Housing, consumption and EMU

EMU study

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This study has been prepared by HM Treasury to inform the assessment of the five economic tests

This study has benefited from review by Professor John Muellbauer, working in a personal capacity as an academic consultant to HM Treasury. All content, conclusions, errors and omissions in this study are, however, the responsibility of HM Treasury alone.

This is one of a set of detailed studies accompanying HM Treasury's assessment of the five economic tests. The tests provide the framework for analysing the UK Government's decision on membership of Economic and Monetary Union (EMU). The studies have been undertaken and commissioned by the Treasury.

These studies and the five economic tests assessment are available on the Treasury website at:

www.hm-treasury.gov.uk

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1 This EMU study informs the assessment of the convergence test – the first of the Government's five economic tests for determining whether adoption of the euro would be in the UK's economic interest: *"Are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?"*. It considers in detail a particular, and important, structural aspect of the transmission mechanism of monetary policy: the housing market. The transmission mechanism as a whole is the subject of the EMU study by HM Treasury *EMU and the monetary transmission mechanism*.

2 There are four structural aspects of housing markets which could potentially lead to differences in the interest rate sensitivity of UK and euro area households, and to differences in the sensitivity of consumption to housing wealth:

- house price trends: differences in long-run growth rates or in house price cycles may affect household consumption;
- mortgage markets: 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;
- housing tenure: high levels of owner occupation, as compared to private or social renting, are likely to increase the impact of changes in housing wealth on consumption; and
- mortgage equity withdrawal: the ability of households to withdraw equity from housing is important in determining the impact of changes in housing wealth on consumption.

3 This study considers evidence on differences in these structures across the UK and the euro area, and considers the implications for households' interest rate sensitivity and consumption.

Context: the UK housing market

4 Strong cycles in the housing market have been a striking feature of British economic life over the past three decades. Most recently, 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 Monetary Policy Committee's decisions about interest rates. The nature of the UK housing market, and its link to households' spending decisions, motivates close investigation of the possible effects if the UK were to adopt the single currency. Interest rate decisions taken by the European Central Bank would be determined by developments in the euro area as a whole rather than being exclusively focused on UK conditions, as they are under the UK's current monetary framework. If households' spending is significantly more sensitive to interest rate changes in the UK than in the euro area as a whole, a common monetary policy could induce some relative instability in the UK housing market and households' spending.

5 Since 1999, consumption growth has been rapid in the UK, partly due to strong growth in housing wealth. Over the same period, Ireland and Spain were the only euro area countries to have experienced above trend consumption growth, despite lower official interest rates in the euro area than in the UK. This raises the possibility that growth in house prices may be less strong in the large euro area countries, or that the link with consumption may be weaker.

House prices

6 House price behaviour in the UK has differed from the euro area average in the past, though there has been a wide variety of experience across Europe. The UK has seen a rise in real house prices over the long term of around $2^1/_2$ per cent a year. This is double that in France and Italy, while in Germany real house prices have hardly changed. Among the larger countries, only Spain has seen real house prices increase at a comparable rate to the UK. Faster house price growth has made housing a better investment asset in the UK. Insofar as the gains can be accessed, this has increased the wealth of homeowners available for consumption.

7 The volatility of UK house prices has tended to be more marked than in France and Germany. But UK volatility has not been unusual compared with other European countries, many of which have also experienced significant house price cycles. However, where house price cycles have occurred, there is no evidence that they have been synchronised. Rather they appear to have been generated by local conditions.

8 The differing behaviour of house prices reflects both supply and demand factors. A number of studies suggest that the responsiveness of housing supply to demand pressures is particularly low in the UK. Certainly the UK has, on average, invested a relatively 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

9 There are some key differences in mortgage markets across Europe which bear on the issue of the sensitivity of households' disposable income to interest rate changes. Owner occupation itself, at 70 per cent, is not very different in the UK from the EU average. It is, however, significantly higher than in Germany and France, although lower than in Spain.

10 The level of mortgage debt tells a rather different story. Mortgage debt in the UK, at 60 per cent of GDP, is well above the EU average and exceeded only in Denmark and the Netherlands. Mortgage debt is much lower in France and Italy. Perhaps surprisingly, in the light of its low level of owner occupation and stable real house prices, German mortgage debt is similar to that of the UK – the explanation of this apparent paradox lies in fact that there are mortgages held by householders who are private landlords. The high level of mortgage debt in the UK suggests that household income after mortgage payments is likely to be more sensitive to interest rate changes than in many other European countries.

11 Another way in which changes in interest rates may impact differently on household income is through differences in the prevalence of fixed and variable rate mortgages. The rate of interest paid on fixed rate mortgages does not vary with changes in the base rate for the period of the fix, while variable mortgage rates tend to move closely in line with base rates.

12 On the latest comparable figures, over 60 per cent of new UK mortgages were variable rate and most others were short-term fixed rates of one to five years. In Germany, 80 per cent of mortgages were at long-term fixed rates of over five years, with all the rest at short-term fixed rates. In France, 60 per cent were at long-term fixed rates and nearly all the rest were at short-term fixed rates. Among the larger EU countries, only Italy – where the level of mortgage debt is low – had an appreciable proportion of variable rate mortgages; and then, at around 35 per cent, the figure was almost half that in the UK.

I3 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 higher in the UK than in any other EU country, and far higher than in the other large EU economies.

Mortgage equity withdrawal

I4 The influence of the housing market on 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 now has a liberalised and competitive mortgage market and so do the Scandinavian countries. Both the UK and the Scandinavian countries have seen rapid rises in personal borrowing. In France, the deregulation process started later and has not progressed as far, while in Germany, the mortgage market remains heavily regulated. Mortgage equity withdrawal has been strong in the UK and in Sweden, but negative in France, Germany and Italy. This reflects both the relative ease of achieving mortgage equity withdrawal in the less regulated markets and trends in housing equity itself, largely the result of house price movements. This study includes a case study of the Netherlands which shows that substantial house price movements and associated mortgage equity withdrawal can occur even in a predominantly fixed interest rate environment.

Housing wealth and consumption

I5 Other things equal, differences in housing and mortgage markets between the UK and other EU countries together indicate the potential for greater sensitivity of household spending to interest rate changes in the UK than in the larger euro area countries. The study also considers variations across Europe in the responsiveness of households to changes in interest rates and housing wealth by examining estimated consumption functions. Existing studies of consumption functions are reviewed and some new comparable modelling results by HM Treasury are presented. 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. These consumption function based studies do not consider the link between interest rates and house prices. Other work presented in this study suggests that this link may also be more sensitive in the UK, tending to enhance any response of household spending to interest rates.

Could these differences change in EMU?

I6 This study recognises that past relationships may not be a good guide to what might happen if the UK were to join EMU. Established patterns of behaviour might change sharply, leading to convergence in the interest sensitivity of household spending in the UK and the current euro area. The best place to search for evidence of this kind is in the housing and mortgage markets of those countries which have already adopted the euro. However, there is little sign of significant convergence to date. While nominal 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. While the moves towards a single financial market have made it easier for banks to operate in different countries, this has yet to make much impact at the retail level.

Conclusions

17 The study seeks to address the question of whether UK households are more interest rate sensitive than the euro area average as a result of differences in housing market structures. It finds that:

- real house price growth has been stronger in the UK than in the larger 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 to changes in interest rates is higher in the UK than in euro area countries;
- the UK owner occupation rate is well above the levels in Germany and France, although lower than Spain and a number of smaller EU countries;
- 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 higher levels of mortgage equity withdrawal; and
- the evidence of the euro area to date suggests little by way of convergence of housing and mortgage markets following EMU membership.

18 These conclusions are drawn on in the EMU study by HM Treasury *EMU and the monetary transmission mechanism*, which considers the overall interest rate sensitivity of the UK compared to the euro area. That study finds that there are other structural factors, in addition to housing, which may make the UK more interest rate sensitive than euro area economies, but that there are also factors which work in the opposite direction. Overall, it finds that there is more evidence for structural factors that will increase the strength of the transmission mechanism in the UK relative to other countries. While empirical econometric studies at the aggregate level, as reported in *EMU and the monetary transmission mechanism,* do not demonstrate consistently that the UK transmission mechanism stands out, these techniques are not always the best way of considering specific areas which may have special characteristics and particular importance and risk.

19 This is a key motivation for the current study, which has revealed 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 home owners 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.

20 These conclusions are considered further in the convergence test – the first of the Government's five economic tests for EMU entry.

INTRODUCTION

1.1 This EMU study supports the assessment of the convergence test – the first of the Government's five economic tests determining whether adoption of the euro would be in the UK's economic interest: *"Are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?"* The study examines the links between the housing market and consumer spending in EU countries, and considers whether particular aspects of the UK housing market mean that household consumption is more sensitive to interest rates and housing wealth in the UK than in the euro area.

1.2 This study therefore focuses on a single aspect of the monetary policy transmission mechanism. The EMU study by HM Treasury *EMU and the monetary transmission mechanism* addresses the broader question of whether the UK economy as a whole reacts differently to changes in interest rates. Its conclusions are based partly on this study, but also reflect a wider examination of UK economic structures and whole economy econometric evidence.

1.3 HM Treasury's October 1997 assessment of the five economic tests recognised the potential significance of divergences in housing market structures for a common euro area interest rate policy in the UK, and the extent to which the UK could achieve sustainable convergence. It suggested that the UK's relatively high mortgage debt stock could make households more vulnerable to changes in interest rates. It noted that the UK housing market has been relatively volatile in the past, although some other EU countries have also exhibited highly variable house prices.

1.4 These issues have been central to the debate over UK membership of EMU. For example, Bush (2001) argues that: "*Britain's unique combination of high mortgage debt at variable rates means that it is far more affected than other European countries by changes in interest rates*" (page 37). Academic experts on the UK housing market have also raised concerns about differences between transmission mechanisms in the UK and euro area. Two academic contributions to the EMU study *Submissions on EMU from leading academics* focus on the UK housing market. Professor Geoffrey Meen argues that in the UK *"the responsiveness of house prices to interest rates is strong (particularily since financial liberalisation), monetary policy has a signficiant impact on consumers' expenditure, and hence GDP, through the housing market."* In the same study, Professor John Muellbauer highlights a number of differences in housing market structures in the UK and euro area and argues that *"institutional differences between European countries will be slow to dissipate; some sources of asymmetric shocks will always remain".*

The study's approach

1.5 This study presents HM Treasury's detailed analysis of these issues. It examines evidence on key structural aspects of housing markets in the UK and the euro area: house price trends, the structure of mortgage debt, tenure patterns and the extent of mortgage equity withdrawal. It also reviews empirical models of the link between housing wealth and consumption, and presents the results of HM Treasury modelling work on this issue. The study also draws on evidence provided by a case study of the Netherlands, which has a housing market which is in some ways similar to that of the UK.

Structure of the study

1.6 The study is structured as follows:

- Section 2 provides the theoretical underpinnings of the study;
- Section 3 focuses on the structure of mortgage markets in the UK and the EU, and the role that this plays in determining the interest-rate sensitivity of household finances and housing demand;
- Section 4 reviews house price behaviour across the EU, examining long-term trends and short-term volatility. This is relevant in assessing the potential for asymmetric responses in house prices to changes in interest rates or other shocks to demand;
- Section 5 examines mortgage equity withdrawal across EU countries, and in particular highlights the importance of the degree of financial liberalisation in mortgage and credit markets;
- Section 6 reviews a number of external empirical studies and also presents HM Treasury's own analysis of the links from interest rates and housing wealth to household consumption in the UK and a number of euro area economies;
- Section 7 assesses the potential for closer convergence of UK housing and mortgage market structures with those in the euro area if the UK were to join EMU; and
- Section 8 concludes.

Relevant EMU studies

1.7 The conclusions from this study are drawn on in the EMU study by HM Treasury on *EMU and the monetary transmission mechanism*. The EMU study by HM Treasury *EMU and the cost of capital* considers developments in EU financial markets, which are relevant to the discussion of mortgage market developments in this study. The housing market is a potential source of shocks to the economy, in or out of EMU. The question of how the UK would adjust to economic shocks within EMU is explored in the EMU studies *Modelling shocks and adjustment mechanisms in EMU, EMU and labour market flexibility* and *The exchange rate and macroeconomic adjustment.*

2 Consumption, Housing and Interest Rates: Theory

This section sets out the theoretical links between short-term interest rates and consumer spending, showing that variations between countries in housing market structures are likely to have a key bearing on the strength of this relationship.

The *direct* impact on spending of a change in interest rates via housing is straightforward. For homeowners, the rate of interest helps to determine the immediate burden of mortgage interest payments (MIPs). Other things being equal, high levels of mortgage debt and/or a high reliance on variable as opposed to fixed rate financing is likely to mean stronger short-term impacts on income and hence spending.

Against this, short-term variations in the MIPs burden are less likely to be important if consumers are able to borrow easily to smooth spending in the face of fluctuations in disposable income. It is also important to remember that the UK household sector has significant holdings of interest-bearing assets as well as liabilities, hence the impact of a change in interest rates is not all one-way.

Overall, there are good reasons to think that the *indirect* effects of interest rates on consumer spending may be more important. First, changes in interest rates affect house prices through movements in housing demand interacting with supply conditions. Second, changes in house prices alter household wealth, which may be a key determinant of consumption.

The response of house prices to a change in interest rates is likely to vary between countries due to differences in housing and mortgage market structures.

The responsiveness of housing supply to changes in house prices is also important. Where supply responses are weak, volatility in house prices are likely to be much stronger in the face of changes in interest rates or other demand shocks.

The implications of this for the wider economy and hence convergence overall depend on the strength of the link between housing wealth and household consumption. Housing is a key asset for households but, while there is a general consensus that housing wealth does affect spending, there is less agreement over exactly how it exerts its influence or whether such effects are long-lasting or more transitory. The ability of households to access their housing wealth through the credit market is also important.

Overall, wealth effects seem likely to be strongest in countries where the degree of home ownership is high, there are marked gains in housing equity over time and the financial system is sufficiently liberalised to allow homeowners to access their wealth.

Interest rates and consumption

2.1 This section sets out the theoretical links between short-term interest rates and consumer spending. It shows that changes in interest rates can be expected to have both direct and indirect effects on consumer demand. In both cases, housing market structures and performance are likely to have a critical bearing on the strength of these impacts.

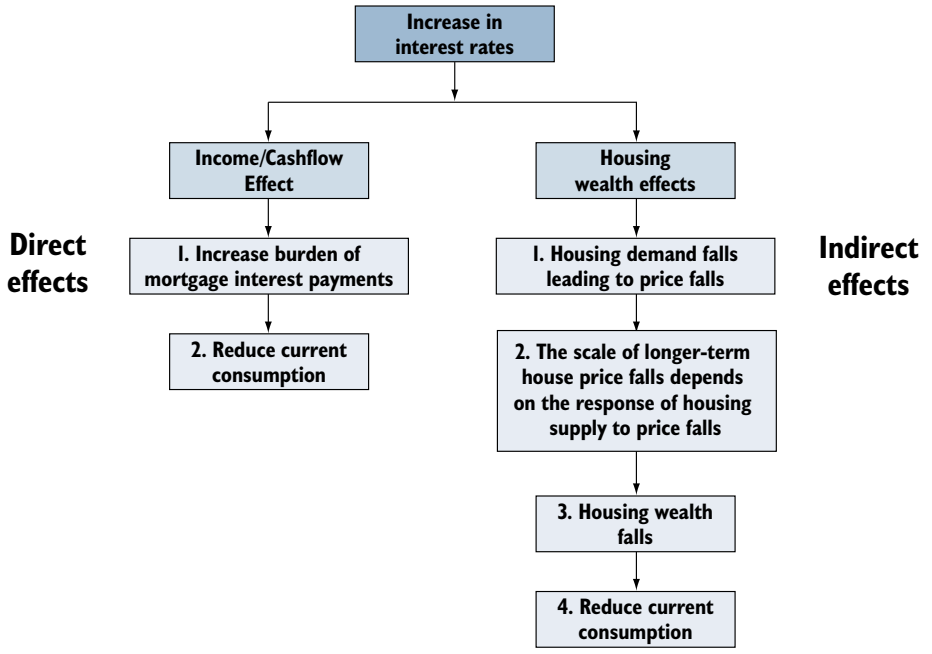
2.2 Interest rates affect consumer spending both directly and indirectly. Focusing on the role played by housing:

- the direct effect is straightforward. For homeowners, a change in interest rates alters the immediate burden of mortgage interest payments (MIPs). An increase in interest rates, for example, reduces household disposable income net of mortgage interest payments, which might lead to lower consumer spending in the shorter term;

- the indirect effect is more complex. First, changes in interest rates will impact on housing demand and supply, and therefore lead to a change in house prices and housing wealth. Second, there is evidence that such changes in housing wealth are a key determinant of consumer spending.

2.3 The direct and indirect relationship between housing and consumption using the example of an interest rate increase is demonstrated in Chart 2.1.

Chart 2.1: The relationship between interest rates, housing and consumption



Source: HM Treasury

2.4 Housing market structures and performance are likely to play a key role in determining the size of these effects at each link in the chain. Most obviously, the direct effects will depend, among other things, on the degree of home ownership and the level of mortgage debt. Similar factors will also help to determine the indirect effects of the response. However, the overall impact on house prices will also depend on other parameters including, critically, the responsiveness of housing supply. Finally, the link between house prices, housing wealth and consumption is likely to depend on the overall importance of housing wealth in households' financial balance sheets, and the ease with which consumers are able to access such wealth to support spending.

The direct effects

2.5 Consumption theory distinguishes between two direct effects of interest rates on household spending: the substitution and income (or cashflow) effects.

Substitution effect

2.6 Consumers face a choice between spending their income today or saving to fund future consumption. A rise in real interest rates increases the return on saving, making it more worthwhile relative to current spending, and so current household consumption is likely to fall. The strength of this effect depends on consumer preferences, and specifically the rate at which households are willing to substitute current for future consumption (the intertemporal elasticity of substitution). This is an important justification for the direct inclusion of interest rate terms in models of consumer demand, but it is not directly related to housing market structures. For this reason, it is not included in Chart 2.1.

Income or cashflow effect

2.7 Households pay interest on the majority of their debts and receive interest income on a proportion of their assets. Changes in interest rates might therefore have a short-term impact on household consumption by changing the amount of disposable income available for current spending. This effect will be greater the nearer households are to their budget constraints and the more that current spending is constrained by lack of access to credit. Where consumers can borrow easily, they are better able to smooth spending in the face of short-term variations in disposable income. Indeed, it is often argued that relatively high levels of personal borrowing in the UK show that availability of credit is not likely to represent a serious constraint on household spending in the short term, especially for homeowners.

2.8 Beyond this, the direction and magnitude of any direct income or cashflow effect is likely to depend on:

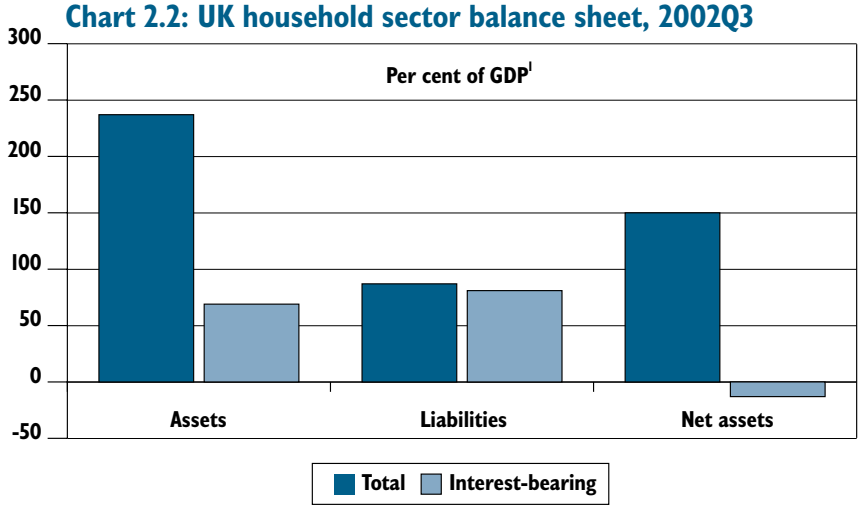
- the household sector's net position on interest-bearing debt – the balance between interest-bearing assets and interest-bearing liabilities; and
- whether the interest rates on their assets and liabilities are variable or fixed; and, where interest rates are variable, the relative responsiveness of these rates to changes in base rates that are set by the central bank.

2.9 In practice, mortgage debt is the single largest financial liability for many households. Hence the housing market plays a key role in influencing the sector's overall net debt position. Chart 2.2 shows that the UK household sector has a large net surplus of financial assets relative to liabilities. However, household net equity in life assurance and pension schemes, which accounts for around half of total financial assets, is not easily accessible by households.[1] Changes in this equity may have little effect on households' spending decisions in the short term. Focusing on interest-bearing assets and liabilities only, the household sector's net financial position shows a modest deficit. Mortgage debt accounts for some three quarters of UK households' total interest-bearing liabilities.

2.10 This broad balance in interest-bearing assets and liabilities might suggest that the direct impact of changes in interest rates on spending is likely to be modest. However, there remains scope for important cashflow effects, depending upon the behaviour of creditors and borrowers. In particular, it is generally assumed that most borrowers tend to be young and have relatively high propensities to consume out of income compared with creditor households, partly reflecting their access to credit. The short-term response of consumer spending to an increase in interest rates, therefore, will still be negative if the reaction of this borrowing group dominates.

[1] A detailed discussion of household and corporate net financial assets in the UK compared to the euro area can be found in EMU study by HM Treasury *EMU and the monetary transmission mechanism.*

Chart 2.2: UK household sector balance sheet, 2002Q3



[1] *GDP summed from 2001 Q4 to 2002 Q3.*
Source: Office for National Statistics.

2.11 The structure of debt, particularly the use of variable rate financing, together with the level and distribution of household indebtedness will also be an important determinant of the size of the income effect. The more that rates faced by individuals respond to official interest rates, the greater the likelihood that spending will respond to changes in short-term interest rates. In the UK, the bulk of mortgage debt and total personal sector borrowing is subject to short-term variable rates as opposed to longer-term fixed rates of interest, increasing the sensitivity of household finances to changes in base rates and raising the scope for stronger direct impacts on consumer spending.

Summary: the direct effects

2.12 Overall, mortgage market structures are likely to play a key role in determining the strength of the direct impact of changes in short-term interest rates on consumer spending. The direct effect on consumption is likely to be strongest where:

- the level of interest-bearing debt is high relative to interest-bearing assets;
- the link between base rates and mortgage rates is strong; and
- consumers are credit constrained and so find it hard to smooth spending in the face of variations in disposable income.

The indirect effects: interest rates and house prices

2.13 Changes in interest rates also have an indirect effect on consumer spending through changing house prices and therefore total household wealth. The impact of interest rates on house prices is considered first within the context of a very simple model of housing demand and supply, set out formally in Box 2.1.

Housing demand

2.14 In this model, the demand for housing, like any other normal consumption good, is assumed to be negatively related to real prices and positively related to real incomes. Housing demand is also negatively related to the level of interest rates, as this is a key component in the overall cost of investing in housing relative to other assets. Although house purchases may also be funded wholly or partly through savings, an increase in interest rates reduces housing demand by raising the rate of return on alternative interest-bearing assets. These income and substitution effects are separately identified in the model presented in Box 2.1.

Box 2.1: Basic model of house prices

This box sets out a formal model for housing supply and demand.

Housing demand: $$logH_d = \alpha_0 - \alpha_1 logP_h + \alpha_2 logY - \alpha_3 r + \alpha_4 Z_d \quad [1]$$

Housing demand (H_d) is negatively related to real house prices (P_h) and real interest rates (r), and is positively related to real incomes (Y). Z_d represents other factors influencing demand, for example demographics or the expected returns on housing.

Real income comprises labour income (Y_L) plus net interest receipts. Abstracting from inflation:

$$Y = Y_L - r(M-A)$$

and so

$$logY = logY_L - r(M-A)/Y_L \quad [2]$$

where M and A represent real mortgage debt and real interest-bearing financial assets respectively.

Housing supply: $$logH_s = \beta_0 + \beta_1 logP_h + \beta_2 Z_s \quad [3]$$

Housing supply (H_s) is determined by the profitability of new housebuilding and so is positively related to real house prices. Z_s represents other influences on profitability, for example, real construction costs (the prices of land, labour and materials including taxes).

After substituting [2] into [1], equating demand [1] and supply [3] gives an expression for equilibrium real house prices:

$$logP_h = [\ (\alpha_0 - \beta_0) + \alpha_2 logY_L - (\alpha_3 + \alpha_2 (M-A)/Y_L) r + \alpha_4 Z_d - \beta_2 Z_s] \ /\ (\alpha_1 + \beta_1) \quad [4]$$

From [3] the long-run responsiveness (or semi-elasticity) of house prices with respect to interest rates can be deduced:

$$\delta logP_h / \delta r = -\ (|\alpha_3| + |\alpha_2| (M-A)/Y_L) \ /\ (|\alpha_1| + |\beta_1|) \quad [5]$$

That is, the final impact on house prices of a change in interest rates will depend not only on the interest sensitivity of housing demand, but also on the price elasticities of housing demand (α_1) and supply (β_1). The expression also makes clear that the interest sensitivity of housing demand comprises both substitution (α_3) and income effects (α_2). The negative substitution effect reflects the return available on alternative (non-housing) assets. The income effect is directly proportional to the mortgage debt burden (M/Y_L).

Similarly, the response of house prices to other demand or supply shocks will also be partly determined by the price elasticities of demand and supply. For example, the elasticity of house prices with respect to labour income is given by:

$$\delta logP_h / \delta logY_L = |\alpha_2| \ /\ (|\alpha_1| + |\beta_1|) \quad [6]$$

Note that [1] and [3] are long-run relationships and so the expression in [5] describes the long-term responsiveness of house prices to changes in interest rates. In the shorter term, this elasticity may be different depending on how the key parameters vary over time. Most obviously, it is expected that the price elasticity of housing supply would be very low in the short term, whatever its longer-term position.

2.15 Returns to housing relative to other assets are typically formalised in a concept known as the user cost of housing, which is explained in Annex A. Key components of the user cost include the tax treatment of housing relative to other assets and expected future capital gains on housing. Neither capital gains nor the imputed rent gained through owner occupation are taxed in the UK, increasing the incentives to invest in housing. Until recently, this was reinforced through the availability of tax relief on mortgage interest payments. Finally, the expected change in house prices has a significant impact on housing demand, as it is a key determinant to the expected returns in terms of future capital gains. The importance of this factor will depend on the trend and volatility of house prices.

2.16 For simplicity, these and other important determinants of long-run housing demand are represented by a single vector of demand side factors (Z_d) in the model set out in Box 2.1. This also includes household formation and demographic trends which will help to determine underlying demand for housing over the longer term. Birth and death rates and trends in net migration affect the numbers of new entrants and those exiting the housing market. However, changes in average household size are also important. Rising divorce rates and the increased tendency for people to live alone raise pressure on the housing stock.

Housing supply

2.17 The supply of housing is very different from that of other goods and services. Because housing is very durable, the bulk of supply at any point in time is dominated by the large second hand market, with new housing accounting for only a very small proportion of the housing stock in any one year. That said, it is important that new house building responds to rising demand over time to maintain housing market equilibrium.

2.18 In the simple model in Box 2.1, housing supply is assumed to be positively related to the profitability of house building, and hence positively correlated with the level of real house prices. Remaining influences on the profitability of new house building are subsumed in the vector of other supply side factors (Z_s). These will include the various input costs of house building, including the prices of land, materials and skilled labour as well as taxes.

Equilibrium house prices

2.19 In the model the responsiveness (or semi-elasticity) of house prices to changes in interest rates depends upon three factors:

- the interest elasticity of housing demand, comprising both income and substitution effects (the parameters α_2 and α_3 in the model in Box 2.1);
- the price elasticity of housing demand (α_1); and
- the price elasticity of housing supply (β_1).

2.20 A higher interest elasticity of housing demand boosts the responsiveness of house prices to changes in interest rates, while higher price elasticities of housing demand and supply will reduce it. For example, a reduction in interest rates will raise housing demand causing house prices to begin rising. The more responsive demand is to interest rates, the greater the final increase in prices will be. At same time, the more responsive housing demand is to price, the less prices need to rise to moderate the impact of the initial shock to demand. Likewise, the less responsive supply is to price, the more prices need to rise in order to induce the higher supply to meet increased demand.

2.21 The key point is that divergences across countries in the responsiveness of house prices, and hence wealth and consumer spending, to changes in interest rates could be a result of differences in *any* of the three parameters. Most obviously, a high level of mortgage debt, or a greater reliance on variable rate finance, is likely to boost the responsiveness of housing demand to changes in interest rates. However, even when the interest elasticity of housing demand is comparable across countries, house prices could still behave differently if there are differences in the price elasticity of housing demand or supply. In particular, a weak supply response would tend to boost the response of house prices to changes in interest rates (or indeed other demand shocks) implying greater indirect effects on household consumption.

House price dynamics and cycles

2.22 Limited availability of land, together with planning regulations, and inelastic supply of skilled labour, are likely to represent important constraints on housing supply. In the presence of these factors, house prices are likely to react swiftly to changes in housing demand, while housing supply adjusts much more gradually. This partly explains strong short-term cycles in UK house prices, with prices initially undershooting or overshooting their new long-run equilibrium position in response to a demand shock before supply adjusts. By contrast, supply side shocks, for example a change in planning regulations, are likely to lead to a more gradual adjustment in house prices to their new long-run equilibrium level.

2.23 Demand side factors also contribute to short-term cycles in house prices. Box 2.1 focuses on the impact of current house prices and income on housing demand. In practice, expectations and lumpy transaction costs may contribute to demand volatility. Expectations of future house price movements help to determine the expected return from owner occupation, and there is strong evidence that these expectations are strongly influenced by the current rate of house price inflation.[2] So there is scope for initial shocks to demand to be reinforced through increased speculative investment in housing as prices begin to pick up. Econometric studies of house prices also point to the existence of important 'threshold' effects, or non-linearities, in house price determination: as prices begin to rise in response to a positive shock, more households are pulled over the transaction costs barrier[3] to engage in trade, fuelling price 'bubbles' where prices may move far out of line with longer-term fundamentals as a result of unrealisable expectations.

Summary: the indirect effects – interest rates and house prices

2.24 Differences in housing and mortgage market structures contribute to divergences in house price behaviour across countries. High levels of mortgage debt and a reliance on variable rate financing will increase the interest sensitivity of housing demand. However, the long-term responsiveness of house prices to interest rates, and indeed other demand shocks, is also critically dependent upon the price elasticities of housing demand and supply. As already noted, weak supply responses are likely to imply both stronger trends and also greater volatility in house prices. Depending on the strength of the link between house prices, housing wealth and consumption, this would imply a stronger indirect relationship between interest rates and consumption. Section 4 examines house price behaviour in the UK and other EU countries.

The indirect effects: house prices, housing wealth and consumption

2.25 Housing is a key asset for households. This implies considerable potential for changes in house prices, and therefore wealth, to impact on consumer spending and hence wider economic activity. The relationship between the housing market and consumer spending has been the subject of detailed research in the UK, particularly in the period following the breakdown of conventional consumption function relationships during the late 1980s boom and subsequent downturn. There is now a general consensus that housing wealth does affect consumer spending, but much less agreement regarding exactly how it exerts its influence and whether such effects are transitory or more permanent. Box 2.2 provides a brief theoretical overview.

[2] House price inflation exhibits serial correlation in a wide range of countries. Much of the explanatory power of most models of house prices is provided by the inclusion of lagged terms in the dependent variable.

[3] The transaction costs barrier describes the point up to which the level of transactions costs affect the decision of the individuals to participate in the market, and beyond which no longer acts as barrier.

Box 2.2: Housing and consumption: theoretical overview

Conventional economic theory assumes that housing demand is derived from the demand for the flow of services provided by owning a house. At the margin, it is assumed that householders equate the marginal benefits of the service flow with the marginal cost. This principle is adopted in the national accounts treatment of owner-occupied housing, in that the imputed values of housing services are included in both consumption and income.

Demand theory suggests that an increase in real house prices would induce substitution between consumption of housing and non-housing services, other things equal. Moreover, for non-householders, the income effect of such an increase is negative: non-householders may increase their saving in response to such changes if they aspire to home ownership or in anticipation of a future increase in rents.

Existing householders, by contrast, have experienced an increase in (real) housing wealth which may have expenditure implications to the extent that they can realise the capital gain. The extent to which householders may exploit such gains depends crucially on the degree to which housing wealth can be liquidated. This in turn depends on the behaviour of lending institutions and on the degree to which such markets are formally regulated especially in terms of direct restrictions on credit. These issues are discussed in Section 5 of this study.

There is a distinction between the effects of increases in real house prices and the effects of other additions to housing wealth. The former can be thought of as a transfer or redistribution of wealth between young and older households. Indeed, excluding bequests, such effects should wash out across generations (Aoki *et al.* 2001). A bequest motive modifies this conclusion since it is akin to the direct acquisition of wealth. However, simulations with 'overlapping generations' models incorporating bequests have generally shown the effects of permanent changes in real house prices on consumption to be small but highly persistent, with the steady state effect taking well over fifty years to emerge. Other additions to housing wealth, via say the transfer of housing stock from the public sector to the private sector at a discount, represent permanent increases in wealth and can be expected to have long-run spending implications.

The brief theoretical overview above suggests that there may be a role for housing wealth in consumption functions. However, it also indicates some of the difficulties to be faced in estimating such effects (or the lack of them) with the relatively short time series that are available. Moreover, it seems likely that housing wealth effects may be time varying depending both on the institutional regime and demographics.

Some studies disaggregate wealth into 'liquid' and 'illiquid' components with the latter containing bonds and equity holdings in addition to (gross) housing wealth. Others aggregate wealth by combining housing and net financial wealth. Those studies that do disaggregate tend to find that the coefficients on illiquid assets are smaller and less well determined than those on liquid wealth.

Wealth effects

2.26 Movements in household wealth and consumer spending were strongly correlated during the 1980s and early 1990s, though it is not clear that this was a causal relationship. In a closed economy, the main beneficiaries of rising house prices (last-time sellers and those trading down) and the 'losers' (first-time buyers and those trading up) will broadly balance overall. This suggests that the aggregate housing wealth effects need not be large, though it is possible that the 'winners' have higher marginal propensities to consume from wealth than typical 'losers' such as first-time buyers. More generally, the idea that there are strong links between housing wealth and consumption rests on the notion that a large number of homeowners who do not move house when prices rise choose to increase spending simply because they feel much better off and are able to mobilise their wealth through the credit market. Homeowners therefore 'cash in' on paper gains in housing wealth well before 'losers' have to pay a higher price when buying a house.

Mortgage equity withdrawal

2.27 The process of extracting housing wealth gains to fund current consumption is known as mortgage (or housing) equity withdrawal. From a macroeconomic perspective, mortgage equity withdrawal is defined as net new borrowing secured against housing in excess of new investment in residential property. Davey (2001) sets out five ways in which housing equity can be withdrawn to support current spending (Table 2.1). Households may also use these opportunities to inject equity into housing, so the overall result of this process is not clear cut.

Table 2.1: Methods of mortgage equity withdrawal

Last-time sales	A seller does not buy a new property, so the proceeds of the sale are released from the housing market.
Trading down	A seller moves to a cheaper property but reduces the mortgage by less, to leave a cash sum.
Over-mortgaging	A moving owner-occupier increases their mortgage by more than the price difference between the old and the new property.
Re-mortgaging	A borrower takes a new mortgage and increases their debt without moving properties or improving the property to the same extent.
Further advances and second mortgages	A borrower raises a further advance on an existing mortgage or takes a second mortgage without improving the property to the same extent.

Source: Davey, 2001.

2.28 Table 2.1 shows that three of the methods for extracting mortgage or housing equity involve selling a property and moving home. Not surprisingly then, there is a close correlation between mortgage equity withdrawal and housing market transactions. For example, Holmans (2001) estimates the various components of mortgage equity withdrawal, and highlights the importance of last-time sales within the total. But, while it is clear that households may choose to withdraw equity when they move, withdrawing equity will not be the primary reason for moving in many cases, not least because moving home entails significant transactions costs, and equity can be released by other means.

2.29 Table 2.1 also shows that individuals may withdraw housing equity without selling their home, either by re-mortgaging or taking further mortgages and advances against the property. In either case, the level of household net equity in the home is clearly important, as individuals can only choose to withdraw housing equity when the value of their home exceeds their mortgage debt. With mortgage debt fixed in nominal terms, the evolution of house prices is therefore a key factor. The extent to which households are able to access housing equity to support current spending is critically dependent upon the degree of regulation in mortgage markets and, more generally, on the behaviour of mortgage lenders.

2.30 UK financial and mortgage markets went through an extensive process of deregulation during the 1980s, embracing the elimination of exchange and credit controls, the abolition of the Bank of England's minimum lending rate, and the removal of barriers to commercial bank participation in the mortgage market. Many other European countries went though the same process of financial sector liberalisation, although to varying degrees. It follows that divergences across countries in the degree of financial liberalisation in credit and mortgage markets could be a key element in any explanation of why the indirect links between house prices, wealth and consumption appear to be much stronger in some countries than in others.

Landlords and institutional investors

2.31 The discussion so far has focused exclusively on homeowners. Maclennan *et al.* (2000) note that the wealth effect for landlords and institutional investors who own rental properties should also be considered. The wealth effect from rising house prices is likely to be smaller per unit of wealth than for owner-occupiers in either case. In the case of institutional holdings of property, rising house prices will be reflected in stronger financial returns to households, mainly in the form of enhanced pensions. Since pensions are a relatively illiquid component of household sector wealth, it is likely that the impact on household spending will be muted. All other things being equal therefore, wealth effects on consumer spending are likely to be increasing in the rate of owner occupation and decreasing in the proportion of households in the rented sector. As discussed in Section 5, there are large variations in tenure pattern across European countries.

Offsets to the positive wealth effect

2.32 Muellbauer and Lattimore (1995) note that while rising house prices have a positive wealth effect on consumption for owner occupiers, there are some offsets:

> *"The real price of owner-occupied houses has two effects on non-housing consumption: a positive wealth effect for owner-occupiers and a negative income/substitution effect for everyone whose price of housing services is affected by the market price of owner-occupied housing."* (pages 226-227)

2.33 The negative income effect of higher house prices on consumption comes through higher rents. Households that are not owner-occupiers will expect higher future rents when house prices increase, which reduces disposable income available for the consumption of non-housing goods. As noted above, it is expected that this transfer from renting households to landlords will depress consumption overall. There are, however, some caveats to this. First, if private rents are regulated[4] or the social rented sector is comparatively large, rents may be relatively insensitive to house price changes. Second, if house price rises encourage growth in the stock of rented housing, this will moderate the final increase in rents. However, even where rents are insensitive to rising house prices, non-owner occupiers might still reduce current consumption, because those who aspire to home ownership will have to save more for a deposit on a future house purchase.

2.34 In theory, changes in house prices relative to the price of other goods and services should also cause all consumers to substitute between housing and non-housing consumption. But it is not clear that this effect will be large. While households may choose between owner-occupation and renting, housing of one form or the other is a necessity. The ease with which owner-occupiers in particular are able to substitute between housing and non-housing consumption[5] (for example, by trading down) is likely to be severely limited by the significant financial and non-financial transactions costs of moving house. The combined income and substitution effects of rising house prices are likely to be negative overall.

[4] Regulation of rents across Europe has tended to lead to reduced supply of private rental housing.

[5] The exception to this is complementary goods for the home, such as furniture or carpets. Otherwise it might be expected that rising house prices would tend to reduce both the demand for housing and also demand for household goods.

Summary: the indirect effects – house prices, housing wealth and consumption

2.35 The overall impact on consumption from an increase in house prices depends on the balance between the positive wealth effect and the negative combined income/substitution effects. Based on the theoretical considerations above, it seems likely that the wealth effect will tend to dominate and be strongest where:

- owner occupation rates are high and the private rented sector is small;
- net equity in housing is high and transactions costs are low;
- housing is seen as good collateral against which to borrow, and the financial system is sufficiently liberalised to allow homeowners to do so; and
- the rental sector is heavily regulated or dominated by social rented properties, so that rents are relatively insensitive to house price movements.

2.36 This means that, within countries, changes in interest rates will have distributional effects – directly between savers and debtors according to their holdings of interest sensitive assets and liabilities (in particular mortgages), as well as indirectly between property owners and others, according to the extent that interest rate changes lead to changes in house prices and thus housing wealth. Between countries, divergences in housing and finance structures offer considerable scope for variation in the strength of the relationship between house prices and consumer spending. Some of the basic indicators are set out in Section 3 of this study. The link between house prices, housing wealth, secured borrowing and consumption are discussed in Sections 4 and 5.

3 Mortgage Market Structures and Housing Demand in the EU

The UK owner occupation rate is above the EU average, and well above the levels in Germany and France. But the UK position is not unique. Owner occupation rates are higher than in the UK in Spain and a number of smaller EU countries.

Variations in levels of mortgage debt across EU countries are important in determining the direct impact of a change in short-term interest rates on consumer spending and housing demand. The UK, along with the Netherlands, Denmark and Germany, has mortgage debt as a proportion of GDP well above the EU average.

Rapid growth in the UK mortgage debt burden is probably largely a reflection of financial liberalisation in the 1980s, signalling a significant relaxation of credit constraints.

The UK stands out in that the bulk of new mortgage debt (around 60 per cent) are subject to variable rates of interest. Fixed rate mortgages, especially long-term fixed rate mortgages, have a low share of the UK mortgage market. Mortgage borrowing is funded by variable rate retail deposits and hence any rise in interest rates could lead to the costs of short-term funds exceeding revenues from fixed rate mortgage loans. Lenders are able to offer fixed rate mortgages through the use of the derivatives swaps market, but these tend to only enable rates to be fixed for relatively short periods of time.

An alternative means of funding mortgages is through wholesale markets. In other EU countries these have tended to offer fixed rates over long periods. Mortgage bonds, which are the main wholesale instrument across Europe, are the dominant form of funding in Denmark and Sweden, a significant part of the market in Germany and are growing in popularity in a number of other EU countries. Longer-term fixed rate mortgages are therefore more important in the rest of the EU than in the UK. This means that households' mortgage interest payments are less sensitive to interest rate changes in these countries.

Illustrative calculations by HM Treasury suggest that household mortgage interest payments in the UK are much more sensitive to changes in short-term interest rates than the average for the majority of EU countries.

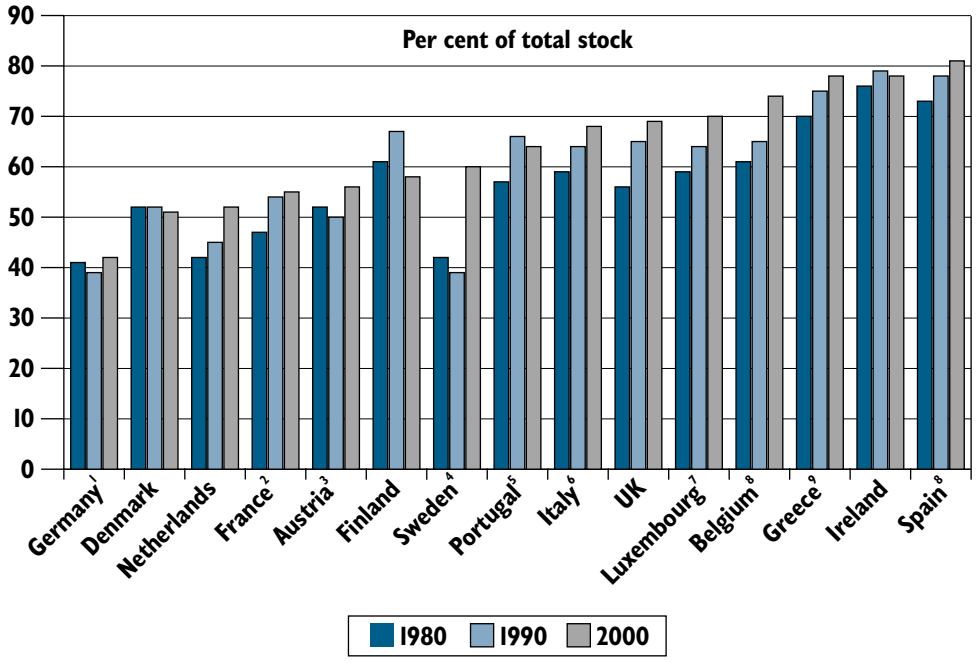
3.1 Differences in mortgage market structures across the EU are likely to have a key bearing on the initial response of households to changes in short-term interest rates, both in terms of the demand for housing and also any direct impacts on consumption through variations in disposable income. This section reviews some of the key indicators, highlighting both variations in levels of mortgage debt across EU countries and also the degree to which changes in base rates feed through to mortgage interest rates. This section also outlines some of the key factors underlying these divergences, and is supported by a detailed review of mortgage funding across EU countries in Annex B.

Housing and mortgage market structures

Owner occupation rates

3.2 Chart 3.1 shows that around 70 per cent of UK households own their own home. In 2000, Luxembourg, Greece, Belgium, Ireland and Spain had higher proportions of owner-occupiers than the UK. Only seven EU countries have less than 60 per cent owner-occupation. France and Germany are among this group, with Germany recording an owner occupation rate of just over 40 per cent. There is little evidence of convergence over time in owner occupation rates. The trend towards increased owner occupation in countries such as the UK, Spain and Belgium over the past 20 years appears to have been just as strong as in countries where initial rates of owner occupation were much lower, such as France and the Netherlands. Owner occupation in Germany and Denmark has remained relatively low and close to current levels for the past 20 years.

Chart 3.1: Owner occupation rates



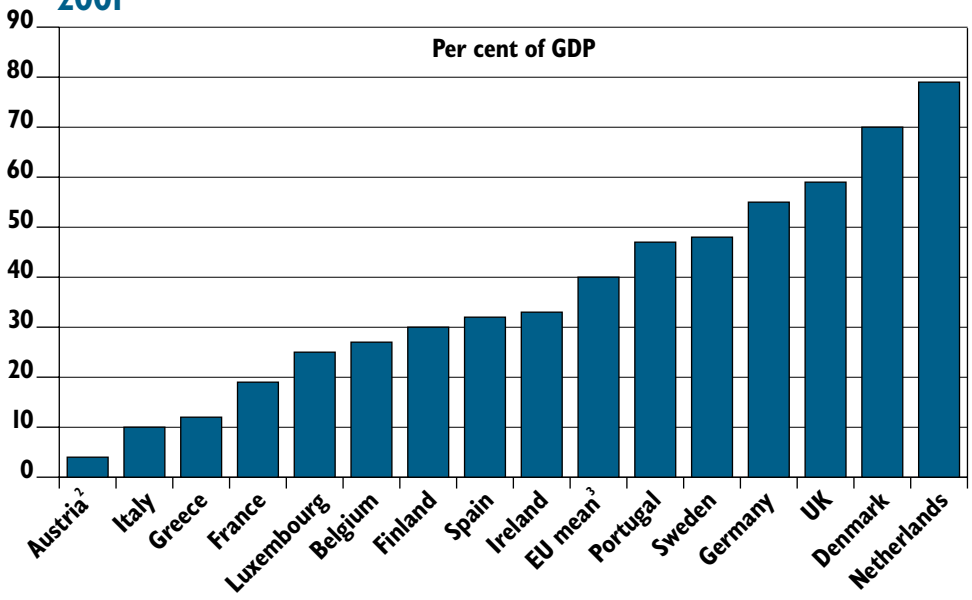
Source: European Commission, 2002 and European Mortgage Federation, 2002.
Note: 1: 1981 (excluding former East Germany) and 1993; 2: 1978 and 1999; 3: 1998; 4: 1995 (not 2000); 5: 1981, 1991 and 1998; 6: 1991; 7: 1981 and 2001; 8: 1981, 1991 and 2000; 9: 1981, 1991 and 1999.

3.3 Beyond historical and cultural conventions, these variations are traditionally ascribed to a range of economic factors. In the UK, investment in housing may have been seen by households as a good hedge against high and variable rates of inflation. Government intervention in the form of tax treatment of housing assets, VAT on new homes or repairs, and also interest relief on mortgage interest payments varies widely across EU countries. Imputed rent from owner occupation has been subject to tax in around half of EU countries, and capital gains are also liable to tax in many cases where homes are resold after a short period. With neither element taxed in the UK, and mortgage interest relief phased out only recently, owner occupation has been encouraged by a favourable tax environment. At the same time, divergences in social housing provision and regulatory frameworks have led to marked variations in the development of the private rented market across the countries. Certain restrictions on the letting of residential property remain in the UK, though private rents were deregulated in 1989.

Mortgage debt levels

3.4 Variations in levels of mortgage debt across EU countries are important in determining the direct impact of a change in short-term interest rates on consumer spending and housing demand. Compared with variations in owner occupation, Chart 3.2 reveals a far sharper distinction between a relatively small group of EU countries where the mortgage debt burden is high, and the remainder where levels of mortgage debt are significantly lower. The UK falls firmly within the former group, with mortgage debt as a per cent of GDP standing at around 60 per cent in 2001. The mortgage debt burden also lies above the EU average in Portugal, Sweden and Germany, but the UK level is exceeded only in Denmark and the Netherlands.

Chart 3.2: The value of outstanding residential mortgage debt, 2001[1]



[1] *Except Luxembourg (1997) and Finland (2000).*
[2] *Includes outstanding commercial lending.*
[3] *Excludes Luxembourg and Finland.*
Source: European Mortgage Federation, 2002.

3.5 These variations in the mortgage debt burden reflect a variety of factors. Kasparova and White (2001) link the rise in the UK mortgage debt burden during the 1980s with increased owner occupation. Within countries, trends in owner occupation will clearly have a key bearing on levels of mortgage debt over time. However, it is clear from Charts 3.1 and 3.2 that the correlation between owner occupation rates and levels of mortgage debt is not close. High levels of mortgage debt in Sweden, Germany, Denmark and the Netherlands, for example, do not reflect high levels of owner occupation. The apparent disparity between low owner occupation rates and high mortgage debt can be explained by mortgage debt held by private landlords and the high price of housing in these countries. Similarly, relatively insignificant mortgage debt burdens in Italy and Greece go hand in hand with a strong bias towards home ownership. National customs are relevant in some cases. The Italian tradition, for example, of families buying homes for younger generations, along with credit restrictions, helps to explain the low debt ratio.

3.6 In the UK, rapid growth in mortgage debt was associated with financial deregulation in the 1980s. While relatively high mortgage debt implies enhanced sensitivity of household disposable income to changes in short-term interest rates, financial deregulation is evidence of the significant relaxation in credit constraints facing UK households. As far as the direct (cashflow) effect of a change in short-term interest rates on consumer spending is concerned, therefore, the net impact is not immediately clear.

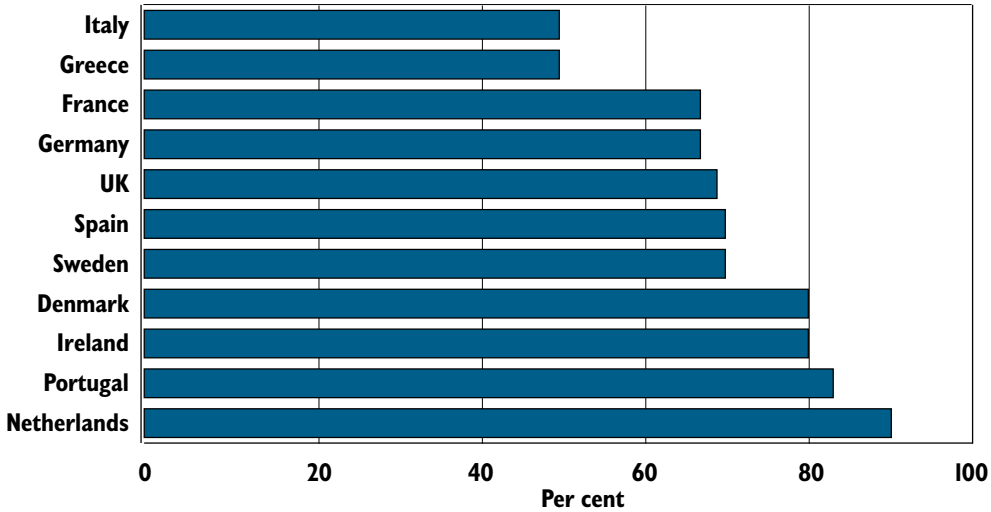
3.7 Variations across the EU in the overall degree of liberalisation in credit and mortgage markets are considered more fully in Section 5 of this study, as this has an important influence on the link between house prices and consumer spending. In the current context, however, it may be noted that the German mortgage debt burden is close to the UK level despite still strict regulations governing lenders' participation in the mortgage market. On the other hand, extensive financial deregulation in Finland, for example, occurs with a relatively low level of mortgage debt overall. As discussed in Annex D, in the Netherlands housing demand and mortgage lending were significantly boosted by a change in lending criteria in 1993, which allowed mortgage loans to be based on dual household incomes where applicable.

Loan-to-value ratios

3.8 Direct restrictions on mortgage borrowing, in particular maximum loan-to-value ratios applied to lending for house purchase, will influence overall levels of mortgage debt across countries. Girouard and Blondal (2001) report a wide range of restrictions applied in OECD countries, ranging from the 100 per cent loans that are available in the UK down to a 50 per cent maximum in Italy. For the vast majority of other EU countries, maximum loan-to-value ratios are reported to lie in the range 60 to 80 per cent, with Portugal the only other country exceeding this. Restrictions partly reflect the degree to which the law provides security to lenders in the case of default. In Italy, for example, it can take up to seven years for lenders to take possession of a property if the borrower defaults, helping to explain the low loan-to-value ratio that applies there, and the low levels of mortgage debt.

3.9 The European Mortgage Federation reports average or typical loan-to-value ratios[1] for new mortgage loans across EU countries (Chart 3.3). On this basis, the UK position is less striking, with the typical loan-to-value ratio in 2001 lying close to that in most larger EU countries, including Germany, France and Spain. Chart 3.3 shows that the bulk of large EU

Chart 3.3: Loan-to-value ratios across European countries, 2001[1]



[1] *Except France, 2000.*
Source: European Mortgage Federation, 2002.

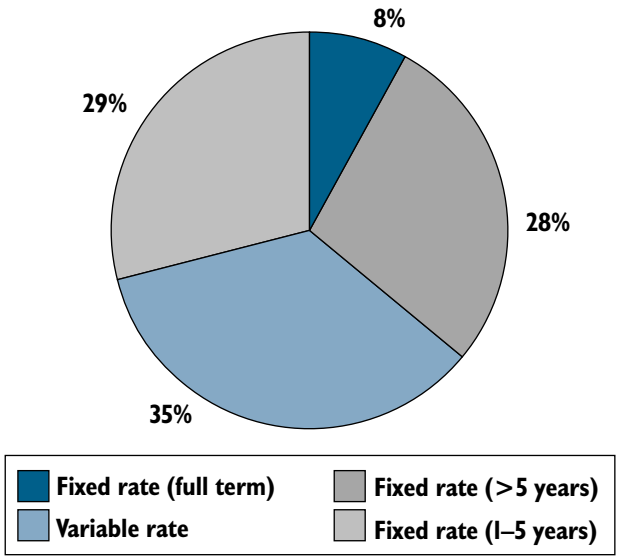
[1] Loan-to-value ratios use average loan values on new mortgage and house purchase values.

countries are bunched around the 70 per cent mark on this measure. But these figures should be treated with caution. Different legal definitions are attached to loan-to-value ratios in the various countries, and it is not easy to make cross-country comparisons. Average loan-to-value ratios are also likely to follow the housing market cycle, with greater caution exercised by both lenders and borrowers during a downturn.

Term structure of mortgage debt

3.10 Beyond the level of mortgage debt, term structures of mortgage debt are one of the major influences on the sensitivity of households' finances to changes in short-term interest rates. Chart 3.4 shows that the majority of mortgage debt in the EU is subject to fixed rates.

Chart 3.4: Market share[1] for term structure of mortgage debt (per cent of new residential mortgage lending in 1999)

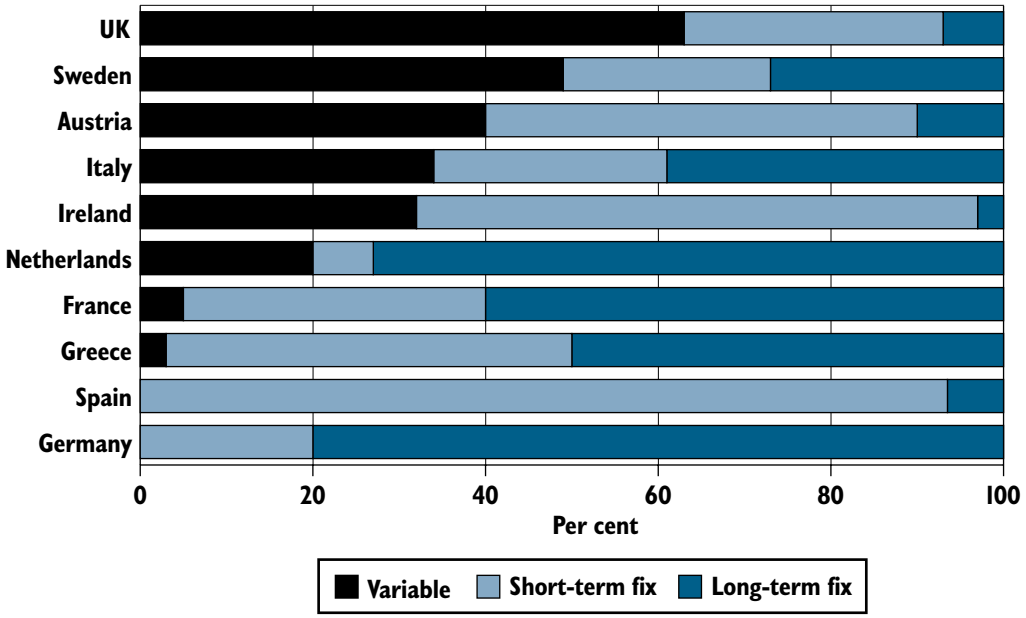


[1] *Includes France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Spain, Sweden and UK.*
Source: European Mortgage Federation, 2002.

3.11 Chart 3.5 shows the term structure of new mortgages in 1999. It shows that there are wide variations in the proportion of new additions to mortgage debt across EU countries that are subject to variable rates of interest, short-term fixed rates (one to five years) or rates of interest fixed over substantially longer periods. At one extreme, long-term fixed loans are dominant in Germany and the Netherlands and, to a lesser extent, France. The UK is at the other extreme, with over 60 per cent of new mortgages exposed to variable rates, and the rest tending to be fixed for only relatively short periods (typically up to five years). While Chart 3.5 relates specifically to 1999, the available data suggest that these figures give a good representation of the general trend. The UK figure in particular is supported by alternative evidence which shows that the share of variable rate mortgages has averaged about 65 per cent between 1995 and 2002.[2]

[2] See Chart 7.1 later in this study. For other discussions of the structure of mortgages in European countries, see Lea *et al.* (1997), Meen (1998), Maclennan *et al.* (2002) and European Central Bank (2003).

Chart 3.5: Term structure of new residential mortgage debt in EU countries, 1999



Source: European Mortgage Federation, 2002.

3.12 Of the countries with higher household mortgage debt stocks, it is clear that German households are, by comparison to the UK, relatively insulated from changes in short-term interest rates. The same is true in the Netherlands where the bulk of new mortgages are subject to fixed rates of interest over a period of around ten years.

3.13 To some extent this structure of mortgage debt in the UK may be a reflection of household preferences. Households tend to move relatively frequently in the UK, on average around once every 11 years (based on housing market turnover as a proportion of the total housing stock). Furthermore, a substantial proportion of households tend to remortgage every two to five years. UK households are therefore familiar with 'shopping around' to get the best mortgage deals, and seem to prefer this to fixing for long periods. To move to a longer-term fixed rate mortgage environment would require either that long rates become expected to remain below short rates for some time and to be competitive with up-front discounts offered on other deals or a switch in consumer preferences, with borrowers placing more value on the certainty about future interest payments which fixed rate mortgages provides. Alternatively, a system that allowed renegotiation when long rates fell, as in the US, would be likely to encourage the take up of longer-term fixed rate mortgages.

The influence of mortgage funding on term stucture

3.14 At the same time, the dominance of variable and short-term fixed rate mortgages in the UK is related to the way in which mortgage lending is funded. Traditionally, variable rate retail deposits have financed mortgage loans in the UK. Building societies and commercial banks have recycled funds invested on deposits to make longer-term loans to house purchasers. Since deposits typically may be withdrawn on demand or at short notice, their rate of interest must vary with returns available elsewhere. In this situation, it is risky for institutions to offer fixed rate mortgages, as any rise in interest rates means that the cost of short-term funds may rise above revenues from long-term fixed rate loans.

3.15 The price of fixed rate mortgage finance reflects expectations of inflation and interest rate changes. Prior to the 1990s, the UK's history of high and volatile inflation and interest

rates probably served to raise the cost of fixed rate mortgage finance beyond levels which households would have been willing to pay. One option for lenders is to insure themselves against the interest rate risk by hedging. Under a swap arrangement, a lender will offer a stream of fixed interest rate payments in return for a stream of variable rate payments from another institution. The UK swap market was relatively undeveloped prior to the 1990s, but has grown rapidly since. This has facilitated the development of shorter-term fixed rate mortgage products in the UK, and it is now likely that the bulk of this lending is hedged through swap transactions.

Wholesale market funding

3.16 Since interest hedging is only available for relatively short periods, the structure of funding in the UK still creates barriers to the development of longer-term fixed rate mortgage products. The alternative is greater funding of mortgages through wholesale markets, as is more common in some European countries. The use of wholesale markets in the UK was difficult in the past due to limits imposed on building societies. However, the conversion of many large building societies to publicly limited banks has significantly reduced this constraint. There are two main types of wholesale market funding:

- **mortgage bonds** are the dominant form of funding in Denmark and Sweden, and are a significant part of the market in Germany. Mortgage bonds represent a longer-term funding source, supplied typically at fixed rates of interest. Mortgage bond markets are strictly regulated to ensure risks are low, and returns are usually a little higher than on government bonds. This makes them an attractive asset for long-term investors such as insurance companies and pension funds. At present, mortgage bonds account for just 19 per cent of mortgage funding across the EU as a whole, but are growing in popularity in a number of EU countries. The UK is one of the few countries where there are currently no mechanisms for creating mortgage bonds; and
- an alternative wholesale funding strategy is through **mortgage-backed securities (MBS)**. This is the dominant funding mechanism in the US, but the EU market remains very small. In this form of funding, mortgages are grouped together into securities and sold on to investors. This removes them from the lender's balance sheet, thereby freeing up capital. The attractiveness of MBS depends on the quality and risks associated with the cash-flow of the underlying mortgage.

3.17 Wholesale mortgage funding mechanisms are described in greater detail in Annex B. Analysis of recent trends and, importantly, the possibility of convergence of the UK and EU mortgage markets are considered in Section 7. But for the present and shorter-term future, the dominance of variable and short-term fixed rate debt in the mortgage stock marks the UK out as quite dissimilar from most EU countries.

Implications

3.18 Overall, the UK stands out for its combination of relatively high levels of mortgage debt and its high share of variable rate mortgages. Of the six countries with above average levels of mortgage debt, the UK has the highest per cent of mortgages subject to variable interest rates. Moreover, the level of provision of long-term fixed rate mortgages is insignificant in the UK, whereas Germany and the Netherlands have at least 70 per cent of mortgages on this basis. As many commentators have previously noted, this means that compared with other large euro area countries, household finances in the UK are relatively sensitive to changes in short-term interest rates.

3.19 The UK's high value of residential mortgage debt in relation to GDP alone would tend to indicate a somewhat higher sensitivity of property owners' income after taking account of mortgage interest payments than the EU average. A one percentage point rise in mortgage interest rates would reduce income in the UK by 0.6 per cent of GDP once it had fully fed through to *all* mortgages while on average in the EU income would fall by 0.4 per cent. But in practice not all mortgages will be affected to the same extent by changes in official interest rates. The feed through from official interest rates to the rates that are set by lenders and thus actually paid by borrowers will vary according to the type of mortgage and the state of competition in the financial sector. The EMU study by HM Treasury *EMU and the monetary transmission mechanism* includes analysis of the strength of pass-through of official interest rate changes to mortgage rates. It finds that the speed of pass-through is higher in the UK than in other EU countries.

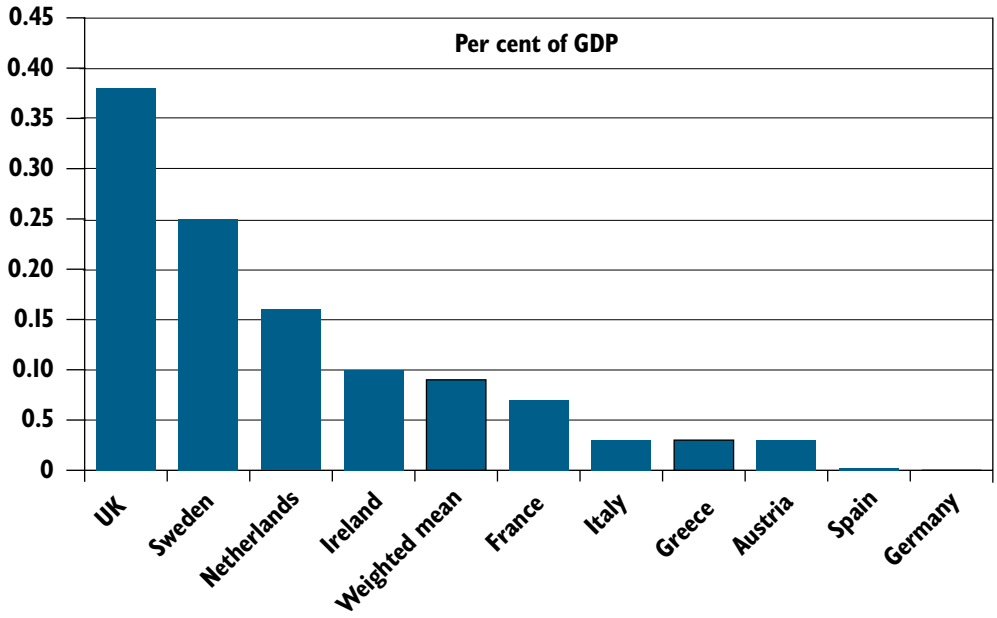
3.20 Thus the overall sensitivity of incomes to changes in official interest rates will depend both on the feed through to individual mortgage products and on the share of each mortgage product in the overall mortgage market. Countries, such as the UK, which have high proportions of variable rate mortgages in their mortgage stock, will have high sensitivity because the variable mortgage rate is closely linked to official interest rates. At the other extreme, countries like Germany, where fixed rate mortgages predominate, will have low sensitivity because property owners' interest payments do not vary at all with changes in official rates.

3.21 Chart 3.6 provides some illustrative calculations. These assume that the shares of mortgage debt in GDP are as show in Chart 3.4, that the structure of the stock of mortgages is in line with the shares shown in Chart 3.5 and also that variable rate mortgage rates move exactly in line with official rates in all countries. In countries where the share of variable rate mortgages is low, there is only a small effect from changes in official rates on mortgage interest payments. In the UK the effect is very high, reflecting both the high proportion of variable rate mortgages and the high level of mortgage debt in relation to GDP. On this measure, sensitivity is higher in the UK than in any other EU country for which 1999 data are available, and much higher than in the other large EU countries – France, Germany, Italy and Spain.[3]

3.22 Chart 3.6 needs careful interpretation. For example, it makes no allowance for the use of annual review schemes for variable rate mortgages. Under this arrangement, which is common in the UK, the total payment made by the borrower to the lender is fixed once a year on the basis of interest rates prevailing at the time. If interest rates change during the year the borrower's payment remains the same, but its composition in terms of interest payments and capital repayment alters. Thus if interest rates decline, the borrower will repay more capital than anticipated at the earlier annual review, and this will be taken into account when fixing the payment for the subsequent year at the next annual review. If borrowers' spending on consumption is affected by their total payment to the lender, rather than simply by the interest payment, the use of annual review schemes will mean that Chart 3.6 will tend to overstate the relative short run interest rate sensitivity of the UK, until mortgages on annual review schemes have reached their review date.

[3] The 1999 European Mortgage Federation data for Spain shows a very large share of short-term fixed rate mortgages, other sources show Spain having a very high share of variable rate mortgages which would put Spain in a similar position to the UK.

Chart 3.6: HM Treasury estimates of the sensitivity of average households' mortgage interest payments to a change in short-term interest rates,[1] 2001



[1]*Change in gross mortgage interest payments (per cent of GDP) following a one percentage point change in short-term interest rates.*
Source: European Mortgage Federation, 2002 and HM Treasury calculations.

3.23 Chart 3.6 also ignores the fact that a proportion of fixed rate mortgages will require refixing from time to time. For example, if all fixed rate mortgages had their rates fixed for two years, half of them would need refixing in the year following an interest rate change and all of them would need refixing within two years.[4] Thus in countries in which fixed rate mortgages are prevalent, the interest sensitivity will build up over time. The shorter the term of the fix, the faster the build up will be. This will reflect both the faster turnover of short term fixes and the fact that short term rates are more sensitive than long term rates to changes in official interest rates. The interest sensitivity of the UK would, like that of other countries, increase over time. Indeed as virtually all of the UK's non-variable rate mortgages are short-term fixed rates, its interest sensitivity would increase quite quickly, suggesting that its relative interest rate sensitivity might not change much at least over the first two or three years.

3.24 In conclusion, it is not possible to say precisely how much more sensitive household finances are to mortgage rate changes in the UK than elsewhere in the EU. This will depend on the distribution of the stock of mortgages amongst the available mortgage products, the response of the relevant mortgage interest rates to changes in official rates, on how borrowers switch between products following a mortgage rate change, on the level of mortgage debt in relation to GDP and on the time horizon at which the comparison is made. Nevertheless it is clear that sensitivity in the UK is particularly high at horizons relevant to monetary policy. This reflects the high value of mortgage debt in relation to GDP in the UK, the high proportion of variable rate mortgages in the stock of mortgages, and the fact that longer term interest rates are normally less sensitive to changes in official rates than shorter term interest rates.

[4] This assumes that the refixing dates are spread evenly and that mortgagors refix for a further two years at the end of the term. In practice mortgagors could take the opportunity to move to a different mortgage product – either a variable rate mortgage or a longer term fixed rate mortgage.

Conclusion

3.25 Differences in mortgage structures suggest that housing demand and household incomes in the UK are likely to be more sensitive to changes in short-term interest rates than is the case in the existing euro area countries. This conclusion is in line with that reached by academic experts on the UK housing market. For example, the contributions of Professor John Muellbauer and Professor Geoffrey Meen to the EMU study *Submissions on EMU from leading academics* similarly argue that the combination of higher owner occupation rates, high mortgage-to-debt ratios and the reliance on floating rate mortgage debt makes the UK distinctive and likely to be more interest rate sensitive.

4 House Prices in the UK and EU

Changes in house prices are a key link in the chain between changes in interest rates and consumer spending. Divergences in house price behaviour across the EU, reflecting differences in housing market structures, could therefore contribute to asymmetric responses in consumer spending to changes in interest rates, or indeed other demand shocks.

Long-term trends in real house prices vary widely across EU countries. The UK has experienced relatively strong real gains in house prices over the past 25 years, certainly compared to Germany, France and Italy.

Likewise, there has been marked variation in the long-run responsiveness of house prices to household incomes. UK house prices appear a little more responsive to changes in incomes than in most EU economies though, Germany apart, the differences are not that large.

There is a good deal of evidence to suggest that housing supply is relatively unresponsive to demand pressure in the UK. The UK has invested a low proportion of GDP in housing compared to other EU countries since 1960. New housing starts in the UK relative to the existing housing stock have also been below the EU average. Estimates of the price elasticity of new housing supply suggest that the UK supply response is weaker than in Germany or France.

UK house prices have also been significantly more volatile than in France or Germany but, compared with the EU as a whole, the UK's experience has not been particularly unusual.

There is little evidence of any strong synchronisation in house price cycles across EU countries. Correlations between house prices in the larger EU countries vary widely, and it is difficult to identify any core of countries where prices have tended to move similarly. If anything, the UK house price cycle bears most similarity to that in some Scandinavian countries.

4.1 Changes in house prices are an important link between changes in interest rates and consumption, through the impact on household wealth. This section compares house price behaviour in the UK and other EU countries. It considers long-run house price trends, and examines possible explanations for the strong long-run growth of UK prices. It also examines the pattern of short-term house price cycles and their causes in the UK and other EU countries.

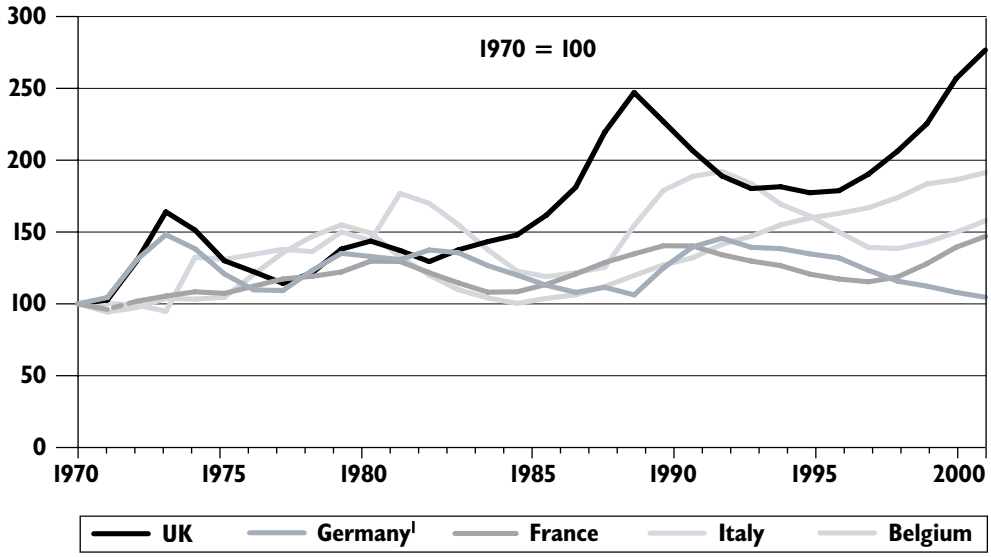
4.2 The analysis is based on the international house price dataset compiled by the Bank for International Settlements (BIS) using national sources. Further details of this data source are provided in Annex C. But cross-border comparisons of house prices are complicated due to the absence of agreed guidelines for data compilation and, in some cases, relatively poor measurement. Some house price indices are based on valuers' estimates, and others on actual transaction prices. Some indices are genuinely national while others are skewed towards particular regional markets. Methods of mix adjustment – to take account of variations in the characteristics of housing being traded over time – vary significantly. Even within a single country, different measures may yield very different results in the short run; the differences between the Nationwide, Halifax and Office of the Deputy Prime Minister (ODPM) indices of UK house prices demonstrate this. A cautious interpretation is therefore required.

Trends in house prices

Real house prices

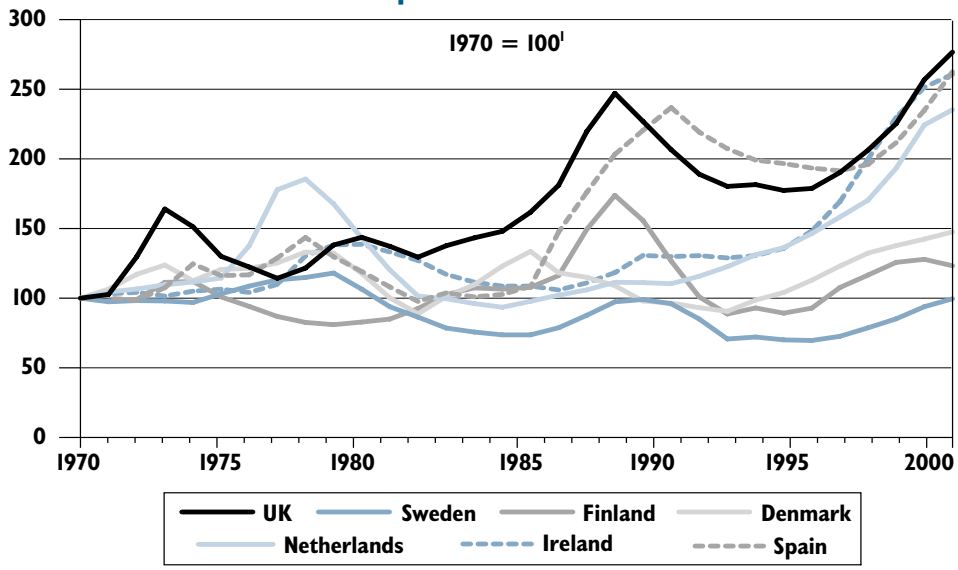
4.3 Charts 4.1a and 4.1b show the evolution of real house prices across the EU between 1970 and 2001.[1] The UK experienced three periods of strong gains in real house prices during this period: first in the early 1970s, then the strong boom recorded in the late 1980s, and finally the strong rise in recent years. Each past episode was followed by a period of falling real house prices, particularly in the early 1990s when UK house prices fell sharply even in nominal terms. The charts also show that most other EU countries have experienced at least one significant short-term cycle in real prices over the same period.

Chart 4.1a: Real house price indices



[1] *Excluding former East Germany.*
Source: Bank for International Settlements (using national data).

Chart 4.1b: Real house price indices



[1] *Except Spain where 1971 = 100.*
Source: Bank for International Settlements (using national data).

[1] In 2002, real house prices rose strongly in the UK. However, 2002 data for other EU Member States were not available at the time of finalising this study.

4.4 A feature of Charts 4.1a and 4.1b is the wide variation across countries in the strength of the underlying trend in real house prices. Table 4.1 confirms this and highlights two key points:

- of the larger EU countries, real house prices have hardly risen on average in Germany, and risen mildly in France and Italy. But they have shown much larger long-term gains in the UK and Spain. The real house price trend in Germany has undoubtedly been affected by reunification, which led to some oversupply of housing (and raises more general concerns about the reliability of the data); and
- average real house price inflation has also been strong in a number of smaller euro area economies, in particular the Netherlands and Ireland.

4.5 These figures for average house price inflation partly reflect the particular sample period chosen for comparison. In particular, it is clear from Charts 4.1a and 4.1b that *average* house price inflation in a number of EU countries has been significantly boosted by exceptionally strong house price gains over recent years. In particular, house price inflation was unusually high during the second half of the 1990s in the UK, Ireland, the Netherlands and Spain. Prior to this, there is little evidence of an upward trend in real house prices in Ireland. The recent boom in the Irish housing market appears to be largely cyclical, reflecting rapid economic growth and possibly a one-off adjustment to lower interest rates. House price inflation in the Netherlands peaked at around 20 per cent in 2000, likewise driven by lower interest rates and also sharp falls in unemployment. As described in the case study of the Netherlands in Annex D, the same factors have helped to underpin rapid gains in UK house prices over recent years.

4.6 Table 4.1 also presents estimates of the underlying annual trend in real house price inflation, based on a regression of real house prices on a time trend. Fitting a trend gives equal weight to all the points in the sample and may therefore give a better estimate of house price developments. A sharp upward UK trend in real house prices is evident and, on these estimates, has been exceeded only in Spain. The estimated long-term trend in other EU countries is much more modest. An earlier cross-border study by Ball and Grilli (1997), on behalf of the Royal Institute of Chartered Surveyors, also concluded that the UK trend in real house prices was significantly stronger than in most other EU countries.

Table 4.1: Real house price inflation, 1971 to 2001[1]

	Average[2]	Trend[3]
UK	3.3	2.4
Germany[4]	0.1	0.0
France	1.2	0.8
Italy	1.5	1.2
Spain	3.3	3.0
Netherlands	2.8	1.3
Belgium	2.1	1.7
Ireland	3.1	2.2
Sweden	0.0	–1.0
Finland	0.7	0.7
Denmark	1.3	0.2

[1] *Except Spain, 1972-2001.*
[2] *Geometric mean.*
[3] *Based on a regression of (log) real house prices on a constant and time trend.*
[4] *Excluding former East Germany*
Source: Bank for International Settlements (using national data) and HM Treasury calculations.

House price to income ratios

4.7 Chart 4.2a and 4.2b show the ratio of house prices to household disposable income per capita for selected EU countries. Over the long run, the relatively strong trend in real house prices in the UK has meant that the house price to income ratio has been broadly constant, notwithstanding the cycles noted earlier. More recently, the UK ratio has risen above its long-run average, reflecting relatively strong house price inflation since 1998. By contrast, the house price income ratio has declined over the period in Germany.

4.8 By comparing long-run growth in real house prices and real household per capita incomes over the full sample period, Table 4.2 provides crude estimates of the long-run income elasticity of house prices for these countries, and also for some smaller EU Member States. Overall, UK house prices appear a little more responsive to changes in incomes than in most large EU economies, particularly Germany. Recent growth in house prices in the Netherlands has strongly exceeded that of incomes, an issue discussed further in the case study of the Netherlands in Annex D.

Table 4.2: Long-run income elasticity of house prices[1]

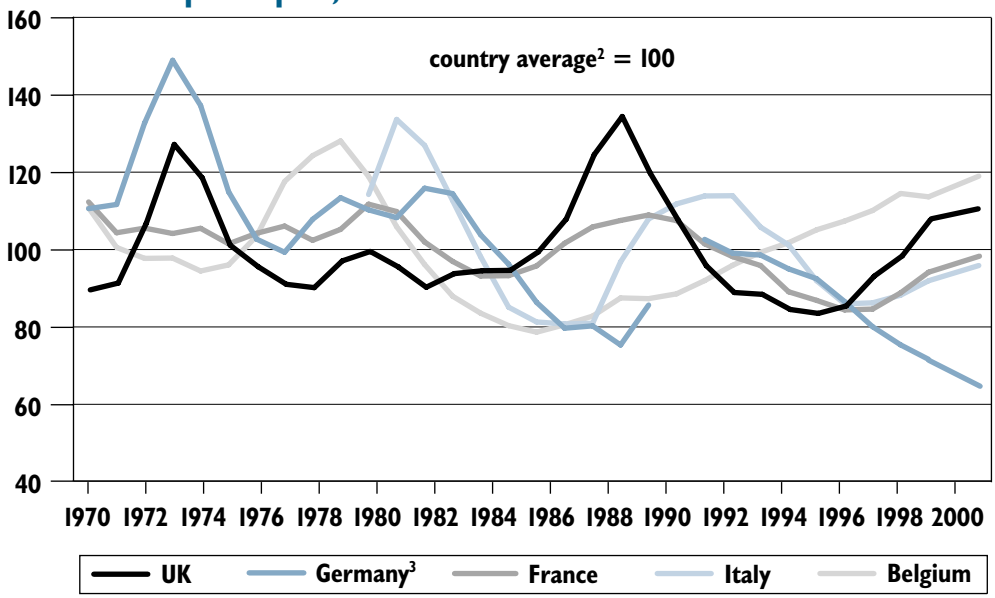
UK	Germany	France	Italy[2]	Spain[3]	Netherlands	Belgium	Ireland[4]	Sweden	Finland
1.0	0.0	0.6	0.4	1.9	1.2	1.0	1.1	–0.7	0.5

[1] This shows the long-run percentage increase in real house prices per 1 per cent increase in per capita real household disposable income. Based on a regression of the level (log) real house price and the level (log) of real household disposable income per capita.
[2] 1980–2001
[3] 1971–2001
[4] 1977–2001
Source: Bank for International Settlements (using national data), OECD and HM Treasury calculations.

Conclusions: trends in house prices

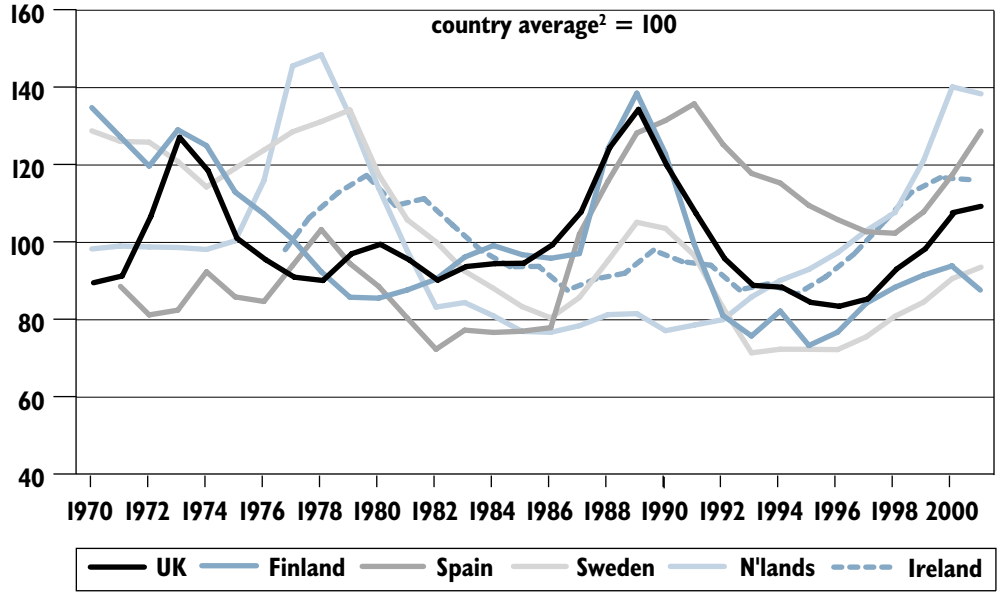
4.9 Overall, this analysis suggests that UK house prices have grown strongly in real terms over the long run. This growth has been greater than in other large EU countries, such as France, Germany and Italy. This will have made housing a better investment for households in the UK. The next sub-section considers possible explanations for these trends.

Chart 4.2a: Ratio of house prices to household disposable income per capita, 1970 to 2001[1]



[1] *Except Italy, 1980 to 2001.*
[2] *The ratio for each country is divided by the country's own arithmetic mean for the period covered, therefore the country average equals 100.*
[3] *Excluding former East Germany, except 1992-2001 household disposable income. Data for 1991 not included due to reunification effects.*
Source: Bank for International Settlements (using national data), OECD and HM Treasury calculations.

Chart 4.2b: Ratio of house prices to household disposable income per capita, 1970 to 2001[1]



[1] *Except Spain, 1971 to 2001, and Ireland, 1977 to 2001.*
[2] *The ratio for each country is divided by the country's own arithmetic mean for the period covered, therefore the country average equals 100.*
Source: Bank for International Settlements (using national data), OECD and HM Treasury calculations.

Explaining house price behaviour in the UK

4.10 It is often argued that the strong growth in UK house prices stems from a high UK propensity to consume housing services (that is, a high income elasticity of housing demand). The purchase of a home as a good hedge or insurance against the relatively high inflation seen in the past in the UK is a common explanation for this, as is the traditionally generous tax treatment of housing compared with other capital assets.

4.11 Such factors may well be important. However, the house price model set out in Section 2 shows that any one (or a combination) of three key parameters – interest elasticity of housing demand, price elasticity of housing demand and price elasticity of housing supply – could account for UK house prices being much more responsive over the longer term to changes in income than in most other EU countries. One way to determine the influence of these parameters is through empirical estimates.

Empirical estimates of the key parameters

4.12 Empirical studies of the various long-run elasticities have tended to focus on the UK and US. Meen and Andrew (1998), in summarising the outcomes of cross-sectional studies for the UK, report that the income elasticity of housing demand is likely to lie in the range of 0.5 to 0.9, with a bias towards the top end of the range. Aggregate time series studies meanwhile suggest that this elasticity may in fact exceed unity. Cross-section studies estimate that the price elasticity of housing demand falls in the range –0.4 to –0.7, while time series studies suggest a range of –0.4 to –0.5. Comparable estimates for the US suggest that housing demand is generally less responsive to incomes and more responsive to prices than in the UK.

Table 4.3: Key UK housing market parameters

	Income elasticity of housing demand	Price elasticity of housing demand	Price elasticity of housing supply	Long-run income elasticity of house prices
Model parameter (Section 2)	α_2	α_1	β_1	$\lvert\alpha_2\rvert / (\lvert\alpha_1\rvert + \lvert\beta_1\rvert)$
Cross section view[1]	0.5 to 0.9	-0.4 to -0.7	-	-
Time-series view[1]	1.0 to 1.5	-0.4 to -0.5	-	-
Time-series view[2]	-	-	0.5	-
Illustrative 'best' estimate	**1.0**	**-0.5**	**0.5**	**1.0**

[1] *Reported by Meen and Andrew, 1998.*
[2] *As estimated by Meen, 1996 and Swank et al., 2002.*

4.13 The final key parameter to complete the model is an estimate of the price elasticity of UK housing supply. Many commentators have noted that the strong trend in UK real house prices has not been matched by any similar upward trend in new house building (the situation in other EU countries is described later). In other words, builders have not reacted to, or perhaps have been unable to react to, the incentive of rising real house prices. This observation is formalised in Meen's (1996) analysis of housing starts in England and Wales. Controlling for borrowing and other construction costs, Meen estimates that the price elasticity of housing supply is fairly low in England, at around 0.5, and particularly low in southern regions (excluding the Greater London area, which may be regarded as a special case). Based on a similar approach, Swank *et al.* (2002) likewise estimate the UK price elasticity of new housing supply to be around 0.5.

4.14 Table 4.3 summarises the results of these various studies to arrive at an illustrative 'best' estimate of the key housing market parameters, and hence the long-run income elasticity of house prices. This shows that the results are consistent with the finding that UK house prices grow broadly in line with income in the long run. Unfortunately, it is not possible to construct comparable bottom-up estimates of the income elasticity of house prices in other EU countries. However, it is possible to analyse some of the key evidence on housing demand and supply, and so draw some tentative conclusions on what drives the long-run divergence in the behaviour of the house price to income ratio between the UK and other EU countries shown in Chart 4.2.

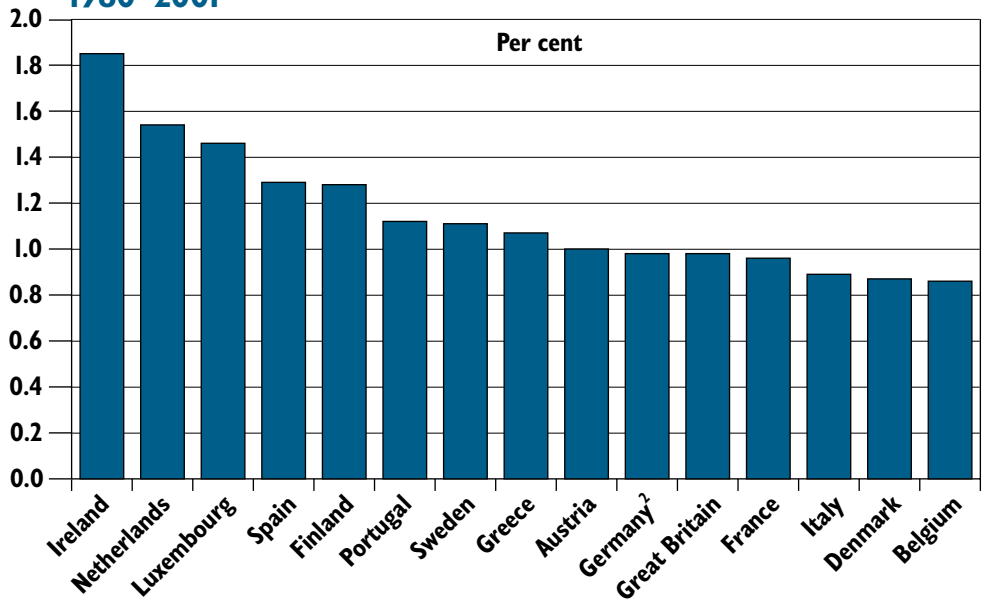
Housing demand and supply in the UK and EU

Housing demand

4.15 In the absence of cross-country empirical studies, it is difficult to judge whether the key parameters of housing demand – that is, the elasticities of house prices with respect to income or other key demand side variables – are very different in the UK compared with other EU countries. While Section 3 of this study argues that the interest elasticity of housing demand is likely to be higher in the UK than in the euro area countries, this does not on its own explain the stronger upward trend in real UK house prices. This section considers whether this upward trend can be explained by other key determinants of housing demand (i.e. within the vector, Z_d, of other demand side factors in the model set out in Section 2).

4.16 One possible explanation is demographic pressures. Chart 4.3 shows the average annual growth in the number of households in EU countries in the period 1980 to 2001. Far from helping to explain the strong trend in UK house prices, this suggests that demographic pressures have been a little below those in most EU countries. One possible problem is that household formation is, to some extent, endogenous. That is, if housing supply is unable to respond to meet rising desired demand as a result of demographics, then prices are likely to rise sharply, hence constraining actual growth in household formation.

Chart 4.3: Average annual growth in number of households, 1980–2001[1]

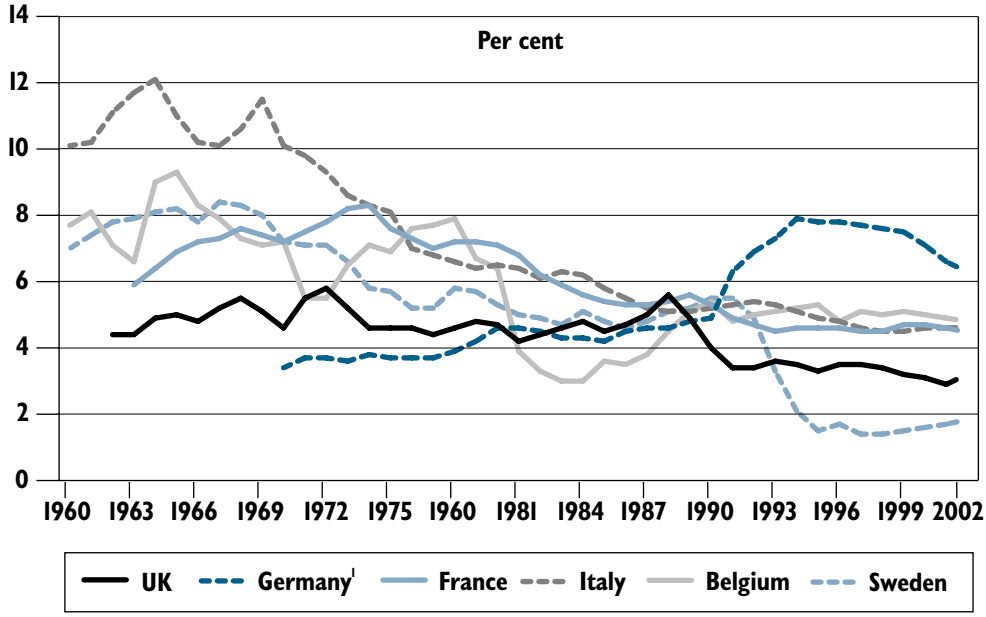


[1] Except 1981–2001 for Belgium, Greece, Italy, Luxembourg and Portugal and 1980–2000 for France and Sweden.
[2] Pre-1991 West and East Germany, post-1991 unified Germany.
Source: European Commission, 2002.

Housing supply

4.17 By contrast, there is evidence to suggest that UK house price trends could reflect relatively weak housing supply. Chart 4.4 shows that the UK has invested a low proportion of GDP in housing compared to other EU countries since 1960. Over recent years, only Sweden has invested a smaller proportion of GDP in housing in the UK.

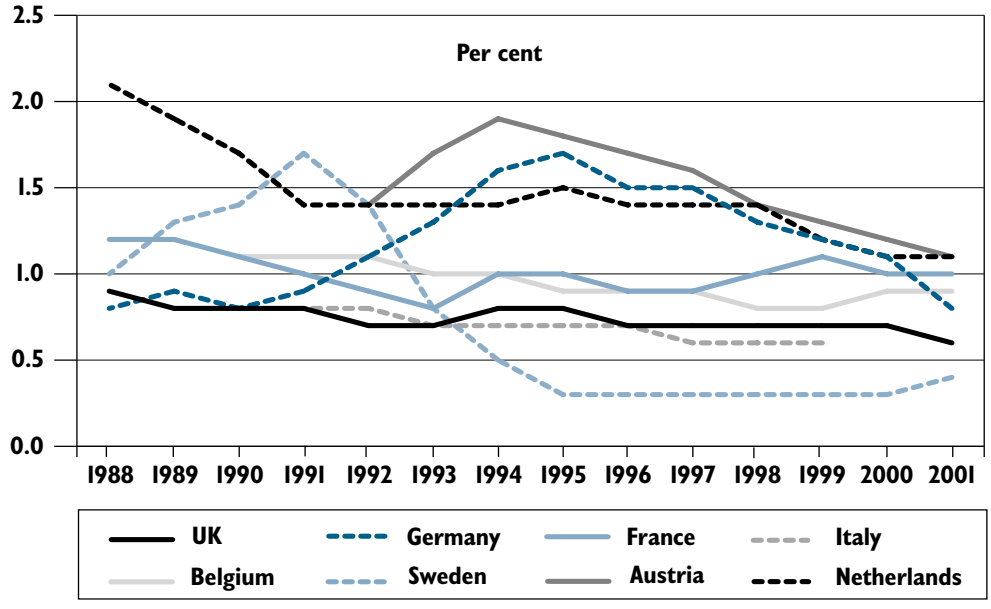
Chart 4.4: Investment in housing as a percentage of GDP



[1] *1970 to 1990 excludes former East Germany.*
Source: OECD, Deutsche Bank and HM Treasury calculations.

4.18 A similar pattern is seen in new house building. Chart 4.5 shows housing completions relative to the size of the existing housing stock in a selection of EU countries over the period 1988-2001. This also shows the relatively low provision of new supply in the UK.

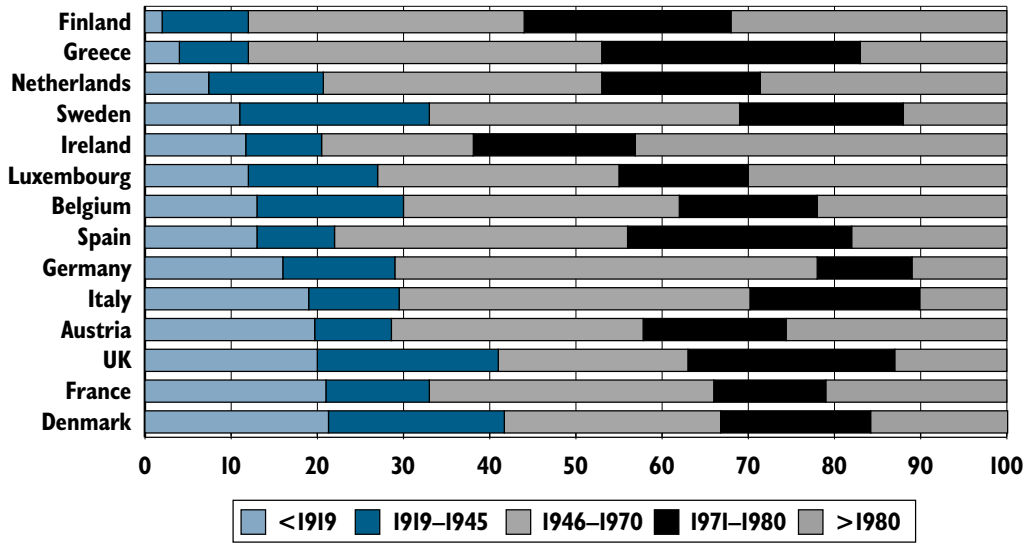
Chart 4.5: Housing completions[1] as a proportion of the existing housing stock



[1] *Except France, Italy and Austria which use housing starts.*
Source: OECD; European Mortgage Federation, 2002; European Commission, 2002; and HM Treasury calculations.

4.19 Total housing supply depends on investment in previous decades and even previous centuries. Ball and Wood (1999) note that comparing housing investment over even fairly long periods can give a misleading impression. Chart 4.6 shows the age profile of the housing stock across the EU. The general picture is that the UK has a relatively old housing stock. Ball and Wood (1999) note that the UK was unique in having a sustained inter-war housing boom. To some extent, the legacy of that boom may have allowed the UK to invest less in housing in the post-War period. However, the fact that real house prices are on a steeper upward trend in the UK than in other EU countries suggests that new supply may not be keeping up with demand.

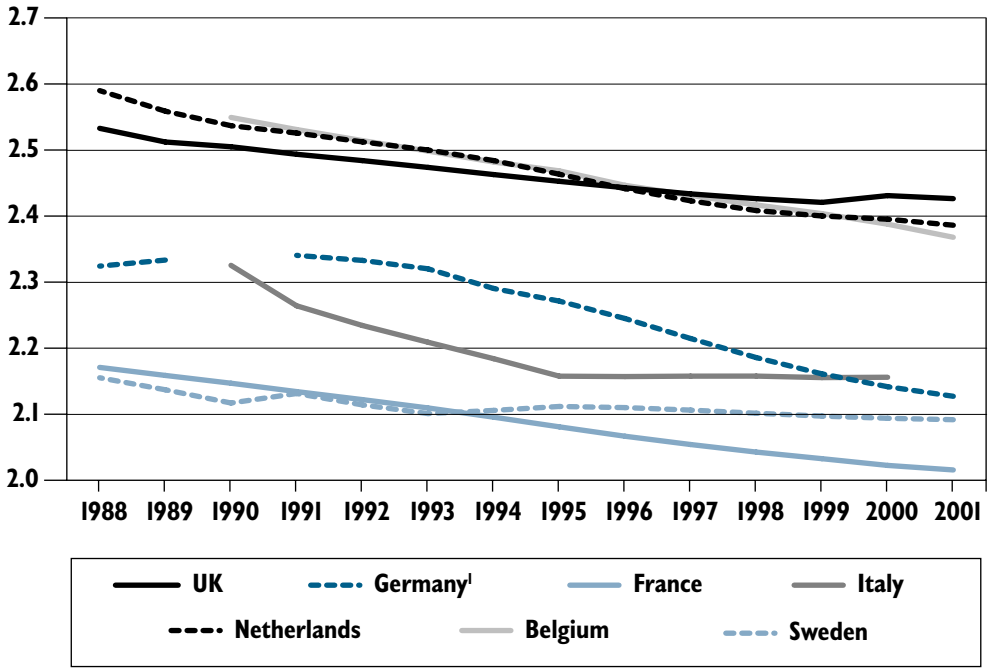
Chart 4.6: The age profile of the housing stock



Source: European Commission, 2002.

4.20 The average number of individuals living in each property may also indicate whether demographic pressures have moved ahead of housing stock. Chart 4.7 shows the population to housing stock ratio across time for selected EU countries. This ratio indicates that while the average number of inhabitants per dwelling fell slightly in the UK over the period 1988-2001, other countries, such as France and Germany, still have fewer people per dwelling. This may reflect supply problems in the UK, although it could also reflect a number of other factors.

Chart 4.7: Population to housing stock ratio



[1] *1990 data removed as East German housing stock added one year earlier than population.*
Source: European Mortgage Federation, 2002, OECD, European Commission, 2002, and HM Treasury calculations.

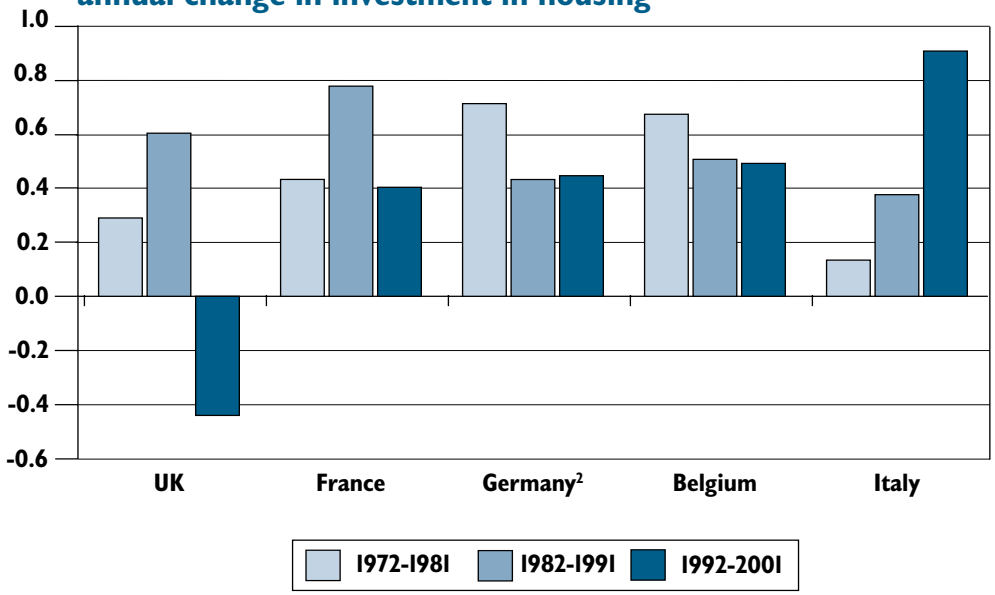
The response of housing supply to changes in house prices

4.21 So far, the evidence has pointed to a relatively weak response of UK housing supply to the long-term rise in house prices. Charts 4.8a and 4.8b assess the short-term responsiveness of housing supply by showing the 10-year correlation between changes in housing investment as a per cent of GDP and annual house price inflation for EU countries.

4.22 Notwithstanding the longer-term decline in housing investment relative to GDP in most EU countries (shown in Chart 4.4), this provides evidence that rising prices are associated with increased supply in the shorter term. In the 1970s and 1980s, the short-term correlation between UK housing investment and changes in house prices was relatively strong, and certainly not out of line with the average for other EU countries. However, unlike in most other EU countries (except the Netherlands, Ireland and Denmark), this relationship appears to have weakened significantly in the UK since the early 1990s, to the extent that the short-term correlation has turned negative.

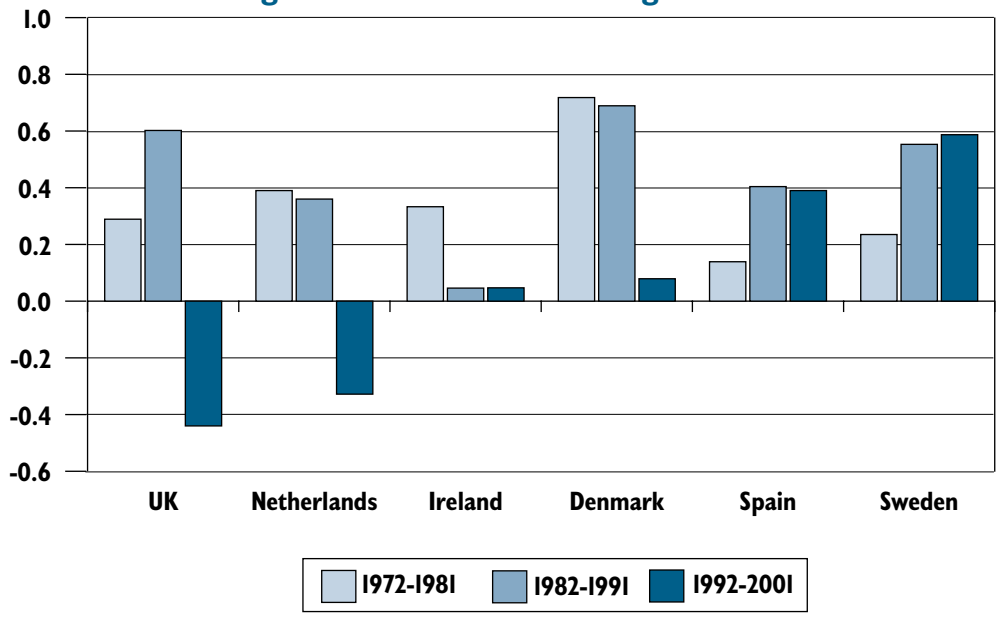
4.23 But these figures should be treated with caution. The UK correlation might simply be indicative of greater comparative housing market instability overall, reflected in the volatility in both house prices and housing investment. As far as the smooth functioning of the housing market is concerned, it is much more important that housing supply responds to long-term trends in housing demand and hence price signals, and it is here that UK supply performance appears to be relatively weak.

Chart 4.8a: Correlations[1] between house price inflation and the annual change in investment in housing



[1] 10-year correlation.
[2] Excluding former East Germany.
Source: Bank for International Settlements (using national data), OECD, and HM Treasury calculations.

Chart 4.8b: Correlations[1] between house price inflation and the annual change in investment in housing



[1] 10-year correlation.
Source: Bank for International Settlements (using national data), OECD, and HM Treasury calculations.

4.24 Formal cross-border investigations of supply responses are relatively scarce. However, a recent study by Swank *et al.* (2002) for the Dutch Central Bank provides formal estimates of the price elasticity of new housing supply, as measured by housing starts, for the US and a small selection of EU countries. As with Meen's (1996) analysis of housing starts in England and Wales, the responsiveness of housing supply to changes in house prices is estimated after controlling for other key determinants of house-building profitability including wage and capital costs. An allowance is also made for producer confidence.

4.25 These results are reported in Table 4.4 and confirm that supply responses vary widely across countries. Although the sample of countries covered is relatively small, the results suggest that housing supply responds relatively weakly to changes in house prices in the UK and the Netherlands, in the latter case attributed by the authors to government intervention. The UK result is the same as that reported by Meen (1996). By contrast, the price elasticity of housing supply is estimated to be much greater in France and higher still in Germany. All other things being equal, this would be expected to contribute both to the relatively strong upward trend in UK house prices and also to sharper short-term cycles and volatility in UK house prices relative to Germany and France. As noted in the case study of the Netherlands in Annex D, weak supply responses are likely to have contributed significantly to rapid gains in house prices in both the UK and the Netherlands over recent years.

Table 4.4: Price elasticity of new housing supply

	UK	Germany	France	Netherlands	Denmark
Price elasticity	0.5	2.1	1.1	0.3	0.7

Source: Swank et al. (2002).

Conclusion: explaining long run house price behaviour in the UK

4.26 Overall this analysis suggests that the strong long-run growth in UK house prices is mainly due to a relatively unresponsive housing supply. Estimates suggest that the UK has a weak price elasticity of housing supply and has invested a lower proportion of national income in new housing than other EU countries since 1960.

Housing market cycles and volatility

4.27 The long-run increase in house prices has made housing a better investment asset in the UK than in other EU countries, and this may boost consumption (an issue discussed further in Section 5 and 6). The remainder of this section considers a second potential difference between housing markets in the UK and other EU countries: the pattern of short-run housing market cycles.

4.28 Depending on the strength of the links between housing and consumer demand (which are considered in Section 5), instability in housing markets may be transmitted to instability in economic activity more generally. Although the UK housing market is generally characterised as being relatively volatile, any assessment of past housing market performance can only be indicative. As with wider assessments of cyclical convergence, it is difficult to separately identify the contribution of asymmetric shocks (including policy shocks) and underlying differences in economic structures to divergences in housing market cycles and volatility overall.

House price volatility

4.29 Table 4.5 depicts three measures of real house price volatility for EU countries. The first measure shows the coefficient of variation in real house prices, the second the standard deviation of real house prices relative to their (simple) trend over the same period, and the third the standard deviation in annual house price inflation. Real house prices in the UK have been more volatile than in France or Germany according to all measures. This is important in itself, although the UK experience does not appear that unusual relative to most other EU countries. Past volatility in real house prices in the UK has been comparable to that in many smaller EU Member States. And, on some measures, volatility has been greater in Spain, Italy, the Netherlands, Ireland and Finland than in the UK. In Spain and Finland, the late 1980s and early 1990s housing booms and busts appear to have been more pronounced than in the UK (in terms of cyclical deviations in house prices from trend). In the case of the Netherlands, the greatest volatility was recorded in the late 1970s and early 1980s.

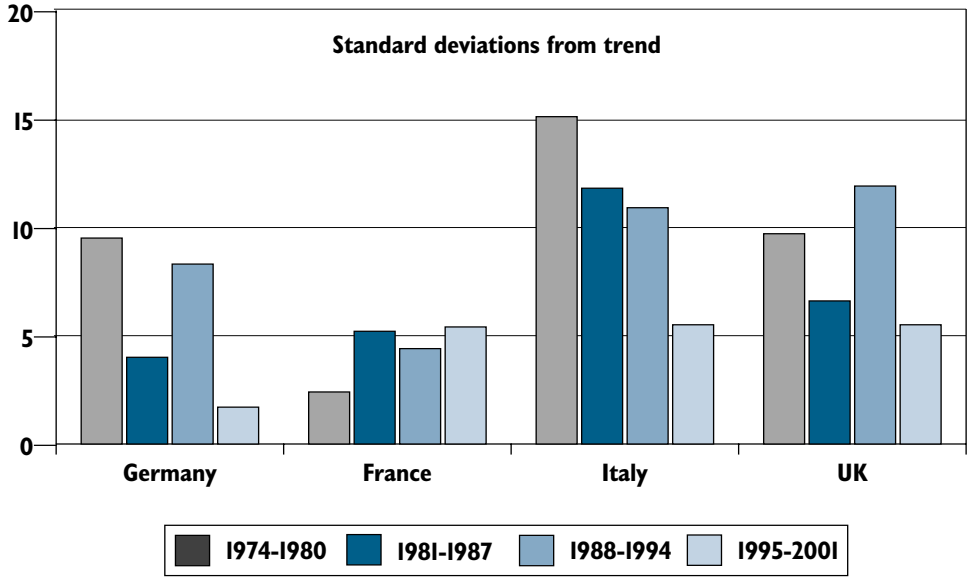
Table 4.5: Volatility[1] in real house prices

	Volatility of real house prices (1970-2001)[3]	Volatility of deviation of real house price from trend[2] (1970-2001)[3]	Volatility of real house price inflation (1971-2001)[4]
UK	0.27	15.1	10.3
Germany	0.11	11.1	8.5
France	0.11	7.6	4.5
Italy	0.18	15.5	10.9
Spain	0.33	17.3	10.3
Netherlands	0.29	25.1	9.4
Belgium	0.22	14.3	6.0
Ireland	0.31	17.4	6.8
Finland	0.20	19.0	10.3
Sweden	0.16	13.5	7.2
Denmark	0.14	13.4	7.9

[1] Volatility in real house prices measured as coefficient of variation. Volatility in house price inflation and deviation of house prices from trend measured as standard deviations.
[2] Based on a regression of (log) real house prices on a constant and time trend.
[3] Except Spain 1971 to 2001.
[4] Except Spain 1972 to 2001.
Source: Bank for International Settlements (using national data) and HMT calculations.

4.30 Chart 4.9 indicates the standard deviation of real house price inflation over seven year periods. Compared to France and Germany, volatility in UK house price inflation has been relatively high over sustained periods. UK house price behaviour was more stable during the second half of the 1990s. However, since 2000, house price inflation in the UK has reached over 30 per cent a year according to some measures. Nevertheless, the experience in the Netherlands, where house price inflation reached 20 per cent a year in recent years, highlights that the UK experience is not unique.

Chart 4.9: Short-term real house price volatility

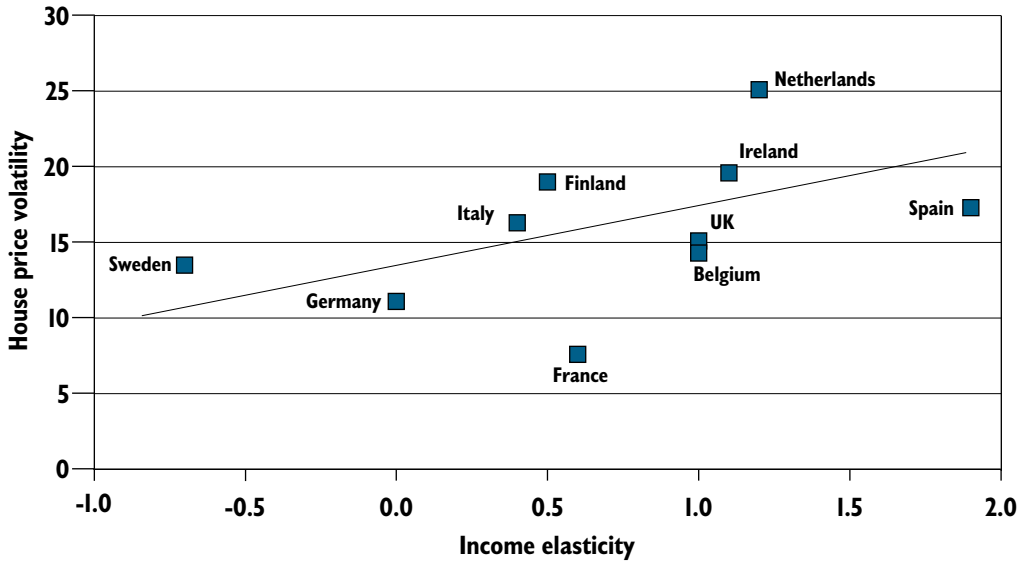


Source: Bank for International Settlements (using national data) and HM Treasury calculations.

4.31 It is reasonable to expect some relationship between house price volatility and the long-run responsiveness of house prices to incomes, described earlier in this section. Particularly in the situation where the stronger responsiveness of house prices to changes in income is a reflection of inelastic housing supply, this would be expected to show up in sharp short-term house price movements in response to demand shocks. A low elasticity of supply in the short run combined with relatively responsive housing demand to changes in incomes, suggests that it would take many years before a new equilibrium is reached following a demand shock. Hence significant overshooting or undershooting of house prices relative to equilibrium would be probable, implying strong short-run volatility in house prices. Chart 4.10 shows positive correlation between estimated income elasticities and price volatility, though this may be sensitive to both the countries included in the sample and the precise definitions of the two variables.[2] As far as the UK is concerned, it is not surprising that relatively unreponsive housing supply (reflected in a high income elasticity of house prices) has been associated with periods of extremely strong house price growth, as has been the case recently.

[2] The correlation is lower when house price volatility is measured as the simple standard deviation of annual real house price inflation.

Chart 4.10: Income elasticity of house prices and house price volatility



Source: Bank for International Settlements (using national data) and HM Treasury calculations.

Volatility in housing investment

4.32 Some commentators, for example Meen (1998), have also noted that UK housing investment appears to be relatively volatile compared to other large EU countries. Ball and Wood (1999) present a detailed analysis of volatility in housing investment for a selection of EU countries. The authors separate the trend volatility in housing investment from the seasonal and cyclical movements. Their results are repeated in Table 4.6. This analysis suggests that volatility in housing investment in the UK is concentrated in shorter-term cycles. For the period 1950 to 1992, the standard deviation of the detrended series in the UK was greater than in France, Germany, Sweden, Finland and the Netherlands. However, the relatively long length of the cycle in the UK makes it more like a trend. Countries such as Germany and the Netherlands have shorter cycles.

Table 4.6: Volatility in housing investment, 1950-1992

	Standard deviation of percentage change in housing investment	Standard deviation of detrended series	Period of cycle (years)
UK	9.6	11.2	17
Germany	10.1	5.5	7
France	7.0	7.0	19
Netherlands	8.9	6.8	8
Belgium	15.3	20.9	13
Sweden	6.8	11.1	29
Finland	10.5	11.0	8
Average	9.7	10.5	14

Source: Ball and Wood, 1999.

House price cycles across the EU

4.33 There is little evidence to support the existence of a common house price cycle across the EU, or across the euro area countries. This is an issue for the operation of a common monetary policy within EMU. As the previous analysis has shown, the evolution of real house prices over time has varied markedly between countries. Similarly, there is considerable variation in house price volatility across EU Member States. This is supported by Englund and Ioannides' (1997) analysis of house price dynamics in 15 OECD countries. Although the authors found that house price dynamics show a high degree of similarity across countries, they found little or no synchronisation between countries, and hence no firm evidence of any international cycle in house prices.

4.34 Henley and Morley (2001) reach similar conclusions, although they suggest that there is some evidence that house prices movements in some EU countries are converging with those in Germany. On the basis of a time-varying parameters technique, the authors suggest that this converging group includes Italy, Ireland, the Netherlands and Sweden. But this type of evidence is far from conclusive. Indeed house price inflation has been markedly different in Germany relative to these countries in recent years. Table 4.7 shows cross correlations in real house prices relative to trend for several EU countries over this period. There is scant evidence of any strong correlation between house price cycles over the past 25 years. More generally, there is no strong evidence of synchronisation in house price cycles for the larger EU countries as a group.

Table 4.7: Correlation in house price cycles[1]

	Germany[2]	France	Italy	Spain	UK	Finland	Sweden
Germany[2]	1.0	0.2	0.5	0.1	0.0	-0.4	-0.1
France		1.0	0.7	0.5	0.4	0.2	0.7
Italy			1.0	0.2	-0.2	-0.2	0.4
Spain				1.0	0.5	0.3	0.7
UK					1.0	0.8	0.3
Finland						1.0	0.2
Sweden							1.0

[1] *Table shows simple correlation between real house prices relative to trend for the country pairs.*
[2] *Excluding former East Germany*
Source: Bank for International Settlements (using national data) and HM Treasury calculations.

4.35 As far as UK house prices are concerned, some commentators have suggested that the strongest correlations appear to be with certain Scandinavian countries. Henley and Morley (2001), for example, have noted that house prices in Finland and Sweden show broadly similar movements to the UK. This may partly reflect liberalisation of mortgage markets in all these countries during the 1980s. Table 4.7 provides some support for this view from the Bank for International Settlements (BIS)§ dataset employed in this study, at least in the case of Finland. The BIS dataset also reveals a relatively high degree of correlation between real UK house prices and those in Spain and France, in both cases reflecting some degree of synchronisation in the boom and bust cycle of the late 1980s and early 1990s (though the peaks and troughs for both countries lagged those in the UK).

Conclusions

4.36 This section compares house price behaviour in the UK and other EU countries. If house price behaviour varies widely, this implies potentially different patterns of consumption, or different responses of consumption to interest rate changes. The links between house prices, housing wealth and consumption are considered in detail in Sections 5 and 6. On the basis of the evidence presented in this section, it is clear that the UK is characterised by a relatively strong long-run trend in real house prices and a relatively high responsiveness of prices to changes in income. Although there are no detailed cross-border investigations of the causes of this, there is much informal evidence to suggest that it is at least partly due to the relatively weak responsiveness of UK housing supply.

4.37 The evidence on demand and supply highlights potential for relatively sharp movements in UK house prices in response to interest rate or other demand shocks. Although measures of past house price volatility suggest that UK experience has not been that unusual, UK house price volatility has been greater than in Germany and France.