

THE ECONOMIC ROLE OF NEW HOUSING¹

Geoff Meen, Kenneth Gibb and Daniel Mackay

April 2001

1. Introduction

The production of new housing has a major impact on the built environment, urban form and, through augmenting the housing stock, in providing new opportunities for households, business and communities. In academic and policy debates much has been made of the possible impacts (negative and positive) new housing could have on these and related factors. While there has been limited research into the wider impacts of social housing investment, there has been no rigorous analysis of the economic impact of new housing *as a whole*, either in terms of new modelling or of a comprehensive review of work that has been done and remains to be done. This paper is concerned with such an analysis.

Our approach is to examine new housing and the economy at three spatial scales: national, regional and urban/metropolitan. Although, in some respects, artificial, in practice, the distinction is useful because (i) different parts of the literature deal with each spatial scale, (ii) a single, integrated theoretical model, covering all scales does not exist and (iii) fully consistent data from the urban to national level do not exist.

At each spatial scale, *key themes* emerge, which are useful ways in which to structure the arguments surrounding the way housing interacts with the economy:

- ?? At the national scale, the issues of crowding-out and cyclical volatility.
- ?? At the regional scale, the issue of regional economic convergence.
- ?? At the urban scale, the issue of cumulative causation.

The paper begins by outlining the most important trends relating to new housing. It next reviews the relevant literature at the three spatial scales, identifying the absence

¹ This research was funded by the Housing Research Foundation. We are grateful for their support. Michael White (University of Aberdeen) also made an important contribution to the research. The authors are at the University of Reading (Meen) and the University of Glasgow (Gibb and Mackay). All errors and omissions are the responsibility of the authors alone. This paper is a draft. Please do not quote without the written permission of the authors.

as well as the presence of evidence. The paper then looks at new evidence on each of the three spatial scales in turn before drawing together major conclusions.

2. New Housing Trends

Figure 1 graphs housing starts in Britain since the beginning of the sixties. Starts are measured in thousands of units. Two features stand out - the long-run trend and cyclical volatility. In contrast to most economic aggregates, such as GDP, private housing starts have shown no upward trend over the last thirty years. The long-run decline is even more evident with the inclusion of the public sector. Historically, housing and property in general are amongst the most volatile sectors of the economy. For example, between the peak in private housing starts in 1988 and the bottom of the subsequent trough in 1992, starts fell by 45%. Although, by contrast, the stability of private housing starts since the mid nineties is striking. The long-term trend brings out a more general point. New housing may have relatively modest economic effects in the short run but, over time, long-run effects accumulate and can have significant impacts on economies. Short-run models cannot address this point (by definition) and policies aimed at long-term change should acknowledge the long-term consequences of previous patterns.

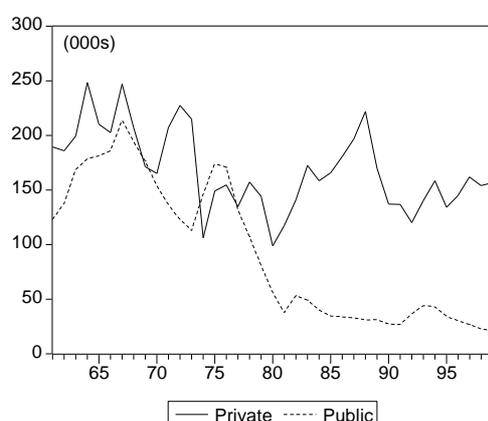


Figure 1 Private and Public Sector Housing Starts
Source: Economic Trends

Figure 2 plots changes in repair, maintenance and improvement construction output (RMI) against the volume of total new housing construction. In contrast to Figure 1, each series is here expressed in millions of pounds at constant, 1995 prices. The figure indicates that, over time, the negative trend in new building (-0.75% per annum between 1960 and 2000) has occurred alongside a rise in RMI, at an annual average

2.5% since 1960; this is faster than GDP as a whole. In fact, the ratio of RMI relative to new construction is now the highest in Europe amongst the major economies. RMI is now approximately twice as large as new housing construction. Wilcox (2000) reports the share of housing investment in GDP in a selection of mature economies. The UK has been around the bottom of the international league table of economies at similar stages of economic development since the 1970s.

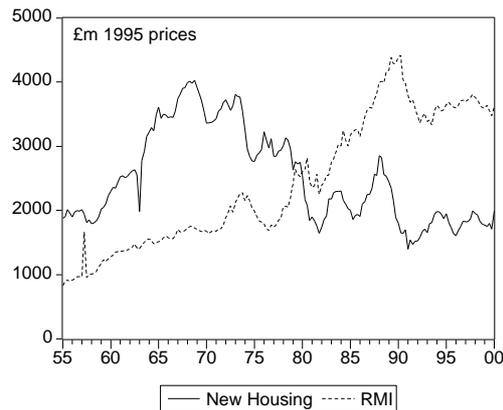


Figure 2 Repair, Maintenance and Improvement Output (1995 prices)
Source: DETR

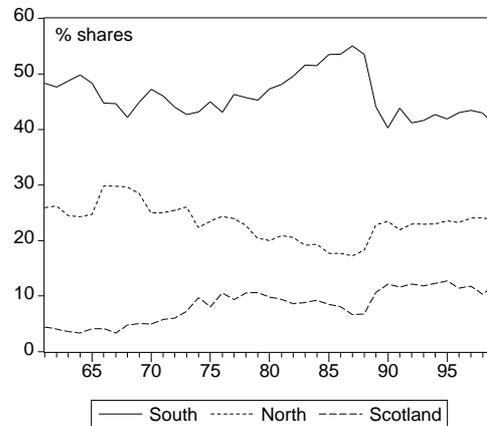


Figure.3 Regional Shares of Private Housing Starts
Source: DETR

Figure 3 compares regional shares (in the GB total) of private housing starts. The figure concentrates on the South (aggregating London and the South East, East Anglia and the South West) and the North (Yorkshire and Humberside, the North and the North West Standard Statistical Regions). The share in the South of England has shown only limited long-run change (although varying over the cycle). The constancy of the shares contrasts with a gradual shift in population growth from the North

towards the South. The expanding southern economy has not been matched by an increasing share of new housing. Moreover, the relative stability of national construction in recent years noted above disguises an absolute fall in construction in some of the southern regions.

One plausible explanation of low rates of construction in recent years, despite the Southern boom in the market, is the presence of planning controls. Using different methodologies, both Evans (1988) and more recently Cheshire and Sheppard (2000) argue cogently that planning generates costs for the economy as a whole. There is strong *prima facie* evidence that planning is at least partly responsible for the comparatively low price elasticity of supply in Britain, although other factors also play a role such as skilled labour shortages at particular stages of the cycle. Simulations in Meen (1998) suggest that differing real house price movements across countries suggest the existence of different supply elasticities. Stronger real price trends in the UK than in the US are consistent with weaker supply responses. This means that the required increases in new construction to choke off high house prices have to be very large indeed. Malpezzi (1996), for example, suggests that the long-run UK supply elasticity on post-war data is between 0.9 and 2.1, but pre-war the elasticity was between 4 and 7. For the US, the figures are between 9 and 16 and 11 and 18 respectively.

Do these trends matter? They may simply reflect a mature economy with an ageing housing stock (a point highlighted in the 2000 Housing Green Paper). Furthermore, investment in other countries may be “too high”, caused, for example, by high levels of housing subsidies in the UK which other forms of (business) investment do not enjoy. In order to answer this question, we need to examine what is known about the economic impacts of new housing and judge whether these trends are worrisome. First, we consider the existing literature and then we turn to new research findings.

3. Literature

The National Scale

At the national level, interest in this country increased enormously in the late eighties because of a hypothesised (and controversial) link between increases in house prices and the strong boom in consumers’ expenditure at that time (see Muellbauer 1990).

Prior to that, it was recognised that the national economy had a strong effect on housing, but housing construction, by itself, was thought to be too small to have a major impact on the economy. However, it has always been recognised that housing could exacerbate economy-wide cycles. In the literature, the main ways in which new housing *directly* influences the national economy are through: GDP, inflation, the trade balance and cycles

Housing pressure groups have long argued that increasing housing investment produces positive benefits to *GDP and employment* (Clapham, 1996). Many economists would argue that increases in housing investment may be at the cost of lower output elsewhere in the economy. Meen (1995) shows that, although there are positive short-term benefits from additional public expenditure on housing, almost full crowding out takes place in the long run and increased public housing expenditure is partly offset by a reduction in private housing. It has also been argued that imperfect substitutability between housing and non-housing forms of construction leads to rigidities and bottlenecks in the supply process, (Ball, 1996).

In principle, higher levels of housing construction could *reduce inflation* but it is unlikely that the effects are very large (Meen, 1997). Although house prices are one of the indicators regularly tracked by the Bank of England (because house price inflation is viewed as a forward indicator of inflation in general), new house production is not. There might be two effects on the *trade balance*. Muellbauer (1990) has argued that, in the late eighties, the house price boom led to higher levels of consumers' expenditure that sucked in extra imports. If so, then higher levels of new housing production might have mitigated the effect. The construction industry exports its products to the rest of the world (but also imports raw materials). However, it is difficult to disentangle how much of the net exports are related to housing rather than to other sectors of the construction industry. Our expectation would be that housing might contribute rather little.

Housing (and construction as a whole) is one of the most volatile sectors of the economy and, clearly, *volatility* causes problems for the design of macroeconomic policy. Meen (2000) suggested that monetary policy, designed with general inflation targets in mind, is often inconsistent with stability in housing. Therefore, policy

exacerbates fluctuations in housing. DiPasquale and Wheaton (1996) argue that new construction is heavily dependent on how long builders expect to take to sell dwellings. But, in their view, the expected sales time is related to the *change* in prices, rather than the *level* of prices examined above. Indeed, empirical work suggests that the rate of change of prices has a strong positive effect on construction. But since prices are themselves volatile, this generates strong volatility in new construction.

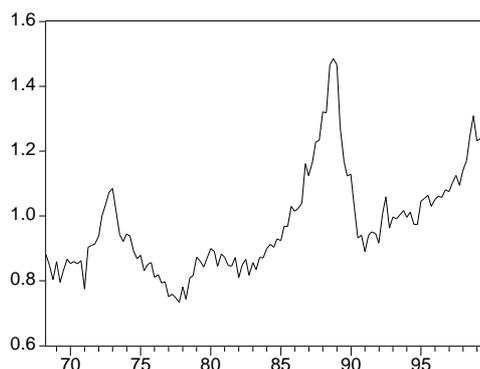


Figure 4. UK House Prices: South East/North 1990=1.0
Source: DETR

Regional Aspects

The late eighties witnessed an unprecedented rise in the divide between house prices in the North and South of the country, summarised in Figure 4. The view was that such housing market segmentation would generate segmentation in labour markets, leading to higher national unemployment, higher wages and inflation. As Figure 4 shows, however, the ratio of prices in the South relative to the North reached its peak in 1989 and fell dramatically in the early nineties due to the collapse in house prices in the South. Holmans (1990) has argued that the long term trend is positive if data are taken back to the 1930s. Figure 4 suggests that he may be right. Recently, the ratio has risen again with economic recovery strongly concentrated on the South.

Bover *et al*, (1989), suggested that in a perfectly functioning market that inter-state migration flows are effective in eliminating unemployment differences that may arise from state-specific demand shocks. In the US, this argument was confirmed empirically by Blanchard and Katz (1992). In the US, however, migration rates for manual workers are much higher than in the UK. In the UK, the market is not perfectly-functioning and housing impacts on adjustment (Bover *et al*, 1989). The fact that house prices are considerably higher in the South may deter migration towards

low unemployment areas. Blackaby and Manning (1992) found support for Bover *et al*'s work with both regional house prices and the cost of living having significant effects. Cameron and Muellbauer (2000) developed a model of wage formation and unemployment on regional data. Their results again confirm the influence of house prices on the two variables.

Migration is also thought to be a major regional adjustment mechanism. Hughes and McCormick (1981, 1985, 1987, 1990, 2000) were concerned primarily with the effect of *tenure* on migration. However, there is still no empirical evidence on the related question of whether house building itself generates migration. We cannot argue that extra building in the South East, for example, would generate extra population flows from the North to the South. Hughes and McCormick conclude that the effect of relative house prices on out-migration rates is negligible and the influence on destination choice is only small. These findings are not universally accepted but as Gordon (1990) argues, it is unlikely that housing price variables alone can account for low rates of migration in the UK relative to the US, particularly amongst manual workers. Labour market conditions are probably more important in explaining flows. Furthermore, there is evidence that local authority tenants have become more mobile in recent years (Keenan *et al* 1999; Hughes and McCormick, 2000), but the movements represent changes between (and within) low quality estates within urban areas rather than interregional migration.

There is also evidence that house prices affect regional aggregate demand. Evans and McCormick (1994) and Taylor and Bradley (1994) found significant effects on unemployment. In addition, Carruth and Henley (1993), Green and Hadjimatheou (1990) and Muellbauer and Murphy (1994) all investigate the role of housing wealth as a determinant of regional consumers' expenditure. Their findings are rather mixed.

From the limited evidence available, supply elasticities appear to be low in all regions of England (Meen, 1996). However, Pryce (1999) finds much greater variation in elasticities at the local authority level. Starts appear to be much more responsive to the *rate of change* of house prices, therefore, regions that experience the most volatile house prices are also likely to experience the most volatile construction markets. Typically, the most volatile have been in the South. This still tells us little about the

effect of new construction on regional economies (except through house prices). In fact, there have been no empirical studies of the direct effects and any indirect effects are quite subtle. The regional multiplier effects of additional housing investment are likely to be smaller than at the national level since the economies are more open. Instead, the most important effects are likely to come from the influence on the distribution of population, employment and of industry and housing's role in the generation of social exclusion (Meen and Andrew, 1999). These are more properly considered as urban issues.

Urban Analysis

Primary areas of concern are house price effects and their alleged urban impacts. Gerald Eve (1992) argues that house prices are, in part, determined by planning-constrained land supply and that between 1970-90 house prices were 35-40% higher than they otherwise would have been in the South East. Monk *et al* (1992) reviewed the US literature on the housing market impact of zoning development controls. They found that the results vary depending upon assumptions about the local economy. Bramley (1999) found that the elasticity of house prices with respect to plan provision was low - an increase in the provision of new sites by one third would reduce house prices by only 5-9%.

The second area of debate concerns the impact that housing's location has on employment opportunities and whether using the planning system can have the desired impact of increasing employment among the households in these areas. Turok and Edge (1999) argue that there has been a strong long-standing urban-rural shift in employment that has been worst in the core cities of the UK's major conurbations and that employment decrease has been greater than population loss. This work follows on earlier work by Webster (1994). Specific corrective action is required to redirect the location of employment opportunities to core cities, thereby, increasing the demand for blue-collar labour. Following the experience of Sunderland and the coalfields task force, Turok and Edge argue that key sites and vacant land can be redeveloped to encourage and cajole investment into the core of UK cities.

This position has been contested (Morrison, 1999; DTZ Pineda, 2000). Morrison argues that the 'jobs gap' thesis rests on a segmented view of the labour market. A

seamless view of the metropolitan labour market, on the other hand, argues that commuting would equalise job opportunities across the city-region and that, consequently, unemployed households in peripheral or isolated concentrations of housing could not benefit disproportionately. Morrison argues that the evidence is in favour of the seamless labour market and is supported by DTZ Peda, who also criticise the scope for manufacturing job creation in the face of wider change in the economic structure towards services. Breheny (1999) asks whether the changing spatial pattern of jobs identified by Turok and Edge has any relevance for the spatial pattern of existing housing and new development. He argues that planning interventions will be unlikely to reverse a process based on long-term trends (e.g. population decentralisation, technology and office re-organisation, changing working practices, residential locational preferences and car ownership). These processes are further reinforced by the trend towards households choosing residential locations and, then, changing job to suit their home location.

Muth (1971) suggests that models of employment and population change have to be constructed in a simultaneous framework. Core-Periphery models under increasing returns to scale (Krugman, 1991) also imply co-location to take advantages of scale economies in both factor and goods markets. Steinnes (1977, 1982) found that, in manufacturing, jobs typically move to workers. Thurston and Yezer (1994) found little evidence that jobs follow population except in the service sectors.

Housing is also intimately connected to neighbourhood quality. Policies that invigorate the city centre are argued to be more inclusive, particularly if diverse residential urban neighbourhoods can be promoted and sustained. Planning has a major interventionist role in this sort of policy world. Second, there is the brownfield targeting of new development at high density to both recycle existing urban land and to promote the external benefits of agglomeration economies. This is where the aims of contemporary private housing policy and urban policy meet. However, there may be significant costs associated with these policies. Can these policies 'buck the market' of the trends identified by Breheny and will there be significant economic distortions as a result of these policies of spatial redistribution of new housing?

There are, intuitively, likely to be significant distributional consequences when high density new supply is considered for cities. At lower spatial levels, new developments have a significant impact on the existing housing market, affecting prices through normal market adjustment but, arguably, also changing the attribute bundle of properties and potentially changing the stock's amenity value. These might be either positive or negative. Evidence is limited but MacLennan (1988) attempts to measure the house price impact on unimproved properties of adjacent neighbourhood investment, which rehabilitated the tenement stock in Glasgow. He finds evidence of positive spill-over benefits onto the values of nearby properties.

For communities living at high densities, negative externalities can be generated (Bramley *et al*, 1995). Housing markets also affect the desirability of neighbourhoods, towns and cities. This arises from neighbourhood change following new supply, gentrification and the like, but it also concerns the role of house building in the urban regeneration of neighbourhoods. It is also, moreover, about low demand problems and neighbourhood abandonment and the role that the housing and mortgage markets play in causing and then reinforcing processes of local area decline (Gibb *et al*, 1999). Falling property values not only affect individual households' borrowing power but also undermine neighbourhoods.

The idea of cumulative causation has become more fashionable in economics as a whole due to the work of Krugman (1991) and Fujita *et al* (1999). Amongst the central ideas of Krugman's work is the conflict between centripetal and centrifugal forces. Depending on the relative strength of these forces, economic activity will be either concentrated in a small number of locations or dispersed. Although housing does not enter into Krugman's models, the ideas of cumulative causation can be found in housing models. Population flows may, in some circumstances, generate cumulative processes of decline in urban areas (Galster, 1998). Power and Mumford (1999) and Power (2000) describe the cumulative processes of urban decline leading to neighbourhood collapse. The Housing Green Paper and the Urban White Paper have suggested a range of proposals that aim to make inner or the core of cities more attractive residential environments.

Construction of new housing and improvement work has direct and indirect impacts locally through job creation, income generation and local spending. The presumption from the literature is that the local economic multipliers involved in new housing are relatively low as a result of the distant sourcing of materials and low proportions of local workers (Gibb and Keoghan, 1998). It is commonly argued that extra public expenditure on housing has wider beneficial effects because it creates jobs. In fact, data deficiencies make it difficult to show that housing programmes create more jobs than other construction programmes. Moreover, most analyses have been *partial* - they do not take into account wider feedback effects, such as crowding-out employment elsewhere. Job creation will also be overstated because some expenditure will be on land, and on raw materials that are imported. This rather negative view applies more at the national level and has to be amended at finer spatial levels.

Summary

At the national level, the literature suggests that new housing may have an effect on GDP, volatility and inflation, although the effects should not be overstated and the short-run effects are likely to differ from the long run. At the regional level, there is no evidence on the impact of regionally differentiated construction programmes. At the urban level, the potential effects are widespread including influences on household and industrial location, neighbourhood quality, urban regeneration and local employment creation. The next three sections present new or recent research by the authors that attempts to fill in some of these gaps.

4. National Scale Analysis

In general terms, housing potentially plays a number of roles in the national economy:

- ?? As a factor of production contributing to the capital stock
- ?? As a component of household sector wealth
- ?? As a contributor to economic cycles

Below, we discuss each of these aspects in turn providing, as far as possible, quantitative evidence in support of each element. New housing-economy simulations that examine new housing explicitly are then presented.

Housing as a Factor of Production

How does new housing output affect growth?

- (i) Directly as a factor of production i.e. it increases the capital stock
- (ii) Housing may affect the rate of technical progress. For example, well-housed workers and children are more productive and educational standards rise.
- (iii) By either crowding-in or crowding-out other parts of the capital stock, i.e. some have argued that extra housing reduces business investment and, therefore, reduces output growth in the economy.

Since housing is a small share of national output, any *direct* effects from a national expansion of new housing construction are likely to be limited. We shall argue that many of the *indirect* effects, if they can be modelled at all, are most evident below the national spatial scale. Empirical work on production functions often treats the capital stock as a homogeneous entity. It is hard to believe that new building, which has changed only slowly over time, has the same impact on productivity as, say, enhanced computing power. Similarly, there is every reason to believe that the way in which new housing enhances labour productivity is different from new office space. Figure 5 shows that, historically, the main components of building construction have behaved in very different ways over time - there is no obvious relationship between them.

Empirical work on production functions in this country has never separately distinguished housing as an element of the capital stock. Therefore, there is no evidence on whether or not new housing adds to the economy's long-run productive potential. Arguably, one of the main failings of mainstream economics over the years has been its inability to explain the causes of technical progress and productivity growth. However, so-called endogenous growth theory has recently provided an important new direction. Both infrastructure investment and enhancements to human capital have been investigated as a part of the explanation, although empirical evidence on these issues remains highly controversial. In principle, new housing could play a role in both by improving educational performance and raises human capital and as part of the economy's infrastructure. However: there has been no empirical work in this country that looks at the contribution of housing to technological progress and productivity.

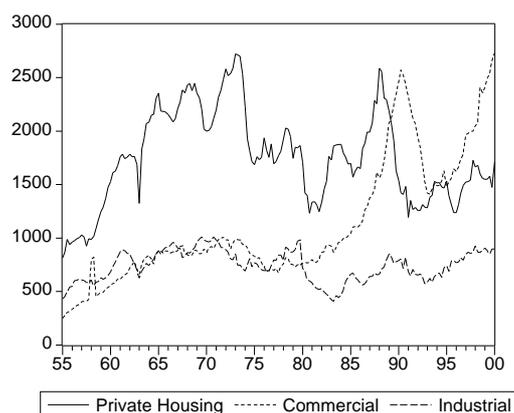


Figure 5. Construction Output - Private New Housing, Commercial and Industrial (£ million, 1995 prices; Source DETR)

Issues of crowding-in and crowding-out have received much more attention. If aggregate supply or GDP is fixed, an expansion of housing can only take place by a reduction in some other slice of the “cake”. But the cake is not, in practice, “fixed” in size but increases and decreases with the size of the economy. Expansion and contraction is partly cyclical, but the long-run growth rate can also change. It is by no means certain that business investment is fully crowded-out by housing but, nevertheless, crowding-out is a feature of most macroeconomic models.

A Component of Wealth

It is commonplace to suggest that housing is the largest component of household wealth. However, it is important to note that we are talking about wealth *stocks*. At the current rate of production, new private housing supply adds about 1% to the stock per annum. Therefore, new construction has only a limited direct effect on household wealth. By contrast, changes in house prices affect the whole of the stock and, consequently, have much larger effects on wealth. Therefore, for new construction to affect wealth substantially requires new building to have a major impact on prices.

Much more is known about the effects of house prices on the economy than new construction (new construction would, however, be expected to affect prices). Estimates can be calculated, using a study of house prices taken from Meen and Andrew (1998a). With the caveat in mind that this was not the original purpose for this model, the analysis indicates the impact on house prices, over a ten-year horizon, of reducing new housebuilding by 25% compared with current levels of production. *Implicitly these cutbacks are spatially distributed in line with current production. In*

the short run, lower construction appears to have only a very small effect. This is because a cut of 40,000 homes is small in proportion to the overall housing stock. In the long run (here taken to be ten years), although house prices are nationally 4% higher than would otherwise have occurred, this is still fairly small. The effects imply that the required extra production to offset real price rises would need to be very large. This is particularly true in a rapidly expanding economy such as the South East, where housing shortages are an indication of economic success.

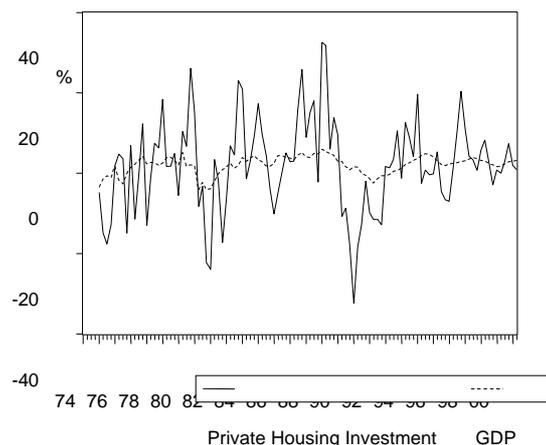


Figure 6. Private Housing Investment and GDP
(Annual percentage changes)
Source: ONS

Contribution to Cycles

It is well-known that housing and, indeed, construction as a whole is one of the most volatile sectors of the economy. As Figure 6 shows, cycles in GDP almost disappear when compared with housing. This implies that housing’s effect on national cycles is disproportionate. Governments are, typically, just as interested in cycles and volatility as they are in long-run trends. Simulations below examine the extent to which cycles in the UK economy are attributable to housing.

Housing and the Economy - Results from an Econometric Model

In the model set out below, we look further at crowding out, the wider effects of housing on the economy and the impact on economic cycles. However, since there is no empirical evidence on the effects of housing on the capital stock and technological progress, these important aspects have to be excluded. This is unfortunate since, in many ways, they are the most interesting aspects and, potentially, contribute to

improving the economy's long-run growth. To the extent that these effects exist, the benefits of housing to the economy are understated.

Table 1 looks at the economic effects of reducing new housing construction by 25% per annum over a 10 year period². As noted above, this is approximately equal to a reduction in private completions by 40,000 p.a. compared with what might otherwise have occurred. These are, of course, fairly large changes and it may well be the case that much smaller changes have non-proportional effects. However, the model we use cannot capture non-linearities of this form. The results are consistent with the house price effects discussed in terms of the Meen and Andrew (1998a) model above. Since short-run effects differ from long-run effects (crowding-out takes some time to occur), the results are shown over a run of years.

Subject to margins of error, a number of points stand out from the table. First, although cutting housing production would reduce GDP in the first few years, through standard multiplier effects, even the initial effects are modest. This arises from the fact that housing is only a small share of GDP. Second, crowding out causes any effects to die away over time. In the absence of any supply-side effects, changes in construction affect prices. Here we see that the RPI falls at the lower pressure of demand, which improves the UK's competitiveness and trade performance, raising GDP back towards its original level. Third, although employment in the construction industry falls substantially, in the long-run, there is little effect on unemployment in the economy as a whole. Employment in other industries expands, particularly in export-orientated industries.

Table 1 Effect on the Economy of 25% Lower New Housing Construction (% changes from base scenario, except where stated)

Year	GDP	Unemployment (% points)	RPI	Construction Employment (000s)
1	-0.50	0.05	-0.15	-5
2	-0.25	0.07	-0.30	-20
3	-0.15	0.04	-0.50	-30
4	0.00	-0.03	-0.70	-40
10	0.10	-0.03	-0.75	-50

² We use the Joseph Rowntree Foundation Housing and Construction model for the simulations, which links a housing model to a wider model of the macroeconomy.

We can conclude that there appear to be few detrimental effects at the national level from cutting new housing construction, since crowding-in of other goods occurs, i.e. cuts in housing are compensated by an expansion in other sectors of the economy. But this is an artefact of the model and arises from treating housing as just another consumption good and because the model does not capture potentially important sub-national effects. By design, housing has no supply-side effects on the economy. The results change as soon as this restriction is relaxed. However, even if full crowding-out occurs in the long run, there is still a case for expanding production in a recession, since there are positive short-run effects on the economy from housing provision.

Table 2 Effects of Trend Housing Investment Growth on the Economy

Year	GDP (%)	Unemployment (% points)
1987	-0.45 (4.4)	0.04
1988	-0.90 (5.2)	0.15
1989	-0.35 (2.1)	0.14
1990	0.50 (0.7)	-0.11
1991	0.75 (-1.5)	-0.28
1992	0.30 (0.1)	-0.24
1993	0.00 (2.3)	-0.08
1994	-0.65 (4.4)	0.24
1995	-0.60 (2.8)	0.56
1996	-0.25 (2.6)	0.54
1997	0.30 (3.5)	0.27
1998	0.35 (2.6)	-0.02
1999	0.30 (2.2)	-0.15

Removing Volatility

Table 2 constructs a hypothetical, counterfactual simulation in which we assume that housing investment rose each year between 1987 and 1999 at its (smoothed) annual average growth rate for the period 1980-1999 of 1.8%. Note that, in the long run, housing investment has grown at a slower rate than GDP. The 1987-1999 period was one of strong fluctuations in both housing and the economy, so the simulation represents a high degree of smoothing. We are, of course, ignoring the question of how the smoothing might have been achieved. The first column in Table 2 shows the effects on GDP of smoother housing investment. The figures in brackets are the actual growth rates of GDP. Overall the effects of the housing cycle are noticeable, but not dramatic. The effects would have been considerably larger if smoothing of house prices had also been achieved. These are believed to affect consumers' expenditure. However, there is no necessary reason why construction smoothing should cause

house price smoothing. Housing construction, therefore, makes a significant contribution to overall cycles in the economy, but the wide fluctuations in the economy since the late 1980s cannot be entirely attributed to housing construction.

Construction and Infrastructure

Intuitively, we might think that housing and infrastructure investment are positively related. Housing requires support services in terms of roads, schools etc. *A priori*, the effects may differ between the short run and the long run. In the short run, each sector of the industry may compete for skilled labour, so that an expansion in one sector can cause a reduction in output in another. In the long run, as such constraints are eliminated, the relationship may be negative, neutral or, intriguingly, positive.

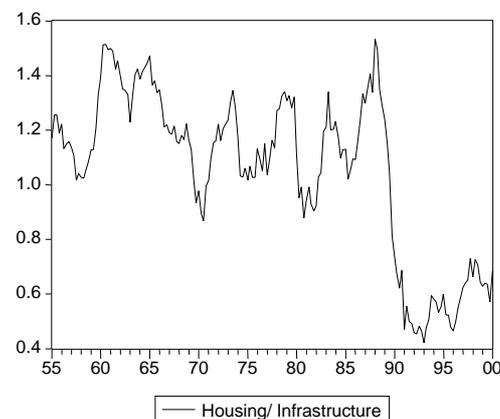


Figure 7. Ratio of Private Housing to Infrastructure Construction Output
(constant prices)
Source: DETR

We use data on construction output and new orders from the DETR at constant (1995) prices. Output data are available quarterly since 1955 and new orders since 1964. An appropriate method for looking at long-run relationships between these variables is co-integration. Over the period 1955 to 2000, there appears to be no long-run relationship between infrastructure construction and housing, nor any other category of construction. However, as Figure 7 shows, the ratio of private housing to infrastructure construction changed markedly in the nineties presumably reflecting the influence of privatisation investment programmes, which are not directly related to new house building. Confining the sample to the period 1955 to 1990, there appears to be some relationship between infrastructure and industrial and commercial construction, but still no clear relationship to housing. There does appear to be a

strong *positive* relationship between housing output and industrial construction new orders. This would not have been predicted by the national macroeconomic models we used above. There does not, however, seem to be any similar relationship with commercial construction.

National analysis typically requires a strongly simplified view of what actually constitutes housing. Housing, however, possesses a number of features that distinguish it from other goods. First, *spatial fixity* – housing cannot be moved around the country in response to changing demand. This is why we have to consider regional and urban markets separately. Second, the *durability* of housing is important. Because housing deteriorates very slowly, the stock of housing is always more important than new housing supply. New housing, therefore, has important effects, but they take place over decades – a period typically much longer than conventional macro models consider. The problems of city structure concern decisions made over centuries and one cannot expect them to be solved quickly by policies aimed at new supply. But this does not make such policies less important.

5. Regional Analysis

In the long run, regions might grow at similar rates, exhibiting convergence. Is there evidence that housing construction has hindered the process of convergence in regional economies? In terms of the effects of housing, two issues arise:

- (i) Does new housing have a *permanent* effect on regional unemployment differentials, earnings and per capita GDP?
- (ii) Does new housing have a transitory effect, although the transition period may be very long? In other words, do housing conditions slow down the adjustment of regional economies to some long-run equilibrium?

Under the Blanchard and Katz (1992) view of the world, the effects on unemployment of state-specific demand shocks are eliminated primarily by migration. Implicitly, housing markets impose few constraints on inter-state adjustment. Cameron and Muellbauer (2000) found that their findings have to be modified in a British context because of a potentially stronger role for housing. None of these models, however, look directly at the role of new housing supply. We require a model that traces through the economy the effects of new construction, including the inter-linkages

across the regions. This is no easy task. Although regional econometric models exist in this country, none specifically looks at housing.

Modelling the Impact of New Housing on Regional Economies

In summary, new housing potentially has a role through the following routes: (i) housing might affect the local NAIRU (unemployment rate); (ii) if housing shortages raise wages, national and international competitiveness are worsened; (iii) housing affects migration; and, (iv) there is a direct demand effect from new construction in the same manner as at the national scale. But, by contrast, points (i)-(iii) concern supply-side changes to the regional economies.

Our approach has been to construct an illustrative two-region model calibrated to data for the South East (including London) and the North West. The structure is given in the appendix at the end of the paper. Our major problem, however, is that there is no consensus on the size of many of the coefficients. Some, for example, would argue that house prices do not affect wage settlements and hence have little effect on unemployment. In the absence of full econometric testing, we have therefore had to rely on a combination of theory and judgement. On the basis of available empirical evidence, it appears unlikely that any increase in housing construction would be met entirely by an increase in North/South migration (although Champion and Ford (1998) found that the younger, most skilled parts of the labour force are the most mobile, implying higher rates of construction in the South could *raise* unemployment in the North as output potential begins to fall).

A reasonable scenario to investigate is the effect of lower levels of new housing construction in the South East. Our simulation assumes that private housing starts in the South East are reduced by 25% each year compared with what might otherwise have occurred. Since there were approximately 32,000 private housing starts in 1999 in London and the South East, this represents an annual reduction in houses of approximately 8,000. We begin by considering, in general terms, the likely effects.

(a) The South East

- (i) *in the South* we would expect an initial reduction in aggregate demand (less work for builders) which will die away over time as crowding-in of other expenditures take place.
- (ii) However, even with crowding-in, output in the South would be expected to fall *permanently*, if our hypothesised model is accurate. If lower new construction leads to a permanent increase in house prices, which raises employee wage demands, the real product wage rises, cutting employment and increasing the natural rate of unemployment. Furthermore, if in-migration falls, the labour supply contracts relatively, which also cuts capacity.
- (iii) In the long run, output is expected to grow at the new lower rate of capacity. But in the short run, aggregate demand and the economy's long-run growth rate can diverge.
- (iv) Real wages are likely to be higher measured in terms of producer prices, but lower measured in terms of consumer prices, because of higher housing costs.
- (v) Crucially all of these results depend on the assumption that lower construction induces higher house prices. If the hypothesised price effects do not occur, most of the results in the following tables disappear.
- (vi) However, it should also be remembered that the regional model does not incorporate any potential effect on labour productivity and technical progress.

(b) The North West

- (i) The long-run effects in the North depend, in general terms, on both changes in migration and the real product wage. Both of these are difficult to estimate without appropriate econometric work.
- (ii) Any gains in population in the North in response to higher house prices in the South will raise labour supply and hence long-run productive capacity in the North. Note, however, that since migration is inversely related to distance, only a minority is likely to come into the North relative to, say, the Midlands.
- (iii) However, we estimate that all these effects are likely to be fairly small and we do not believe that cutting housing production in the South is an appropriate way of expanding economic growth in the North.

Table 3 illustrates these issues under an assumed set of parameters. We constructed a baseline scenario where construction was assumed to be similar to that achieved in

1999. In a second scenario, the level of construction in the South East was reduced by 25%. The tables compare the differences in outcomes between the two scenarios for the two regional economies. Table 3a suggests that, after 12 years, employment in the South East might be 0.4% lower than at higher levels of construction, but employment in the North would be 0.8% higher. But since employment in the South East is larger than in the North West, the overall impact is considerably greater in the former so national unemployment rises.

Table 3a A 25% Cut in Private Housing Construction in the South East (% differences from base, except where stated) (i) Effects on The South East

Year	Producer Prices	Earnings	House Prices	Migration (000s)	Unempl. (% points)	Empl.	Capacity Output
3	-0.1	-0.4	0.1	-0.8	0.3	-0.4	-0.02
5	-0.7	-0.9	0.5	-0.5	0.2	-0.2	-0.05
10	-1.3	-1.1	2.0	-2.4	0.2	-0.4	-0.40
12	-1.2	-1.0	3.0	-3.0	0.2	-0.4	-0.60

Table 3b A 25% Cut in Private Housing Construction in the South East (% differences from base, except where stated) (ii) Effects on The North West

Year	Producer Prices	Earnings	House Prices	Migration (000s)	Unempl. (% points)	Empl.	Capacity Output
3	0.0	0.0	0.0	0.15	0.0	0.0	0.03
5	-0.05	-0.1	0.1	0.05	0.0	0.0	0.15
10	-0.30	-0.5	0.6	0.50	-0.4	0.6	0.30
12	-0.15	-0.3	0.9	0.70	-0.6	0.8	0.30

The results broadly support the hypotheses expressed earlier although, the precise numbers must be treated with caution. The long-run effects are non-zero - the final column of Table 3a suggests that a long-run fall in output occurs. Notice that, in the South, capacity continues to fall rather than returning to a new equilibrium and this is because permanent cuts in new construction cumulate into an ever-decreasing housing stock, which forces house prices ever higher. The table also shows a rise in real product wages – wages fall more slowly than producer prices. There are relatively modest net migration flows away from the South, which are noticeably smaller than the loss of new housing production. Similar points arise with respect to the North, shown in Table 3b. Here, the reduction in construction in the South leads to some rise in GDP in the North, although the effects are not fully compensating. This arises primarily from a modest reduction in the real product wage.

The results assume that house prices have an impact on wage settlements and that workers and employers have equal strength in wage bargaining - this may not be the

case. If workers are relatively strong, the effects on output and unemployment would be greater. If workers have limited power, then the effects would be smaller. The simulation can be repeated on the assumption that house prices have no effect on wage determination. Comparing results, the assumption that housing affects wages has a noticeable effect on the results. In the absence of a “wedge”, most of the effects on capacity output in the two regions disappear. The migration effects that remain are smaller and have only a limited effect on productive potential.

Our simulations suggest that if new construction succeeds in reducing house prices, there are *permanent* effects on both unemployment and the real wage via house prices. This is in contrast to the US evidence. The model is only indicative but captures the types of interactions that lie behind existing reduced form models. The model confirms the central importance of any impact of housing on wage determination. It remains doubtful whether rates of migration by unskilled workers could be improved further by higher rates of building in the South East: higher rates of new construction would be taken up first by better-informed locals.

6. Urban Analysis

In our view, the influence of new housing is more pervasive at this spatial scale. However, much urban analysis remains founded in residential location theory. Although this large volume of work is extremely valuable in its place, it does not provide an integrated empirical model of housing choice, industrial location, labour demand and supply, social cohesion and exclusion and transport. In the background paper to the Urban White Paper, Robson *et al* (2000) recognise that policy requires complex spatial models that capture the interconnections between markets. In practice, although the Urban White Paper is full of ideas, it does not rest on an explicit economic model. The danger is that policies that might seem desirable in a partial context can have unexpected consequences elsewhere in the urban economy. The models of Meen and Andrew (1999) and Meen (2001) begin to move in the direction of an integrated framework, although there are still many missing pieces in the jigsaw. This work is estimated for London and South East England (similar modelling has also been applied to Glasgow – Gibb, et al, 2000).

New Housing and the Life-cycle

It is our contention that cities and their suburbs constitute integrated labour market areas. Second, within those integrated labour markets, housing markets are segmented. Third, this often means that households choose their residences first according to their preferences and, subsequently, adjust either their commuting patterns or their place of employment in line with their place of residence. In contrast to regional models, moving takes place primarily to meet housing demand rather than as an adjustment to labour market change. Therefore, a central element is to model housing demand and location choice, which vary over the life cycle. As argued by, for example, Clark and Dieleman (1996), the housing demands of young single-person households are very different from those of families with children. The vast majority of moves take place either because of life-event changes e.g. marriage, divorce, additional children, or in order to improve housing conditions.

Meen (2001) concentrates on London and South East England. According to the 1991 Census, London had a younger age structure than the rest of the South East, particularly in the 16-24 and 25-39 age groups. Households tend to move away from London as they become older. Population changes in the South (excluding London) over the period 1991-1998, (Bate *et al*, 2000) show that although a significant proportion of the population change comes from natural increase and international migration, the biggest proportion (370,000) comes from net migration from London. This illustrates the main concern of those who believe that new housing supply “creates its own demand”. Although any increase in new housing is not likely to induce extra migration from the North and Midlands, there is a major concern that migration from London would increase significantly to offset any benefit.

Meen (2001) (and Gibb, *et al*, 2001) shows that environmental factors are crucial in explaining population outflows. Unsurprisingly, families do not wish to live in areas of high crime and unemployment. The recently released deprivation indices for 2000 (DETR 2000) confirm that, on all measures, inner city local authorities are at the top of the league table. It is hardly surprising, therefore, that families wish to leave. Interestingly, despite the outflows from London, it is not true that London is losing population. In recent years, this has been the experience of many cities. However, the common feature is that population gains are predominantly in terms of young, single-

person or couple, high income households who are attracted to cities by the amenities. At that stage in their housing careers, good quality city locations are highly attractive. At later stages as they acquire partners and children they tend to move to the suburbs.

Table 4 Moving Probabilities

Household Type	Inner London	Outer London	Rest of South East
Income quartile 1; private renting; 0 children; <40	0.870	0.179	0.363
Income quartile 4; private renting; 0 children; <40	0.949	0.377	0.612
Income quartile 1; owner occupn.; 0 children; <40	0.301	0.014	0.036
Income quartile 4; owner occupn; 0 children; <40	0.544	0.038	0.093
Income quartile 1; public renting; 0 children; <40	0.520	0.034	0.085
Income quartile 1; owner occupn.; 1 child; >45	0.206	0.010	0.022
Income quartile 2; owner occupn; 0 children; retired	0.137	0.005	0.013

Source: Meen (2001)

The first cell shows, for example, that a household with a head under the age of 40, in the lowest income quartile, renting privately in Inner London and with no children has an 87% chance of moving in any year between 1991 and 1996. Inspection of the cells suggests that the moving probabilities for upper income households are significantly higher than for low income households. Furthermore, moving propensities fall with age and with the presence of school-aged children. Those in private renting have considerably higher moving probabilities than owner-occupiers and public tenants also have higher moving probabilities, *for households of common characteristics*, than those in owner-occupation. The table also shows that mobility rates are greater in Inner London than in the Rest of the South East.

Meen (2001) stresses the role of environmental conditions in explaining the location choices of households in London and the South East. Of the variables above (many of which are correlated), statistically the most important in determining household location between London and the Rest of the South East were the crime rate, unemployment, housing costs and previous location. Similarly, neighbourhood deprivation was found to be a key influence in determining location in a study of Glasgow (Gibb *et al* 2000). However, these studies found no statistically significant

effect directly from new housing supply in determining location choice between Inner London, Outer London and the Rest of the South East.

One must be careful in concluding that new housing has no effect. There is, first, an indirect effect through housing costs: other things equal, households prefer low cost locations and, hence, households could be attracted to areas of increasing housing supply. Second, housing *stocks* typically have more important effects than new construction flows, since the former primarily determines the structure of any neighbourhood. New flows are important but they take many years to have any major effect on the structure of cities and suburbs (except at a very localised scale). Therefore, it is unsurprising that simply including new supply in a model of this form has an insignificant effect. Third, new housing produces externalities, which, in some circumstances, worsen the environment and in others improve the neighbourhood. Neighbourhood conditions also have important effects on household location choices and, hence, migration flows.

Table 5. Location Probabilities

	Inner London	Outer London	Rest of South East	Rest of England
Previously IL	0.466	0.106	0.220	0.209
Previously OL	0.033	0.671	0.152	0.144
Previously SE	0.018	0.042	0.859	0.082
Previously England	0.081	0.182	0.378	0.359

Source: Meen (2001)

Meen (2001) shows the likely destinations for households, originally based in London and the South East, who decide to move. These are reproduced in Table 5, disaggregated by origin and destination. The main diagonal shows the importance of current location. For those previously living in Inner London there is a 22% probability that moving households will relocate in the Rest of the South East. By contrast, for those living in the South East, there is a less than 2% probability that they will move to Inner London. For this latter group, there is an 86% probability that any moves will be to another South Eastern location, although there is an 8% chance that they will move out of the South East altogether. Moves by Outer London residents also show relocation outwards rather than back into Inner London.

It might appear that a natural pattern for population structures is that wealthy households always live in the suburbs and the poor in the city centres, despite the fact that land prices are dearer at the centre. Standard residential location theory suggests that this pattern will, indeed, occur if housing demand is income elastic. Experience of the UK and USA might suggest that this model is a reasonable approximation. Other countries, though, do not conform. (for example, Paris, (Brueckner *et al* 1999), Sydney and Melbourne). Wealthy households do not always choose the suburbs. This seems to be due to a number of reasons: high quality environments, including good quality schools and low crime rates. historically low density development, coupled with tenure structure also seems to be significant.. Despite these advantages, growth in the urban core is concentrated on a narrow group of young households. Families still, typically, move outwards. This illustrates the problems Britain faces in attracting families back to cities. There is no evidence to suggest that simply providing extra housing in cities will overcome the problems.

We can now begin to see how the population age structure of London and the South East might be explained. Table 4 shows that mobility is stronger amongst the under 40s, those marrying and amongst households with pre-school children. Furthermore, these moving households will tend to be attracted to better environmental conditions in suburban locations. Above the age of 40, households are more likely to stay where they are, but these groups will already have typically migrated out-of-town. In turn, the population of London will be “replenished” by young migrating households from other regions, by international in-migration and by natural increase. These differing trends lead to a segmentation of household types by areas.

Housing, Households and Business Location

We argued earlier that there appeared to be a positive relationship between housing and industrial construction, consistent with jobs moving to workers in that sector. More detailed evidence is given here. Table 6 shows the relationship between housing construction output (both public and private) and industrial construction over sub-periods. The housing variables are measured in terms of construction output whereas industrial construction is measured by new orders; this is in order to aid identification of the timing of any relationship since new orders precede output. The first cell

implies that, in the long-run, a 1% increase in new private housing is associated with a 0.573% increase in industrial construction.

Table 6. Sub-Sample Estimates of the Relationship between Industrial New Orders and Housing Output

	Private	Public
66(4)-95(2)	0.573	0.153
73(1)-95(2)	0.597	0.065
80(1)-95(2)	0.505	-0.146
66(4)-80(4)	-0.047	0.724

Over the period 1966-1995, private sector housing and less so, public housing, have significant positive effects on industrial new orders. Moreover, causality tests suggest that new housing causes later private sector industrial development. This result is consistent with the view that existing firms in this sector relocate or newly-forming firms locate in places where more highly skilled workers desire to live. The table also shows that the relationship has changed over time. The private sector variable became much more important after the 1960s - indeed it was insignificant during the earliest period - whereas the public sector variable was most significant earlier on. In earlier years, the public sector contained a high proportion of skilled workers, but, if anything, industrial investment now appears to be deterred by social housing.

Testing the relationship at the regional level is more difficult because constant price data are not available below the national level, hence current price data have to be used. Moreover, the data begins only in 1980. Therefore, we would not wish to place too much emphasis on the results. Nevertheless, Table 7 suggests that the positive relationship between industrial new orders and private housing is not uniform and that the relationship only holds in the three southern regions and is strongly negative in the North West. By contrast, public housing generally has an insignificant effect in the southern areas. The national results are disguising distinct spatial patterns, which are consistent with the skill requirements of high technology companies, disproportionately distributed in the South East. Such companies need to be in locations where skilled labour can be found.

Table 7. Regional Industrial Construction & Housing 1980(4)-1996(1)

Region	Private	Public
South East (ex. London)	0.738	-0.074
East Anglia	0.901	0.089
South West	0.931	0.291
North West	-0.917	-0.474

Although we cannot test the relationship in the same way, it is useful to speculate on the relationship between housing and office and retail developments. In particular, office developments might have little relationship with housing because of strong commuting patterns by employees in financial services. But the connection is likely to be stronger for retail developments, which require concentrations of relatively low-skilled local employment and rely on local population centres for their markets.

If high income, high skilled households have greater moving propensities and prefer out-of-town locations as they age and have families, then industrial development is attracted to the same areas. Out-of-town locations have concentrations of high-income families and high technology companies. One implication is that there is little point in providing housing in locations where households do not wish to go. There may well be benefits to meeting the demands for housing of young, single person or couple, high-income households who prefer the convenience of cities, but there is little evidence that older families will be attracted back to cities once they have left. Housing markets are segmented and policy has to take this into account.

7. Conclusions

This paper has presented a lengthy review of the economic role of new housing, both in terms of existing literature and in reporting research by the authors. There are a number of conclusions that relate to academic and policy debates but also to the direction of future research.

First, space is important to the impact of new housing and the evidence supports the spatial structuring of the analysis. We found that the way national models are organised (short run and often demand-oriented) mitigates against any special role for new housing. Regional analysis suggest that housing is an important constraint to regional economic adjustment to shocks. Our analysis of household and business location choices within metropolitan regions implied that new housing has a cumulative effect on the attractiveness of residential neighbourhoods and that life-cycle factors are critically important to locational decisions. The impact of new housing has to be contextualised within these spatial dimensions.

Second, we asked in Section 2 whether the emerging trends were worrisome. The downward trend in new housing and the consequences of the constant shares of regional new build are problematic in so far as new housing does indeed contribute to the capital stock and technological progress in a specialised manner. However, we do not yet know whether this is the case and new research is required in this direction. However, the research reported in Sections 5 and 6 do suggest that the cumulative effects of new housing (and its long term decline) matters and affects regional and urban economic development.

Third, there are important policy ramifications. Urban policy has to be conceptualised within a coherent economic framework and has to operate within the parameters of what we know about locational and life-cycle decision-making. Re-urbanising policies may have to be more modest in their ambition if they are not to be wasteful. At the regional level, there is both a need to take a wider cognisance of the inter-regional impacts of investment decisions and a need for greater co-operation (a shared vision of what is trying to be achieved) across regional land release planning conferences.

Each spatial scale, finally, indicates scope for new research such that many of the unanswered questions uncovered above can be addressed. At the urban scale, the model of the urban economy has only been partially developed and much more integrative work is required. The regional simulation model also is ‘work in progress’ and requires much more empirical validation. At the national level, the only way to answer the crowding-out thesis of contemporary economy models is to seriously investigate the role of housing in the production function, to link it systematically to endogenous growth ideas, and to find ways to test these relationships. This is a substantial research agenda, some of which is at the frontiers of current knowledge. It is, nonetheless, a valid agenda, particularly given the importance of new housing, cumulatively, to our cities and regions.

8. Technical Appendix: A Two-Region Model

There are no off-the-shelf models that can readily be used for the regional simulations. Therefore, we have constructed our own, based on a combination of economic theory and parameter guesstimates. Estimation and formal testing of the model would certainly lead to improvements. We have tried to stress that regional models incorporating housing variables place more emphasis on the supply-side of the economy than national models. This is also true in the model below. Aggregate demand is treated simply as the sum of consumers' expenditure, housing expenditures and a "residual" aggregate demand category.

The supply-side of the model consists of equations for:

?? Employment

?? Wages

?? Prices

?? Capacity utilisation

?? Capacity output

?? Unemployment (the NAIRU)

Each of these is modelled consistently. We assume that firms are profit maximisers, operating under Cobb-Douglas technology and constant returns to scale. Firms and workers bargain over wages (with equal market power). Since firms face different prices (producer prices) from households (consumer prices), a "wedge" exists between the two. In this model, the main component of the wedge is the existence of house prices, which affect only consumer prices. Therefore housing supply shortages, which affect real house prices, raise the real wage and, then, unemployment. Almost all the parameters of the above equations are derived from theory.

In addition the labour supply (and both employment and unemployment) are affected by migration between regions. Net migration, by assumption, is related to employment growth differentials and relative house prices. The parameters of the migration equations cannot be derived from theory, but are taken from earlier econometric work by the authors. Migration is more responsive to employment than to house prices, in line with the majority view in the literature. The model is derived for two regions, which interact through general prices, house prices and migration. For each region the equations take the following general forms – only the determinants of the central equations are given. $f(.)$ defines a functional relationship, i.e. a relationship between sets of variables.

Aggregate Demand (AD)

$$AD = C + NH + DOTH$$

Consumers' Expenditure (C)

$$C = f(ER/PC, ET, R, W/PC)$$

Wealth (W)

$$W = f(PH, HS)$$

Housing Stock (HS)

$$HS = HS_{-1} + NH$$

House Prices (PH)

$$PH = f(HS, HD)$$

Housing Demand (HD)
 $HD = f(ER/PC, ET, R, POP)$

Population (POP)
 $POP = f(POP_{-1}, MIGR)$

Labour Supply (LS)
 $LS = f(LS_{-1}, MIGR)$

Migration (MIGR)
 $MIGR = f(PH, ET)$

Employment (ET)
 $ET = f(AD, ER/P)$

Wages (ER)
 $ER = f(P, UP, WEDGE)$

Producer Prices (P)
 $P = f(ER, CU)$

Consumer Prices (PC)
 $PC = f(P, PH)$

Wedge (WEDGE)
 $WEDGE = f(P - PC)$

Capacity Utilisation (CU)
 $CU = f(AD, Y^*)$

Capacity Output (Y)*
 $Y^* = f(NAIRU, K)$

The NAIRU
 $NAIRU = f(WEDGE)$

Unemployment rate (UP)
 $UP = (LS - ET) / LS$

Other Variables Not Defined Above:

<i>NH</i>	=	<i>New housing construction</i>
<i>DOTH</i>	=	<i>“Residual” demand</i>
<i>R</i>	=	<i>Market interest rate</i>
<i>K</i>	=	<i>Capital stock</i>

9. References

- Ball, M. (1996). *Housing and Construction: A Troubled Relationship*. Policy Press. Bristol.
- Bate, R., R. Best, and A. Holmans. (2000). *On the Move: The Housing Consequences of Migration*. Joseph Rowntree Foundation: York.
- Blackaby, D.H, and D.N. Manning. (1992). "Regional Earnings and Unemployment-A Simultaneous Approach", *Oxford Bulletin of Economics and Statistics*, 54(4): 481-502.
- Blanchard, O.J., and L.F. Katz. (1992). "Regional Evolutions", *Brookings Papers in Economic Activity*, No. 1, pp 1-61.
- Bover, O., J. Muellbauer, and A. Murphy. (1989). "Housing, Wages and UK Labour Markets", *Oxford Bulletin of Economics and Statistics*, 51(2): 97-136.
- Bramley, G. (1999). "*The Influence of Planning on Housing Supply and Economic Performance*". Paper presented at University of Reading ESRC Colloquium on Housing, Property and Competitiveness, May.
- Bramley, G., W. Bartlett, and C. Lambert. (1995). *Planning, the Market and Private House Building* UCL Press, London.
- Breheny, M. (ed) (1999). *The People: Where Will They Work?*, TCPA.
- Brueckner, J., J-F. Thisse., and Y. Zenou. (1999). "Why Is Central Paris Rich and Downtown Detroit Poor? An Amenity-Based Theory." *European Economic Review* 43: 91-107.
- Cameron, G., and J. Muellbauer. (2000). "Earnings, Unemployment and Housing: Evidence from a Panel of British Regions". *CEPR Discussion Paper No. 2404*.
- Carruth, A., and A. Henley. (1993). "Housing Assets and Consumer Spending: A Regional Analysis", *Regional Studies*, 27(7): 611-622.
- Champion, A., and T. Ford. (1998). "The Social Selectivity of Migration Flows Affecting Britain's Larger Conurbations: An Analysis of the Regional Migration Tables of the 1981 and 1991 Censuses", *Department of Geography, University of Newcastle, Working Paper*.
- Cheshire, P., and S. Sheppard. (2000). "Building on Brown Fields: The Long Term Price We Pay", *Planning in London*, 33 (April/June): 34-36.
- Clapham, D. (1996). "Housing and the Economy: Broadening Comparative Housing Research", *Urban Studies*, 33(4/5): 631-648.
- Clark, W.A.V., and F.M. Dieleman. (1996). *Households and Housing: Choice and Outcomes in the Housing Market*. Center for Urban Policy Research: Rutgers.

- DETR. (2000). *Indices of Deprivation 2000*. London.
- DiPasquale, D., and W. Wheaton. (1996), *Urban Economics and Real Estate Markets*, Prentice Hall.
- DTZ Pidea Consultancy (2000). *Spatial Patterns of Housing Development: a Summary of Research Evidence*. Research Review No 1. Scottish Homes: Edinburgh.
- Evans, A.W. (1988). *No Room! No Room!* Institute of Economic Affairs Occasional Paper No. 79. London.
- Evans, P., and B. McCormick. (1994). "The New Pattern of Regional Unemployment: Causes and Policy Significance", *Economic Journal*, 104: 633-647.
- Fujita, M., P. Krugman and A. Venables. (1999). *The Spatial Economy*. MIT Press: Cambridge, Mass.
- Galster, G.C. (1998). *An Econometric Model of the Urban Opportunity Structure: Cumulative Causation Among City Markets, Social Problems, and Underserved Areas*. Fannie Mae Foundation Research Report.
- Gerald Eve (1992). *The Relationship Between House Prices and Land Supply*. DOE: London.
- Gibb, K., A. Kearns, and K. Kintrea. (1999). *Low Demand, Housing Preferences and Neighbourhood Choices: Evidence from Four Local Studies in the City of Glasgow*. Paper presented at ENHR Conference, Balaton, Hungary, August.
- Gibb, K. and M. Keoghan. (1998). "Backward Linkages from Construction: Exploring the Economic Development Potential of Scottish Building Supplies", *Local Economy*, Vol.13, November, pp. 6-23.
- Gibb, K., D. Mackay and G. Meen. (2000). *The Demand for Social Rented Housing in the City of Glasgow: Citywide Needs and Demand*. Report prepared for Glasgow City Housing, Scottish Homes and the Glasgow and West of Scotland Forum of Housing Associations.
- Gordon, I. (1990). "Housing and Labour Market Constraints on Migration Across the North-South Divide", in *Housing and the National Economy*, Ermisch J (ed.), Avebury.
- Green, F., and G. Hadjimatheou. (1990), "Regional Differences in Personal Savings", *Applied Economics*, 22(7): 933-945.
- Holmans, A. (1990). "House Prices: Changes through Time at National and Sub-National Level", *Government Economic Service Working Paper No. 110*.

- Hughes, G.A., and B. McCormick. (1981). "Do Council House Policies Reduce Migration Between Regions?" *Economic Journal* 91(364):919-39.
- Hughes, G.A., and B. McCormick. (1985). "Migration Intentions in the UK. Which Households want to Migrate and Which Succeed?" *Economic Journal* 95(Supplement): 113-23.
- Hughes, G.A., and B. McCormick. (1987). "Housing Markets, Unemployment and Labour Market Flexibility in the UK." *European Economic Review* 31(3): 615-45.
- Hughes, G.A., and B. McCormick. (1990). "Housing and Labour Market Mobility." in J.Ermisch (ed.). *Housing and the National Economy*. Avebury.
- Hughes, G.A., and B. McCormick. (2000). *Housing Policy and Labour Market Performance*, DETR.
- Keenan, P., S. Lowe, and S. Spencer. (1999). "Housing Abandonment in Inner Cities – The Politics of Low Demand for Housing." *Housing Studies*, 14(5): 703-716.
- Krugman, P. (1991). *Geography and Trade*. Leuven University Press and The MIT Press.
- Maclennan, D. (1988), "Resident Benefits, Spillovers and Expectations in a Housing Revitalisation Programme". *University of Glasgow, Centre for Housing Research mimeo*.
- Malpezzi, S. (1996). "Is Theory Outrunning Measurement in Real Estate Economics? Some Observations from the US." *SHAPE Conference Paper*. London Business School.
- Meen, G.P. (1996). "Ten Propositions in UK Housing Macroeconomics: An Overview of the Eighties and Early Nineties", *Urban Studies* , 33(3): 425-444.
- Meen, G.P. (1997). "House Prices in the Late 1990s - Performance and Policy", *Housing Finance*, No. 35: 18-27.
- Meen, G.P. (1998). "Modelling Sustainable Home – Ownership: Demographics or Economics?" *Urban Studies* 35(11): 1919-1934.
- Meen, G.P. (2000), "Housing Cycles and Efficiency", *Scottish Journal of Political Economy*, 47(2): 114-140.
- Meen, G.P. (2001), *Modelling Spatial Housing Markets: Theory, Analysis and Policy*. Kluwer Academic Publishers, Boston.
- Meen, G.P., and M. Andrew. (1998). *Modelling Regional House Prices: A Review of the Literature*, DETR.

- Meen, G.P., and M. Andrew. (1998a). "On the Aggregate Housing Market Implications of Labour Market Change." *Scottish Journal of Political Economy* 45(4): 393-419.
- Meen, G.P., and M. Andrew. (1999). "Spatial Structure and Social Exclusion", *University of Reading Discussion Paper in Urban and Regional Economics No. 140*.
- Monk, S, B. Pearce, and C. Whitehead. (1992). *Planning, Land Supply and House Prices: Literature Review*. Property Research Unit, University of Cambridge Monograph 21.
- Morrison, P. (1999) "*Unemployment and Urban Labour Markets*", unpublished paper presented at University of Glasgow, Department of Urban Studies seminar. November.
- Muellbauer, J. (1990). "The Housing Market and the UK Economy: Problems and Opportunities." in J. Ermisch (ed.) *Housing and the National Economy*. Avebury.
- Muellbauer, J., and A. Murphy. (1994), "Explaining Regional Consumption in the UK", *University College Dublin, Department of Economics Working Paper WP94/29*.
- Muth, R.F. (1971). "Migration: Chicken or Egg?" *Southern Economic Journal* 37: 295-306.
- Power, A. (2000). "From Unlettable Homes to Urban Sprawl: Planning for Housing Need." in R. Bate, R. Best and A. Holmans (eds), *On the Move: The Housing Consequences of Migration*. Joseph Rowntree Foundation: York.
- Power, A., and K. Mumford. (1999). *The Slow Death of Great Cities?* Joseph Rowntree Foundation.
- Pryce, G. (1999). "Construction Elasticities and Land Availability: A Two-Stage Least-Squares Model of Housing Supply Using the Variable Elasticity Approach." *Urban Studies* 36(13): 2283-2304.
- Robson, B., M. Parkinson, M. Boddy, and D. Maclennan. (2000). *The State of English Cities*. DETR.
- Steinnes, D.N. (1977). "Causality and Intraurban Location." *Journal of Urban Economics* 4: 69-79.
- Steinnes, D.N. (1982). "Do People Follow Jobs or Do Jobs Follow People? A Causality Issue in Urban Economics." *Urban Studies* 19(2): 187-192.
- Thurston, L., and A.M.J. Yezer. (1994). "Causality in the Suburbanization of Population and Employment." *Journal of Urban Economics* 35: 105-118.

Turok, I and N. Edge. (1999) *The Job's Gap in British Cities*. The Policy Press: Bristol.

Webster, D. (1994). *Home and Workplace in the Glasgow Conurbation*. Glasgow City Housing Working Paper.

Wilcox, S. (2000). *Housing Finance Review 2000/2001* The Joseph Rowntree Foundation.