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Report

Policy approaches for improving affordability

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Executive summary

One of the most important debates in housing economics today concerns the roles of supply shortages and "over-consumption" in explaining affordability problems in the UK. This report argues that it is unfortunate that the debate has become polarised since demand and supply side policies, which aim to improve affordability, are complements rather than alternatives. However before appropriate policies can be designed, we need improved measures of affordability directly applicable to those who face problems[1] and an understanding of how housing markets work in determining house prices and rents. This report attempts to summarise the evidence and apply the models that have been developed in the literature to explore the effectiveness or otherwise of demand and supply policies. These recognise that the most important factors that affect affordability come from the macroeconomy and from labour markets (the incomes of younger individuals have risen at a slower rate than employees more generally), whereas initiatives specifically aimed at the housing market play a secondary, but still important, role.

Section 1 of the report is concerned with understanding changes in house prices and rents over time, particularly in the UK but also incorporating evidence from other countries. The fact that house prices in the UK have risen in real terms over the long run (and generally faster than in most other countries) has meant that the subject has attracted a considerable amount of research; in fact, we demonstrate that the main factors that affect house prices – notably real incomes, interest rates and the cost of capital, and housing supply – have changed little over time; furthermore, and perhaps more remarkably, the responsiveness of house prices to each of these factors appears to have been broadly constant since the late 1960s. For example, the effect of a change in household income on house prices today is similar to the effect in the 1970s. In addition, most (but not all) of the rise in house prices up to the Global Financial Crisis (GFC) can be explained by these variables rather than by speculative bubbles. Deregulation of financial markets in the early 1980s and the credit shortages that emerged during and after the GFC certainly affected prices, but it is possible to incorporate both events into models. The results also show why changes in house price to earnings ratios over time should not be used as measures of affordability – the rise

[1] This is the subject of the companion paper: *How should housing affordability be measured?*

primarily reflects the capitalisation of low interest rates into house prices; low interest rates imply that households can afford the mortgage repayments on higher priced properties.

The paper also considers differences in regional house prices; historically, prices have exhibited what is sometimes known as the ripple effect, where in a boom prices have risen first in London and the South East, but prices have gradually caught up over time in the other regions to restore price relativities. These movements have not been a mechanical process and the reasons for the regional variations have differed over the cycles. The most recent cycle has, however, behaved rather differently, with prices in London rising faster for longer than has been the case in the past. Although London prices have begun to ease, they still remain well above the historical norm and the explanation is far from clear. Weakness in new supply provision is unlikely to be the only factor, but, speculatively, low interest rates may boost the London market more than other areas.

Although changes in house prices are well researched in the UK, the evidence on the determinants of market rents is less clear cut. This is partly because historical rent controls meant that data were poor and had little meaning and also because the size of the sector had been declining until the expansion of Buy-to-Let mortgages in the mid-1990s. It is only recently, therefore, that formal empirical tests could be conducted. In principle, economic theory indicates that house prices should equate to the discounted present value of a future rental stream, establishing a relationship between rents and house prices. However, the rent index used as part of the Consumer Prices Index, suggests that rents have risen at a similar rate to consumer prices in general, but more slowly than house prices. One reason is that the discount rate has fallen (for at least part of the period), but this is unlikely to be the full story. A possible reason may relate to the heterogeneity of properties and market segmentation, where tenants are often housed in poorer quality properties, but there is much that is not fully understood.

The second section of the report uses our understanding of the market to explore policy options; we show that although increases in housing supply continue to play an important part in improving affordability, we have known since the Barker Review of Housing Supply in 2004 that increases in supply have to be large and long-lasting to have a major effect on affordability and there is no reason to change that judgment. The paper presents a condition that defines the factors that drive long-run affordability in terms of the relative growth rates of income and the housing stock. Since income grows faster than the housing stock, this worsens affordability, at least measured by price to income ratios. It also suggests that the benefits to those on low incomes from market provision alone are unlikely to be adequate and an

important role for expansion of social rented housing remains. Policies such as Help to Buy and Shared Ownership are primarily of benefit to those already on the fringes of home ownership. The crowding out of private construction by additional public building is often cited as a reason for not expanding the latter, but it is probably less of an issue at current levels of construction than it would be at full capacity.

An alternative view is that housing shortages could be reduced if owner occupiers could be persuaded to reduce "over consumption" of housing and downsize; this is sometimes measured in terms of bedroom standards and, indeed, it is true that, on this basis, owners consume more housing than those in either the private or public rented sectors. But this misses the point; owner-occupied housing represents a market demand and households demand more space because their incomes and the price permit it. More households have now paid off their mortgages than are still paying mortgages and so housing costs are low. Therefore, there is little incentive to downsize. The paper demonstrates the consequences of changing the tax system so that property taxes are proportional to income and the housing costs of older households would rise considerably. Were this to be considered, any changes would need to be introduced over a long period of time and/or offset in other ways.

The paper also discusses the impact of second homes, including Buy-to-Let investments. From the limited information available, the probability that a household on relatively high incomes will own a second home has risen. On our estimates, a household with an income in the top quintile and living in the South East has a high probability of owning a second home. By contrast a head of the same age in the bottom income quintile has almost no chance of owning an additional home. This clearly contributes to a widening of the wealth distribution. The problems for potential first-time buyers are worsened by the low levels of mortgage lending; in aggregate real net mortgage advances (deflated by house prices) are lower than before deregulation in the early 1980s. The number of loans to first-time buyers has increased recently, but required deposits remain high; these constraints are less binding on current owners who wish to trade up or buy a second home because of the ability to use the equity in the existing home.

Even if increases in new supply or a fall in demand by existing owners fail to materialise, the market will provide a solution, even if it is not considered socially acceptable; increases in market risk at times of high house prices could lead to a market collapse with consequences for macro stability. In addition, household formation and owner occupation rates will be lower, particularly for the younger cohorts and we have already seen evidence of this. This important point should be stressed; household formation is as much an outcome of the market as a

driver. Official household projections are trend-based and take no explicit account of expected changes in affordability, but worsening affordability implies that the future number of households is likely to be below official projections. It follows that ex post differences between the number of homes and the number of households cannot be used as an indicator of excess supply or demand since the market will ensure the two are approximately equated.

Introduction

This report has two sections; the first section considers the factors that determine changes over time in affordability based on the extensive literature. It concentrates on national and regional dimensions, but since local house prices have significant common trends over time, many of the issues are also relevant to narrower spatial scales. An understanding of the changes in affordability is a prerequisite, but provides only limited information on what policies are the most effective in improving affordability; this is the focus of the second half of the report, covering policies for both the demand and supply sides of housing markets. The report is an addition to a companion paper, Meen (2018), henceforth known as the companion paper), which discusses the most appropriate ways of measuring affordability; therefore, the review provides an integrated analysis across three dimensions – measurement, understanding and policy effectiveness.

Whatever measure of affordability is employed, house prices and rents play a central role and, therefore, this first section is concerned with their main determinants, bringing in relevant findings from different countries, but with an emphasis on the UK. In fact, the review of measurement methods in the companion paper highlighted three of the key influences; incomes, interest rates and mortgage market conditions. We emphasised that commonly-used house price to income ratios provide a flawed indicator for prediction and for policy, but this does not imply that incomes are unimportant for house prices; incomes are, in fact, one of the most important determinants quantitatively, but they are not the *only* influence and it is the neglect of other factors that causes the problems, even at the national scale. House prices relative to incomes have been above trend since the beginning of the century, despite the Global Financial Crisis, reflecting low interest rates, which are capitalised into prices. At low interest rates, households can afford to pay higher prices. Furthermore, the earlier paper demonstrated the importance of credit markets; if households face restrictions in access to mortgages, then their consumption of housing is likely to be sub-optimal with consequences for house prices.

However, nationally, there are potentially other variables that help to explain changes in house prices over time; most importantly for policy these include the influence of housing supply. Further possible influences include demographics and, given our interest in low-income households and first-time buyers in the companion paper, changes in the income distribution. This review explores in more detail the quantitative impact of these variables. The paper also considers rent determination; although in principle the relationship between house prices and

market rents is well-understood and house prices should reflect the discounted present value of the future rental stream, the practice is more complex. For example, the definition of the appropriate discount rate is not straightforward and, again, needs to take into account credit market constraints; in addition in the UK, data on market rents have been less than ideal and the market is partly segmented. At one level it caters for some high-income households, but at the other end of the spectrum, private renting now houses more low-income households than the public sector.

Section 1: Understanding affordability

Understanding national house prices

A great deal of quantitative research has been conducted into the main factors that determine changes in house prices over time[2]. A common argument is that UK house prices are unstable and difficult to model; however, instability should not be confused with volatility. Historically, there have certainly been periods when prices were highly volatile, exhibiting strong cycles, but this is not the same as instability. Instability occurs when an external event or shock causes prices permanently to diverge from their long-run equilibrium position, but simply looking at Figure 2 in the companion paper might cause some scepticism; there appear to be forces that prevent house prices permanently moving too far away from incomes, despite the weaknesses of Figure 2 as an affordability indicator. The idea of instability is also sometimes linked with the idea that the parameters of equations used to explain changes in house prices are not constant over time and vary either randomly or are trended.[3] We suggest below that, in fact, the parameters have been remarkably invariant over the last thirty years. With caveats, the main factors that have affected house prices are fairly straightforward.

House prices are determined by the interactions of demand and supply, but the same approaches typically used to explain outcomes in non-durable goods markets cannot be used; the critical differences are the longevity of the housing stock and its spatial fixity. Longevity implies that housing is an investment as well as a consumption good, whereas spatial fixity implies that house prices do not necessarily change at the same rate in different parts of the country. In addition, the treatment of housing in policy has meant that all tenures have received forms of subsidy, which distort the market and are reflected in prices.

Longevity and the role of housing as an investment have meant that the standard approach to explaining house prices is derived from a model concentrating on a household's resources over its lifetime rather than just current economic conditions. Key elements are:

[2] Much of this research is summarised in Meen (2001) and Meen et al (2016), which set out the theoretical models underlying the research more formally.
[3] Consequently time-varying parameter methods are sometimes advocated; see, for example, Hall et al (1997).

(i) Housing demand is determined by long-run or permanent income when deciding what house to buy or rent. Households do not take into account only current income but also future income.

(ii) The existence of mortgage markets allows households to borrow against future income;

(iii) Expectations of future capital gains are central to investment demand. One of the key concepts derived from the model is the housing user cost of capital, which measures the annual costs that a home owner incurs in using housing. The true annual cost is not the house price (although this is taken into account), but includes the mortgage rate – or the opportunity cost of investing in housing rather than other assets - maintenance and depreciation expenditures, property taxes and the expected future capital gain. The user cost also takes into account the effects of mortgage market restrictions, although these are difficult to measure in practice.

The user cost is one of the most important concepts in housing economics and an understanding of its properties is crucial to explaining both long-run and short-run changes in house prices. Therefore the definition is summarised as relationship (1) which holds in all time periods. As an illustration, if we take the first term in brackets – the mortgage interest rate[4] - and multiply it by the house price, this approximates annual mortgage interest payments. Annual maintenance expenditures and property taxes also have to be added to the annual cost. But if house prices are expected to rise so that households make a capital gain, this reduces the costs that households face.

Housing User Cost = House price * (market nominal interest rate + depreciation + maintenance + property taxes + mortgage market constraints – expected annual capital gain) (1)

[4] In fact the theoretically correct variable is the post-tax opportunity cost of investing in alternative assets, although, in practice, the mortgage interest rate is often used in applied studies.

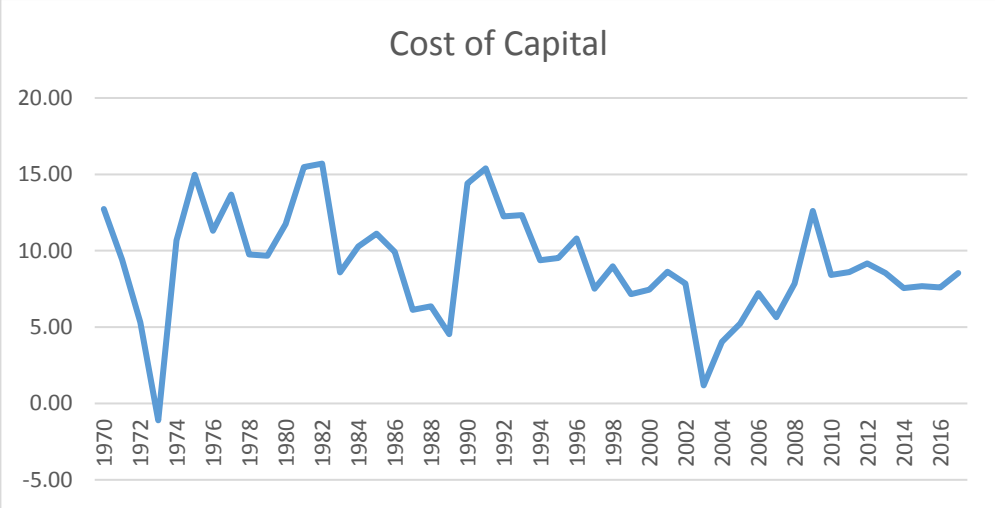


Figure 1. UK Cost of Capital (%, 1970Q1-2017Q4). Source: Authors' estimates, See Meen et al (2016).

The cost of capital, which is the element in brackets in (1) is graphed in Figure 1 and is a form of real interest rate; as might be expected from a *real* interest rate, the series has no long-run trend and, so, cannot explain any long-run increase in real house prices. However it is highly volatile and so could contribute to an explanation of short-run volatility. The variable is also a discount rate; if house prices represent the discounted present value of a future rental stream arising from the consumption of housing services, then the cost of capital is the appropriate discount rate. It has been suggested that the fact that the ratio of rents to house prices fell from the mid-1990s until the Global Financial Crisis in both the UK and US is consistent with a decline in the discount rate[5], and there is some evidence to support this from Figure 1, but equally the graph implies that the ratio cannot fall permanently. A key difference from conventional measures of the discount rate is that the figure allows for the shortages of mortgage credit that occurred before the liberalisation of mortgage markets in the early 1980s and after the Global Financial Crisis; the continuation of mortgage shortages is discussed in more depth in the second section. In fact, the cost of capital can be even more volatile than Figure 1 suggests if debt leverage is taken into account; leverage raises the return from investing in housing when prices are rising, but also increases the losses in a downturn[6].

[5] See Himmelberg et al (2005) for the US.
[6] See Muellbauer and Murphy (1997).

Two further points arise from the definition of the user cost in (1); first, the shape of the graph depends on the definition of price expectations. In the graph the expected rate of house price growth is taken as the rate that occurred over the previous year (and there is some empirical support for this), but a case can be made for taking into account outcomes over a longer historical period. Alternatively, some models explicitly adopt a forward-looking framework, particularly in theoretical work, although empirical work typically rejects forward-looking, rational expectations, because housing markets do not process information in the efficient manner typically found in financial markets. This can occur, for example, because the costs of buying and selling houses are much larger. But the choice between backward and forward-looking expectations affects the degree of price volatility in house price models[7]. Second, we noted that (1) represents a real interest rate, but empirical work often finds that nominal rates also affect prices; this is known as front-ending loading. A rise in inflation reflected in a corresponding increase in nominal interest rates implies that the burden of debt interest repayments will be shifted towards the earlier years of the loan; this can cause particular problems for first-time buyers and those in the early years of their loans. Inflation causes even greater problems for potential new first-time buyers if tax advantages exist for owner-occupation. For example, if owners are able to deduct mortgage interest payments from their income tax bills (this was the case in the UK until 2000 and still exists in some countries), then a rise in inflation compensated by an increase in nominal interest rates, reduces the cost of capital and, therefore, leads to a rise in house prices. Therefore, existing owners make a capital gain, but it becomes even more difficult for first-time buyers to enter the market and, so, inflation has distributional consequences. An implication is that maintaining low rates of inflation is important for first-time buyers if there are tax advantages to ownership.

Further clarification is needed on the role of mortgage debt in explaining house prices since this is widely misunderstood in empirical research; the two variables are closely correlated, but this does not mean that changes in debt *cause* changes in house prices. In fact, the causation is likely to be the other way round and explains why house prices are important for macro stabilisation policy. It was undoubtedly true that restrictions on mortgage credit before the early 1980s and the subsequent deregulation of mortgage markets had a strong effect on house prices. Similarly the restrictions on mortgages (see Section 2) since the Global Financial Crisis have also affected house prices, but, arguably, in the intervening period

[7] DiPasquale and Wheaton (1994). See also Case and Shiller (1988) on the use of surveys of house price expectations in the US.

between 1984 and 2007, variations in credit availability had little effect on prices since most conventional households faced only limited lender-imposed constraints on their borrowing, although credit expansion could have an effect if it opened up new markets, for example, to sub-prime borrowers. There is now a very large literature that has emerged in recent years on the relationship between house prices and credit. One area concerns the expansion of Buy-to-Let mortgages in the mid-1990s; an important feature of the market was that it enabled existing owners to use equity in their current home to purchase additional properties, adding to overall demand. It can be shown[8] theoretically that this may increase the volatility of house prices, but, rather surprisingly, there is little evidence that this has been the case and conventional models do not appear to have "broken down".

Figure 1 can help to explain changes in house prices, but the cost of capital is, by no means, the only factor. Table 1 sets out the responsiveness of house prices to a set of variables, taken from a series of empirical studies conducted by the author over a number of years[9]; the comparisons are designed to show the consistency of the findings over the studies. Each value in the table represents an elasticity (the percentage change in house prices in response to a one percent change in each variable); therefore, for example, in the most recent study, column (4), a 1% increase in income is expected to increase real house prices by approximately 2.5%. The exception in interpretation is the user cost where the values are *semi*-elasticities; so, a 1% *point* increase in the user cost decreases prices by 4.5%. The user cost coefficients may appear small by comparison, but they are, in fact, large effects; however from Figure 1 the variable has no long-run trend and its influence is primarily in helping to explain the cycle.

[8] See Meen (2013).
[9] In policy circles, variants of the equation are used in the UK for forecasting by the Office for Budget Responsibility, and the Ministry of Housing, Communities and Local Government.

Table 1: Estimates of the Determinants of House Prices

Study[10]	(1)	(2)	(3)	(4)
Estimation Period	**1964(Q3)-1987(Q4)**	**1969(Q3)-1996(Q1)**	**1969(Q3)-2007(Q4)**	**1969(Q4)-2017(Q3)**
Per household real disposable income	3.000	2.401*	2.614	2.457*
Real household financial wealth	0.451	0.336	0.321	0.118
User cost of capital (semi-elasticity)	-0.054	-0.037	-0.061	-0.045
Housing stock/number of households	-1.809	-1.744*	-1.545	-1.776*

* Specification is slightly different because neither variable is divided by the number of households.

At first sight, the table appears to suggest an anomaly; since an increase in income leads to a more than proportionate rise in house prices, we would expect the price to income ratio to exhibit a strong upward trend. In the absence of a noticeable trend in Figure 2 in our companion paper, the figure would suggest an income elasticity closer to one. The results are, however, consistent because the table takes into account the effects of additional factors; for example, increases in housing supply in response to a rise in demand will mitigate an increase in house prices relative to incomes.

The feature that stands out from Table 1, however, is the consistency of the values over studies spanning approximately thirty years, suggesting that the underlying housing demand relationship has also changed little. Since the parameters are fairly constant, the equation in the second column, estimated only up to the first quarter of 1996, is able to predict fairly successfully the subsequent time periods; 1996 is significant in that it marks the beginning of the boom period that lasted until the collapse in the GFC. On this basis, there was some but limited evidence of a major over-valuation of property prices between 1996 and 2008 and certainly not as much over-valuation as some commentators suggested using simple price to income ratios or rent to price ratios. Over-valuation can have a number of definitions – for example the extent to which prices exceed construction costs[11] – but here we refer to the

[10] The four studies are: (1) Meen (1990); (2) Meen and Andrew (1998); (3) Meen (2013); (4) an updated version on more recent data. Therefore, the earliest study was published almost 30 years ago.
[11] Prices would be expected to be closer to construction costs if there were fewer constraints imposed by the planning system.

prediction errors of equations such as those in Table 1. Conventional models that did not attempt to incorporate explicitly speculative bubbles were able to explain the period fairly well.[12] Nevertheless, this does not imply that the models predicted the GFC; for example, housing models could not easily have predicted the credit shortages that occurred, although, as argued below, models should have paid greater attention to potential risks.

The results in Table 1 can be used to derive formally a simple rule to explain the conditions under which the ratio of house prices to income rises or falls over the long run, i.e. abstracting from short cycles[13], given by (2). The third equation from Table 1 is used, although similar results arise from the other versions. This equation implies that the price to income ratio can only be constant over time if aggregate household income in the economy grows at the same rate as the housing stock; the speed at which the ratio changes depends on the income and price elasticities of housing demand reflected in the coefficient 1.5. This is shown formally in footnote 13. In countries, such as the UK, that have a high income elasticity of housing demand[14] , the ratio is likely to improve or deteriorate quickly.

Percentage change in the ratio of house prices relative to per capita income $\approx$ 1.5 * [percentage change in household income / percentage change in the housing stock] (2)

Notice that household formation has no role in the rule and footnote 13 shows formally why this is the case; this controversial result arises because increases in the number of households have to be accompanied by a rise in income to influence *effective demand* and, thus, prices. Household formation can affect the wider social concept of housing *need* and may lead to increases in non-market housing, but this does not necessarily influence prices. We return to

[12] See Meen (2008).

[13] This abstracts from changes in household wealth which only has a modest effect quantitatively. The user cost also has an effect but since, from Figure 1, it has no trend it cannot contribute to long-run changes in the price to income ratio. Notice also that the coefficient of 1.5 is only an approximation. For the coefficient to be exactly equal to 1.5 the coefficient on the housing stock in Table 1 would have to be -1.5 and that on income 2.5. To see this, let g = real house prices; Y = real aggregate income; HH = the number of households; HS = the housing stock, then the equation in Table 1 can be written as: ln(g) = 2.614 ln(Y/HH) -1.545 ln (HS/HH). Therefore the equation for affordability becomes: ln(g/(Y/H)) = 1.614 ln(Y/HH) -1.545 ln (HS/HH). Since on the right hand side the two coefficients on HH are approximately equal in absolute terms, they cancel out and so the equation becomes: ln(g/(Y/H)) $\approx$ 1.5 ln(Y/HS).

[14] See, for example, Cheshire and Sheppard 1995, 1998).

the important question of required increases in house building that can stabilise affordability in Section 2, but the fundamental problem should be immediately clear; in the long run real incomes have grown by more than 2% per annum but the housing stock by less than 1%. Therefore, the required increases in housing would need to be much larger than has occurred historically.

Nevertheless, as a caveat, (2) reveals a problem with the standard modelling approach; there is little evidence from Figure 2 in the companion paper, despite stronger growth of aggregate income than the housing stock, that the ratio of prices to income has risen significantly over time. There must, therefore, be something missing from the model; as it stands it is unsurprising that investors are attracted to housing as an asset, since it implies that the asset price continuously rises faster than earnings. The missing ingredient may be risk or, more precisely, the fact that the user cost does not include a risk premium, which is likely to increase at times of high house prices, and therefore impart downward pressure on the market; this provides an in-built stabilisation mechanism. Arguably, this was fundamental to the housing problems that arose during the Global Financial Crisis; investors believed that house prices could not fall and under-estimated housing market risk. However, the incorporation of risk into empirical house price models is still in its infancy[15].

Finally, intergenerational housing problems arise not only from the housing market itself, but also from differences in relative income growth rates; over long periods of time, the incomes of young households have grown at slower rates than those of older households. Since the responsiveness of house prices to changes in income is shown to be strong in Table 1, this puts young households at a relative disadvantage. It also has implications for the structure of aggregate models used to explain house prices. Formally, the models are only valid if *either* the income and price elasticities of housing demand are the same across different households *or* incomes grow at the same rates for all households[16]. Neither condition holds in practice and implies that aggregate price relationships have to be modified to include a measure of changes in the income distribution, which also affects the affordability relationship (2).

[15] But see Meen et al (2016) where a formal definition of the risk premium is derived.
[16] See Meen and Andrew (1998); the result arises from the Theil (1954) aggregation conditions.

International comparisons

House prices have also been heavily discussed in other countries; in addition to their volatility and consequent macroeconomic effects, an important spur to the construction of long-run house price indices has been Thomas Picketty's work on long-run changes in wealth distributions[17]. Since housing comprises a large percentage of household wealth in most developed economies, adequate data on long-run changes are a pre-requisite and this has led to recent studies designed to construct international measures of house prices, typically, from the 19th century[18] .

In addition, the factors that affect house prices over shorter periods have been widely studied in countries other than the UK however a problem in drawing conclusions from international studies is that the variables taken into account in models are rarely the same; for example, some studies do not include the housing stock as a measure of housing supply and, from the arguments above, we would expect this to lead to a lower estimated response of house prices to changes in income[19]. Also international comparisons are hampered by data inconsistencies and by institutional differences; for example, even across Europe, mortgage market structures differ considerably. Nevertheless, it is important that an attempt is made to understand the reasons for variations in international house price trends since it is easy to draw incorrect policy inferences and a significant volume of comparative research has emerged in recent years[20].

Based on a sample of 13 European countries, Table 2 sets out the growth in real house prices and in prices relative to wages. Real house prices in the major European economies

[17] See Picketty (2014).
[18] See Knoll et al (2017) and Jordà et al (2017). There are also a significant number of single country studies: Eichholtz (1997), Eichholtz et al (2012) for Amsterdam, Friggit (2012) for Paris, Stapledon (2010) for Australia, Shiller (2005) and Fishback and Kollman (2012) for the USA.
[19] See Meen (2002) for a comparative study of the UK and USA, which standardises model specifications.

[20] See Adams and Füss (2010) for a panel study across 15 countries; Agnello and Schuknecht (2011) show the importance of monetary indicators in explaining housing short-run booms and busts across 18 industrialised economies; Anundsen and Jansen (2013) look at the relationship between house prices and household debt in Norway; Oikarinen (2012) looks at the response of prices and transactions to demand shocks in Finland; Cuestas (2017) considers the effects of foreign capital flows on Spanish prices; Damen et al (2016) look at the effects of mortgage interest tax deduction across eight countries; Miles (2017) discusses the synchronisation of international house price cycles; Vansteenkiste and Hiebert (2011) estimate price spill overs across the Euro area; Zhu et al (2017) consider prices and monetary policy also across the Euro area.

have not consistently grown at the same rate over time; for example real prices in the UK grew at an annual average rate of 3.6% between 1970 and 2015, whereas real prices in France grew by 2.1%, in Spain by 3.3%, in Italy by 1.2%, in the Netherlands by 2.5% and in Germany by -0.3%. These variations suggest that European markets cannot be treated as a single entity, reflecting tenure patterns and institutional differences in mortgage market structures. In addition, the trends may indicate international variations in housing preferences. Differences in housing supply, arising from land-use planning controls have attracted particular attention and it is now widely believed[21] that countries with the strongest regulations are more likely to experience both stronger long-run price growth and greater volatility. The UK and Germany, as extreme cases, are highlighted.

Using relationship (2) changes in Germany relative to the UK depend on whether the ratio of aggregate income to the housing stock grows more slowly in the former and on whether the income elasticity of housing demand is lower. In fact both may be the case, although there is less evidence on the latter; in Germany, since 1970, the housing stock relative to incomes has been broadly constant[22], but has fallen sharply in the UK, by approximately 1.5% per annum. But, in addition, the responsiveness of affordability to changes in income (derived from the income elasticity of demand) may be weaker than the 1.5 shown in (2) for the UK[23]. Decomposing price movements in the two countries indicates that a large part of the rise in real prices (and worsening affordability) in the UK, relative to Germany, may be attributable to the demand side of the market. Although policies that aim to increase housing supply are important, measures that pay attention to the demand side of the market are also important since, under high income elasticities, it is more difficult to stabilise affordability through supply alone. An important question remains, however, why the income elasticity of demand may be lower in Germany. Currently, there is little evidence on which we can draw; does it arise because home ownership rates are lower and, therefore, housing is less important as a positional or status good than in the UK? This remains a topic for further research.

[21] See for example, Anundsen and Heebøll (2016), Glaeser et al (2008), Green et al (2005), Huang and Tang (2012).
[22] Although some care is needed because of German reunification.
[23] See Meen (2016).

Table 2. Long-Run Growth in Real House Prices (Col. 2) and Relative to Wages (Col. 3)

	Annual Average Growth Rates in Real Prices **1970-2015, (%)**	**Annual Average Growth Rates in House Prices Relative to Wages** **1970-2015 (except where stated), (%)**
Belgium	2.3	1.58 (1980-2015)
Finland	1.5	-0.68
Denmark	1.7	-0.26
France	2.1	0.12
Germany	**-0.3**	**-1.86**
Ireland	3.3	-0.59 (1990-2015)
Italy	1.2	n.a
Netherlands	2.5	0.63
Norway	2.7	-0.25
Spain	3.3	1.17 (1995-2015)
Sweden	1.5	0.83 (1980-2015)
Switzerland	0.3	n.a.
Great Britain	**3.6**	**1.27**

Source. OECD (uses annual averages of quarterly data for house prices)

Regional differences

In a country as large as the USA, it is unsurprising that house prices do not evolve in a uniform manner across areas (see Table 3 below). But even outside North America, house prices within a country exhibit distinct spatial differences; however a problem is the appropriate spatial scale at which housing markets should be considered. One approach defines housing market areas, but, in practice, time-series data are rarely constructed on this basis; a second approach is to construct “clubs”. The idea of clubs is, perhaps, best known in the literature on economic growth convergence. However, some of the features have been captured in the

house price literature and characterises a situation where groups of local or regional house prices within a country converge to common levels (allowing for housing quality differences, neighbourhoods characteristics, climate etc.), even though, in the short run, local price growth rates may still differ considerably.

However, empirical work on clubs is often constrained by the availability of time-series data – we noted the problems for international comparisons above. Within countries, analysis typically takes place across the administrative units for which information is published; in the UK, most research has been conducted across regions - the Standard Statistical Regions until the 1990s and, subsequently, the Government Office Regions (GOR)[24]. The international literature on regional house price convergence has expanded rapidly in recent years; the concept of ripple effects is often used, so that a country typically has a lead city or region, where prices change first and, then, neighbouring and subsequently more distant areas gradually catch up over time. But there is no necessary reason why all areas should exhibit common trends and so price clubs could exist[25]. Indeed, US results suggest that local or regional house prices do not converge to the national level, but rather converge to club averages. This implies a degree of segregation[26]. In the UK[27], a variety of different statistical approaches have been employed and the extent to which convergence has been found to exist depends on the method. But, as a generalisation, we might think of three meta-regions where convergence occurs, consisting of the South (including London), the Midlands and the North.

[24] The GORs were also abolished in 2011 as administrative units and a more limited range of data has been available since then.

[25] Recent examples from the international literature include: Gupta and Miller (2010, 2012), Clark and Coggin (2009), Miao et al. (2011), Holmes et al. (2011), Barros et al. (2012), Kim and Rous (2012), Cohen et al. (2016) - all for the USA; Berg (2002, Sweden); Stevenson (2004, Ireland); Van Dijk et al. (2011, Netherlands); Fereidouni et al. (2016, Singapore and Malaysia); Luo et al (2007, Australia); Shi (2009, New Zealand); Lean and Smyth (2013, Malaysia); and Balcilar et al. (2013, South Africa).

[26] For example, Kim and Rous (2012) find evidence for multiple clubs and suggest that housing supply regulation is an important determinant of club membership. Blanco et al (2016) find evidence for four clubs in Spain; in the UK, Chowdhury and Maclennan (2014) suggest two super-groups, based on the amplitude and duration of cycles, broadly corresponding to a North-South divide. However, Montagnoli and Nagayasu (2015) find four convergence clubs in the UK. Clark and Coggin (2009) suggest two super regions for the US.

[27] See, for example, Chowdhury and Maclennan (2014).

With exceptions[28], the emphasis of much of the literature is on the development of econometric tests of co-movements,[29] rather than understanding the underlying transmission processes. But, in general, spatial price changes can be decomposed into those caused by variations in the drivers, for example, incomes or the housing supply may differ across space, and those arising from variations in spatial responses to common income or supply changes[30]. Figure 2 shows house prices[31] in Greater London relative to Yorkshire and Humberside; the former is often taken as the lead region, whereas Yorkshire and Humberside lies in the North of England and is chosen because the boundaries did not change with the move from Standard Statistical Regions to Government Office Regions and, so, consistent data exist since 1969. The vertical axis is expressed in logarithmic scale and, therefore, approximately represents the percentage difference in prices between the two areas. Because the ratio is always substantially greater than zero, London average house prices are, unsurprisingly, consistently higher than in the North. However, the cyclical pattern illustrates the so-called ripple effect; in each housing cycle, prices in London have, initially, risen relative to those in the North but, subsequently, there is some visual evidence that the ratio has returned to trend, shown by the dotted line calculated as the average ratio between 1969 and 2000; an exception has been the post-GFC period, when London prices have risen much more rapidly.

There is a danger in taking this as a mechanical rule that always occurs; if that were the case, London prices could be used as a forecasting forward indicator to enable speculative returns to be made on housing investment in the North. But, in fact, the patterns have been different in each cycle. In terms of the transmission mechanisms, there are a number of possibilities: first, the patterns could arise from mobility since there is evidence that households respond to differences in relative house prices[32]. As households typically move only short distances, local house prices are more likely to change quickly in response to any initial London rise, but the subsequent induced spatial chain eventually leads to changes in more remote areas; second, the linkages could arise from speculative investment and spatial arbitrage of the form noted previously; third, co-movements may arise from common changes in incomes across the

[28] For example, Blanco et al (2016) find population growth, the size of the rental market, housing supply and geography to be important determinants in Spain. Füss and Zietz (2016) examine the effects of US national monetary policy on local price changes.
[29] For example through cointegration or spectral techniques.
[30] These will be represented by different values for the coefficients in regional house price equations. The differences may be either random or have a distinct spatial structure.
[31] These are measured by simple average prices, rather than adjusting for quality differences. Mix adjustment does not change the central message.
[32] See Cameron and Muellbauer (1998) for example.

regions. As shown in Table 1, the responsiveness of house prices to income is high and, so, if labour markets in an upturn expand initially in the South, before spreading to other areas, then similar patterns in house prices are expected. Although there may be some truth in all these explanations, they do not appear to be fully consistent with the data. An additional explanation is that the regions respond differently to common national events; there is evidence[33] that London and the South East are more responsive to changes in interest rates. One hypothesis is that households in these areas are more highly indebted than those in the North and are, therefore, more heavily affected by changes in interest rates. The continuing low level of interest rates is one possible reason why the South/North ratio, shown in Figure 2 has yet to be restored to the historical position.

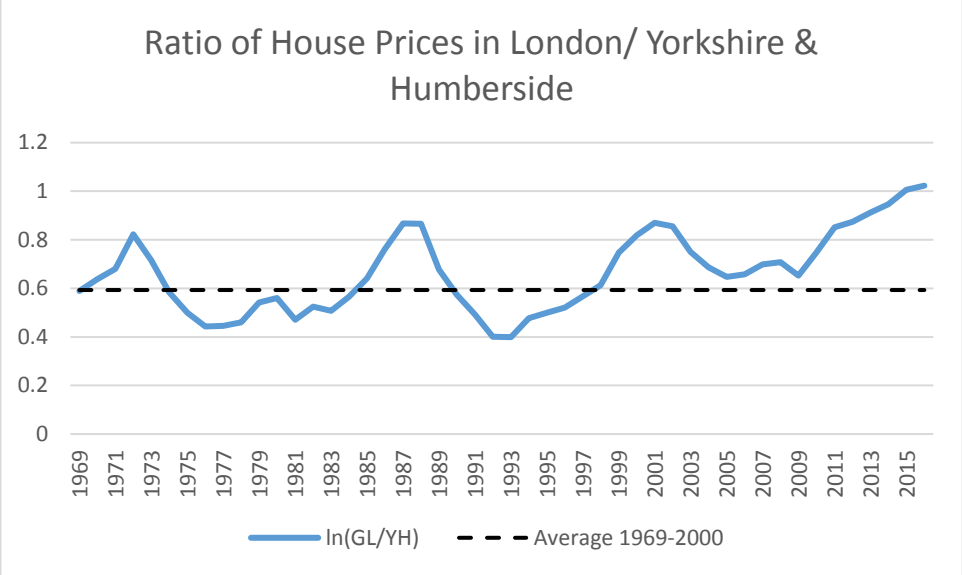


Figure 2. House Prices in London Relative to Yorkshire & Humberside (log scale), 1969-2016.

Source. Office for National Statistics

Spatial variations in regional house prices are not confined to the UK and the US provides a further example. Table 3 sets out measures of house price volatility, calculated for each of the US Census divisions; more precisely, the table shows the standard deviation of divisional house price growth rates between 1992 and 2017, ranking each division by order of volatility. The feature that stands out is that the four divisions experiencing weaker volatility than the US average lie in the Mid-West Census Region and parts of the South and are located away from

[33] See Meen (1999); the result still holds in an updated unpublished study.

the east and west coasts; by contrast the West and North East Regions and the South Atlantic Division (which includes Florida) are much more volatile. Florida was, in fact, the first area of the US to experience a residential housing market crash in the 1920s[34]. Restricting the estimates to the pre-GFC period, reduces volatility in all divisions, but does not fundamentally affect the rankings, although New England rises to second place.

Table 3. Volatility in US House Prices: Census Divisions, 1992-2017(Standard deviation of nominal annual house price growth rates)

Division	Volatilty 1992-2017
Pacific	9.52
Mountain	6.78
South Atlantic	5.80
New England	5.46
Middle Atlantic	4.64
USA	**4.60**
East North Central	3.54
West North Central	3.03
East South Central	2.82
West South Central	2.35

Source. Federal Housing Finance Agency

The rankings in Table 3 are correlated with measures of local land use regulation[35]. The Wharton Residential Land Use Regulation Index indicates that coastal areas are the most heavily regulated, particularly in the North East, followed by the Pacific coast, notably California. By contrast, states in the South and Mid-West are less highly regulated than the average. The role of land-use planning in restricting supply and the effects of controls on prices has generated a large literature and considerable policy debate on both sides of the Atlantic.

Rents and their relationship to house prices

The relationship between house prices and rents gives rise to an important debate about whether housing shortages exist or not; the conventional wisdom has been that severe shortages exist, aided by the constraints of the planning system, evidenced by strongly rising

[34] See Fisher (1933), Simpson (1933).
[35] See Gyourko et al (2008).

real house prices. This has been challenged by the observation that real rents (which reflect the demand for and supply of housing services) have shown little increase. In principle, these can be reconciled by the fact that standard theory predicts that house prices are expected to be determined by the discounted present value of the future rental stream and many housing models work on this assumption; this establishes a link between ownership (including the demand for housing for investment purposes) and renting. Therefore, under this view, the fall in rents relative to prices reflects a rise in investment demand rather than an underlying shortage, fuelled by the low returns on alternative financial assets. Furthermore, since housing benefit payments are affected by the level of market rents, there are links to social housing and wider public expenditure issues. Therefore, none of the sectors – and indeed the macro economy - are independent.

Market commentators have closely examined changes in house prices relative to rents and the OECD regularly publishes estimates of the ratio across a wide range of countries; in the British case, data are available from 1970. Prices rose sharply relative to rents, on the OECD measure, from the mid-1990s until the Global Financial Crisis, but Britain was not alone; this has sometimes been taken as an indicator that house prices were overvalued and a crash was in prospect. However, the overvaluation hypothesis is invalid if the discount rate was falling and Figure 1 provides some evidence that this was the case over this period. However, historically in Britain, time-series rental indices have been limited in their usefulness, particularly before the final removal of rent controls and the establishment of a private rental market of sufficient size to provide more reliable information; now, approximately 20% of households are private renters, but only half this proportion were renters in the mid-1990s. Therefore, there is still limited information which can be used to examine the relationship between house prices and rents, but the introduction of the Index of Private Rental Housing Prices in 2005 in its current form was a step forward; the index grew on average between 2005 and 2017 by approximately 2% per annum, whereas house prices grew by 3%, although the latter was affected by a fall during the GFC.

Some additional evidence can be obtained from examining rents across households at a particular point of time, although, by its nature, a cross section does not necessarily represent a market equilibrium. The English Housing Survey for 2015/16 provides the information on rents (and other property and household variables), whereas the Land Registry provides data on the prices of individual properties, disaggregated between terraced, detached, and semi-detached houses and flats. The relationship between rents and house prices, expressed as a ratio, provides an estimate of the yield in the private market and, hence, the willingness to

supply rentals including in the Buy-to-Let sector. Non-market transactions are excluded in our estimates, but the sample still includes a range of rentals aimed at both the top and bottom ends of the market. In line with the companion paper, we concentrate on properties in the South East and the North East to provide a contrast. However, the yield is, by no means, the same across different types of properties or market segments. Furthermore, rents are likely to be affected by the length of time the tenant has been in occupation, since good tenants reduce voids and minimise maintenance expenditures. The rent may also be affected by the status of the tenant reflected, for example, in income, employment position and household size.

A problem, however, is the measurement of house prices; since we do not know the exact location of each household in the EHS – only the region in which they live – regional house prices, disaggregated by property type, are used as a proxy. The likely measurement errors are expected to lead to an under-estimate of the effect of house prices on rents[36]. Nevertheless, the details in Appendix 1 show that there is a statistically significant relationship between the two variables and, so, the relationship between tenures is established, even if the size of the effect is understated.

[36] This is a standard errors in variables problem, which leads to a downward bias in the estimated coefficient.

Section 2: Policies to improve affordability

Approaches to housing policy

Understanding the causes of changing affordability is a pre-requisite but, in itself, does not provide a solution. At best, it reduces the chances of moving down inappropriate policy paths. It is, however, clear that there is no silver bullet, nor easy solutions that can be adapted from other countries; as we shall see, increasing housing supply remains important to improving affordability, but alone it can only achieve so much. From the last section national monetary policy is crucial. Demand-focussed policies also play a role and it is unfortunate that the two stances are sometimes seen as alternatives rather than complements. Furthermore, there is an additional "policy inaction" option, which relies on the market alone; this perhaps Panglossian view[37] relies on the idea that there are in built stabilisation mechanisms. Each is discussed in turn. However, first, we need to be clear about what we mean by improving affordability; we do not mean either a sudden or sustained reduction in house prices since this would undermine the asset bases of financial institutions and households, with wider macroeconomic consequences (although there may well be a case for a more gradual reduction over longer time periods). Nor do we necessarily mean a situation in which house prices rise at the same rate as general inflation to maintain constant real house prices; rather we are concerned with the definitions in the companion paper on affordability measures; an improvement in affordability implies lower levels of stress and improved access to home ownership as measured by the Gini coefficient.

The next section considers housing supply policies and provides quantitative evidence on what can be achieved by an expansion of market supply alone and, therefore, brings in the role of affordable housing. We, then discuss demand policies, including taxation and the idea that some (typically older) households are over-consuming housing; it considers the feasibility of encouraging these households to down size, releasing larger homes for younger families. The following section turns to wider macroeconomic policies and their effects on affordability, recognising that affordability is not only about the cost of housing, but also access to finance; therefore, it discusses initiatives such as Help to Buy, which are primarily concerned with reducing deposit constraints and also the influence of changes in the income distribution. Then we turn to "policy inaction" approaches, including the role of market stabilisers. Unusually,

[37] See Evans (1998) for a discussion related to planning.

changes in household formation and first-time home ownership are considered as a form of market adjustment; these become an outcome of market processes as much as a driver of the market.

Improving affordability through increasing housing supply

At one level it appears obvious that, if affordability is worsening, then there must be a housing shortage and, so, increasing housing supply is the optimal response. Therefore, policy needs to eliminate any constraints on increasing supply and, since the publication of the Barker Review of Housing Supply[38], land-use planning has been the focus of attention. The proposed 2018 reforms to the National Planning Policy Framework set out in draft Planning Practice Guidance include an approach by which all local authorities are required to incorporate affordability indicators (based on median house price to earnings ratios) into local needs assessments. More radical proposals have argued that presumption in favour of land development should be triggered when land prices exceed a threshold, unless a public interest can be demonstrated[39]. It also appears to be the case – Table 3 provides an example for the US – that those areas where land-use regulation is strongest experience larger and more volatile house price changes, although some caution is needed in applying results for large countries, such as the US, directly to the UK .

The key variables that explain the number of housing starts[40] are (i) the volume of housing transactions, (ii) whether the market exhibits excess demand or supply, (iii) borrowing and construction costs, (iv) the level of house prices. Of the four influences, the level of house prices is, perhaps surprisingly, the least important quantitatively. Furthermore, housing starts are strongly related to the rate of house sales, measured by transactions[41]. Our empirical research indicates that, faced with an external shock to the market, housing transactions change first, then housing starts and, finally, house prices. Prices are generally a lagged indicator of the state of the market. In addition, the price elasticity of housing supply in Britain is low compared with many countries – the consensus is less than one, so that a one percent increase in house prices raises construction by less than one percent.

[38] See Barker (2004).
[39] Cheshire and Sheppard (2005).
[40] See Ball et al (2010).
[41] See Lyons (2014), Figure 16.

The Barker Review provided estimates of the required increase in housing supply that would be necessary to reduce the rate of growth of real house prices to European average levels. The headline figures suggested a doubling of output would be necessary from the levels at the time; this would not be just a temporary change but a permanent shift on a scale that had rarely been observed historically[42]. Since the late 1960s, private starts have exhibited considerable volatility but no permanent upward shift[43]. These conclusions were later broadly confirmed in more detailed empirical analysis[44]. Arguably, the origins of the Conservative government's commitment to annual net additions to the housing stock of 300,000, made in 2017, dates back to this result. To stress the point, in order to have a significant effect on affordability – however it is measured - increases in supply have to be long-lasting and large, but this does not imply that they are unimportant; it simply emphasises the scale of the problem and the policy changes (including to planning) that would be needed. Most reports that advocate supply increases as the solution fail to provide quantitative estimates of the necessary changes or to consider adequately the feasibility of the changes. As a guide, a 50% increase in the number of housing starts in England for ten years compared with current levels might improve affordability, measured by the price to income ratio, by about one point[45]. But even increases of this magnitude could not bring price to income ratios back to the levels experienced, for example, in 2000; in that year the median house price to earnings ratio in England stood at 4.2 compared with 7.9 in 2017. As discussed in the companion paper, this heavily reflects the weaknesses of the price to earnings ratio as an affordability indicator, because the rise between the years has occurred from the capitalisation of low interest rates into prices. This also suggests it is not possible to return this affordability indicator to the equilibrium level implied by the new National Planning Policy Framework (4.0) by increases in supply alone, because the current value reflects interest rates as well as supply shortages.

In summary, the argument is not that there is no role for increases in market housing supply – indeed it is an important part of a portfolio – but increases in market housing alone are unlikely to overcome the affordability problems faced by either low-income households or potential first-time buyers, because general supply increases do not drive prices down sufficiently. As an illustration, across the South East, even a 20% fall in house prices would

[42] Post First and Second World War expansions provide exceptions, but both periods included significant public sector involvement, including slum clearance programmes.
[43] Meen et al (2016), show that the last permanent upward shift took place in the 1920s.
[44] See Meen (2011)
[45] See Meen (2011, Figure 1b).

only reduce the Gini coefficient from 0.74 to 0.6; 50% of renters would still not be able to afford to purchase properties even in the cheapest property decile.

From the companion paper, for those who receive housing benefit, housing stress is limited even in the lower income quintiles. Therefore, for those able to obtain affordable homes in the social sector, given the existence of support, stress is not, in itself, an issue. The problems arise from, first, access to low-cost, decent housing and, second, the wider macroeconomic consequences of benefit payments. The policy response to the latter has been to reduce eligibility and levels of support. Housing benefits paid to low-income households in the private and public rented sectors constitute the largest class of housing current subsidies paid in Britain and amounted to £24 billion in 2015/16. Despite attempts in recent years to reduce the benefits bill, the total has remained stubbornly high and the Government's expenditure plans show little prospect of a future significant fall. An evaluation of the recent restrictions on benefit receipts lies outside the scope of this paper[46], but the companion paper implied that restrictions on benefits are associated with a rise in housing stress. The removal of the Spare Room Subsidy in April 2013, for example, has received considerable attention and the policy was accompanied by a reduction in households affected from 547,000 in May 2013 to 465,000 eighteen months later, a fall of 14.2%[47]. In fact, the proportion of social tenants "under occupying" housing on official definitions had been falling since the early years of the century; the English Housing Survey shows that the proportion of social tenants who exceed the census bedroom standard and were "under-occupying" (we criticise the use of this term below) had fallen to 10% in 2015/16. By contrast, the number and proportion of under-occupying households in ownership increased between 1995/96 and 2015/16 from 39% (5.3 million households) to 52% (7.4 million households). So, more than half of owner-occupied dwellings are under-occupied on official definitions. We return to over-consumption by owner-occupiers below.

There is now a wider recognition that the trickle down benefits from a general expansion in market housing are insufficient[48] to improve conditions for low-income households; indeed the problems are not confined only to those on low incomes, but also affect those on median incomes and it is hard to reach any other conclusion than that an expansion of social or

[46] See, for example, Department for Work and Pensions (2015) for an evaluation of the removal of the Spare Room Subsidy.
[47] Department for Work and Pensions (2015).
[48] See, for example, House of Lords (2016).

affordable housing needs to play a role. Remaining resistance to an expansion is not primarily ideological, but arises from concerns with methods of public finance[49] and the possibility that an expansion might crowd out private housing since the sectors compete for resources[50]. Figure 3 shows housing completions since the Second World War split between the private sector and housing associations/local authorities; after the ending of private building controls in the 1950s, private completions have exhibited no trend, although considerable volatility, but there has been a major decline in local authority construction since the 1970s, not fully compensated by a rise in housing association building[51]. These changes are well known, but slightly misrepresent the levels of affordable housing since the private sector figures include homes built under Section 106 agreements and other initiatives.

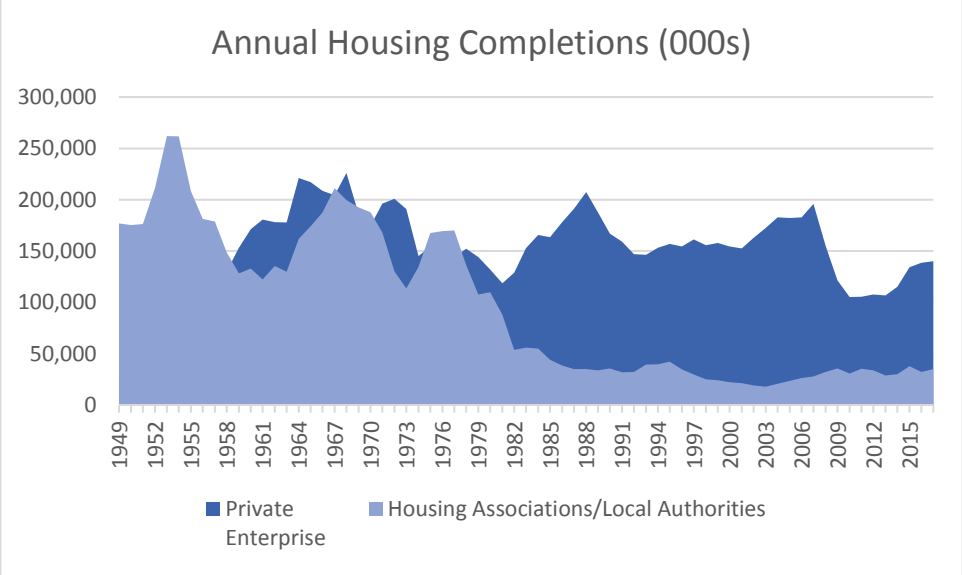


Figure 3. Private Sector, Housing Association and Local Authority Completions (GB, 000s). Source: ONS.

Affordable homes are officially defined in accordance with the 2012 National Planning Policy Framework as: “housing units (or traveller pitches and bed spaces when describing a shared dwelling such as a hostel) provided to specified eligible households whose needs are not met by the market”. Table 4 shows the distribution of affordable homes completed in 2016/17

[49] Issues of public finance are outside the scope of this paper.
[50] Australia, for example, has undergone a similar debate; see Gurran et al (2018), for a recent enquiry into strategies for increasing affordable housing supply.
[51] Figures in the immediate post-war period over-estimate the increase in available housing supply because of slum clearances and so the net increase in the housing stock was less than the gross supply.

across the range of products available for renting or purchase; figures for 2008/9 are added for comparison. The table shows the importance of Section 106 agreements for affordable housing delivery, amounting to more than 40% of the total in 2016/17 and was the primary vehicle, except for affordable rental properties, where grant funding is provided through the government's Affordable Homes Programme. Since 2011, this has been the main source of affordable housing supply and rents are subject to controls, limiting them to 80% of the local market rent. The table also shows the decline in social rented housing from local authorities and private registered landlords where target rents are determined through the national rent regime.

Table 4. Affordable Housing Completions (Nos). Source: MHCLG, Table 1000c ,

Affordable Housing Supply: April 2016 to March 2017 England

	2008/9	**2016/17**	**2016/17: of which Section 106**
Social Rent	30.900	5,900	2,750
Affordable Rent	-	24,390	8,060
Intermediate Affordable Housing of which:	24,600	11,940	7,410
(i) Intermediate Rent	1,710	970	750
(ii) Affordable Home Ownership	22,900	2,060	1,170
(iii) Shared Home Ownership	*	8,910	5,490
Total Affordable Housing	55,500	42,230	18,220

* Included in Affordable home ownership in 2008/9

Table 4 indicates the importance of shared ownership schemes, but, in practice, these are generally not taken up by households at the bottom end of the income distribution and Figure 4 shows why. This repeats the Lorenz Curve, Figure 4a from the companion paper, but in this instance under 50% shared ownership and a rent equal to 3% of the capital value, rather than outright ownership. Although the Gini coefficient falls to 0.48 under shared ownership for potential owners in the South East from 0.74 under outright ownership (0.32 and 0.58 for the North East respectively), the figure still finds that those in the bottom half of the income distribution cannot afford even homes in the bottom decile of the price distribution if their housing costs are to remain under 30% of household income. The number of households

identified as shared owners in the 2015/16 English Housing Survey is small[52] but almost all are in the top three income quintiles[53]. Samples in the Family Resources Survey are slightly larger and broadly support the same conclusions. Furthermore, shared ownership appears to be concentrated on the South and Midlands. The possibility, therefore, arises that shared ownership may have been attractive to households bringing forward ownership, rather than permanently raising the level.

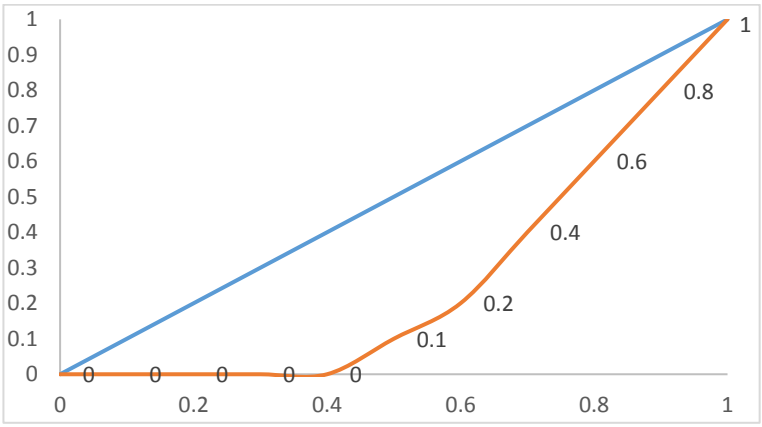


Figure 4. Lorenz Curve for Potential Purchasers in the South East under Shared Ownership.

Horizontal axis: cumulative percentage of households. Vertical axis: cumulative percentage of house prices

There is, therefore, clearly still a role for rental housing directed towards those in the lower part of the income distribution; however, as noted above, one objection has been in terms of possible crowding out. The crowding out of private construction by public housing may arise from two sources; "old style" crowding out arises from competition for resources (both for land and other factors such as skilled labour and finance) between the two sectors, particularly at times of full employment. However, from Figure 3, the supply of social housing has been weak since the late 1970s and there is no econometric evidence that public housing has led to reduced private construction. In fact, the two variables appear to be positively related[54]. This is not to say that crowding out can never occur – and there is international evidence to support this – but it is less likely to be significant at current levels of output. The second source arises from the requirement to provide social housing under Section 106 agreements, which reduces

[52] In fact only 44 households nationally had become shared owners since 2006 in the sample.
[53] Note that income quintiles in the sample refer to 2015/16, rather than the year in which the mortgage was taken out and, therefore, may overstate the position for some households.
[54] One test is to add social housing starts to the relationship explaining private starts discussed earlier. This suggests that since 1978 an increase in public starts may have *raised* private starts.

the profitability of private developments, an issue addressed through viability assessments, which may lower the social provision in such cases[55]. But, overall, there is little evidence that the construction of affordable rental housing negatively affects private house building.

Reducing housing demand

Table 5 sets out the forecasts of annual house price growth made by the Office for Budget Responsibility (OBR) since November 2016; the reduction in expected house price inflation – particularly since November 2017 – is evident. But these reductions are not associated with an expected improvement in housing supply; rather they reflect low productivity in the economy and, therefore, weak real wage growth. In the March 2018 OBR forecast, real wages are projected to rise by under 1% per annum between 2018 and 2022. Since Section 1 suggests that the income elasticity of house prices is approximately 2.5, then most of the change in projected house prices can be attributed to earnings. Alternatively, this is a further reflection of condition (2), which stresses the importance of demand, as reflected primarily in income growth, as a driver of house prices.

Table 5. Office for Budget Responsibility Forecasts for House Prices (annual % change)

Forecast made in …	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
November 2016	7.8	4.0	4.1	4.6	4.7	4.7	n.a.
March 2017	7.6	6.5	4.0	4.4	4.5	4.6	n.a.
November 2017	7.0	4.4	2.9	2.9	2.9	3.3	n.a.
March 2018	7.0	4.8	3.7	2.7	2.2	2.4	2.9

Changes in demand arise from two sources; first from new household formation (which is a *flow*) and, second, from the requirements of existing households (which is a *stock*). Between the last two censuses, approximately 160,000 net new households were formed each year in England, but there are more than 23 million existing households, so potentially policies that

[55] These are controversial; see Crosby and Wyatt (2016) and Sayce et al (2017).

affect the latter have a greater impact than those directed at the former. Therefore, increasing attention has been paid to the extent to which current households – particularly older households – are deemed to under-occupy housing and the policies that might be implemented to induce “right sizing”. On this view of the world, there is a mismatch between household size and the quantity of housing services consumed. The most commonly used measure is a bedroom standard. The bedroom standard is an indicator of the density of occupation in a dwelling and is calculated for each household according to its size and composition. This notional standard number of bedrooms is then compared with the actual number; households are considered as overcrowded if they have fewer bedrooms available than the standard, but under-occupying if they have two or more bedrooms above the notional value. Table 6 summarises the trends in under-occupation since the mid-1990s. As noted above, whereas under-occupation has fallen in the social sector, under-occupation has risen sharply amongst owners. Further analysis of the English Housing Survey indicates that a higher proportion of owners over the age of 60 are under occupying than across all age groups. 67% of owners over the age of 60 have two or more bedrooms above the standard.

Table 6. Under Occupation by Tenure (% of households)

	Owner Occupiers	**Private Renters**	**Social Renters**	**All tenures**
1995/96	39.4	18.4	12.1	**31.2**
2000/01	42.8	16.6	12.7	**34.1**
2005/06	46.6	18.2	11.5	**36.7**
2010/11	49.3	15.5	10.0	**36.9**
2015/16	51.9	14.4	10.0	**37.2**

Source. English Housing Survey, 2015/16

Nevertheless, considerable caution is needed in concluding that affordability can be improved by downsizing older households. One view is that this group would welcome downsizing, but is prevented from doing so by the absence of suitable smaller accommodation that meets their requirements. Furthermore, they are dissuaded by the transactions costs, notably stamp duty

land tax, and attachment to their current properties[56]. In 2015/16, approximately 40% had been in their properties for more than 30 years. An additional perspective is that older households have little incentive to move while their health remains good; measures of under-occupation are based on household size, but actual consumption is a market outcome reflecting the incomes of the households and the costs of housing. In 2015/16 only approximately 10% of owners over the age of 60 had any mortgage payments and, so, their only housing-related expenditures consisted of fuel and maintenance costs and council tax payments. Furthermore, approximately 60% had incomes in the top three income quintiles and, on retirement, households are likely to spend more time in the family home, providing an added reason for wanting more space. Therefore, an unwillingness to move is a rational market response, particularly in the light of low returns on alternative financial assets, where released housing equity might be re-invested.

Although sample sizes are modest in the EHS, there is little evidence that the over-60s who do move, in fact, downsize significantly; in 2015/16 of the over 60s who had been in their current property for two years or less, more than half were still occupying at two or more bedrooms above standard. In fact, the freeing up of properties in the older age groups arises primarily from mortality and this heavily outweighs that arising from movers under existing incentive structures. In summary, it is unsurprising that downsizing is modest since home ownership is a market where movers respond to incentives: for most older households the current costs of ownership are low; incomes are generally adequate; the probability of moving falls with age and the young are typically more mobile; home owners are less mobile than renters across all age groups; the returns on alternative financial assets are low and it is not necessary to move home to release equity; attachment to home is strong; transactions costs are significant; and there is a shortage of suitable alternative accommodation. This all suggests that changes to incentive structures would need to be strong to overcome the inertia. Two interlinked proposals are sometimes suggested – the removal of stamp duty to encourage mobility and an enhanced form of property taxation, for example, an extension of council tax or an annual land value tax, designed to raise housing costs in the most expensive areas[57].

[56] See House of Commons (2018, Chapters 4 and 5).
[57] The House of Commons Communities and Local Government Committee (2018), rejected proposals for stamp duty exemption for older households. One reason was that stamp duty for most owners would be covered by the released equity from their homes.

A further CaCHE study will consider aspects of property taxation in more detail but, as an illustration, Table 7 looks at the effects of the introduction of an annual property tax in England equal to 0.5% of market values. By contrast, under the current council tax system, houses are divided into eight property bands (A-H), based on valuations in 1991 and one of the criticisms of the present system is that no uprating has taken place since that date. However, some assumptions are needed; the Family Resources Survey for 2016/17 provides information on the council tax band for each property in the survey, but not the property value itself. Therefore, we take the midpoint of the band and increase valuations from 1991 to 2016/17 using regional house price indices. This, therefore, assumes that all properties within each region increase at the same rate, rather than using measures that vary by property type. The 0.5% tax rate is then applied to each house; the rate is arbitrary, but different rates affect the absolute values rather than the distributions, which are our main interest.

Table 7 sets out the average percentages of gross household income that would be spent on the notional property tax at 2016/17 house prices and incomes, assuming the household does not move. The table shows the distribution by age group and by region and refers only to those currently buying with a mortgage or outright owners and so excludes renters.

Table 7. The Effects of the Introduction of an Annual Property Tax in England (% of gross household income). Distributions by Age and Region.

By Age Group				By Region		
Age Group	**% of Gross Household Income**	**Sample Size**		**Region**	**% of Gross Household Income**	**Sample Size**
25-34	2.9	655		**North East**	3.1	454
35-44	3.3	1298		**North West**	4.0	1271
45-54	3.7	1692		**Yorks & Humber**	3.7	922
55-59	4.4	822		**East Midlands**	4.4	837
60-64	5.9	830		**West Midlands**	4.2	958
65-74	6.6	1863		**East**	5.9	1023
75 and over	8.5	1500		**South East**	6.9	1481
				Greater London	8.7	775
				South West	5.9	966

The first part of the table suggests that the tax percentage would rise with age, at least on average. Since the older age groups are paying little in terms of mortgage costs, the tax redresses some of the imbalance in housing costs. However, the averages disguise a wide dispersion; taken at face value, some households own very expensive properties relative to their incomes. These are often outright owners – but not necessarily older households – who would be hit heavily by an annual property charge; approximately 1.5% of the sample would be estimated to pay more than 25% of their incomes on the tax and a large majority of these are outright owners with approximately 80% over the age of 55. The second part, as expected, indicates that the southern regions, notably London, would face considerably higher charges than the North, reflecting the differences in property values, whereas this is not necessarily the case under the current council tax structure, where charges are not proportionate to property values. Since property taxes are a part of the user cost of capital (see Section 1), the expectation is that the tax would both reduce the level of house prices and narrow the regional dispersion.

Importantly, the tax is likely to raise considerably more than the current council tax. However, the aim is to improve the efficiency and equity of property taxation, rather than raise the overall yield. Potentially, the increased yield provides scope for further reform of transactions taxes, such as stamp duty, which reduce household and labour mobility. More generally, the yield may be used to provide support for those most heavily affected by the change.

Some home owners also have second homes; in many cases these are temporary arising from moving or from inheritance, but homes held for investment or holiday purposes are more permanent and add to overall housing demand. As noted in Section 1, one of the defining features of the period since the mid-1990s has been the recovery of the private rental market, fuelled by Buy-to-Let mortgages, which has doubled in size and 20% of households are now housed in the sector. In principle, we should expect purchases for investment purposes both to increase the level of house prices and their volatility; this is because accumulated equity in existing homes can be used to finance the purchase of additional properties and this creates a form of financial accelerator[58]. Since potential first-time buyers have no accumulated equity – and, indeed, as discussed below, have faced high deposit requirements – they are at a disadvantage relative to investment buyers. But, in fact, at the aggregate national level, it is difficult to discern a clear effect from the rise in the Buy-to-Let sector on house prices. As

[58] See Meen (2013) for a formal model that demonstrates the increase in volatility.

noted in Table 1 the parameters of the relationship determining house prices have been remarkably stable over time and there is no evidence of structural change since the mid-1990s.

Nevertheless, there is evidence from micro data that the demand for second homes is sensitive to income and other variables. The most recent information on the reasons for holding second homes comes from the 2013/14 English Housing Survey. Of the sample of 13,276 households, approximately 9% had a second home; of these 90% had only one or two properties. Those with additional homes gave the following motives:

A property recently bought for occupation that not moved into yet	23
An empty property that you plan to sell in the near future	78
For occupation while working away from home	24
Mainly let to others as a holiday let	34
Mainly used by family and friends as a holiday home/weekend cottage	151
Occupied by someone as their main residence	**798**
Occupied by student son/daughter whilst as college/university	13
Other	54
Total (numbers)	1175

So 68% were “occupied by others as a main residence”; although there is no information on the proportion that is financed by Buy-to-Let mortgages, this might be taken as a measure of the investment market. Using the 2013/14 sample, it is possible to estimate the probability of owning at least one additional home, excluding those homes which are held only for transitional purposes. The key influences turn out to be the current tenure of the household, location, income and age. Unsurprisingly, those renting from the social sector had a lower probability of owning a second home; the likelihood is greatest for households living in London and the South East; the probability increases with age, but falls in the oldest groups; and those in the highest income quintiles have a much higher probability of second home ownership. The analysis can be repeated on data for 2008/09 and, although there are qualitative similarities, there are also distinct trends. As examples, Table 8 shows the probability of second home ownership for a range of household types, varying by age, tenure, location and income. First, the probabilities are uniformly lower in 2008/9; the fact that this was during the GFC may be part of the explanation, but it also shows that the advantages to the rich (through both income and tenure) have increased over time. Whereas those at the bottom of the income distribution and living in council housing continue to have a zero probability of having a second home, the probability for an outright owner in the top income quintile has increased from 27% to 35% over five years. The age that maximises the probability is around 50.

Table 8. The Probability of Owning a Second Home (2008/09 and 2013/14) for Selected Household Types.

	2013/14	**2008/09**
50 year old head, living in council housing, in bottom quintile, 1 earner, 2 person household, living in South East	0.007	0.006
50 year old head, outright owner, in top quintile, 1 earner, 2 person household, living in South East	0.349	0.270
40 year old head, outright owner, in top quintile, 1 earner, 2 person household, living in South East	0.300	0.237
75 year old head , outright owner, in top quintile, 1 earner, 2 person household, living in South East	0.236	0.156
50 year old head, outright owner, in top quintile, 1 earner, 2 person household, living in North East	0.248	0.198

The growth of the Buy-to-Let market has come under increasing scrutiny from government and the Bank of England, particularly because of concerns with macro stability. Figure 5 shows the growth in the share of gross mortgage advances going to Buy-to-Let investors since 2007 and adds the share of loans to first-time buyers for comparison. Although the share fell sharply during the GFC, it steadily recovered until early 2016, approaching the quantity of loans for first-time buyers; however the investor loan share peaked with a spike in the first quarter of 2016, before the introduction of phased restrictions on the tax deductibility of mortgage interest payments for Buy-to-Let investors and the addition in April 2016 of a three percentage point stamp duty rate surcharge for these and for second home owners generally. The fall in advances (and the recovery in the first-time buyer share) is evident in Figure 5. Nevertheless, the *stock* of loans to Buy-to-Let investors has not fallen, suggesting that, although further expansion might be discouraged, those already in the market are not necessarily attempting to seek other investments.

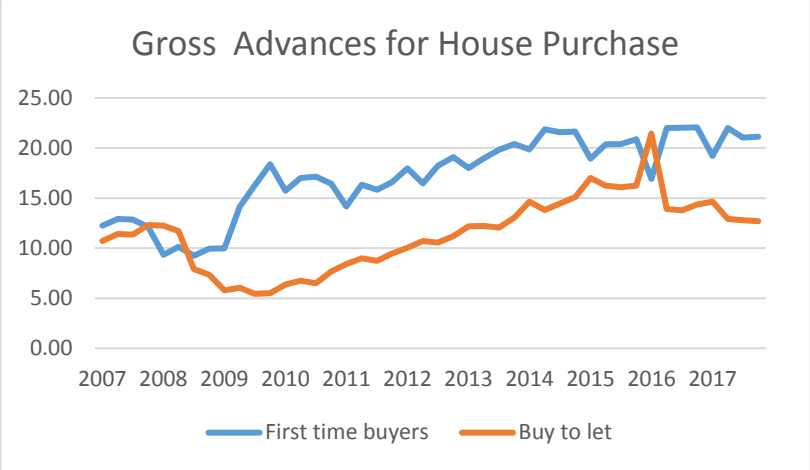


Figure 5. Mortgage Advances to Buy-to-Let Investors and First Time Buyers (% shares of total). Source: Bank of England/FCA MLAR Statistics.

Macroeconomic policies and issues

In practice, general monetary policies are likely to have as large, if not larger, effects on housing than direct housing policies, both through changes in interest rates and through the availability of finance. This can be seen through the user cost definition. A particular issue is the consistency of policies aimed at general inflation targets and macro stabilisation with housing market equilibrium. As noted in Section 1, the literature in the early 1980s established that high rates of inflation, coupled with tax advantages to owner occupation, favoured existing owners, relative to first-time buyers. Therefore, it is the case that a monetary policy that maintains low inflation is beneficial to new buyers; but there are other instances where there may be a conflict. One possible case comes from controls on loan-to-value and debt-to-income ratios, which particularly affect first-time buyers.

Figure 6 shows the outstanding stock of mortgage debt relative to household disposable income in the UK, with the US for comparison. For the former, five distinct phases can be distinguished, related to institutional developments. In the first phase, which occurred until the early 1980s, the low debt ratio reflected the dominance of building societies, providing approximately 80% of the mortgage stock and operating under a cartel arrangement, which, typically, kept mortgage and deposit interest rates low, but also led to mortgage rationing to households. The second phase, lasting until approximately 1990 shows the rapid growth in lending as the market was liberalised and shortages disappeared. From this period until the Global Financial Crisis, mortgage shortages were not generally a feature of the market. The third phase from the early to mid-1990s was a period of recession, but the long-term nature of

mortgage contracts meant that the debt stock did not fall significantly; households could only reduce debt by selling their properties, (but both house prices and transactions fell in this period) or by early repayment of principal (which is difficult for many households during a recession), or by default and, indeed, default rates reached levels never seen before or since. In the fourth phase, with the recovery of the economy, debt relative to income again rose sharply until the GFC; in the fifth phase, since 2008, debt for the first time fell, although the decline was noticeably weaker than in the US.

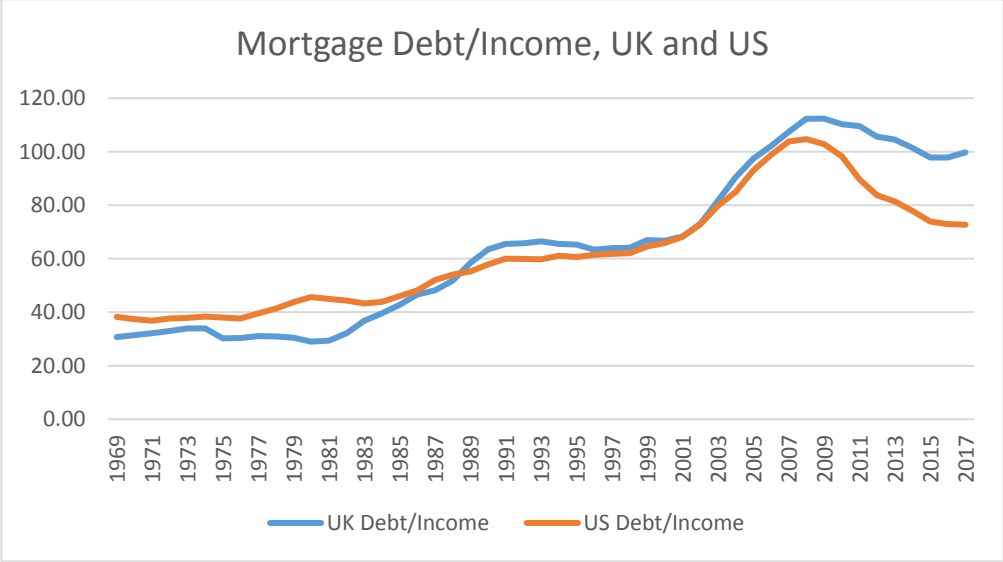


Figure 6. Mortgage Debt as Percentage of Household Disposable Income, 1969-2017. Sources: UK – Bank of England and ONS; US – Federal Reserve Board and Bureau of Economic Analysis.

But, even with a relatively modest decline in the debt *stock* to income ratio - the ratio still remains well above that at the start of the century – net mortgage advances expressed relative to the level of house prices (see Figure 7) have never recovered after the GFC. In fact, real net advances remain well below the level of the pre-liberalisation period of the 1970s.

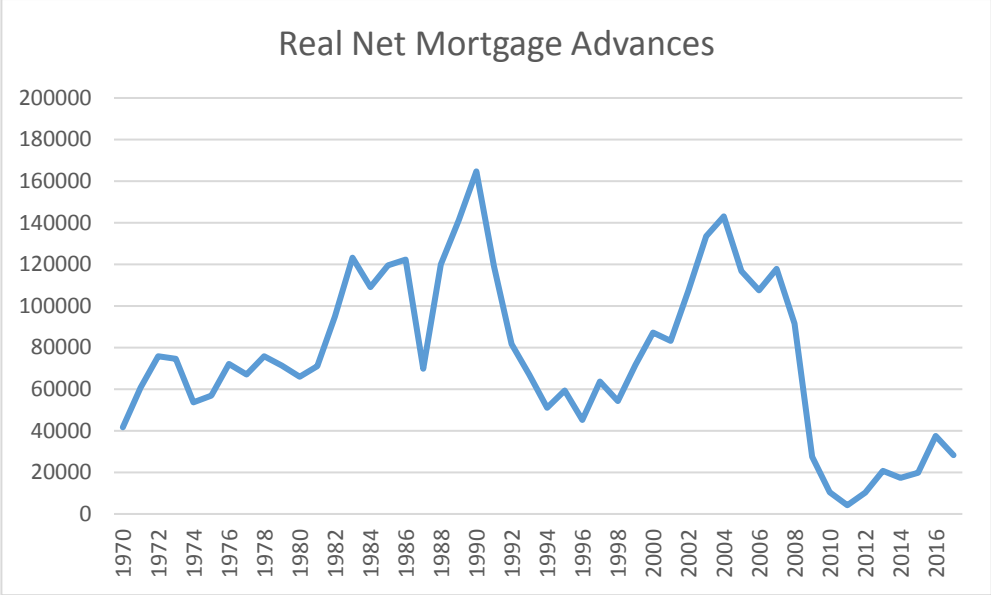


Figure 7. Net Mortgage Advances Divided by the House Price Index, 1970-2017, £m. Sources: Bank of England and ONS. (Net advances are derived as the difference between the mortgage stock in any quarter and the stock in the same quarter of the previous year).

This suggests a possible return to the era of mortgage shortages and, indeed, this is incorporated into the measure of the user cost of capital in Figure 1; one indicator of shortage is the deposit that purchasers are required to provide. Typically, deposit requirements do not provide a constraint for current owners moving upmarket because they are able to reinvest the equity in their existing property, but the deposit requirements for first-time buyers are more onerous; since the GFC the mean deposit for a first-time buyer has exceeded 25% of the purchase price. However, the aggregate indicator hides important underlying changes; those households most at risk of default are likely to be those taking out high value loans in proportion to incomes or the value of the property, those where household income is volatile or those where evidence of income is not provided when the loan is taken out. Since 2014 the Financial Policy Committee (FPC) of the Bank of England has had powers of Direction which currently limit the number of mortgages at loan to income ratios exceeding 4.5 to 15% of new mortgage lending. Standards for affordability stress testing in response to possible higher interest rates are also set out. Additionally, the FPC has powers over the proportion of loans exceeding loan-to-value limits, but these have yet to be used[59]. Importantly, the Directions are not intended to constrain current lending, but are an insurance against future fluctuations

[59] Controls also exist on the debt to income, debt to value ratios and the ratio of rent receipts to mortgage interest payments for Buy-to-Let investors.

in the housing and macroeconomic environments. Indeed, since the introduction of the controls, high value lending has remained well below the permissible levels and the historical norm and controls appear to have had only a modest impact on lending, given the tightening of lenders' own underwriting standards. In 2007, before the GFC, the proportion of regulated residential loans for which households were not required to provide evidence on their incomes[60] exceeded 20% of the total; in 2017 the proportion was close to zero, but the share was already beginning to fall by 2009. Furthermore, in 2007, approximately 4% of loans both exceeded 95% of the purchase price and 3.5 times the income of single borrowers (2.75 times the incomes of joint borrowers), but these loans had almost disappeared by 2009 and have never recovered[61].

Arguably, the cost of macro stability has been weaker access to credit for first-time buyers and the thrust of direct housing policy has been to mitigate the deposit constraints; for those who can achieve ownership (or have family support) the costs, in terms of mortgage repayments, are not high by historical standards, but access is constrained by the inability to raise sufficient finance. Help-to-Buy schemes attempt to provide support. In addition to the Shared Ownership schemes discussed above[62], those introduced since 2013 include Help-to-Buy equity loans, Help-to-Buy mortgage guarantees (the scheme is now closed), and Help-to-Buy ISAs (which provide a government savings boost). However, equity loans are quantitatively the largest intervention; the scheme provides a government loan of 20% of the market value (40% in London) to purchasers of a newly-built home. Approximately 80% of loans have been taken up by first-time purchasers. The buyer is required to provide a 5% deposit and a primary lender the remaining 75% through a conventional loan (55% in London). By the end of 2017, almost 160,000 loans had been completed in England: 16% purchased flats, 23% terraced properties, 31% semi-detached homes and 30% detached houses. Therefore, purchases were, by no means, confined to the lower end of the market. In 2015/16, the median purchase price by first-time buyers under the scheme outside London (only 7% of participants were in London despite the higher limits) was almost £200,000, which was similar to the overall national median purchase price for all properties. In the same year, the median household income for first-time buyers under the scheme was more than £42,000 (£68,000 in London), although cumulatively from the beginning of the scheme, 26% of first-time buyers

[60] See Bank of England/FCA MLAR Statistics Table 1.31.
[61] Loans between 90% and 95% of the purchase price have shown a similar profile, but have experienced some recovery in recent years.
[62] Shared ownership schemes have a much longer history.

had incomes between £30,000 and £40,000 and 18% incomes between £20,000 and £30,000. However, the point is that equity loans are typically not taken up by those on the lowest incomes; as an illustration, using the results from the companion paper, a household with an income of £42,000 would have been able to afford a house in the sixth house price decile in the South East even under a conventional mortgage. Arguably, therefore, the effects on aggregate home ownership rates are likely to be modest, even though ownership may be brought forward and participants might buy larger properties in better areas[63].

This also highlights the importance of the income distribution; changes in affordability reflect labour market as well as housing market dynamics. Figure 8 shows that the incomes of young full-time employees have fallen relative to employees as a whole since 1997 (the first year for which the Annual Survey of Hours and Earnings is available). By 2017, earnings of the 22-29 age group were approximately 84% of the overall median. But using the earlier New Earnings Survey, there is evidence that the relative decline dates back to the early 1990s[64]. Since, from Section 1, the income elasticity of house prices is well in excess of one, the widening of the earnings distribution exacerbates the inability of younger age groups to achieve ownership.

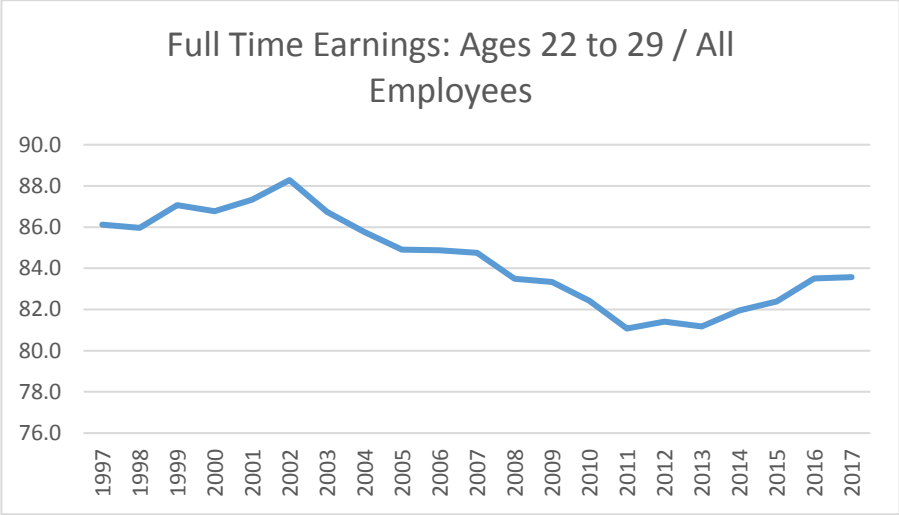


Figure 8. Median Gross Weekly Earnings of Full-Time Employees Aged 22-29 Relative to All Employees, 1997-2017. Source: Annual Survey of Hours and Earnings.

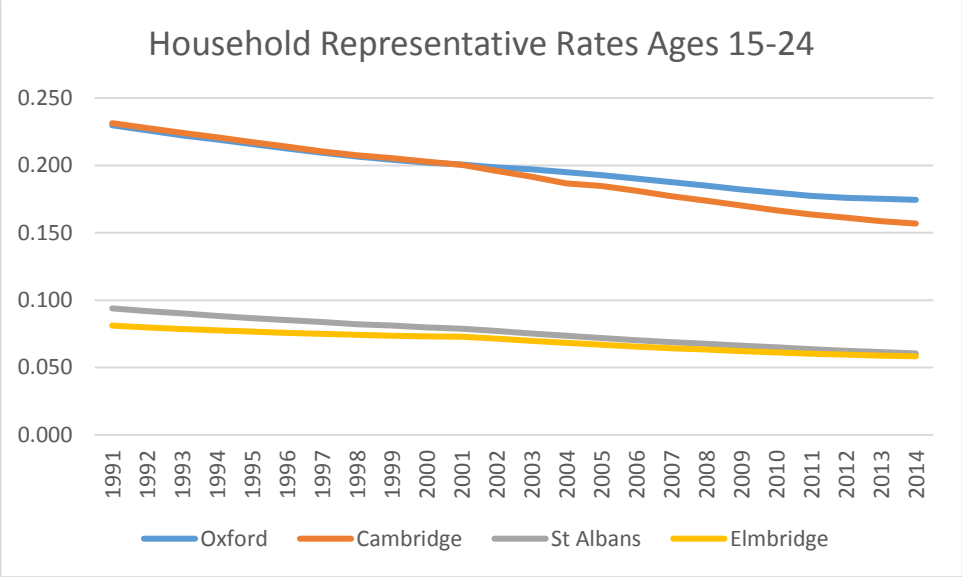
[63] See Finlay et al (2016).
[64] See Andrew and Meen (2003).

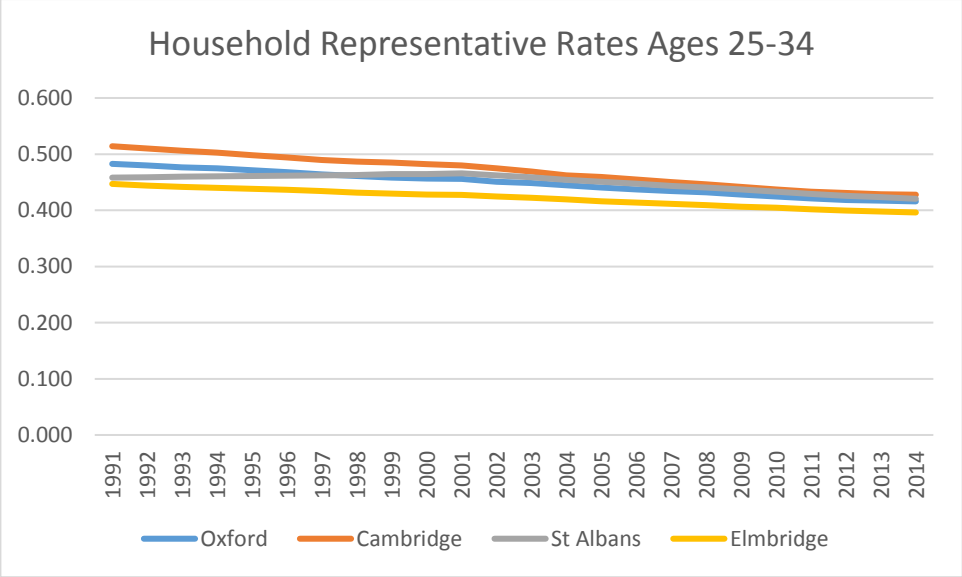
Market adjustments

Since housing is primarily provided by the market, the market will always provide solutions (even in the presence of planning constraints), but the question is whether those solutions are socially acceptable in terms of inequality or whether there are externalities for the economy as a whole, for example through possible effects on health or education. So far, we have said little about the impact of new household formation or the number of first-time buyers on affordability. This is because the two variables are just as much an *outcome* of the market process as a *driver* and contributes to an explanation of why both have fallen, particularly amongst the young, in recent years as affordability has worsened. Two further market adjustments also play a role in stabilising prices; first, housing risk, which is likely to increase at times of high house prices, may generate a fall in the market in response to external shocks. Second, household mobility across areas may provide a contributory explanation.

Figure 9 sets out the household representative rates (HRPs) for a selection of local authorities across England, for two young age groups 15-24 and 25-34, between 1991 and 2014; the latter year provides the base year for current household projections. Household representative rates are the proportion of each age group who are heads of households. The locations in the first two frames are chosen as the three most unaffordable cities, on the basis of median house price to earnings ratios in 2014, and the fourth, Elmbridge (a wealthy local authority in the southern county of Surrey), was the most unaffordable authority in 2014. As expected the 15-24 group has uniformly lower HRPs than the 25-34 age group, since more will still be living with parents or sharing; nevertheless, the declines in both groups since 1991 are striking. By contrast, the final frame suggests that major towns in the North and Midlands did not experience the same fall for the 15-24 group – the group which showed the largest fall in the first frame. The four locations shown in the final frame are all assessed as in the top twenty most affordable authorities. Therefore, *prima facie*, part of the market adjustment is that fewer young individuals form independent households where housing costs are highest, although the decline in the South is not new and has been underway since at least 1991[65].

[65] It might be argued that house prices are not the most appropriate measure for assessing household formation since households may rent and Section 1 indicates that rents have increased at a slower rate than house prices. But since, in equilibrium, rents may be proportional to prices (for a given nationally determined discount rate), relative house prices across locations may also provide information on relative rents. This argument is stronger in Figure 10, which looks at a single year. The trends over time in Figure 9 might also be affected, for example, by the expansion in higher education.


Household Representative Rates Ages 15-24
0.250
0.200
0.150
0.100
0.050
0.000
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
Oxford
Cambridge
St Albans
Elmbridge


Household Representative Rates Ages 25-34
0.600
0.500
0.400
0.300
0.200
0.100
0.000
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
Oxford
Cambridge
St Albans
Elmbridge

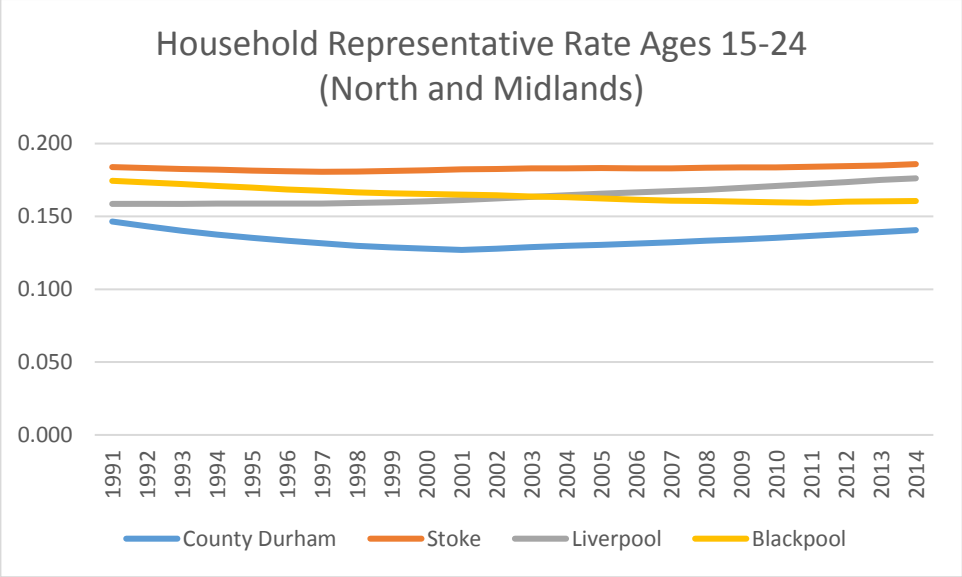
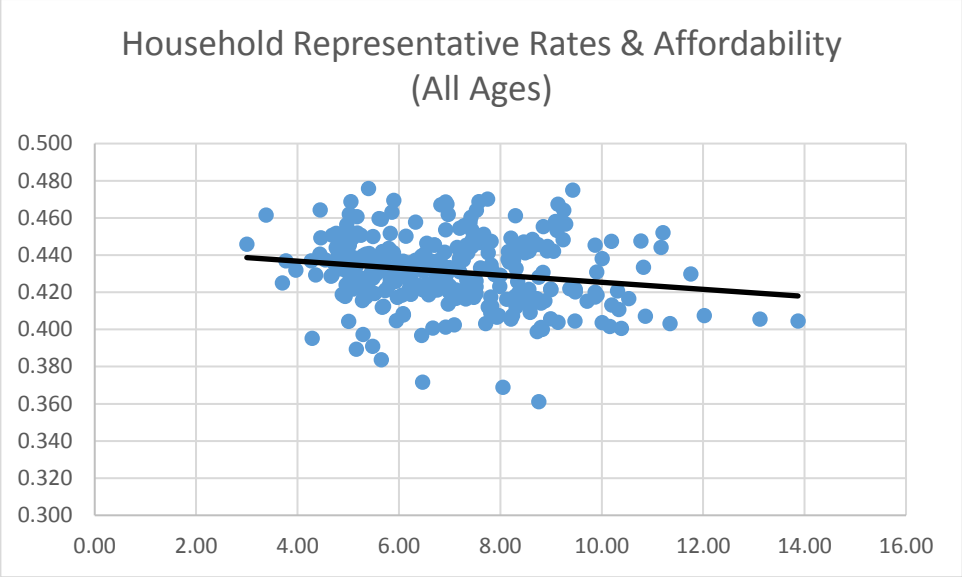


Figure 9. Household Representative Rates, 1991-2014. Source: ONS Household Projections

Nevertheless, the graphs are only indicative of the response to affordability. Further information can be derived from empirical research which attempts to quantify the effects of demographic and economic factors that affect the probability that any individual will be a household head; in general demographics – age, marital status and numbers of children have stronger impacts on household formation than economic variables. For example, in 2014 in Oxford, the household representative rate for 15-24 year olds averaged 17.4%, but stood at 41.6% for the 25-34 age group and 62.9% for the 45-54 age group. But, economic influences nonetheless play a role, particularly for the younger age groups, and Figure 10 provides an initial indicator. The graph plots household representative rates in 2014 (averaged across all household types and for the 15-24 age group separately) for the English local authorities, excluding London, against the median house price to earnings ratio. The correlation between the two variables is negative, but modest at -0.18 across all age groups; there is clearly considerable unexplained variation in the HRPs, not captured by the affordability measure; the standard deviation of affordability is much greater than that of the HRPs across the local authorities[66]. But, in the second frame, the correlation between the two variables is much stronger for the 15-24 age group at -0.54. It appears to be the case, therefore, that the younger age groups bear the brunt of poor affordability.

[66] The coefficient of variation for the household representative rate was 0.04, but 0.25 for the price to earnings ratio.



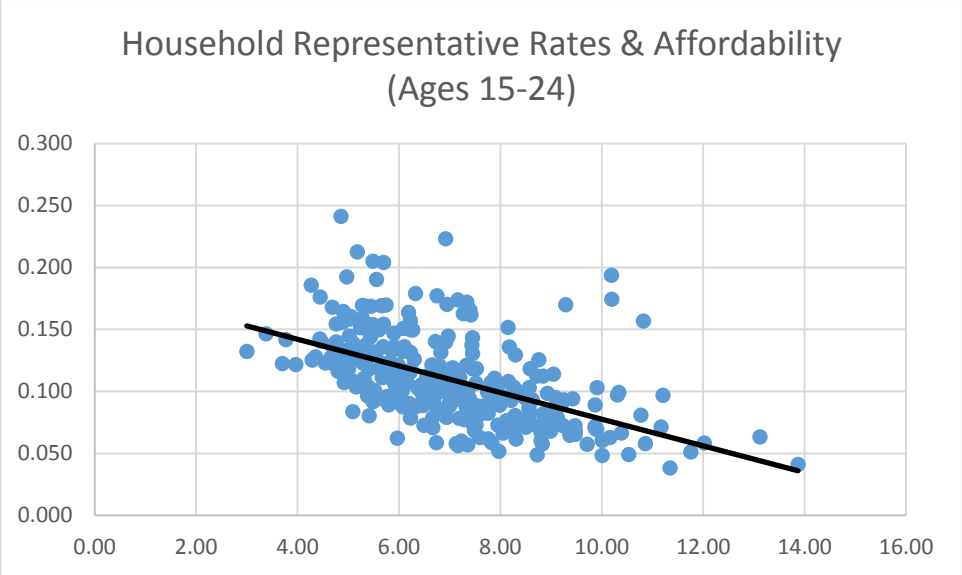


Figure 10. Household Representative Rates (vertical axis) & House Price to Earnings Ratio (horizontal axis), (local authorities, 2014). Source: ONS

Additional information comes from formal modelling of the probability that any individual will form a separate household in any year, using micro data, incorporating both demographic and economic variables together. Table 9 sets out the probabilities for a selection of illustrative individuals living in London in 2001; although the probabilities are now a little out-of-date, the general principles still hold[67]. As the table shows, the probabilities depend very strongly on the

[67] The probabilities are derived from probit equations.

individual's status in the previous year. If she/he is already in a separate household (the lower half of the table), there is a high probability of remaining as a separate household irrespective of income. By contrast, an individual previously living in the parental home or sharing is more strongly influenced by both demographics and economics; for example, comparing the fifth and sixth rows, having a partner and children more than doubles the probability. But rows six and seven suggest that, even with a partner and children, income has a significant impact on household formation. Finally, as above, younger age groups are less likely to form separate households.

Table 9. The Probability of Household Formation (London, 2001)

	Probability (%)
Not a separate household in the previous year	
Female, 25-29, single, no children, income quartile 4	27.6
Male, 20-24, single, no children, income quartile 2	9.7
Male, 30-34, single, no children, income quartile 4	24.3
Male, 30-34, partner, children, income quartile 4	60.8
Male, 30-34, partner, children, income quartile 1	50.2
A separate household in the previous year	
Female, 25-29, single, no children, income quartile 4	97.2
Male, 30-34, single, no children, income quartile 4	96.5
Male, 30-34, partner, children, income quartile 4	99.8
Male, 30-34, partner, children, income quartile 1	99.6

Source: Meen and Andrew (2008), derived from the British Household Panel Survey.

The indications, therefore, are that changes in household formation, particularly amongst the younger age groups, form a significant element in the market adjustment process at times of poor affordability. The young are squeezed out and have to remain with their parents for longer. However, given the number of households, the tenure distribution is even more responsive to economic influences. At the aggregate level, this can be seen in changes in the number of first-time buyers from the mid-1990s (Table 10), although some care is needed in

the interpretation of the table, which refers to recent first-time buyers resident for less than three years, not the number of households who became owners in each year. But, on this basis, first-time buyers fell from 922,000 in 1995/96 to 654,000 in 2015/16. Although the aggregate English home-ownership rate peaked at 71%, in 2003 falling to under 63% in 2016/17, Table 10 indicates that the weakening had started earlier. Again the decline was heavily concentrated on the two youngest age groups in the table (and values for the youngest may have been affected by the expansion in higher education and student debt); indeed the rise in buyers in the 35-44 age group suggests a delaying of entry into ownership.

Table 10. Recent First-Time Buyers (resident for less than three years)

	1995/96	**2005/06**	**2015/16**
	thousands of households		
Age of HRP			
16-24	197	104	49
25-34	569	426	418
35-44	103	105	137
45-54	34	25	41
55+	19	15	9
All households	**922**	**675**	**654**

Source: English Housing Survey 2015/16, Annex Table 1.6

The same data sources used in Table 9 can be used to go behind the aggregate home ownership trends; Table 11, therefore, shows the probability that a household head with a given set of characteristics will be an owner occupier in the high priced South East region. The second column indicates that households who are already owners are highly likely to maintain their status irrespective of their demographic or economic profiles, partly reflecting the fact that housing costs fall relative to income, the longer the households are owners. Older households have very low housing costs and have high levels of accumulated equity in their homes. As noted above, there are typically few economic reasons for older households to move out of ownership, or even to downsize. But the probability that a household, who is currently a renter, becoming an owner is fairly sensitive to income; the probabilities may, at

first sight, appear low, but it should be remembered that they are the probability of becoming an owner *in a given year*, not the probability of ever achieving ownership over the lifetime. Although not shown in the table, the probabilities for this group are also related to the relative costs of ownership and renting and, crucially, to the ability to raise a sufficient deposit. Consequently, even if relative tenure costs favour ownership, an inability to raise the required deposit is expected to extend the period spent in renting, lowering the probability of ownership in any period, but not necessarily permanently lowering the ownership rate. This depends on the rate of increase in house prices relative to the rates at which households can save.

Table 11. Owner-Occupation Probabilities for those who were Owners in the Previous Year and Renters in the Previous Year (South East, 2003)

	Previous Owner (%)	**Previous Renter (%)**
Female Household Head, aged 30-34, single, no children		
Income quartile 2	0.936	0.023
Income quartile 4	0.961	0.040
Male Household Head, aged 35-39, partner with children		
Income quartile 2	0.982	0.078
Income quartile 4	0.991	0.120

Source: Meen and Andrew (2008), derived from the British Household Panel Survey.

Therefore, declining rates of home ownership amongst relatively young households provide a second form of market adjustment to worsening affordability. But a third form of market adjustment may arise from the nature of housing risk. Since housing is an asset as well as a consumption good, it is perhaps surprising that most empirical work pays little attention to the nature of risk. The determinants of mortgage default have been extensively discussed in the literature, but this has had little impact on empirical house price models. As shown in the first section, in the absence of risk, standard models predict that the ratio of house prices to earnings can increase almost indefinitely, if the income elasticity of house prices is greater than one. Since we observe historically that there are bounds on the ratio, something must be missing. The inclusion of the risk of capital losses in the user cost of capital is a prime

candidate, although this is speculative since no published empirical house price models include a theoretically consistent risk premium[68].

The final set of potential market adjustments occur over space, through household migration and moving, which may contribute towards an equalisation of house prices, but there are limits to what can be achieved through this route. Most moves are only short distance and this has been the case since the 19th century. According to the 2014/15 English Housing Survey, 74% of movers, where the HRP was under the age of 55, relocated by under 10 miles and 24% moved under one mile. Of this age group, 17% moved for family reasons, 11% wanted a live in a better neighbourhood, 17% wanted a larger property, 11% moved for job-related reasons and 17% wanted either to buy or live independently. Although more of those over the age of 55 (15%) reported that they wanted to downsize, the desire to move to a cheaper area was not reported as a reason by either age group. In fact the influences on mobility are complex and include: tenure (private renters move more frequently than owners); those in professional occupations have higher rates of mobility than the unskilled; mobility falls sharply in middle age until retirement; moving is low for those with school-aged children or for dual income households or those facing negative equity. Furthermore, high relative prices discourage migration into an area, but this may be offset by expectations of future capital gains[69]. Nevertheless, Figure 2 graphs the ratio of house prices in London relative to the North; although movements in relative prices have been, by no means, consistent over different cycles, there do appear to have been processes at work, including migration, that at least ensure that, over time, prices do not diverge too far. As discussed in Section 1, however, the causes of relative regional price movements are not fully understood; migration may be one element of the complex story but, given the short distances and reported reasons for moving, is unlikely to provide the whole picture.

[68] Although some models include the variance of house price inflation as an additional regressor and Meen et al (2016) provide a formal definition of the risk premium.
[69] See Böheim and Taylor (2002), Cameron and Muellbauer (1998).

Conclusion

In conclusion, there are a number of messages to be reinforced, concerning both our understanding of affordability and policy effectiveness. First, in terms of understanding, at the national level, models of house prices are more robust than commonly believed, although this does not imply that forecasts of house prices are likely to be accurate. Table 1 showed that house prices are sensitive to changes in incomes and interest rates; therefore even if the responsiveness has changed little over time, small errors in predictions of future interest rates or incomes produce even greater errors in house price forecasts. The revisions to OBR house price forecasts provide one example. Second, internationally, a significant proportion of the differences in responsiveness of house prices to incomes and other variables found in studies arises from differences in model structures, for example, the variables that are included in the model; standardisation sometimes reduces the differences, although does not eliminate them. Third, those involved in modelling and forecasting house prices have paid insufficient attention to risk; in its absence, models typically predict that house prices will go on rising forever and we have already seen the problems to which this has given rise in the Global Financial Crisis. The incorporation of risk is in its infancy, but of crucial importance.

Fourth, at the regional scale, a criticism that can levelled at the literature is that more attention has been paid to differences in statistical techniques than attempting to understand why housing markets are interlinked. The simplest explanation is that the linkages are an artefact of the data because of the drawing of regional administrative boundaries. There is probably more to it than that, but equally it is over-simplistic to assume that the links are entirely due to mobility and migration. Furthermore, the nature of ripple effects has differed across each cycle; it is not a purely mechanical process.

Housing policy lies in a difficult position and it has to be recognised that there are limits to what it can achieve alone. Housing is primarily provided by the market, capturing both consumption and investment motives. Furthermore, market influences are not limited to the owner-occupied sector; private (and by implication) affordable rentals are not independent of the market since rents reflect house prices. Housing policy, therefore, is constrained by strong market forces. Next, macroeconomic policies provide additional limitations on housing policy action; attempts to reduce housing benefit, as part of a debt reduction strategy, provide one example, but the stance of monetary policy aimed at general inflation targets and macro stabilisation is not necessarily consistent with the policy settings required for equilibrium in the housing market. Low levels of net mortgage advances were discussed above. In addition (and

this has not been the focus of this study[70]) most progress in housing over the long term has not arisen from housing policies, but as a by-product of wider developments; advances in transport, technology and design have been extremely important in improving the housing conditions for the majority of the population.

This is the background against which housing policy has to operate - it tries to pick up the pieces. Nevertheless, there are messages to be derived from this study. First, policy to improve affordability over the last twenty years has notionally concentrated on methods to improve housing supply, including planning reforms. The macro view was that general market supply improvements would filter down to those on low incomes. It is undoubtedly true that increases in supply have an important role to play, but we have shown – and this was true even in 2004 – that general supply increases can only achieve so much. There remains a role for the direct provision of housing for low-income groups. Furthermore, concentrating exclusively on supply shuts off action on the demand side of the market. One reason may be that this is considered politically too difficult, since it involves action – notably through taxation – on large numbers of households who are already home owners. The stock of current owners is much larger than the flow of new households and first-time buyers and it is the former who primarily determine prices in the market. This is because housing demand is income elastic and price inelastic, so that prices typically rise at a faster rate than incomes – condition (2) is crucial for an understanding of why affordability changes over time; demand is further enhanced by low yields on financial assets, which make Buy-to-Let properties attractive and increases demand for second homes by high-income households. Furthermore, since older households have low housing costs, there is little incentive for them to downsize. Despite the difficulties, action on the demand side of the market is important to enhance action on the supply side. This includes an understanding of why the income elasticity of demand appears to be higher in the UK than in, for example, Germany. Also, some attempts have been made to restrict the growth in the Buy-to-Let market, primarily through additional taxation. The relative advantages of Buy-to-Let investors compared with first-time buyers arise primarily from the accumulated equity that the former have in a current property, which can be used to finance additional purchases. By contrast, first-time buyers have difficulties in raising sufficient deposits. Although Bank of England macro stabilisation policy has begun to address lending to the investment market, this is a recent innovation.

[70] See Meen et al (2016) for further discussion.

However, there are examples where changes to the taxation of housing have been successful; the clearest case was the abolition of mortgage interest tax relief, which finally disappeared in 2000. The key reason why abolition attracted little criticism at the time was that the change took place over a number of years and was finally abolished at a time when interest rates were low, so that the loss to borrowers was limited. Economists frequently call for the abolition of stamp duty and council tax and their replacement with an annual tax on the market value of land or property; this was explored above. But there is little evidence that such policies are likely to be adopted – they are too radical – but the mortgage tax relief example suggests that gradual implementation over a number of years is a minimum requirement for acceptability.

We have stressed that the market, if it were left to its own devices or in the absence of policy intervention, will provide a solution; the problem is that the solution is unlikely to be socially acceptable in terms of inequality. Our simulations suggest that market processes alone under the current system are inadequate to overcome the problems of those on low incomes. In addition, the solution may come in the form of a market collapse with consequences for macro stability and the asset bases of households and financial institutions. Furthermore, the market solution does not necessarily allow for the externalities associated with housing, for example, through health and education. A message of the report is that new household formation and the number of first-time buyers are as much the outcome of a market process as principle drivers. Arguably, this runs against the conventional wisdom that a significant flow of new buyers is necessary to oil the market and to allow existing owners to trade up. Even if this was ever true, it has not been the case since the rise in the Buy-to-Let market and the increase in second homes more generally. An implication is that policies such as Help-to-Buy have only a limited effect on overall house prices and are beneficial to those on relatively high incomes rather than those at the bottom end of the income distribution. Long-term changes in the income distribution, which have worked against the young, have made the position even more difficult; housing problems are not just about housing, but also the labour market.

Appendices

Appendix 1: Determining private market rents

Table 1a is obtained from a linear OLS regression where private sector annual rental payments, taken from the 2015/16 English Housing Survey, are regressed on regional house prices, disaggregated by property type, and a series of control variables representing the characteristics of the households, since rents reflect demand as well as supply. Non-market rents are excluded from the sample.

The table shows that there is a statistically significant relationship between rents and house prices (the t-value is 3.6), but measurement errors are likely to bias downwards the size of the coefficient. In other words, the relationship is likely to be even stronger than the table indicates.

Rents are also sensitive to the length of time the residents have been in place, household size and composition, the size of the property, income and employment status. But since house prices are correlated with income and the number of rooms, excluding these variables approximately doubles the size of the house price coefficient, although the fit of the equation worsens.

Table 1a. The Determinants of Market Rents (Dependent variable = Annual rent payment, gross of housing benefit, £)

Variable	**Coefficient**	**t-value**
Constant	-344.3	0.5
House price	0.0074	3.6
Number of children	-2383.5	7.6
Household size	2351.6	8.3
Length of residence	-105.8	3.6
Number of employed persons	-1215.7	4.5
Number of rooms	895.8	4.6
Household income	0.0734	4.8
R^2	0.41	
Equation standard error	£3,968	
Number of observations	415	

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