

# **The Micro and Macro Effects of the Location of New Housing Supply**

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# 1 Introduction

## 1.1 Context

The recently published Barker Review of Housing Supply (Interim Report, 2003, p.58) estimates that the current number of new homes per annum would need to be doubled in order to “achieve the European trend rate”, and “more than double to get real price stability”. Macro estimates of this kind implicitly contain a plethora of assumptions, however, about the nature and operation of local housing markets. The coexistence of spiralling house prices in some areas and low demand in others demonstrates the complexity of the supply-demand mismatch at the micro level and raises the crucial question of where those new properties should be located.

Given the relative proximity of contrasting housing submarkets, it is possible that the actual impact on house price growth of a major expansion in housing supply (were that at all achievable) would depend on where those new houses are built. If new supply is to realize its potential impact on macro house price trends, careful thought needs to be given to the substance of local land planning strategies and whether the local economic and housing market effects of land release decisions are being fully considered. And it is not just whether the decisions of local planners are evidence based that is at question here. Are there sound economic grounds, for example, for the choice of the four expansion areas outlined in the sustainable communities plan? Has the estimated local impact been systematically measured and evaluated against alternative locations? Regional and macro policy also has to be evidence based.

Whilst the questions may seem obvious, delivering on them is not. How the location of new houses relates to their final micro and macro impact is a relatively unexplored topic. Identifying the appropriate evaluation framework for new supply is a much more difficult task than simply stating that evaluation is needed. The situation is complicated further by questions of how and whether land release policy can be integrated with initiatives aimed at encouraging the regeneration of areas and the promotion of sustainable communities. Given the complexity of local housing markets and the social interactions that affect them (Meen and Meen, 2003), meaningful evaluation can really only be achieved from empirical analysis of housing markets based at the very local level.

Unfortunately, there have been relatively few published empirical studies in the UK of housing supply at all, and none of these extend to an analysis of the hypo-micro impacts of new construction

on existing housing markets. To date, one of the few attempts to consider these issues in a UK context is an unpublished pilot study by researchers at the University of Glasgow for the Joseph Rowntree Foundation in 2003. Using housing supply and transactions data on Glasgow, Pryce and Gibb 2003 investigated whether there was a different impact of new construction on contiguous second hand housing markets depending on whether those areas were deprived or affluent. The results suggested a potential asymmetry in the impact of new supply. For deprived areas, new construction was found to have a substantial positive impact on house price, but for affluent areas, the effect was barely traceable.

But in terms of establishing the optimal location of new supply, these results only scratch the surface. A great deal more needs to be learnt about the local effects of new construction and the goal of this report is to offer some suggestions as to how future research could provide a useful evidence base. My goal is to offer some detailed (though inevitably incomplete) practical suggestions that draw on some recent advances in modelling techniques and data collection.

## **1.2 Aims**

The report attempts to address three core questions:

1. What is the macro house price effect of new supply?
2. How might new supply have a regenerative effect?
3. What is the role of submarkets in determining the effects of new supply?

It is immediately apparent that these are not separate but interrelated questions. Note that there is an important hypothetical premise, that of a significant expansion in the release of land for residential use and in the rate of new construction. To some extent this may be viewed as a distraction from the core problem facing UK housing policy of how to increase the rate of new completions given the failure to do so in any significant way over the past thirty years (see the Barker Review Interim Report 2003). While this is ostensibly the more pressing question, in reality it is contingent upon the issues addressed in this report. For if the truth be told, the political pressures against land release will persist and indeed intensify at the least sign of planning liberalisation and as (if) more properties are built. Reform of supply-side housing policy is inevitably going to be a gradual process, where convincing justification for deregulation is likely to be a political necessity at every stage (and justifiably so). As such, understanding the local effects of land release will become increasingly important since it is the reports of local examples of success or failure that are often most influential

in shaping public opinion. The more we can understand the local adjustment process of the market in response to new supply and how these feed through to macro house price changes the better informed will policy be and the more constructive (hopefully quite literally) the debate.

### **1.3 Plan**

The plan of the report follows that of the Interim Technical Report (available on request from the author) which offers a more detailed and technical version of the current volume. First, a brief review of the literatures pertinent to local impact of housing supply is presented (chapter 2). The literature of most obvious connection is the submarkets literature and I offer a critique with respect to the usefulness of current approaches to delivering identification of submarket boundaries that are of practical use. I then consider the crucial question of how the existence of submarkets might impose spatial qualifications on the impact on adjacent second-hand dwellings, and in particular the potential for using the location of new supply to regenerate deprived areas (chapter 3). Chapters 4 and 5 return to the question of how submarkets might distort the macro price effect of new supply. Different rates of turnover of stock, and different demand elasticities across submarkets may have a crucial role to play in the long term price effect of the location of new supply. This is something of a leap in the role usually ascribed to submarkets which typically occupy a fairly minor place in the greater scheme of housing economics (though there have a limited number of papers that have discussed these issues at a fairly preliminary level, such as Jones and Watkins 1999). Bourassa et al (2003), for example, in answer to the question posed in the title of their paper, “Do housing submarkets really matter?”, conclude that they do because when properly accounted for, better specified house price equations can be derived. What I argue below, however, is that far more may be at stake than goodness of fit of statistical simulations. Perhaps submarkets hold the key to the optimal location of new supply, and indeed, to what the notion of “optimal location” might entail. The final chapter of the report proposes a framework for expanding the knowledge base necessary to facilitate future decisions on the location of new supply.

## **2 Submarkets**

### **2.1 Introduction**

Existing empirical literature on housing supply in the UK has tended to focus on its causes and effects at the city, regional and national levels, and in so doing, has overlooked the implications of new housing at the very local level. There is no need to review this supply literature since that task has competently and recently been executed by a number of authors (see White and Allmendinger 2003; Cullingworth and Nadin, 2002; Adams and Watkins, 2002; and not least, the Barker Review Interim Report, 2003). What needs to be explored more thoroughly is the link with literatures usually viewed as tangential to the supply question, the most obvious of which (given the goals of the current report) is the extensive body of work that defines, describes and delineates submarkets. Whilst there is a brief discussion of the potential importance of submarkets to land planning decisions by Jones and Watkins (1999), the links between submarkets and housing supply remain conceptually undeveloped and there is almost a complete absence of empirical analysis.

What *has* emerged out of this literature, however, is that submarkets do exist and that they have potentially profound implications for housing supply. Moreover, as I explain in the next chapter, the impact of new supply at the local level might be quite different to its regional and macro effect. Essential to our understanding of the ramifications of land release and new-build, therefore, is an understanding of the local housing adjustment process and this in turn requires an understanding of the operation and delineation of submarkets, which are the two core themes of the current chapter.

### **2.2 The Existence of Submarkets**

The conventional notion of an urban housing market is one of a single homogenous market, where all dwellings can be viewed as perfect substitutes for one another. In reality, differences in local amenities, environmental factors, school performance, crime and other drivers of neighbourhood “quality” conspire to shape the location of each dwelling into a unique and inimitable attribute. Add to this the clustering of dwellings of a particular type, age and quality, and a not unrelated clustering of particular demographic, social and ethnic groups, and the bland terrain of a single housing market rapidly transforms into a rich patchwork of varied but interrelated submarkets, each changing shape

and size over time, each metamorphosing at different rates, and each at different points in the housing business cycle.

In this light, it is not surprising that the effect of new supply on the local housing and employment market will crucially depend on how that new housing relates in type and quality to existing contiguous (and possibly non-contiguous) submarkets. Most importantly, it is those units with which the new supply will be perceived to be in competition with that will experience the greatest downward pressure on price as a result of the new construction. There may be a domino effect caused by the new supply that ripples through the whole housing system. For example, if high income households move into the new dwellings, the houses they vacate will fall in value, bringing them into the price range of lower income households. A complex bout of *musical chairs* takes place which, once complete, results in the poorest quality dwellings being left vacant, and ultimately demolished (Fallis, p. 82).

In an economy with a large private rented sector, these vacant dwellings arise because landlords cannot find tenants for the lowest quality housing. However, in the UK context, where many cities have a residualised rental sector, the process might succeed through low income mortgage borrowers in the lowest quality owner occupied housing failing to meet their mortgage payments (either because of a fall in household income or because they no longer wish to live there but are unable to sell). Mortgage borrowers might take possession of the dwellings but may then be unable to resell them. This is clearly a potential cause for concern. Were new supply to filter down in the form of falling real prices at the lowest end of the housing distribution, the brunt of the adjustment process would be borne by those on lowest income (rather than asset-rich landlords).

### **2.3 Delineation of Submarkets**

If submarkets are so important, why have they not held greater precedence in planning and economic analysis of the housing market? The answer is that whilst the literature has been successful in providing evidence of the existence and importance of submarkets, it has been less successful in constructing practical ways of delineating submarket boundaries. As a result, submarkets have not emerged as a practical unit of analysis. However, recent and emerging developments in the submarkets literature (such as that set out in section 2.6 of the Technical Report that accompanies this volume) combined with new sources of data (such as the recent expansion of the Survey of



Mortgage Lenders sampling frame) opens up the possibility of ascertaining the boundaries of submarkets in a way that will greatly assist the goal of modelling the true impact of new supply.

In addition to the question of where submarket boundaries lie are a series of questions about the nature of submarket boundaries and submarkets themselves. First, there is the question of whether submarket boundaries are discrete or fuzzy. The answer may not be uniform – the boundary governing the delineation of a particular submarket could be at one end precipitous, at the other, gradual. For some purposes it will be useful to break up regions and cities into discrete submarket boundaries even though the true borders are of gradual in slope (in the same way that for some purposes it is useful to assign households into artificial income brackets, even though income is really a continuous variable). Defining submarket boundaries will be useful (if not essential) to phases of further analysis, particularly the consideration of price and turnover trends over time (see **chapter 4**).

Second, at what spatial scale should we test for submarket boundaries? The grid search method, described in the Technical version of this report, uses a moving “window” of 400 observations. But what if we increased this to 1000 or even higher? Would the meaning of the results change? The answer is “yes”, since for a given spatial density of observations, raising the sample size on which the structural break tests are based would raise the spatial level at which one is considering submarket boundaries. One of the shortcomings of the existing literature is that the impact of spatial scale is not typically discussed. Systematic analysis of the granularity of submarkets would uncover the spatial scale at which the most important segmentation of housing market occurs. The “correct” spatial scale of submarket analysis depends partly on the use to which such submarket identification is going to be put. If subsequent analysis is based on data available only at a relatively large spatial scale (e.g. post code regions or local authority level) then the submarkets should be defined accordingly.

Third, do submarket boundaries shift over time? This is an important question since there is no theoretical reason why submarket boundaries should be frozen at any level. Anecdotally, we may know of processes of gentrification some areas and relative decline in others, but one is generally aware also of inertia (cf the persistence of regional and intra-urban disparities, some of which have existed for many decades; note also the original Hoyt, 1939, rationale for market segmentation summarised in the Technical version of the report). One of the advantages of adopting an evidence

based approach (rather than an administrative one) to submarket delineation is that it could in principle be applied to different years of data to ascertain, not only whether submarket boundaries shift, but the extent to which they shift and the way in which they shift (for example, the nature of the boundaries themselves might change from being precipitous to gradual declines, or visa versa). By analysing the movements of these boundaries over time, we might also discover that it is a practical way of investigating the kind of tipping point behaviour described by Meen and Meen (2003) as it would allow us to identify significant and rapid shifts in the relative fortunes of particular areas and would form the first step in a process of unpicking why and how the transition occurred (which in turn might help us understand the processes that are needed to induce rapid regeneration of an area).

## **2.4 Recommendations:**

This chapter has emphasised the importance of submarkets in determining the effect of new supply, and the imperative to base policy analysis at the submarket level. This discussion leads to the recommendation that housing and land policy (both at the micro and macro level) needs to be based on a sound understanding of the nature and role of submarkets. Because of the paucity of research into the nature of submarkets and their role in shaping the effect of new supply, the corollary is that significant improvements need to be made to the current level of information gathering and research in this area. I recommend that full use be made of the recent advances in submarket modelling and in data availability in order to construct evidence based submarket boundaries for the major UK cities. These submarket areas, once defined, could be used as the basis of a range of research and policy analysis that extend beyond housing markets and new supply (they could provide, for example, an appropriate spatial scale for the computation of deprivation indices, which are currently computed along arbitrary administrative boundaries).

## **3 Regeneration Effects of New Supply**

### **3.1 Introduction**

We have so far considered how submarkets might shape the impact of new supply, but an equally important possibility is the potential for new supply to shape and influence submarkets. Because most analyses of new supply have tended to focus on the macro effects, this is a topic on which there exists very little empirical evidence. Yet it is vital to our understanding of the housing system and the impact of the recommendations of the Barker Review. Local price dynamics will condition the impact of new supply on the areas immediately surrounding new-build and these dynamics need to be at the forefront of the debate on housing supply. Unfortunately, we know very little about the indirect price effects generated by new sites on existing housing markets at a micro scale. A pilot study by the Joseph Rowntree Foundation (Pryce and Gibb, 2003) offered some initial glimpses into the possible neighbourhood-level effects of new construction. Their results, though preliminary, offer some insight into the possibility of using land planning as a means of area regeneration. This chapter summarises the rationale and findings of the Pryce and Gibb (2003) study and considers ways in which the investigation could be applied more broadly.

### **3.2 The Neighbourhood Effects of New Supply**

Pryce and Gibb (2003) suggest two categories of influence of new construction on house prices. They first describe the direct affect, which corresponds to the conventional outcome following an outward shift of the supply curve. Given a downward sloping demand curve for housing, such a shift would, other things being equal, result in a fall in price. Pryce and Gibb argue that, although this would be the most obvious effect of an increase in new-build, it is possible that it may in fact be dominated by *indirect effects* at the neighbourhood level (particularly if the number of new-build on a particular site is substantial and is of a high quality relative to existing adjacent housing). Such a development has the potential to give rise to a positive externality effect, arising from the improvement in aesthetics that the new site brings, particularly if it is replacing derelict or former industrial land. In addition to the aesthetic externality effects, the prices of adjacent housing may benefit from an influx of higher income families.

For adjacent areas that are already prosperous, the impact may be negligible or negative. But for deprived areas, there may be a regenerative effect, the new development acting as a signal of future

inward investment and upward spirals in future demand and employment. Local retail and enterprise benefit from the inflow of more affluent households, unemployment rates fall, further retail and amenities emerge, and more workers seek to locate in the area, causing house prices to rise further.

### **3.3 Gaps in our Understanding of the Regeneration Effect**

Whilst there are good intuitive reasons to believe that such regenerative effects of new supply can occur, there is very little analysis currently available that will help us gauge the extent or permanence. Is the regenerative effect sufficient to dominate the direct price effect or will it merely ameliorate a price fall? If the effect is dominant, how localised is its influence? How stark is the contrast between the impact of building new supply adjacent to already affluent localities compared with construction adjacent to deprived areas? How large does the new estate have to be for the regenerative impact to have any real effect and what are the long term price implications for both the adjacent markets and the new estate itself?

It might well be that the city-wide impact of the new supply is indeed to reduce prices overall, but there may be strategic reasons for releasing land away from the most affluent areas. If new supply can at the same time regenerate deprived areas and take the heat out of the housing boom in demand hot spots, city planners will have good reason to consider the regenerative potential of new supply. Such a strategy is unlikely to work on the basis of a serendipitous approach to the release of land. Without economic analysis of the likely urban contours of price response to the construction of a large estate, location decisions will be ill informed and the consequence of new construction unpredictable. Such an analysis requires an understanding of the submarket structure of the existing housing market (chapter 2), the dynamics of those submarkets (chapter 4) and the possible variation in demand elasticities across those submarkets (chapter 5).

There is also the difficult issue of where developers will be willing to build – releasing land does not in itself guarantee an increase in the stock of housing. Developers have to be confident that there will be adequate demand for proposed sites and this often is dependent on contingent adjacent development. The success of one site will be contingent on the development of adjacent sites and so the fear of systemic failure can be a deterrent to development taking place at all. An important omission for many city developers is the availability of information on the liquidity and volatility performance of city submarkets – a point discussed further in chapter 4. Importantly, greater

understanding by developers and policy makers about the possible positive externality and regenerative impacts of new supply could go some way to removing some of the uncertainty surrounding new supply. Therefore, I shall now briefly describe the approach taken by the Pryce and Gibb (2003) attempt at measuring the neighbourhood effects of new supply, and to suggest how estimation might be developed in future.

### ***3.4 The Pryce and Gibb Approach to Estimating the Regeneration Effect***

Pryce and Gibb (2003) develop a model of house purchase where each potential buyer (labelled “bidders”) are assumed to have a unique set of preferences for housing attributes. Though personal valuations will vary from individual to individual, the valuations will form a regular distribution for each attribute. Not many potential bidders will place a very valuation on an attribute; not many will place a very high valuation, and most will place a valuation somewhere near the mean. Thus an approximately normal (i.e. ‘bell’ shaped) distribution of attribute valuations is assumed. Because of the symmetrical nature of the distribution this means that if more than 50% of bidders place a positive valuation on an attribute, then the average valuation will be positive, and visa versa. This approach allows the authors to make use of the standard output of regression analysis to estimate the proportion of successful bidders who place a positive valuation on a particular attribute. They find that the effects of new construction on the price of second hand properties are minimal in most areas, and particularly small in areas of low deprivation. However there was evidence to suggest that the effects of new construction may have a substantial positive effect on second hand properties in the most deprived areas.

### ***3.5 Recommendations:***

Two recommendations emerge from this chapter with regard to plugging the knowledge gaps regarding the regenerative impact of new supply. First, I recommend the application of the Pryce and Gibb method to CML and Land Registry Data. One of the impediments to applying the Pryce and Gibb approach more widely has been the highly involved process of acquiring, cleaning and preparing the local authority land supply data. Clearly, this would be a very time consuming process to repeat for each major city in the UK. There is, however, an alternative in the form of using Land Registry data to identify new-build and utilising CML data to provide dwelling-attribute information (distances from each CML second-hand property to the clusters of new build identified in the Land Registry data could be computed and used to estimate the local impact of new supply).

Second, an important potential extension of the Pryce and Gibb study is to formulate the full spectrum of gradations of the regeneration effect across space following a large increase in new-build on a particular site. Geographically Weighted Regression (see appendix at the end of chapter 3 of the Technical Report) would be one possible medium for establishing how steeply (and in which direction) the contours of the regenerative effect decline away from the most deprived areas and these contours may help planners and developers to identify the location(s) of optimal trade-off between developer's most desired location, and the location most beneficial for the city as a whole.

## **4 Spatial Variation in Market Dynamics**

### ***4.1 Introduction***

So far the report has largely been couched in static terms. But what of the distinctively dynamic aspects of submarkets? Of particular concern is the calculation of macro price indices. A defining characteristic of housing market dynamics is the differing rates at which properties of different types and location tend to return to the market. Because house price indices are invariably transactions-based they will be dominated by the properties that sell most frequently. If new supply is of the kind that sells frequently, a large price effect may result, but the success could be illusionary, reflecting computation bias in price indices rather than any true economic benefit. This would be true, for example, if length of stay reflects household satisfaction with the dwelling and its surroundings. This chapter considers the feasibility of correcting the bias intrinsic to existing house price indices. Finally, the chapter considers how volatility and liquidity may vary across submarkets and how private sector investment in housing could be encouraged by the provision of volatility/liquidity corrected house price information at the local level.

### ***4.2 Variations in the Frequency of Sale Across Space***

One of the complicating factors in understanding the impact of new supply on house price trends is the variation in the frequency of sale of properties across different parts of the country, and even within a particular city. Turnover rates also vary pro-cyclically with the housing market cycle (Gatzalf and Haurin, 1998). This variation in the rate at which dwellings enter and leave the market will obviously affect the impact on price indices of new supply. This is because price indices are usually based on transactions data without controlling for the frequency of sale. As a result, some properties will enter the market many times over a ten year period, whereas others will only enter once or not at all. Clearly, it is those properties that repeatedly enter the market that will drive a house price index if that index is computed from the average of all transactions. The question is whether properties that trade frequently can be considered as a separate submarket (either because of location or attributes) from those that rarely come on to the market. If so, then an important question to ask is: to which of these submarkets will newly constructed dwellings belong? The answer will depend again on the location and attributes of those new properties.

Suppose first that a new dwelling enters the infrequently sold submarket. As such, it is purchased upon completion by a family that do not move for the next ten years. If the construction of this dwelling and those of a similar ilk successfully relieve price inflation in the infrequently traded sector, then to what extent will this be reflected in price indices based on the aggregate volume of trade? The answer is not very much. For one thing, alleviating price pressures in a low turnover area may do very little to affect prices in a high turnover areas. The two are separate submarkets and viewed as such by prospective purchasers. Furthermore, price movements in the low turnover area will have less of an effect on regional house price indices than those in high turnover areas simply because each low turnover property will carry a lower weight in the computation of the headline house price index.

#### **4.2.1 What Target?**

This raises the important question of what house price measure macro supply policy should use as its target. If the target is to reduce house price inflation, then policy makers have to be aware that current measures carry with them an intrinsic bias towards frequently traded properties. Does this computational bias reflect the desired policy bias? It may be, for example, that there are differential house price inflation rates between different sectors of the housing market according to frequency of sale. If less frequently traded property is experiencing higher inflation than high turnover dwellings (see the extended version of this report for evidence in support of this proposition), then there may be a case for giving greater policy priority to alleviating demand pressures in the infrequently traded sector. The case might be supported if there is reason to believe that length of stay is a measure of consumer satisfaction. Given the emotional and pecuniary upheaval associated with moving house, a family will only consider moving if they anticipate a significant improvement in living standards. A major reason for moving will therefore be dissatisfaction with current living conditions (due to lack of space, for example). A policy that achieves a major increase in the stock of frequently sold dwellings (and hence a reduction in house price inflation) may do so at the expense of increasing the proportion of the total housing stock with which homeowners are generally dissatisfied. The policy will only exacerbate the price differential between desirable and undesirable properties.

Understanding the role of frequency of sale is not just of relevance to policy makers. The bias it implies for house price indices has the potential to distort private sector investment decisions. The lack of an appropriately adjusted house price index will be a source of uncertainty for potential investors in either new construction or potential landlords. To make appropriate financial decisions, such investors need to be able to readily compare the performance of the housing sector with that of



other tradable assets such as stocks and bonds and so lack of information in the housing asset market relative to other asset markets will further reduce the attractiveness of housing construction as a destination for investment funds.

### **4.3 Correcting for Sample Selection Bias**

One way of viewing the sample selection problem is as one of omitted variable bias (Heckman 1979), where the omitted variable in the house price equation is the probability of the property coming onto the market. Gatzlaff and Haurin (1998) take this view and use logistic regression to estimate the probability of a property coming onto the market. This estimated probability<sup>1</sup> can then be entered into the sale price equation to correct for sample selection bias. Unfortunately, the applicability of this approach to the UK context is limited since comprehensive data on unsold properties are rarely available. An alternative approach would be to make use of information that could potentially be gleaned Land Registry data on frequency of sale. Duration modelling techniques could then be applied to explain the length of time the property remains off the market to construct a correction factor to be included in the calculation of house price indices that would control for sample selection bias.

### **4.4 Submarket Price Volatility**

A major deterrent to investment in new construction is the level of risk associated with development and a key component of this risk arises from the volatility of prices. The Barker Review Interim Report (2003, p.64) estimates that, “For a 1 per cent increase in house prices, gross development profit on some sites can increase by almost 8 per cent”. In practice, the perceived risk is greatly exacerbated by the uncertainty surrounding the true volatility of prices at the local level. There is almost complete absence of robust, appropriately adjusted price indices at the submarket level for most cities in the UK. Compared with the great volume of information available on the performance of other assets, it is perhaps not so surprising that both the level of investment in new construction and the magnitude of supply elasticities are so low. There is a very real need, therefore, to develop a practical and robust strategy for improving the availability and quality of information. The first step of such a strategy would be to develop submarket based price indices that correct for sample selection bias. A natural corollary of this will be an analysis of the variations in volatility between

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<sup>1</sup> More precisely, the inverse Mills ratio is calculated.

submarkets. In the long term, attempts could be made to explain the determinants of volatility and to ascertain the relationship between submarket price volatility and new construction at the sub-city level. (For example, a possible determinant of volatility is the spatial pattern of mortgage debt -- differences in LTVs (loan to value ratios) and other mortgage characteristics can potentially cause significant asymmetries in the impact of interest rate changes and can themselves influence local housing market dynamics, as argued by Stein, 1995).

#### **4.5 Liquidity Bias**

Fisher et al (2003) argue that investors are interested in the expected time taken to sell property (“liquidity”) as well as the price and growth in price. Liquidity, and knowledge of liquidity, will affect investment rates in new construction. Clearly the motivation for developers to actually make use of land released for new residential construction is a prerequisite to the success of any such policy. Crucial to the investment decision is adequate information about expected liquidity and such information may also be a driver of the growth of the private rented sector (other things being equal, landlords will be more likely to expand their portfolio of properties if there high rates of liquidity in the housing market). Like many other housing market factors, liquidity will may not only over time and across regions but across housing submarkets (for empirical evidence see the extended Technical version of this report) within cities and so there is much to be gained from improving our understanding of the submarket behaviour of housing liquidity. Though this is an under researched area, there are recent examples of data are being released by estate agencies that is making such research increasingly feasible.

#### **4.6 Recommendations:**

Two clear recommendations emerge from this chapter: (1) house price indices used in macro models and supply simulations should be corrected for frequency of sale; and (2) volatility and liquidity measures need to be provided at the submarket level to improve the information base of potential investors in the housing market. With respect to the second recommendation, the ODPM should explore the possibility of working with the large national estate agents on the systematic release of data that would allow liquidity indicators to be provided for all the major UK cities.

## 5 Income and Price Elasticities

### 5.1 Introduction

Another way of describing submarkets is in terms of demand elasticities – the responsiveness of quantity demanded to changes in price (“*the price elasticity of demand*”) and income (“*the income elasticity of demand*”). If demand is highly sensitive to price (income) then it is described as “highly price (income) elastic”. Conventional economic theory stipulates that price elasticities are determined by the number of close substitutes available. If there are many close substitutes then demand will be highly responsive to price and demand for that good is described as being “price elastic”. An increase in price will simply cause consumers to switch to a substitute good. Income elasticities, on the other hand, tend to be determined by the extent to which a good is considered a necessity or luxury. If it is considered a necessity, as income rises there will be only a small increase in the demand for that good and it is described as being “income inelastic”. If, on the other hand, it is considered a luxury, then as income rises there will be a large increase in the demand for that good and it is described as being “income elastic”. This chapter considers the implications of demand elasticities for the price-impact of new supply.

### 5.2 Price Elasticity of Demand

#### 5.2.1 What Determines the Price Impact of New Supply?

What will be the price-impact of an outward shift of new supply? The determining feature, ironically, is not the price elasticity of supply (how responsive is the quantity of new construction to changes in price) but the price elasticity of *demand*. In turn, the price elasticity of demand is determined by the closeness and availability of substitutes, both of which are closely related to the shape and nature of submarkets. Indeed, a submarket can be thought of as a *lattice of substitutes*. If a submarket is characterised by a *tight lattice of substitutes* – that is, where there is a high degree of substitutability of dwellings within the submarket – and where dwellings frequently come onto the market and do not sell particularly rapidly when they do, then one would expect a house buyer seeking to locate in that area to be able to choose from a fair range of close substitutes. So the market demand schedule in such an area would typically be elastic (represented by a shallow demand curve). Land release, followed by an outward shift of new construction, in this type of submarket would result in a rather small deflation of prices. Conversely, in areas where the

submarket is characterised by a *loose lattice of substitutes* that infrequently come onto the market and are typically sold rapidly when they do, one would expect demand to be highly inelastic and outward shifts of supply of similar dwellings will have a large impact on price. It is clear, then, that the impact of new supply may vary considerably across submarkets, and so macro estimates that overlook the existence of spatial segmentation should be treated with caution.

Note that the frequency of sale and time on the market will affect the number of substitutes and hence the elasticity of demand. This is because, “purchasers ... do not have perfect information regarding all dwellings for sale, and so buying a house entails a search process. The buyer begins this search process by examining dwelling A, which has a given set of characteristics and price. In order to decide whether or not this is a good purchase, the buyer seeks to examine further dwellings B, C, ..., Z which lie in the same price range. The price elasticity of demand is assumed to be determined by the price and availability of known substitutes. Thus, the more dwellings the buyer can survey, and choose from, the more ‘effective substitutes’ there are available to him, and the more sensitive he is to price. Therefore, if there exists a constraining factor which limits the number of dwellings he can survey, or which increases the cost of surveying further dwellings, then the effect of this factor will be to dampen the price elasticity of demand.” (Pryce 2001).

Clearly, if there are large number of properties of a similar type available for purchase relative to the number of buyers, then buyers of that type of dwelling will enjoy a large number of close substitutes. Heterogeneity of dwellings and location are key factors here. A two bedroom flat in Mayfair is viewed very differently by the market to an identical property in the East End of Glasgow. Historical properties made with traditional materials and techniques and which have enjoyed an enriching ageing process, may not depreciate in value, but like good wine, may be perceived to have improved with age. The ambience and aesthetic of such properties and localities render them inimitable. Developers, however resourceful, could not reproduce the look, lifestyle or authenticity of Old Town Edinburgh, for example. The set of potential substitutes in the future as well as the present rests entirely on the existing stock and as a result, the demand for such dwellings may be highly inelastic.

Frequency of sale of properties is also a factor to consider, particularly when inimitability constrains the set of potential substitutes to the existing stock. That there may be a vast supply of a particular class of properties in the total housing stock is of little consequence if those properties never come onto the market. However, even if there is a high turnover of stock, if properties of a particular ilk

or location sell within a day, the physical limits to a housebuyer's search capacity may mean that at any one point in time, he/she only has a limited number of properties to choose from. The probability that another house-seeker will purchase the property in the interim means that each time a potential buyer chooses to view an additional property, there is a chance that a previously viewed property is no longer available. So the number of "effective substitutes" is conditioned by time-on-the-market as well as frequency of sale. There is evidence that both these factors vary considerably not only over time but also across space. Submarkets again are the decisive driver of the demand elasticities.

Price elasticity of demand will also be affected by the flexibility of consumers to adjust their demand for housing. Consumers can only take advantage of bargain prices if they can easily adjust their consumption of housing services. Unfortunately, housing is perhaps the least of goods in its amenability to realising demand changes. To increase ones' consumption of housing one typically has to either refurbish/extend one's property, or move house. Both these options entail considerable upheaval (house moving is often listed as one of the most stressful life events, and also one of the most the most expensive). Households may wait for years for a property of a particular type/location to come on the market, but when it does, to have a chance of being the successful bidder the household has to be able to rapidly sell its own property, have sufficient ready cash available to pay conveyancing and survey fees, and have the capacity to swiftly raise appropriate mortgage finance. Note also that the mortgage valuation of a property can fall short of the final selling price and so borrowers with little or no equity would need a loan to value ratio of greater than one to compete. So asset liquidity, transactions costs and credit constraints are all potentially inhibiting factors to the demand-adjustment process. One would expect demand to be more price elastic the less prevalent are these barriers. Since these barriers to adjustment vary across household type (previous owners, for example, are likely to be less credit constrained than first time buyers), one would expect demand elasticities to vary across households and areas, even if property types were identical.

If the impact of supply depends on price elasticities, and if price elasticities potentially vary across submarkets, the crucial question for any planner interested in the price effects of new construction, is to which submarket will the new supply belong? Bearing in mind the inertia of location (once a new property has been built on a particular spot, it cannot easily be moved to another!), this decision is effectively irreversible. New construction will have a permanent influence in shaping the nature of the housing stock and will alter the number of effective substitutes of a particular dwelling type for some time to come. Thus, if the increase of new supply is large enough, it may actually shape the

price elasticity of demand for its parent submarket (and hence change the nature and shape of that submarket). To the extent to which planners and government policy control the nature and location of new supply, the state (in the UK at least) has a potentially profound influence on the long term demand-elasticity structure of the housing market.

### **5.3 *Where will people want to live in future?***

According to textbook micro economic theory, “luxury” housing will have a higher income elasticity of demand (IED) than “necessity” housing. This is because, as incomes rise by a given proportion, it is improbable that households will want to consume an equivalent proportional increase in necessity housing. Because the IED is smaller for necessity housing, a given proportionate increase in income will cause the outward shift of demand to be less pronounced. This in turn will result in a much smaller price increase for necessity housing than for luxury housing. The key corollary is that if an insufficient proportion of the new land is released for luxury type housing, then the overall mitigating impact on rising real price trends will be negligible.

What causes the income elasticity of demand to vary? Other things being equal, the larger and more attractive the property, the more of a luxury good it will be perceived to be, and the greater the sensitivity of demand to changes in income. Location is also an important driver. Once the basic facilities of access to transport and employment have been achieved, households will seek to spend a greater proportion of increases in income on “luxury” location aspects, such as views, access to leisure facilities and status. Household preferences may also vary. There is evidence from the US to suggest, for example, that households seek racial and social compatibility. Different preferences for rural/urban lifestyles, and for different leisure activities, will also give rise to different perspectives on what is considered ‘luxurious’ and what is considered ‘necessity’ housing. There are also lifecycle factors. Location next to excellent schools may be seen as the height of luxury for families with young children. Not so for a retired couple living alone. Demographic factors will therefore have an important influence on the shape of the price elasticity matrix across households. An ageing population may give rise to a lower average preference for access to the central business districts and greater preference for semi-rural locations.

Growing income inequality will exacerbate the effects of heterogeneous income elasticities for property type and location because it will imply greater variation in the size of the outward shifts of demand for housing and an increase in the polarisation of prices between the most luxurious housing

and the least desirable dwellings. The former will enjoy ever greater increases in price inflation relative to the latter. As such, the “class reproduction” consequences of home ownership are set to intensify. Those on highest incomes will be able to afford the most luxurious housing which will enjoy the greatest levels of capital gains. Higher income, asset-rich households will be able to accumulate capital at an ever increasingly greater rate than low income, asset-poor households. Ironically, the consequence of restrictive planning may be to exacerbate rather than alleviate the most socially divisive aspects of capitalism and as such add to the long list of state failures associated with the allocation of land (see Pennington 2000, and Pryce 2003 “Greening by the Market?”).

Ironically, the only way to counteract this growing disparity in house price inflation is to increase the number of “luxurious” properties being built, and take the pressure out of the top end of the housing market. As noted in chapter 2, while there may be a filtering effect whereby poorer households eventually gain access better quality properties previously occupied by the wealthy, the process may be unpredictable, and has the dubious ethical consequence of helping the poor by subsidising the rich. The dilemma is less direct, however, if the policy entailed, not a subsidy to luxurious housing, but simply a relaxation of restrictions on the development of all types of housing. If price gains are indeed greatest at the highest end of the quality scale, then the market will ensure that supply will adjust accordingly.

#### **5.4 Recommendations:**

This chapter has presented a list of anticipated effects of demand elasticities on the impact of new supply. The discussion has been largely theoretical because there is no published research in the UK that attempts to gauge variations across submarkets in the price or income elasticities of demand. Given the potentially profound implications of heterogeneous demand elasticities on the impact of new supply, there is a clear imperative to improve our understanding of the nature of demand elasticity variation in the UK. A proposed methodology is presented in the technical version of this report.

## **6 Conclusion and Recommendations**

### **6.1 Introduction**

This report has considered three questions essential to our understanding of the impact of new supply: (1) What is the macro house price effect of new supply? (2) How might new supply have a regenerative effect? (3) What is the role of submarkets in determining the effects of new supply? This chapter will summarise the conclusions with respect to the first of these two questions (the answer to third is wrapped up in the answer to the first two) and then offer a strategy for accomplishing the recommendations made at the end of each preceding chapter.

### **6.2 Macro impact of new supply**

With regard to the first of our core questions, I have argued that the true macro house price effect will be the sum, not across a uniform housing system, but across a complex mesh of housing submarkets. These market segments have boundaries that do not necessarily correspond to administrative jurisdictions and they are entities that can evolve and merge over time. The report has presented a number of perspectives on the possible ways in which new supply will feed through to local and then national house prices. One view presents new dwellings as being purchased largely by high income groups, setting in motion a domino filtering effect throughout the housing system. The homes vacated by the wealthy fall in value and so become affordable to the next income tier. Adjustment continues until the lowest tier of housing becomes vacant and is eventually demolished. In a tenure system dominated by homeownership and where ‘half the poor’ are in owner occupation, this outcome may not be entirely desirable. Those on lowest incomes may not be able to sell their low quality properties making them immobile and their homes vulnerable to possession in the event of a downturn in their financial circumstances.

There are, however, a number of possible alternative outcomes. First, it may be that it is low/middle income households that have a preference for new construction. Listed buildings, and dwellings of particular character and ambience, may hold special value in the market place and so it is older buildings, rather than new construction, that desired by the wealthiest households. Such properties are intrinsically inimitable. If new houses are not of a particularly high standard they will be viewed as poor substitutes, and older luxury dwellings will become increasingly scarce as average incomes continue to rise. The demand curve will become steeper over time, increasing the price effect of supply shifts in that sub-market. It might be, therefore, that new housing tends to be purchased by



middle to low income households and tends to be of a type and location for which there may exist a plethora of substitutes. New housing would consequently have a shallow demand curve that dampens the price impact of shifts in supply, and results in a much lower than anticipated macro price effect.

Yet another perspective of the supply story emphasises the role of turnover in determining the effect on macro house price indices. So for example if new dwellings do indeed have shallow demand curves, the low- micro price effect may be offset if such dwellings are also of the ilk that tend to be re-sold relatively frequently. But the benefits of any macro price effect would then be illusory, reflecting computation bias rather than any true economic benefit. This would be true, for example, if length of stay reflects household satisfaction with the dwelling and its surroundings. One of the goals of supply policy should therefore be to increase the number of properties which people will be happy to inhabit long term. To avoid conflict with macro price goals, the price index used in macro models should be adjusted for frequency of sale.

### **6.3 Regeneration Effects**

These insights into the role of supply are complicated further by neighbourhood effects that new supply can cause. Perhaps locating new construction adjacent to deprived areas can engender an upward regeneration cycle as more affluent households move in, local economic activity rises, schools improve, and further rounds of investment result. New supply therefore has the potential to shape the character and perception of the neighbourhood and so may actually result in a rise in house prices, at least at the very local level. The complexity of this effect, particularly when combined with the subtleties of submarket dynamics (chapter 4) and demand elasticities (chapter 5), is bewildering. A pessimistic response would be to opt for the status quo – cities and their housing markets are too complex to understand so let's continue to make planning and investment decisions from a position of agnosticism or on purely political lines. Less pessimistic, and certainly more radical, is the view taken by Portugali (2000; reviewed in Meen and Meen 2003). Portugali's view of the planning system is as a top-down hierarchical system, where targets are set at the national level and fed down through the various branches of the rigid hierarchical tree without any interactions between branches at the same spatial level. Cities, in contrast, can be viewed as lattices "in which there is no central organising authority, but there are overlaps between systems at similar spatial levels" (Meen and Meen 2003 p. 931). This implies that planning authorities would do better to work *with* the fluidity of the city rather than attempt to manage and structure it.

One should not over emphasise the role given to fluidity, however. Whilst there are examples of rapid decline or advancement, what is perhaps most apparent (at least anecdotally) is the persistence of submarkets over time. Edinburgh's New Town has remained a relatively prosperous and attractive locale since the time it was built, and is one example among many of spatial inertia rather than dynamism. There is much to be gained, therefore, from cross-sectional snapshots of submarket structures, and even more to be gained from an investigation into the demand elasticity and dynamic behaviour of the urban system within these housing segments. Planning can still have an efficient and valid role if it is well-grounded in an evidence based understanding of submarkets.

## **6.4 A Suggested Programme of Research**

Our knowledge base be at a low starting point but there are very real improvements within our grasp. While the submarket structure of most UK cities may be something of an unknown, it does not have to remain so. The coincidence of recent data opportunities in the UK with developments in the methods for examining submarkets give rise to a potential sea-change in our capacity to understand the role of submarkets in determining the outcome of new supply. These opportunities have formed the basis of the recommendations listed at the end of each chapter, which can be synthesised into four phases of proposed research:

### **1. Delineation of submarkets for UK cities**

I speak here of the application of the grid-search approach to the location of submarket boundaries described in chapter 2 of the Technical Report, allied with geographically weighted regression approaches of the kind developed by Stewart Fotheringham and others. Submarkets should be defined for all major UK cities, but in the first instance, submarkets could be derived for a carefully chosen sample of cities (a city from the major urban conurbations, for example, supplemented by at least one other city from each of the four constitutional regions).

### **2. Modelling the Dynamic Properties of Submarkets**

Four aspects of submarket dynamics need to be investigated: (i) the movement of submarket boundaries over time using Nationwide and CML data; (ii) variations in the rate of turnover across space and time; (iii) submarket house price volatility; and (iv) variation in liquidity between submarkets. A more ambitious version of this project would seek to establish the interactions between submarkets and the existence of ripple effects within the urban system using techniques analogous to those applied to regional level studies of such effects (see Andrew and Meen 1998).

### **3. Identifying spatial variation in regeneration effects of new supply**

This would entail an analysis of the impact of new supply on the prices of adjacent second hand dwellings analysis informed by step 1 of the research programme: the delineation of submarkets. An alternative and complementary approach would be to apply geographically weighted regression techniques with a view to deriving contours of the price effects of new supply.

### **4. Demand Elasticity Structure of 6 UK cities**

Hendershott, Pryce and White (2003) have demonstrated that income and price elasticities of demand can in principle be estimated from CML data. This project would estimate these demand elasticities at submarket level for the selected cities and infer from these estimates the effect of new supply. Again, a combination of grid-search and geographically weighted regression techniques could be applied.

The only necessary sequence to these projects is that project 1 should precede the remaining projects because submarkets have to be appropriately defined before they can be used as the basis for analysis of regeneration effects, dynamics, and demand elasticities. Projects 2, 3 and 4 could conceivably be executed in any order, though there might be a case for project 2 to come before the remaining projects since it will add substantially to our understanding of the persistence and evolutionary nature of submarkets, which will itself add to our understanding of how regeneration and elasticities should be analysed. The duration of these projects will depend on the number of cities considered and the depth and sophistication of the analysis carried out. By applying a consistent set of analyses to submarkets of different cities, the result will be a comprehensive set of information whereby cities and submarkets can be compared on a national scale and where future changes can be gauged in a systematic way.

By making the results freely available to local authorities, landlords and developers, and by actively disseminating the information as widely as possible, a significant contribution could be made to the information infrastructure that underpins crucial housing-related decisions in both public and private sectors. The proposed programme of research therefore has the potential to significantly help housing policy in its goal to become evidence based.

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