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## Urban land markets and policy failures

**Discussion paper**

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**Urban Land Market and Policy Failures**  
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## Executive summary

This paper surveys the sources of market failure in urban land markets, and the evidence of their quantitative significance. It shows that land use planning generates benefits, but at significant cost. Policies of containment and densification limit the supply of land (and also space), not just for housing but for all non-agricultural land use in Britain. Our system of designated land use categories and development control imposes considerable costs. Where a full net welfare evaluation has been possible – for a tightly constrained urban area in South East England – it shows that the increased costs of space for housing substantially exceed the value of planning amenities generated, imposing a net welfare loss equivalent to a tax of 3.9% on incomes. Eliminating that welfare loss by substantially relaxing the constraint on land supply policy was estimated to increase the urban land take by 70%. Given that the total area of greenbelt land alone is 1.5 times the total urbanised area, even such a strong relaxation of containment policy as this would leave very substantial areas of greenbelt, and even if all additional urban land was taken from existing greenbelt areas.

This evidence is now quite old. But given what has happened to prices for housing land relative to agricultural land over the intervening period, and the evidence that the valuation of greenbelt amenities has fallen rather than risen, it is almost certain that the net welfare cost today would exceed the earlier value. There is also evidence that the planning system is imposing higher costs on productive uses of land. The costs of regulation imposed on office space in Britain substantially exceed those in Continental Europe.

There seem to be three main policy changes that would preserve the role of regulation in offsetting for problems of market failure while greatly relieving the costs of policy-imposed supply restrictions. The first would be to impose a tax (perhaps a modified Community Infrastructure Levy) on new development so that all the costs imposed on the community – more congested infrastructure, public services etc. – are covered. The second would be to change the fiscal incentives facing local planning authorities so that there is a net revenue benefit to local communities if they allow development, instead of the present situation in which a local community is in effect fined if development occurs. The third would be to introduce price information into land use planning decisions. This could be done by using information on land price discontinuities. Where these exceeded the environmental or amenity value of land in its existing designated use, there should be a presumption that development should be permitted.

# 1 Overview: sources of market failure in urban land markets

Left unregulated, land markets in general, and urban land markets in particular, suffer from endemic problems of 'market failure'. These problems arise in part because of the locational specificity of any legally defined plot of land, and the fact that the value that can be generated from that land and the welfare or enjoyment associated with its occupation are strongly influenced by the uses and characteristics of neighbouring plots of land. There are important and systematic externalities associated with land use, especially in the more densely developed context of cities. Understanding the sources of such market failures is not so hard. But devising regulations and interventions to offset their impact on market outcomes may sometimes be difficult.

Apart from the unpriced influence of activities on neighbouring plots, there is a further type of externality that is more generalised and perhaps less easy to grasp. In an existing city with a fixed infrastructure, the would-be purchaser of an additional property would add to the costs of congestion experienced by all existing residents and agents in the city. But this will be an external cost which, in the absence of intervention, would not be reflected in the costs of new construction or the prices of additional homes. Against this is our increasing understanding of the importance of agglomeration economies. Recent estimates (Rice et al. 2006, Graham 2007, Graham and Kim 2008) suggest that doubling the size of a city-region is associated with a 3.5 to 8% increase in total factor productivity. Such agglomeration economies, too, are a form of externality not taken into account by our hypothetical additional city resident. It could be that the gain in productivity and incomes generated for the existing inhabitants by the addition of one extra resident more than offsets the increase in congestion and space costs imposed. But in the absence of public policy, neither effect will influence decisions about urban growth, so we can have no expectation that individual cities will reach or exceed their 'optimum' size<sup>1</sup>. Successful policy would ensure that urban expansion maximised the positive agglomeration gains from growth but minimised the impact on space costs and congestion.

Some of the origins of the current system of land use planning can be traced to a response to the 'ribbon development' of the 1920s and 1930s. Previous urban growth had exploited the expansion of suburban railways and, in London, the underground system. This concentrated development at the access nodes – stations – on the system and allowed many of the advantages

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<sup>1</sup> It is important not to conceive of there being a single 'optimum' size for all cities. Each sector and activity is subject to varying agglomeration economies; preferences for living in cities of varying sizes are also likely to vary across households and with age. Cities of a great range of sizes should be expected to be the optimum pattern and there is a vast literature on the structure of city sizes (briefly surveyed in, for example, Cheshire 1999) as well as ample empirical confirmation of the existence of a more or less predictable urban hierarchy – sometimes referred to as Zipf's law. Nevertheless, given its economic structure it may be useful to think of a particular city having an optimum size.

of expansion (reflected in land value gains) to be internalised by the developers working together with the railway developers. Indeed, railway development was often financed by the uplift in land values. But as cars and new arterial roads replaced the railway as the dominant transport technology, more fragmented patterns of so-called 'ribbon development' became common. This allowed smaller developers and builders to free-ride on the publicly funded infrastructure, the new roads, and push cities as narrow strip development far out into the countryside surrounding them. This meant that the new arterial roads quickly became congested and failed to deliver much in the way of improved transport services for existing residents. In the minds of observers – particularly those who had recently purchased their own outlook on green space only to find development had engulfed them – ribbon development 'ate up the countryside'.

This leads us naturally to consider a third type of market failure problem, which arises from the provision of optimal quantities of land-consuming public goods such as parks. The provision of public goods of this type may require the regulation of property rights, for example to conserve historic cityscapes. This is sometimes achieved by 'conservation clubs' such as the National Trust. In an extreme form, as embodied in the Town and Country Planning Act of 1947, it can involve the expropriation of landowners' development rights to prevent development on greenbelts around cities.

The following sections review some of the evidence that has been built up over the past 20 years or so about the overall welfare effects of land use planning. In principle the net effects could be positive or negative. By correcting market failure and ensuring a supply of amenities that would otherwise be undersupplied, land use regulation, in the form of planning or zoning, creates benefits. At the same time, however, it may restrict the supply of valued goods, notably specific kinds of space including housing, offices, shops, factories or private open space such as gardens. Any planning policy that curbs urban expansion, increases densities or restricts building heights necessarily restricts the supply of particular types of space. If supply is restricted, the good in question becomes more expensive, and there will almost certainly, as a result, be effects on productivity and mobility. In addition there will certainly be distributional effects. Those landowners who own land on which it is allowed to build (or build higher) get an increase in their asset values, while those who are unable to develop their assets in the most profitable way get a corresponding reduction in asset values. Those who own houses gain in asset values, especially if their houses are endowed with more of the attributes the planning system is restricting the supply of. The 'winners' may have bigger gardens, own houses in beautiful but now preserved locations, or they may be owners of existing houses constructed in the greenbelt prior to 1947, such as former farmhouses. Those who lose out include people who rent or are would-be house buyers. They suffer a reduction in asset values or real incomes.

## 2 Separation of incompatible land uses

There are two main methods of valuing amenities empirically, by 'hedonic' models, and by stated preference analysis. The use of hedonic<sup>2</sup> models is in principle preferable since it is based on clear theoretical foundations and observes the actual behaviour of people. Any house consists of a complex bundle of attributes, and because each parcel of land has a unique location, its occupation determines access to a wide range of amenities, neighbourhood characteristics and local public goods. This implies that the value of these characteristics is reflected (or capitalised) in house prices. The price of any house is in a sense the aggregate price of all its attributes, including the access it gives to local amenities and public goods. These non-structural attributes of houses typically account for the great majority of the total value of a house. A fundamental locational attribute of houses is the access they give to jobs and other income-earning opportunities. It is this attribute, in isolation from all others, that drives the classical theory of urban land rents and residential location as elaborated by Alonso (1960), Muth (1969), Mills (1972) or Evans (1973).

Although as an empirical technique, the estimation of hedonic models goes way back to the 1920s (see Sheppard 1999), it was Rosen (1974) who provided the theoretical framework and showed how the valuation of such goods may be estimated in hedonic models. A sizeable and ever growing literature has followed his contribution.

Thurston and Yezer (1994) investigated the drivers of suburbanisation, in the most disaggregated study to that date, and tried to unpick the old puzzle: does suburbanisation of jobs drive decentralisation of people? Or is it the suburbanisation of people that pulls jobs out of cities? They were surprised to find that growth in industrial employment within the central city was associated with more – not less – population suburbanisation in subsequent periods. Perhaps at the back of their minds was a conventional wisdom which assumed that jobs – especially blue collar, industrial jobs – were a community 'good' and would attract population. In the wider urban region that might be the case; but not locally. Living in close proximity to industry generates negative externalities, which the land use planning system attempts to reduce by separating residential from other land uses.

When Thurston and Yezer published, hedonic studies of housing markets were already showing that more industry in a neighbourhood was something people buying houses paid a premium to avoid. House prices in neighbourhoods in which less land was used for industry were – all other things equal – more expensive. Cheshire and Sheppard (1995) reported that in 1984, for a sample mean house in a sample mean location within the Reading housing market area, a reduction of 1% in the proportion of the neighbourhood in industrial use was worth £74, or 0.145% of the total house price. In 1993, and measured in the same way, a similar reduction in industrial

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<sup>2</sup> 'Hedonic' from the ancient Greek for 'pleasure'.

land use in the neighbourhood was worth £224 – or 0.236% of the total house price. The sample mean house price was £51,066 and £94,990 in 1984 and 1993 respectively.

Later studies have found that while houses nearer to railway stations command a premium, other things equal, being closer to a railway line reduces a house's price. People pay to avoid the noise (Cheshire and Sheppard 2004). A similar result for the avoidance of industrial land use was found recently for three Dutch cities – Amsterdam, Rotterdam and The Hague – by Rouwendal and Van der Straaten (2008), again using hedonic methods.

Song and Knaap (2004) studied an area of Portland, Oregon, to evaluate the economic impact of design aspects associated with the 'New Urbanism', using various measures of 'mixed use'. They found in general a negative but non-significant effect on local house prices of more industrial land in a neighbourhood, and a positive and significant effect of more non-industrial jobs in a neighbourhood. They also confirmed the general finding that, other things being equal, higher density development is discounted. People seem to prefer to live at lower densities and are prepared to pay a premium to do so.

Recent work by Day et al. (2006), again using hedonic techniques, shows that ambient noise – from aircraft, roads or railways – is negatively capitalised into house prices. People pay a premium to live in more tranquil surroundings, all else being equal, and in this context 'all else' includes access to jobs. They find indications that peace and quiet is a 'normal good', one for which willingness to pay increases with income, and that a given reduction has higher welfare effects in a noisier context. In 1997 prices (for a model calibrated on house price data for Birmingham) a 1 decibel (dB) reduction from a level of 56dB was worth £31.49 as an annualised sum while the same reduction from an ambient level of 80dB was worth £88.76. Reductions in noise from railways seemed to be valued somewhat more highly (Day et al. 2006, page 24). The study had difficulties accurately identifying the impact of aircraft noise and the demand for peace and quiet with respect to it<sup>3</sup>, although their study suggests a substantial demand for less disturbance from aircraft.

### **3 The provision of public goods and valuing amenities**

#### **3.1 Open space**

The most obvious public good provided by the planning system is open space. This includes space within the city in the form of parks, recreational spaces or other types of preserved space, and outside it, most obviously in the form of greenbelt land but also farmland on which development is prevented by containment policies. In their survey of hedonic studies on the

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<sup>3</sup> The authors suggest this may have resulted from the wider area affected by aircraft noise and their technique of spatial smoothing, although they additionally included proximity to an airport which had a significant negative price attached to it in some specifications.

benefits of open space, McConnell and Walls (2005) report a wide variation between estimates of its value, and they highlight the importance of distinguishing between different types of open space. The value of preserving a piece of land in a certain use depends strongly on whether it is a park in an urbanised area, a piece of ex-urban agricultural land, or a wetland. The careful study of house prices in the Minneapolis–St Paul metropolitan area in the USA by Anderson and West (2006) shows more than this. The capitalised value of proximity to open space depends on the type of open space and how far away it is from the house, and also on the characteristics of the neighbourhood. For a home with the sample's mean characteristics (including sample mean park size), they find that benefits from proximity to open space range from a low of 0.0035% of sale price for every 1% decrease in the distance to the nearest neighbourhood park, to a high of 0.034% for every 1% decrease in the distance to the nearest lake. Special parks – national, state, natural habitat reserves etc. – were substantially more highly valued than neighbourhood parks. With the mean house price estimated at \$142,322, halving the distance to a neighbourhood park for a home with sample mean characteristics was associated with an increase in price of \$236; while halving the distance to a 'special park' increased house values by \$1,790. But an important finding was that the value of proximity to open space rose with average income and density in the neighbourhood, while it fell with distance to the central business district. Thus 'open space' might be physically identical but its context conditioned its value.

Given that access to open space is a 'normal' good, it is not surprising to find that it has a higher value in richer neighbourhoods, a finding that might be considered complementary to that of Day et al. (2006) with respect to tranquillity. Equally, the finding that the value of open space is higher in higher-density neighbourhoods suggests that, at least to an extent, public open space is a substitute for private open space. The reason why the value of open space falls with distance from the city centre could be that the total supply of private and public open space in suburban areas is higher, so that its marginal benefit is lower, or that residents of suburbs have easier access to open space outside city boundaries as a substitute for parks.

A potential drawback of estimating the value of proximity to open space by means of its hedonic price, as done by Anderson and West (2006), is that, while this yields the slope of the valuation of open space with respect to distance, its level – its total value – is not inferred. The valuation of a large special park might decline less with distance, simply because it is appreciated over a wider area. So its value to the whole metropolitan community might be considerably larger than the total value of a local park, whose valuation declines more steeply with distance. This problem is circumvented by estimating the value of the amount of open space surrounding a house, at the expense of imposing more restrictive assumptions on the relationship between valuation and distance. This latter approach has been applied by Cheshire and Sheppard (1995, 1998), who estimated a hedonic model for house prices in two British towns, subject to land use restrictions that varied significantly in severity. In order to measure the benefits of planning-induced amenities, these authors considered the share of land in a square kilometre



around each house that was used for either ‘accessible’ or ‘inaccessible’ open space (as well as the share of land that was not in industrial use, as discussed above). Although confining the valuation to the supply of open space within the kilometre square containing each house in the sample might seem restrictive, testing for alternative distances and areas suggested no significant effects beyond 1 kilometre.

In these studies ‘accessible’ open space meant transparently accessible to the public – parks, recreation grounds, churchyards or common land. This was mainly internal to the urban area. ‘Inaccessible’ open space was land not built on and not accessible to the public except in a restricted way by means of ‘rights of way’. This was mainly greenbelt land used for farming at the urban fringe, but also included private woodland. Table 1, which employs the same units of measurement as used above to quantify the value of less industrial land, summarises the results for both 1984 and 1993. It will be seen that the ‘price’ of parks rose relative to that of greenbelt land between these years. In a study also for Reading, using data for 1999–2000, Cheshire and Sheppard (2004) found no significant price associated with more local greenbelt land.

**Table 1: Hedonic price of 1% more open space in local area: sample mean house Reading**

	1984		1993	
	£	As % of house price	£	As % of house price
‘Inaccessible’ open space: greenbelt land and farmland	102	0.200	60	0.063
‘Accessible’ open space: parks, common land, recreation grounds etc.	51	0.100	227	0.239

Source: Cheshire and Sheppard (2005)

Similar estimates were made for 1984 for the Darlington housing market. A difference was that Reading was well endowed with accessible open space such as parks, commons and recreation grounds, which totalled 18% of the city. In Darlington the mean value was only 8%. For edge of town open but inaccessible space, the position between the two cities was reversed. Darlington is a smaller urban area so the mean distance to the edge of town is much less. In Darlington the mean value was 16% compared to 8% in Reading. These differences in supply were reflected in estimated prices. The comparable values for Darlington were £83 for a 1% increase in locally available accessible open space, but the impact of inaccessible greenbelt-type space was non-significant<sup>4</sup>.

<sup>4</sup> Very few studies have moved on from estimating the hedonic prices of open space and other amenities to attempting to estimate price or income elasticities of demand. That by Day et al. (2006) provides somewhat indirect evidence on income elasticities of demand for ‘peace and quiet’, suggesting that the demand is income-elastic – a higher proportion of income is spent on peace and quiet as households get richer. So far as is known the only studies for Britain estimating a structure of demand for housing characteristics and so able to offer estimates of elasticities are those by Cheshire and Sheppard (1998) and Cheshire et al. (1999). They generated estimates for three different housing markets for different dates (Darlington 1984 and 1997, Nottingham, 1997 and Reading 1984 and 1993) and found

Cheshire and Sheppard (2002) showed that increasing the shares of both types of open space yielded significant gross benefits expressed as equivalent variations in incomes. The benefits associated with accessible open space considerably exceeded those from inaccessible open space, but accessible open space was valued less at the margin in the town where land use planning was more restrictive. In a similar hedonic analysis of house prices in three Dutch cities, Rouwendal and Van der Straaten (2008) find a significant effect of the share of land in parks and public gardens within 500 metres of a house.

Irwin (2002) focused on the value of open land external to the city in the form of farmland or woodland. She analysed residential transactions in an ex-urban region in central Maryland, USA, and found that within 400 metres of a house the conversion of 1 acre of developable pastureland to conservation land raised the average house price by 1.9%, while converting it to public land yielded a premium of 0.6%. That is, the more certainly the agricultural land was protected from development, the greater its 'value'. Even conversion to low-density residential land had a negative impact on surrounding house prices, underlining the fact that one of the important attractions of open space is simply that it is not developed. This negative impact is also likely to be one reason for NIMBYism. As Fischel (2001) has argued, since houses form a substantial element in people's asset portfolios and they are immobile, there is a significant incentive to protect their value by using local zoning or planning policies to prevent land in one's neighbourhood from being developed.

Although the hedonic approach has the advantage that it rests on revealed preferences – actual behaviour – it also has potential limitations. It is only truly applicable if the value of the amenity in question is localised within the housing market area covered by the study. This may be reasonable in the case of a neighbourhood park or a local school, but would be questionable in the case of an amenity for which demand extended over a wide area, such as National Parks or heritage coastline, or world famous attractions, such as Hyde Park in London, or a famous cityscape such as Venice.

There is an alternative approach to valuing such amenities and that is stated preferences, sometimes known as 'contingent valuation'. In this approach, people are asked to put a value – how much they would be willing to pay and in what circumstances – to have access to particular amenities or just to know that they exist so they could access them if they felt inclined. This approach has the disadvantage that people may make different choices or suggest different values when they are actually confronted with decisions for which they have to pay. There is also potential for the 'free rider' problem in which people overstate their valuations in order to increase the supply of an amenity that will largely be paid for by others. Although research using the contingent valuation method has become substantially more sophisticated over time,

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substantial stability of estimates for different markets and over time. Estimates of the income elasticity of demand for open space amenities were in the range 1.0 (accessible land in Reading in 1984) to 2.0 (closed land in Darlington in 1997).

these methodological concerns remain (cf. Arrow et al. 1993, McConnell and Walls 2005). Nevertheless, it may yield valuable insights that complement findings relying on revealed preferences, and sometimes there is simply no alternative method available.

As in their survey of hedonic studies, the McConnell and Walls (2005) survey of stated preference research finds substantial heterogeneity in the estimated stated value of open space, and again its type and location appear to matter a lot. Nevertheless, for agricultural land, the stated value is in the same order of magnitude as in the Irwin (2002) study of ex-urban house prices discussed above, suggesting that fears about missing wider benefits of agricultural land using hedonic methods may be misplaced. Also consistently with Irwin's results, stated preference studies suggest that negative externalities of residential development are an important motivation for the preservation of open space.

On the basis of a survey of stated preference research in the UK, Barker (2003) also reported that the value of open space depends strongly on its location and use (see Table 2, copied from Barker 2003, page 36). For instance, publicly accessible open space in the urban core was estimated to be valued much more than greenbelt land, and the landscape value of intensively farmed land is particularly low. However, the values in Table 2 are derived from various sources using a variety of methodologies and are not comparable to those discussed above.

**Table 2: Benefits from different land use in the UK**

Land type	Present benefit (per hectare per year, in 2001 £)
Urban core public space (city park)	54,000
Urban fringe greenbelt	889
Urban fringe forested land	2,700
Rural forested land	6,626
Agricultural extensive	3,150
Agricultural intensive	103
Natural and semi-natural wetlands	6,616

Source: Barker (2003)

These values are, nevertheless, broadly consistent with those in Cheshire and Sheppard (1995). Open space at the urban fringe, not accessible to the public, has a relatively low but still significant value. Extensively farmed land – with higher amenity value and more likely to have public access – is estimated to be worth considerably more than 'fringe greenbelt', much of which has no significant public access and is intensively farmed. The values reported in Barker are significantly higher than in most US studies that are surveyed by McConnell and Walls. Perhaps this is a parallel finding to that of Anderson and West (2006): open space is more valuable in more densely developed contexts and densities are greater in the UK than in the USA. In the UK there are also some access rights even to agricultural land by means of public footpaths or other 'rights of way'. So the amenity value of agricultural land in

the UK – even in Europe generally – may be higher than in the USA or other countries which have no rights of public access to private land.

### 3.2 Urban design and densification

While this discussion of the benefits of land use regulation has so far focused on the separation of incompatible land uses and the provision of open space, planning is about much more. It is regarded as providing benefits to citizens that markets would not offer. Benefits which have received attention in so-called “initiatives in the USA, and their variants in Europe, are dense development (‘densification’), mixing land uses, particularly to provide jobs near to homes, access by public transit and the provision of infrastructure for pedestrians and bicycles. The valuation of such planning-induced features of neighbourhoods may be estimated using hedonic techniques. This is obviously appropriate because any benefits of urban design in new developments seem likely to be fully capitalised. An interesting example is Song and Knaap (2003, 2004), whose work was discussed above in the context of valuing the separation of incompatible land uses. They find some significant effects for several new urbanism design features in a hedonic model of the Portland, USA, housing market, but not all were valued positively.

They did find that better connectivity of local street networks, pedestrian accessibility to commercial uses and proximity to light rail stations raised house values. On the other hand they found that higher densities of neighbourhoods and mixed land uses within a neighbourhood have a negative impact on house prices. This is the complementary finding to that which shows ‘space’, both within houses and external to them in gardens, is a highly valued attribute of houses. There is also evidence that there is a strong income elasticity of demand for private space (Cheshire and Sheppard 1998). This finding of a preference for lower density development, other things being equal, is also consistent with the detailed findings of Burchfield et al. (2006) that one of the drivers of lower density development is the existence of drillable aquifers. The need for a mains water supply generates a diseconomy of lower densities because of the costs of a mains supply and the associated pipelines. Where there are drillable aquifers this centripetal force is lost, the costs of lower density development fall and densities are observed to become lower. When a given urban area contained a zone in which there was a drillable aquifer then, all else being equal, development within the zone over the aquifer was at lower densities.

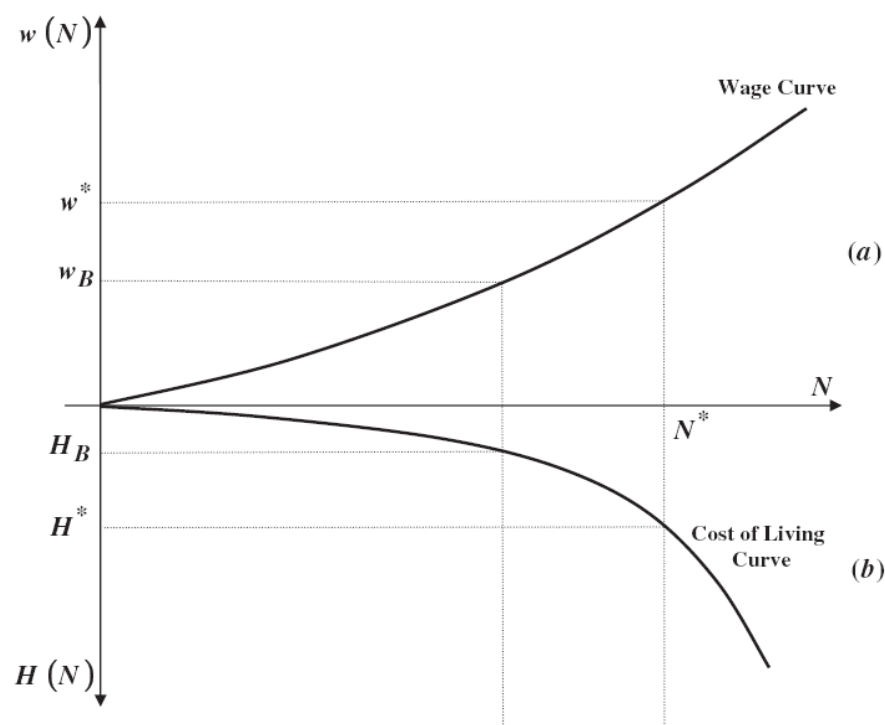
## 4 Optimising urban growth and size

It was noted in the introduction that agglomeration economies are the *raison d’être* of cities and that there is increasingly convincing evidence not just of their existence but of their importance. Figures 1a and 1b illustrate this, and show how city size in an unregulated world might tend to be too big. Again it should be stressed that since the significance of agglomeration economies varies strongly by sector (see for example Graham 2007 or Overman 2009),

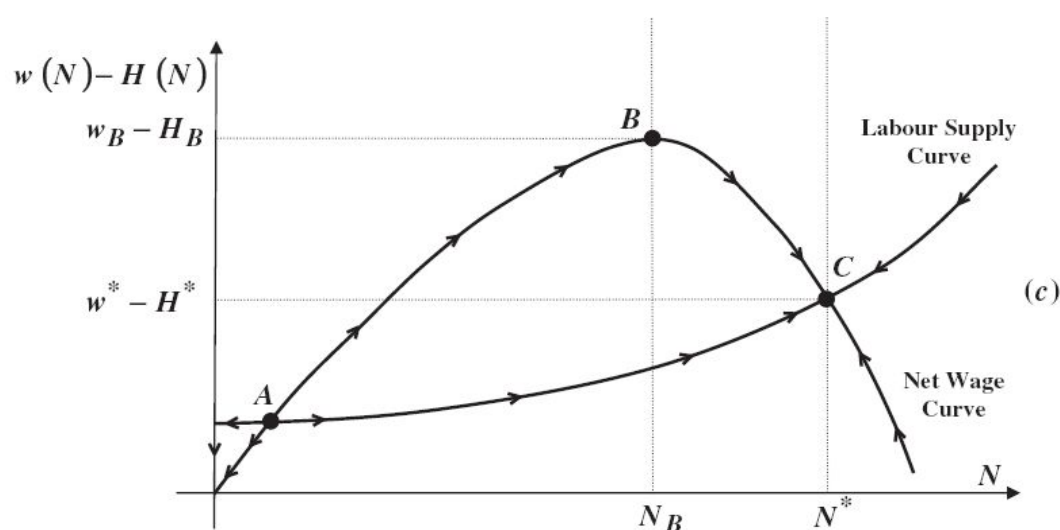
and preferences for different sized cities are likely to vary between households, there is no single 'optimum' size for cities. But for any given city, given its economic activities and the preferences of households living within it, there is likely to be a particular optimum size.

In Figure 1, adapted from Combes et al. (2005), city size is measured as  $N$ , the number of workers within it. In both the upper and lower halves of the figure wages ( $w$ ) and costs ( $H$  – housing costs) rise moving away from the origin. Both wages – because of agglomeration economies – and housing costs rise with city size. The reason for housing costs rising with size is consistent with basic urban economic theory and competition for space and accessibility to jobs.

**Figure 1a: Wages and costs of living with city size**



**Figure 1b: 'Optimal' city size**



In Figure 1b we can see the net real wage rising and then falling with city size, as labour productivity rises but rising 'gross' wages are eventually offset by rising costs. The labour supply curve – in the sense of the number of workers wanting to live in or move to the city – also rises with city size. The point, however, is that the city is attractive to individual workers to the point where the labour supply curve crosses the net wage curve at a size of  $N^*$  – which will be the equilibrium size for the city. But the 'social' optimum from the point of view of existing residents would be at  $N_B$ , where the net wage is maximised. The discrepancy between optimal and equilibrium size arises because new migrants to the city are motivated by whether their net wage exceeds the supply price of their labour, but their arrival triggers a cost to all existing residents by driving up house prices. Although the increase in costs is represented here only in the form of rising space costs, there will in fact be increases in congestion and perhaps infrastructure costs too.

The above analysis suggests a case for planning to limit the size of cities below that to which they would grow in an unregulated world. But this market failure does not mean that current planning policy, with its goal of urban containment designed to limit the physical spread of cities, increase mean densities and limit their growth, has got it right. The evidence suggests almost conclusively that it has got it wrong from a welfare and economic point of view, and that policy is unduly constraining both the physical spread and the size of British cities.

There are at least two issues. The first is how policy might transfer the cost of their decision to live in the city to marginal urban inhabitants. The second is the welfare and price effects of current policies of urban containment and restrictions on space availability. Let us consider the first of these issues.

## **5 Internalising costs of urban growth – paying for infrastructure**

Part of the market failure associated with city growth is the increase in space costs imposed by additional workers on all existing inhabitants, and on the commercial users of space. Another element is the cost imposed in the form of additional strains on infrastructure and more congestion – not just of transport systems but also of other urban public services such as education.

The obvious solution to at least the second of these is to charge additional urban residents the full costs they impose on the transport system and other infrastructure. Within the framework of land use regulation, this can be done by charging developers for the full costs they impose. Such fees would become capitalised in land prices so the ultimate incidence would be on the landowners whose land is developed.

Two quite distinct and separate logics support charging developers for the granting of planning permission. The first is the long-established legal principle of Betterment. The existing system of Section 106 Agreements is based on the logic of Betterment. The second is a much more recent idea of community impact. The logic for Impact Fees rests on this. Where Impact Fees are imposed in the USA, they have legally to satisfy a ‘rational nexus’ test: that is, for them to be legally valid government has to be able to show a clear connection between the development and the need for additional infrastructure and other resources, and the level of fees has to be a function of these costs.

Betterment goes back to a case of 1427 and rests on the idea that, if the community has created a part or all of the increase in land values, it should benefit from that increase. The idea of an Impact Fee rests on the argument that if development imposes costs on the community in the form of additional infrastructure, perhaps schools, amenities or utility capacity, these costs should be thought of as a part of the costs of the development and be paid for by the developer in the form of an Impact Fee. In practice, where such fees are charged, it appears, as theory would predict, that they are 100% capitalised into the price paid by developers for land (Ihlanfeldt and Shaughnessy 2004).

Impact Fees have several advantages over planning gain charges. Unlike Betterment levies they do not require establishing land values before and after the granting of planning permission. They seem to have a firmer basis in natural justice and are entirely transparent. By contrast, Section 106 Agreements are far from transparent and have high transaction costs associated with them. Each Agreement has to be negotiated separately, and large developers acquire considerable expertise in their negotiation. Indeed, it is likely that Section 106 Agreements produce a significant barrier to entry. These high transaction costs are reflected in the fact that less than 50% of all local planning authorities have ever negotiated a Section 106 Agreement.

Charges based on Betterment, where they require the estimation of how much the community has increased land values by their action, have a long history of failure. Historically, attempts to impose such charges seem to have led to a short to medium-run reduction in land supply because of expectations of repeal. Impact Fees create an incentive – or at least remove an important disincentive – to local communities to allow development.

The level of Impact Fees should be set in relation to national formulae calculated to reflect estimates of actual community development costs in different locations, and the revenue from Impact Fees should be hypothecated to the purposes which gave rise to them, so infrastructure is constructed where it is most needed.

The level of Impact Fees would vary from place to place according mainly to the extent to which existing infrastructure was congested, and would be calculated on the basis of formulae designed to reflect the costs of new development. Estimating the increase in land price uniquely associated with granting planning permission is fraught with difficulty and has to be done on a case by case basis. Here the term infrastructure is shorthand for all costs imposed on the community. These might include open space provision, schools and other educational establishments, medical facilities, utilities such as water supply, libraries and transport capital spending among others.

With respect to natural justice, one of the problems of 'Betterment' is that most of the uplift in value associated with granting planning permission at present comes not from the expenditure of effort and resources by the community, but from the constraint on supply imposed by existing planning regimes. If development imposes extra costs on the community it is hard to argue that these should not be paid for by the developer and ultimately by the landowner. Moreover, there is the danger that any tax (including Section 106 Agreements) based on value uplift could create a perverse incentive for planning authorities to keep land even scarcer to increase net revenues from permissions. With Impact Fees, revenues only accrue if development goes ahead, and their value depends not on land values (which can be kept high by keeping land in short supply) but on the costs of the necessary complementary infrastructure. It has been shown in the USA that, where they are applied, Impact Fees reduce planning restrictiveness (Burge and Ihanfeldt 2006).

Impact Fees would reduce the incentive for local communities to be NIMBYist and would help finance and focus new infrastructure investment where there was most congestion. If Impact Fees were calculated on the basis of formulae designed to reflect local and regional infrastructure congestion, and the revenues were used to relieve that congestion, a major source of the negative incentive for planning authorities to grant planning permissions, particularly for commercial development, would be removed. At the moment, a negative incentive arises because local governments and planning authorities have to spend money to service any development but get no revenues from them (see Cheshire and Hilber 2008). Impact Fees would also eliminate a negative 'political economy' incentive to local voters – they would not suffer increased



infrastructure congestion as a result of development but instead would get better, more modern, facilities.

The Community Infrastructure Levy (CIL) is a form of Impact Fee, although its basis of calculation should be revisited so that the charge reflects all aspects of 'congestion' imposed by new development. If a more active CIL or Impact Fee were introduced, it would seem essential not to reform Section 106 Agreements but to eliminate them. One further advantage of Impact Fees is that they would apply to all development on a common and transparent scale. Section 106s are highly variable and opaque and, because of transaction costs, apply only to larger developments. One paradox is that our planning system is generating smaller and smaller developments because of densification and smaller site sizes, so presumably a falling proportion of developments are actually incurring Section 106 Agreements.

## **6 Sustainability and carbon emissions**

It is often claimed that land use planning is a weapon with which to combat market failure leading to global warming. The idea of 'sustainability' is related to this, as is the policy of 'densification'.

While patterns of urban development may influence energy use in the very long run, it is important to note that:

- Because new construction is such a small proportion of the stock of buildings, the regulation of new construction can only significantly influence energy use in the very long run. To get results over a period corresponding to that needed effectively to meet emission targets requires action to reduce energy use in existing buildings;
- Policies of containment, town centre first and greenbelts, may in fact increase energy use because they separate residents (who are decentralising) from retail outlets, and as commuters move out beyond the greenbelt commuting journeys are likely to lengthen;
- The relationship between density and energy use is at best weak. The early reported findings of Newman and Kenworthy (1989) have been largely discredited. Simply adding the price of energy to the model almost eliminates the statistical significance of urban density;
- Most importantly, if there is a market failure because the market for energy does not reflect the external cost of global warming, the solution is not to tackle the failure by regulating land markets but by regulating or taxing energy markets appropriately.

While as a complementary policy land use regulations may attempt to encourage more energy-efficient buildings and patterns of development, the underlying market failure is not in the land market so excess energy consumption provides no grounds for significant planning policies. Moreover, since newly constructed buildings tend to be more energy efficient than older ones, it is important to frame any regulation in ways which increase the rate of building rather than restraining it, since this will lead to the more rapid replacement of older, less energy efficient buildings. Indeed, if regulations

governing energy use in buildings are too ambitious and so impose undue costs on developers, this could in principle slow the rate of improvement in energy use of the total stock of buildings by reducing the rate of new building.

## **7 Correcting market failure contrasted with restricting supply**

It is possible to have a powerful system of land use regulation or planning without restricting the overall supply of space or buildings. For example, there could be strong coordination of development with infrastructure and a direction of new development to planned areas without restricting supply.

In reality, almost any system of land use planning is likely to have some restricting effect on supply. The question in practice is to what extent supply is restricted and whether this restriction causes significant price distortions or welfare effects. For many years the Dutch system of land use planning (see Needham 1992) appeared to provide strong direction for development and to prevent urbanisation in large areas (the Groene Hart, or Green Heart, separating the four cities of the Randstad, which acted very much as a large urban park with much public access) without restricting the overall supply of land for urban development. This appeared to reflect the historical development of planning in the Netherlands out of the legal requirements on local authorities to drain land and supply sufficient land for community purposes. This gave not only a cultural tradition of providing land for development but a significant fiscal incentive to local communities, which profited from selling prepared land on to commercial developers. In recent years, however, political pressure for urban containment has increased in the Netherlands.

There may be reasons associated with market failure, as discussed in Section 4 above, for regulation to limit the extent of urban growth if the negative externalities of additional residents more than offset the gain in agglomeration economies that such residents might generate. As we shall see below, however, the evidence from the UK suggests strongly that policy in Britain restricts urban growth to an extent which leads to substantial welfare losses, higher costs for economic agents and serious price distortions in land markets: in other words a situation of policy failure rather than one of market failure.

In offsetting for any of the land market failures identified above, planning will restrict supply to some extent. The provision of open space benefits can only be achieved by preventing building on protected land<sup>5</sup>. By definition, when

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<sup>5</sup> This does not mean that an unregulated market will never provide optimal quantities of public goods such as open space or separating incompatible uses. Where a tract of land owned by one developer is large enough, such benefits can be 'internalised' and captured by the developer. This is the exact complement of using hedonic analysis to measure the price paid for such benefits or their value in welfare terms. Their value is capitalised into the price paid for houses. It is often claimed that the development pattern of West London, with larger landowners participating in residential development, led to its typical pattern of 'garden

open space is provided external to the built-up area via 'containment' policies designed to protect 'greenbelts', urban land supply is restricted. Equally, height controls or other controls restricting the area of buildings relative to site size (frequently a binding constraint for office development), or conservation measures requiring the preservation of the external appearance of buildings, are effectively restrictions on the supply of land or space in buildings.

Even with such policies, the question which has to be asked is what exactly the regulatory system restricts the supply of. Different systems and instruments of land use planning may restrict the supply of different attributes of the built environment. For example, the planning system in the UK explicitly restricts the supply of land for urban development by imposing containment boundaries and greenbelts. There are also stringent restrictions on the height of buildings and on preservation<sup>6</sup>. But British planning policies do not impose much restriction on the subdivision of existing developed sites where they are not subject to conservation policies. In the USA, by contrast, there are strong restrictions on converting existing houses to multiple occupation or to subdividing already built lots. Portland, Oregon, is famous for its 'growth boundary' – an instrument of containment analogous to the urban envelope boundary in Britain. But the system in Portland still restricts the numbers of lots available for development rather than the area of land directly. Many communities in the USA also impose minimum lot sizes which to European eyes can be oppressively large<sup>7</sup>.

## **8 Evidence on the effects of land use regulation**

### **8.1 Land and house prices**

Notwithstanding the heterogeneous form in which supply restrictions come, their universal effect is to push up land and building prices. Indeed, various countries and cities have experienced soaring house prices in recent years, and, in some cases, the role of planning as a mechanism restricting supply has been well established. Glaeser et al. (2005) in their study of the Manhattan housing market, where prices increased by more than a half between 1980 and 2000, concluded that supply restrictions imposed by the New York zoning laws, particularly on height, were the likely cause.

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squares'. Similarly 'gated communities', especially in newer developments in the USA, are developed specifically to internalise benefits of security, open space and the exclusion of incompatible land uses.

<sup>6</sup> An interesting curiosity of conservation policies in the West End of London is the price premium commanded for larger single-floor flats. Listed building regulations prevent knocking through dividing walls between many houses in Mayfair and Belgravia, thus restricting the supply of larger single-floor apartments in the area. These now command a significant premium per square metre.

<sup>7</sup> Some communities in the Midwest have 10 acre minimum lot sizes. Glaeser and Gyourko (2003) conclude that in many communities in New England the willingness to pay for an increase in lot size beyond the mean is negative, so that people are being constrained to buy and consume more land than they would ideally like. But they still found that house prices were increased as a result of this restriction on supply. What was being restricted was the supply of house-plus-land bundles.

In several European countries recent rises in aggregate house prices have also been related to land use regulation. This has been a particular issue in Britain, where there has not only been a long-run upward trend in real house prices (increasing in real terms by a factor of 3.5 between 1955 and 2002 – see Cheshire and Sheppard 2004), but also increasing volatility in the housing market. The argument here is that if the supply becomes less responsive to price changes because of regulatory restrictions, any short-run changes in demand translate more directly into price changes. In a series of reports to the Treasury and the Office of the Deputy Prime Minister, Barker (2003, 2004) identified both the falling affordability of housing and a reduced responsiveness of supply to demand. She argued that the British planning system was the main cause of these problems. Furthermore, the Barker reports contain a thorough discussion of the consequences of such housing and land market institutions for the wider economy and for aggregate welfare. Real house prices have also risen substantially over the past decades in the Netherlands (increasing by a factor of three in real terms since the early 1970s), which may be attributed at least in part to a lack of supply responsiveness. Vermeulen and Rouwendal (2007) find that Dutch housing supply had become almost totally price-inelastic as a consequence of government interventions in land and housing markets.

Long-term trends in real house prices in the UK and the Netherlands contrast starkly with, for instance, the German experience, where the real price of houses fell in both the decades of the 1980s and 1990s and was completely stable over the whole period 1971 to 2002. Over the same 30-year period, German real household disposable incomes increased at 2.6% a year compared to 2.3% in the Netherlands and 2.9% in the UK (OECD 2004), so variation in this typical determinant of housing demand across these countries has been modest compared to the observed variation in real house price growth. However, similar shifts in demand may lead to strongly divergent price developments under different supply conditions, and in line with this argument the estimated price elasticity of housing supply in Germany of 6 is of a completely different order of magnitude from that in the other two countries (Swank et al. 2002).

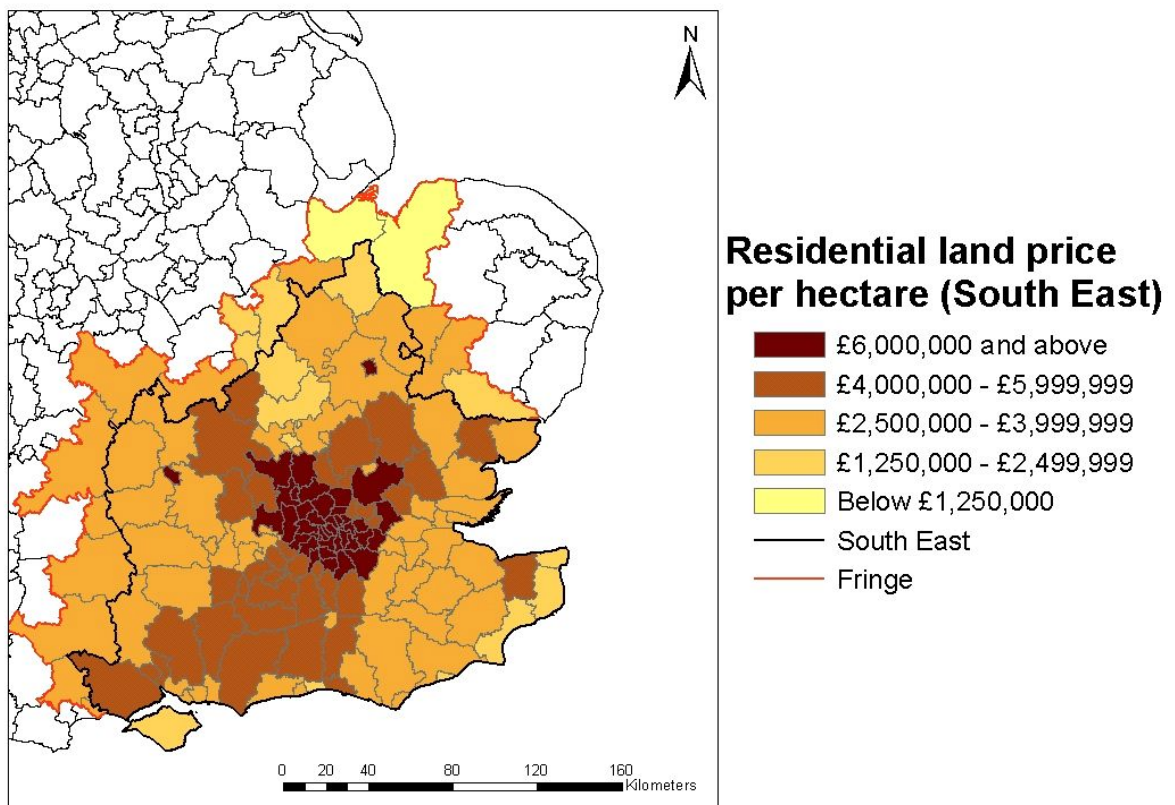
Some of this evidence pointing to the role of planning in restricting supply elasticities is circumstantial in nature. But recent studies that deal with one or more of these issues do suggest that land use regulation restricts housing supply while pushing up prices. In an analysis of new residential construction in US cities, Mayer and Somerville (2000) distinguish separately the average delay in obtaining permission for subdivisions, the number of growth management techniques and the imposition of impact fees. They report that metropolitan areas with more extensive regulation can have up to 45% fewer starts, and price elasticities that are more than 20% lower than those in less regulated markets, even if the effect of Impact Fees is not statistically significant. Ihlanfeldt (2007) analysed the impact of an aggregate measure of land use regulations on jurisdictional variation in house prices in Florida, USA. Dealing carefully with the issue of endogeneity, he also found a significant positive impact of tighter regulation on prices. Moreover, in another study with

Burge (Burge and Ihlanfeldt 2006) he had already shown that communities which used Impact Fees and therefore had a greater fiscal incentive to permit development were indeed less restrictive.

US researchers have only become sensitised to the role of land use regulation in increasing real house prices and market volatility quite recently. Few if any studies there pre-date 2000. Many European countries have tended to have stronger and more restrictive land use policies for much longer. The basic framework and aims of current British policy were established by the Town and Country Planning Act of 1947, so urban land take and space have been restricted for two generations.

The most obvious ways in which these restraints manifest themselves are in price distortions in land markets. In South East England or the west of the Netherlands, for instance, 'grotesque' (Muellbauer 2005) discontinuities exist between the price of land in agricultural use and adjacent land that is zoned for residential development. Cheshire and Sheppard (2005) report an increase of price from £7,500 to £3,000,000 per hectare at the urban boundary in Reading.

**Figure 2a: Prices of developable cleared land in South East England**

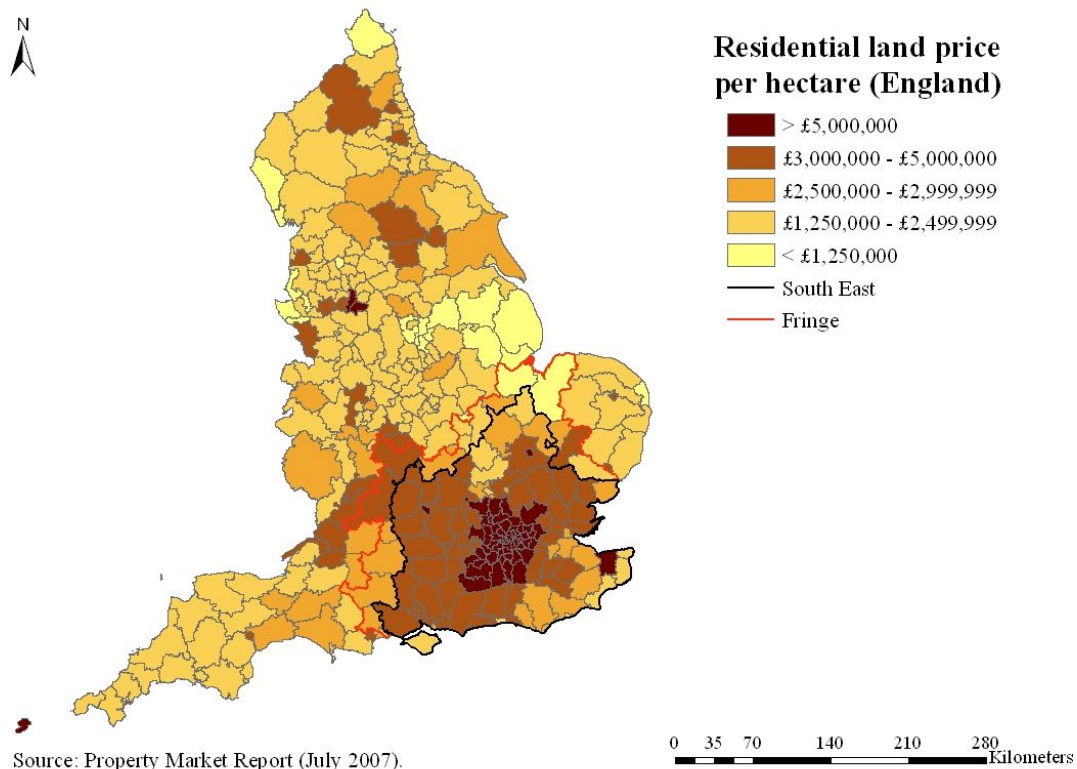


Source: Property Market Report (July 2007)

Data for 2007 – see Figures 2a and 2b – shows several locations where the value of agricultural land if it were rezoned to permit residential development is well over £6,000,000 per hectare. This means that permission to change

use from agricultural to residential increases the price of land some 700-fold. The highest-priced locations are in South East England, as would be expected since pressures for urban growth are strongest there, but there are a number of areas in the South West, West Midlands, North West and North with housing land prices estimated to exceed £3,000,000 per hectare. Some of these, such as parts of Cumbria and Northumberland, are in National Parks, but most are not. Against the background of such direct evidence on the planning-induced segmentation of land markets, the question of whether land use regulation raises prices seems somewhat pedantic.

**Figure 2b: Price of land developable for housing: England**



## 8.2 Net welfare costs

Nevertheless, in spite of a sizeable literature on the impact of land use regulation on supply and prices, evidence on its net impact on welfare and the distribution of any such impact over different groups in society is scarce. The first such study and so far the only one for Britain is that by Cheshire and Sheppard (2002). This set out a methodology to estimate the net welfare effects of land use regulation and implemented it in Reading, a tightly restricted but reasonably representative community in South East England. The study used hedonic price estimates reported in Cheshire and Sheppard (1995), coupled with data on the incomes, travel costs and demographic composition of the households, to estimate the structure of demand for both private residential land and planning-produced amenities such as open space, as a function of prices and household income. This demand system is integrated in a monocentric urban economic model calibrated to various data sources for the Reading housing market.

Since the costs and benefits of changing the planning system both operate through the residential land market, the authors can use this model to estimate the trade-offs involved in producing a little more or less of the 'planning amenities' and a little more or less of private space for residential occupation. From this it is possible to estimate the net welfare effects of relaxing the planning system's constraints on land supply in various ways. Since the underlying model assumes equilibrium in urban land markets – an assumption which seems reasonable given the results of hedonic research over the past 20 years or so – it simulates long-run static equilibrium outcomes. The area of open space amenities and housing densities adjust fully to changing prices<sup>8</sup>. The results are summarised in Table 3.

**Table 3: Welfare costs and impact on urban land take of land use planning policies restricting the supply of land**

Net costs of open space and containment policies: Reading 1984

	Modest relaxation	Significant relaxation
Average net cost of land use planning (£ per annum)	210.94	407.44
Standard deviation of net costs of land use planning	376.68	335.40
Net cost as percentage of income	2.01	3.89
Capitalised land value at urban periphery	30,000	25,000
Percentage increase in urban land area	46.0	70.7

Source: Cheshire and Sheppard (2002)

The results show that both increasing the amount of residential land made available within the city boundary and shifting the containment boundary outwards have positive net social gains, although the gains from the latter policy option are substantially larger. Thus there is clear evidence that current policies were restricting the supply of land in the Reading housing market to an extent which had a substantial negative impact on welfare. It could be said that a significant relaxation of the supply restriction – even though it would reduce the value of the amenities generated by planning – would produce a welfare gain equivalent to 3.9% of income or, put another way, the extent of the restriction was roughly equivalent to a 3.9% tax on incomes.

Since the demand for land was estimated within the model, it was also possible to estimate the impact on total land take which such a relaxation of policy would imply. As the price of land fell and consumption increased, the total size of the Reading urban area would expand by 70%. These findings do not support the abolition of land use regulation altogether, since the system did produce benefits. The problem is that this restrictive system produced those benefits at considerably greater cost to the community than the value of

<sup>8</sup> This is not literally possible, but hedonic studies suggest highly sophisticated search behaviour in housing markets with expected values of some attributes such as the degree of protection of open land or school quality commanding a price rather than current values. Moreover, densities adjust quickly via for example infill, conversion or multi-occupation, at least in a British context in which land use planning permits such changes.

the benefits themselves. It forced residents to substitute open land, mainly greenbelt land (since containment was by far the most severe constraint on urban land supply) to most of which there was only limited access for private open space in the form of gardens. People's observed consumption behaviour implied they valued more garden space (and cheaper housing) more than they valued the loss of planning-produced open space.

In the same study, Cheshire and Sheppard consider the distributional effects of land use regulation. This was possible because their sample included the precise location of the houses (and so the 'value' of their consumption of planning-produced amenities) and the income of the households. With respect to the gross benefits, they report that the provision of inaccessible open space – greenbelt land – tended to increase inequality. The benefits were even more inequitably distributed than were the incomes of owner-occupiers. The separation of industrial from residential land was broadly neutral in distributional terms compared to the incomes of owner-occupiers, while the provision of accessible open space tended to reduce inequality. But adding all three amenities together, the net welfare effect was almost distributionally neutral, again relative to the distribution of the incomes of owner-occupiers. This suggests that richer households benefit more from planning-induced amenities, but that they also pay a higher price for them through the housing market.

A more recent study for the Netherlands by Rouwendal and Van der Straaten (2008) closely follows the work by Cheshire and Sheppard, although their prime focus was on open space within cities. In a stylised theoretical model, the authors show that the amount of open space in a neighbourhood is optimal when the total benefits of increasing it by one unit are equal to the local price of residential land. Applying this cost-benefit rule to three Dutch cities, they find that the share of land in open space is too high in Amsterdam, too low in The Hague and approximately optimal in Rotterdam. The similarity in the specification of land use externalities suggests that the same first-best policy rule would apply equally in the Cheshire and Sheppard model. Since the local provision of open space renders urban growth boundaries superfluous in such an ideal setting, it is not surprising that relaxing growth restrictions in Reading was found to be so beneficial in welfare terms.

In a later paper Cheshire and Sheppard (2003) used the structure of demand and the valuation of open and private space as estimated in their 2002 model (rather than assuming values as was done by Bento et al. (2006), in their simulation for 'ideal' US cities) and then modelled the welfare effects of three alternative containment policies: growth boundaries, fuel taxes and a tax on the consumption of land.

Each tax rate was selected to achieve the same total urban take of land as the observed urban growth boundaries in the first case. The result was that by a significant margin, the most welfare-effective mechanism was a tax on land consumption. A fuel tax was no more efficient in welfare terms than an urban growth boundary. This assumed, however, that tax revenues were converted entirely into welfare – there was no deadweight loss associated with collection



and spending. It also did not evaluate the welfare impact of the growth boundary itself. It simply asked the question: if this is the total urban area that society wants, what is the least costly way in welfare terms of achieving it? They also took no account of other possible benefits associated with fuel taxes.

## **9 Cost on economic users of commercial space**

All the above evidence has related to the impacts of land use planning on prices and welfare through the residential sector. By far the largest proportion of a city's occupied land is in residential use. But planning restrictions can also have impacts on prices and welfare in other land uses. There is very little evidence, but again in principle there are likely to be benefits and costs, and to observe price increases is not necessarily to infer a welfare loss. If the supply of, say, commercial space is restricted, then there will be both distributional effects and output and efficiency impacts. Owners of property who are allowed to (fully) develop will gain, while owners of property unable to develop will lose. The costs of commercial space will be increased and since such space is an input into production, output prices will increase and total output and employment will fall. It is the difference between the value of any amenities generated and the loss of output which reflects the net welfare cost. But without information on the nature of trade-offs in the production function between space and other inputs it is not possible to estimate the change in output which higher space costs produce<sup>9</sup>.

As has already been noted, European governments seem less wary of regulating markets than is the case in the USA. Moreover, since revenues from property taxes accrue to the local community in the USA, the US fiscal system provides a very strong incentive for local communities to encourage commercial development, and to use minimum zoning regulations to price out poorer households which are perceived as demanding more locally financed services than they contribute in property taxes. Business property taxes are a particularly important source of net revenues to local governments. In the USA, business property creates more tax revenues than it costs local communities to service. Again these conditions are not often found in Europe, where in some countries, notably the UK, business property taxes are a national tax providing no direct revenues to local communities at all despite the legal obligation which local communities have to provide services for businesses. Thus, in effect, the fiscal incentive is reversed and local communities in Britain are 'fined' for allowing any development at all.

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<sup>9</sup> The revealed behaviour of firms suggests space is not perfectly substitutable for other factors and that, therefore, there is some output or efficiency loss. We can infer this because in locations where space is cheaper, the same firm uses more space per employee – industry estimates are that space per employee is about twice the level in New York as it is in similar firms in London. A comparison between space use in British supermarkets compared to the US also reveals that where retail space is cheaper the optimal use of it is greater per unit of sales. Since space still costs something – even in the cheapest locations – firms would not use more of it if that did not produce a productivity gain.

**Table 4: Reading urban land prices: 1984**

Land use	£000's per acre Current	£000's per acre 2002 prices
<b>Office use</b>		
Zone 1	7,964–13,241 <sup>1</sup>	15,748–26,183
Zone 2	3,806–8,370 <sup>1</sup>	7,526–16,551
Zone 3	2,621–5,103 <sup>1</sup>	
Zone 4	602–1,308 <sup>1</sup>	1,190–2,586
<b>Retail</b>		
Zone 1a	28,779–34,151 <sup>2</sup>	56,908–67,531
Zone 1b	24,467–27,818 <sup>2</sup>	48,382–55,008
Zone 2	12,807–15,794 <sup>2</sup>	25,325–31,231
Zone 3	9,786–12,458 <sup>2</sup>	19,351–24,635
Zone 4	8,941	17,680
Zone 5	3,020–3,927 <sup>2</sup>	5,972–7,765
Zone 6	5,688	
Zone 7	2,539	5,021
<b>Industrial</b>		
Zone 1	400*	791
Zone 2	500*	989
Zone 3	450*	890
<b>Residential</b>		
Edge of existing urban area	120–205	237–405

Source: Cheshire and Sheppard: Estimated by Healey and Baker (2005)

\*Estimated variance  $\pm$  5%

<sup>1</sup> Range of observations.

<sup>2</sup> Range of estimates varying with exact location and floor plan size/access/permitted structure type.

We should not be surprised to discover, therefore, that there are significant restrictions on the supply of land for offices and other commercial uses such as retail. The impact of these is revealed by the land price data shown in Table 4, which shows a discontinuity of land prices at the margin of each use. In 1984 prices, land zoned for residential use was around £200,000 per acre, whereas the cheapest land zoned for industrial use was £400,000 per acre, the cheapest land zoned for office use was a minimum of £600,000 per acre and the cheapest retail land more than £2.5 million. Land values collected less systematically for the same market in 2005 (see Cheshire and Sheppard 2005) confirmed the very large premium for land zoned for housing compared to agricultural land (£3 to £4 million per acre compared to around £5,000) but also that there was by then a significant premium for residential land compared to industrial land.

This is strong circumstantial evidence that for a long time the planning system – at least in more prosperous parts of Britain – has been constraining the supply of land: not just for residential purposes but for a range of commercial uses. A recent study by Cheshire and Hilber (2008) produces far more systematic evidence. They estimated the 'Regulatory Tax' (RT) for 14 British office locations over as long a period as data were available – in the case of the City of London and the West End, from 1961. They also were able to

generate comparable estimates for eight Continental European locations and Manhattan for shorter periods.

The key idea of the RT approach is simple. In a world with competition among property developers and free market entry and exit, the price of developed space will equal its minimum average cost since this includes 'normal' profit. It seems reasonable to argue that competition between developers and free entry are reasonable assumptions, both because of the low costs of entry to small-scale development (such as converting a single building to office use) and the international nature of the development industry. In Britain the best known example of international entry might be Olympia & York, the Canadian developers of Canary Wharf, but most provincial office locations have examples of buildings developed by Japanese, German, Dutch or Swedish developers.

Marginal construction costs rise with building height, so in the absence of restrictions on heights, buildings should rise to a point where the marginal cost of adding an additional floor equals its market price. If building higher is less profitable per square metre than building over a greater area, we still should expect the marginal cost of an extra floor to be equal to price. Buildings would be lower and the urban land take would be greater. Bertaud and Brueckner (2005) demonstrate the formal equivalence of height restrictions compared to land supply restrictions. Any gap between the observed market price and the marginal construction cost can be interpreted, therefore, as a 'regulatory tax.' This is the additional cost of space resulting – in aggregate – from the system of regulation in that particular market. If the sales price of an additional floor of office space exceeded the marginal cost of building this additional floor, then developers would have an arbitrage opportunity. The difference between the price of floor space and its cost of construction must be due to some form of regulation.

The RT is an aggregate measure of the gross cost of regulatory constraints limiting the height and floor area of buildings and – more indirectly – the supply of land for the use in question. So it reflects the costs of restrictions on land supply, space by plot ratios or height restrictions, or common forms of conservation designation. It does not, however, capture costs imposed by compliance complexity or delays in decision-making. In addition, it only gives a 'cost,' not a net welfare or net impact on output measure. As discussed above, there are measurable benefits from some aspects of regulation and, since space is substitutable to a degree in both production and consumption, the effects on output or welfare can only be estimated if both the benefits and the extent of substitutability are known. So the RT estimates are a lower bound estimate of a gross cost of land use regulation in any location.

Mean values of the RT as estimated by Cheshire and Hilber (2008) are shown in Table 5. They are shown as a percentage of capital values or costs. The mean value for London's West End between 1999 and 2005 – shown as 809 – therefore represents a tax rate of 809%. It is immediately apparent that values for the British office locations are substantially higher than those for Continental European locations and that the only available estimate for

Manhattan is effectively zero. That is consistent with the observation made above about how the US fiscal system generates a substantial incentive to allow commercial development.

It is not surprising to find a higher cost in London's West End or the City of Paris than in the City of London, London's Docklands or La Défense. Amenity values are higher and conservation regulations are stronger in such locations. Nevertheless, it is not clear why much lower levels of restriction are justified by local amenities in Amsterdam or Brussels (Belgium is well known for having very flexible planning controls by European standards) than in London Docklands or even Birmingham. The gross costs for most British office locations strongly suggest that the degree of restriction on office space goes far beyond the value of any amenities generated. It is not clear what amenities could possibly justify office space in Birmingham costing nearly 50% more than in Manhattan.

**Table 5: Estimated Regulatory Tax for UK and selected European office markets. The RT is expressed as a percentage of marginal construction costs**

City	Estimated Regulatory Tax rate (RT)		
	1999	2005	Average 1999–2005
<i>UK Markets<sup>†</sup></i>			
London West End	918	889	809
City of London	641	334	488
Canary Wharf	343	277	327
London Hammersmith	277	182	219
Manchester	271	250	230
Newcastle upon Tyne	106	119	97
Croydon	118	99	94
Edinburgh	311	262	291
Glasgow	233	205	204
Maidenhead	372	227	270
Reading	271	161	203
Bristol	153	196	157
Birmingham	259	268	250
Leeds	215	217	193
<i>Selected European Cities: alternative data sources – see Cheshire and Hilber (2008) for details</i>			
	1999	2005	Average 1999–2005
London West End	762	837	800
City of London	468	431	449
Frankfurt	544	331	437
Stockholm	428	330	379
Milan	207	411	309
Paris: City	235	375	305
Barcelona	223	316	269
Amsterdam	212	192	202
Paris: La Défense	141	193	167
Brussels	52	84	68

<i>United States</i> (based on Glaeser et al. 2005)	1996 (cycle bottom)	2000 (cycle peak)
Manhattan (New York City)	0	50

Source: For details of how these values were calculated see Cheshire and Hilber (2008). Here they are expressed as percentages.

A large number of observations over many years also allowed the Cheshire and Hilber (2008) study to investigate the causes of more and less restrictive planning regimes across British locations. This provided strong evidence that, where planning policies were controlled by or on behalf of business interests, the planning regime was significantly less restrictive; that the degree of restrictiveness responded to local prosperity, so that higher unemployment meant a less restrictive regime; and that the transparent elimination of any incentive for local communities to allow commercial development, generated by the transformation of the Business Rates into the Uniform Business Rate – a national tax – significantly increased the degree of restrictiveness. Indeed, the paradoxical finding was that a change which was intended to stop local councils penalising entrepreneurship by imposing too high a property tax in fact increased the costs of office space by more than any feasible business rate increase could have done.

## **10 Instruments to offset for market failure and reduce economic costs**

This means that there is clear evidence of market failure characterising urban land markets. But there is equally clear evidence that in Britain land use planning designed to offset these problems has led to a very significant restriction in the supply of land not just for housing but for all urban uses. Land use planning generates valued benefits, but it does so at a significant net cost, borne by economic agents and in the form of net welfare costs to citizens.

Two potential solutions to problems of land market failure, and to reducing the costs of supply restriction, have already been identified. One – discussed in Section 5 – was to impose an Impact Fee or Levy on all new development, set to offset for the full costs which additional development imposes on the community. Another related change would be to alter our system of local taxation so that local communities derived some benefit from permitting development. At present, because Business Rates are a purely national tax and Council Tax covers such a small proportion of local authority obligations, there is in effect a fine on local communities for permitting development. Additional housing or business property imposes greater financial obligations on the local resident – and voter – than it generates in tax revenues.

There is, however, a third and more radical change that should be made. At present planning allocates a scarce resource – land – but does so without any reference to the price effects that such decisions impose<sup>10</sup>. As was shown

<sup>10</sup> It could be argued that PPS3, by requiring the planning system to take account of its decisions in terms of the impact on housing affordability, did introduce some price information.

above, this causes very serious distortions in land markets. Huge price discontinuities are observed at the boundary separating one designated use from another. Moving a metre or so in many parts of South East England, from within the urban boundary to identical land beyond it, could see land prices drop from perhaps £6,000,000 per hectare to £10,000. Obtaining permission to convert industrial land to retail use might increase land values tenfold.

These price discontinuities contain important information about relative scarcity. They also respond very flexibly to local conditions. They should and could be used to inform planning decisions. Obviously there may be good reasons for preserving a park or a beautiful area of high amenity countryside from being developed, especially if there is public access to it. Equally, many historic townscapes and habitats have high environmental or amenity value and should be conserved. However, as the evidence of both Table 1 and Table 2 demonstrates, much greenbelt land, and most intensively farmed land, has very little environmental or amenity value. The market does not fail, and the market price of this land more or less represents the value its existing use contributes to the economy and to society. There may be an argument for restricting urban growth if congestion and the other costs of urban growth exceed agglomeration economies, but that concern can be handled as discussed below.

This suggests that where the premium for land in some other use such as housing compared to its existing use, say agriculture or industry, is sufficient, then that should generate a presumption in favour of development unless it can be shown that the amenity or environmental value generated by the land staying in its existing use exceeds the observed premium. If there is a general judgement that, on balance, the costs associated with urban growth exceed the agglomeration economies, then there could be added to this rule the requirement that the premium exceed some minimal threshold. In effect this would impose a specific tax on the transfer of land from agricultural to urban use and, as was discussed in Section 8, urban containment produced by taxing land use seems to have lower welfare costs than achieving the same urban land take by means of regulation alone.

This proposal to introduce price signals into land use planning decision-making is outlined in more detail in Cheshire and Sheppard (2005). Although it seems radical, it would be relatively easy to implement. Of course, determining the exact value of environmental or amenity benefits associated with any parcel of land in its current use presents an almost impossible task. It cannot be done precisely and beyond argument. However, this would not be necessary. There is so much land which clearly has little or no environmental or amenity value attached to its current use that would-be developers would confine their proposals to such land. The area of greenbelt land is 1.5 times the total area of cities in England, and even in the South East some 85% of the surface area is green space, mostly in agriculture (Barker 2006). So there would be more than enough land to allow urban expansion without significant

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But this is very weak and indirect. It is moreover very difficult to impose.

damage to either the environment or to amenities. Such a system would guide all development to land with the lowest environmental quality and, if coupled with the application of a modified Community Infrastructure Levy designed to vary according to the actual costs development imposed on the community, would ensure that the costs of urban development internalised most of the externalities identified above as leading to market failure in land markets.

Such a proposal would have the additional advantage – rather like making the Bank of England independent in setting monetary policy – of distancing decisions from the political process, reducing both planning delays and political difficulties.

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