retirement income. However, recently improved regulations on disclosure, for example through pension and endowment projections, and gravitation from defined benefit to defined contribution occupational pension schemes, will have made individuals more aware of the value of their indirect institutional assets holdings. These developments, and associated publicity, have strengthened the link between changes in indirect wealth holdings and consumer spending.

The corporate sector **I.87** The level of financial assets and liabilities in the corporate sector will affect how domestic investment reacts to changes in interest rates and asset prices through the cost of capital. The UK non-financial corporate sector has a high level of financial liabilities and a large negative net financial asset position, similar to that in France but higher than that in Germany or Italy. Loans to the corporate sector as a percentage of GDP are very similar across the four economies. A key difference is that the UK and France have much higher levels of equity financing. This implies that the UK and French corporate sectors will be particularly sensitive to equity price movements.

The impact of equity price movements **I.88** Equity price movements can affect the real economy through their impact on private consumption and investment. A fall in equity prices reduces households' financial wealth and may lead to a fall in consumer confidence – affecting prospects for private consumption. A fall in equity prices also raises the cost of capital – discouraging business investment.

I.89 In general, results of empirical studies, reported in Box 1.4, suggest that the equity 'wealth effect' is higher in the US, Canada and the UK than in the other G7 countries, due to the greater size of their equity markets. The propensity to consume out of financial wealth may also be lower in France and Germany because high-income and older households dominate equity holdings to a much larger degree than in the UK and the US.

I.90 Overall, the UK exhibits some differences in non-housing financial structures and investment linkages which could feed through to the real economy. Together these structural differences represent a low to medium risk factor to the achievement of settled and sustainable convergence.

Box 1.4: The potential differential impact of an equity price shock

Research reported in the April 2002 *IMF World Economic Outlook* concludes that the impact on consumption of changes in equity wealth tends to be higher in economies which it classifies as using market-based financial systems (for example, the US, UK and Canada), than in economies which it classifies as using bank-based financial systems (for example, Germany, France and Italy). The table below presents the key findings.

Equity wealth effect on consumption

Increase in consumption, cents ¹	1970–2000	1984–2000
Market-based	3.0	4.3
Bank-based	-0.2	0.9
Full sample	0.9	2.0

¹Per US dollar increase in equity prices.

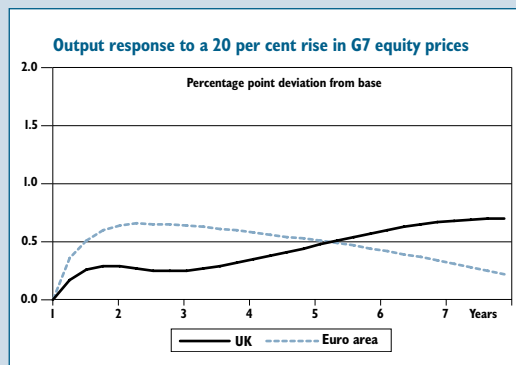
Source: *IMF Economic Outlook*, April 2002.

Over the period 1984–2000, consumption in market-based economies has been on average over four times more responsive to changes in equity wealth than in bank-based economies. The IMF also concludes that the impact of changes in equity wealth has increased over time in both groups of countries.

The European Commission’s 2002 review of the EU Economy contains simulations of the impact of a 20 per cent fall in equity prices on output, through the private consumption channel. The results show that the impact on euro area GDP is only about half to a third of the impact on US GDP. The Commission concludes that the direct impact of equity prices on consumption and investment in the euro area is probably not very large. But indirect effects via the availability of credit could be much greater. This is consistent with the findings of the EMU study *EMU and the monetary transmission mechanism*.

As in the case of shocks to oil and trade, the NiGEM model has been used to test whether the UK is more susceptible to world equity market shocks than the euro area. A 20 per cent rise in G7 equity prices is simulated.

In this simulation, equity prices are assumed to have risen due to a fall in the perceived risk associated with equity holdings. A rise due to other influencing factors, such as improved prospects for corporate profits, might be expected to have a different impact on UK and euro area output.



The results show that the initial output response in the euro area is greater than in the UK. In the longer term, the NiGEM results are more consistent with the IMF and Commission findings, with the impact on UK output 1/2 percentage point greater than in the euro area.

Structural convergence: housing markets

I.91 Pronounced cycles in the housing market have been a striking feature of the UK economy over the past three decades. In 2002, house prices rose strongly and the state of the housing market and its influence on households' spending was an important consideration in the MPC's decisions on interest rates. If households' spending is significantly more sensitive to interest rate changes in the UK than in the euro area as a whole, monetary policy set by the ECB would generate relative instability in the UK economy. A key conclusion of the 1997 assessment was that the housing market would be a source of instability to the UK economy in EMU.

I.92 This assessment revisits these conclusions, drawing on the detailed analysis and conclusions of the EMU study *Housing, consumption and EMU*. This highlights four important housing market structures:

- differences in long-run **house price trends or cycles** due to supply-side factors may affect household consumption;
- the level of **mortgage debt** and the nature of **mortgage interest rates**, in particular whether they are variable or fixed, will affect households' interest rate sensitivity;
- high rates of **owner occupation**, as compared to private or social renting, are likely to increase the impact of changes in housing wealth on consumption; and
- the ability of households to **withdraw equity** from housing is important in determining the impact of changes in housing wealth on consumption.

House price trends **I.93** House price behaviour in the UK has been different from the other large EU countries. The UK has seen a long-term trend rise in real house prices of around 2½ per cent a year over the last 30 years. This is at least double that in France and Italy, while in Germany real house prices have been stable. Faster house price growth has made housing a better investment asset in the UK. Insofar as the gains can be accessed, this has increased homeowners' wealth available for consumption.

I.94 The differing behaviour of house prices reflects both demand and supply factors. A number of studies suggest that the responsiveness of housing supply to demand pressures is particularly low in the UK. This reflects long-term under-investment in housing. The UK has, on average, invested a low proportion of its national income in housing compared to other EU countries since 1960. A low supply response would help to explain the much stronger upward trend in real house prices in the UK. It would also tend to accentuate house price volatility – increased supply should help to check house price rises when demand for housing expands.

Mortgage markets... **I.95** Mortgage markets differ significantly across Europe with important implications for the sensitivity of household spending to interest rate changes. For homeowners, the rate of interest helps to determine the immediate burden of mortgage payments. High levels of mortgage debt and/or a high reliance on variable as opposed to fixed-rate mortgage financing is likely to mean that interest rate changes have a stronger short-term impact on disposable income and hence spending:

- owner occupation, at 69 per cent, is not very different in the UK from the EU average. It is, however, higher than in Germany and France, although lower than in Spain;
- mortgage debt in the UK, at almost 60 per cent of GDP, is above the EU average and exceeded only in Denmark and the Netherlands; and

- most strikingly, over 60 per cent of new UK mortgages are variable rate and most others are short-term fixes of one to five years. In Germany, 80 per cent of mortgages are at long-term fixed rates of over five years, with all the rest shorter-term fixed rates. Among the larger EU countries only Italy – where the level of mortgage debt is low – has an appreciable proportion of variable rate mortgages, at 34 per cent.

...and the sensitivity of household spending to interest rates

I.96 The UK's level of mortgage debt and its greater reliance on variable rate mortgages imply that the sensitivity of housing-related interest payments to changes in interest rates is far higher in the UK than in the other large EU countries. As a result, household disposable income and thus spending is likely to be more sensitive to interest rate changes in the UK than in many other European countries. This conclusion is in line with that reached by academic experts on the UK housing market. The contributions of Professor John Muellbauer and Professor Geoffrey Meen to the EMU study *Submissions on EMU from leading academics* both note that the UK's high mortgage debt and reliance on variable rate mortgages may make the UK more interest rate sensitive than other EU countries.

Housing wealth

I.97 The link between the housing market and household spending also depends on the extent to which housing wealth can be accessed and, in particular, the extent to which homeowners are able to borrow against their housing wealth (known as mortgage equity withdrawal). The UK has a liberalised and competitive mortgage market and the Scandinavian countries have followed a similar path. Mortgage equity withdrawal has been strong in the UK and in Sweden but, as shown in Table 1.5, it has been negative in France, Germany and Italy. This reflects both the relative ease of securing mortgage equity withdrawal in less regulated mortgage markets and trends in housing equity itself, largely reflecting house price movements.

Table 1.5: Key features of housing markets

	UK	Germany	France	Italy
Long-term trend real house price inflation (per cent a year, 1971-2001)	2.4	0.0	0.8	1.2
Value of outstanding residential mortgage debt (per cent of GDP, 2001)	59	55	19	10
New residential mortgage lending on variable rates (per cent of total, 1999)	64	0	5	34
Owner occupation rate (per cent, 2000)	69 ¹	42	55 ²	68
Mortgage equity withdrawal (per cent of household disposable income, 1979-1999)	2.6	-5.7 ³	-6.3	-6.1

¹ 2001; ² 1999; ³ 1979-1997.

Note: Mortgage equity withdrawal averaged 5.8 per cent of household disposable income in the UK in 2002.

Source: EMU study *Housing, consumption and EMU*.

I.98 On the overall question of whether UK households are more sensitive to interest rate changes than euro area households, the EMU study *Housing, consumption and EMU* concludes that:

- real house price growth has been stronger in the UK than in the large euro area countries, and the low response of housing supply in the UK appears to be an important reason for this;
- high levels of mortgage debt in the UK, combined with the dominance of variable rate mortgages, implies that the sensitivity of household interest payments, and thus disposable income, is higher in the UK than in euro area countries;

- the UK owner occupation rate is close to the EU average, though above the levels in Germany and France, while lower than in Spain and a number of smaller EU countries; and
- the competitive, liberalised mortgage market in the UK makes it easier for households to access their housing wealth than is the case in the larger euro area countries and UK households have been active in taking advantage of these opportunities, as shown by the higher levels of equity withdrawal.

1.99 The EMU study *Housing, consumption and EMU* also examines empirical studies of consumption functions and presents Treasury modelling of the consumption function. While the results are not as clear cut as the evidence of structural differences, on balance they support the view that the sensitivity of household spending to housing wealth and house prices is higher in the UK than elsewhere. Other work also suggests that the link between interest rates and house prices may also be more sensitive in the UK, tending to enhance any response of household spending to interest rates.

1.100 If the UK were to enter EMU, established patterns of behaviour might change, leading to convergence in the interest rate sensitivity of household spending in the UK and the euro area. However, there is little evidence of significant convergence of euro area housing and mortgage markets to date. While mortgage rates have converged, mortgage markets remain segmented with little tendency for the types of mortgage product available to become more similar across the different countries. This issue is discussed further in the next section on endogenous convergence.

The detailed analysis of housing...

1.101 Overall, the analysis in the EMU study *Housing, consumption and EMU* reveals high sensitivity of incomes (after mortgage payments) to interest rate changes in the UK and high house price growth and volatility, reflecting to a significant extent the low supply response of house building in the UK. This is a combination which may mean that deviations in UK interest rates from their appropriate level could lead to particularly large swings in the housing market (implying correspondingly large swings in the distribution of wealth between homeowners and others) and hence in the wider economy in the UK, while similar deviations would be less problematic in some other EU countries. In EMU, interest rates are set in relation to conditions in the euro area as a whole rather than in relation to conditions in any individual country. The resulting gap between what is appropriate for the euro area and what would be appropriate nationally could matter more in the UK than elsewhere.

...shows it is a high risk factor

1.102 In terms of the assessment, this incompatibility of housing structures means that the housing market is a high risk factor to the achievement of settled and sustainable convergence.

1.103 Since 1997, the Government has recognised that reforms to the planning and supply of housing are needed to reduce volatility and promote stability in the wider economy. The Deputy Prime Minister set out a wide-ranging programme of reforms in the February 2003 Communities Plan¹⁷ including: proposals for significant development in four growth areas in the South East; new regional housing bodies to better coordinate funding at the regional level; and action in areas facing a surplus of housing backed by an additional £1.1 billion a year by 2005-06 to support a substantial increase in affordable housing. Through the tax system, successive Governments have recognised the distortion in treatment of owner occupied housing and from April 2000 the Government announced the complete abolition of mortgage interest tax relief (MIRAS).¹⁸ The Government has also taken action (since its 1998

¹⁷ *Sustainable communities: building for the future*, Office of the Deputy Prime Minister, February 2003.

¹⁸ Budget 2000, HM Treasury, March 2000.

Modernising Planning Initiative¹⁹) to make the planning system work more quickly, predictably and effectively by speeding up the processing of applications, ensuring, through intervention if necessary, that local authorities in areas of high demand deliver housing numbers set out in Regional Planning Guidance²⁰ and committing to build at higher densities.

I.104 To deliver a more settled platform of stability in the future and a higher degree of convergence, the Government is committed to a comprehensive programme to improve the functioning of the housing market, as set out at the end of this section.

Structural convergence: monetary policy transmission

Monetary policy feeds through to the real economy...

I.105 Taken together, all the structural features discussed above will influence how monetary policy affects the real economy: the monetary policy transmission mechanism. If a change in interest rates causes a different response in the UK compared to euro area countries, in terms of the speed of response or its overall effect on output and inflation, this might result in a divergent cyclical path or greater volatility of output and inflation in the UK.

I.106 The transmission of monetary policy is complex in both theory and practice. The EMU study *EMU and the monetary transmission mechanism* takes a wide-ranging approach to consider both the workings of the transmission mechanism and the overall speed and strength of the UK transmission mechanism when compared to other countries.

...through a number of channels

I.107 Monetary policy affects output and prices through a wide variety of channels and numerous structural factors will influence the speed and extent of the transmission mechanism through these channels. Analysis of these structures suggests that when compared to other countries, the UK may be more sensitive to monetary policy through some channels and less sensitive through others:

- the pass-through of interest rate changes from official rates to bank lending rates is faster in the UK, potentially making the UK more sensitive to monetary policy changes;
- the household sector in the UK may react more strongly to interest rate changes than in euro area countries due to: higher levels of mortgage debt in the UK, combined with the dominance of variable rate mortgages; UK house prices being potentially more responsive to interest rate changes due to the low supply response of UK house building; and UK households being more sensitive to changes in housing and financial wealth;
- there is little to suggest the corporate sector in the UK will react more strongly than in the euro area. The structure of production is service intensive, whereas monetary policy has a stronger effect on investment and durable goods sectors which are more important in the German economy. UK banks are relatively large and firms use a range of financial products and so are less likely to face credit supply constraints at a time of monetary tightening;
- the UK is potentially more sensitive to monetary policy through its impact on the exchange rate as the UK has a larger stock of foreign assets and liabilities than major euro area countries; although this may be a reflection of the UK's role as an international financial centre and so have limited implications for the behaviour of consumption; and

¹⁹ *Modernising Planning: A policy statement by the Minister for the regions, regeneration and planning*, Department for the Environment, Transport and the Regions, 24 February 1998.

²⁰ Regional Planning Guidance can be found at <http://www.planning.odpm.gov.uk/rpg/index.htm>.

- anticipating the analysis in the flexibility test chapter, the UK is seen to have relatively low levels of nominal wage rigidity. Nominal wage and price rigidity strengthens the impact of monetary policy on output (and temporarily reduces the impact on inflation).

I.108 The UK's overall sensitivity to monetary policy relative to euro area countries will depend on how these effects add up.

Findings of empirical work...

I.109 The EMU study *EMU and the monetary transmission mechanism* examines empirical studies which attempt to model cross-country differences in the monetary transmission mechanism at the macroeconomic level, to identify the overall sensitivity of output or inflation to a monetary policy change. The findings are:

- when comparing cross-country responses to a monetary policy shock using different country-specific macroeconomic models, the UK appears to have a significantly stronger output response than euro area countries; however
- when the same theoretical model is applied across countries, studies often find that differences in transmission mechanisms are quite low and the UK does not appear to be an obvious outlier. Treasury work using the NiGEM model finds some differences in the compositional impact, but no significant difference between the overall impact on output and inflation between the UK and the euro area.

...are subject to significant problems

I.110 There are significant problems with each of these approaches. Using different models for each country may mean variations in responses are due to theoretical differences in model specification. On the other hand, imposing a common theoretical model across countries will mean that real structural differences such as housing are not fully captured. Although the NiGEM model has recently been developed to include a consumption channel via housing wealth effects for the UK, the scale of the effects are small. The detailed structural analysis of the housing sector already presented shows important differences between the UK and euro area housing structures, implying that the degree of asymmetry between the UK and the euro area is likely to be greater than indicated by the NiGEM model.

I.111 The wide range of structures which influence the transmission mechanism have distributional implications. For example, the structure of the housing market in the UK suggests that homeowners will be affected differently to non-homeowners by the level of interest rates and by interest rate changes, an issue returned to in the assessment of the growth, stability and employment test.

Conclusion: which differences in structures are important?

I.112 Certain structural differences between the UK and the euro area are risk factors for the achievement of settled and sustainable convergence. Differences in the UK and euro area housing markets are high risk, differences in investment linkages and financial structures are low to medium risk and sectoral and trade differences are lower risk. In terms of industrial specialisation the UK is quite similar at the aggregate level to other large EU countries.

I.II3 Distinct supply and demand features of the UK housing market mean that both the relationship between house prices and household consumption, and the underlying rate of real house price growth, are stronger in the UK than in the euro area. The structure of the UK mortgage market is such that UK households are more sensitive to interest rates, which has implications for the transmission of monetary policy.

I.II4 Analysis of monetary transmission suggests that the UK may be more sensitive to monetary policy through some channels and less sensitive through others: the pass-through of interest rate changes from official rates to bank lending rates is faster in the UK; the household sector in the UK may react more strongly to interest rate changes than in euro area countries; the UK is potentially more sensitive to monetary policy through its impact on the exchange rate; but there is little to suggest that the corporate sector in the UK will react more strongly than in the euro area. The UK's relatively low levels of nominal wage rigidity will tend to reduce the impact of monetary policy on output.

Policy requirements: housing

I.II5 To deliver a more settled platform of stability in the future and a higher degree of convergence, the Government is committed to a comprehensive programme to improve the functioning of the housing market. Building on the reforms to deliver a step change in planning policy, the Government is undertaking further significant changes in the planning system, supply of housing and housing finance to tackle market failures, increase the responsiveness of supply to demand and reduce national and regional price volatility. These measures are beneficial in their own right to improve the stability and flexibility of the UK housing market and wider economy, but will also increase the housing market's compatibility with the euro area, encouraging greater convergence over time.

I.II6 This means implementing quickly and decisively past reforms to housing supply and going further to address both supply and demand in the housing market and macroeconomic stabilisation more generally:

- on the supply side, the Government is requiring new Regional Spatial Strategies to take account of volatility in the housing market and promote macroeconomic stability as part of delivering sustainable development; tough and credible measures, including intervention, where local authorities are not delivering housing numbers in high demand areas; and exploring whether, in the medium term, achieving the Government's objectives will require a system of binding local plans. The Government has also commissioned a review of issues affecting the elasticity of supply in the UK in particular to look at the role of competition, capacity and the financing of the house building industry and possible fiscal instruments, and the interaction of these with the planning system and sustainable development objectives;
- on the demand side, through a review of the UK mortgage market to establish why the share of fixed rate mortgages is so low in the UK compared to many other EU countries and to identify ways of encouraging the market for longer-term fixed rate mortgages; and
- at the macroeconomic level, given that housing is identified as a significant risk factor to the achievement of sustainable and durable convergence and in the context of the Treasury discussion paper *Fiscal stabilisation and EMU*, to consider what additional reforms and measures might help deliver wider stability in the economy, including with reference to the housing market, to create the right conditions for convergence within EMU. The Government's announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will help ensure inflation expectations in the UK remain in line with those of the euro area.

ENDOGENOUS CONVERGENCE

I.I17 The act of joining EMU may in itself lead to changes in economic structures and business cycles. This concept is known as endogenous convergence. If the economic structures and business cycles of countries in a monetary union converge over time, this reduces the potential costs of membership of monetary union. However, while convergence of structures can help to reduce the incidence of future shocks after entry has occurred, it cannot help with the potential shock of entry to EMU itself. This section addresses the question of how strong endogenous convergence effects are likely to be and how rapidly they could occur.

I.I18 Different drivers of endogenous convergence potentially operate over different time periods:

- the **immediate effects** of EMU entry change the macroeconomic policy environment – a common monetary policy and a permanently fixed nominal sterling-euro exchange rate;
- over the **short to medium term** firms and households would gradually adapt their behaviour to the new economic environment – for example, the removal of barriers such as exchange rate transaction costs is likely to promote trade and investment within the currency union; and
- over the **longer term** an increase in cross-border trade and investment will lead to greater integration of economic structures. This might induce a change in the industrial landscape with more specialisation in production.

Endogenous convergence: immediate effects of EMU entry

Common monetary policy

I.I19 UK membership of EMU would immediately mean adopting a common monetary policy and greater fiscal policy coordination through the full application of the SGP. If previous national policies were misdirected, causing greater business cycle volatility than there might otherwise have been, then a common monetary policy could lead to greater convergence between countries. In this case, a single monetary policy may lead to a greater degree of business cycle co-movement.

I.I20 However, if independent monetary policies are set to pursue broadly similar objectives, as has been the case for the UK and the euro area since 1997, then different policy responses to country needs may have contributed to convergence. If transmission mechanisms are very different, then diverse national policy responses may be required to achieve the same objective. In such circumstances, a common monetary policy may lead to increased divergence. These important considerations are returned to in the assessment of the flexibility test.

I.I21 In the EMU study *Analysis of European and UK business cycles and shocks*, Professor Artis updates earlier influential work to examine how the policy commitments made as part of the ERM (which *de facto* resulted in a single monetary policy based on Germany as the anchor) affected the correlations of business cycles of the member countries. Professor Artis' work confirms that most of the ERM countries developed a closer connection with the German cycle during the first ERM period (1979-93), which could indicate a convergence effect through policy discipline. However, the direction of causation is not clear. The UK left the ERM at least in part because of a lack of convergence. Success in the ERM may have reflected prior convergence just as much as increased convergence reflected the impact of ERM membership.

I.122 Interestingly, the existence of a separate European cycle is not apparent in Professor Artis' updated work for the post-1992 period presented in his EMU study. Instead it confirms the findings of the IMF and others that in the past ten years there has been a general increase in the global co-movement of business cycles. But it may also be the case that the run-up to EMU membership saw greater convergence with the euro area than seen in the period since, as discussed in the assessment of transition.

The exchange rate is not a source of shocks generally...

I.123 Analysis in the next section and in the flexibility test considers the role of the exchange rate as an adjustment mechanism. Movements in the real exchange rate provide one of the adjustment mechanisms that brings the demand for UK goods and services into balance with supply. Outside EMU, nominal exchange rate movements can provide a means of facilitating real exchange rate adjustment. If the UK were in EMU and a shock occurred that required a change in the real exchange rate between the UK and the rest of the euro area, this could only be achieved if UK inflation differed from inflation in the rest of the euro area for a period of time. However, some nominal exchange movements may be unwarranted by economic conditions. Joining EMU would eliminate this source of country-specific shocks between the UK and euro area economies. Professor Willem Buiter and Dr Clemens Grafe, in their contribution to the EMU study *Submissions on EMU from leading academics* argue that: "For the UK the exchange rate during the 1990s and until well into 2002 has been a source of competitive misalignment and persistent imbalances in the structures of production and demand". Were this the case, EMU entry would encourage convergence between the UK and the euro area. But this depends on whether exchange rate movements tend to be stabilising or destabilising.

...but acts as an adjustment mechanism

I.124 Treasury analysis in the EMU study *The exchange rate and macroeconomic adjustment* shows that large exchange rate movements have not had a disruptive impact on the overall level of UK output or prices, although they have undoubtedly had a differential impact on individual sectors of the economy. The study concludes that exchange rate changes themselves generally reflect changes that are occurring in the underlying structure of demand and supply in the economy and appear to be more the symptom than the cause of underlying imbalances. In particular, the strength of sterling since 1996 has been associated with strong domestic demand in the UK compared with the euro area.

I.125 In the absence of any nominal exchange rate movement these developments would have generated greater inflationary pressure in the UK and greater deflationary pressures in the rest of the euro area, a key lesson of the stylised exercise presented in the Introduction considering 'what if' the UK economy had joined EMU in 1999.

I.126 If the UK were to enter EMU this would not, in itself, remove a significant source of shocks to the economy. Instead, it could remove one of the mechanisms by which the economy currently absorbs underlying shocks. This need not necessarily be a problem, provided that other adjustment mechanisms can compensate for the loss of nominal exchange rate flexibility without additional disruption. This could be the case if the economy has sufficient alternative channels of flexibility, as assessed in the flexibility test.

Endogenous convergence: short to medium-term effects of EMU

Trade and investment integration

I.127 The immediate effects of EMU entry could promote important dynamic changes over the short to medium term. The removal of currency barriers should promote greater trade and investment integration. This reduces the probability of members of the currency union experiencing country-specific shocks, thus leading to greater convergence of business cycles:

- the EMU study *Analysis of European and UK business cycles and shocks* reports that a positive association between increased bilateral trade and cyclical co-movement is widely accepted, and as Professor Jeffrey Frankel states in his contribution to the EMU study *Submissions on EMU from leading academics: "Along with trade links, cyclical correlations rise"*;
- the EMU study *EMU and trade* concludes that trade intensity within the euro area has increased since the start of EMU. Since the majority of trade in developed countries is intra-industry, increases in trade will tend to promote convergence; and
- increases in cross-border investment should also result over the short to medium term. The investment test concludes that EMU entry on the basis of sustainable convergence would allow the UK to participate in a more active cross-border investment market.

Endogenous convergence: longer-term effects of EMU

Specialisation effects **I.128** By their nature, the longer-term consequences of these short to medium-term effects are harder to forecast. Greater trade and investment within a monetary union, combined with higher levels of competition as a result of price transparency and more integrated markets, may result in increased industrial specialisation, where regions specialise in certain types of economic activity. With the permanent elimination of exchange rate risk, firms will have greater certainty about relative costs and may have less need to locate plants across Europe in order to manage exchange rate risk. In these circumstances, firms may concentrate production where they have a comparative advantage and can best exploit economies of scale.

I.129 Specialisation of production might increase the likelihood of sector specific shocks having differential effects across countries, potentially leading to divergence of business cycles in the monetary union. A counter-argument, highlighted by Professor Barry Eichengreen in the EMU study *Submissions on EMU from leading academics*, is that growth in intra-industry trade, as opposed to growth in inter-industry trade, could imply that trade could rise without a comparable increase in sector specialisation. This would suggest that the removal of barriers to trade might have only limited implications for the vulnerability to sector-specific shocks.

I.130 To assess the probable impact of the single currency on specialisation, the EMU study *EMU and business sectors* takes into account trends in EU specialisation and specialisation in other currency unions, such as the US.²¹ The EU appears less specialised than the US, though a very gradual increase in EU specialisation has been apparent over recent decades. However, as discussed in the assessment of structural convergence, the large EU countries have relatively diversified industrial structures and so are unlikely to be affected by sector-specific shocks. This argument has less force for the smaller, more specialised euro area countries that engage in less intra-industry trade, notably the relatively low income countries such as Greece and Portugal.

²¹ Comparability is complicated by the reliability and availability of data, the size of the regions sampled and also the fact that specialisation calculations can be based on different levels of aggregation.

Financial structures **I.131** Another source of potential medium and long-term convergence is in financial structures. Greater financial market integration and greater similarity of financial structures could promote convergence of business cycles:

- the integration of financial markets between euro area countries is considered in the EMU studies *The location of financial activity and the euro* and *EMU and the cost of capital*. The evidence so far indicates that the euro has had a considerable impact on financial markets, with rising cross-border activity. However, full integration is still some way off with regulatory constraints remaining in place;
- financial market integration in EMU may promote the development of UK-style capital markets across the euro area. A rise in institutional investment in the euro area, which is being driven by an increasing need for the provision of private pensions, has been occurring for several years;
- over time, a common monetary policy may affect the structure of credit, as considered in the EMU study *Housing, consumption and EMU*. The UK now has a macroeconomic framework which is delivering stability and low inflation. This has led to periods in which fixed rate mortgages have been attractive to UK borrowers, although the length of fix remains below that of much of the rest of Europe; but
- evidence from the euro area, in particular Ireland, suggests that the structure of the UK mortgage market would be unlikely to change quickly if the UK were to join EMU. Borrowers in Ireland have continued to switch between fixed and variable rate mortgages depending on which is expected to be cheaper. There are also serious impediments to the development of a single EU mortgage market at this early stage. Differences in market structures, regulation, interest rate terms and risks of default are likely to act as a barrier to the development of cross-border competition. To date, as highlighted in the assessment of structural convergence, there is little evidence of mortgage market convergence in the euro area.

Conclusion: how strong are endogenous convergence effects likely to be and how rapidly could they occur?

I.132 The process by which membership of EMU encourages convergence gives grounds for optimism about the future compatibility of UK structures, including housing. However, these effects are only likely to be realised over time and so will not compensate for current short to medium-term cyclical and structural differences between the UK and the euro area economies.

THE TRANSITION TO SUSTAINABLE CONVERGENCE AND THE EXCHANGE RATE

I.133 All the aspects of convergence assessed so far come together in the assessment of the transition to settled and sustainable convergence – and the particular risks it poses, the issues raised and the potential policy responses to them. Together these factors determine the scale of the transition challenge and the ‘transition strategy’ of policymakers to deal with it, including the fiscal and monetary policy options available for managing transition and the option of delaying entry until the transition conditions are more amenable:²²

- cyclical factors are important to transition. The transition conditions are marked out by the extent of the interest rate differential and by the divergence of the exchange rate from the level consistent with long-term sustainable convergence and overall competitiveness;
- history matters because past exchange rate decisions such as the decision to join the ERM in 1990 (and to rejoin the Gold Standard in 1925) and the ‘what if’ exercise revisiting the decision not to join EMU taken in 1997 indicate the scale of the problems, both immediate and longer term, likely to be encountered if transition conditions are not taken seriously;
- structures matter because of the potential for the economic impact or ‘shock’ of the transition to have longer lasting, and possibly permanent, effects via their impact on and interaction with the structures of the economy; and
- endogenous convergence effects in the future matter to the extent that, if they were to come through quickly and to a significant extent, they may lessen the longer-term consequences of the transition shock.

I.134 In his contribution to the EMU study *Submissions on EMU from leading academics*, Professor Robert Mundell notes: “*The issue of timing is important... If Britain enters when its economy is in a strong boom compared to Europe, the pound would be high against the euro, and that might in the long run put Britain at a competitive disadvantage; the opposite would be true if Britain’s economy was relatively weak.*”

I.135 This section assesses how important transition issues are to the overall assessment of sustainable convergence at the present time for the UK economy. It does this by considering:

- the difference in adjustment mechanisms in EMU, anticipating the analysis of the flexibility test;
- the exchange rate level consistent with sustainable convergence;
- the reasons for the strength of sterling in recent years; and
- the options for entering EMU if the prevailing market exchange rate differs from this sustainable level and if there is an interest rate differential.

²² The importance of transition was discussed by Ed Balls, Chief Economic Adviser to the Treasury, in ‘*Why the five tests?*’, the December 2002 Cairncross lecture.

I.136 Outside EMU, experience shows exchange rate stability can only be achieved on the basis of sound economic fundamentals, in particular low and stable inflation, steady and sustainable growth and sound public finances. As has already been emphasised, the Government sees the exchange rate as the outcome of all other policies. However, in the context of the assessment of EMU membership, although the sustainable real exchange rate is still determined by fundamentals, the nominal sterling-euro exchange rate becomes a policy variable in the transition strategy.

I.137 In terms of its eventual impact, the shock of transition is the same as any other demand shock. The difference is that policy choices which go to make up the transition strategy can potentially influence its nature and lessen any damaging impact in terms of the transition costs. This was a clear lesson from the ‘what if’ analysis in the Introduction.

I.138 The EMU study *Modelling the transition to EMU* provides a substantive analytical framework for assessing the transition to sustainable convergence, which is drawn on in this section. In order to motivate the later discussion of the practical considerations of managing the transition, the analysis starts by establishing some key analytical themes, drawing on various EMU studies.

Real exchange rate adjustment inside and outside EMU

I.139 The role of the real exchange rate in adjustment is a key theme running throughout the assessment and is a focus of the assessment of flexibility. As already established, the real exchange rate is the nominal rate adjusted for the differences between measures of domestic and overseas prices. As entry to monetary union only involves fixing the nominal exchange rate, differences in inflation rates between countries will still enable relative prices, real exchange rates and competitiveness between countries to change inside a single currency area.

The exchange rate is determined by fundamentals

I.140 From any starting point for the UK economy, the UK’s real exchange rate will eventually return to its sustainable equilibrium level which is determined by the fundamentals of the real economy. The way that the economy adjusts to reach this sustainable equilibrium would be different if the UK were to join EMU:

- **inside EMU** real exchange rate changes between the UK and euro area occur entirely through changes in relative prices via national inflation rates. If there were excess demand for UK production, then there would be upward pressure on UK inflation and hence on the UK-euro area real exchange rate. UK products would become less competitive, encouraging some switching of demand towards euro area production. This process would continue until the initial excess demand had been eliminated; or
- **outside EMU** the same eventual shift in relative prices would need to take place but the adjustment could also come about through a change in the nominal exchange rate. Nominal exchange rates tend to adjust more rapidly than prices and are potentially less disruptive to growth and jobs in the adjustment phase, as described in more detail in the EMU studies *The exchange rate and macroeconomic adjustment* by HM Treasury and *Modelling shocks and adjustment mechanisms in EMU* by Dr Peter Westaway.

Box 1.5: Adjustment in and out of EMU and the transition to EMU

A simple worked example illustrates the basic differences in the mechanisms available for economic adjustment inside and outside EMU. Assume a shock to the UK economy necessitated a permanent 10 per cent depreciation in the real exchange rate:

- inside EMU this would require UK prices to rise at a slower rate than in the rest of the euro area. This adjustment could be protracted – with around ½ per cent lower inflation over 20 years – or could be short and sharp, with 2 per cent lower inflation for five years. Either way, such an adjustment would mean years of output below trend with knock-on effects in terms of lower employment and higher unemployment; and
- outside EMU a nominal exchange rate depreciation could help facilitate the adjustment, lessening the impact on output and employment.

These considerations are common to the assessment of adjustment in EMU and the flexibility required to minimise the costs that come with it. They are a key focus of the analysis in the flexibility test. The same adjustment mechanisms are at work in the specific case of the transition to EMU. If the sustainable real equilibrium exchange rate for UK entry into EMU is 10 per cent below the nominal level at entry, then the transition phase could be associated with a period of imbalance for the economy characterised by weak output growth and lower inflation in the UK than in the rest of the euro area. This would either take the form of a long period of gradual adjustment or a short, sharp adjustment. Similarly, if the entry rate were too low in the sense that it was below the sustainable rate, UK inflation would tend to be higher than in the rest of the euro area for a period of time.

I.141 Only the nominal sterling-euro exchange rate can be chosen on entry to EMU. If the real exchange rate, which represents price competitiveness, is initially too high or too low then this divergence will eventually be corrected by changes in relative price levels, with no long-run effect on the economy, in principle. In practice, key lessons from the ‘what if’ analysis in the Introduction are that:

- the costs associated with the misalignment may be potentially large and long-lasting, and would depend on the size of the initial misalignment and the flexibility of wage and price adjustment;
- if the misalignment of the exchange rate were sufficiently large in terms of an entry rate far above the sustainable rate, there may be permanent damage to the real economy since trade opportunities may be permanently lost and resources devoted elsewhere;²³ and
- the adverse effect of going in at too high a rate, in terms of the impact on growth and jobs, is likely to be greater than the effects of going in at too low a rate. The costs are potentially asymmetric.

The sustainable exchange rate for entry

I.142 Getting the entry rate at the time of entry right is obviously a key factor in achieving sustainable convergence. But this is not straightforward because the medium-term sustainable exchange rate is not directly observed and because of the many uncertainties in estimating it, which are complicated by the significant movements in sterling and other exchange rates since 1996.

²³ Another example of hysteresis, as discussed in the Introduction.

Equilibrium sterling-euro exchange rates

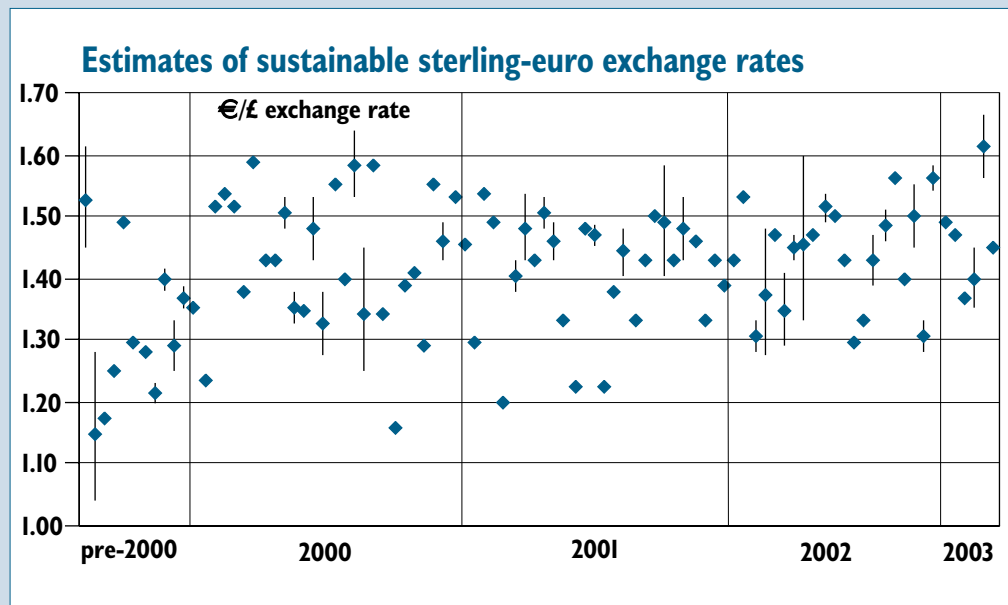
I.143 The EMU study *Estimates of equilibrium exchange rates for sterling against the euro* by Professor Simon Wren-Lewis reviews a number of alternative concepts of the equilibrium exchange rate and the methodologies that have been used to estimate each concept, and provides updated estimates on the basis of the ‘macroeconomic balance’ approach, described along with other approaches in Box 1.6.

Box 1.6: Measures and estimates of the sustainable exchange rate

There are two main approaches to measuring the equilibrium exchange rate:

- the purchasing power parity (PPP) approach, which gives the exchange rate that equates the price of a basket of goods and services when expressed in a common currency. The OECD estimates that the PPP exchange rate was 1.36 €/£ in 2002. However, in practice, exchange rates tend to deviate from PPP levels for long periods of time. The costs of transportation and distribution limit the speed and extent to which the demand for goods and services responds to divergences between the actual exchange rate and its PPP level. This slow response enables such divergences to persist. PPP exchange rates also make no allowance for savings and investment flows which may have a significant influence on exchange rates in both the short and medium term; and
- another more general approach is to estimate the level of the exchange rate that both balances the national supply of and demand for goods and services (internal balance) and ensures that the desired flow of net national savings is consistent with the net trade position (external balance) in the medium term. This is sometimes known as the ‘macroeconomic balance’ approach.

A wide range of estimates for the equilibrium sterling-euro exchange rate have been proposed in recent years using a variety of techniques. These estimates are plotted in the chart below. In general, estimates derived using statistical and econometric methods have tended to be at the lower end of the spectrum. The estimates have ranged from around 1.15 to over 1.60 €/£.



I.144 Professor Wren-Lewis considers 1.37 €/£ to be the current medium-term sustainable sterling-euro exchange rate, a slightly higher rate for sterling than in his earlier work reflecting trends in recent years. On the basis of this, and reflecting the uncertainties inherent in calculations of this sort, the assessment is based upon a medium-term estimate of the sustainable sterling-euro exchange rate in a range around 1.37 €/£. But on different assumptions about the recent and future sustainable trade performance of the UK and other countries, equilibrium exchange rate estimates vary significantly.

The equilibrium exchange rate against the dollar is also a factor

I.145 Professor Wren-Lewis' EMU study also highlights the need to take account of the euro-US dollar exchange rate. This matters because if the UK were to join EMU, then price competitiveness of UK exports to the US dollar area would depend on future movements in the euro-US dollar exchange rate. Professor Wren-Lewis estimates the equilibrium sterling-US dollar exchange rate at 1.59 \$/£, close to the actual level in May 2003. Professor Wren-Lewis estimates the equilibrium euro-US dollar exchange rate at around 1.15 \$/€, in line with the level in May 2003.

I.146 If the UK were to join the euro, and the euro were subsequently to appreciate above its estimated equilibrium exchange rate against the US dollar, a consequence of this would be that sterling would be overvalued against the US dollar. Although half of the UK's trade is with the euro area, a large proportion of UK trade is with the US, so this could have adverse consequences for UK companies exporting to the US at a time when the economy was already adjusting to EMU entry. This adds an additional uncertainty which a country that did more of its trade with the euro area would not face.

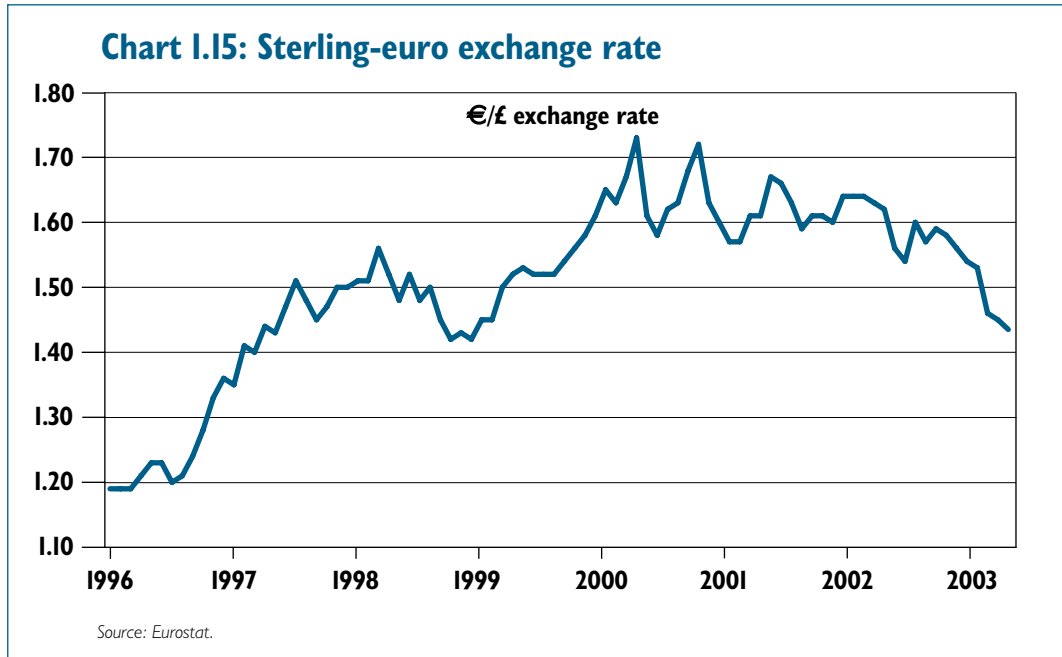
Why has sterling been strong in recent years?

I.147 A further important question which must be addressed is why the sterling-euro exchange rate strengthened so much after 1996, as shown in Chart 1.15. The EMU study *The exchange rate and macroeconomic adjustment* assesses whether this strengthening was warranted by the economic conditions in the UK and the euro area over this period. This has implications for the transition strategy, as assessed below.

A number of explanations...

I.148 The EMU study reviews a number of explanations for sterling's strength:

- that it has simply been driven by a foreign-exchange market bubble which will eventually 'burst';
- that there may have been an improvement in the UK's trade performance relative to the euro area since the mid 1990s. The EMU study *Estimates of equilibrium exchange rates for sterling against the euro* finds some recent empirical evidence to support this; and
- that there has been a fall in desired net saving by the private sector in the UK, driven in particular by the interaction between the housing market and consumer behaviour causing domestic demand to be unusually strong. This behaviour, while financially unsustainable in the longer term as consumers' ability to borrow becomes increasingly constrained by high levels of debt, may have been sufficiently strong and sufficiently persistent to warrant an exchange rate appreciation to enable the economy to absorb the demand pressures in the interim.



...some more plausible than others

I.149 The review in the EMU study *The exchange rate and macroeconomic adjustment* suggests that, of these, the financial market bubble explanation is least plausible. Had an appreciation of this magnitude and this duration been unwarranted, then UK output and employment would not have remained as strong for as long as in fact occurred. More generally, and importantly, as discussed in the assessment of endogenous convergence, the EMU study's analysis of the relationship between exchange rate changes, output and prices does not support the proposition that the exchange rate has been a destabilising source of shocks across the whole economy.

I.150 Sterling's appreciation absorbed some of the inflationary pressures that might otherwise have been generated by the strength of demand for UK goods and services. And it alleviated some of the deflationary pressures in the euro area generated by relatively weak demand for euro area goods and services. If the UK had joined EMU in 1999, these underlying pressures would have had greater effects on price levels as the nominal exchange rate would not have been available as a safety valve. This would have led to higher inflation in the UK than actually occurred, a key lesson from the 'what if' analysis in the Introduction.

I.151 The analysis so far clearly suggests that the divergence of sterling from its equilibrium rate in recent years, while warranted by economic conditions, is evidence of a lack of sustainable convergence. Up until the end of 2002, sterling remained very strong (it averaged 1.56 €/£ in December 2002). Sterling has subsequently fallen back against the euro, increasing the likelihood that sterling's strength may have reflected cyclical pressures rather than longer-term trends. But explaining past exchange rate movements is inherently difficult – forecasting the future path is harder still – and so this uncertainty complicates further the assessment of the transition.

Managing the transition in practice

I.152 A decision to enter EMU means:

- the differential between short-term interest rates in the UK and the euro area would need to be eliminated by or on the date of entry; and
- the sterling-euro nominal exchange rate would be permanently fixed at an agreed rate at the date of entry.²⁴

I.153 Central to the practical implications of transition are the reasons for the transition conditions which exist and the choices they pose for policymakers. In a world where price and wage flexibility is not total, the adjustment required for transition will never be either costless or without risk. The transition strategy followed by policymakers needs to be designed to minimise the costs of transition, as analysed in the EMU study *Modelling the transition to EMU*.

Modelling the transition **I.154** The EMU study investigates a number of scenarios designed to provide a toolkit for policymakers faced with the practical question of assessing the costs and risks associated with different approaches to managing the transition. As with any work based on an empirically estimated model of the economy, its findings are illustrative rather than definitive, based on a range of assumptions summarised in Box 1.7.

Assessing transition at present... **I.155** By their very nature, the importance of transitional issues will vary over time according to the cyclical position of the economy at the point of entry, the degree of cyclical convergence and the level of the exchange rate relative to its longer-run equilibrium sustainable level. In addition the more flexible the economy the smaller any transitional cost would be.

...aligning interest rates... **I.156** At the present time, the assessment of cyclical convergence shows that UK short-term interest rates are currently 1¼ percentage points higher than in the euro area, and are expected to remain so in the short to medium term, reflecting differences in cyclical conditions and the reasons for them. So, other things equal, if the UK were to join EMU during this period, some of the analysis from the 'what if' simulation of joining EMU in 1999 is potentially relevant (albeit on a materially different scale, since the interest rate differential is 1¼ percentage points compared with nearly 4 percentage points at the time of the 1997 assessment). On the basis of this stylised model:

- lowering UK interest rates by 1¼ percentage points compared with the level that the MPC has set them at would stimulate UK domestic demand with risks for the economy;
- this would lead to higher output and prices in the short run, which would have a further destabilising effect through the decline in real interest rates it would generate;
- these developments would not be sustainable and the increase in inflation would serve to bring the UK economy back towards trend, but this would require reduced demand and output growth; and
- the flexibility of prices would determine how much disruption continued into the medium term and whether it had permanent effects.

²⁴ As set out in Article 123(5) of the EC Treaty, if the UK were to decide to join EMU and the ECOFIN Council of Economic and Finance Ministers decided that the UK met the 'necessary conditions' to join EMU, the finance ministers of the euro area countries plus the UK would subsequently adopt, by unanimity, the rate at which the euro would be substituted for sterling.

Box 1.7: Assumptions for the ‘transition strategy’ modelling toolkit

The EMU study *Modelling the transition to EMU* develops a transition strategy toolkit to analyse the transition problem. This toolkit is applied to the NiGEM model to analyse, in a relatively stylised way, some different transition options for the UK. Four sets of assumptions underpin the toolkit:

- the key assumption is whether the **level of the real exchange rate is sustainable into the medium term**. In one case it is assumed to be sustainable. In another case it is not assumed to be sustainable but depreciates over the medium term consistent with empirical estimates of the equilibrium exchange rate;
- two alternative **entry rates** are also considered:
 - 1.50 €/£ – a rate close to the prevailing market rate at the time the NiGEM model base was set up in early 2003; and
 - 1.37 €/£ – a rate in line with the main estimate presented by Professor Wren-Lewis in the EMU study *Estimates of equilibrium exchange rates for sterling against the euro*.
- on the modelling assumption that entry would occur in 2005Q1, two main **interest rate policies** are described. In the first, UK interest rates immediately converge to euro area levels. In the second, active monetary policy allows UK interest rates to be held higher than ECB rates until the point of entry, as occurred with Ireland and Greece in the run up to their entry to EMU; and
- **fiscal policy** is either set simply by allowing the automatic stabilisers to function, or alternatively fiscal policy is set in a ‘discretionary’ manner through changes in taxes and spending in an attempt to lessen the impact of the transition on the real economy and inflation and the cost that imposes.

...and the sterling-euro exchange rate

I.157 In May 2003, the sterling-euro nominal exchange rate had fallen to within the medium-term estimate of the range for the sustainable sterling-euro exchange rate which is the basis for the assessment, around 1.37 €/£ (or 2.68 DM/£). But on different assumptions about the recent and future sustainable trade performance of the UK and other countries, equilibrium exchange rate estimates vary significantly. Moreover, it is too early to judge the impact on the paths of growth and inflation in the UK and the euro area from the recent sharp movements in the euro-US dollar and sterling-euro exchange rates.

I.158 Box 1.8 draws on the analysis in the EMU study *Modelling the transition to EMU*. The box illustrates some alternative policy options for dealing with different possible transition conditions of joining EMU for different combinations of interest rate differentials and exchange rate overvaluation relative to a sustainable exchange rate. It is important to recognise, as the box makes clear, that these simulations are illustrative and dependent on a series of stylised assumptions.

Box 1.8: Illustrative options for the transition strategy to EMU

The type of model-based analysis described in the EMU study *Modelling the transition to EMU* has been drawn on, adopting similar stylised assumptions to examine a range of possible transition scenarios for different combinations of interest rate differentials and exchange rate overvaluations at the time of the decision on entry relative to what is required on entry.^a For the purposes of this exercise, it is assumed that entry would take place in 2005Q1. The table shows two different transition policies designed to return the output gap to zero in 2005Q1 to illustrate the issues:

- one where, over and above the automatic stabilisers, government spending is cut over the period up to 2005Q1; and
- a second where UK monetary policy is actively tightened in the 18 months before EMU entry to dampen domestic demand.

		Required percentage cut in government spending sustained over the period 2003Q3 to 2005Q1			Estimated percentage point interest rate differential sustained over the period 2003Q3 to 2004Q4		
		Degree of exchange rate overvaluation relative to sustainable level prior to entry (per cent)					
		0	5	10	0	5	10
Initial interest rate differential (percentage points)	0	0	4	8	0	1 1/2	3
	1	3	7	11	1 1/4	2 3/4	4 1/4
	2	6	10	14	2 1/2	4	5 1/2

It is important to recognise that these simulations are illustrative scenarios, based on linear economic models, and are dependent on a series of stylised assumptions including starting positions and the stabilisation objective. Subject to these caveats, the table illustrates that:

- output can be stabilised in the short run as specified, but potentially only by significant changes in fiscal or monetary policy as modelled, with monetary policy the more effective tool reflecting the difficulties in using fiscal policy in particular to achieve stabilisation over such a short period of time; and
- the greater the interest rate differential or exchange rate overvaluation, the greater the policy adjustment required as modelled.

Clearly in practice the more flexible the economy is, the less significant any transitional issues will be.

^a The earlier description of the properties of the NiGEM model in the structural convergence section applies to the results from this exercise which draw on the NiGEM based simulations used in the EMU study *Modelling the transition to EMU*.

Managing the transition through the use of active policy **I.159** As illustrated in Box 1.8, fiscal and monetary policy could be used to ease the transition problem. Fiscal tightening, through either higher taxes or lower government spending, would offset the stimulatory impact of lower interest rates and a lower exchange rate on entry. Alternatively, monetary policy could be tightened in the run up to entry through higher interest rates. But the necessary policy tightening would be more modest if the transitional costs were spread over a longer period, including the initial years of membership which was the approach adopted by some countries (see Box 1.9). Clearly in practice the greater the degree of sustainable and settled convergence and flexibility the less significant the impact of the transition will be.

I.160 The performance of the current euro area in the transition phase sheds valuable light on the importance of transition and what it entails. Box 1.9 describes the transition phase for some of the current euro area countries.

Global uncertainties **I.161** There are additional uncertainties for the UK at present reflecting both the current state of the global economy and how it will evolve, relating to:

- the current uncertainty in global markets, which might impact disproportionately on the UK given the UK's strong global investment and financial linkages;
- the future evolution of the US dollar and the euro. If the US dollar were to fall against the euro (overshooting its equilibrium level on Professor Wren-Lewis's estimates) this would affect the transition evaluation for the UK; and
- the economic performance of the euro area, and in particular the German economy. Financial market and forecast expectations are conditioned on the German economy recovering with growth picking up. If this does not happen and there are knock-on effects for the rest of the euro area, then ECB rates would be lower for longer than expected.

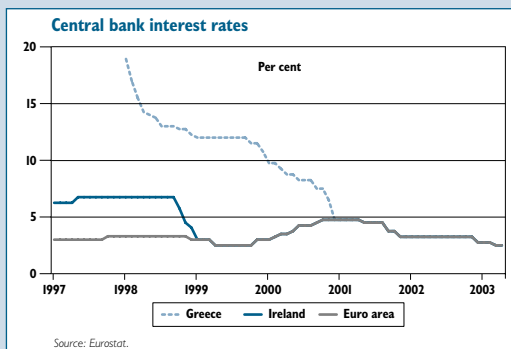
I.162 The transition is always an uncertain period, reflecting the inherent permanence of the EMU decision. This also means that the scale of any policy tightening is uncertain, but at the current time, although transition issues are less acute than they have been in the past, a policy tightening would still be necessary.

The risks of transition **I.163** Given all the uncertainties, the first best solution is to ensure economic conditions are sustainable at entry: this minimises the risk of a difficult and prolonged adjustment once locked into EMU.

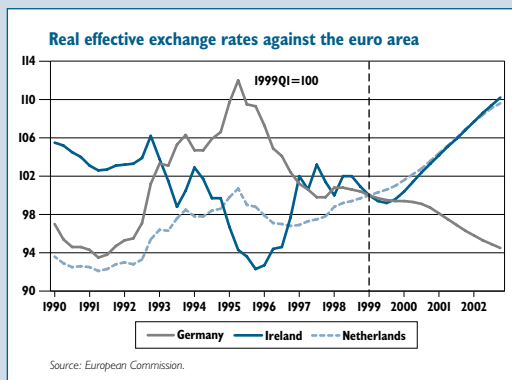
Box 1.9: Transition in the first wave of EMU membership

The experience of current euro area members illustrates the importance of transition issues.

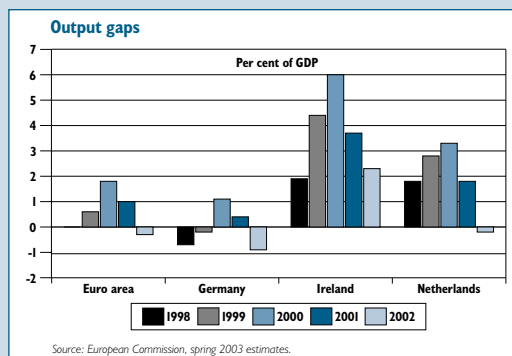
In terms of nominal interest rates and exchange rates, Germany and France experienced a fairly smooth transition: interest rates converged two years prior to entry and no exchange rate revaluations were made in the years prior to January 1999.



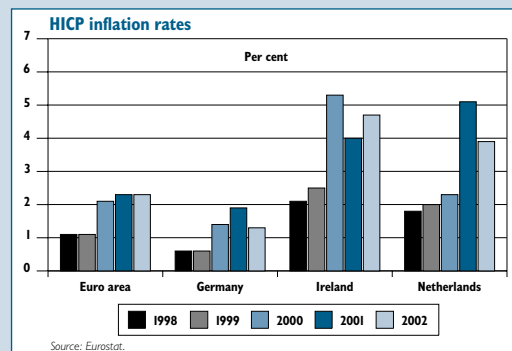
In contrast, Ireland and Greece experienced fairly pronounced transitions to EMU. The need to meet the inflation convergence criterion necessitated a sharp adjustment prior to entry as both countries needed tight monetary conditions for as long as possible to keep inflationary pressures in check. In Ireland interest rates fell by $3\frac{3}{4}$ percentage points in the four months prior to entry, and in Greece they fell by 5 percentage points in the year prior to entry in 2001.



There is considerable debate over whether Germany joined EMU at an overvalued exchange rate, which may have contributed to the relatively weaker performance of the German economy since the beginning of EMU. In their contribution to the EMU study *Submissions on EMU from leading academics*, Professor Willem Buiter and Dr Clemens Grafe state that: “The D-Mark was almost surely overvalued and the Irish Punt undervalued on December 31, 1998...”. Since the start of EMU, relatively low inflation in Germany has led to a significant fall in the real effective exchange rate.



At the start of EMU, Ireland and the Netherlands were in more cyclically advanced positions, with both experiencing positive and rising output gaps. In contrast, both Germany and France had slightly negative gaps that were closing. Since 1999, Ireland and the Netherlands have experienced a more pronounced cycle than Germany or France.



Inflation differentials narrowed to historical lows in the lead up to EMU, partly reflecting the need to fulfil the EC Treaty convergence criteria. Once inside EMU differentials widened again. Ireland and the Netherlands have experienced relatively high inflationary pressures, which have reduced competitiveness and helped in the adjustment process of returning the economies to trend. Economies such as Germany, with relatively weak growth, have experienced weaker inflationary pressures.

Conclusion: how important are transitional issues at present?

1.164 If the UK were to enter EMU now, other things equal, a transitional shock of a 1¹/₄ percentage point cut in interest rates (the differential between the UK and the euro area), could have a destabilising effect, working in particular through the UK housing market and consumption. It is too early to judge the paths of growth and inflation resulting from the recent sharp movements in the euro-US dollar and sterling-euro exchange rate. In addition, there are significant future uncertainties in the current economic and political climate, for example, trends in global financial markets, in the US dollar and euro and in the relative growth paths of the UK and the euro area. All these suggest that there are clear risks associated with transition to EMU membership at the present time and emphasise the importance of sustainable and durable convergence and increasing the flexibility of the economy through the measures the Government is setting out.

CONCLUSIONS: THE CONVERGENCE TEST

I.165 There has been significant progress on cyclical convergence since 1997. But robust growth in consumer spending has continued to provide substantial support to GDP growth in the UK, supported by a buoyant housing market. UK short-term interest rates remain $1\frac{1}{4}$ percentage points above those in the euro area and have consistently been above euro area rates since 1999. With interest rates higher in the UK and with the sterling-euro exchange rate remaining above sustainable levels throughout this period, inflation, measured on a harmonised basis, has averaged $\frac{3}{4}$ percentage point less in the UK than in the euro area. Financial markets and the forecasts by international organisations suggest that monetary conditions need to remain tighter in the UK than in the euro area into the medium term. However, the UK now exhibits a greater degree of cyclical convergence than some EMU members demonstrated in the run-up to the start of EMU in 1999 and while some EMU countries still demonstrate substantially more cyclical convergence than the UK, some demonstrate substantially less. The lack of cyclical convergence with the euro area constitutes a risk factor, particularly given the considerable degree of global uncertainty at present.

I.166 On past performance, UK business cycles have been much less compatible with the euro area average than has been the case in other countries such as Germany and France. There is some evidence that compatibility may have increased in recent years, reflecting greater macroeconomic stability in the UK and increased convergence between the business cycles of all the advanced economies. Over the last five years, the UK output gap cycle has been more highly correlated with the German cycle than that in the US, although the UK has fluctuated around a higher growth trend. France, Germany and Italy have experienced output gaps on average close to the euro area aggregate, at an average absolute deviation of between $\frac{1}{4}$ and $\frac{3}{4}$ per cent of GDP over the last decade. The average UK deviation is larger at almost 1 per cent of GDP, but not as large as some of the existing euro area countries and not out of line with the sort of regional deviations seen within countries. However, the UK's history of divergence remains a risk factor.

I.167 Certain structural differences between the UK and the euro area are risk factors for the achievement of settled and sustainable convergence. Differences in the UK and euro area housing markets are high risk, differences in investment linkages and financial structures are low to medium risk and sectoral and trade differences are lower risk. In terms of industrial specialisation the UK is quite similar at the aggregate level to other large EU countries.

I.168 Distinct supply and demand features of the UK housing market mean that both the relationship between house prices and household consumption, and the underlying rate of real house price growth, are stronger in the UK than in the euro area. The structure of the UK mortgage market is such that UK households are more sensitive to interest rates, which has implications for the transmission of monetary policy.

I.169 Analysis of monetary transmission suggests that the UK may be more sensitive to monetary policy through some channels, and less sensitive through others: the pass-through of interest rate changes from official rates to bank lending rates is faster in the UK; the household sector in the UK may react more strongly to interest rate changes than in euro area countries; the UK is potentially more sensitive to monetary policy through its impact on the exchange rate; but there is little to suggest that the corporate sector in the UK will react more strongly than in the euro area. The UK's relatively low levels of nominal wage rigidity will tend to reduce the impact of monetary policy on output.

I.170 The process by which membership of EMU encourages convergence gives grounds for optimism about the future compatibility of UK structures, including housing. However, these effects are only likely to be realised over time and so will not compensate for current short to medium-term cyclical and structural differences between the UK and the euro area economies.

I.171 If the UK were to enter EMU now, other things equal, a transitional shock of a 1¼ percentage point cut in interest rates (the differential between the UK and the euro area), could have a destabilising effect, working in particular through the UK housing market and consumption. It is too early to judge the paths of growth and inflation resulting from the recent sharp movements in the euro-US dollar and sterling-euro exchange rate. In addition, there are significant future uncertainties in the current economic and political climate, for example, trends in global financial markets, in the US dollar and euro and in the relative growth paths of the UK and the euro area. All these suggest that there are clear risks associated with transition to EMU membership at the present time and emphasise the importance of sustainable and durable convergence and increasing the flexibility of the economy through the measures the Government is setting out.

I.172 Alongside settled and sustainable convergence, there needs to be sufficient flexibility to ensure that the economy can respond and adjust quickly to divergences which emerge, minimising the adverse impact on growth, stability and employment. The question of whether convergence and flexibility together provide the necessary degree of sustainable and durable convergence is answered after the assessment of the flexibility test.

Overall conclusion

I.173 There has been significant progress on convergence since 1997, which marks a break with the UK's past history of divergence and reflects greater stability of the UK economy and global trends towards integration. Indeed, the UK now exhibits a greater degree of cyclical convergence than some EMU members demonstrated in the run-up to the start of EMU in 1999 and remains more convergent than a number of EMU countries today. The UK meets the EC Treaty convergence criteria for inflation, long-term interest rates and government deficits and debt. But there remain structural differences with the euro area, some of which are significant, such as in the housing market. Because of the risks these factors pose, and the fact that any dynamic changes would take time to come through, we cannot yet be confident that UK business cycles are sufficiently compatible with those of the euro area to allow the UK to live comfortably with euro area interest rates on a permanent basis. Overall, at the present time, while the extent of convergence with the euro area has significantly increased, the convergence test is not met. The Government is committed to building on the platform of stability and has announced a wide-ranging forward-looking policy agenda to deliver high levels of output and employment. This will help to make the economy more convergent with the euro area for the future.

Policy requirements

I.174 In terms of macroeconomic policy, the Government's announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will improve the quality of the UK inflation target and will also help ensure inflation expectations in the UK remain in line with those of the euro area.

I.175 To deliver a more settled platform of stability in the future and a higher degree of convergence, the Government is committed to a comprehensive programme to improve the functioning of the housing market. Building on the reforms to deliver a step change in planning policy, the Government is undertaking further significant changes in the planning system, supply of housing and housing finance to tackle market failures, increase the responsiveness of supply to demand and reduce national and regional price volatility. These measures are beneficial in their own right to improve the stability and flexibility of the UK housing market and wider economy, but will also increase the housing market's compatibility with the euro area, encouraging greater convergence over time.

I.176 This means implementing quickly and decisively past reforms to housing supply and going further to address both supply and demand in the housing market and macroeconomic stabilisation more generally:

- on the supply side, the Government is requiring new Regional Spatial Strategies to take account of volatility in the housing market and promote macroeconomic stability as part of delivering sustainable development; tough and credible measures, including intervention, where local authorities are not delivering housing numbers in high demand areas; and exploring whether, in the medium term, achieving the Government's objectives will require a system of binding local plans. The Government has also commissioned a review of issues affecting the elasticity of supply in the UK, in particular to look at the role of competition, capacity and the financing of the house building industry and possible fiscal instruments, and the interaction of these with the planning system and sustainable development objectives;
- on the demand side, through a review of the UK mortgage market to establish why the share of fixed rate mortgages is so low in the UK compared to many other EU countries and to identify ways of encouraging the market for longer-term fixed rate mortgages; and
- at the macroeconomic level, given that housing is identified as a significant risk factor to the achievement of sustainable and durable convergence and in the context of the Treasury discussion paper *Fiscal stabilisation and EMU*, to consider what additional reforms and measures might help deliver wider stability in the economy, including with reference to the housing market, to create the right conditions for convergence within EMU. The Government's announcement of its intention in the next Pre-Budget Report to give the Bank of England a symmetric inflation target as measured by the Harmonised Index of Consumer Prices will help ensure inflation expectations in the UK remain in line with those of the euro area.