

5 December 2013

## Supplementary forecast information release: House price model

The OBR is releasing the information below as a supplement to the December 2013 *Economic and fiscal outlook*. We explain our new approach to forecasting UK house prices, which are an important fiscal determinant and conditioning assumption for our economy forecast. The new method will be explained in greater detail in a forthcoming briefing note.

### The UK housing market and house prices

In the decade prior to 2008, the UK housing market was characterised by rapidly rising house prices, rapid turnover of the housing stock and housebuilding insufficient to keep up with the growing number of households.<sup>1</sup>

The financial crisis and subsequent recession changed conditions dramatically. Prices, which fell almost 14 per cent from the end of 2008 to mid-2009, have returned to their previous peak, but transactions remain nearly 40 per cent below their mid-2007 level and construction of new homes is similarly depressed. Given this change, and the growing complexity of the policy environment, we have developed a simple model of demand for (owner-occupied) housing services. Together with our view of future housing supply, we use this model to inform our near-term forecast for house prices.<sup>2</sup>

### Demand for mortgage debt

Our modelling approach begins with the simplifying assumption of a stable ratio between mortgage debt and the value of residential property secured against it (referred to as 'housing leverage' in Chart 1). Therefore, in the long run, we assume that mortgage debt accumulation is dictated by house price growth and the stock of (owner-occupied) residential property. A number of short-term factors also affect demand for mortgages, including income growth and mortgage interest rates.<sup>3</sup> Combining both long and short-run factors gives a demand function for housing finance, as in Chart 1.

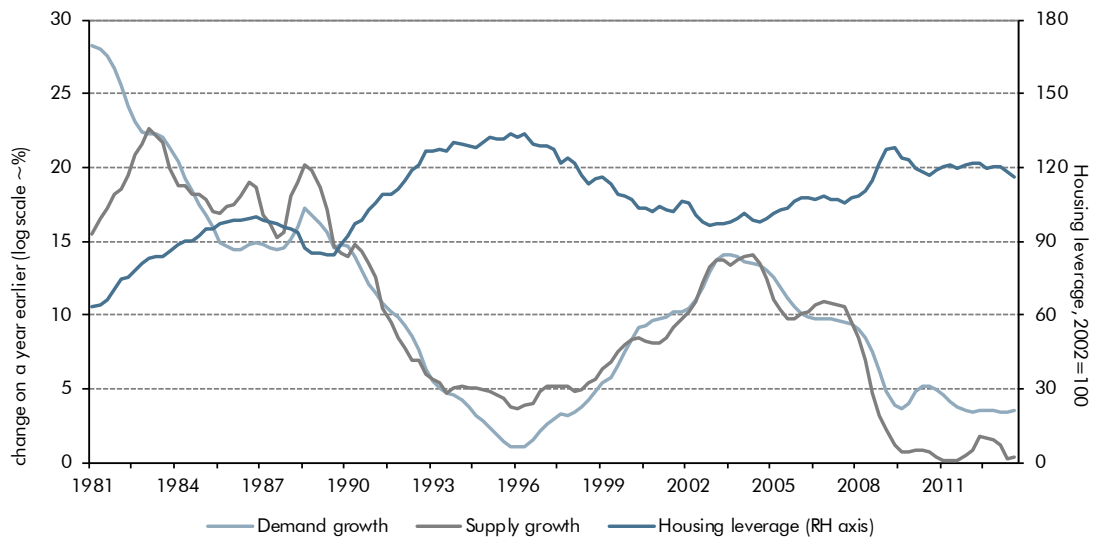
---

<sup>1</sup> ONS data suggest the dwelling stock per household was fairly stable in the ten years to 2008 but the amount of houses built was outpaced by household formation, the difference being met by conversions and change of use of existing structures.

<sup>2</sup> The method used is informed by a range of academic papers, including: "A simple model of Housing and the Credit crunch", G Meen, 2008; "Housing Supply Revisited", Ball, Goody, Meen and Nygaard; and "Improving the functioning of the housing market in the UK", André/OECD, 2011.

<sup>3</sup> Change in mortgage demand = f(change in house prices, change in disposable income, change in mortgage rates, housing leverage).

Chart 1: Supply of and demand for housing finance



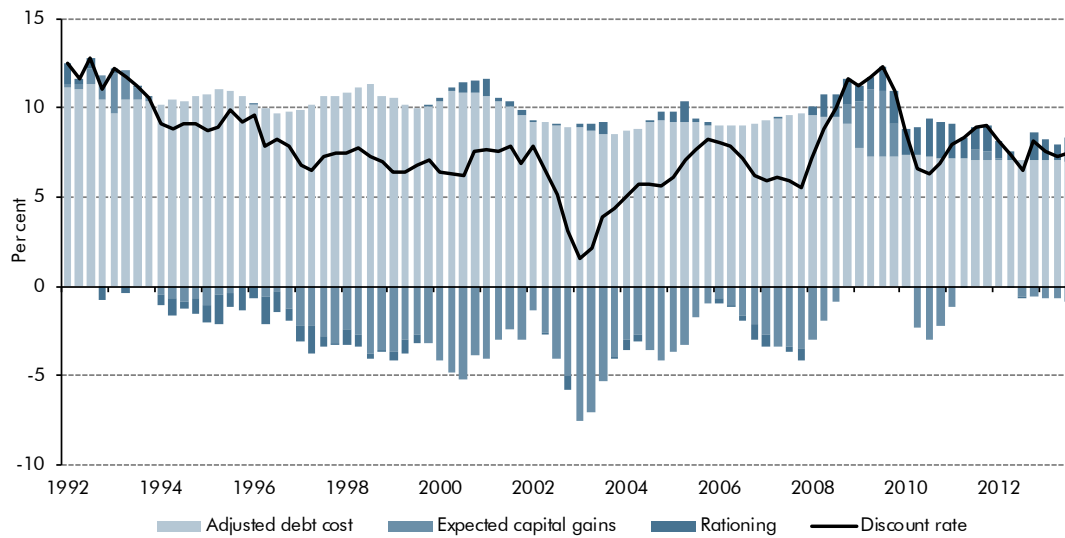
In the run-up to 2008, housing leverage was stable; mortgage debt grew at approximately the same rate as the value of the property it was secured against. In our model and the chart above, the supply of mortgage debt also broadly kept pace with demand. As house prices and the value of housing fell in 2008, housing leverage rose sharply, and fell back again as prices recovered. But households have been constrained by tighter lending standards and elevated uncertainty. In spite of a substantial fall in mortgage interest rates, continued growth in disposable incomes (although lower than expected) and rising house prices, households took on less debt than might have been expected –supply fell short of demand.

### The household discount rate for housing services

The gap between demand and supply growth in Chart 1 implies a measure of credit rationing. We combine this with other costs of housing finance to estimate the discount rate used by households to value their current demand for housing services, where:

Discount rate =  $f(\text{adjusted debt cost, expected capital gains, credit rationing})$

Chart 2: Households' housing discount rate



Source: OBR estimates

The adjusted debt cost is the effective interest rate on all mortgages adjusted for taxes, depreciation and maintenance costs. This has been relatively stable over time, barring a big fall in 2008, when Bank Rate was cut sharply. The discount rate is driven much more by changes in expected capital gains – here represented by the previous year's house price growth. This relies on an uncertain approximation of how households measure the return on housing assets and its stability over time, but the central concept is clear: the faster house prices are rising, the greater the return on housing assets and the lower the discount rate. This was the main influence behind a fall in demand for housing services in 2008-09, and would become an increasingly positive factor if house prices accelerate.

## Housing supply

Conditions for builders are improving, with better access to finance and stronger demand. But recent rates of housing starts have been very weak and, given the characteristically slow response of supply to rising house prices in the UK, we expect only a weak supply response in the near term. We assume housing stock growth consistent with our dwellings fixed investment forecast, and a further small fall in the owner-occupation rate, continuing the recent trend. But given DCLG projections for household formation, at roughly 1 per cent a year, this means that housing supply per household is still falling throughout the forecast period.

## House prices

Combining the discount rate, our view of housing supply and proxies for imputed rent, we estimate a model for real house prices<sup>4</sup> (in log form) where:

<sup>4</sup> ONS house prices adjusted for changes in the consumption deflator.

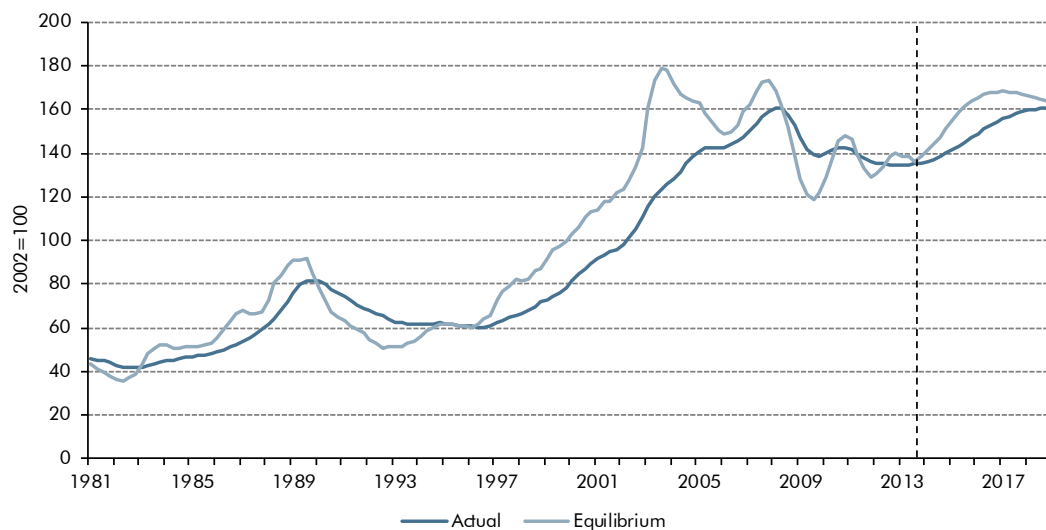
Real house price (1) = f((2) real disposable income<sup>5</sup> per household, (3) housing stock per household, (4) wage share in disposable income, (5) housing discount rate)

This produces a long-run relationship describing the path of real house prices, with the solution:

$$(1) = 2.66*(2) - 1.03*(3) + 2.76*(4) - 0.05*(5)$$

The coefficient on the long-term vector in this model is quite small and the speed of adjustment quite slow: for a given movement away from the equilibrium price<sup>6</sup> and no further shocks, half the gap is recovered in 5 to 6 quarters. However, in our model, the long-run path of house prices is ultimately determined by these four factors. Chart 3 shows equilibrium and actual prices over the past 30 years and in the forecast period:

Chart 3: Real house price level, rolling 4-quarter average



Source: OBR, ONS

When the 'equilibrium' line rises above 'actual', the underlying determinants of the model imply future price rises. In the 1990s, house prices were particularly driven by strong real income growth; in the forecast period, the discount rate (given low mortgage rates and growing expectation of future capital gains) will be most important. The weakness of housing supply will also contribute positively to house price growth in the short term. Given the great uncertainty over supply response beyond the next two years, our forecast reverts to a neutral long-run assumption of house price growth in line with average earnings thereafter.

### Credit rationing and the impact of Help to Buy on house prices

As shown in Chart 1, a degree of credit rationing emerged in 2008 and has persisted ever since. This is consistent with the observed tightening in lending

<sup>5</sup> ONS disposable income adjusted for changes in the consumption deflator.

<sup>6</sup> The level of house prices consistent with the fundamental drivers of the model (see Chart 3).

standards, fall in transactions and fall in numbers of first-time buyers. This was the context for our March 2013 forecast, in which we expected a gradual pick up in the housing market and relatively weak price and credit growth.

In October 2013, the Government launched the mortgage guarantee element of Help to Buy, three months ahead of schedule. This, together with Help to Buy equity loans, will directly ease collateral constraints.

Prices and transactions have already begun to pick up, albeit with considerable regional variation. Taken together with the policy environment, these factors push the discount rate in our model down and therefore the outlook for house prices up.

It is difficult to isolate the impact of Help to Buy from the wider improvement in market conditions. The Government has stated that up to £12 billion of guarantees are available, which could support up to £130 billion of mortgage lending or 10 per cent of the current stock of household mortgage debt. But it is not possible to estimate whether these guarantees will be used in full or, more importantly, the extent to which guaranteed mortgages might have gone ahead anyway.

The model presented here suggests that an immediate one per cent addition to the stock of mortgage lending, with no supply response, would lift house prices by one per cent within a year. Assuming a price elasticity of supply of considerably less than one, consistent with historical experience in the UK,<sup>7</sup> the housing stock would then increase, but by less, and more slowly, than prices. A slow response of supply to price signals – which many researchers argue is related to rigidities in the planning system – would mean additional mortgage lending feeds mainly into upward pressure on house prices.<sup>8</sup>

---

<sup>7</sup> Barker Review of Housing Supply, interim report, 2003. Estimates vary widely depending on models used, but all are less than 1.

<sup>8</sup> Barker Review of Land Use Planning, 2006; “The Impact of Supply Constraints on House Prices in England”, Hilber and Vermeulen, 2012.