

Wednesday 4 April 2007

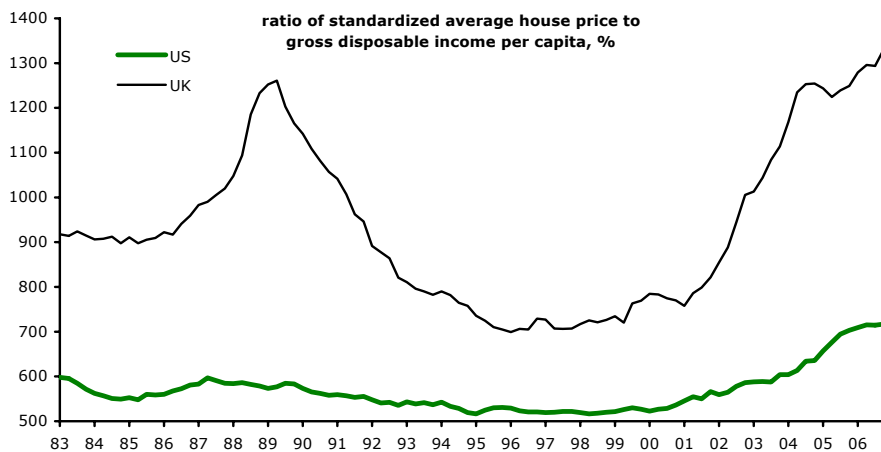
## Euro Vision

## Economics

### Home truths

**Markets fear the US housing market adjustment will undermine broader activity. But the UK looks even more vulnerable. The overvaluation in housing appears more acute and there is greater risk of spillovers to the rest of the economy.**

**Chart 1 : Relative house prices in the US & UK**



Source: OFHEO, BEA, Halifax, ONS

## Europe

#### Housing worries

Markets remain concerned about problems in the US housing market. We continue to believe these problems will be contained and the wider economy will prove resilient. Yet given the markets' concerns, it seems puzzling that they appear relatively relaxed about the UK situation, where the overvaluation looks more acute.

#### UK overvaluation

UK housing looks almost 50% overvalued, compared with 25% in the US. This seems difficult to rationalize, considering trends in employment, income and interest rates. Structural factors, such as a lack of supply and migration, don't appear to explain the premium on UK housing as rents have remained subdued relative to prices.

#### Inflated expectations

So why has the UK not experienced a US-type adjustment? Expectations appear to be crucial. In contrast to the Fed, the Bank of England reinforced expectations of continued rapid house-price gains. But with growing evidence of speculative activity, the BoE has created the risk of a more disorderly correction in the future.

#### Policy paralysis

The UK economy looks more vulnerable to a housing downturn than the US. Consumers depend more on housing as a source of wealth. The banking sector could also be exposed. Most worrying, if a housing correction undermines confidence in sterling, the BoE might be unable to cut interest rates to soften the impact.

**Important disclosures and analyst certifications regarding companies can be found in the Disclosures Appendix.**

250 Bishopsgate, London, EC2M 4AA, United Kingdom

#### Analysts

**Dominic White**  
United Kingdom  
+44 20 7678 0417  
dominic.white@uk.abnamro.com

**Robert Lind**  
+44 20 7678 7175

**Dario Perkins**  
+44 20 7678 1849

**Tim Drayson**  
+44 20 7678 7339

[www.abnamroresearch.com](http://www.abnamroresearch.com)

# Contents

---

ECONOMIC ANALYSIS

**Home truths** **3**

We believe the UK is more vulnerable to a housing adjustment than the US. The overvaluation in the UK appears more acute. There also appears to be greater risk of spillover effects to the broader economy.

US concerns 4

UK risks 5

Inflated expectations 10

UK vulnerabilities 12

Policy paralysis 17

## Home truths

**We believe the UK is more vulnerable to a housing adjustment than the US. The overvaluation in the UK appears more acute. There also appears to be greater risk of spillover effects to the broader economy.**

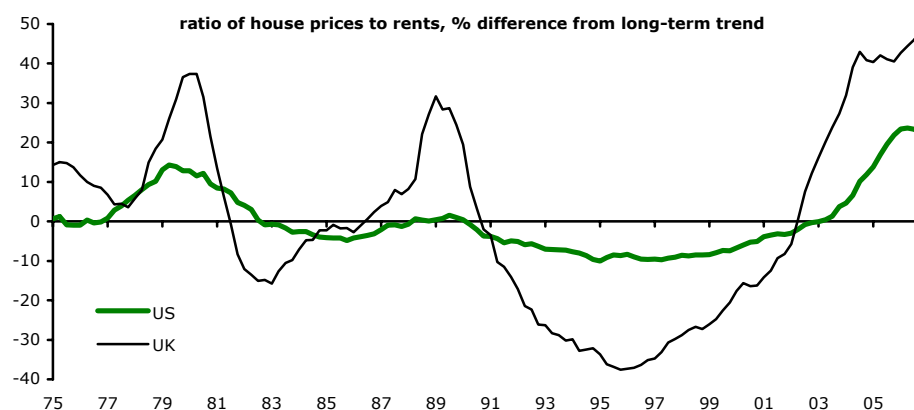
The US housing adjustment has been the focus of markets' attention in recent months. Problems in the sub-prime mortgage market have intensified fears of a broader slowdown in activity and generated expectations that the Fed will cut interest rates before year-end. We continue to believe these fears are exaggerated; problems should remain confined to the housing market and the rest of the economy prove resilient. Yet, given these worries about US housing, the lack of concern about the UK situation is puzzling.

The UK has experienced a much sharper increase in house prices over the last decade: a cumulative increase of nearly 180%, compared with 105% in the US. Consequently, the degree of overvaluation looks more acute, close to 50% in the UK compared with 25% in the US (Chart 2). Trends in employment, income and interest rates help rationalize the increase in US house prices. But developments in the UK are harder to explain. Standard arguments, such as a lack of supply and migration, don't stand up to scrutiny. A sustained increase in demand or a shortage of supply should also put upward pressure on rents. But these have remained relatively subdued. The rapid increase in house prices appears linked to speculative behaviour.

This leaves the UK more vulnerable to a housing correction than the US. Supply constraints make UK house prices more likely to 'overshoot', while in the US the burden of adjustment should fall on construction. This suggests greater risk of 'spillover' effects. UK consumers have more exposure to the housing market. And given elevated levels of household debt, the banking sector could also be at risk.

The Bank of England must take some of the blame. By cutting rates in August 2005 when the UK housing market had cooled, the MPC reinforced expectations that house prices can only rise. Unlike the Fed, the BoE has also made little attempt to warn borrowers and lenders of the risks they are taking. This appears to be storing up problems for the future. Most worrying, if a housing downturn undermines confidence in sterling, the MPC may be unable to cut rates and stabilize the wider economy.

**Chart 2 : Relative housing valuations in the US and UK**

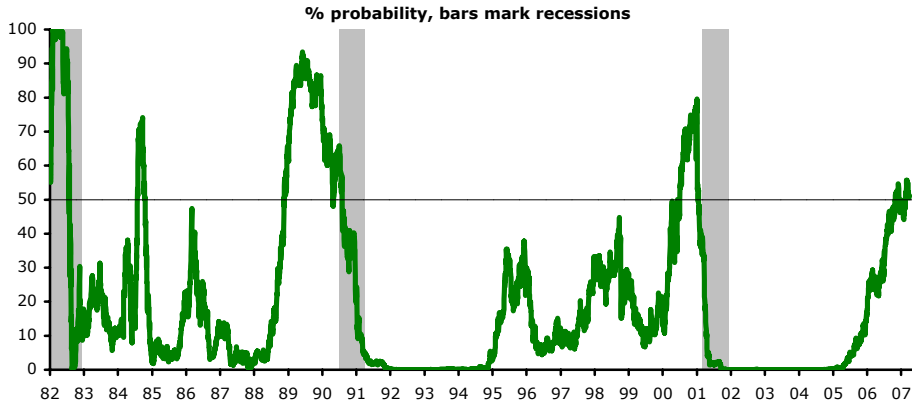


Source: OFHEO, BLS, Nationwide, ONS and ABN AMRO estimates

## US concerns

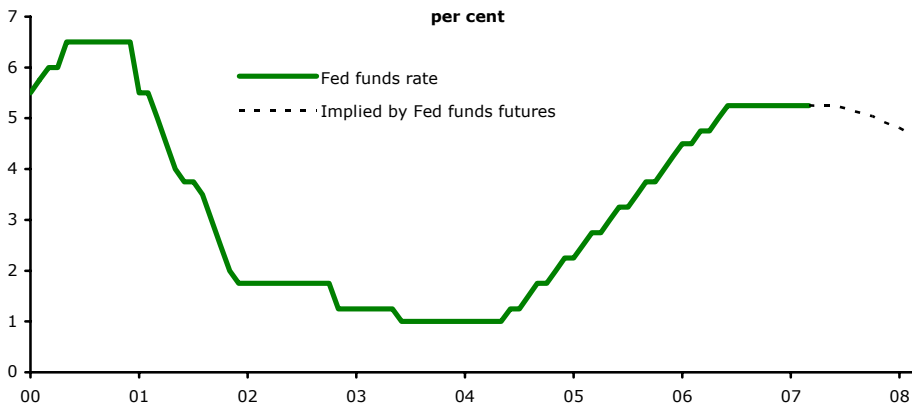
In recent months, markets' concerns about the health of the US economy have intensified. Problems in the sub-prime mortgage market have led to fears of a deeper housing market slump and a broader slowdown in activity. The shape of the yield curve suggests the probability of a recession in the next 12 months is greater than 50% (Chart 3). Consequently, markets expect the Fed to cut rates before the end of the year to support growth (Chart 4).

**Chart 3 : Probability of US recession predicted by yield curve**



Source: Federal Reserve, ABN AMRO estimates

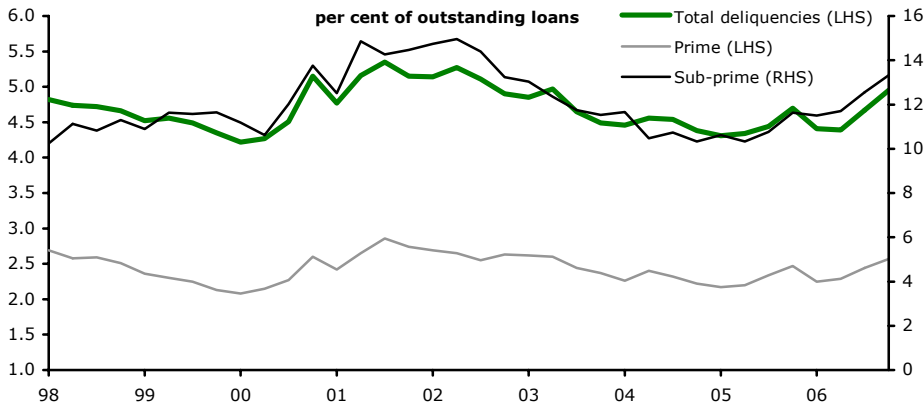
**Chart 4 : Market expectations of US interest rates**



Source: Federal Reserve, Bloomberg

We continue to believe these fears are exaggerated (see *Economics Focus 'Farewell to ARMs'*, 21 March 2007). Problems in the sub-prime mortgage market should remain contained, with the rest of the economy proving resilient. Though delinquency rates have risen, this has been concentrated in sub-prime adjustable-rate mortgages (Chart 5). The vast majority of homeowners have relatively low fixed-rate mortgages and are not facing repayment difficulties. With the labour market remaining robust and incomes rising strongly, most households are under little financial strain.

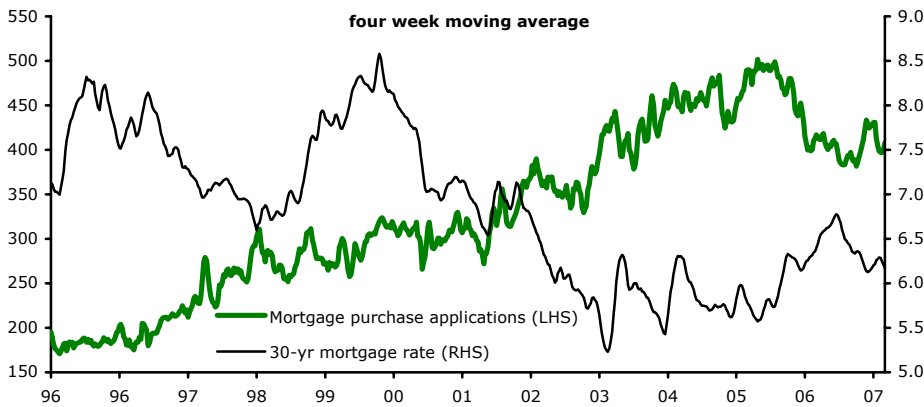
**Chart 5 : Mortgage delinquencies**



Source: Datastream, MBA

Already there are some tentative signs of stabilization in US housing. Lower long-term interest rates have helped mortgage purchase applications level off (Chart 6). Housing starts have also fallen further. With demand now outstripping new supply, excess housing inventories have started to decline.

**Chart 6 : US mortgage rates and mortgage applications**



Source: EcoWin, MBA

## UK risks

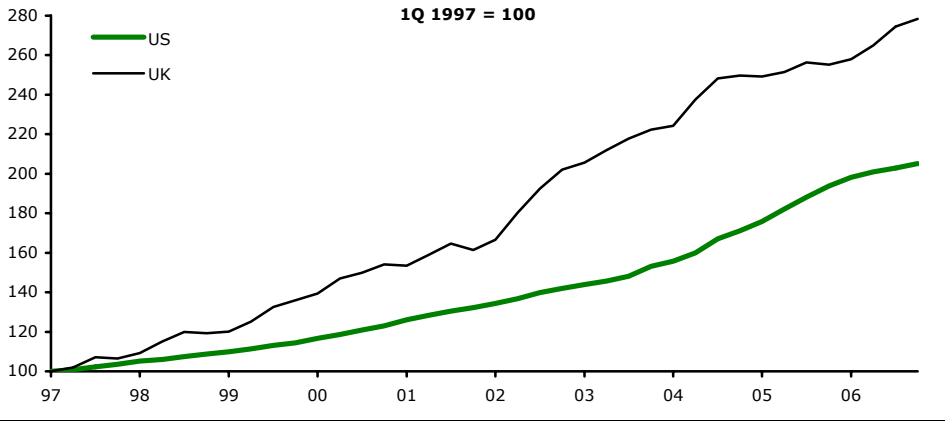
Despite our relatively benign view of the US housing market, some kind of adjustment was inevitable: house prices could not continue to rise at the rates they did in 2005. Still, given trends in employment, income and – most crucially – interest rates in recent years, it seems possible to rationalize what has happened. Significantly, with interest rates having risen to more normal levels, excesses in the housing market have started to unwind.

The UK situation looks different. Prices appear to have become firmly detached from fundamentals. Given concerns about the US housing market, it looks puzzling that investors have maintained a relatively benign view of the UK.

## Stretched valuations

The UK has experienced much more rapid increases in house prices than the US over the last decade. UK house prices have risen 180% since 1997, compared with a 105% increase in the US (Chart 7). But are there fundamental factors that can explain this difference?

**Chart 7 : US and UK house prices**



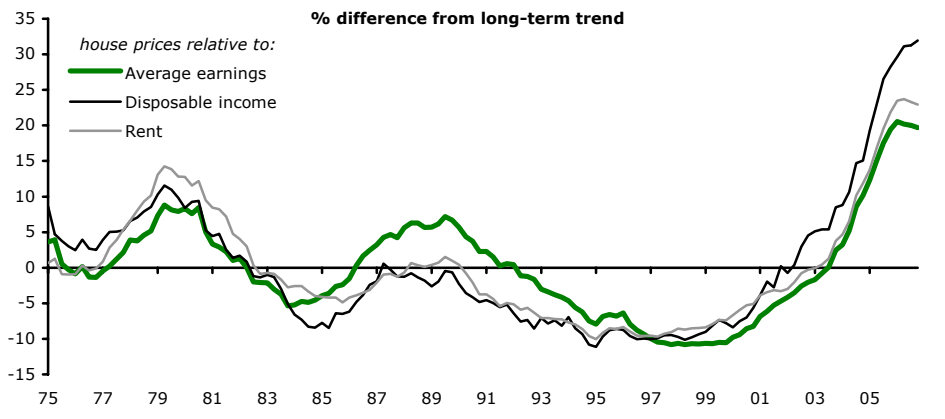
Source: OFHEO, DCLG

We use several metrics to judge whether house prices are 'fairly' valued: the ratio of house prices to disposable income, average earnings and rents. Ultimately, it is these factors which determine the sustainable level of house prices. Consequently, these ratios tend to revert to their long-term trend over time.

Each of these measures has its advantages. For example, the house price to average earnings ratio shows how a rise in the average wage level improves housing affordability and bids up prices. The ratio of house prices to disposable income also captures changes in employment, which affect the sustainable level of house prices.

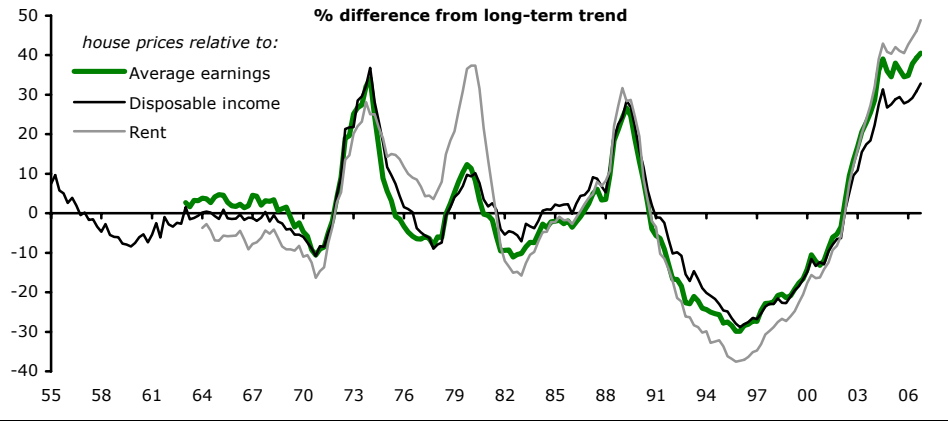
The ratio of house prices to rents is perhaps the most useful measure. This is similar to the price-earnings ratio used to evaluate equity prices. If a sustained increase in demand for housing (perhaps because of stronger population growth) or a shortfall in supply has boosted house prices, rents should also rise by a similar amount. Charts 8 and 9 show these valuation metrics for the US and the UK.

**Chart 8 : US housing valuation metrics**



Source: OFHEO, BEA, BLS, ABN AMRO estimates

**Chart 9 : UK housing valuation metrics**



Source: Nationwide, ONS, ABN AMRO estimates

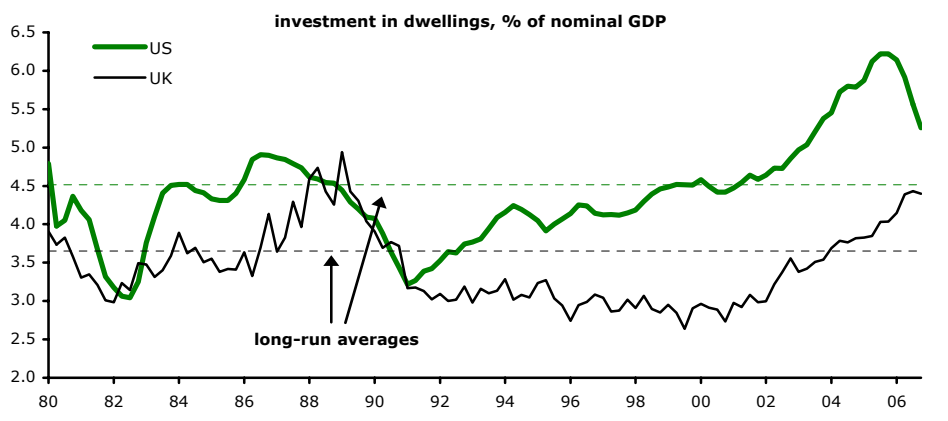
As these charts illustrate, housing in both the US and UK looks expensive relative to historic relationships. But the degree of overvaluation in the UK appears much more severe. Relative to rents, UK house prices look inflated by nearly 50%. The equivalent measure for the US suggests a 25% overvaluation.

**Deflating conventional wisdom**

In recent years, numerous attempts have been made to rationalize the growing premium on UK housing. These arguments generally point to supply shortages (due to the UK’s perceived lack of undeveloped land), a fundamental increase in demand (due to immigration or demographics) or most often, some combination of the two.

While these arguments might seem theoretically appealing, the evidence does not seem to support them. The most obvious counter-argument is that rents have remained subdued relative to house prices. As already noted, any increase in housing demand relative to supply should put upward pressure on rents, as marginal buyers get forced out of the market and are forced to rent. The strength in house prices has also encouraged a significant supply response in recent years (Chart 10). Though admittedly, this response has been less aggressive than that in the US.

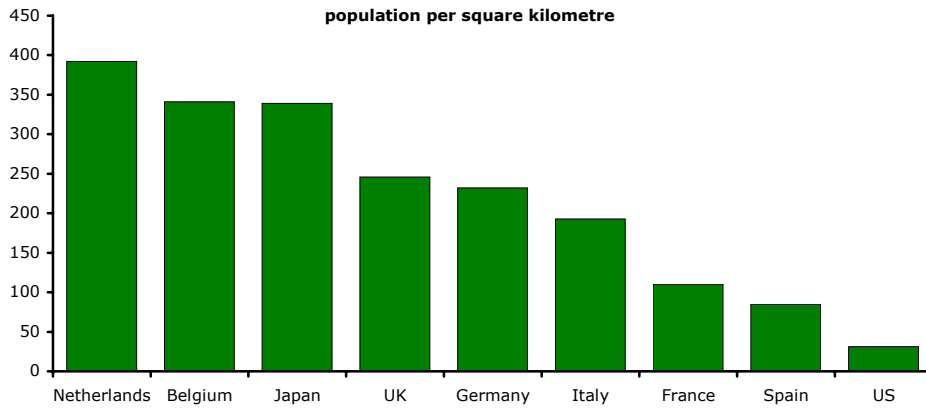
**Chart 10 : US and UK residential investment**



Source: ONS

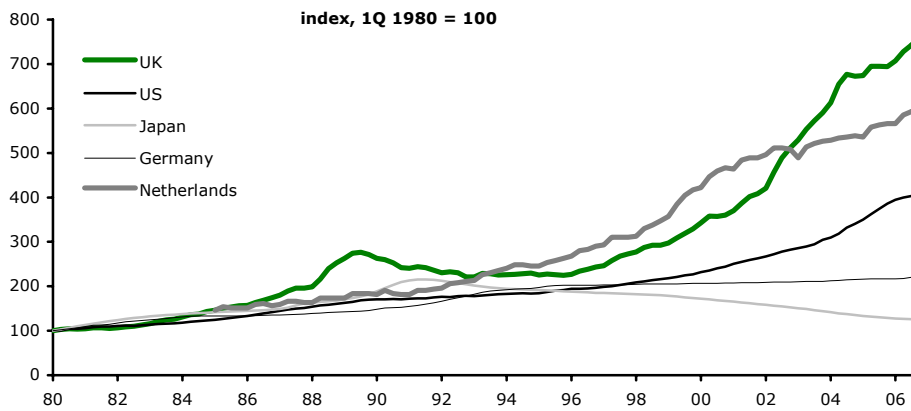
We can also cross-check this conclusion by looking at house price trends in other countries. As Chart 11 illustrates, the Netherlands, Belgium and Japan have a tighter supply of land, while Germany and Italy have similar population densities to the UK. Yet these countries have all seen less rapid increases in house prices than the UK has in recent years (Chart 12).

**Chart 11 : Population density**



Source: United Nations

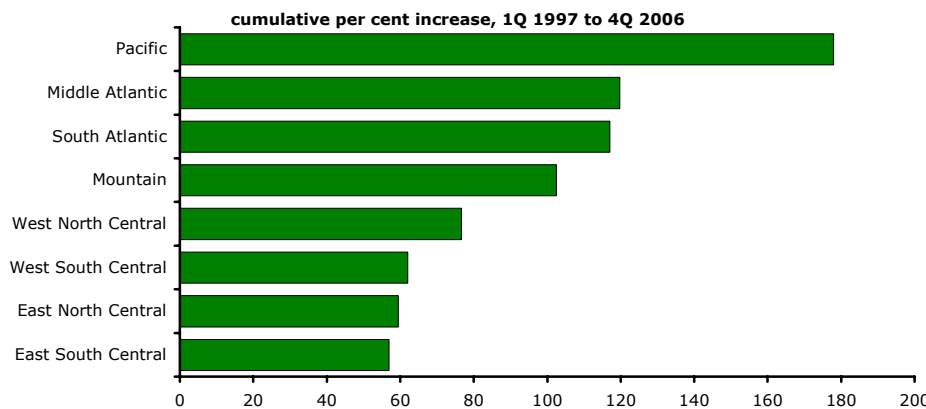
**Chart 12 : International house price trends**



Source: EcoWin

Regional trends in UK house prices also appear to challenge the prevailing orthodoxy. House prices should rise most in areas with acute shortages of land, or in areas that have seen a significant increase in demand. This certainly appears to have been the case in the US in recent years, with highly-populated areas on the East and West coasts experiencing the highest rates of house-price appreciation (Chart 13).

**Chart 13 : US house prices by region**

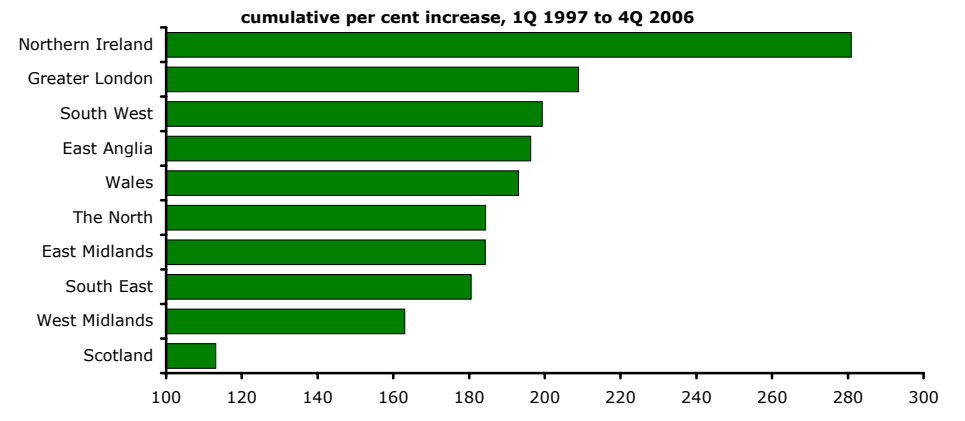


Source: Halifax

Evidence from the UK is less convincing. Population densities are heaviest in Greater London, the South East and parts of the Midlands. According to data from the Home Office, these regions have also seen the largest migrant inflows in recent years. It should follow that these areas have seen the sharpest rise in property prices. But as Chart 14 shows, this has not been the case. Price increases have been quite uniform across regions, with the exception of Northern Ireland and Scotland.

How do we explain these outliers? The population in Scotland has been declining in recent years, suggesting less demand on the existing housing stock. But justifying the outsized increase in Northern Irish house prices is more difficult. House price appreciation has been particularly rapid in the last three years, at a time when trends in population, employment and income have been unremarkable. Fundamental factors appear unable to explain the distribution of house price increases by region.

**Chart 14 : UK house prices by region**



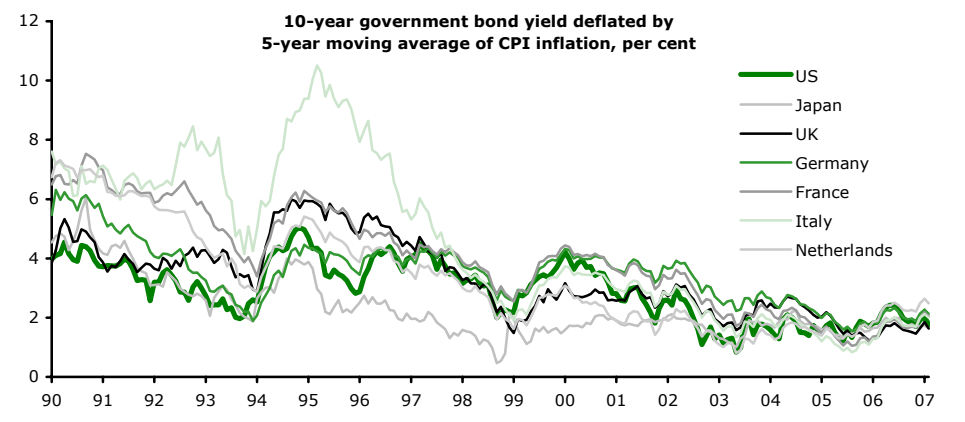
Source: Halifax

**Housing conundrum**

An alternative explanation for the behaviour of house prices over the last decade is that housing has 're-rated'. On this argument, the decline in long-term interest rates has boosted the sustainable level of house prices relative to rents and income, by allowing households to sustain higher levels of debt and depressing the rate used to discount future returns on an asset (see 'Household debt, house prices and consumption growth', Steve Nickell 14 Sept 2004).

Given the broad nature of house price gains across the global economy in recent years, this argument seems more persuasive than others we have looked at. Still, considering that France, Italy and the Netherlands have seen larger declines in real interest rates during recent years (Chart 15), it would seem reasonable to expect house prices in these countries to have kept pace with those in the UK. Again, this has not been the case.

**Chart 15 : Real long-term interest rates**



Source: EcoWin, ABN AMRO estimates

A paper written by the OECD supports this conclusion ('Recent house price developments: the role of fundamentals', OECD Economic Outlook No 78). It attempts to gauge the impact that lower long-term rates have had on the equilibrium level of house prices across a number of countries. The paper uses data ending in 2004. But even at this stage, it argues that UK house prices were overvalued by about 33%. Prices have since risen by a further 16%. In contrast, US house prices were judged to be close to their equilibrium level.

But it is also questionable whether the prevailing low level of real interest rates will persist. We have previously argued that several factors contributing to the decline in real rates could ultimately prove unsustainable. These include the shift in investors' preference away from equities and towards bonds, which has depressed the term premium, and shifts in investment and saving across the global economy, which have generated growing trade imbalances (see *Economics Focus* 'Virtual reality', 17 August 2006). If housing has 're-rated', a rise in long-term interest rates could leave prices vulnerable to a correction.

## Inflated expectations

In contrast to the US, fundamental factors seem unable to explain the increase in UK house prices during recent years. So why have prices continued to rise in the UK, but faltered in the US? We believe expectations have been critical, with monetary policy playing a significant role in shaping these expectations.

In August 2005, the Bank of England cut interest rates by 25 basis points, as a cooling housing market coincided with a broader moderation in growth. This decision helped foster a recovery in activity. But it also had significant, and potentially more destabilizing implications for the housing market. It seems to have created an impression that the Bank of England will not let house prices fall and reinforced the perception that UK housing is a sound long-term investment. Consequently, speculative activity in the housing market has rebounded.

The Fed has taken a more pragmatic approach. One of the reasons it has raised interest rates in recent years has been to discourage excessive risk taking in the housing market (both on the part of lenders and borrowers) and generate a slowdown in house prices. In fact, the Fed made an explicit attempt to talk the housing market down:

"All else being equal, interest rates are higher now than they would be were real estate valuations less lofty; and if real estate prices begin to erode, homeowners should not expect to see all the gains of recent years preserved by monetary policy actions. Our actions will continue to be keyed to macroeconomic stability, not the stability of asset prices themselves." *Don Kohn, 16 March 2006*

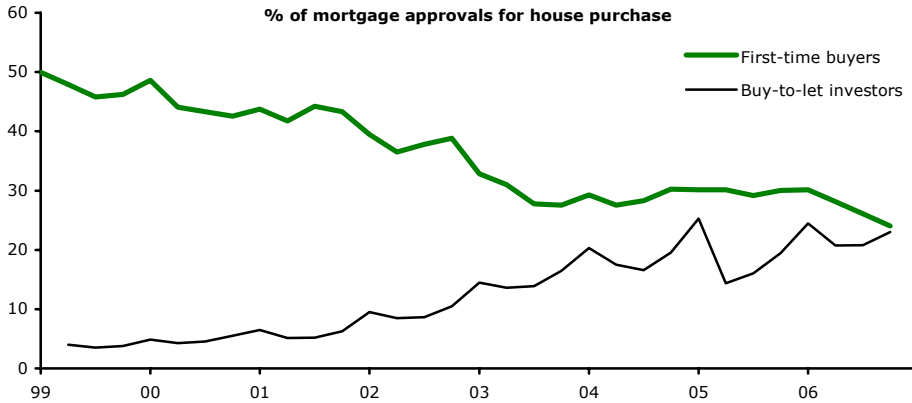
In this sense, events up till now will not have come as a surprise to the Fed. Provided there is no sign of contagion from sub-prime to other areas of the financial system, the Fed will be content to let the correction run its course. In contrast to the Bank of England, the Fed has managed to limit longer-term risks to growth and inflation.

## Speculative excess

In any market, evidence of speculative activity (i.e. buying based on the belief of continued capital gains) provides perhaps the most reliable indication that prices are detaching from fundamentals. There is lengthy anecdotal evidence of this type of activity in both the US and UK housing markets in recent years. Speculative demand for housing surged in the US during 2005, but has since ebbed. In contrast, there is increasing evidence of speculation in the UK.

This can be seen most clearly in the buy-to-let market – people buying property for investment purposes. Data from the Council of Mortgage Lenders suggests 25% of new mortgages taken out for the purpose of buying a house (as opposed to refinancing an existing mortgage) are buy-to-let mortgages – a similar proportion to first-time buyers (Chart 16). Buy-to-let constitutes about 9% of the total stock of outstanding mortgages, up from less than 1% in the late 1990s. Yet these figures could understate the true magnitude of buy-to-let activity, as some investors are likely to have bought properties on standard mortgages.

**Chart 16 : Importance of buy-to-let investors in the UK housing market**

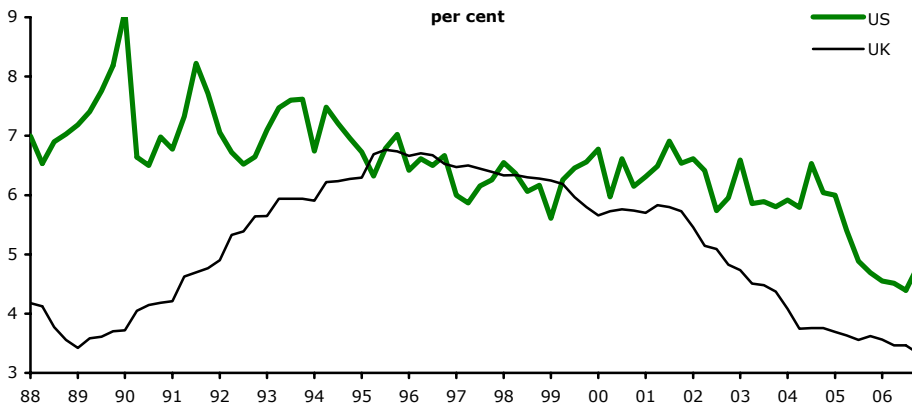


Source: CML

The buy-to-let market also appears to have grown in size in the US in recent years. So what makes the UK experience symptomatic of speculative activity? The clearest evidence is that rental yields (rental income as a per cent of the cost of housing ownership) have declined significantly in recent years.

We have estimated a time-series for rental yields in the US and UK to illustrate this point, using data on gross rental income and house prices (Chart 17). The decline in UK rental yields has been particularly evident in the last five years and has outstripped the decline in long-term interest rates. The decline in US rental yields has been less pronounced, though they fell sharply in 2005 as speculative activity became more widespread.

**Chart 17 : Rental yields in the US and UK**

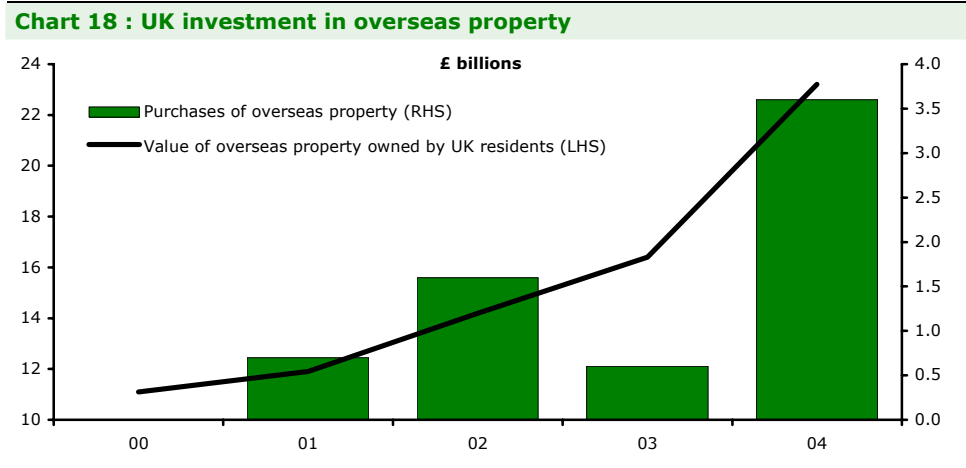


Source: Bureau of the Census, DCLG, Halifax, ONS, ABN AMRO estimates

Effectively, buy-to-let appears to have competed down returns on UK property. With gross rental yields significantly below mortgage rates, investors need to see a continuation of strong capital appreciation in order to compensate them for this negative carry.

Perhaps the most worrying element of this is that buy-to-let demand could quickly evaporate. It is this section of the market which seems to have represented the 'marginal' buyer in recent years. This group could also explain the apparent lack of supply on the market. The expectation of capital gains has encouraged investors to 'hoard' housing. If expectations about future house price gains flip, buy-to-let demand could rapidly wane as supply simultaneously increases.

The belief that housing is a good long-term investment has also encouraged UK investors to look beyond the domestic market. Purchases of overseas properties have surged in recent years, with Spain and France proving most popular (Chart 18). Eastern Europe is also accounting for a growing share of transactions. The 2005 edition of *Social Trends* suggested one third of UK adults were considering buying an overseas property. This looks symptomatic of herd-like behaviour, with investors rushing to invest in property without adequately assessing the risks involved.



Source: ONS

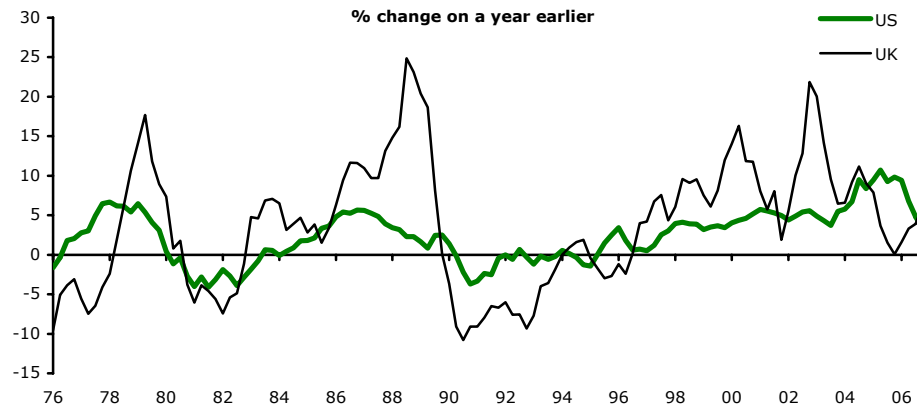
## UK vulnerabilities

The UK economy looks more vulnerable to a correction in housing than the US, for several reasons. First, as we have already argued, the degree of housing overvaluation looks more severe in the UK. Prices need to fall further before the market re-establishes equilibrium. Second, supply constraints mean the burden of adjustment in the UK housing market will fall on prices rather than output, as is the case in the US. This also makes prices more likely to 'overshoot' their equilibrium level. Third, the potential for spillover effects to the broader economy looks greater in the UK than in the US. Both the consumer and the banking sector could be exposed.

### Overshooting

Historically, house prices have been more volatile in the UK than in the US (Chart 19). In both nominal and real terms, UK house prices have risen more sharply and declined more precipitously than in the US. There is good reason for this. Supply constraints mean a given change in demand will generate a larger variation in the equilibrium house price.

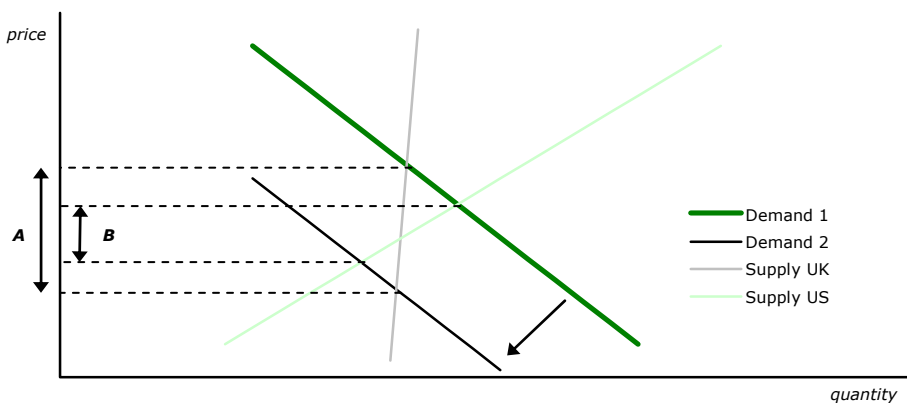
**Chart 19 : Real house prices in the US and UK**



Source: OFHEO, DCLG

Chart 20 illustrates the reasoning behind this point. It provides an example of how a shift in housing demand impacts prices and quantities differently depending on the elasticity of housing supply. In a market such as the UK, where land is constrained and the supply curve is steep, a fall in demand (perhaps due to a swing in expectations about future price increases) produces a large decline in prices but only a small reduction in output. If land is more abundant, as in the US, the burden of adjustment falls primarily on output rather than prices. This explains why recent quarters have seen a large contraction in US residential construction investment, but house prices have not yet fallen on a national basis.

**Chart 20 : Supply and demand in the US and UK**



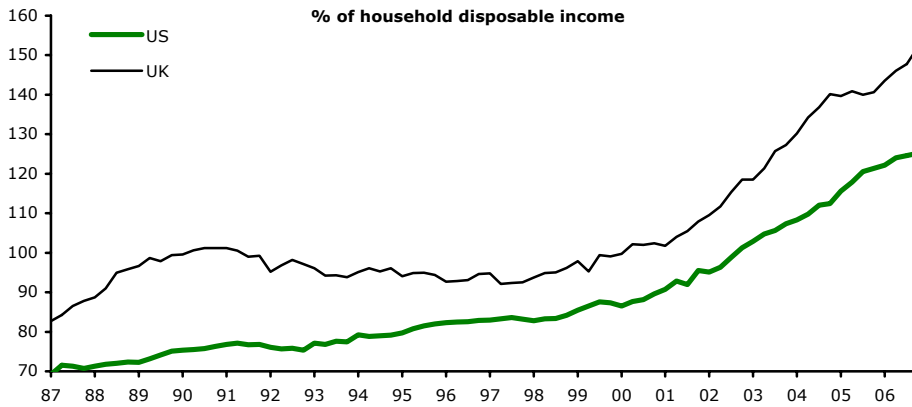
Source: ABN AMRO

In theory, this could limit the impact on the macro economy. Prices, rather than quantities, are what primarily drive spillover effects. There are two main channels. First, lower house prices depress household wealth, which can boost saving and curb consumption. Second, a fall in house prices hurts banks' balance sheets making them less willing to lend. These effects can be magnified, if prices 'overshoot'. Just as rising house prices can fuel expectations of further gains and boost demand, this process also works in reverse.

**Household finances**

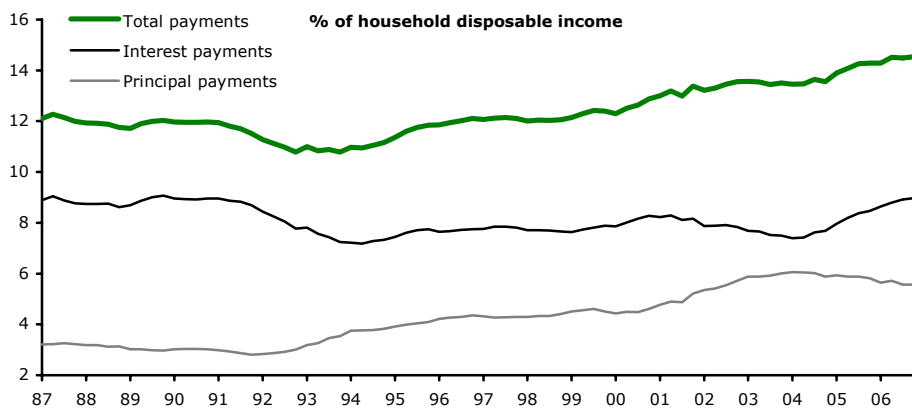
Given rapid increases in UK house prices in recent years, household debt levels have also risen sharply. Total household debt in the UK stands at around 150% of disposable income compared with 120% in the US (Chart 21). Mortgage debt explains most of this difference. Accordingly, UK debt servicing costs have also risen by more than in the US (Chart 22 and 23).

**Chart 21 : US and UK household debt**



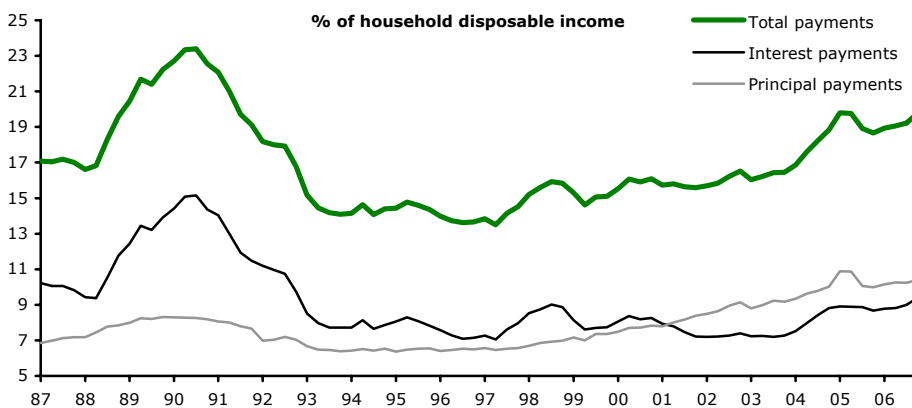
Source: Federal Reserve, BEA, ONS

**Chart 22 : US debt servicing costs**



Source: Federal Reserve, BEA, ABN AMRO estimates

**Chart 23 : UK debt servicing costs**

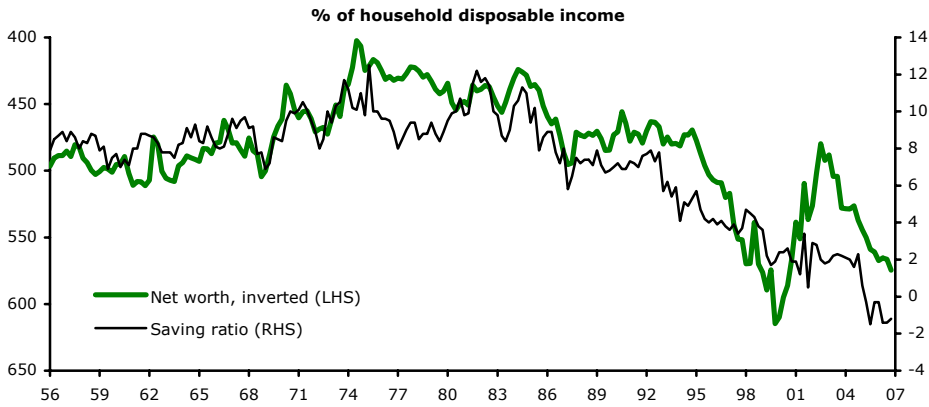


Source: ONS, Bank of England, ABN AMRO estimates

Given this increase in debt servicing costs, it's often believed that US and UK consumer spending is on the verge of collapse. But clearly, this has not yet happened. Recent data have indicated a continuation of robust consumption growth in both the US and UK. How have consumers managed to withstand the increase in debt servicing costs relative to disposable income?

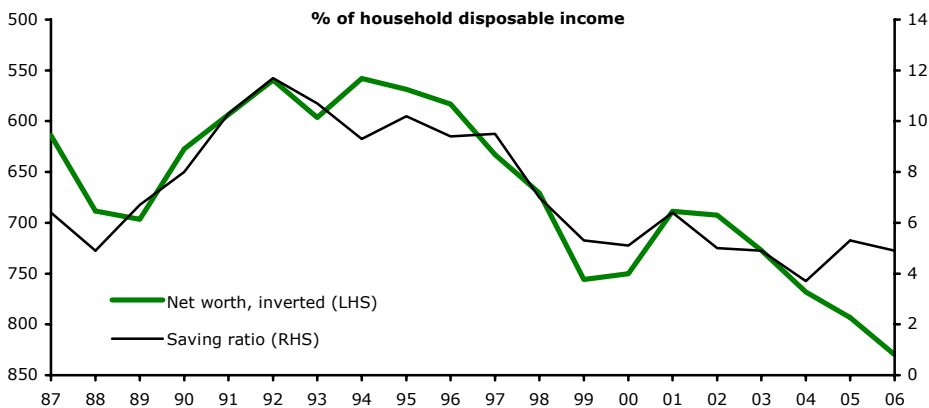
Crucially, household assets have continued to rise faster than liabilities. This has encouraged US and UK consumers to save less (Charts 24 and 25). At the extreme, households have been able to cash in wealth gains in order to help service debt. Indeed, the rise in sub-prime default rates in recent months is evidence of this.

**Chart 24 : US household net worth and saving**



Source: Federal Reserve

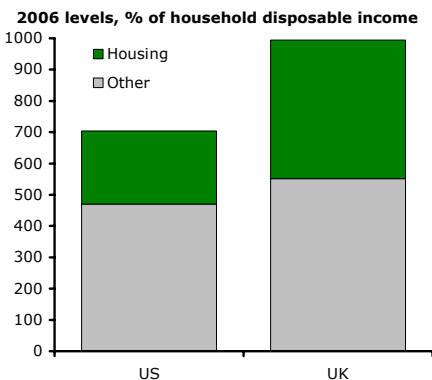
**Chart 25 : UK household net worth and saving**



Source: ONS

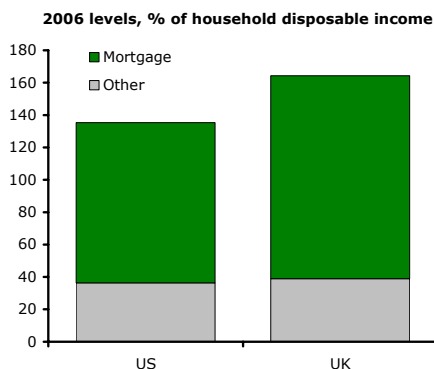
But this leaves households more vulnerable to a correction in asset prices, housing in particular. This vulnerability is most obvious in the UK. As we have already argued, UK house prices are more likely to come under pressure than those in the US. UK consumers also have greater exposure to the housing market. Housing assets constitute about 45% of wealth in the UK, rising to 60% if we exclude pension fund assets held indirectly by households. This compares with 33% in the US (Chart 26). As directly-held equities represent a large proportion of US household wealth, the continued buoyancy of stock markets has helped insulate the US consumer from weakness in the housing market. This is unlikely to be the case in the UK. A correction in house prices is likely to have more significant implications for UK consumer spending than US.

**Chart 26 : Household assets**



Source: Federal Reserve, ONS

**Chart 27 : Household liabilities**



Source: Federal Reserve, ONS

## Banking sector

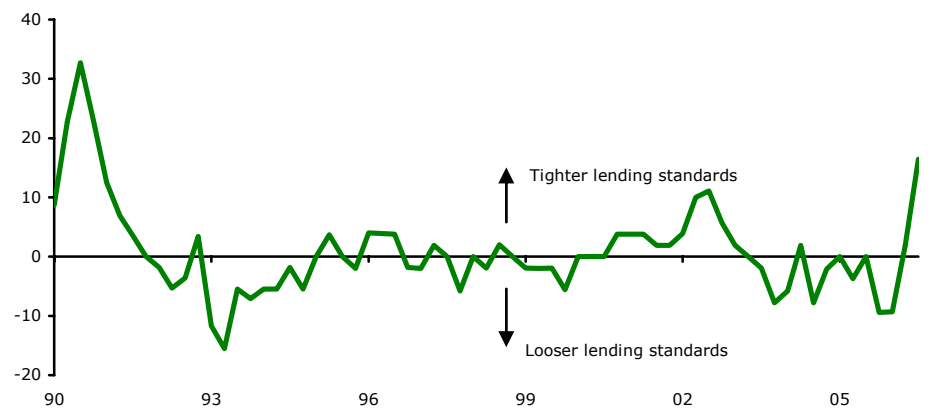
Problems on household balance sheets could also spill over to the banking sector. We have already seen some evidence of this in the US, with the pick-up in sub-prime default rates causing some wider turbulence across the financial sector.

There are two routes through which the banking sector could be affected. First, banks' balance sheets deteriorate as the assets that loans are secured against start to decline in value. If UK house prices fall more sharply than those in the US, this would appear likely to leave the UK banking sector more exposed to declining capital values. The structure of the UK mortgage market could magnify this effect. In the US, mortgages are typically originated by a broker, who sells it to bank. The bank then securitizes and distributes the asset in the capital markets. This helps spread the risk associated with that asset across a range of investors. In contrast, UK banks tend to hold mortgages on their balance sheets, which concentrates risk.

But the structure of the UK mortgage market might also limit banks' exposure to the second route: rising default rates. Defaults tend to occur as falling house prices expose individuals that banks should not really have lent to. As UK banks hold mortgages on their balance sheets, this provides an incentive to accurately assess the risk of lending to a certain individual. This incentive is much weaker in the US.

Consequently, US mortgage lending standards loosened significantly as house prices rose rapidly. This can be seen in the Fed's Senior Loan Officer survey (Chart 28). Unfortunately, there is no equivalent of this survey for the UK. But the popularity of sub-prime loans in the US and UK provides a rough comparison. While sub-prime loans account for around 14% of outstanding mortgages in the US, they account for just 6% in the UK.

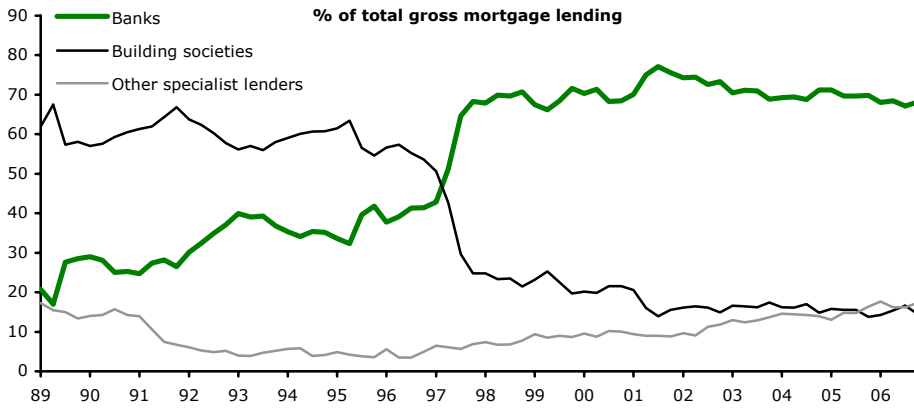
**Chart 28 : Senior Loan Officer survey – residential mortgages**



Source: Federal Reserve

Still, loans to riskier individuals have been rising as a share of new mortgages in recent years (Chart 29). Lenders who tend to focus on these risky individuals are classed in the 'other specialist lenders' category. This coincides with evidence that traditional lenders have relaxed lending criteria in recent years, offering loans at higher income multiples and covering a larger proportion of the property being purchased. Interest-only mortgages have also risen in popularity recently. This suggests households are having to stretch their finances to afford property, but banks have taken on more risk in response.

**Chart 29 : UK gross mortgage lending by type of lender**



Source: Bank of England

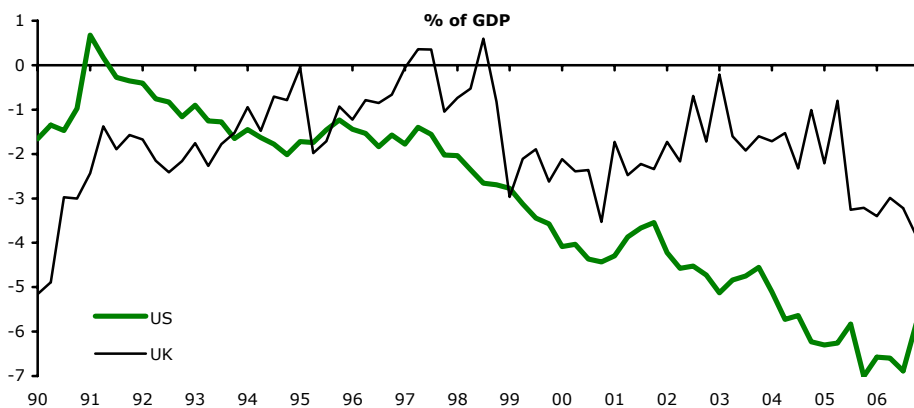
## Policy paralysis

The UK looks more vulnerable to a housing correction than the US. The degree of overvaluation looks more acute, nearing 50% in the UK compared with 25% in the US. This suggests prices need to fall further before the market re-establishes equilibrium. In addition, supply constraints make UK house prices more likely to 'overshoot' than those in the US, implying greater risk of 'spillover' effects.

The Bank of England must take some of the blame for this situation. By cutting rates in August 2005 when the UK housing market had cooled, the MPC reinforced expectations that house prices can only rise. In contrast, the Fed actively tried to cool the housing market, both through higher interest rates and its rhetoric. This has helped reduced longer-term risks to the US economy. The BoE's reticence could be storing up risks in the UK.

Most worrying, the UK economy is also running a significant current-account deficit, suggesting the pound is fundamentally too strong. If a housing downturn undermines confidence in the currency, the MPC may find itself unable to respond. Unlike the US, there is little evidence that exporters price in sterling to the UK market. A falling currency could boost inflation, ruling out rate cuts in the MPC's inflation targeting system. This could magnify the effects of a housing market correction. But with non-interest rate sensitive areas of the economy now performing strongly, the BoE has the opportunity to act. A series of rate hikes in the short-term could provide the shock to expectations needed to cool the housing market. This could mitigate those longer-term risks without having an undue impact on broader activity.

**Chart 30 : US and UK current-account balances**



Source: BEA, ONS





## Regulatory disclosures

None

## Global disclaimer

© Copyright 2007 ABN AMRO Bank N.V. and affiliated companies ("ABN AMRO"). All rights reserved.

This material was prepared by the ABN AMRO affiliate named on the cover or inside cover page. It is provided for informational purposes only and does not constitute an offer to sell or a solicitation to buy any security or other financial instrument. While based on information believed to be reliable, no guarantee is given that it is accurate or complete. While we endeavour to update on a reasonable basis the information and opinions contained herein, there may be regulatory, compliance or other reasons that prevent us from doing so. The opinions, forecasts, assumptions, estimates, derived valuations and target price(s) contained in this material are as of the date indicated and are subject to change at any time without prior notice. The investments referred to may not be suitable for the specific investment objectives, financial situation or individual needs of recipients and should not be relied upon in substitution for the exercise of independent judgement. The stated price of any securities mentioned herein is as of the date indicated and is not a representation that any transaction can be effected at this price. Neither ABN AMRO nor other persons shall be liable for any direct, indirect, special, incidental, consequential, punitive or exemplary damages, including lost profits arising in any way from the information contained in this material. This material is for the use of intended recipients only and the contents may not be reproduced, redistributed, or copied in whole or in part for any purpose without ABN AMRO's prior express consent. In any jurisdiction in which distribution to private/retail customers would require registration or licensing of the distributor which the distributor does not currently have, this document is intended solely for distribution to professional and institutional investors.

**Australia:** Any report referring to equity securities is distributed in Australia by ABN AMRO Equities Australia Ltd (ABN 84 002 768 701, AFS Licence 240530), a participant of the ASX Group. Any report referring to fixed income securities is distributed in Australia by ABN AMRO Bank NV (Australia Branch) (ABN 84 079 478 612, AFS Licence 238266). Australian investors should note that this document was prepared for wholesale investors only.

**Canada:** The securities mentioned in this material are available only in accordance with applicable securities laws and may not be eligible for sale in all jurisdictions. Persons in Canada requiring further information should contact ABN AMRO Incorporated.

**Denmark:** ABN AMRO Bank N.V. is authorised and regulated in the Netherlands by De Nederlandsche Bank. In addition, ABN AMRO Bank N.V., Copenhagen Branch is subject to local supervision by Finanstilsynet, the Danish Financial Supervisory Authority. ABN AMRO has adopted rules to ensure the integrity and independence of research analysts and the research function, as well as to identify, manage, avoid or make public actual or potential conflicts of interest relating to analysts or ABN AMRO. All analysts located in Denmark follow the recommendations from the Danish Securities Dealers Association.

**Finland:** ABN AMRO Bank N.V. is authorised and regulated in the Netherlands by De Nederlandsche Bank. In addition, ABN AMRO Bank N.V., Helsinki Branch is subject to local supervision by Rahoitustarkastus, the Finnish Financial Supervision Authority. ABN AMRO has adopted rules to ensure the integrity and independence of research analysts and the research function, as well as to identify, manage, avoid or make public actual or potential conflicts of interest relating to analysts or ABN AMRO.

**Hong Kong:** This document is being distributed in Hong Kong by, and is attributable to, ABN AMRO Asia Limited which is regulated by the Securities and Futures Commission of Hong Kong.

**India:** Shares traded on stock exchanges within the Republic of India may only be purchased by different categories of resident Indian investors, Foreign Institutional Investors registered with The Securities and Exchange Board of India ("SEBI") or individuals of Indian national origin resident outside India called Non Resident Indians ("NRIs") and Overseas Corporate Bodies ("OCBs"), predominantly owned by such persons or Persons of Indian Origin (PIO). Any recipient of this document wanting additional information or to effect any transaction in Indian securities or financial instrument mentioned herein must do so by contacting a representative of ABN AMRO Asia Equities (India) Limited.

**Italy:** Persons in Italy requiring further information should contact ABN AMRO Bank N.V. Milan Branch.

**Japan:** This report is being distributed in Japan by ABN AMRO Securities Japan Ltd to institutional investors only.

**Malaysia:** ABN AMRO research, except for economics and FX research, is not for distribution or transmission into Malaysia.

**New Zealand:** This document is distributed in New Zealand by ABN AMRO Securities NZ Limited an accredited NZX Firm.

**Russia:** The Russian securities market is associated with several substantial risks, legal, economic and political, and high volatility. There is a relatively high measure of legal uncertainty concerning rights, duties and legal remedies in the Russian Federation. Russian laws and regulations governing investments in securities markets may not be sufficiently developed or may be subject to inconsistent or arbitrary interpretation or application. Russian securities are often not issued in physical form and registration of ownership may not be subject to a centralised system. Registration of ownership of certain types of securities may not be subject to standardised procedures and may even be effected on an ad hoc basis. The value of investments in Russian securities may be affected by fluctuations in available currency rates and exchange control regulations.

**Singapore:** Any report referring to equity securities is distributed in Singapore by ABN AMRO Asia Securities (Singapore) Pte Limited (RCB Regn No. 198703346M) to clients who fall within the description of persons in Regulation 49 of the Securities and Futures (Licensing and Conduct of Business) Regulations and Regulations 34 and 35 of the Financial Advisers Regulations. Any report referring to non-equity securities is distributed in Singapore by ABN AMRO Bank NV (Singapore Branch) Limited to clients who fall within the description of persons in Regulations 34 and 35 of the Financial Advisers Regulations. Investors should note that this material was prepared for accredited investors only. Recipients who do not fall within the description of persons under Regulation 49 of the Securities and Futures (Licensing and Conduct of Business) Regulations or Regulations 34 and 35 of the Financial Advisers Regulations should seek the advice of their independent financial advisor prior to taking any investment decision based on this document or for any necessary explanation of its contents.

**Sweden:** ABN AMRO Bank N.V. is authorised and regulated in the Netherlands by De Nederlandsche Bank. In addition, ABN AMRO Bank N.V., Stockholm Branch is subject to local supervision by the Swedish Financial Supervisory Authority. ABN AMRO has adopted rules to ensure the integrity and independence of research analysts and the research function, as well as to identify, manage, avoid or make public actual or potential conflict of interests relating to analysts or ABN AMRO.

**Thailand:** Pursuant to an agreement with Asia Plus Securities Public Company Limited (APS), reports on Thai securities published out of Thailand are prepared by APS but distributed outside Thailand by ABN AMRO Bank NV and affiliated companies. Responsibility for the views and accuracy expressed in such documents belongs to APS.

**United Kingdom:** All research is distributed by ABN AMRO Bank NV, London Branch, which is authorised by De Nederlandsche Bank and by the Financial Services Authority; and regulated by the Financial Services Authority for the conduct of UK business. The investments and services contained herein are not available to private customers in the United Kingdom.

**United States:** Except for any documents relating to foreign exchange, FX or global FX, distribution of this document in the United States or to US persons is intended to be solely to major institutional investors as defined in Rule 15a-6(a)(2) under the US Securities Act of 1934. All US persons that receive this document by their acceptance thereof represent and agree that they are a major institutional investor and understand the risks involved in executing transactions in securities. Any US recipient of this document wanting additional information or to effect any transaction in any security or financial instrument mentioned herein, must do so by contacting a registered representative of ABN AMRO Incorporated, Park Avenue Plaza, 55 East 52nd Street, New York, N.Y. 10055, US, tel + 1 212 409 1000, fax +1 212 409 5222.

- Material means all research information contained in any form including but not limited to hard copy, electronic form, presentations, e-mail, SMS or WAP.

The research analyst or analysts responsible for the content of this research report certify that: (1) the views expressed and attributed to the research analyst or analysts in the research report accurately reflect their personal opinion(s) about the subject securities and issuers and/or other subject matter as appropriate; and, (2) no part of his or her compensation was, is or will be directly or indirectly related to the specific recommendations or views contained in this research report. On a general basis, the efficacy of recommendations is a factor in the performance appraisals of analysts.

For a discussion of the valuation methodologies used to derive our price targets and the risks that could impede their achievement, please refer to our latest published research on those stocks at [www.abnamroresearch.com](http://www.abnamroresearch.com).

Disclosures regarding companies covered by ABN AMRO group can be found on ABN AMRO's research website at [www.abnamroresearch.com](http://www.abnamroresearch.com).

ABN AMRO's policy on managing research conflicts of interest can be found at <https://www.abnamroresearch.com/Disclosure/Disclosure.AspX?MI=5>.

**Should you require additional information please contact the relevant ABN AMRO research team or the author(s) of this report.**