LOW DEMAND FOR SOCIAL HOUSING ESTATES IN NORTH EAST ENGLAND

by

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ABSTRACT.

'LOW DEMAND' FOR social housing emerged during the late 1990s as a new and significant problem, differing from previous management problems such as 'difficult to let' housing. It is affected by housing and economic policy and the labour market as well as more localised environmental and neighbourhood factors. It is significant in that it affects many local authorities and social landlords. It has clear implications for the sustainability of social housing investment, and calls into question the extent, form, and location of that investment. This project aims to describe low demand in a northern city, Bradford, and situate it within a housing market framework. This framework is developed to take appropriate account of the unique economic characteristics of housing and the way that dynamic processes are contingent on opportunity for mobility within the market. Submarkets that are defined using functional rather than spatial criteria are offered as an appropriate way of conceptualising local housing markets. These conceptually nest within higher-order housing market areas that are spatially defined with reference to employment and migration criteria. Using lettings data collected for a five-year period by the local authority and housing associations, the project develops a predictive model of housing demand which can respond to policy and investment scenarios. It employs a form of *vacancy chain analysis* to allow movement probabilities to be

estimated from empirical data. Such a model both appropriately deals with the market and housing as they have been conceptualised, and exploits information available from a new generation of housing information systems. Suggestions are made as to how such a model can be future developed to ensure a better fit with local submarkets. Finally, it is concluded that investment in certain forms of social housing will have a greater impact on opportunity in the housing market than others over the longer term. It is also found that, while significant work would be necessary to replicate such models, they could potentially form the basis of more accurate scenario-testing models to inform regional and local housing strategies.

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This project is based on data from many different organisations, which have very generously made it available to the author, along with much

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Credits.

Data used in this project of course remain the property of the respective organisations that supplied it, although value-added data derived from it are subject to the intellectual property regulations of the funding bodies and the University of Sheffield.

Throughout this thesis, use has been made of output from the 1981, 1991 and 2001 national censuses of the population, which have been cited in the text as 'Census 1981,' 'Census 1991' and 'Census 2001' respectively. For all censuses, data are © Crown copyright. All rights reserved. Furthermore, use has been made of digital map data for the analysis and manipulation of census statistics. For the 1991 Census, this work is based on data provided with the support of the ESRC and JISC and uses boundary material which is copyright of the Crown and the ED-LINE Consortium.

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Data on house sale prices are from Her Majesty's Land Registry, and were supplied via Experian. These data and some additional indicators have been derived from the Experian Limited Postal Sector Data via the ESRC/JISC Agreement. HMLR data are © Crown copyright.

Postcode sector boundaries were used for the display and manipulation of several data sets, including HMLR house sale prices. The boundaries were from Geoplan and were supplied as part of the CHEST agreement with higher education institutions. Data are © Geoplan.

In the course of this work, use was made of a Natural Language Processing (NLP) algorithm for the parsing of postal addresses developed by Peter Bibby. The author expresses deep gratitude for the time that he spent developing and operationalising the algorithm.

CONTENTS.

Chapter One.

INTRODUCTION: SOCIAL HOUSING AT THE TURN OF THE CENTURY.

SOCIAL HOUSING IN Britain at the end of the 20th Century was at a very significant juncture. As we now firmly establish ourselves in a new century, there are signs that this juncture is still confounding us, with a future that is only certain in that further change is inevitable. Problems in the social housing sector mean that such change has to be inevitable if social housing is to become a sustainable form of housing.

I. INTRODUCTION: THE ROLE OF SOCIAL HOUSING.

For the past two decades, the 'social' in social housing has been contested. It has been contested by ideology and policy, and finds itself awkwardly positioned in a rapidly changing cultural and political environment. Not only are these fundamental issues related to the philosophical justifications for housing provision still uncertain, but Britain has also entered another of

those cyclically-occurring periods of 'housing crisis.' This time it is different. Again, there are signs that house prices are 'overheating.' In the south-east—and to a lesser degree other economic powerhouses around the country—first-time buyers are completely priced out of the owner-occupation market. This is in places having a severe effect on the recruitment and mobility of workers for essential and public services. At the same time, however, hundreds of thousands of homes around the country are boarded up—unsaleable, unlettable, and in some cases even abandoned. The Office of the Deputy Prime Minister (ODPM) estimates that just under one million dwellings may be affected in England alone (Bramley *et al.* 2000). New housing of relatively high quality is among this, and entire streets and parts of estates lie empty for the few remaining residents to rattle around, hopeless and marginalized in obsolete and unloved corners of our cities and towns.

Yet at the same time there has been a real renaissance occurring in the city centres, some of it even along the lines of that envisaged by Lord Rogers in the late 1990s (Urban Task Force 1999). The British public appears to be enthusiastically rediscovering the joys of the urban mode, and everything from popular culture to the spending power of the middle classes is gearing up to the downtown. However, it is not the unbridled success it all appears at first glance. The benefits are not being felt uniformly across the city. The 'Barcelonification' much beloved of John Prescott has stubbornly refused to make its mark felt beyond the retail cores. The city living utopia has been hijacked by image-savvy developers rediscovering the benefits of system-building all over again, yet this time it is the platinum card rather than the waiting list that meters access to these high-rises. The council estates have never looked worse, despite attempts at environmental improvements. Fear of crime and antisocial behaviour; transient and depopulated communities; the no-hope signals of bulldozers and boarded-up windows are undoing any gains that were ever hoped for. We may only have been ever picking away at the margins of the problem. Visitors to our cities may be impressed by our reinvigorated public spaces, fountains and cafés. But what they are not given

the opportunity to assess is just how far removed such amenities are from the realities of everyday habitation for the people who may only occasionally enjoy that city centre. Housing conditions—in the private sector as well as the public—are completely at odds with the shiny renaissance images of urban life we are fed through the city-centre experience and the urban hype of the '24 hour' city that was once promised. By contrast, in fact, anybody with any money or opportunity moves in one of two directions – upwards (into the concierged style-pads that pose as 'city living') or outwards (to the executive villas of the once-green-belt). The urban renaissance has so far only exacerbated the problems of the inner city; making the moat of deprivation and emptiness seem that much more striking.

This position is untenable. Low demand for housing provided by the public sector represents a waste of valuable public resources; a situation perhaps only mitigated in impact by the fact that generalised low demand can sometimes be seen to pervade across all tenures. The consequences for the health of our cities, and the hopes of their citizens, are even more drastic. The interface between the different forms of capital that housing represents—infrastructural, cultural, investment—needs to be evaluated. The implications for the way that the Government and its agents invest in housing need to be understood. This thesis is about understanding the effects of low demand and its causes and remedies on the 'investment questions' of 'how much?,' 'what?,' and 'where?' It therefore, inevitably, addresses housing markets and the role of geographic space in their operation.

A new generation of interventions will soon be making its mark. The 500 million pounds shared among nine Housing Market Renewal Fund (HMRF) Pathfinders[1] could make a real difference in some of the most badly functioning local and sub-regional housing markets in the North and Midlands of the country. The boards that are charged with drawing up the strategic frameworks for spending this money will be first of all concerned

[1] See Appendix C for more details.

that there are realistic answers to the investment questions outline above. Furthermore there is—perhaps genuinely for the first time—acceptance among a diverse set of actors that the answers will in all likelihood be politically challenging, and will transcend not only the boundaries on the map but those of the conventional 'boxes' in which we categorise response and responsibility. Investment in housing alone may not be what is required in areas where economic and environmental problems are at the root of housing market failure.

Housing as a basic commodity

Housing is a central concern of the vast majority of people. It is at the same time possibly the greatest constant in peoples' material lives, but its meaning and the ways in which it is provided and consumed are highly sensitive to changes in the other contexts of those lives. People will presumably always strive to obtain shelter. At this level, houses are an irreducible constant: every household will try to obtain shelter, or will at least try to reconfigure themselves in such a way that shelter is obtainable. At this most basic level, housing is more akin to the hermit crab's shell (Chase 1991). There is really no need for more than one each, yet there is still opportunity for mobility between shelters if and when this is regarded as expedient. Further, there is only a finite supply of houses, in the short run at least, just as the crabs need to find a vacant shell to occupy. Of course, humans and their houses are more complex than that, at least insofar as the problem of resource allocation goes. Humans tend to group together and consume shelter jointly. Even more inconveniently, housing exists not as a natural phenomenon but as a composite creation, and as such, as part of a complex inter-related social and economic system attuned to (but not necessarily in tune with) the societal and cultural needs of humans. Changes in that system result in changes to those needs.

When such changes have impacts on the factors governing both the supply and demand of housing, and when they redefine the very roles of society

and individuals, then the results are significant for the way housing is 'consumed' and its function in that society. We think here of changes in British society in the post-industrial era and in the political agenda which precipitated them. Individuals have been made to feel as if they have been given more control and freedom in the way that they access and consume housing services. Various devices (the Right to Buy being clearly the most significant) have been used to this end. In this respect, Mullins (1998b) talks of "the use of a rhetoric of choice to mask a reality of control" by Government (p. 253). This observation chimes with Balchin's (1989) suggestion that Thatcherite housing policies in the 1980s served to shift the role of the state from that of overt control (as a social arbiter) to "an instrument of class rule" (Bassett 1979 quoted in Balchin 1989).

The word 'social' in this context therefore takes on a different meaning. Housing becomes not something of common *ownership* but of common *experience*. Housing is culturally defined as a basic societal need; but increasingly society as a whole is discharging itself from the responsibility of providing it. That Mullins (1998a) now finds it necessary to defend the term 'social rented housing' from proposals that its definition should include provision from profit-making landlords only accentuates this point.

A recent significant example of the impact on local housing markets of the increasing ambiguity between 'social' and 'private' has been felt through the housing of asylum seekers. The National Asylum Seekers' Service (NASS) and its policy of contracting private sector landlords means that the private rented sector essentially widens its role in the provision of housing for low-income and special-needs groups. At the same time many outstanding issues to do with stock condition and regulation remain unaddressed.

In an uncertain and shifting environment like this—at the interface between market forces and state intervention where housing is caught between its role as a constant and as a commodity—the equilibrium between houses and

those who want or need to live in them has become ever-more distorted. Furthermore, it is not an easy task to rejoin the route to equilibrium when the parameters continue to change, and when the mechanisms for doing so are in a state of just as much flux.

The problem of vacant housing is a national paradox; at worst, it represents something of an embarrassment for the Government. At a time when the Deputy Prime Minister announces urgent and contentious measures to increase the provision of new housing in the South East (one plank of the Communities Plan[2]), the Government is effectively forced to admit the existence of a housing North-South divide:

> "The problems in the north and the midlands are different, but just as pressing. Some of our towns and cities are experiencing a renaissance in their economic and cultural fortunes, but many also have communities where properties are almost worthless [...]. We are building the wrong kind of houses in the wrong places and failing to tackle fully the urban decay associated with that." (HC Deb (2001-02) 389, col.438).

A recent select committee enquiry into vacant homes heard much evidence from housing practitioners and researchers in the UK, including from a number of the leading academic studies that have been completed in the last three or so years. Among the committee's concluding recommendations were that better information was needed on the problem, particularly with regard to geographic data, and that constraints to the use of existing detailed data sets needed to be relaxed to allow more sophisticated models of the problem and responses to be formulated. The housing market restructuring process clearly needs to know something more about the nature of supply and demand than the crude net figures contained in Regional Planning Guidance, for instance. It is intended that the project that this thesis reports on represents a demonstration of the possibilities of better information and access to it.

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[2] The 'communities plan' consists of a national strategy document (ODPM 2003) and nine associated regional 'daughter' documents.

Housing's role in society

Stepping back to a macroscopic overview of the changing role of housing within a changing society, Marsh (1998) usefully identifies three highly interrelated spheres of influence upon the changes that have happened in the housing field over the last two decades. These are demographic and social change; economic change; and changes in public policy. Together, the effect has been a marked shift in the position of social housing within the housing system as a whole; or, rather, that the society around housing has shifted such that it now embodies a vastly different set of cultural and functional expectations. The term 'social' is key; but just as characteristic of the new position of housing within society is an increased concern with matters of 'affordability.' The fundamental ideological concern now is that housing can be *accessed* by those who need it, and not for who provides it. The housing green paper, *Quality and choice for all,* made it plain that it is expected that both public and private sector housing providers have to play their part in delivering the right housing for peoples' needs, and that housing strategies needed to transcend tenure more successfully in order to achieve this (DETR 2000). The *Communities plan* (ODPM 2003) and the establishment of regional housing forums are putting this into practice.

There exists a tension between the qualitative aims and outcomes of housing strategy and the more quantitative modes of its provision, whether by negotiation with private developers at the planning stage, or though more direct subsidy via not-for-profit rented housing, or through the demand-side subsidy of welfare payments and tax credits. If one was forced to single out an aspect of the housing system for further scrutiny, one could do worse than to look at the ways that Government invests public money in housing. Indeed, possibly the most contemporary discussion of the position of social housing in society is that around housing subsidy. Debate between the essential poles of demand- and supply-side subsidisation encapsulates within it discourses of the economic role of social housing; its desirability in

society; its ideological position in party politics; and the methods of its delivery (Galster 1997; Yates & Whitehead 1998).

That is not to say that within this thesis there will be an overt normative stance. It will, however, seek to interpret its empirical findings in close relation to subjects of these fundamental debates, and in doing so can hopefully enlighten our understanding of the low demand phenomenon and its myriad associated problems. Having said this, the primary analytic output aimed for is that of a model of variation in housing demand in response to investment scenarios. These investments are themselves forms of housing subsidy. The aim is that a wider interpretation of the models results will be taken: not just testing certain limited forms of investment but also what this says about fundamental questions related to the structure of the UK housing and welfare systems. This is of necessity an ambitious task, which will of course remain largely unfulfilled. However, it is hoped that the presentation of some innovative modelling techniques coupled with the timely nature of the debate will pave the way for future research in this area.

II. ORIGINS OF THE RESEARCH

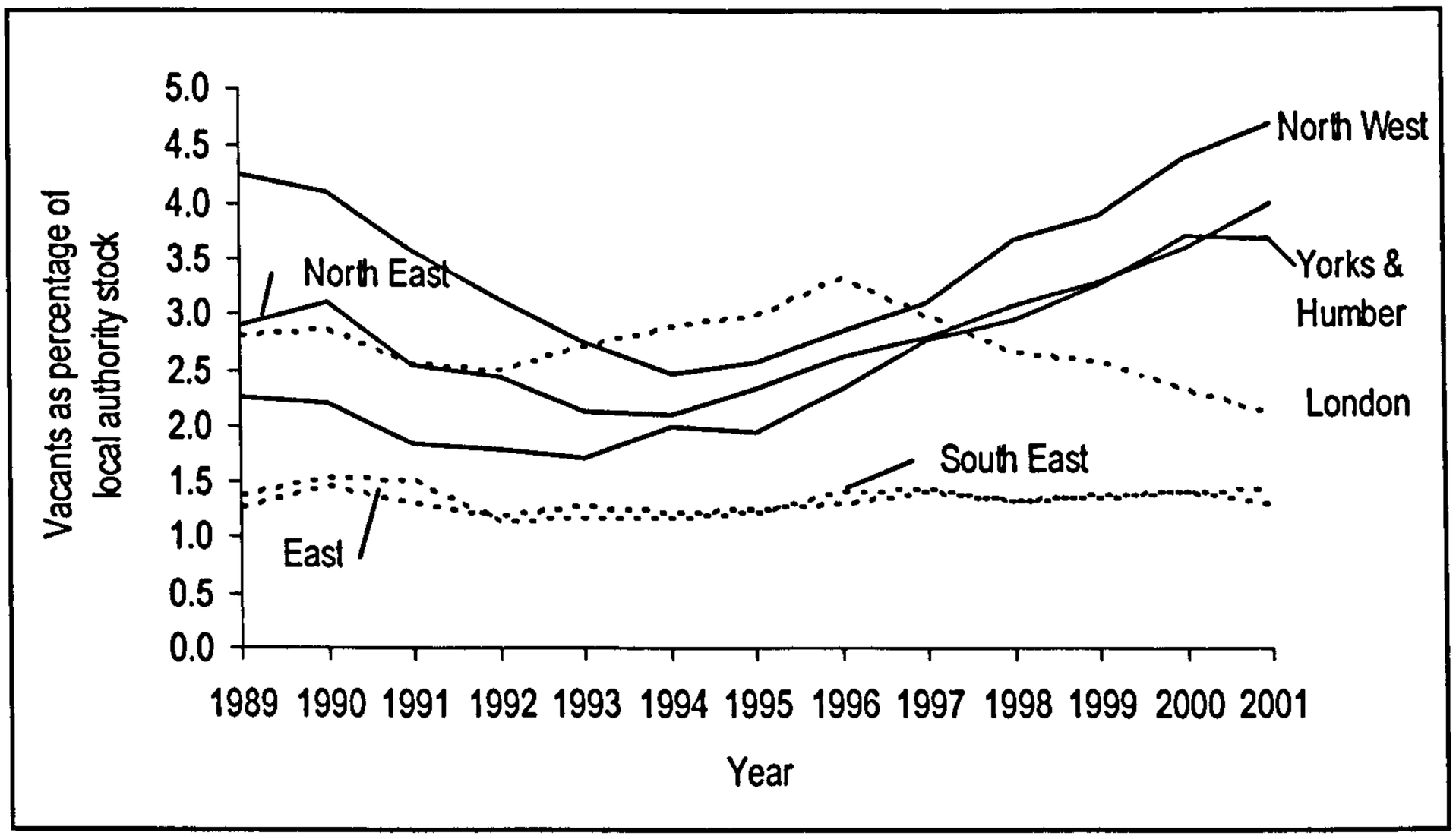
In 1998 the director of the Housing Corporation's north-eastern regional office[3] explored the possibility of a collaborative project with the academic sector to look into what was clearly by this time a problem of extremely worrying magnitude: generalized low demand for low-income housing. It was a problem that was at the time particularly affecting the north-east of England, parts of the north-west, and there was a sense that the same problems were beginning to emerge in Yorkshire and parts of the Midlands.

The Housing Corporation was particularly worried that some of the investments that it was making and was planning to make were misguided and were responding to notions of demands that were not really there.

[3] The north-eastern regional office (NERO) was subsumed with the north-western office to create a single 'north' office in April 2001.

Several notable examples of unlettable new developments funded through the Corporation's Approved Development Programme (ADP) had been reported in the local and national press, and in July 1998 a national conference was called at short notice in York where worried practitioners and academics mused over the emergence of what looked like US-style rustbelt abandonment (Lowe *et al.* 1998).

The principal cause for confusion was the contradiction between national housebuilding estimates of 3.8 million new houses between 1996 and 2021 and the realisation among social landlords (and others) that problems related to the letting of houses were no longer exclusively related to poor physical conditions or environmental factors alone. Holmans & Simpson (1999) found subsequently that the estimates remained credible but that they masked strong regional variations and localised low demand. Continuing inter-regional migration to the south, and immigrants disproportionately favouring the south, had contributed to these regional imbalances. Seen through local authority housing, the mainstay of social-renting, clear regional differences in vacant properties are evident. Since the mid-1990s, there has been a marked divergence of the vacancy rate in local authority housing, with southern regions steady or declining to a rate of around 1.5 per cent. At the same time, vacancy rates in northern regions have inexorably risen such that regional rates are now some 3.5–4.5 per cent (see Figure 1.1).



Data source: ODPM Regional housing statistics, table 611.

Figure 1.1. Local authority voids by region, 1989–2001.

Such demographic trends do not occur in isolation from other changes, however. The residualisation of social housing, particularly council housing, has long been documented (Forrest & Murie 1983). Perceptions of the tenure have changed and continue to do so, many now seeing it mainly as a tenure of 'last resort.' Turnover rates have increased, partly in response to this new, transient mode of consumption and partly because high vacancy rates and the portability of housing benefit have expedited the process of mobility (e.g., Kemp 2000; Keenan 1998). The composition of households and their consequent demands on particular housing configurations—particularly house size—are also changing.

At the same time, changes in the economy of the north have not only had the effect of increasing unemployment and eroding affluence among lower-income groups, but of instigating migration and the break down of social cohesion as new job opportunities and relocations began to bed down. Those who were able to take advantage of these opportunities were also those who were most able to re-skill in the post-industrial years, thus systematically draining the industrial heartlands of the necessary triumvirate of skills,

money, and people (Turok & Edge 1999). The result: a widening rift between the haves and the have-nots; a reinforcement of the ethic of personal independence and self-reliance (inculcated by the gravity and necessity of circumstances rather than any societal evolution); and the elevation of owner-occupation as the only viable option for everybody but the most marginalised. Add to this the continuing supply of land for cheap, new-build private housing in the north, at first on green-field land but eventually on land that no longer had an economic role (at least in terms of employment).

This multiplicity of fluid variables makes it very difficult to plan what levels of investment (and of what type) are required in local housing markets. Historically, there has always been a presumption that social housing is a scarce resource, more of which will always be necessary, and as such strategic thinking and planning by local authorities and housing associations has been geared to this. Cross-boundary working, for example, had rarely been required in the past.

Essentially, what has been happening is that social housing has been becoming more exposed to the housing market as a whole. It is becoming the case that it performs a specific function *within* the market, not alongside it. It cannot, therefore, be viewed in isolation from the housing market, and any attempt to plan for future social housing provision (or, indeed, stock reduction or reconfiguration) needs to be cognisant of this. This has two important implications for the way that this research attempts to gain a foothold in this planning dilemma. First, clarity is needed around what is meant by a housing market, particularly as it relates to the local administrative contexts in which they operate (for example, local authorities). This necessitates the specification of a housing market area and structure. Second, there is a need to conceptualise processes of mobility into, out of, and within the social rented sector *as part of* wider household mobility processes in the overall housing 'system.' The important part of this is recognising that moves are *contingent* on opportunity, and that in a low

demand market opportunities in the form of vacant housing are generally more plentiful.

Returning now to the 'hermit crab' analogue that was described in the opening paragraphs, the research needs also to take stock of the fact that contingent opportunity manifests itself as part of a *linked system*. It is not a dynamic resource-allocation problem, as electrons might distribute themselves instantaneously around an electrical circuit according to the criterion of least resistance. Instead, opportunities in the housing system are created by households taking advantage of *other* opportunities, as if in a sliding-block puzzle. A move can only take place if there is space available *and then only* in the directions dictated by those spaces. The act of building a house does not merely dilute housing demand (like adding more links to a circuit). Instead, it triggers a process of delayed reallocation when a household vacates their house to take advantage of the newly built one, starting a vacancy chain.

In simple terms, building houses has complex and sometimes unintended consequences. This makes the planning of new housing investment difficult to score against social criteria. It is not altogether clear at the point of investment exactly *how* the investment will lead towards the satisfaction of housing needs, or indeed when.

It is suspected that the tools are available to make a better job of understanding how these aforementioned processes just impact on the business of allocating funds to the provision of new social housing. Social landlords' information systems in particular have become notably advanced in recent years such that it is possible—with some work—to reconstruct an exact picture of moves into, out of and within social housing for a given period and geographical area. Using these data it would then be possible to test how the housing system as a whole responded to certain investment

events, through the microscopic operation of household mobility events. This is essentially what this project aims to achieve.

In the course of this work, the first step was to find a suitable laboratory for investigation and modelling. Such a laboratory needs to have all the requisite data on households and individuals and, furthermore, the institutional arrangements to expedite its extraction. Following this began the task of specifying a housing market in which the reconstructed, empirical model could sit. Finally, it was possible to use the data themselves to run various scenarios. Given that no part of this work came pre-assembled, it represented a significant challenge; the first parts of which proved to be just as onerous as the last. This experience has implications for the way that this type of research should be conducted in the future, and the type of commitment and arrangements that must be put in place if the type of vacancy chain model developed herein is to become a useful plank of the evidence base that informs investment decisions and wider housing strategy development.

Necessarily, then, part of the value of this work comes not just in the results but in the experience of constructing the model. Can the work be replicated in the future? Does the end justify the means? What changes would need to be made to enable such models to be more widely deployed in the future? These and other questions may appear at first glance to be almost incidental; in the end they become perhaps more important than the 'investment questions,' these latter of which, in all honesty, only a very preliminary attempt can be made at answering.

This thesis reports on this work, and the answering of both these sets of questions. In doing so, it considers theories of housing markets (and advocates a particular reading that emphasises submarkets). It contests the way that geography is often used within housing market models, and considers the technical and theoretical issues that surround the incorporation of questions of geography and spatial location into ways of understanding

the housing market. Finally, it operationalises this into a working vacancy-chain model for the social housing sector in Bradford, UK and in doing so attempts to answer both the substantive and epistemological sets of questions alluded to above.

The value of this project, therefore, can be framed not only in terms of the conclusions it enables us to make regarding an appropriate schedule of future housing investment, but also by way of illustrating (and assessing) concepts and methods that have hitherto been largely bypassed by social housing researchers and strategists in England. Despite its many other shortcomings, this project aims to make a number of contributions both to the practitioner-oriented world of investment planning as well the more academic stage of housing and urban studies. The main such contribution is the drawing together of a number of complementary research techniques and their application to a contemporary housing problem in the UK. While there have been vacancy chain studies before, these have normally been limited by the lack of longitudinal resolution in the data or have been based on a sample of a very specific population. This project, on the other hand, tries to make some advance in the comprehensive analysis of an entire housing market area using a very large data set of individual moves. It also tries to provide a better fit between vacancy transfer models and the role of geography in housing markets. It uses a Geographical Information System (GIS) as a tool for the collection and organisation of the base data and also to allow the collection of additional data not normally associated with vacancy transfer models. Needless to say, this project does not wholly succeed on any of these counts. It does however chart some new territory in the course of its attempts and maps out quite clearly the road to be taken if, indeed, there is any mileage in pursuing its aims.

III. Relationship to the Housing Corporation's investment function

As over 98 per cent of new social housing provision is made through the construction and management activities of the housing association sector[4] it is essential to look at the role of its regulatory body, the Housing Corporation, and particularly the responsibilities that it has in allocating central government funding. The Housing Corporation's functions are largely concerned with investment and regulation of housing associations.[5] It is an executive agency of the Office of the Deputy Prime Minister (ODPM) with an annual budget of grant funding of around £1.42 billion[6] of which 98 per cent is distributed to the social landlords it regulates as part of the *approved development programme* (ADP). As such, its investment function is the main route for the funding of new social housing construction in England. The Housing Corporation annually sets its ADP, which details the amount and type of new social housing provision within a national strategic framework. Within the ADP, funding will be made up from a variety of sources. A major component of the funding for any new construction, however, comes from Social Housing Grant capital (SHG), which is administered by the Corporation. The remainder will be made up from limited local authority resources and money raised through market-based financial instruments.

In the past, ADP was set by the Minister and allocated according to the *housing needs indicator* (HNI) formula. For some time the system has been moving towards a more flexible and strategic process based on locally identified needs and priorities rather than the use of set formulas like HNI. Recently, the Corporation has stated that it no longer uses HNI at all

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[4] In 2001/02, construction of some 11,186 housing association dwellings was started in England. The local authority sector started construction of only 137 dwellings (source: table 2.1c in ODPM 2002a)

[5] The term *registered social landlord* (RSL) is sometimes used to refer to housing associations and other forms of social or charitable housing provision regulated by the Housing Corporation. It will be used interchangeably with *housing association* in this thesis.

[6] See Housing Corporation (2002).

(Housing Corporation 2001b). Instead, the cornerstone of the new approach is the Regional Housing Statement,[7] which aims to identify—in consultation with relevant stakeholders—a strategy for the division of regional ADP among constituent Local Authority areas. It is then the job of the Housing Corporation's regional investment teams to distribute ADP among eligible schemes and proposals put forward into a bidding process by RSLs. This is done in close cooperation with local authority housing strategy officers.

Assessing the sustainability of bids

When submitting a bid, RSLs are required to carry out an audit of their proposal against a toolkit of sustainability indicators (the *Sustainability toolkit*).[8] In this way, they are supposed to have the likely future demand for properties of the proposed type in the area. The methods for doing such audits are not prescriptive; indeed there would be major problems if they were. Such prescription would work against the Corporation's objectives of flexibility and local sensitivity that came out of its 1999 review of the investment process (Housing Corporation 1999). These objectives are particularly important in the context of low and changing demand. However, the upshot could be argued that it is now largely a matter for individual RSLs to gauge future demand in such a way as they see fit.

While demand problems are not a necessary feature of the assessment of 'risk' associated with capital investment in all cases, there is a problem when different RSLs put forward different measures of demand based on different methods, models, assumptions, and data. The Corporation, as an accountable body charged with administering public funds, needs a coherent way of contextualising the bids and demand arguments put forward by bidding RSLs. If the process has in recent years been precipitating a shift towards dialogue instead of diktat, then the Corporation needs a view on

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[7] Regional housing statements are in the process of being replaced by *Regional housing strategies.*

[8] The current version of the sustainability toolkit is Long (2001).

demand and its measurement if it can successfully enter such dialogue, or even where necessary to instigate it. It is on the basis of one view of demand conditions—right or wrong—that submissions by RSLs can be more easily contextualised and their responses (of agreement or disagreement) more telling.

The sustainability toolkit describes demand for housing as "the principal measure of community sustainability" (Long 2001, 7). This is not surprising given that demand is this sense is a conceptual composite, influenced by other factors that are also measured in the toolkit such as area reputation, crime, poverty, accessibility, environmental quality, and social cohesion. The toolkit reflects this by classifying demand as a higher-order factor in a loose hierarchy.

Although the sustainability toolkit is an extremely valuable document in promoting the responsible use of sustainability indicators among RSLs, it is not a prescriptive document (neither should it be given an environment of flexible ADP) and is more suited to individual RSLs assessing the risks associated with a single site or investment. By contrast, the Housing Corporation must take a more strategic overview; one that frames demand not as a measurement of case-by-case feasibility but as an economic condition contingent on a variety of social and administrative processes occurring at a variety of scales.

With respect to this aim of strategic intelligence, there are two main problems with the use of the sustainability toolkit for measuring low demand. First, is its tendency to treat 'demand' as a sustainability indicator in the same way as, say, fear of crime. This robs the paradigm of any explanatory power rather than accepting that demand is both an outcome of the interaction of a set of conditions and a response to price and supply-side constraints or inelasticities. Measures of crime in this way help to predict

demand, *but only with reference to other predictors and 'macroeconomic' parameters such as demographic change, supply activity, and modes of subsidy.*

The second main problem with using the *Sustainability Toolkit* for measuring low demand is its treatment of demand through time. While it makes the distinction between 'current demand' and 'long-term demand' and suggests methods of incorporating future demographic projections, it is unclear how this should be related to demand in different parts of the housing market, or for different 'product groups' based on (for example) house type, size, and location.

What these two shortcomings suggest is that there is a need for a model that situates social housing (particularly demand there for) within the housing market as a whole and treats housing as an economically-unique commodity whose consumption is linked both to occupancy and mobility within a dynamic linked system. It is this latter—the dynamism of the market—with which this project is primarily concerned. This thesis will base its advocacy of the use of *vacancy chain* models of the housing market on the presupposition that existing models and measures do not adequately represent micro-level processes within the housing market or the aggregate structural effects of these. It will go on to argue that approaches to the conceptualisation and measurement of housing demand that are often in use in the UK are based on a flawed economic and geographic framework and ignore *opportunity* and *contingency* in the housing market. Whilst the academic sector has a long tradition of the development of economic models of the housing market, including approaches that *do* recognise these issues, these seldom find their way into the housing strategist's analytic armoury. Instead, we cling on to flat, static measures of demand whose relationship to *future* demand can only work under the assumption that housing operates within a rational, pareto-optimal economic system of perfect competition, unconstrained capacity to vary supply, and most importantly where there are no temporal or procedural constraints to the dynamic matching of supply

and demand. Housing quite clearly violates all of these in the strongest possible terms.

It is furthermore the case that continued reliance on unsuitable ways of conceptualising and measuring housing demand has actually served to exacerbate the low demand problem. It does this by engendering within housing professionals, funders, providers, and politicians a perception that void and turnover rates are the best gauge of low demand and all responses should be in tune with their attenuation.

It is anticipated that this project fits into the overall organisation and strategy of the Housing Corporation in two ways. It should provide consistent baseline measures for demand that can be tested and calibrated in the Bradford area. In doing this it develops a methodology for the prediction of future demand patterns for social housing. Second, it could potentially form a component of a national housing market intelligence system that would be used by investment and regulation teams. The feasibility of such a system using a Geographical Information System as its analytical framework is being explored by the Corporation as part of a wider review of its information strategy.

IV. STRUCTURE OF THE THESIS

The logical starting point in this endeavour is to set the context, both in terms of what has been said about 'low demand' as a newly-emerging sub-topic in its own right, and also the interconnections between this and more mainstream debates in housing economics, UK housing policy, and urban studies. Thus chapter two reviews contemporary conceptions of the problem of low demand and responses to them, and then attempts to link these to a wider theoretical framework. This will culminate in a presentation of a set of research questions that the research design will be oriented towards answering. The reader should remain aware at this point that, almost in parallel, there is another set of epistemological questions that arise during

the course of the research which are not dealt with obtusely within the normal *question-method-analysis* framework, but, rather, are posed and answered as the thesis concludes.

Following these introductory chapters, chapter three introduces the case study area of Bradford, and presents a general tour of its context and housing market. This is done principally through the viewpoint of vacancies, which are framed as the primary analytical object throughout this thesis. The nature of the housing stock in Bradford is examined, as is the flow of housing opportunities through that stock. Particular attention is paid to the relationship of Bradford's large population of Black and Minority Ethnic (BME) groups to the housing market.

Chapter four returns to somewhat more theoretical considerations. Having used the example of Bradford's housing market to highlight some aspects of the way that the housing market reproduces itself through vacancies and turnover, a wider review of the concept of housing markets and their definition and analysis is presented. This leads in particular to a treatment of geography within analyses of the housing market. Particular importance is attached to this because of the subsequent need to compartmentalise the housing market into sectors for the purposes of building the vacancy chain model. It is posited that the sectors required of a vacancy chain model can represent a useful analogue of housing submarkets. An important question then becomes that of how to represent (geographic) space within a submarkets framework. The selection of a Markov vacancy transfer model is suggested as the most appropriate way to deal with the process of vacancy creation and household mobility within a closed sectoral system, as a housing market area is found to approximate.

Whilst conceptually simple, vacancy chain models are data intensive and are far from straightforward to construct. Chapter five describes the prerequisites of such a model from two main perspectives: the data required,

and the geographic area of focus. It describes the process of data collection, including the organisational arrangements that were encountered and the problems of manipulating the necessary data—collected from multiple social landlords—into a usable data file. Whilst this chapter may superficially appear rather mechanical in nature, it contains some important lessons regarding the feasibility of further development of vacancy chain models and the ease with which they will travel to other locales and organisational contexts. The fact that, in sum, the process of identifying suitable partner organisations, approaching them, negotiating and effecting data acquisition, and subsequently preparing the data took well over one and a half years of what was a three-year project highlights the extent of the difficulties encountered. It also begins to say something about the lengths to which interested individuals or organisations may have to go to reproduce this work should the situation *vis-à-vis* the collecting and reporting of basic housing data at small area level not improve in the UK.

In order that subsequent chapters can deal with refinements to the model, chapter six is concerned with an initial specification of a vacancy chain model so that the reader is left clear in his or her mind what it is that the model is trying to do. It does this using two demonstrations: first in very simplistic terms, and then, more formally, using actual empirical data from the project data file.

The model is then extended through the next two chapters. Chapter seven focuses on extending the model's usefulness by addressing they way in which it deals with estimates of changes to the flow of housing opportunities over the model period. Specifically, it attempts to situate the model within accurate estimates of vacancy creation and absorption events. These are the result of various processes, including investment, 'disinvestment,' demographic change, migration, and others. This chapter also attempts to internalise the private sector into what has hitherto been a social housing

model so that it may more accurately represent the interface between public and private tenure with respect to the mobility of households.

Chapter eight considers methods of partitioning space, both geographic and otherwise, so that the sectors chosen for vacancy chain modelling can be the best possible fit to actual housing submarkets. Whilst analyses are presented that make use of data collected, it was not possible to put all the recommendations into practice due to limitations in the data set.

Finally, in chapter nine, the implications of the model's outputs are critically evaluated in the light of the comparative performance of the models themselves, and on what they say about the nature of policy and investment interventions in the UK social housing context. Furthermore, conclusions are drawn as to how the model could be deployed in other situations and how it needs to be improved.

Chapter Two.

LOW DEMAND: SYMPTOMS, CAUSES, RESPONSES.

LOW DEMAND IS problematic. Five years on from general acceptance of its existence, it is still posing very difficult questions of those who plan, invest in, and manage social housing. It is also having severe implications for those who own their own homes or are tenants and residents in affected communities. It is useful to highlight the distinction between low demand as a market condition and as a more generic term—a mindset, almost—among those in the housing profession.

The former, the more narrow view that low demand is a market condition, should not in most circumstances represent a problem in itself. Markets continually have to deal with fluctuations in both the schedules of supply and demand, and the market for housing in this respect is no different. That the problem is a persistent one, is not being cleared by the market, and co-exists with general market confidence is telling. Furnished with sufficient

information and market intelligence, and in a relatively straightforward market, housing providers should be able to circumvent problems by making long term adjustments to their strategies of investment and 'disinvestment' (as demolition and other stock-reduction strategies are sometimes termed). It is clear, however, that providers do not operate in an environment of perfect information. Neither is the application of long term strategies to static, current conceptions of a problem that has its roots in more dynamic processes an easy task. Private housing developers in particular cannot be expected to prioritise long-term strategy before middle-term or speculative gain and in this respect low demand is as much a concern for land use planners as it is for housing strategists.

Notwithstanding the assertion made above, the housing market is actually quite unlike other markets. To begin with, the UK situation is that there has long been a tradition of non-market housing, from the 'five per cent philanthropy' of early industrialists, through the birth of the housing association movement, and on to council housing. Second (more of which will be made in a later chapter), there are certain features of housing that means that is reacts to market stimuli in ways that are quite different to other commodities (somewhat like the labour market). Third, and again a situation that has particular resonance in the UK context, is the operation of a nationalised land-use planning framework that is statutorily expected to exist outside the market. The supply of housing is almost without exception regulated by non-market mechanisms, whilst demand can be expressed by households in a much more fluid way. There have been in addition a number of policies aimed at dissolving even further the buffer between the 'need' expressed by social rented tenants and the 'demand' expressed in the open market. Housing benefit, and its portability around the rented tenures, is the main example of this.

To return to the distinction between low demand as a market condition and as a narrative, it is possible to see that low demand exists as a phenomenon

which has engendered a set of behaviours and responses among actors in the housing arena. It has become a much abused, catch-all term for unpopular housing, which perhaps reflects the way the collective social housing 'industry' was shocked by the way low demand appeared to manifest itself very quickly and become the predominant housing concern towards the end of the 1990s. Now low demand has become firmly embedded within the housing lexicon, and is used interchangeably to refer to lettings difficulties, high void rates and turnover, investment 'mistakes,' and as a characteristic of regional housing market differences. There could be said to exist a mindset of low demand that extends to a general pessimism about social housing and its role. Repercussions of this are a growing concern with alternative modes of investment and its delivery, remodelling the form and extent of housing supply, and the opening up of questions of disinvestment—a discussion that had always been previously somewhat taboo.

It is with this wider reading of low demand in behavioural terms that this chapter will focus. The main concern is first to clear up some points of definition before surveying the different standpoints from which low demand has been conceptualised, and the nature and scale of subsequent attempts to find solutions to housing market problems associated with low demand.

First, the national context is considered, initially in terms of some working definitions of 'low' and 'changing' demand and the extent to which it is perceived to be a problem throughout different parts of the UK. Having done this, the remainder of the chapter moves on to explore the problem of low demand in more depth, including a comparison with what was previously referred to as 'difficult to let' housing. This chapter sets up an analytical framework that relies on different *scalar* viewpoints, from the national perspective, down to extremely localised perspectives. The linkages and relationships between these scales are teased out in this way, and it

provides some of the backbone for what the thesis subsequently goes on to say about the nature and structure of the housing market.

I. DEFINITIONS AND CONTEXT

It is first beneficial to clear up some confusion in semantics and nomenclature. Rather than refer to low demand, Murie *et al.* (1998) suggest the use of the term 'changing demand' to refer collectively to the whole gamut of factors that have a negative impact on demand for housing. This term is probably more powerful for describing the way that a range of factors are acting in combination to result in sudden collapse of the market for housing—social or otherwise—in neighbourhoods and wider areas. However as a collective term referring to the state of there being demand deficiencies (particularly as a result of being exposed by more structural processes like the economy), the term 'low demand' will continue to be used throughout this thesis.

What is clear is that the previous policy concern of difficult-to-let housing is now only one factor. 'Difficult-to-let' is used to describe stock that suffers from physical, locational or aesthetic problems, or where management arrangements impede access to housing. It does not, however, fully account for the complex and severe demand problems faced by many social landlords in the north and parts of the midlands where many properties that would historically have been considered as in-demand struggle to attract occupants.

A number of studies have made headway into the quantification of the low demand phenomenon. These range from the large survey by Bramley *et al.* (2000), the first work to provide a consistent national picture of low demand, to more prognostic attempts to conceptualise areas as 'at risk' of low or changing demand (notably the CURS 'M62' study[9]). The former study reported that 61 per cent of local authorities in England were experiencing

[9] Nevin *et al.* (2000)

low demand problems, and that local authorities in the North East and North West together accounted for some 48 per cent of the national problem. In all, Bramley *et al.* estimated that some 928,000 dwellings nationally were affected by low demand: over half of these in the private sector. An early analysis of these results provided the evidence for the work of the cross-cutting Policy Action Team report into unpopular housing (DETR 1999b).

However one of the clearest findings of all researchers active in this field is that low demand does co-exist with an overall national picture of additional housing need and, in places, the inability for lower-income households to access the housing market. While low demand affects a large number of local authorities across large contiguous areas it remains a problem whose most significant symptoms are localised. The geographic scales at which low demand operates are confusing.

Scale: an analytical framework

This leads us to look at issues affecting the demand for housing and leading to low demand areas at a variety of scales. In this section, attention starts with a national perspective before moving down through regional, borough, local and 'sub-local' levels. In definition, the national, regional and local authority levels are all relatively self-explanatory. To clarify, regions are those conforming to government office regions (GORs), which are also the areal focus of regional development agencies (RDAs). They also largely corresponded with the Housing Corporation's regional office areas prior to their amalgamation in 2000.

The local level, as noted above, is highly significant yet may be the most problematic to consistently define. Whether the focus should be estates (for example, in the traditional sense of council estates) or even more localised (pockets of low demand such as in streets, blocks and in-fill schemes) is unclear. The concept of a neighbourhood is perhaps the most useful in terms of peoples' perceptions, particularly as and when they make housing

decisions, but it is notoriously problematic to define. It may lie awkwardly in between estates and streets, for example. Or, as Galster (2001) contends, it may not of necessity be spatially bounded but, rather, consist of a more abstract confluence of attributes:

> "Neighbourhood is the bundle of spatially based attributes associated with clusters of residences, sometimes in conjunction with other land uses" (Galster 2001).

A neighbourhood in this way is even more likely to vary wildly in size according to local context and in response to demand concepts like popularity. It is partly to circumvent these definitional problems—but also in acceptance of Galster's arguments—that this project proposes that the basic units of analysis should not be streets or estates or indeed neighbourhoods. As later chapters will make a more reasoned case for, the context dictates that there is little alternative but to study the *atoms* of the housing market: individual dwellings and households.

This section—indeed the remainder—of the chapter cannot be concerned with those atoms yet, however. It is difficult to derive a clear picture from such minutiae when the basic structures in which the atoms sit have not been adequately described. Therefore, this chapter continues by offering a relatively wide-ranging review of what has been said or suggested *vis-à-vis* low demand, framed within the distinctive spatial scales of those perspectives. It should allow the identification of critical elements and linkages as well as those that have not been treated thus far by the emerging body of research into low demand. The objective is to take stock of the experiences and responses of practitioners and researchers who have been grappling directly with the issues during—and since—that tumultuous period in the late 1990s when low demand exploded into the overt consciousness of a very worried industry. This leads to a subsequent section that synthesises what is known and what is not; leading naturally and intuitively, it is hoped, to the research questions that the project attempts to

answer. It is the author's hope that this will represent a worthwhile contribution to our understanding of the way low demand manifests itself, and perhaps of housing markets more generally.

II. NATIONAL PERSPECTIVES

From a supply point of view, the most immediate and basic concern is that of projecting future population growth and, as a related exercise, household numbers and their consequential impact on estimates of need for new housing. In recent years there have been a number of attempts at this, employing a variety of approaches. Holmans & Simpson (1999) favoured the 'net stock' approach to arrive at a national estimate of as many as 115,000 new houses in the social rented sector per year, while Bramley (1998) used an affordability model to return roughly comparable national estimates but went on to show that there was significant regional variance. This led to the northern regions being tentatively described as low demand regions, albeit with a realisation that this mostly affected certain types of local authority characterised by metropolitan and declining industrial areas.

Holmans & Simpson (1999) however also find that pockets of low demand have called into question the validity of national population and household projections—and the consequential estimates of new annual housing need. The figures hold true at national level and have not varied significantly from previous estimates based on 1991 data. However, while the overall estimate is proving correct, at sub-national level the projections are looking less reliable. Since Holmans & Simpson presented their findings, there has been some debate over the accuracy of mid-year population estimates produced using the 1991 Census as their basis, and consequently many areas have had their official population estimates revised downwards. Notwithstanding this, according to Holmans & Simpson (1999), population increases have been more concentrated in the south of England than was previously thought and migration from the north rose. Furthermore, they explain how the unexpected higher number of immigrants from overseas has boosted the

adult population more than expected, and that these migrants have disproportionately settled in London and the south-east. At the same time, they suggest that previous estimates of housing need underestimated the differences between regions because they were carried out at a time of economic recession that was most severe in the south.

Hence, migration patterns have led to increased social housing departures and vacancies that have 'uncovered' surpluses in what were already the least popular locations. Thus Holmans & Simpson argue that low demand is not pervasive across the entire north (which contradicts some views of the north-east and the north-west as being 'low demand regions') but rather is concentrated in certain localities; where the misfortunes of economic decline have been exacerbated by regional out-migration.

Work done by Burrows & Rhodes (1998) confirms the problems in the northern regions, although they take a slightly different perspective. They focused instead on the area dissatisfaction experienced by residents in different regions of England. In their study, population groups in the north-east region in social housing and private rented housing rank both 1st and 2nd respectively in terms of area dissatisfaction, nationally. The same groups in Yorkshire and Humberside and the north-west rank 3rd and 2nd respectively. The study by Burrows and Rhodes categorised area dissatisfaction by 'mapping' subgroups derived from an analysis of a sample survey onto small area statistics from the 1991 Census. Having found that the "broad relationship between different types of accommodation and different levels of area dissatisfaction holds" (p. 12), they then go on to show how areas of social and private rented housing in the north-east and north-west are ranked top in terms of area dissatisfaction *generally regardless* of economic status, social class or type of accommodation. Burrows and Rhodes also show that, at a county level, four of the top five dissatisfied 'county' areas in England are in the North East. Merseyside, 'Outer' London, Greater Manchester, and South and West Yorkshire then followed. The top ranked

area was in Inner London, which also serves to highlight that intense deprivation and low demand 'features' can co-exist with general high housing need, although pockets of low demand are more likely to be surface in regions of low demand as a result of national economic shifts. This also lends weight to suspicions by Lee & Nevin (2003) that housing market weakness is not a necessary condition of deprived areas. Thus there is a clear sense that deprivation and low demand cannot be automatically regarded as the same thing.

The changing profile of tenants

All this is taking place as the well-documented processes of residualisation of social housing continue (see for example Burrows 1999). Residualisation was a dominant theme in the literature of the early 1980s, bound to the massive social and political changes that the decade was ushering in. Residualisation—whereby social housing (council housing in particular) was becoming a 'safety-net' form of housing provision for the least well-off only—represents not only a new political agenda of centralisation and weakening of the local government (and hence local modes of provision—see for example Wolman 1995) but a changing culture of ownership and self-reliance (Balchin 1989; Mullins 1998b). Forrest & Murie (1983) realised that the social, economic and political forces that were leading to residualisation were over and above issues of housing management and process. This is an early echo of the distinction between low demand and unpopularity, and the way that now, in the early 2000s, we need to understand changing demand patterns as a result of wider structural processes in the economy, and of changes in the role of communities and the function of neighbourhoods. Physical and environmental factors or those related to housing management of course retain immense importance, but must at the same time be understood within these wider contexts. Tenants have aspirations that increasingly do not view social housing as a tenure for life. This is particularly the case for new entrants to social housing, and these new tenants are rapidly coming to monopolise the stock as the demographic

composition of the social rented sector changes. Burrows (1997) reports that, as the size of the social sector shrinks, notably through right-to-buy (RTB) sales, the rate of movement within the sector rises. The age profile of household heads in social housing is bi-polar. It is at once an old and a young tenure. However, the large majority (72 per cent) of households entering the sector are headed by someone aged under 30—and they are more likely to be lone parents, unemployed, or both. At the same time, age-related exits from the sector are high due to the large proportion of elderly households. As a result of an age-structure analysis of its own tenants, Sheffield City Council attracted considerable attention when it concluded that it would need 20,000 less homes in 10 years' time, and subsequently geared up its stock reduction programme commensurately.

III. Regional perspectives

Whilst the national picture is important, immense regional variation in demographic shifts, housing needs estimates, and manifestation of the symptoms of low demand mean that a more detailed map must be examined. In any case, it is necessary to understand the role of regional bodies in shaping housing investment, whether that is through the influence of the land use planning system, the regional devolution agenda, regional economic development, or housing investment. This latter has traditionally had a focus on social rented housing. The emerging regional housing boards and the move from regional housing 'statements' to housing 'strategies' emphasises a more strategic, cross-tenurial approach to housing investment. This is still developing and the lack of such a strategic focus in the past has undoubtedly contributed to the fostering of a culture of investment 'at all costs' and in isolation from the wider housing market. The Government Office for Yorkshire and The Humber (GOYH) makes it plain that it believes that social housing no longer plays the role it once did, and that the paternalistic mode of the past has left a legacy that continued economic changes are dealing a cruel hand to:

> "...the true cause of the [sic] housing market weakness is the *historic over-provision of council housing*, the loss of population, changing economic rates and enlarged travel to work areas" (GOYH 2001b, 18, emphasis added).

Regardless of whether this is a fair comment, the point is that crude oversupply of housing is part of the problem. The situation in parts of the north-west—Burnley, Blackburn, and Salford are examples—is different, however, where low demand is recognised to be more of a private sector problem. This perhaps weakens the argument that social housing has 'had its day' although it is true that its image and function need careful management in the future.

Differentials in the regional economy

It is clear that the existence of national and regional forces are over and above the stock condition and management problems that have led to 61 per cent of local authorities reporting unpopular stock (DETR 1999b). As Levi (1999) points out, "There is nothing wrong with the homes"—difficult-to-let issues are now joined by structural demand problems that are characterising regions (even if they are not pervading throughout them). It is not, however, just a case of north versus London and the south-east: the capital's estates suffer from deprivation and social exclusion problems too, but applicants or potential movers in social housing have less choices in the high-demand south.

Regional differentials, both in the economy and in the way that the land use planning system has the capacity to respond to the pressures that this entails, are brought into focus. As Turok & Edge (1999) show in their analysis of the 'jobs gap' between different cities in Britain, there has been significant divergence in the economic fortunes of different types of area. Conurbations and their core cities have fared much worse than rural areas or 'free-standing' cities such as Nottingham and Edinburgh. It is interesting to see from Turok & Edge's work that Newcastle's economic fortunes (in terms of employment, at least) were broadly stable until around 1993. At this time, the

cyclical nature of the national economy was in a 'trough', and a subsequent up-turn in relative employment was evident in most of the major cities outside London except Newcastle. Tyneside as a whole showed a similar picture, followed by sharp up-turn in the mid-1990's (at odds with the rest of the country). Large scale inward-investment projects in the north-east clearly had impact, but the most recent concerns about the long-term viability of this investment in the face of global corporate restructuring, together with a sectoral shift towards lower-paid and casualised forms of work, have serious implications for the region. This was potently demonstrated in the North East in the closure of the Siemens semi-conductor plant, a vaunted inward-investment project, barely a year into its operation. Neither was this an isolated incident: the 'global downturn' has seen recent job losses continue unabated as manufacturing capital relocates abroad, whether new or well-established in the UK. The closure of Motorola in West Lothian; the end of car production at Dagenham; cessation of steel production in Stocksbridge, South Yorkshire; the Hyundai 'white elephant' in Fife: these are some more recent examples that all demonstrate the dispensability of capital assets and hint at the futility of regional economic strategies that are over-reliant on inward investment.

Regional land-use planning

The regional planning system has a crucial role to play in arbitrating the supply of land in areas such that it can respond to economic pressures. Critics point to land availability constraints as one of the prime factors in fuelling unsustainable house price increases in London and the south-east. The paucity of large developable sites has limited the effect of planning policies aimed at low cost housing provision (through the use of Section 106 agreements) as developments are rarely sizeable enough to invoke policy requirements (Crook *et al.* 2002). The effect has been a minimal net increase in affordable housing provision, and a change in its geography.

Housing management

Moving to a management level, the nature of the problem of difficult-to-let housing stock varies around the country, and is by no means restricted to local authority housing. When ranked by Pawson & Kearns (1998), the five major factors making housing association stock difficult-to-let in the north-east were related to excess supply, or social factors such as crime or stigmatisation. A similar picture emerges for the north-west and Merseyside. Conversely, regions not described as low demand regions place a much higher importance on physical design factors and restrictive allocations policies (Pawson & Kearns 1998: 403).

The north-east and Yorkshire and Humberside also have significant ex-coalfield communities that have been severely affected by large-scale closures in the mining industry. The isolated nature of many pit towns and villages and their particular housing structure (including large ex-Coal Board estates) mean that the effects of structural forces causing low demand are felt in a concentrated, unmitigated way. The situation was compounded by the ownership arrangements for the ex-Coal Board houses, many of which were taken over by private landlords or unregistered bodies such as co-ops thus distancing these estates from the reach of strategic intervention (Coalfields Task Force 1998).

Social housing subsidy

Differing regional economic fortunes and the effect they have on the distribution of people's housing chances around the country led to the Housing Corporation reviewing its subsidy mechanisms. In their first consultation paper on reviewing the Approved Development Programme (ADP) process, the Corporation—following the advice of the then Local Government and Housing Minister—suggested that a formulaic approach to ADP distribution that relies on technical indicators such as the Housing Need Indicator (HNI) was not best suited to differing circumstances around the country. A system that rewards housing need "where there will be

significant economic/demographic growth" (Housing Corporation 1999) or "where there are major regeneration requirements" (*ibid.*) (and hence favours new-built and stock improvement) was ignorant of localised demand problems resulting from over-supply:

> "In order to [maintain sustainable housing and neighbourhoods] we [the Housing Corporation] need to ensure that our investment is more closely tailored to the needs of local areas. It is clear that the needs of those areas where there is low demand for housing are different from those areas where there is pressure for housing because of economic or demographic growth." (Housing Corporation 1999: 3)

At the regional scale, there was an argument that the ADP needed to be more flexible and its priorities to be derived from regional and local contexts. In areas of low demand, the Housing Corporation wished to:

> "see the ADP providing flexible responses including re-modelling or re-improvement, major repairs, redevelopment and perhaps demolition. New Build in such areas needs to be used selectively and as a component of the regeneration strategy." (Housing Corporation 1999: 5)

In other words, the ADP began to take into account, among other things, the long term demand for social housing in local areas and to consider using 'new tools' such as demolition and regeneration activity. The ADP process now has, at its core, local authority housing strategies and regional housing statements. These statements are an overlay to LA housing strategy statements and are intended to cover all tenures, identify important housing markets and issues at the sub-regional level (including, presumably, low-demand pockets), in the context of the region's economic outlook, demographic trends and planning strategies, including regional planning guidance.

The Corporation's changes to the ADP were not universally popular and for a time were in danger of accentuating a "bitter north-south feud" between regions. (See, for example, the front-page report in *Housing Today* of April 15,

1999). Southern housing associations claimed that the Housing Corporation was playing at "regional protectionism" by giving money to RSLs in regions where it was no longer needed. Additionally, RSLs in the south pointed to huge housing need, and increasing social housing waiting lists, together with high house prices and rents denying many access to market housing, and a high in-migration rate increasing demand. In other words, all the classic justifications for social housing investment continued to be in place. Furthermore, on the supply side, scarcity of developable land and high land prices mean that social housing developments for reasonable rents were a near impossibility. In the south-east, only one-tenth of the expected social housing requirement was completed in 1999/2000 under the ADP mixed funding programme.[10]

There was also a concern that larger RSLs would lack the flexibility to change their business direction, especially in the north, at a time when housing providers were having to rethink their role, even to the point of not providing any new housing at all.[11] In 1999, this coincided with reports at the time that one of the north's most active housing associations was moving out of a new-build programme to concentrate on its management function.[12]

However, the overall message in reply was that the Housing Corporation was putting the necessary instruments in place to allow RSLs to respond more flexibly to demand problems. It was also argued that new ADP arrangements were a move away from the 'new build' culture that had become fostered by tightly ring-fenced money and regulation. In the north-east for example, *new tools* pilots were underway in Gateshead and North Tyneside. Pilots of Acquisition and Demolition Grant were allowing the RSL sector to become involved in tackling private sector demand problems,

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[10]See *Inside Housing* article "Southern Discomfort" (May 7, 1999).

[11]This fear is stated in an unpublished report for the Housing Corporation, as noted in *Housing Today*, September 30, 1999 ("Low demand crisis puts Northern HA's at risk", page 6).

[12]Reported in *Inside Housing*, March 12, 1999 ("No future in development", page 4).

especially where they were threatening the popularity of nearby social housing.

In summary, the low demand situation and in particular the widening gap between northern and southern regions has been one of the instrumental reasons behind the restructuring of social housing investment in the last four years. A new flexible system—somewhere between the top-down and bottom-up models—has the inevitable risk of strangulating ADP resources in the north where they may be perceived as being at the cost of low-cost housing provision in the overheated south. The recognition by the Corporation of the need to widen the remit of ADP to include restructuring and remodelling is the response to this.

New regional fora

At the same time as this, the rise in regionalism, particularly through the creation of Regional Development Agencies (RDAs), chambers, and revisions being made to Regional Planning Guidance notes (RPGs), was seen as a timely mechanism for providing a regional perspective on housing supply and demand. Initially, there was little involvement of housing organisations in the development of RDAs. This was due to the way that the development of RDAs tended to concentrate on setting the scope of their powers rather than developing their linkages with regional partners, including social housing (Long 1999). These linkages are now more developed and must continue if regions containing low-demand areas are to effectively drive job creation and economic growth, and social housing investment is to mesh with such drivers of demand. Housing must not just be a reactive element to regional economic planning. Economic development and inward investment should capitalise on existing housing resources, particularly in areas of current low demand. This is crucial in the light of brownfield land policies and the need to create denser, more sustainable neighbourhoods (Urban Task Force 1999). Reuse and consolidation of urban land assets should not be confused with decline in this respect, although Power (1999) serves up a

reminder of the signals that derelict land can emit if not tackled with expedience.

Balance between these views and those of the construction industries requires sensitive handling, and there have already been lessons to take heed of. For example, according to the House Builders' Federation (HBF), the draft RPG for the north-east—written at the height of concern about low demand—was primarily concerned with managing decline in the region. Their argument was that, while the draft RPG and the RDA (One NorthEast) aimed for economic upturn, its approach to housing provision was not concomitant with this. The HBF maintains that "the provision of the right kind of housing in the right places is a key element of the infrastructure needed to stimulate investment and jobs" (House Builders' Federation 1999), and regards the immediate availability of suitable housing and continued house building as essential to attracting people and money into the region. This argument has somewhat regained favour within the low demand context, and today a central plank of the housing market renewal proposals that are in preparation is addressing the 'flat' nature of the housing profile in low demand areas. In particular attention is drawn to the lack of 'aspirational' housing pathways to encourage, among other things, the retention of graduates, BME groups, and other groups of increasing affluence and with increasing choice in the market.

It is important that there is consistency between regional estimates of housing requirements and regional economic strategies of the RDAs. In any case, regional planning bodies will need to avoid the danger that debates around regional housing numbers become excessively polarised between the two extremes of the Council for the Protection of Rural England (CPRE) and the HBF; two of the loudest housing voices involved in the RPG process. Moreover, it is a reminder in the most practical of terms of the unresolved 'chicken and egg' debate between economic growth and housing.

As was seen earlier, Levi (1999) commented that job opportunities around the country were key to explaining low demand, especially through the related social exclusion consequences. He also suggests that the RDAs should play a key role: that they should have greater housing powers, and that, at the very least, there is a need to be in very close partnership with housing funders and providers. There is, however, great opportunity for regional response to low demand issues, and strategic partnerships such as 'Core Cities' (involving England's seven largest cities outside London) will continue to be useful in countering any blanket proposals that favour the South East. As Webster (1998) concludes in his prognosis for low demand areas in the future,

> "The emphasis should generally be on rebuilding the blue collar employment base of low-income neighbourhoods in the cities and coalfields" (Webster 1998, 47).

Where such a re-invigoration of the employment base should or could come from is clearly another question. There was, for a short time, a feeling that the new call-centre economy could provide the answer, and many local economic development strategies seem to have been predicated on this flexible and casualised but low-paid and uncertain phenomenon. It is probably the case that the brief bubble of optimism has burst. Already, as the market for domestic call centre traffic becomes open to inter-continental competition (the popular example is India), it is mostly recognised that this form of employment has a limited future and that local economies will need to be re-built on more solid foundations.

IV. LOCAL AUTHORITY LEVEL

The local authority level is important for a number of reasons. First, local housing strategies are formulated by local authorities, which are the constituent members of the regional housing boards responsible for regional strategy. Second, the local authorities themselves largely set the priorities for strategic funding through ADP and other sources, in cooperation with the

Housing Corporation. Third, of course, is that local authorities are not just administrative constructs but also in many cases the largest social housing landlords in their own right and arguably the owners of the most housing in low demand (certainly in Bradford). While it has been the case that a number of measures, including LSVTs[13], stock transfers, and rent convergence policies are eroding the boundaries between traditional council housing and the RSL sector, the housing and neighbourhoods themselves will still suffer from the same issues of low and changing demand regardless of the physical improvements that new investment vehicles will deliver. Finally, housing research is most often carried out at this level, particularly by local authorities in both a management and strategic sense. Management information is normally based on the collection and common definition of indicators such as void rates, turnover rates, and the housing register ('waiting list') usually by local authority areas and subdivisions of them.

The subsequent analysis and use of such research for bargaining in the ADP bidding rounds is used to elevate the local authority position within housing investment. Counter to this, there is, arguably, a resurgence in regional-level research capacity through Regional Observatories and the Regional Housing Strategy process. Such research is far more concerned with market approaches to housing requirements, for example affordability studies.

Local authorities, as housing providers, own a great deal of social housing with known problems, and recognise that a significant proportion of it is difficult-to-let. But differences also exist between the policies of different local authorities, particularly in non-housing policies such as education. These can have some effect on housing demand and its fluidity between local authority areas. The north-east, for example, is characteristic in that its conurbation spans many metropolitan local authorities, sometimes with 'fuzzy' boundaries as far as residents are concerned. Other low demand areas are characterised by multi-authority conurbations: Salford and

[13] Large Scale Voluntary Transfers.

Manchester, Merseyside, and the North Lancashire towns are all examples (although exceptions do exist, notably Hull). In such cases, the lack of one strategic authority can present problems in terms of policy response to low demand issues. It increases competition between areas (perhaps, as alluded to above, driving oversupply through bidding mechanisms), yet at the same time it can have implications for people's housing choices as consumers.

Returning to the Tyneside example, there is a popular perception that schools in Newcastle City are very poor in comparison to neighbouring authorities, and that this is anecdotally driving demand for housing in North Tyneside. This is despite the fact that the boundary between the two authorities is relatively hidden and 'arbitrary'[14] and that North Tyneside, like parts of Newcastle, also has intense social deprivation. The boundary between Bradford and Leeds also shares some of this invisibility, but is anecdotally of notable significance in terms of the housing aspirations of moving households. The issue of local facilities, including education provision, is discussed more fully in the next section.

Poor management of local authority housing has for a long time been seen as an obstacle to the efficient use of stock and this is one of the rationales behind the government's stock transfer policy. But simply transferring properties out of the local authority sector cannot be the only solution to low demand, as is evidenced by Sheffield City Council and Easington District Council's high-profile programmes of stock reduction. While the poor stock condition of some council properties is a problem that needs to be tackled (which RSLs are in a better position to address) there are often other factors leading to unpopularity. Questions arise around the necessity or inevitability of wholesale reliance on stock transfer to tackle the low demand problem given that RSL rents tend to be higher[15] and that low demand is related to housing

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[14] This is particularly noticeable, for example, where the boundary bisects Longbenton.

[15] Although note that there are policies aimed at converging social housing rents over the middle to long term (DETR 2001).

market accessibility, not just stock condition. The argument in this vein would accept that in terms of housing as a substitutable commodity—whereby movers have a sequential list of priorities—tenants place more implicit importance in finding the right type and size of housing, the right area, and access to the right facilities, even if the standards of physical design of the stock are slightly lower than expected.

Stock downsizing

In 1997, Newcastle City Council decided to demolish 400 houses in the city's West End to tackle low demand.[16] There was a recognised failure of investment strategies, which had not attracted tenants from outside the area: instead, tenants had been moving round the areas, travelling relatively small distances (a view confirmed by the work of Keenan 1998 in Newcastle and also confirmed by Burrows ' 1997 analysis of the Survey of English Housing). In 1998, Easington DC unveiled plans to demolish 100 houses, explicitly to cure abandonment problems[17], and the same council subsequently appointed a consultant to explore the best ways to wipe as many as 5,000 properties off its stock list.[18] There is a realisation that simply transferring the stock will not work on its own, given the over-supply of housing in all tenures in the area.

Measures to promote community involvement are ways of fostering ownership and pride in areas, which may help to combat the symptoms of low demand and break the vicious spiral of decline that can ultimately end in abandonment. Newcastle City Council held a two-day community consultation exercise called "The Big Event" in the low demand West End area, in July 1998. The event was used to gather views on a variety of community issues (including housing) and were stated by the council to be "crucial to future developments in the West End" (Newcastle MDC,

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[16] *Inside Housing* June 11, 1997 ("Low demand will see 400 homes demolished", page 7).

[17] *Inside Housing* March 6, 1999 ("Demolition plan for abandoned homes", page 6).

[18] *Inside Housing* January 14, 2000 ("Easington stock reduction", page 12).

undated). This consultation exercise predicated a subsequent plan for large-scale demolition in the Scotswood district of the West End as part of a 'going for growth' strategy. The irony in this was only too clear to local residents and the ensuing disquiet and protest against the council's plans demonstrated how sensitively any responses involving stock reduction must be treated. It also showed that housing is generally held by residents to be a valuable asset, the *raison d'être* of neighbourhoods, and suggests that residents of afflicted areas themselves realise that there are often very good reasons other than the housing itself why neighbourhoods are unpopular. Partial demolition does little by itself to cure these ills.

New-build incentives

The housing subsidy system (traditionally reliant on formulaic and centrist allocation mechanisms) has been said to act as an incentive for new-build. Ring-fencing of money has effectively ensured that LA housing strategies and local housing needs studies have always highlighted a need for more housing. As Keenan *et al.* (1999) point out, "Who dared say, until recently, that there were really too many houses in their area?"

By way of contrast, in 1998 Gateshead MBC was among the first to buck the trend and formally and openly identify the low demand issue as its "new challenge"—in particular the falling demand for rented housing (Gateshead MBC 1998). It went so far as to state in its 1998/99 housing strategy statement that:

> "The significant reduction in demand for Council and housing association housing in all but a limited number of areas, means that the wisdom of promoting a housing association new-build programme must now be questioned." (Gateshead MBC 1998: 5)

Gateshead MBC, having publicly identified serious pockets of low demand right across the borough, proposed several action points specifically related to low demand including demolition of unpopular housing and estates;

policies to exclude anti-social tenants whilst otherwise reducing entry restrictions; and, most significantly, imposing a moratorium on general needs new-build by housing associations. It also intended to work with housing associations to introduce a rent ceiling for new development (Gateshead MBC 1998).

Local authority research and evidence

Local authorities have traditionally relied on measurement of voids—particularly using 'snapshot' rates across the stock — as an indicator of both demand and management problems. Such a way of measuring demand is popular because it is both consistent with the requirements of the ODPM and Housing Corporation statistical returns, and it has direct relevance for the calculation of the monetary impact of empty properties insofar that they do not have a rental income (Pawson *et al.* 1997). RSLs have often tended to continue the tradition of adopting local authority practices with respect to management indicators.

Together with void rates, other management information has tended to be derived from turnover rates (lettings made as a proportion of all stock) and waiting-list data. Each of these has particular problems that make their application for low demand analysis not as straightforward as might be intuitively thought. Such indicators are geared towards the notion of social housing as a scarce public commodity where demand always outstrips supply. In low-demand areas this is not the case, and this has particular ramifications for the use of waiting lists to quantify housing-type and neighbourhood demand patterns.

With particular reference to void rates, it has been suggested that the length of void times expressed as a *re-let interval* is more appropriate (Audit Commission 1986). Pawson *et al.* (1997) have noted the increased adoption of this statistic among social landlords. The use of re-let intervals allows some quantification of the *severity* of the void to be taken into account, which is

particular important given the widespread assertions (including Merrett & Smith 1986; Pawson *et al.* 1997) that zero void rates are an unrealistic and undesirable policy goal, and that empty property is a necessary function of fluidity in the housing system (market or otherwise). This is particularly important in that problematically-vacant or even abandoned properties are 'just another void' at any point in time, yet will be disproportionately representative of social, management and public-resource costs.

Evidence of low demand in the private sector is consistent with the findings of Lee & Murie (1997) that urban deprivation is a cross-tenure problem and that in some cities indices of deprivation in some private sector areas are as high (if not higher) than the worst social housing estates. If housing policy is used—as it always traditionally has been—as a way of tackling poverty and exclusion, then the focus must be much wider than just social housing, notwithstanding the more entrenched causes of social exclusion:

> "A more general approach to deal with social exclusion is required. The scale of the programme required is much larger than has been envisaged so far. Even if this were not the case the evidence from different cities [including Bradford] suggests that to target council estates alone would be highly discriminatory and have very different consequences in different cities." (Lee & Murie 1997, 52, comment in brackets are author's own)

The fact that deprivation can co-exist with areas with little social housing is demonstrated for Bradford in Figure 2.1. Whilst this uses a different index for deprivation than Lee & Murie, and updates for the tenure position in 2001, the picture remains very similar. The map in Figure 2.1 shows that while areas of social housing are nearly always areas of concentrated deprivation, there are areas with little social rented housing that are very intensely deprived. The area in the University ward to the west of Bradford city centre; other inner-city areas in Bradford; the area between Leeds Road and Barkerend Road in the east; and the north of Keighley are particular examples of this.

An analysis of low house sale prices across the country is presented as part of Murie *et al*'s (1998) work into changing demand. Major concentrations of low value sales are to be found across the north-east, the north-west, Yorkshire, and the Welsh valleys. The author's own work into house price sales suggests that problems related to low, and falling, house prices are also prevalent across the West Midlands conurbation, even when controlling for dwelling type.[19] This is occurring at a time when, nationally, house prices are rising, seemingly inexorably. The fact that this is evident in pockets of a sub-region otherwise unproblematic in terms of aggregate figures suggests that concentrations around the worst districts in the North are rife and *relatively* pervasive across areas.

Other local authority-level responses

Solutions tried by local authorities are varied. Power & Mumford (1999) suggest solutions should include better local housing services; regeneration initiatives (as a base for holistic integration with other solutions, rather than in isolation); better local policing; improvements to schools and their performance; open marketing to encourage mixed-income estates; the re-densification of cities; and non-release of greenfield sites. On the subject of local housing services and management, the Policy Action Team on housing management (PAT 5) reported on ways that better localised housing management functions (tailored to areas) can stabilise fragile communities and tackle social exclusion (DETR 1999a).

[19] Work done as part of the 1999/2000 Birmingham housing strategy, based on an analysis of house sale prices 1995–1998. Birmingham City Council Housing Department (unpublished reports); see also Birmingham City Council 1999.

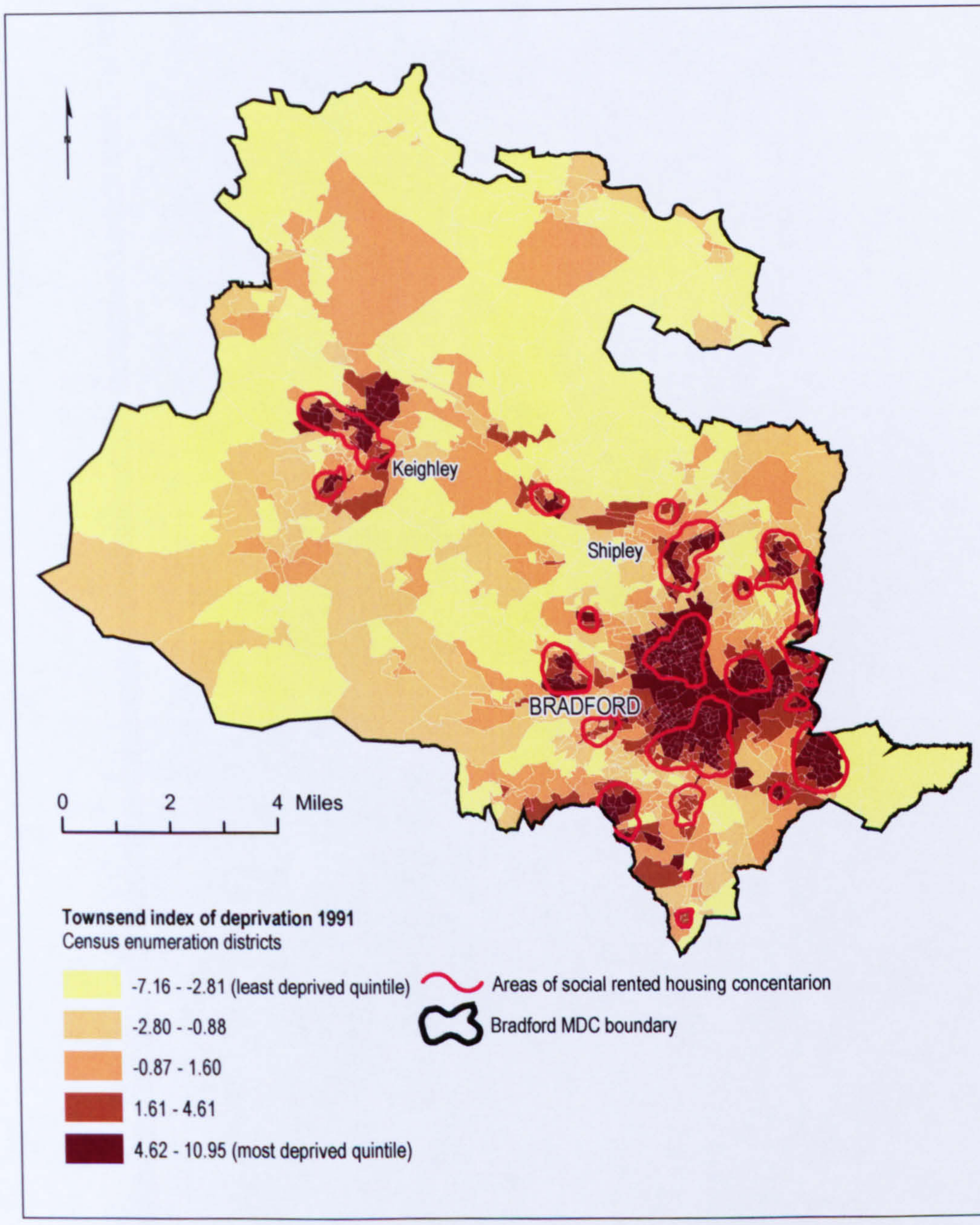

Figure 2.1 Deprivation and social rented housing in Bradford.[20]

[20] Deprivation is measured here using a version of the Townsend deprivation index calculated using data from the 1991 Census. This data set was obtained from the Census Dissemination Unit at Manchester University. Jane Eimermann of the School of Environmental Sciences, University of East Anglia created the dataset originally, and it was supplied to the CDU by Andrew Lovett. The areas of social rented housing concentration shown on the map were calculated by the author using the project data set of known stock location for most social rented housing in Bradford and shows areas where the density of social rented dwellings over a 500m radius exceeds an average of around 25 dwellings per hectare.

Cole *et al.* (1999) suggest that the only response is a relatively sophisticated package of measures dependent on the individual needs of areas (i.e., localities). They suggest that localised intelligence (especially from front-line staff) is crucial in understanding changing demand. Their findings were that some RSLs are situated very far down the 'low demand learning curve' and that their responses have hitherto tended to focus on management issues and well-known responses to difficult-to-let problems.

Allocation policies and marketing

Increasingly, however, such responses are becoming more sophisticated and more openly recognisant of the wider market around social housing. Allowing local authorities to act with more freedom in marketing and allocating its properties is seen as crucial in countering low demand in some areas. Several of the Unpopular Housing PAT's recommendations (PAT 7) are aimed at promoting such measures and opening the debate on relaxation of regulation where appropriate (DETR 1999b: 13). The type of billboard advertising used in Manchester, which challenges the stigmatisation of social housing, is seen as an example of best practice. The relaxation of access restrictions for local authority housing was also one of the recommendations of a DETR study into allocations policies and procedures in 1997 (DETR 1997).

'Community lettings' procedures are also sometimes employed to combat difficult-to-let properties. These rely on the 'screening' of applicants to determine their suitability for the area or estate in question. There is some evidence to suggest that this can lead to satisfactory outcomes (Pawson *et al.* 1997), but it is unlikely to result to in real gains where there are more entrenched demand problems. Excluding anti-social tenants is one way of breaking the circle of stigmatisation that afflicts some estates, but care must also be taken to avoid displacement and subsequent 'ghettoisation,' or to refuse genuine demanders of an area. There has been some criticism of community lettings pilots where the system has been abused and/or used by

powerful groups of local residents to keep out people seen as 'outsiders' or 'different.' Clearly this type of restrictive practice is not going to result in socio-economic or demographic diversification on estates, nor encourage residency in affected areas.

Grant incentives

Financial incentives can be used in the worst hit pockets of voids or abandonment, particularly where there is a type and size mismatch between supply and demand. Such measures are particularly relevant to areas of private sector abandonment, where smaller scale interventions (i.e., short of demolition or compulsory purchase) may be difficult to secure or impose. Newcastle City Council famously implemented a 'homesteading' scheme that while providing shocking evidence of the low demand problem in that city, demonstrates a radical (but non-invasive) solution. The scheme invited people to purchase empty properties on specific abandoned streets for a nominal sum, subject to their investing around £12,000 to convert the Victorian flats into houses.[21] The owners could then be eligible for urban renewal grants, effectively turning a £12,000 investment into a potential £30,000 asset, while encouraging residency take-up.

V. LOCAL PERSPECTIVES

The most shocking form of evidence of the low demand problem is of the highly visible sort seen in real life and in the media, and of the type identified in case studies like those of Power & Mumford (1999). They find entire streets in Manchester boarded up; the same with houses less than five years old. They report private sector properties purchased for £30,000 seven years ago that are now worth less than a sixth of the purchase price. This is evidence that low demand affects not only social housing estates, but is chronically present in the private sector. These are, however, extremely localised symptomatic patterns, affecting streets or blocks—not even

[21]See *Inside Housing* July 16, 1999 ("Short change for fifty pence investment", page 6).

necessarily pervasive across an entire estate. It is clearly important to be sensitive to the low demand issue at an extremely localised level.

Local economic restructuring

Referring to the local level, and the changing demography and economic structure within cities, Power & Mumford (1999) describe cases of abandonment in Newcastle and Manchester as the extreme iteration of low demand. They find that most abandoned housing is structurally sound and that stock condition itself is not a cause of low demand, but that "too few people want to live in cities" (Power 1999). They comment that the growing number of smaller households is thinning out the urban population, while at the same time greenfield land is being released for development at rates surplus to requirement. They cite the fact that inner-city areas are losing jobs (due to downgrading of traditional industrial and manufacturing industries, relocation to the urban periphery and closure of branch establishments) and that those who do have jobs are exercising the choice to move away. This leaves thinned-out, low-income populations where poverty is well above the national average and almost half the population of working age is outside the labour market or education.

Access to local jobs and training are essential for the stability of communities. This relates crucially to the local employment base (where the jobs are), transport provision, and provision of facilities that ease access to the labour market (e.g., childcare facilities). Training is important to ensure that the residents of social housing have skills that are demanded by employers. This is particularly the case in areas where existing skills are concentrated in declining industries such as shipbuilding, steelmaking and mining.

However, there are a number of further issues relating to employment that have specific consequences for social housing demand. The work disincentive sometimes associated with taking a job has the effect of artificially boosting the numbers of households that are eligible for 100 per

cent housing benefit. This is a group associated with a transient mode of social housing consumption, including short tenancies and high turnover (Kemp 1998). It should also be noted however that Ford *et al.* (1995) find that benefit claimants may have an inaccurate idea of the precise economic effects of their actions. As tenants move away from 100 per cent benefit dependency, many households will be more likely to prefer a local authority home to a housing association one due to rent differentials. The characteristics of those entering these sectors support this (Ford *et al.* 1998).

Access to local labour markets for some sections of the community is also dependent on the adequate and cost-effective availability of facilities such as childcare and skills training.

Local housing markets

In terms of methods, there is a strong literature on the economics of housing markets and the definition of submarkets. This literature has developed around private sector housing although much of its basis is the mechanics of housing choice and consumption which can be shown to apply to all tenures. Grigsby & Rapkin (1960) introduced submarket analysis by showing how the population in a housing market area could be disaggregated on a number of dimensions to forecast demand for new developments. Also at around the same time, the notion of 'filtering' was applied which meant that new, good housing gradually become occupied by lower-income households. This is due to the chain of moves meaning that houses vacated by those moving to new houses became available for lower-value occupation, and so on until the house is taken out the system (Grigsby 1963). This inaugurated a long tradition of work in the area of submarkets. Recently, Bourassa *et al.* (1999) have shown how submarkets can be statistically derived using hedonic regression and principal components analysis on the attributes of management areas and individual dwellings. The implications of the housing market analysis literature are the subject of chapter four. Suffice it to say at the moment that a common theme within this literature is the extent to

which wider environmental and area factors are considered within the framework of mobility decisions and actions.

Local facilities and the housing market

The pattern of, or lack of, local facilities should be an integral part of local housing market analysis, and should pay particular attention to shops and other retail services; education provision; community facilities (including places of worship); childcare; and local public transport.

The provision of these facilities, together with housing, must be considered holistically. Higher housing densities have a role to play in ensuring the viability of these services, maintaining vibrant and healthy communities, and ensuring that brownfield targets and integrated transport goals can be met. This is consistent with the recommendations of the Urban Task Force (1999: 59). Housing must be at the fore of rethinking our neighbourhoods, but it is vital that the links are made with the everyday needs and lifestyles of those who are expected to want to live in that housing. There is a need to counter the 'thinning out' of the urban population (Power & Mumford 1999), not least to ensure the viability of local services.

An analysis of local facilities must include reference to the availability of childcare facilities. The poor availability of such services (particularly in relation to other countries) and their high cost is recognised as posing significant barriers for lone parents' employment chances:

> "Childcare was the biggest, and potentially the most expensive, obstacle to paid employment outside the home for women who did not have access to free childcare" (Third 1995).

Childcare initiatives have hitherto been underused for group-targeted regeneration in areas, yet there is some emerging evidence of the benefit of such schemes for improving employment access (McArthur 1999).

Goodman & Thibodeau (1998) have also extended submarket analysis to show how they can be segmented by the quality of local schools. The education link is also explored with reference to the spatial division of cities in Byrne & Rogers (1996), where they conclude that "the poles of division in residential space and schooling do essentially correspond." Reversing the normal story, Clark *et al.* (1999) find that the management policies of social landlords can have a destabilising effect on local schools, suggesting that housing allocations themselves can start a spiral of decline as school stability suffers.

There are even attempts to try to calculate the 'worth' of local schools in terms of the contribution they have to market house prices in the area (Bogart & Cromwell 2000). Clearly, this is an important component consideration if one views households as housing consumers and aims to understand the trade-offs that they make when relocating.

Tenure and the Right to Buy

The tenure make-up of inner-city estates has also contributed to low demand (Power & Mumford 1999). Estates are predominantly local authority or RSL owned and there are very low levels of owner occupation. The take up of the Right to Buy in inner-city areas has been very low for a multiplicity of reasons. Inner city estates usually comprise unpopular dwelling types, many of which may suffer structural problems. Crime and stigmatisation on the estates reduces their attractiveness as long-term options to current tenants, and undermines future resale prospects. Finally, the shrinking and residualisation of the local authority stock as has been mirrored by the concentration of younger, more transitory households in the remaining stock. Therefore, those who can afford owner occupation (particularly the rising number of younger families) can to a large extent source it outside. Right to Buy take up on marginal estates has also been affected by the fact that discounted RTB values were still above market values, undermining economic rationales for staying on an estate. The availability of attractive,

new low-cost private developments (e.g., 'starter homes') nearby may be a feature of low demand or abandoned areas. The combination of these factors suggests that the scope for the Right to Buy as a policy to continue achieving its aims is limited. Those that it was designed to benefit have largely done so; the characteristics of the remaining stock and tenants benefit less from the Right to Buy, and there are serious issues related to the effects of further RTB on the sustainability and manageability of local authority housing (Murie & Ferrari 2003).

It is the view of investment staff at the Housing Corporation that in the north-east the gap between social housing and low-cost starter homes is virtually non-existent. This means that shared ownership initiatives have not been a strong feature in the region, and there is unlikely to be a significant place for such provision.[22] There is also the view that policies such as the Tenants Incentive Scheme (TIS) and Do-It-Yourself Shared Ownership (DIYSO) were providing 'perverse' incentives for tenants to leave areas, undermining neighbourhood stability. DIYSO in particular has not been regarded as a runaway success, and given the marginal nature of the housing market in areas of surplus, 'staircasing'[23] has been minimal.

Household movement

Whether through TIS or traditional routes, as the more 'fortunate' households on an estate move out, they release properties that other households on the estate fill. Turnover rates on afflicted estates rise as the remaining households 'churn' around the estate, creating instability and further undermining the attractiveness or likelihood of in-situ owner occupation. The 'churning' of households and high turnover rates are a component of the research of Keenan (1998). He found that in Newcastle the majority of moves made in the problematic West End were of under a mile to

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[22] *Pers. Comm.* with a member of staff in the Investment division of HC NERO.

[23] 'Staircasing' is the buying in or selling of stakes of ownership in a shared-ownership property.

another nearby area, and that of these a significant proportion would move again very shortly. The reasons cited for moving were predominantly related to crime and neighbourhood disputes; debt; and relationship breakdown. A helpful intervention where there are instances of household dissolution might be the provision of furnished accommodation that might discourage displaced people from regrouping with friends or family.

Burrows (1997) found that movers out of social housing into owner occupation had a propensity to be younger economically-active households where there was a couple (married or cohabiting), especially when both persons were economically active. They cited a desire to buy their house as the main reason for exiting social housing, ranking slightly higher than wanting to move to a better area. Burrows also noted that of moves within the social rented sector, households headed by an economically active person were more likely to be doing so with the intention of buying the new property under the Right to Buy.

Both points made above—the frequent moves as a result of financial and relationship problems; and the reasons given for exiting the tenure—are consistent with the suspicions of Murie *et al.* (1998) that a transitional role for social housing may be replacing a residual one. The habitual, or 'career,' renter of the past is dying off at an increasing rate, leaving a new, younger, more transitional type of renter. This is, in turn, leading to the sharpening distinction between different sub-markets in the social rented sector (Housing Corporation 1996). The use of rent incentives to mitigate against low demand for unpopular housing types or estates may be used to try to attract tenants to afflicted areas. Local rent differentials between areas seen by the landlord as difficult-to-let and those that are not may sometimes result as that landlord tries to entice tenants by lowering the price. However, such measures may not have the desired effect as they will disproportionately fail to affect low-income families who are on 100 per cent housing benefit (Pawson & Kearns 1998: 411).

However, social housing may also be inherently unattractive for those who are not 100 per cent benefit-dependant. A greater dependency on housing benefit to pay rents may have meant that rising RSL rent levels (in comparison to council rents) have disproportionately affected more prosperous households on social housing estates. Households that do not qualify for 100 per cent housing benefit will be forced to pay higher rents, which diminishes the attraction of HA properties (on the whole) for young working households who can afford to go elsewhere. According to John Perry and Mark Lupton of the Chartered Institute of Housing, HA rents had increased by more than 100 per cent in ten years prior to 1999.[24] The housing benefit system was widely expected to be at the core of the housing green paper in 2000, and indeed that document sought views on proposed changes to the system aimed among other things at simplifying the system and reducing the buffer of invisibility between tenants and the rent that is paid for them. One of the options under consideration was a mandatory token contribution for *all* tenants towards their own housing costs to help in achieving more efficient use of housing (particularly with respect to under-occupation). This would be by means of re-introducing a 'shopping incentive' for tenants (Kemp 1998). This could increase the attractiveness of otherwise low-demand properties. Financial hardship, it is argued, would be minimised by replacing the mandatory outlay with a pro-rata rise in Income Support. The government has recently published its intentions regarding housing benefit reform (DWP 2002) and is currently evaluating several pilots.

Organisational functioning and policy failure

Keenan *et al.* (1999) claim that low demand and abandonment have been familiar everyday experiences for housing officers and managers on the 'front line' but that this had rarely been transmitted up through the policy process or onto the research agenda. The reasons for this (and part of the

[24]Perry and Lupton, in an article in *The Guardian* June 23, 1999 summarising a CIH report "Housing Associations—a viable financial future?"

cause for spiralling low demand problems taking policy makers by surprise) are nested in complex local networks of interests, and incentives in the housing subsidy system that reward new-build. It is a "policy failure [that has] served to keep the lid on the gathering problems in some areas of the country" (Keenan *et al.* 1999).

This is made worse by the internal functioning of some housing providers. A Leicestershire HA housing officer blamed poor communications between HA management staff and the strategic development and marketing functions of that HA. The HA would go ahead and construct new developments just because the site was available and there was a funding opportunity, even though staff on the ground plainly knew that there would be problems getting anyone to live in them. The officer had no reason to believe that the problem was any different in other housing associations[25]. This is a view that is compatible with the findings of Crook *et al.* (1996) who find that on one-third of the estates that they examined housing associations had begun to develop in areas that were considered low demand or difficult-to-let. Such developments were leading to housing associations owning around one-tenth of properties of local authority estates, and becoming a significant part of the difficult-to-let/low demand equation.

Stigmatisation

Although a number of factors may lead to areas becoming unpopular (or making some areas become unpopular first and most severely in the context of regional out-migration—see, for example, Holmans & Simpson 1999), some of these factors may themselves become symptoms in an exacerbated form. Stigmatisation is one such symptom—and this has consequences beyond merely deterring those tenants who can exercise choice. Wood & Vamplew (1999) found tenants in some north-east low demand estates who had found that their address had become a liability: they felt that they were

[25]Based on a personal communication with a housing officer from a Leicestershire HA, August 1999.

refused jobs; given less 'time of day' by the police; and denied credit and other services. Niner (1999), in a brief review of contributions to the low demand literature, noted that low demand is not only a result of social problems, but that it exacerbates them.

Disincentives to maintain property

As far as the private sector is concerned, there is the possibility that there are financial disincentives to landlords making the best use of properties in areas of marginal demand. The system of hefty reductions in council tax for unoccupied properties encourages abandonment when lack of tenants, or inability to charge profitable rents, makes it fiscally expedient to do so. Hetherington (1999) believes that financial incentives for allowing properties to remain empty are in part to blame for the 100,000 empty properties in Greater London, and the consequential pressure for low-rent housing in the capital. This is in a high demand area where the comparative benefits from making use of property are high. In low demand areas, this is likely to be even more significant. Additionally, the private rented sector is discouraged from remodelling the supply of its stock to better fit types and formats in demand because conversions attract the full rate of VAT, whilst new-build is non-vattable. This is a concern addressed by Newcastle City Council by giving away the freehold of properties to tenants willing to convert them from flats to houses. Subsequent 'homesteading' policies have found favour in many other authorities afflicted with low demand.

Localised demolition

Because much of the recent evidence suggests that there is a crude imbalance between supply and demand of properties in certain areas of the country, there are suggestions that stock reduction should be the main policy response (e.g., Bramley 1998). While selective localised demolition can be helpful to cut out the worst stock and reduce blight on nearby stock, it must be handled with sensitivity, particularly with regard to safeguarding confidence in and perceptions of areas, and local service delivery.

There is a school of thought that is firmly anti-demolition and sees demolition as a factor contributing to making areas and properties difficult-to-let. Chief protagonists in this argument are Power & Mumford (1999) who argue that demolition contributes to a spiral of decline in areas by forcibly and explicitly signalling that there is a lack of confidence in that area, and that its value is effectively nil. On top of this stigmatisation process there are management issues relating to latency in the demolition process, which give rise to opportunities for vandalism and environmental degradation.

Demolition may also have implications for service delivery to residents by the local authority or housing provider. In 1997, the Newcastle Tenants' Federation warned the city council that declining areas in the West End would not get any better unless service delivery in those areas improved.[26] These claims were centred around environmental services such as street cleaning and grounds maintenance. This warning came within weeks of news of demolition plans for the area and highlights the problems of reluctant service provision in areas where there is a possibility of demolition. There then begins a spiral of decline in service provision leading to problems in the area, which can in turn be a causative factor in low demand.

At the more localised level, social housing providers may be less likely to invest in services for, or improvements in, an area that is either condemned or even is part of a lengthy 'option appraisal' exercise. The former affects properties nearby sites of selective demolition as vandals move in, and neighbours move out. With the latter, where demolition is part of an option appraisal, fears signalling the lack of confidence or care in an area are already being made vocal. As mentioned, there are concerns that such signals have undesired externalities in that service provision to areas under appraisal may become less responsive.

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[26]See *Inside Housing*, July 25, 1997, "Newcastle tenants challenge council".

Also worrying is the situation where local authorities state an intention to demolish selectively, but with an option to demolish more. This is surely the death knell for an area in terms of outside interest or investment:

> "There are frequent discussions in the city council about demolition—the destabilising effect on the community is intense" (Power & Mumford 1999: 25).

Therefore, although it is realised that demolition of specific blocks of poor condition or design may increase the popularity of the remaining housing and the surrounding area, in general demolition is now not thought to be a definitive solution in isolation from other measures. The decline of areas with little justification for existence should be managed, argue Cole *et al.* (1999), even if landlords find it difficult to come to terms with the language of decline.

Bramley (1998) suggests, however, that demolition is the most appropriate response in areas of surplus, simply to reduce that surplus and prevent problems spilling over to neighbouring areas. The removal of the worst housing where there is too much of it is clearly a difficult argument to counter, but it is one that some say undermines the survival chances of areas by creating a more thinned-out, transient urban population (Power & Mumford 1999).

The report by the Policy Action Team on Unpopular Housing (PAT 7) recognised the destabilising effect of demolition although it refers to research by Heriot-Watt University (Bramley *et al.* 2000) which reported that some local authorities found selective demolition to be an effective tool where there is a significant stock surplus. The PAT note, however, that "demolition must be used with care" (DETR 1999b: 9).

At a time when the Housing Corporation was making moves to relax restrictions on ADP spending to include demolition and what might be termed invasive surgery to areas, it is vitally important that such action is

considered in relation to the wider area's strategic housing framework, and that quick, clean incisions are made to minimise the destabilising effect on communities. This is the broad tone of the SEU's recommendations, and is consistent with their call for a review of Compulsory Purchase Order (CPO) processes, which are criticised for their sluggishness.

Demolition and compulsory acquisition remedies have particular scope in coalfield areas in the north-east and Yorkshire and Humberside, with their particular problems of absentee landlords and ex-Coal Board estates. The report of the 1998 Coalfields Task Force recognises this and recommends streamlining CPO procedures and suggests that the rationalisation of existing estates may be inevitable. It also proposes strengthening of legislation to force landlords to better maintain properties (DETR 1998). Recent plans in Durham to demolish significant numbers of properties in the mining village of Quarrington Hill reflect the thinking of the Task Force, in that rationalisation may lead to more sustainable and coherent communities.

'Community'

Although a sense of community is often cited as a desirable—if not essential—component of a sustainable neighbourhood, it is probably worth noting that it can also have a negative effect. Particularly in terms of the growing number of young, more mobile single person households, can seriously act as a deterrent for potential tenants. For—as both Wood & Vamplew (1999) and Richardson & Corbishley (1999) have found—a strong sense of community can be detrimental for newcomers who are made to feel unwelcome, are harassed, or in extreme cases repeatedly burgled. Territoriality can come into play; this is likely to be more the case with well-defined or isolated social housing estates where outsiders are more readily identifiable, and there is no ambiguity to residents' spatial-cognitive perceptions. The implications of this for the effectiveness of 'community lettings' schemes has already been touched upon.

VI. SYNTHESISING THE PROBLEM: A SUMMARY OF THE LITERATURE

The factors contributing to the incidence of low demand are clearly complex. The result of an interplay of different conditions, it is a problem that can manifest itself extremely quickly, do so in any tenure, and afflict perfectly good (if not sometimes brand-new) stock in 'pockets' or selective areas. The spatial consequences of low demand are important: national economic restructuring can lead to regions being deemed 'low demand' while the effects are felt most severely in pockets where other conditions interact. Conversely, extreme local conditions may have a positive knock on effect to other areas of housing. In either case, the worst areas get worse, and polarisation increases.

Sometimes it is difficult to separate the symptoms of the low demand problem from the causes, particularly as many commentators have referred to low demand being a part of a spiral of decline; a vicious circle where symptom becomes cause, sometimes until complete abandonment of properties is reached. Whilst the UK has been largely immune to abandonment on a widespread scale, the symptoms of low demand are nonetheless very visible and sometimes shocking.

Low demand is sometimes confused with difficult-to-let housing, and the two are certainly linked. Difficult-to-let housing, as a recognisable problem with policy responses, has been around for over two decades. Low demand housing—or areas of low demand housing—is a relatively new and serious problem (of which difficult-to-let housing is a part). Webster (1998) suggests that the problem of low demand is not necessarily the same as difficult-to-let and that there is a question of scale. The current problem might be defined as eventually leading to an area's, or certain housing's, *abandonment*, where in the owner-occupied market properties have zero or ridiculously low values, or for rented housing, they cannot be let at all. Notwithstanding what has already been said, there are very few examples of the complete abandonment

of areas in Britain, but certain dwelling types, houses, neighbourhoods and localities are certainly looking around in futility for a role or purpose.

As has been seen, the perceived causes of low demand operate at a variety of spatial scales. This is not to say that each issue operates solely in isolation or does not have an impact at other levels. For example, national increases in population might operate through regional labour and economic differences to impact directly on local areas where there are other local conditions pre-existing, such as poor design factors. This is assuming that where demand in an area becomes reduced or marginal, local areas with lettings difficulties may slide into a more serious low demand state.

What is currently known

The literature review has broadly surveyed current knowledge and linkages in relation to low demand and responses to it. It also allows a better idea of those areas that are relatively undeveloped, or where there are 'hunches' that are poorly substantiated with evidence. As has been seen, the issues that this knowledge relates to operate at a number of scales. Before giving a comprehensive summary of this, however, there are a number of main points:

- It is known that there is a problem of low-demand. This is backed up by several large scale studies, including a large, national study for DETR carried out by Bramley *et al.* (2000). 61 per cent of LAs report a problem with their own stock; over 930,000 units of housing are thought to be affected, split almost evenly between the public and private sectors.

- It is known that it is a regionally differentiated problem (Murie *et al.* 1998; Holmans & Simpson 1999). However, it would be untrue to say that it is just a problem in the north-east and north-west. The midlands and some eastern counties are reporting levels of

low demand stock, and it is a major issue for Yorkshire and Humberside.

- It is known that it is a problem affecting all tenures. There have been high-profile cases of extreme low-demand symptoms in all sectors. As mentioned above, in terms of absolute numbers, it is estimated that just as many private sector homes are affected as social-rented ones (Bramley *et al.* 2000).

A number of explanatory factors have also been investigated. Sometimes these factors are themselves symptoms of low demand in the first place (e.g., stigmatisation of an area, or high crime rates). The factors operate at a variety of spatial scales but will all have some impact at the local level, whether immediately (e.g., a change in benefit rules), or 'cascaded' (e.g., future housing requirement guidance).

At the national level:

- We know that there has been net migration southwards. We know that although the population estimates and subsequent housing requirement numbers are proving robust at the national level, the increases have disproportionately happened in the south.
- In terms of broad numbers, we know that there is a crude over-supply of houses in some regions, especially in the north. This is not to say that such northern regions do not have some areas or tenures in healthy demand.
- We know that certain types of accommodation and tenure are unpopular and that, particularly in northern regions, these are strong predictors of dissatisfaction.
- We know that changes in the social rented sector over previous decades have led to it operating a reduced stock, less well-maintained, catering for those of marginal economic status. The

age structure of social renters has become bi-polar, with many young and old households, and age-related exits are not being immediately replaced by the ageing of middle-aged cohorts. This, together with low demand, calls into question the continued operation of the Right to Buy in its current form.

At the regional level:

- There has been significant divergence in the economic fortunes of different areas around the country.
- Many regions experiencing low demand problems have significant post-industrial and ex-coalfield communities that are isolated and have concentrated unemployment and low-demand problems.
- Local authorities in regions with low demand problems view stock design factors and allocation policies as lower-order explanatory variables after excess supply and crime/stigmatisation.
- The way social housing subsidy is distributed has led to a culture of 'new provision' even where there seems to be little demand-side justification for it.
- Although there was initially some concern about where housing stood in relation to the emergent RDAs, linkages are now being developed. Housing must be closely linked with regional economic development.

At the local authority level:

- We know that local authorities have been responding to low demand problems in a variety of ways and with differing levels of sophistication. Some authorities and landlords have been dealing with low-demand symptoms for some years; for others it is a new problem.

- We know that deprivation and poor housing conditions are not necessarily synonymous with the social-rented sector. The private sector has very bad housing that, too, is often in low demand.

- We know that, in the private sector, average house sale prices are very low in some areas of the country, and have been falling sharply over the last few years.

- Demolition has now been firmly reinstated on the policy agenda. Many local authorities report plans to downsize their stock, and there is some feeling that simply transferring to RSLs will not address crude demand/supply imbalances.

- Some local authorities have used innovative management-level responses such as marketing strategies, new allocation procedures and grant incentives. All of these have been recommended by the PAT 7 report, but Cole *et al.* (1999), among others, see the problem as more than a management issue and thus as requiring more sophisticated (or more sweeping) responses.

At the local level:

- We know of instances of abandonment in particularly localised circumstances, although there is a feeling that this may be a response to specific local factors rather than an inevitable outcome of low demand.

- Shifts in the pattern of employment have occurred within cities as businesses and jobs close, downgrade and/or move to the periphery. Some residential areas of cities are left with little justification for existence in terms of proximity to jobs or cohesiveness of community.

- We know that the issue of employment is strongly linked to the housing choices people make, particularly through the benefit system. A system of 100 per cent housing benefit, coupled with

low rent differentials across property types and sizes in the social rented sector, means that there is a disincentive to make housing quality trade-offs when considering a move involving the rented tenures. This is likely to manifest itself most potently where there is over-supply.

- We know that the physical make-up of areas varies. Some neighbourhoods have better local facilities than others. Access to such facilities is likely to be more or less important to individual households, and may constitute a 'tradable' factor when making housing decisions. We do not know the extent of this, however, or whether it is likely to be a feature of particular types of households, or of households wishing to move to—or refusing—particular properties.

- The marginal cost of moving from the rented sectors to owner-occupation in some areas is minimal, given the opportunity. The greatest tendency to move to owner-occupation is among youngish couples (both economically active) without dependent children. Moves tend to be over short distances. Hence, the local supply of entry-level housing for owner-occupation is likely to be an important feature of problematic areas. Furthermore, since such moves are likely to be conditional on something (like getting a better-paid job, or getting married), there needs to be sensitivity towards the likelihood of these conditional plans being realised.

Ways of conceptualising low demand

The various factors and solutions in the previous section (and summarised above) were placed into a spatial-scalar context, according to the level they operate at. This is not to say that the effects of one policy or perspective are solely felt at the level of prescription: rather, the assumption is that national

policies have distinct localised effects, particularly as they combine with other local conditions.

It is clear from the evidence of low demand and its causes that aspects of choice are ever more important. Choice is critical: it allows people to express (to a greater or lesser degree) their housing aspirations; yet the availability of choice in other lifestyle aspects (for example, education) might have just as much influence on housing decisions. The scope for choice in a weak market is considerably enlarged and those who can exercise choice, will. The components of choice—the things that differentiate between competing products—gain more significance. This is as much the case in the social rented sector as it is in the private sector. To help conceptualise this analytically, it is useful to take the view that housing units are a substitutable commodity, and that these substitutions will be made by households using a number of criteria. Each of these criteria will have an explicit spatial significance resulting from the spatial patterning of these influences (e.g., house type, good schools) around the neighbourhood, across the city, or throughout the region or country. The households demanding housing are a dynamic commodity, in that these units will divide, combine and re-combine constantly, each time with consequences for demand for housing.

Therefore, one possible perspective that might be taken is that of a 'consumerist' demand-led approach. This would tend to emphasise the importance of people and households, the choices they make, and the constraints they face. Criteria such as affordability, household formation patterns, and the benefit system will shape individuals' needs and also their ability to choose. This locks into a spatial supply pattern that governs how effectively and in what way any choice can be expressed. Other factors will operate from a distance or on other spatial levels (e.g., regionally) but will nonetheless have distinct local implications. The role of the planning system in regulating the supply of housing is an example. A market segmentation model, such as that employed by Beevers (1999), could feed into this

allowing us to better understand the different sorts of tenants in social housing, their aspirations and the ensuing implications for provision.

This chapter has shown that the factors that contribute to low-demand problems are diverse and form a complex interrelationship between supply- and demand-side issues at differing levels of spatiality, from (supra)national to neighbourhood. It is likely that each of these interacting variables can be best explained or analysed using a particular approach, and that a more relevant challenge might be found in trying to unify these different components.

For example, the spatial patterning of housing supply is one very strong common thread running through the various issues that are seen to have a low demand implication. As housing-type mismatch may be a factor in accommodating changing household sizes and types, this is reflected in the existence and spread of such housing on the map, so to speak. Similarly, if the stock condition of housing is seen to be an influence, such conditions will be unlikely to be pepper-potted around, but exist in clumps determined by construction type and date, and the maintenance record of the original block or development. (However, this argument loses credence as time goes on. The effect of the Right to Buy has fragmented ownership patterns in most areas of 'monolithic' social housing provision, exposing local authority estates to the less predictable and highly-individualised nature of maintenance in the private sector.) Economic restructuring has spatial implications for the mobility of labour (and the housing that remains for those outside the labour market), whether these are at the short, medium or long distance.

Figure 2.2 shows some possible analytic arenas (and approaches) set within a matrix of supply and demand versus various spatial scales. The housing market—from local markets to the national market—can be seen to be at the

interface between a range of supply and demand-side forces at a number of scales.

In short, a spatial analytic framework may offer us a powerful unifying arena for the holistic analysis of a range of effects, resulting from a range of factors and interventions at all scales, from unique local housing markets to national policies; from education catchment zones to travel-to-work areas. This framework must be borne in mind in the proposed way of analysing the problem and responding to gaps in the knowledge. It particularly helps to relate local level analyses of household behaviour (and any resulting predictive modelling) back to the national and local policy contexts. This is very important in the light of the recently published Housing Green Paper (DETR 2000), which contains a variety of proposed legislative changes dealing with housing benefit, rent differentials and allocations procedures (among others).

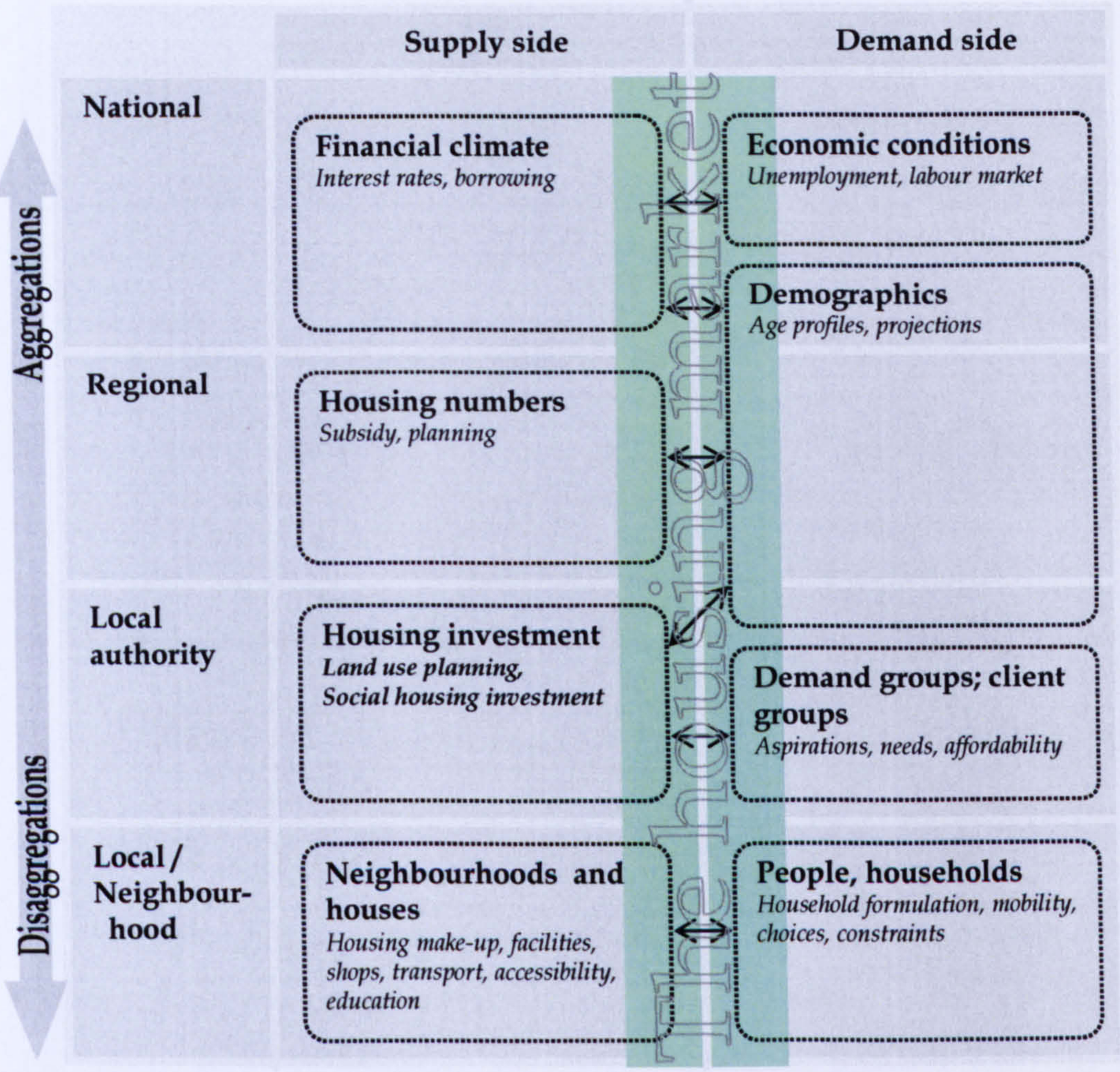


Figure 2.2 Supply/demand v. spatial scale matrix

Gaps in the knowledge

Much of the literature falls broadly into one of three categories. First of these are wide-ranging qualitative studies of symptoms and likely factors in low-demand areas. Second are econometric analyses of aggregate housing demand, generally from a structural viewpoint (migration, employment, *et cetera*). Lastly, there have been quantitative studies of particular facets of the problem, normally from secondary aggregate data sources (e.g., house prices, inter-tenure mobility).

There are of course exceptions, and all of the literature has been invaluable in a number of ways, notably drawing attention to the problem, defining the range of possible analytic foci, and describing the trends at local authority

and regional levels. It seems that what is missing is a way of systematically bringing together the possible causes of low demand regardless of whether they originate from national or local policies and conditions. Furthermore, to do this in such a way that can be related directly to the housing decisions of individual households. This requires looking at individual dwelling, household, and transactional data. Part of the work of Keenan (1998) tracked individual households over a local neighbourhood area for a short time using a variety of local authority data sets: this was both unusual and revealing. But there was a lack of attribute data attached to individual moves, and the motives for household moves were derived from interviews of a sample.

Furthermore, it seems that there has been little work in looking at demand in a whole housing market area, or even local authority area.

When work has attempted to model the future, this has been at national and regional levels relating mainly to demographic changes, such as age profile, migration, and social housing requirement. There has been no modelling to suggest how these *and other, local variables* will affect the demand for small areas like 'estates,' neighbourhoods or even market sectors. This work aims to begin to fill that gap by producing a model of future demand probabilities that can be applied to small areas, yet takes account of structural parameters as well as individual motives.

This paper proposes that what it is crucial to understand, yet has hitherto not been researched in the UK or low-demand contexts, is the way that households moves respond to opportunities in the system that arise as vacant housing. In other words, what seem to be the determinants of household moves? Which variables can we say have any real bearing on the likely demand for dwellings of certain characteristics? It is proposed to somehow empirically observe the movement of households. If we knew the probabilities of certain household types moving to certain dwelling types,

then given some basic assumptions about household behaviour and future demographics, it should be possible to model the future demand for types of houses and areas. ('Areas' insofar that they are characterised by dwellings of particular characteristics; are subject to policies and programmes; and have their own environmental and physical features.)

VII. FRAMING THE RESEARCH QUESTIONS

As this chapter has shown, there has been a lot of work into the problem of low demand, and its symptoms have been witnessed and responded to (albeit in a disintegrated fashion) for a number of years. This has already led us to comment on what we already know, but crucially, what more could enrich our understanding of the issues—what the literature has not adequately treated thus far.

There were a number of dominant themes emergent from the literature. The essence of these now need to be distilled into some usable hypotheses that will drive the research and provide some conceptual 'rules' that describe the fundamental forces governing housing demand problems. These will then allow a more precise set of research questions to be derived which aim to contribute towards filling the identified knowledge gaps in the knowledge.

Housing demand hypotheses

It would appear from the synthesis of the low demand literature presented in this chapter that two starting assumptions can be identified.

First, that low demand is different from difficult-to-let and poor stock condition. It may be related to areas, facilities, structural issues and employment, over-provision, increasing choice and alternatives, and a lack of market incentives (particularly relating to social housing and the benefit system).

Second, that housing demanders (households) can be considered behaviourally as *consumers,* even in a social housing context. In their

function as consumers of housing, households make choices based on the constraints and options open to them. Implicit in this reading is an assumption that households place varying importance on different 'selling points' of houses and, importantly, areas. These will be related to the characteristics of the household. The way that these household preferences match up with features of the supply on offer will determine demand probabilities.

These two hypotheses do not relate to specific aspects of low demand but allow a wide view of the housing system that treats tenures, sectors and other delineations in a relatively transparent way. The focus is on *supply* and *demand* expressed through dwellings and households, respectively. Alternative theories of the housing system and of low demand may have stressed supply-side economics more purely, or may have focused on institutions and other actors in the housing system. Similarly, individual and household behavioural theories may have been more at the forefront. However, both sets of theories may have stressed the importance of either supply- or demand-side issues to the neglect of the other. Low demand problems on the other hand are characterised quite uniquely by a faulty interaction between both supply *and* demand. The detection and measurement of low demand has to be sensitive to both. Responses and policies have been formulated that pertain to both stock and to those who need housing. Essentially, there is a mismatch between supply and demand (not always in crude terms, but in subtle sub-sectoral ways). The theories here allow for both supply- and demand-side analysis, and set up an arena for the study of the interaction between provision and consumption. This interaction, as will be seen, manifests itself in the *mobility* of households, and leads to the study of *household moves* and *opportunities to move*.

Movement in the housing system is the way that it constantly tries to readjust to make best use of the housing stock. This is apparent even after seemingly 'static' events like dwelling construction or demolition. These

events mark key stages in causing households to move about the system: a household moving to a newly-built house leaves another one vacant somewhere else in the city. What happens to it? Who moves into it? Where did *they* vacate? Low demand problems are related to these patterns of moves, and the problems will be felt through vacancies in the market that are excessive (in numbers) and severe (in length).

Research questions

In this context, then, the specific research questions might be framed as,

- What are the characteristics of dwellings that are constantly refused/problematically vacant?
- How do the characteristics of households relate to the characteristics of dwellings? (e.g., what characteristics are the best predictors of a household moving near a 'good' school?; or what characteristics are the best predictors of a dwelling being vacated by a low-income family with no children?)
- What would the effect be of changes in the numbers of new-build over the next 20 years on demand patterns in market sub-sectors?
- What implications do projections of housing mobility and demand in 20 years' time have for current housing policies and programmes?

Not all of these questions can be fully answered within the confines of the current project. However the project does develop a framework and working model of the housing market that can be used to satisfactorily answer these questions and others like them. It should be noted from the outset that the questions, naturally, are dependent on the extent and quality of the data collected. For this reason, the current project is limited in its scope, being limited as it is to the data that it was practical and possible to collect within the constraints of time and organisational capacity of data suppliers. Therefore, to the set of questions listed above must also be added those

epistemological ones that ask about the effectiveness and replicability of the project itself.

Notwithstanding what has been said about data collection difficulties, it is important to recognise the possibilities of alternative sources of data. The project adopts a wide definition of dwelling characteristics, for example. The characteristics do not solely pertain to the property itself, but to the surrounding area. Examples include the performance or popularity of the local school (or some index score), or the crime rate. Spatial analytical techniques and the use of Geographical Information Systems (GIS) allow such attributes to be derived for individual properties on the basis of spatial or network proximity. Proxies and inventive use of existing data are important, particularly insofar as it is important that the analytical objectives of this research—like all research—drive the use of data as much as is possible, and not the other way round. It is, however, beyond the scope of the present research to fully investigate the effects of spatially-related variables on housing market models although some insights are offered. In any case, work of the likes of that of Orford (1999) and Des Rosiers *et al.* (2000) make considerable contributions to these questions.

Chapter Three.

THE HOUSING MARKET IN BRADFORD.

IN THE PREVIOUS chapter it was demonstrated that low demand is a problem that has garnered considerable media, practitioner, and academic attention and is one that is present, or the conditions are present, across much of the north and midlands of the country. Changes in the economy and the labour market, together with continuing demographic changes, have changed the size and shape of the housing demand profile, while housing supply has been slow to respond to this. There is a crude surplus of low-income housing, particularly social housing, in affected areas. Furthermore, there is a qualitative mismatch between what is on offer and the aspirations of those households that are in a position to choose. This has been partly aided by the continued expansion of the private sector—and new-build starter homes for owner-occupiers in particular. With the Right to Buy, this qualitative mismatch means that the low demand problem becomes even

more tenure-blind. While it is true that the Right to Buy has to a large degree altered the pattern of ownership in large former council estates, it has done little to improve the relative attractiveness of the houses—which is inevitably about more than just the houses themselves. The same wider environmental externalities prevail; the same service delivery issues remain; and the properties themselves in any case still constitute an unattractive mix of types and sizes.

There is a sense that something must change if the future sustainability of the housing and neighbourhoods in low demand areas is to be safeguarded. Social housing truly is at a crossroads and although the sector is by no means the only one exposed to low and changing demand, it is compounded in multiples by some of the other problems that are almost synonymous with social housing provision and also the investment regime that it is married to.

There is also a feeling that, happening alongside these processes, acting in tandem as it were, the housing market has been getting on doing what any market does: adjusting and competing. The gap between free-market housing and the social rented sector no longer exists for all but those on the most marginal incomes. The planning system has made great strides towards the great ambiguous 'sixty per cent' of development on brownfield land—and developers have been doing their bit—but yet housebuilding on the edges of cities and on previously undeveloped land has continued. Inexplicably, some local authorities have continued to demonstrate a general needs affordable housing requirement even when the social sector and the inner-city private sector terraces are riddled with the rot of emptiness. Edge-city has even been lent a recent large dose of legitimacy by the identification by central government in the *Communities plan* of three 'growth' areas of new housing around London, Cambridge and Milton Keynes.

Yet house prices have been rising, fuelled by supply constraints in the south, and by a consumer appetite for owner-occupation in the north. Even the

most cursory glance, however, at the postcode geography of these price rises shows just how polarised and skewed they are. Polarisation of house prices is a logical outcome of low demand. The lucky homeowners are seeing improbable year-on-year rises at the sole expense of marginalized owner-occupiers and right-to-buy beneficiaries in the inner cities and the unfashionable or badly perceived districts beyond.

This chapter aims to ground some of these stories in Bradford, West Yorkshire, which provides for the purposes of this project a convenient laboratory in which to test ideas and develop a demand model. Chapter five explains the selection of Bradford in more detail. Clearly some of the stories of housing demand that have been told are more at home in Bradford than are others. Previous chapters have shown that the social rented sector can no longer be viewed in isolation from the market. There is, increasingly, no longer a naïve sense that this realisation is an attack against the form or idea of social housing, but a genuine attempt to find a new life for it and the neighbourhoods it is in.

First, this chapter takes stock of the physical capital in Bradford's housing market. It looks at the shape, size, and heterogeneity of the housing stock and how it is spread across the city. Then, it looks at how the house price 'boom' has largely bypassed significant parts of Bradford. The changing population of Bradford is also considered, and the fact that Bradford is expected to see above-average increases in the numbers of households over decades to come prompts the question: will demography alone fill up the empties? Throughout all of this, the position of BME communities is considered as is imperative to do so in any metropolitan housing market, and particularly in Bradford where non-white households are so numerous and at the same time so segregated. Furthermore, in Bradford there is the existence (and relative sustainability) of specific housing services for some of these communities in the housing association sector. For these reasons the

analysis in this chapter considers some of the unique aspects of BME communities and their relationship with the housing market.

As such the chapter necessarily starts off in a primarily descriptive mode. It uses this as a platform for building a challenge on conventional ways of seeing and measuring the market and the way it performs. This evolves into a more analytic and normative tone. This tone is necessary to set the right conditions for the chapter beyond, which are about the methods we might bring to bear on the housing market (and social housing in it) and the construction of analytic techniques that might have more credence and mileage in the challenging climate of low and changing demand for housing.

After this discussion of the Bradford market context, the second broad section of this chapter focuses specifically on empty properties in the Bradford housing market. The extent to which these can be framed as problems and opportunities within a market framework is subject to scrutiny. This constitutes an analysis of the structure of the flow of supply within Bradford's housing market, looking at such variables as the size of this supply, the types and sizes within the housing stock and the characteristics of that proportion which becomes available for occupation at any given time. Also analysed are some of the unique aspects of the BME community and its relationship with the housing market. This is of course particularly important given the size of the BME community and the identification of patterns of racial segregation in the city by Lord Ouseley and others.

I. THE STRUCTURE OF THE HOUSING MARKET IN BRADFORD

This chapter, then, begins by describing in relatively broad terms the structure of the housing market in Bradford. The composition of housing in the district in particular is analysed, as are market outcome measures such as house prices and void rates. Before this, a brief introduction to Bradford is a

necessary precondition to frame the ensuing discussion of supply of and demand for housing in the city.

Bradford MDC

The study area here has as its extent the boundary of Bradford Metropolitan District Council, which also includes the towns of Shipley, Ilkley, and Keighley to the north of the city. The district council is a unitary authority in West Yorkshire. It falls within the Government Office area for Yorkshire and the Humber (GOYH), in itself coterminous with what was the Housing Corporation's Yorkshire and Humberside Region. (This region was administered jointly with the neighbouring North Eastern Region by the Housing Corporation's North Eastern Regional Office (HC NERO), but is now part of the larger Northern field office.[27]). Bradford and its relationship to other local authority districts in the former regional office area can be seen in Figure 3.1.

Bradford's recent economic fortunes have not stood up well to a comparison with its bigger neighbour to the east, Leeds. This is quite surprising given the geographic proximity of the two cities to each other. With a population of some 467,668, Bradford is the third most populous local authority district in Yorkshire and Humberside, after Leeds and Sheffield (2001 Census). The city has suffered from a decline in its traditional economic base, that of the textiles industry. Whilst Leeds has managed to successfully reinvent itself as the country's second city for financial services, and nearby Manchester has rediscovered its own sense of self-awareness and pride through cultural promotion, Bradford remains bypassed from the spin-offs of these late 20th Century success stories, literally as well as figuratively. It is not well served by national transport networks, for example. Leeds and Manchester are directly connected to each other by trans-pennine motorway and railway,

[27]Certain aspects of the Housing Corporation's regional structure were changed in April 2001. The changes included the creation of four geographic areas (North, South, Central and London) by amalgamation of the existing regions. It was intended, however, that the Corporation's investment role would continue to be administered at the regional level, although senior staff structures changed (Housing Corporation, 2000).

neither of which directly serves Bradford. There is no direct connection with London, or indeed markets to the north-east or north-west. In terms of network proximity as well as simple distance, Leeds and Manchester are simply closer to everything else. In terms of transport connections, Bradford is a distinctly second-tier settlement.

Figure 3.1. The former Housing Corporation North East Region.

In part, this is to do with topography. Bradford is quite disconnected in this respect. It occupies a natural 'bowl,' surrounded quite dramatically on the north and west by the rural Pennines. While it shares a boundary and parts of its built-up area with Leeds to the east, this is only to the extent that parts of Bradford could be considered suburban Leeds. Some of the northern towns in the Bradford MDC area, especially the Wharfedale settlements around Ilkley can certainly be characterised as dormitory towns for Leeds, as indeed many of the residents of these places naturally think themselves as near Leeds rather than proudly proclaiming themselves citizens of the district of Bradford.

This is a point which was made very strongly by Sir Herman Ouseley's report into race relations in Bradford, which found a district divided along both racial and geographic lines, and the relationships between the different communities getting worse (Lord Ouseley 2001). Many likely contributory factors were identified, including the poor image of Bradford to outsiders and potential investors; an opaque 'deal-making' culture among community and political leaders; 'virtual apartheid' in schools; and ineffective policing for fear of being labelled 'racist.' Whilst not to be regarded in a strictly 'causative' sense, multiple deprivation and social exclusion, including poor housing conditions, are problematic in inner-city Bradford, which is Muslim-dominated.

Social housing provision in Bradford like many other British cities is a mixture of a residualised council stock based mainly in monolithic estates, and an RSL sector which has largely established itself through purchasing more traditional housing and also undertaking small-scale infill developments. Bradford does have a relatively high proportion of owner-occupation compared to other metropolitan areas. This is in part a function of cultural preference for owner occupation among early-generation BME household in the city. It is also partly to do with the relatively standard size and form of local authority housing, which was less than suitable for the

cultural needs of those groups. For younger generations of Asians in particular, social housing is badly perceived even if the concerns of the parents may be of less direct relevance to them. Council housing estates in particular are perceived as threatening, where they would be exposed to harassment or racism. Furthermore, many council estates are seen as too far away from the area that they have grown up in have family connections (Ratcliffe *et al.* 2001)

The council stock in particular is split between concentrations in the inner-city and large peripheral estates ringing the city. This geographic relationship between social housing and other residential areas in the district is shown in Figure 3.2.

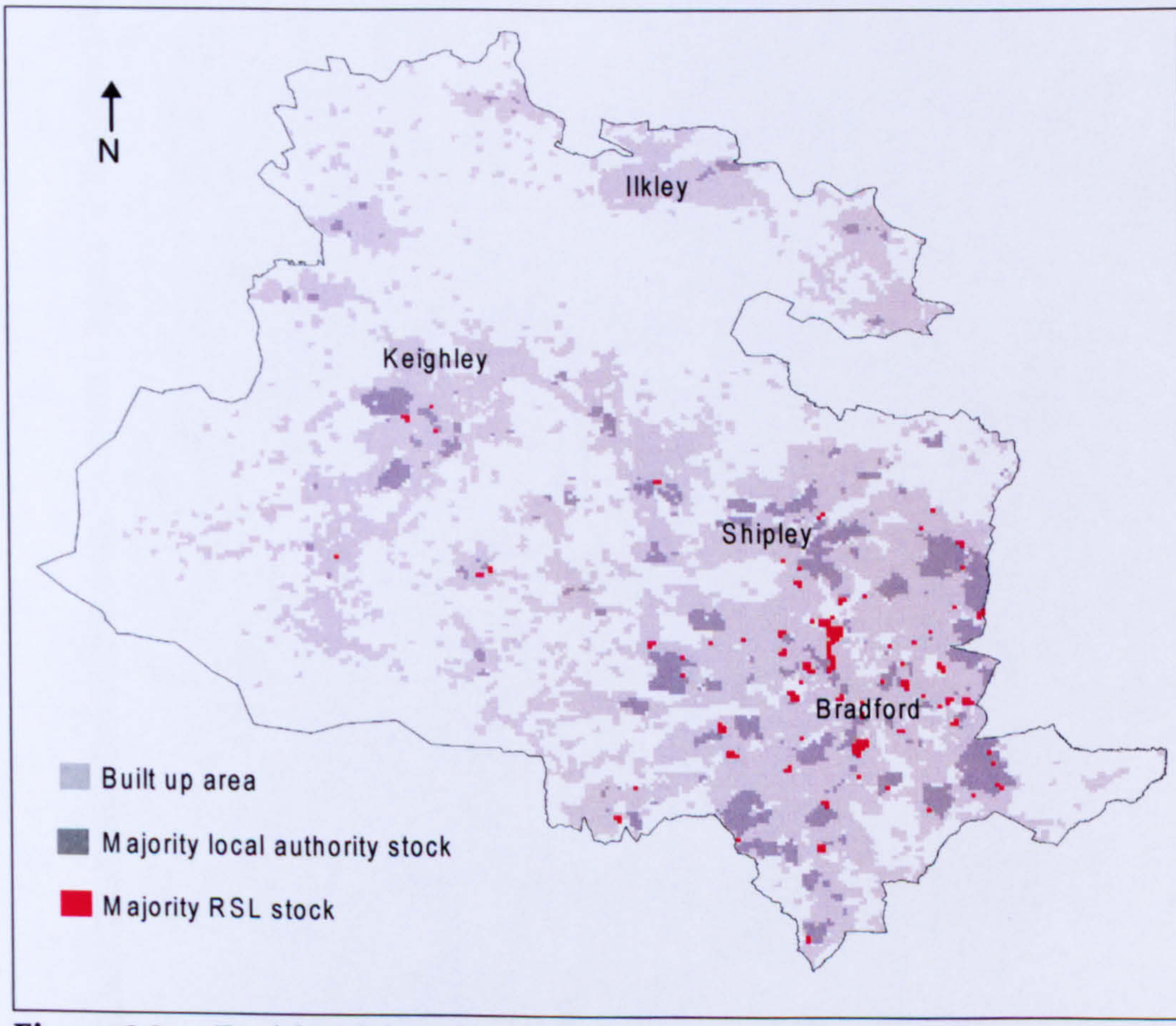


Figure 3.2. Residential areas and social housing estates in Bradford Metropolitan District.

The social housing stock is predominantly made up of houses and flats, with smaller numbers of maisonettes, bed-sits, and bungalows. RSLs in Bradford tend to have more flatted accommodation (although not of maisonettes) and very few bungalows. Approximately 43 percent of local authority stock and 34 per cent of RSL stock are houses in the traditional sense. Figure 3.3 shows the comparative stock make-up of the local authority and RSLs.

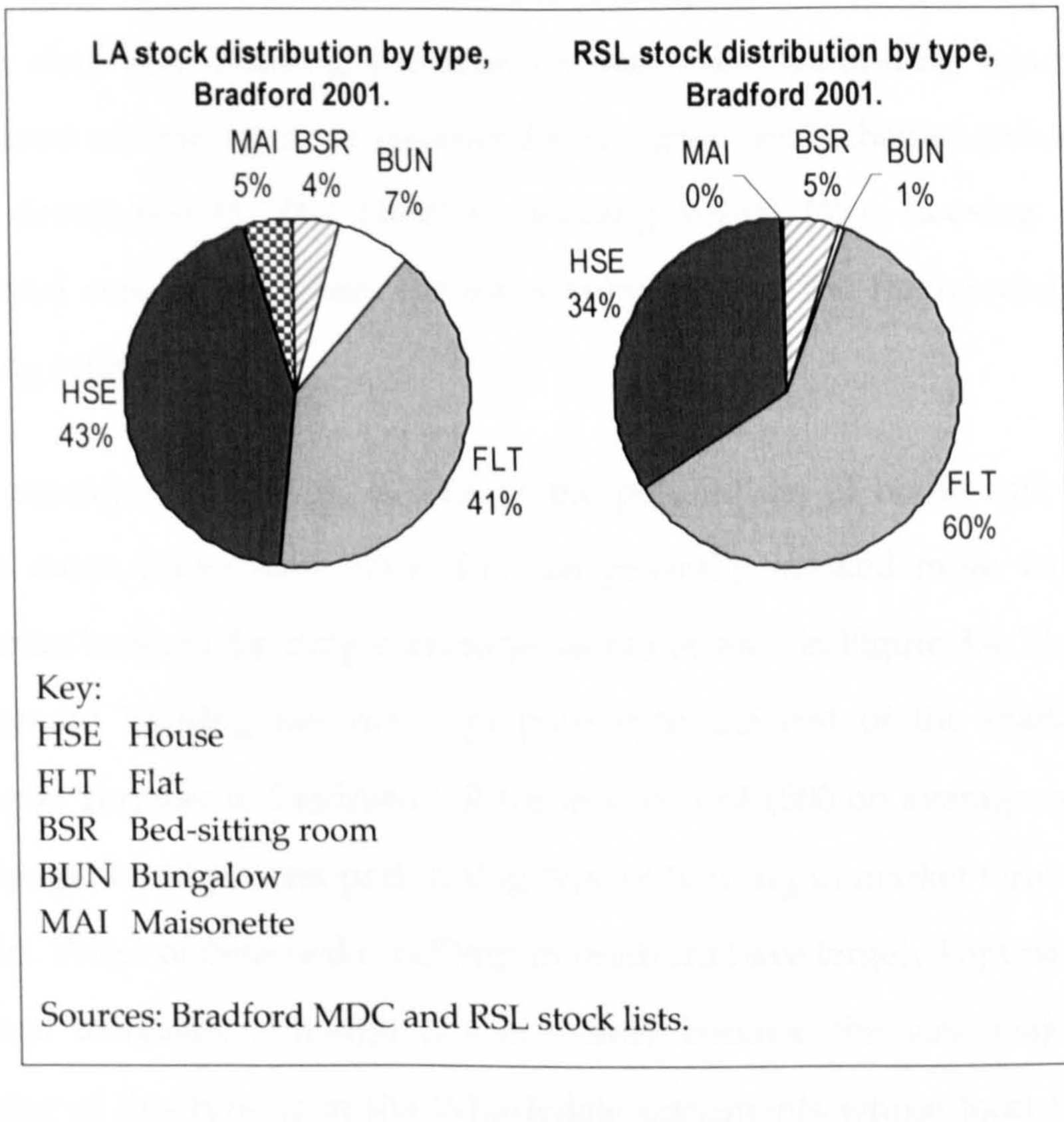


Figure 3.3. Local authority and RSL stock distribution by type, Bradford 2001.

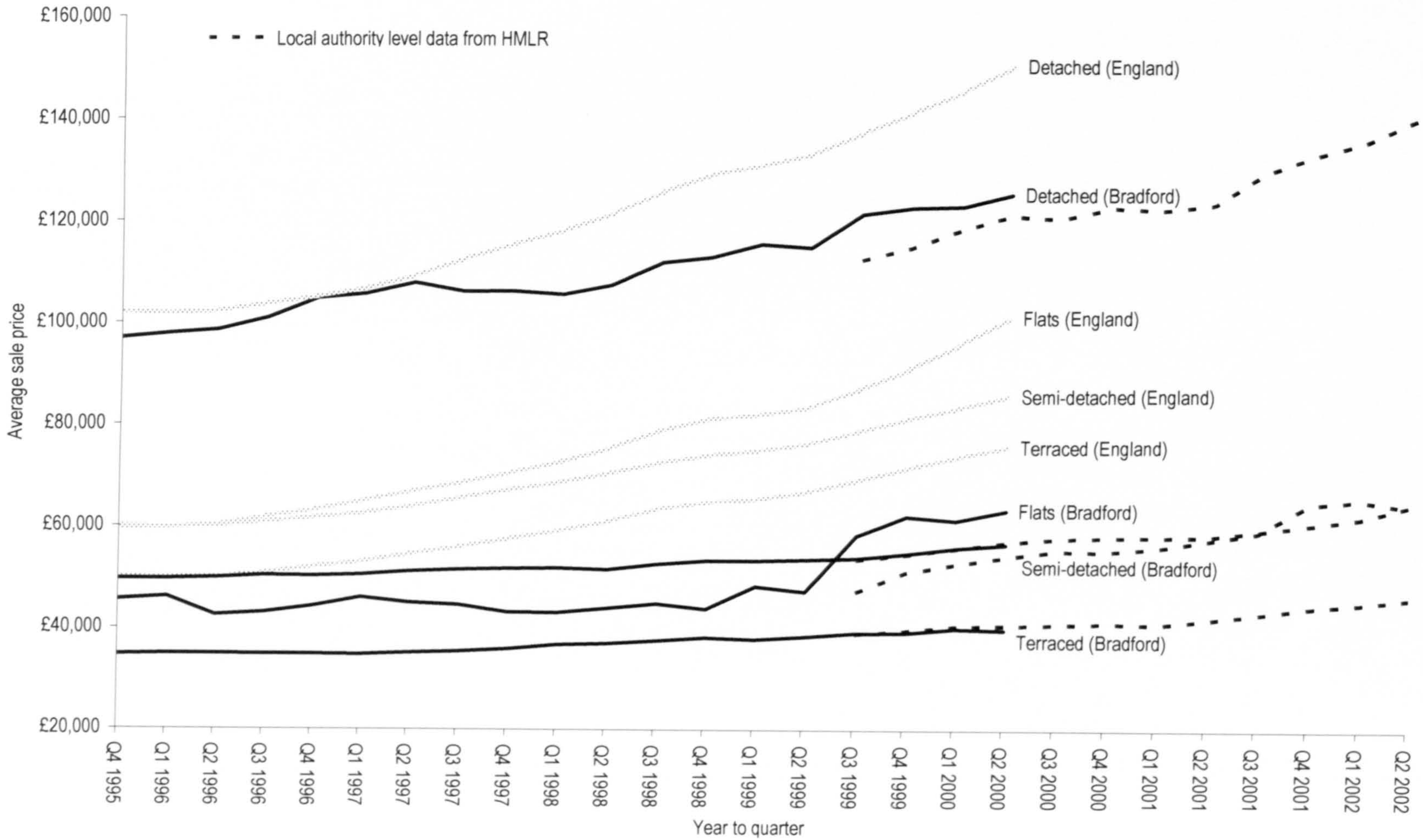
Market 'performance': house prices in Bradford

The price of a house has a unique place in the cultural conscience of the British homeowner and even renter. Owners who are fortunate to be in the right house in the right place watch with satisfaction as the majority of their capital is tied up in an investment commodity whose price rarely—if ever—appreciably falls in relative terms. Occasionally they may allow that satisfaction to become delight as a boom period adds thousand of pounds

onto their net worth year upon year. It has become the main column-filler for Sunday supplements and mid-evening TV schedules for some years now. Consumer interest and the rhetoric of those in the house-selling industry stokes up prices even higher. However it is not exclusively the case throughout England that supply restrictions are forcing prices upwards. There is no shortage of housing in vast swathes of the north of the country. An analysis of the ODPM's Land Use Change Statistics by Bibby (1999) shows that new housing construction has been continuing apace and significant amounts of it are accounted for by greenfield schemes and smaller rural developments. The effect is 'stealing value' from housing in the industrial core of our cities, the older suburbs, and the fragmented social housing estates.

This, among other things, is seen in the polarisation of house sale prices. While mean prices have risen this has generally masked more worrying dynamics beneath the simple averages as can be seen in Figure 3.4. The price of terraced housing has not kept pace with the rest of the market, for example. Terraces in Bradford sell for less than £40,000 on average, and are the cheapest and poorest performing type of housing in market terms in the district. Prices of detached dwellings in Bradford have largely kept pace with national increases, although this is mainly because the vast majority of housing of this type is in the Wharfedale settlements whose local housing market is more related to that of North Yorkshire than it is to Bradford. Having said this, performance even of detached dwellings has lagged somewhat behind the national average since 1997, which is likely to be because of high price rises in the south of the country.

Figure 3.4. Average house sale prices by type, Bradford and England, 1995–2002.



Where the average price of flats has performed better this has usually been as a result of new city-centre developments at the pricier end of the private sector and not the remainder of the flatted stock, including ex-council flats and maisonettes. Even in the context of national rises, Bradford has largely not been witness to similar fortunes. The map in Figure 3.5 forcefully demonstrates three things. First is the intensity of the depression in Bradford's house prices in relation to surrounding areas. Average sale prices in the city of Bradford in particular are far and away the lowest and most prevalent in the sub-region. Second is the contrasting affluence of the northern reaches of Bradford district and more generally the Yorkshire Dales and the dales towns. This begins to reach down into northern Leeds, which highlights the third headline story from the map. That is the experience of Leeds city centre as contrasted with Bradford city centre. Some house sale prices in Leeds city centre are in the top quartile of house prices nationally. In Bradford, they barely register.

These findings are reinforced by looking at the second map (Figure 3.6). This shows the percentage increase in average house sale prices from those in 1996 to those in 2001. Nearly the entire district of Bradford experienced house prices increases that were below the average for the country as a whole. (The average increase in England for the same period and using the same data was 54 percent.) The clear exception, once again, is Wharfedale, and in particular Ilkley, where house price increases begin to match those in rural North Yorkshire, including Harrogate. Also, once again, the difference in trajectory of the housing market—as measured by sale prices at any rate—between Leeds and Bradford city centres is starkly highlighted. Figure 3.7 shows the change in average sale prices for various areas within the district, and selected comparators.

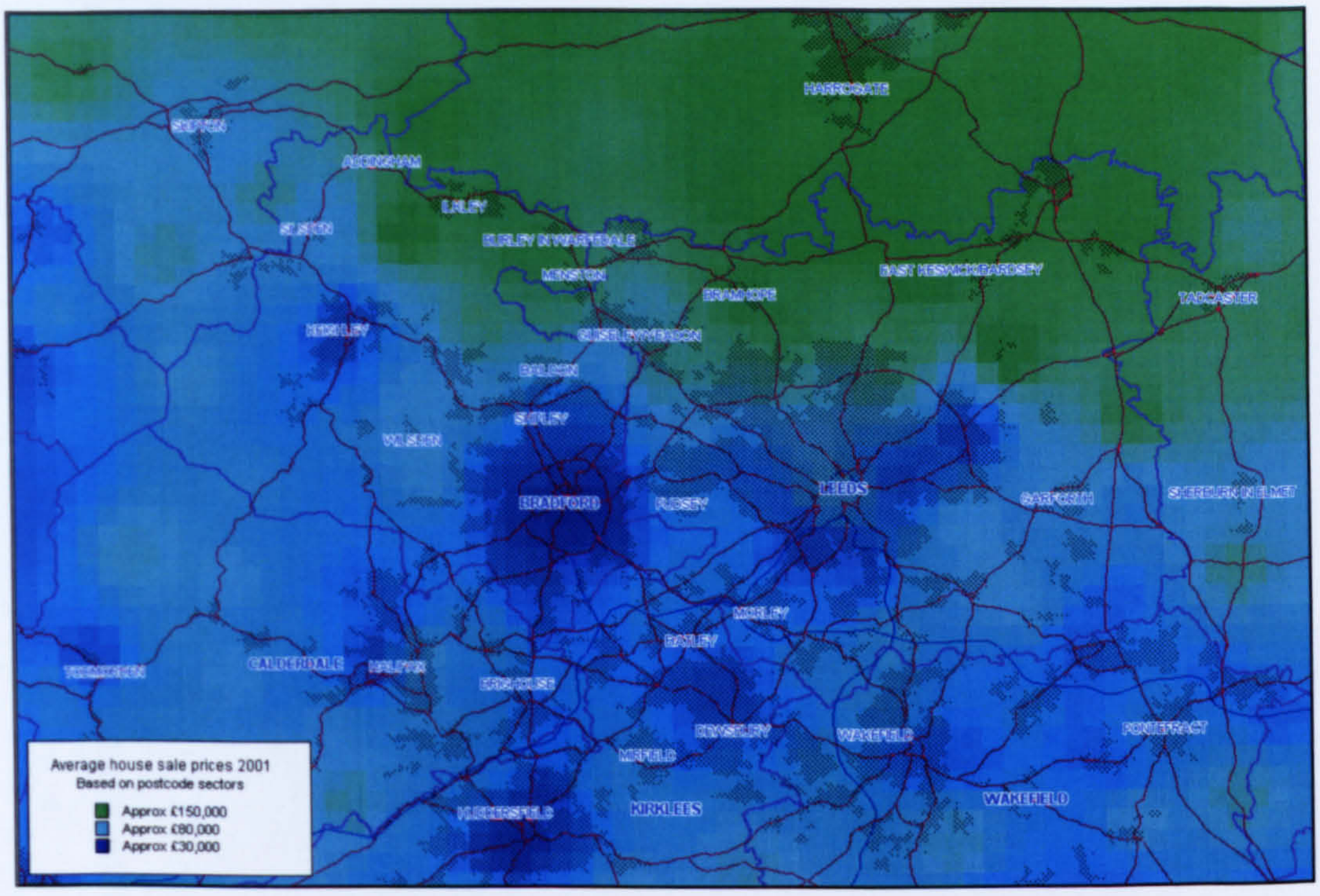


Figure 3.5. Average house sale prices (generalised to 30km), West Yorkshire 2001.[28]

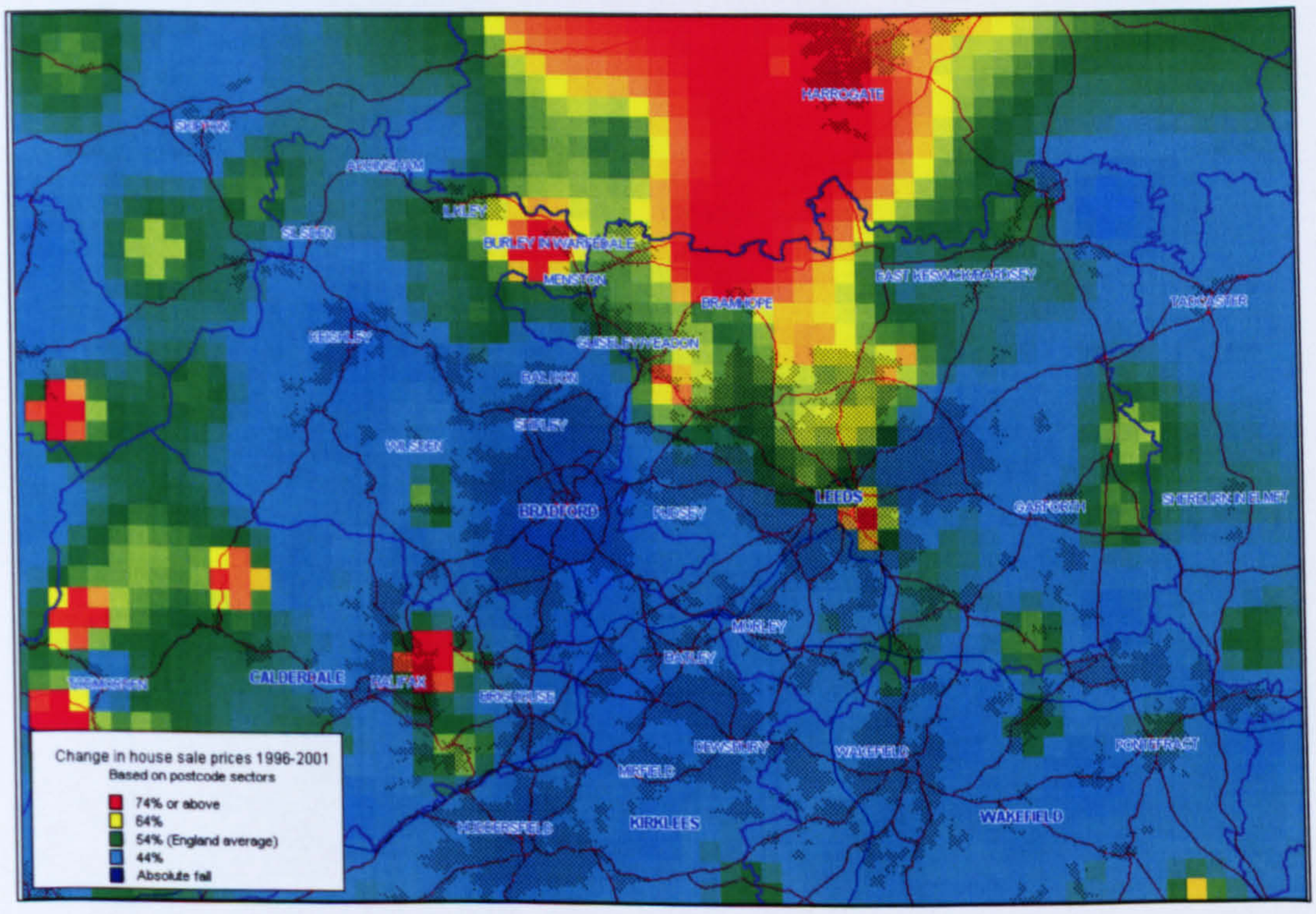
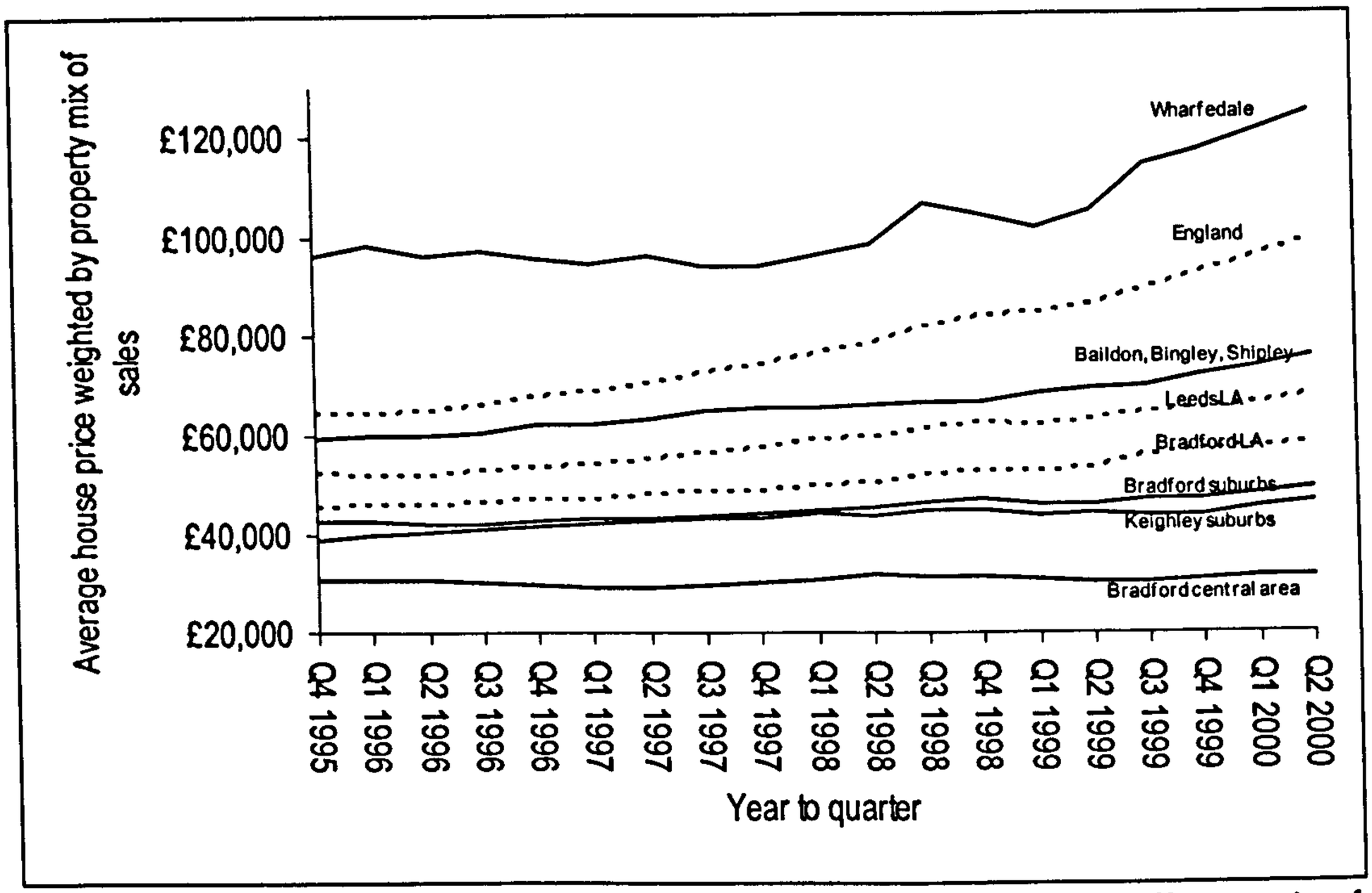


Figure 3.6. Change in average house sale prices (generalised to 30km), West Yorkshire 1996–2001.[29]

[28] Data source: HMLR.

[29] *Ibid.*



Note. The prices shown in this chart have been adjusted to reflect the different mix of property types on sale in each area, and should thus be a more accurate assessment of relative prices in the district than straightforward averages (also see the appendix Allocating post codes sectors to target areas on page 276 for details on the procedure used to derive house prices by area).
Data source: HMLR.

Figure 3.7. 'Mix adjusted' average house prices for Bradford and selected comparators, 1995–2000.

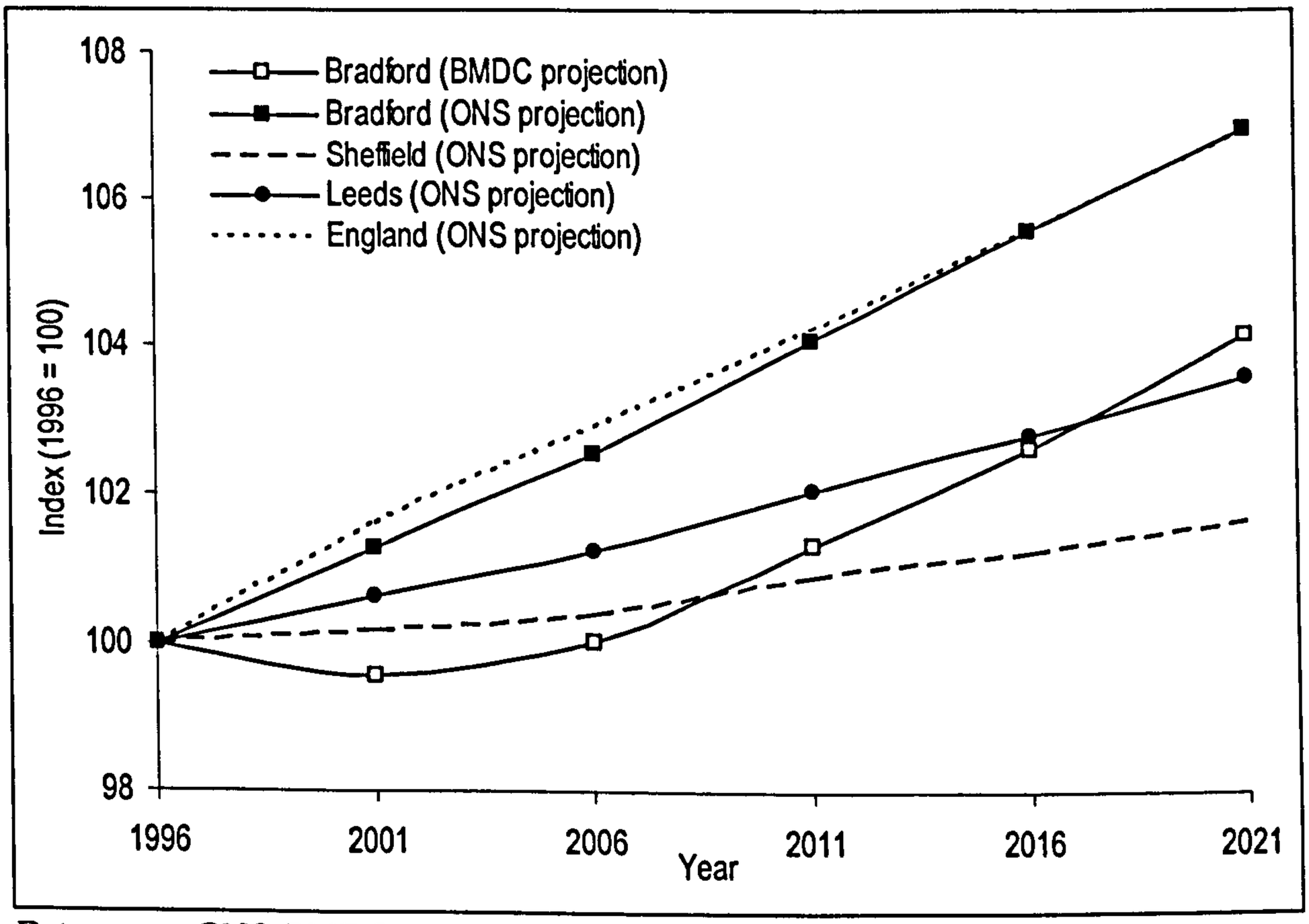
Recently, Wilcox (2003) assessed the ability for working householders to access owner-occupation across all English districts. The average 2002 price of a four- or five-room[30] dwelling in Bradford was found to be £62,908. Of households where there was one working member, only 39 per cent were estimated to be *unable* to afford to purchase their own home. In Leeds, the figure was 54.5 per cent. Furthermore, a lower proportion of Bradford households were unable to buy than in any of the other West Yorkshire districts (Wilcox 2003). The findings are further evidence of the way that affordable routes into entry-level owner occupation undermine demand for

[30] Note that rooms in Wilcox's study refer not just to bedrooms but other living spaces including a kitchen.

rented housing in areas where provision of such housing is high, particularly in northern ex-industrial cities like Bradford.

II. THE CHANGING POPULATION AND DEMOGRAPHY OF BRADFORD

The population of England is expected to continue growing, reaching 51.8 million by 2016. Significantly, around 44 per cent of this expected increase is attributed to net immigration. In an ethnically diverse city like Bradford, the forecasts are concomitantly for continued growth at a time when other major cities have been losing population and are expected to continue to do so.



Data source: ONS, BMDC.

Figure 3.8. Population projections 1996–2001.

Figure 3.8 shows projected population increases in Bradford and the nearby cities of Leeds and Sheffield. While the local authority's own estimate of growth is slightly more conservative than ONS's, the growth of Bradford nevertheless is expected to mirror general population growth in the country as a whole, while the populations of nearby Leeds and Sheffield grow at a below-average rate. The population of Bradford is expected to reach 500,000 before the year 2021 due in large part to decreased net out-migration of

rented housing in areas where provision of such housing is high, particularly in northern ex-industrial cities like Bradford.

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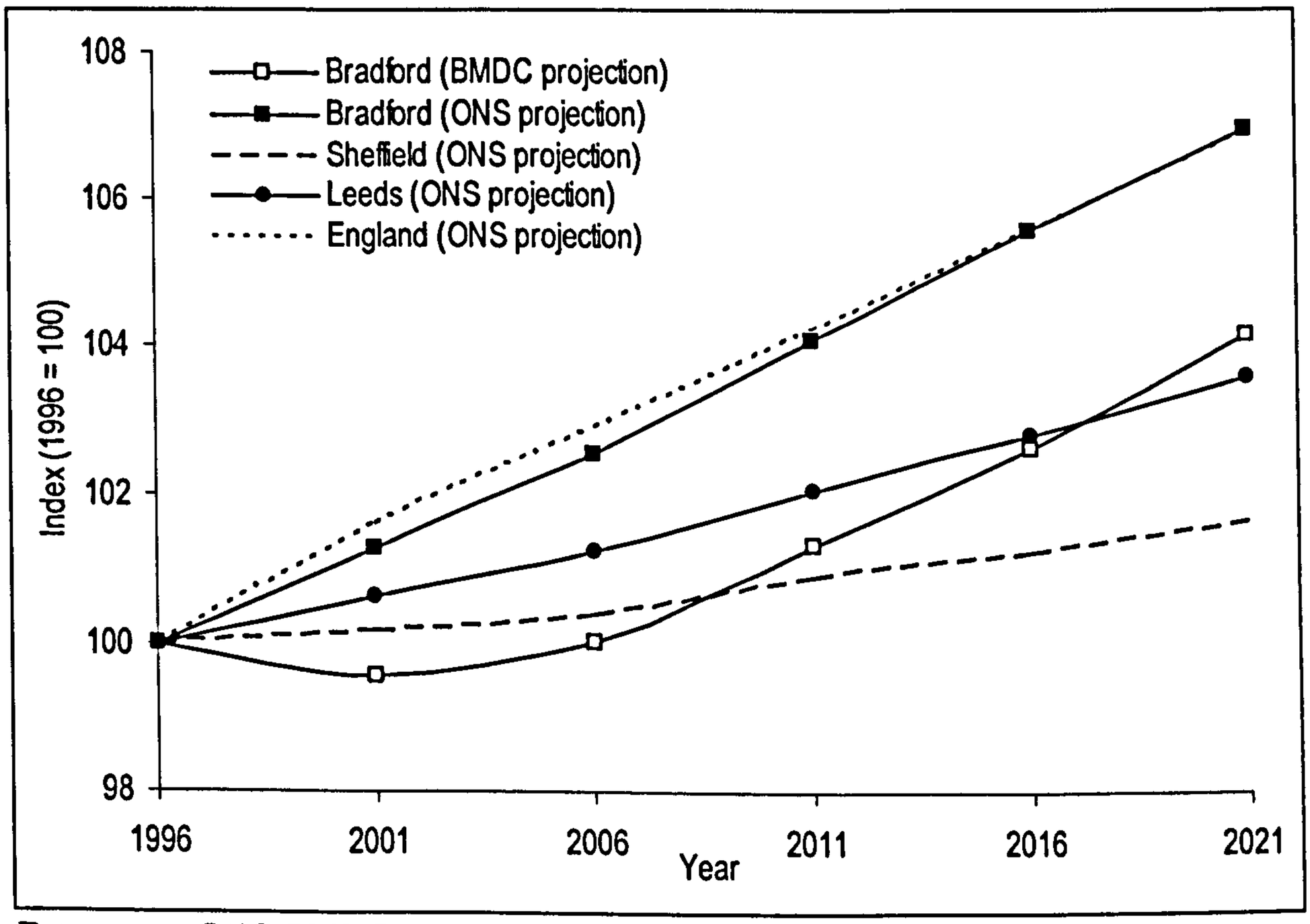

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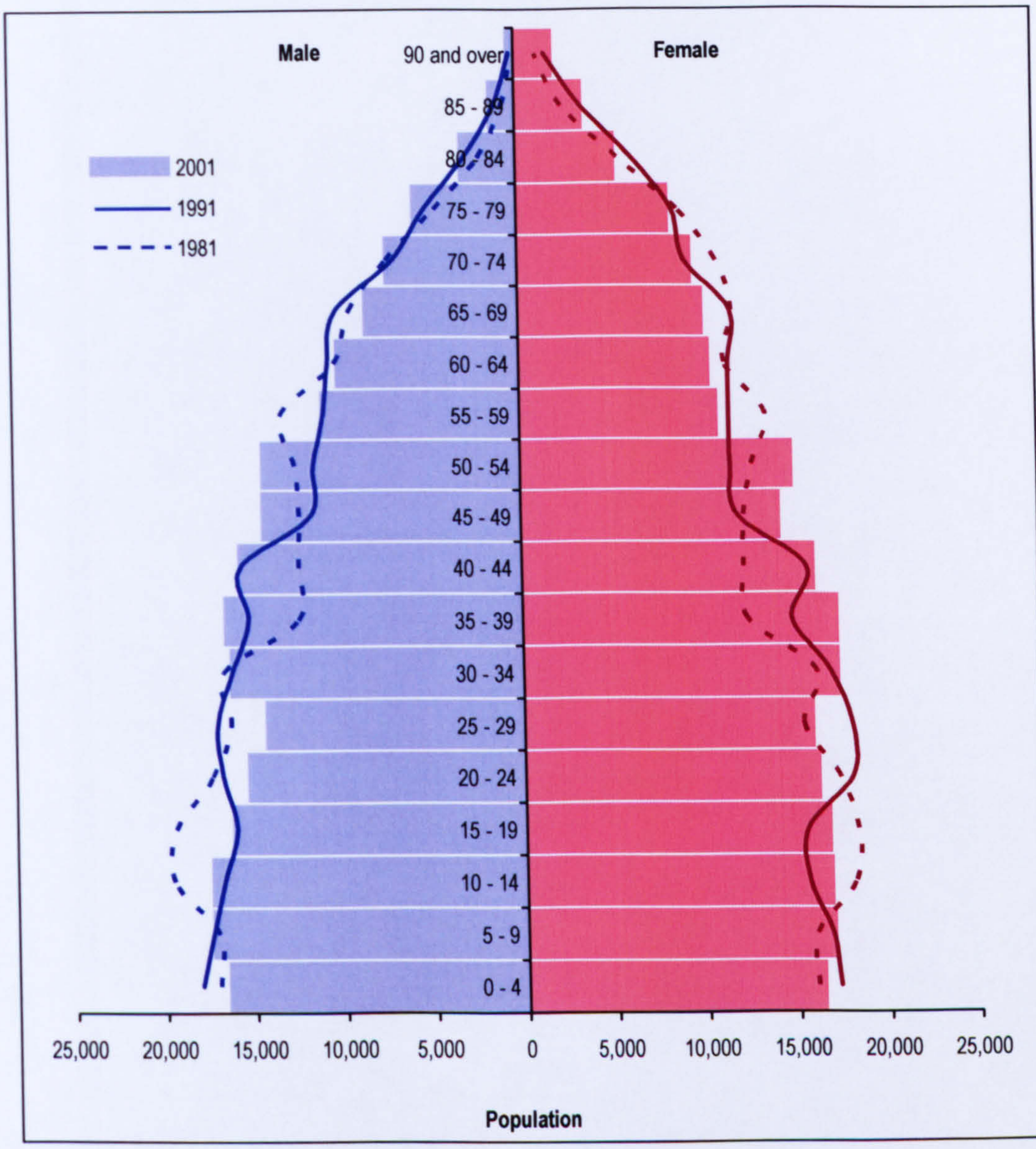
households and the youthfulness of the population structure (Bradford MDC 2000). The resultant household projection for 2020 is 213,500, an increase of some 23,500 households in the period from 2000—mainly due to a rise in the number of single person households (Bradford MDC 2001a).

The 2001 Housing Investment Programme statistics report that there were 200,243 houses in Bradford, representing just under one per cent of the 21,360,647 houses the same statistics estimate that was is in England. Clearly if the household projections bear out, then Bradford will require a net addition to its housing stock in the order of 14,000 dwellings. This sits uncomfortably within an overall picture of low demand, and it is in any case absolutely essential that any new housing provision is of a type and quality commensurate with increasing aspirations rather than need. The consequences otherwise will be continued outmigration from the district of inspirational households, including a high proportion of the BME population that is expected to account for the majority of Bradford's growth.

Figure 3.9 shows the current age structure of the Bradford district, together with a comparison of the 1991 and 1981 structures. The most worrying trend that is evident is the 'hole' that has emerged over the last twenty years in the population aged in their twenties. In 1981, there was a significant youth population, a very high proportion of which did not age in Bradford. On the other hand, Bradford can expect to increase its share of people at retirement age. The effect on the housing market of this paucity of young households is difficult to overstate. Bradford is losing population, probably because of a mixture of limited labour and housing opportunities, that it will probably not regain. If the population projections are correct, and in-migration of and natural growth in BME households boosts the population, then there must be appropriate housing to retain this population in Bradford as they increase their affluence and aspirations. The current flight of Asian households to areas such as Pudsey (in Leeds) is demonstrative of a trend that can only be expected to continue.



Data sources: Census 1981; Census 1991; Census 2001.

Figure 3.9. Age pyramid for Bradford, 1981, 1991, and 2001.

III. VACANT HOUSING IN BRADFORD: PROBLEM AND OPPORTUNITY

Too many vacancies are, of course, the fundamental symptom of low demand. The House of Commons Select Committee enquiry rightly focused on precisely this problem (HC 240-I). Yet at the same time the housing market cannot exist without opportunity. It is the existence of a wide selection of opportunities that facilitates choice and search, the existence of demander behavioural processes, and thus the determination of price. The

alternative is a purely bureaucratic process of allocation that instantaneously assigns houses to individuals or households in need. It is a paradox of the market that vacancies in the system at once embody the functioning of the market and also cause some of its problems. Regardless of how undesirable empty properties superficially appear to be, there must remain a healthy element of choice within the system for us to be able to call it a market and for maximal pricing efficiency to be achieved. That is not to say that an excess of vacancies in any one part of the market can be viewed as desirable; but the boundary between necessity and undesirability is a difficult one to draw and may involve a much more subjective scrutiny of local situations. The point at which empty properties begin to have a noticeably visible manifestation is probably too far, for example.

This section of the chapter aims to describe the creation of opportunity in the market from the point of view of the incidence of vacancies. It is mindful throughout of the basic premise that vacancies represent a phenomenon that, in a low demand context, must be minimised yet at the same time does not necessarily constitute an indisputable, linear measurement of demand problems. Indeed, a parallel aim of this section of the chapter is to demonstrate that traditional measurements such as void rates and turnover rates cannot just be taken 'as read.' In the worst case they may actually give misleading signals which could be seen to have predicated actions that have exacerbated low demand situations.

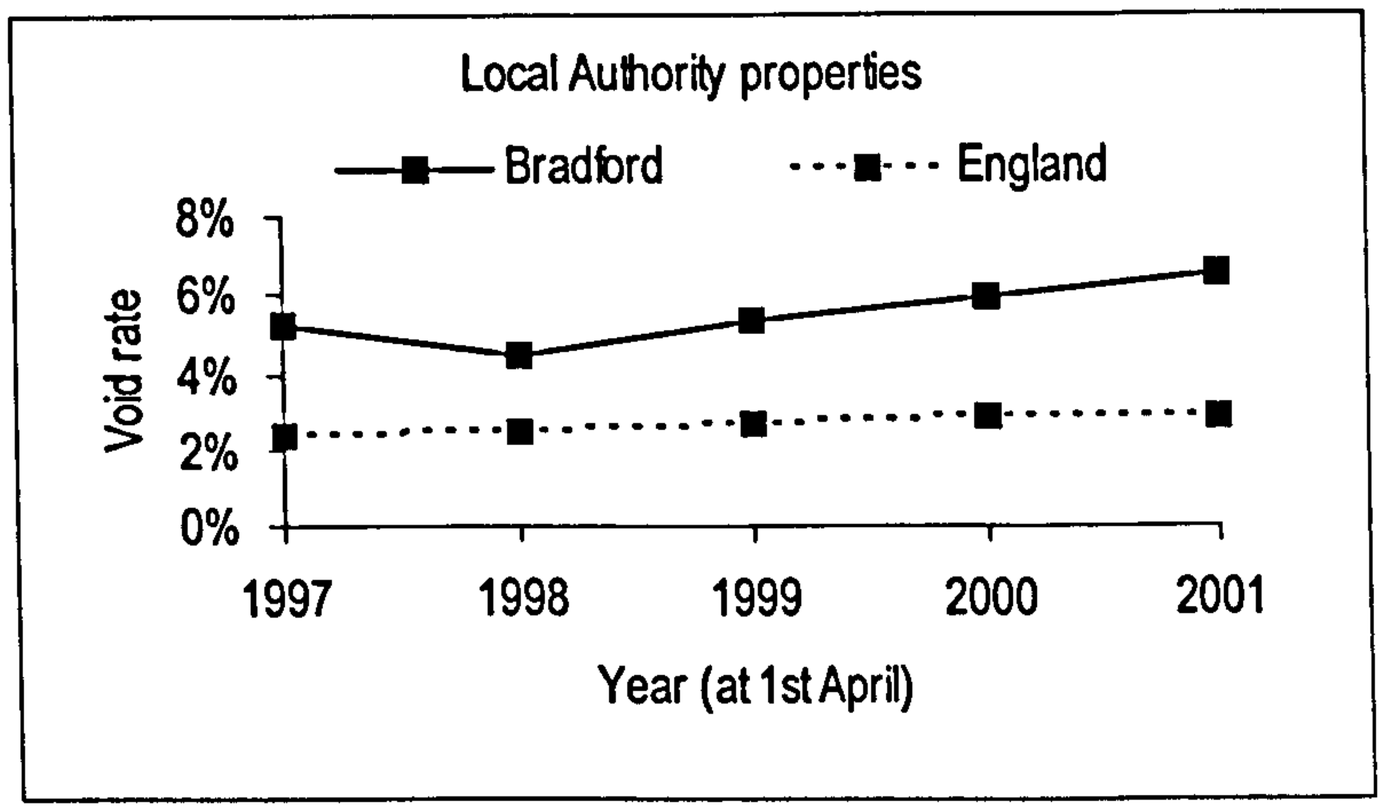
It is an unfortunate limitation of the data collected in the course of this project that the private sector cannot be as comprehensively analysed as the social rented sector. As the data file does not include detailed case-by-case accounts of transactions in the private sector, it is impossible to deduce, first-hand, void lengths or indeed the characteristics of either properties incurring vacancy or households 'causing' them. Instead, it is necessary to look to secondary data sets to fill in the picture, although a degree of localised analysis is possible by looking at council tax records. On the other hand the

nature of the data collected on the social rented sector is such that the possibilities of far more detailed analyses present themselves.

Void rates

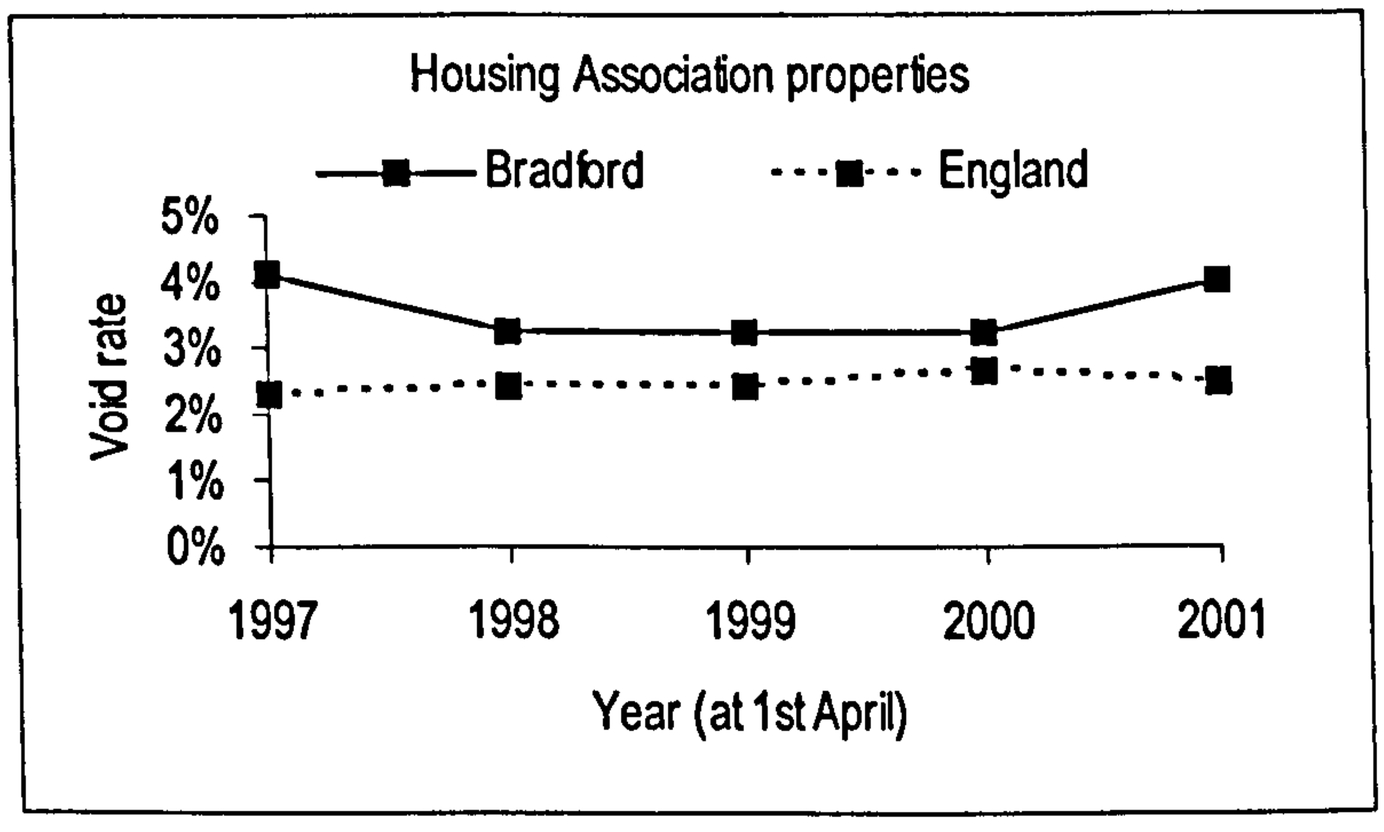
Of first concern is the extent to which properties in Bradford were vacant throughout the study period, and, within this, the extent of opportunity for mobility. Fielder & Smith (1996) make the distinction between vacancies that are problematic, and those that are necessary to ensure there is enough opportunity to allow the market to continue to function. A fuller discussion of this, and a suggested conceptual framework for vacancies, is presented later in this section of the chapter.

Change in void rates from 1997 to 2001 can be seen for local authority dwellings in Figure 3.10; for housing association dwellings in Figure 3.11; and for the private sector in Figure 3.12. As can be expected, void rates in Bradford are higher than the England average. This is to be expected, given the propensity for metropolitan areas to have a higher turnover rate and thus a higher rate of 'frictional' voids at any one time. It is also to be expected because the most difficult-to-let property types are concentrated in metropolitan areas. However, these higher void rates—and, crucially, the higher *rate of increase* in these rates, particularly in the local authority stock—are also in part a function of structural, low demand processes which are reflected in the diminishing attractiveness of these properties. Clearly, it is not enough just to state that void rates are high in Bradford. In most respects, this is to be expected. It is necessary to go further and identify first which areas and groups of the stock are being affected; and second, to make the distinction between voids that are merely a function of the normal market processes, and those that represent long term mismatch between supply and demand. This second distinction is primarily—although not wholly—predicated on an analysis of void lengths.



Source: ODPM Housing Investment Programme.

Figure 3.10. Void rates in local authority properties, Bradford and England 1997–2001.



Source: ODPM Housing Investment Programme.

Figure 3.11. Void rates in housing association properties, Bradford and England 1997–2001.

Source: ODPM Housing Investment Programme.

Figure 3.12. Void rates in private sector properties, Bradford and England 1997–2001.

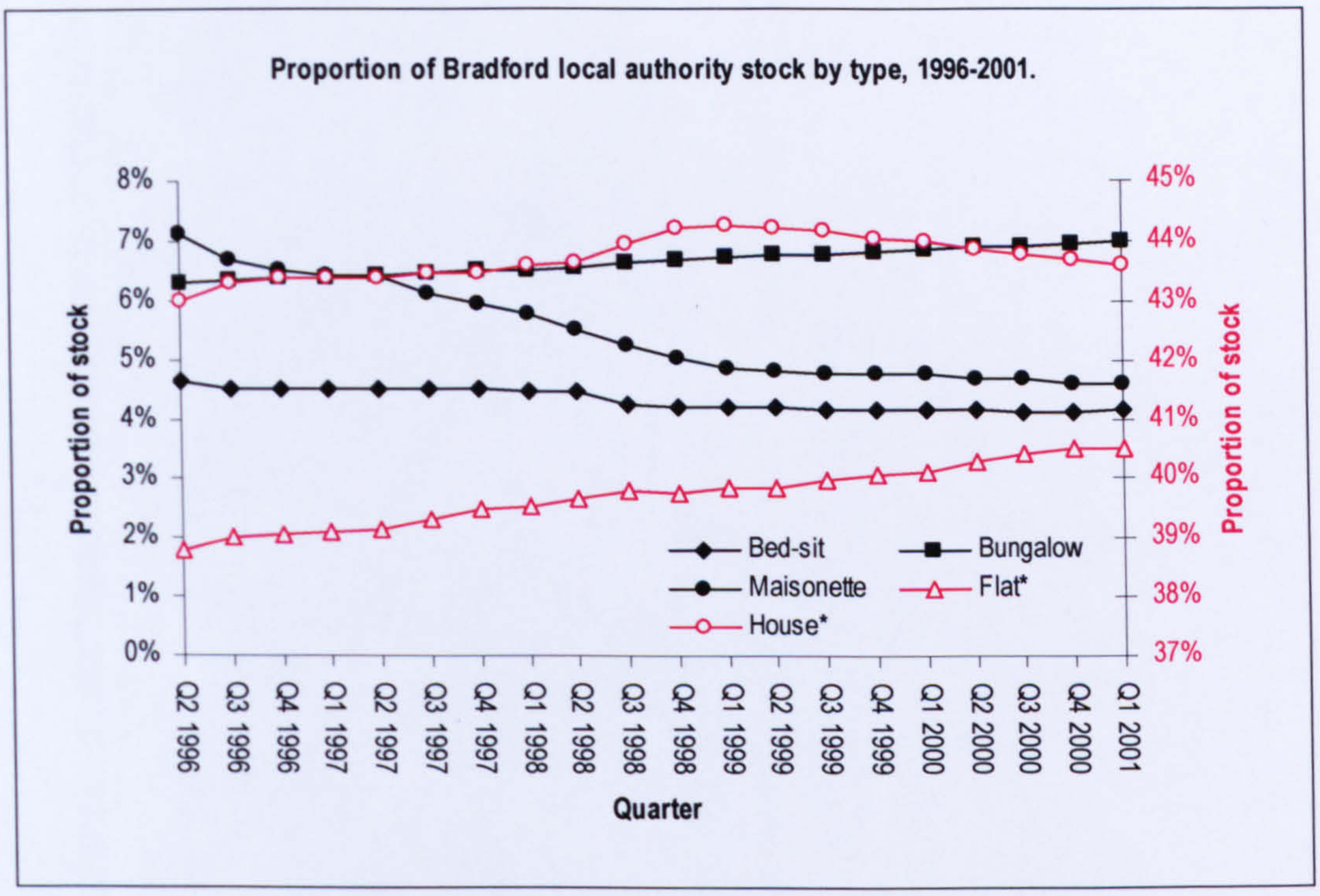
Having made this latter distinction, it is possible to investigate which factors have explanatory power in predicting void incidence and duration (or, at least, type). Whilst this does not explain the dynamics of the market as a whole, an understanding of how voids in the existing stock come to be can help guide us the right direction when thinking about those factors which can usefully be used to segment the market into robust submarket sectors.

For this reason—because it is necessary to look for underlying factors behind vacancy generation and transfer in preparation for the creation of a vacancy transfer model—it is left until chapter six to deal with this topic. Before then, to gain an insight into the relative sustainability of social housing within a dynamic system, an examination of how void patterns in particular dwellings or groups of dwellings change is presented. While it is true that void rates in some sectors are generally rising significantly, this may occur within the stock in a disjoint manner, staggered through time, possibly in response to some stimulus that occurs in a dispersed pattern. Looking for explanation in static tables of void incidence will obscure such processes. It may be, for example, that after the departure of an incumbent occupier (who originally moved into the property when it was in a particular submarket), the function of that property has now changed (for example, it may now occupy a different submarket). Now that that property is exposed to the market—whether as part of a new submarket or not—it represents an opportunity for mobility. As an example of how discreet micro-level vacancy changes may contribute to a shift over time in aggregate vacancy patterns, consider the case of the death of a long-term council tenant. The property may have been previously let for 40 years, but the departure of the long term occupier heralds the onset of a new pattern of use of that property that sees its occupier change every year or so. The property may remain largely unchanged but its mere availability in the market (its emptiness) at that particular point in time places it in a different submarket to the one it was in before.

Void incidence

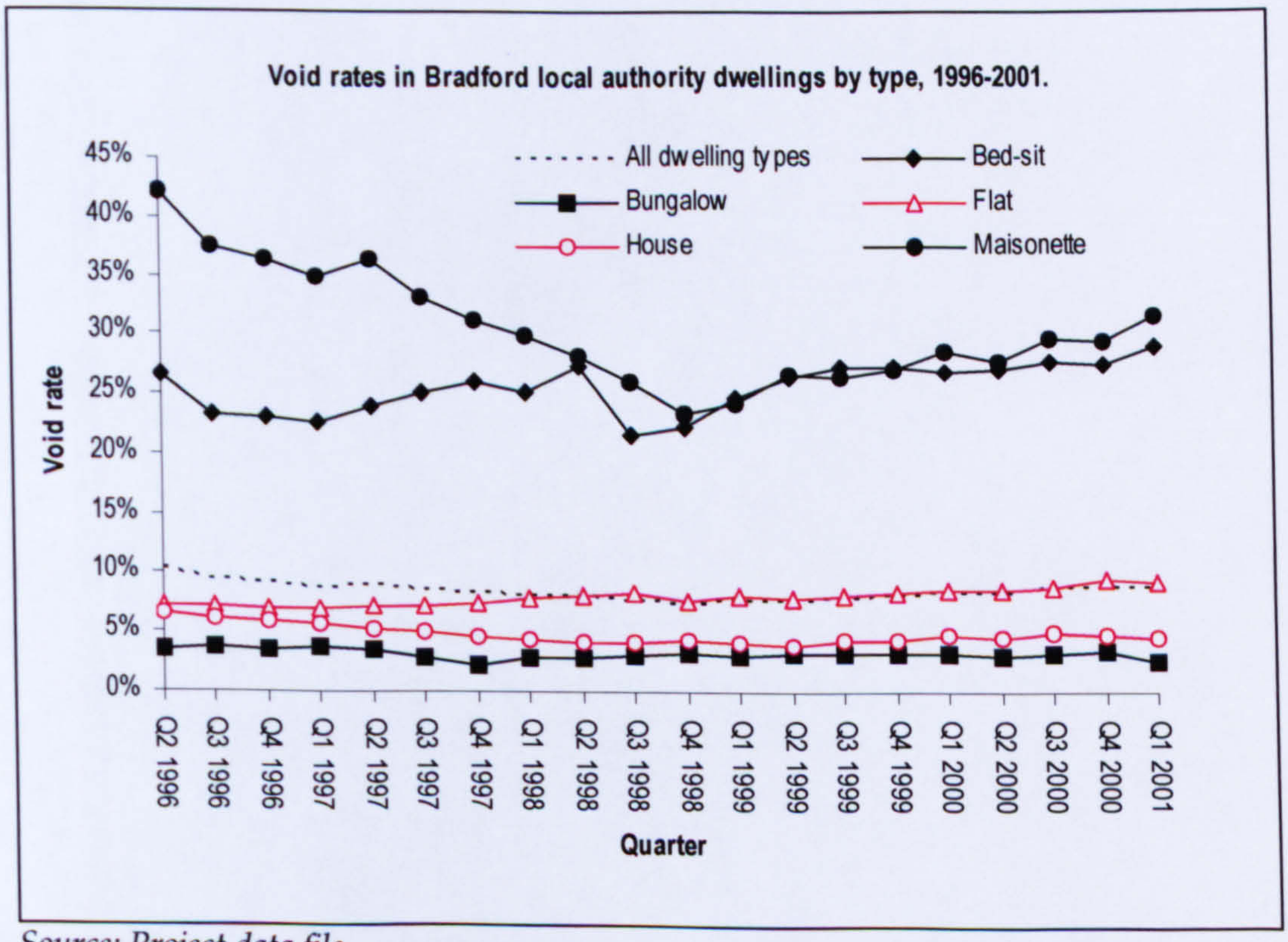
Figure 3.13 shows the changing profile of Bradford's local authority stock. Flats have increased their share of properties whilst at the same time reducing in absolute numbers. This is primary as a result of RTB sales being concentrated among houses, one of the residualisation processes (for recent evidence see Murie & Ferrari 2003). The stock at the end of the study period (April 2001) was predominantly made up of flats and houses in almost equal numbers (43 and 41 per cent respectively), with the remaining 16 per cent comprised of bungalows, bed-sits, and maisonettes. In 1981, over 52 per cent of Bradford's council stock was houses. This equates to a net reduction of over 8,000 houses in the 20 years to 2001, mostly as a result of the Right to Buy.

It is interesting to note the picture with regard to the council's maisonette properties. This in fact serves as a reasonably lucid case study into the difficulties associated with planning for 'disinvestment.' As can be seen from Figure 3.14 the void rate of maisonettes fell dramatically from a very high level of some 42 per cent at the beginning of the study period to a low of around 23 per cent in 1998. The void rate then steeply began to climb again, and was on a distinct upward trajectory by the end of the study period in April 2001.



*Note: Houses and flats are shown on the secondary axis, to the right of the chart.
Source: Project data file.

Figure 3.13. Proportion of Bradford local authority stock by type, 1996–2001.



Source: Project data file.

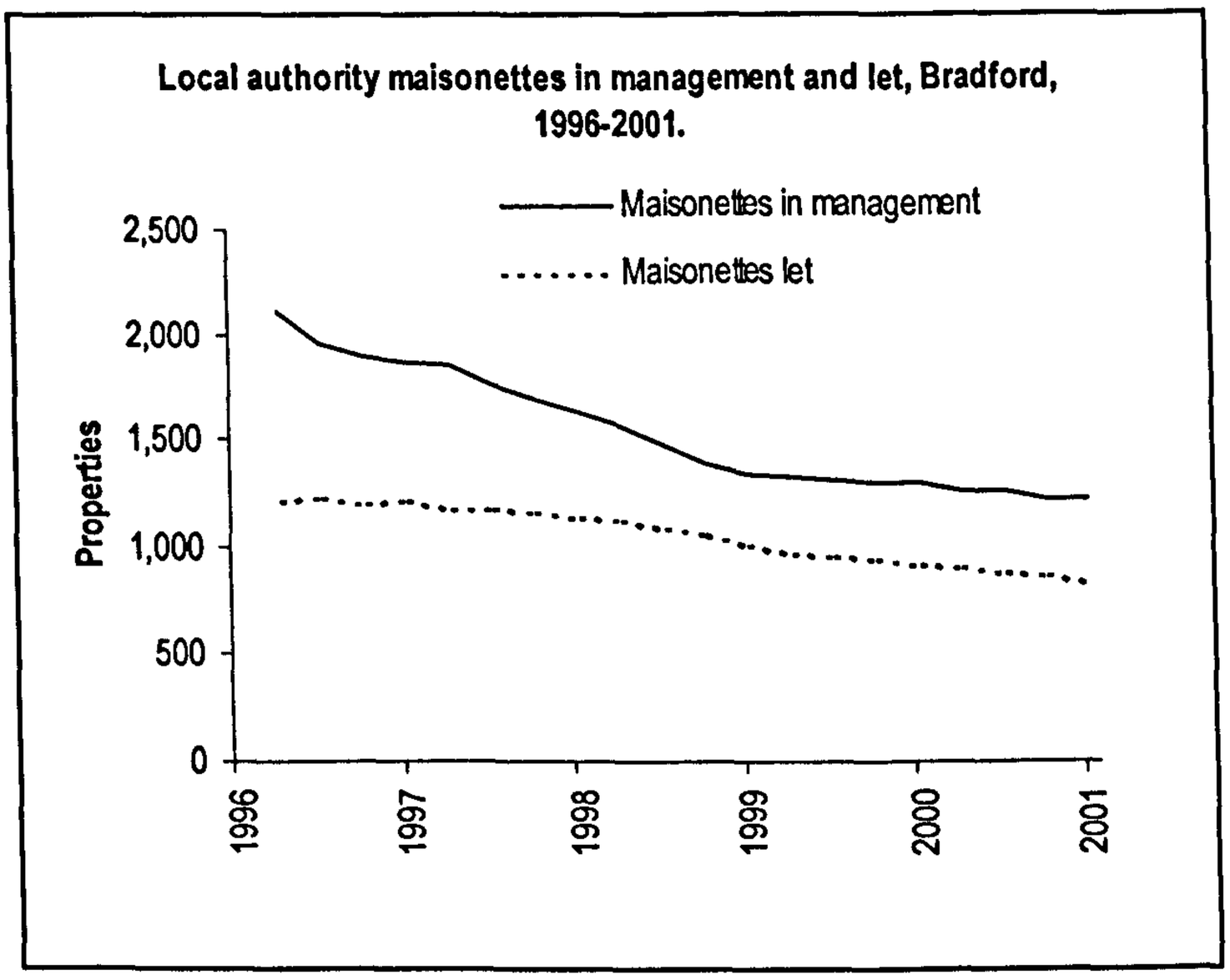
Figure 3.14. Void rates in Bradford local authority dwellings 1996–2001.

Figure 3.15 helps to explain the process behind this phenomenon. As can be plainly observed there was an aggressive reduction in the numbers of maisonettes throughout the first few years of the study period. This was presumably in response to the unsustainable high void rate and unpopularity of this particular form of housing in the district. This action brought the numbers of maisonettes in management much more in parity with the numbers of households living in them. However, the number of households demanding maisonettes and subsequently accepting tenancies in them continued to fall at its existing rate, if not accelerating slightly in decline in the year 1998–99. If the hypothesis holds true that this reflects structural processes of low demand as much as it does bear out the thesis of 'unpopularity' then it cannot be expected that this trend will necessarily reverse.

Of course, what the data do not tell us about are the form and extent of any maintenance investment or capital environmental improvements made in the stock and the estates it is in. Nevertheless, as the number of let maisonettes continues to fall, and the stock reduction programme abates in ferocity, the subsequent gap between the stock and the lets begins to grow once more, and the void rate with it. This reduction in the numbers of let maisonettes is largely explained through exits. Whilst the numbers of lettings are far from inconsequential (in the study period there were 1,901 lettings made of maisonettes in the social sector), tenancies tend to be very short. A survival analysis found that the median length of a maisonette tenancy started during the study period was just 374 days, compared to over 1,000 days for a house. Considering that the study period only 'allows' for a maximum length of five years, this is a very striking statistic. Table 3.1 summarises the 'survival experience' of tenancies in different property types including the Wilcoxon survival score, which allows comparison across groups.

The relationship between voids and turnover

Often, the relationship between an area's void rate and its turnover rate is the



Source: Project data file.

Figure 3.15. Local authority maisonettes in management and let, Bradford, 1996-2001.

subject of intense scrutiny amongst policy makers and researchers looking

Table 3.1. Summary of tenancy lengths by property type, Bradford 1996-2001.

Property type	Number of lettings used in survival analysis[a]	Uncensored cases[b]	Censored cases[c]		Median tenancy length (days)	Mean Wilcoxon (Gehan) score
			n	%		
Bed-sit	2091	1483	608	29.08	352	-5913.4304
Bungalow	1309	411	898	68.60	1669	5834.8365
Flat	14207	7913	6294	44.30	599	-925.6577
House	9239	4069	5170	55.96	1019	3057.5233
Maisonette	1901	1390	511	26.88	374	-5455.2641

[a] Not all recorded lettings in the project data file could be used in this survival analysis because 163 records were missing information on the property type.
[b] Uncensored cases are those lettings that started and ended within the study period.
[c] Censored cases are those lettings that started during the study period and were still ongoing at the end and are thus of indeterminate length.
Source: Project data file.

for indicators of low demand or in the analysis of the risk of low demand symptoms developing. Power & Mumford (1999) used the concept of a 'tipping point' of high voids and turnover to suggest when areas may have gone beyond the stability required of successful and sustainable housing markets. Birmingham University's Centre for Urban and Regional Studies have also applied this concept, and given it some quantitative backing, in a number of regional and local demand studies (Nevin *et al.* 2000; Lee & Nevin 2001; Lee *et al.* 2002). The CURS reports suggest that a void rate above 14.5 per cent presages unsustainable changes in demand. Almost by complete contrast Bramley & Pawson (2000) identify a void rate threshold of 3.5 per cent in their *Good practice guide* for responding to low demand. Whilst this latter figure is not a 'tipping point,' the authors of the guide suggest that the combination of neighbourhood-level voids above the level with other indicators (including high turnover) signifies demand problems or unpopularity. This level may be lower than expected because of the research design that produced it. It is based partly on a postal survey of all local authorities in England whereby the definition of 'low demand' was largely subjective to the respondents. This explains why a significant number of local authorities in the South East described themselves as having low demand or unpopular public-sector housing. While useful, it is clear that this measure and the study informing it is unable to distinguish between low demand as distinct from localised unpopularity or difficult-to-let; a distinction that it has been necessary to make from an early stage in this project.

Notwithstanding such a caveat, there is indeed some merit in looking at void and turnover rates. But at the same time it can be quite dangerous ground to traverse if appropriate care is not taken. As has already been argued, vacancies are the *very embodiment* of a housing market; the market cannot function without them. The interpretation of void rates as a demand symptom is far from straightforward, and the relationship between voids and demand is certainly not linear. There is a theoretical point beyond which

excess voids are indeed indicative of demand problems, and may even have endogenous causative effects themselves (as will be discussed later as part of an analysis of blight). However, because voids represent opportunity necessary for mobility within a housing system—representing a flow of supply—it is not valid to use them as a demand indicator.

It may at first appear unusual to conceptualise a void rate as an independent variable, as in Figure 3.16. Normally, one would think of the void rate as being dependent on demand. However, the point being made here is that, as voids are necessary for mobility (and thus a precondition for the expression of demand), demand cannot exist without voids and will therefore be related to the void rate.

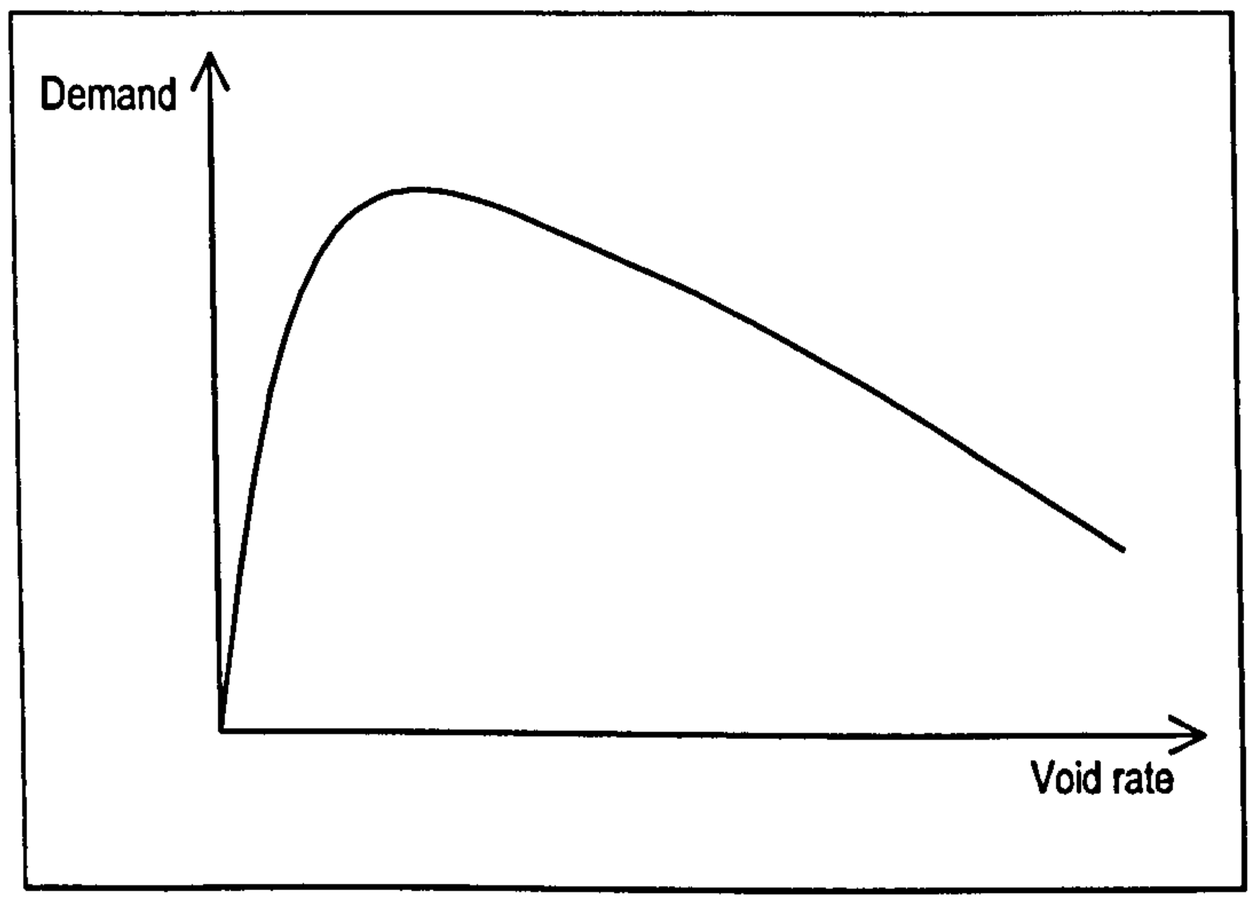
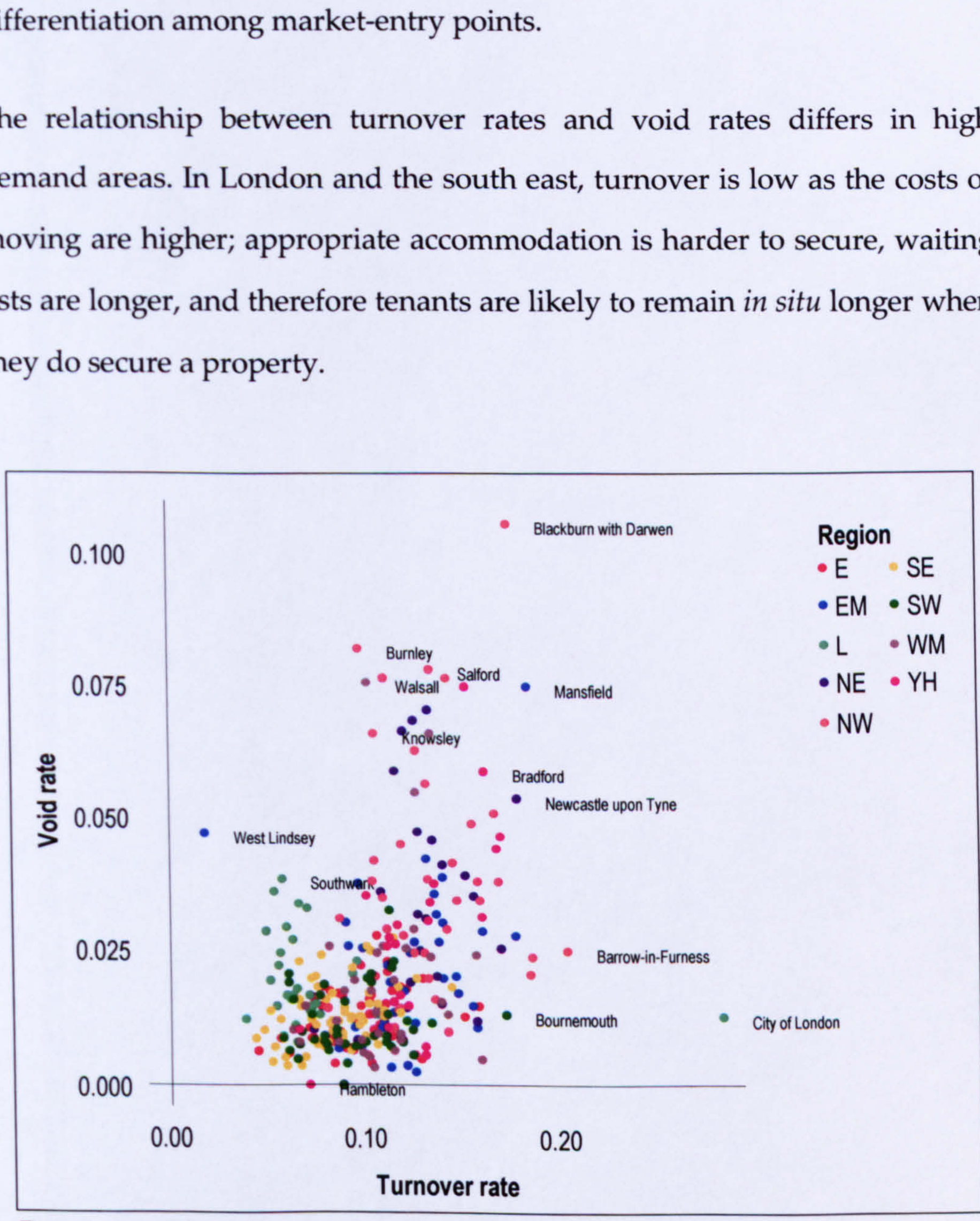


Figure 3.16. Diagrammatic representation of the possible relationship between demand and the void rate.

High turnover has traditionally been viewed as an indication of a weak market and low demand for an area or set of properties. When turnover is high, it is often assumed that resultant social networks and the stability of neighbourhoods are compromised. This reading assumes a single-market model and ignores functional differentiation in the market. For example, some specific submarkets may serve as market entry-points or as transitional

submarkets. In these instances, turnover could expected to be high even when these submarkets are functioning optimally. Whilst it may be true that the strongest social networks occur in areas of low turnover, it is not exclusively the case that weak social networks are undesirable or necessarily suffer from negative externalities. In this respect there will exist differentiation among market-entry points.

The relationship between turnover rates and void rates differs in high demand areas. In London and the south east, turnover is low as the costs of moving are higher; appropriate accommodation is harder to secure, waiting lists are longer, and therefore tenants are likely to remain *in situ* longer when they do secure a property.



Data source: ODPM Housing Investment Programme.

Figure 3.17. Void rate *vs.* turnover rate scatter-plot for social rented housing, England local authority districts, 2001/02.

Figure 3.17 above shows how the relationship between void rates and turnover rates differs in different parts of the country. London boroughs, in

particular, are characterised by having low turnover rates (although in some cases, void rates are similar to those experienced elsewhere). In general, the remainder of the South East and the South West, by way of contrast, has very low void rates but slightly higher turnover. Both these regions dominate the bottom-left quarter of the scatter-plot. The picture for other regions, particularly the North East, the North West, and the Midlands could not be more different, with many local authorities scoring highly on both measures simultaneously. Yorkshire and Humberside, and Bradford in particular, exhibits some similar signs.

Of course, these findings would appear at first sight to confirm that the interaction between void rates and turnover rates provides a good measure of low demand. In some circumstances this will be the case. However, it must be recognised that districts provide a closer approximation of Housing Market Areas than they do of submarkets. Therefore, when we look for those districts that have high void rates and high turnover rates we are indeed viewing a very weak housing market *in general*. This does not make any distinction between different market functions that are contained within the area, nor of their interaction. Indeed, in pure 'market terms' even those districts that score highly on both measures may have some 'successful' (or 'sustainable') submarkets which, *by virtue of the district's wider characteristics,* cater for those who are able to move to housing of higher quality or that is newly-built. This is a case of polarisation, and turnover rates (and void rates) in some submarkets (e.g., social renting, low-income private sector) will be exaggerated by the opportunities released as those who can move do so.

A slightly different measure that can be used in high turnover situations is that of the length of a tenancy. Where tenancy lengths are longer, the opportunity for turnover as a whole in any given area or submarket is diminished. It might be expected, for example, that in a high turnover situation where average tenancy lengths are shorter, then voids would be greater in number but shorter. In fact, an analysis of tenancy lengths and

subsequent void lengths recorded in the project data set found that there was no simple correlation. Cox regression was used to handle the fact that tenancies may still be ongoing and thus of indeterminate length (censored). The resulting fit of the regression model was very weak ($R^2 = 0.0008$; see Figure 3.18).

Clearly, the relationship between tenancies and void lengths is a complex one; particularly in low demand areas where there is greater opportunity for mobility. This suggests that what actually happens is that the ending of a long-term, stable tenancy heralds the onset of an unpredictable (or, at least, different) usage pattern for that property. The submarket that a dwelling is in may thus, as is described in the next chapter, change as a result of becoming unoccupied.

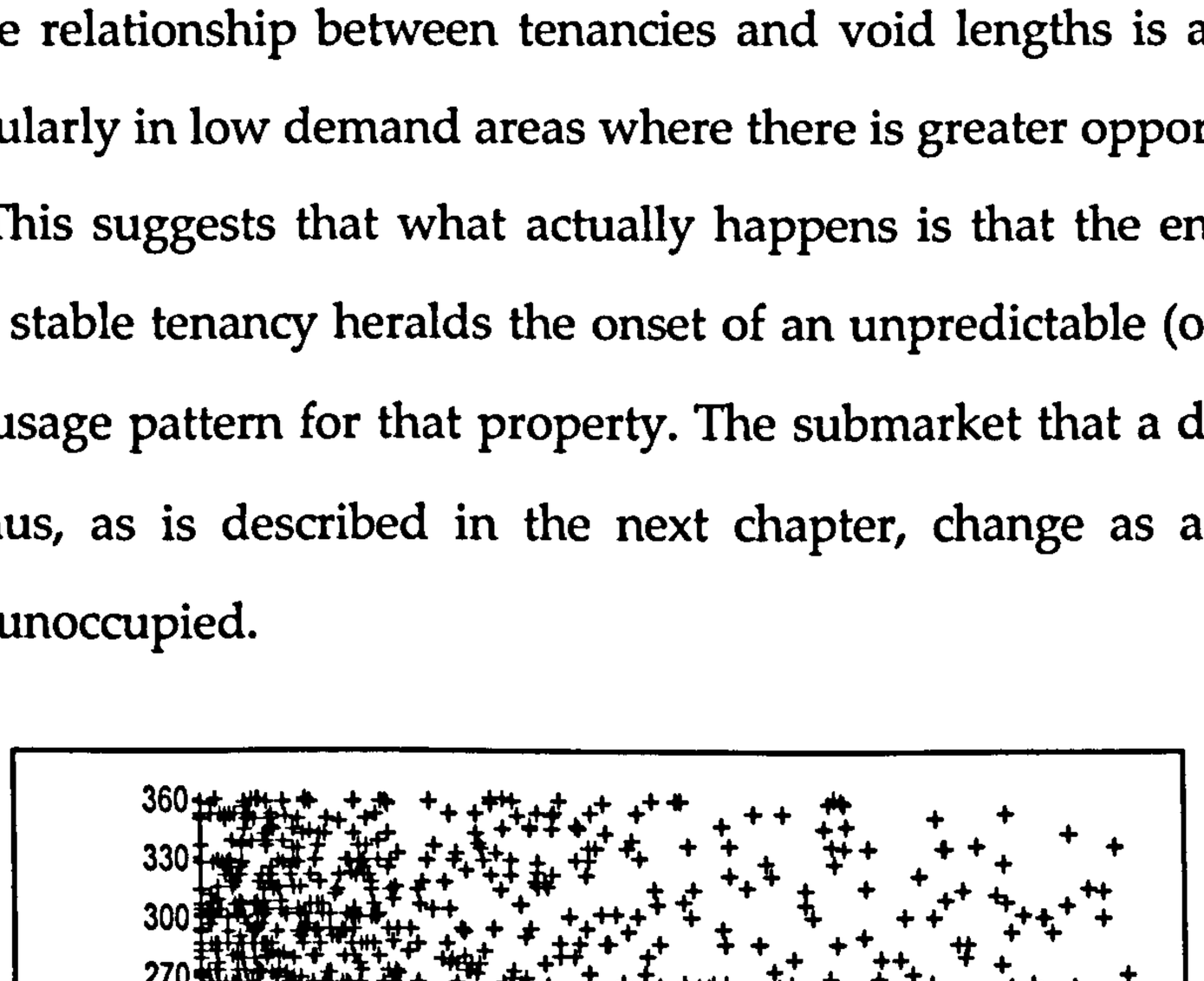


Figure 3.18. Scatterplot of void duration and previous tenancy length, Bradford 1996-2001.

Distinguishing problematic voids

The above analysis of the relationship between void rates and turnover rates suggests that not all voids should be considered an undesirable effect of the

market process, but implies that some sort of monitoring is essential to determine when too many voids do become a cause for concern. An complementary viewpoint, of course, is that not all voids are the same. Some individual voids are more problematic than others. This may be determined by the type of property it arises in, the neighbourhood it arises in, the time it arises at, the length of the void, and a number of other conceivable ways. More briefly, a void can be characterised in terms of its *type*, its *location*, and its *duration*. Some of these aspects can be seen to be constituent and causative parts of others.

Void types

Voids are caused in different ways. It is extremely important to differentiate between different modes of void generation, particularly as the analytical framework developed throughout this thesis uses instances of voids as the objects through which market behaviour and processes are transmitted. For example, the construction of new housing for sale or rent is not treated explicitly, but, rather, as a specific class of vacancy generation.

Various classes of void and, hence, modes of void generation, can be identified These classifications refer to the means through which voids are generated, and it is important to remember that between each group there may or may not be significant variation in the location and duration of voids. The hypothesis that these classifications are useful parallels to market processes however implies that there will be some measurable underlying relationship between these types and the characteristics of their incidence.

The classifications advanced here are *demographic voids; investment voids;* and *mobility voids. Demographic voids* may be seen as principally related to the deaths of single person households or—as a latent process—a result of household configuration following the death of a household member. *Investment voids* are principally the result of new housing investment (but may also occur as landlords consciously restrict lettings to a property or

group of properties with a view to performing maintenance or other investment in the future saleability or let-ability of the dwellings. *Mobility voids* occur as a by-product of households' mobility in the system.

There is some similarity between these classifications and the types identified by Merrett & Smith (1986). Their schema represents a closed system in which voids are generated through rotation; conversion; subtraction; and new-build. Whilst useful as an accounting construct, their identification of a 'subtraction' mode of void generation sits uneasily within the present analytical framework. Subtraction voids happen when there is no subsequent occupier and the property is demolished. In a low demand situation (and particularly in extreme situations leading to abandonment) it is not desirable to specifically identify voids as subtraction voids. We do not know, at the point of incidence of the void, whether it will indeed become 'problematic' or not, much less whether it will eventually be absorbed, as subtraction voids are. By classifying such voids as subtraction voids were are robbing ourselves of the opportunity to explore the relationship between modes of generation and what subsequently happens to the void (does it become 'problematic?', if so, from where?; is it eventually absorbed?).

Merrett and Smith's framework can be far more successfully applied to the description of the *flow* of such empty properties (as, indeed, they do) but this highlights the need to in some way accommodate for the possibility that voids will change in their nature at some time during their existence. Using their classification, a void created intentionally in order to improve a property that then lies empty before being demolished—not unreasonable to expect in a low demand situation—would be classified as a 'post-conversion void.' Using the classification proposed here, it would be an investment void that becomes problematic before being absorbed. In process terms, it is an absorbed void, much like Merrett and Smith's subtraction voids, except it was not evident at the outset that it would become one. The point is that *process* is not necessarily the best way of conceptualising voids in a low

demand context. Instead, we conceptualise of modes of void generation ('void types') which can make transition from one location to another. These locations, as we shall shortly see, include spatial and temporal fixes but also less contiguous constructs like sub-markets and household ('causer') characteristics. The most appropriate framework to deal with voids that can behave in this way is a matrix of transitions, which accounts for the probabilities that a void at one location will become a void at another location, or will *become subject to* absorption of different types. Figure 3.19 shows the general structure for such a matrix.

			Subsequent void type					Row sum of probabilities
			Mobility void[a]				Absorption	
			1	2	3	*n*		
Original void type	Mobility void[a]	1						1.000
		2						1.000
		3						1.000
		n						1.000
	Creation	Investment void						1.000
		Demographic void						1.000

[a] 1,...,*n* here refers to different 'locations' of voids.

Figure 3.19 Position of different void types in notional transition probability matrix.

Void location

Turning now to different void locations, it immediately enriches an understanding of voids to relate the *spaces* of void generation to their modes of generation. *Space,* in this context, includes temporal space alongside traditional Euclidian space; this is further extended to include locations in *attribute space.* The geometric location of a void becomes of decreasing importance the more one incorporates measures of location in other spaces,

particularly attribute space. For this reason, the geometric components of a void's location will be discussed last.

Attribute space refers to these definition and identification of spaces in the 'system.' These can be delineated by characteristics of the other objects in that system that are immediately related to the void. For example, a void is most closely related to one dwelling: the dwelling in which the void occurs. Normally, it is also secondarily related to another dwelling: that from which the void transfers (as a household *in toto* makes the opposite move). Similarly, a void can be closely related to a single household: that which caused the void to transfer (or generate in a property) by moving. Characteristics of these dwellings and households can be used to partition the space within the housing system, such that we can say that a void 'moves' from one location in this system to the other.

Returning now to geometric space, we are not left with much that cannot be satisfactorily explained with reference to the other spaces sketched out above. What we are essentially looking for is those components of a void's location that are *not* explained by situating it in temporal or attribute space. In other words, we are looking for pure spatial effects of a sort—circumstances in which a void's physical, geometric location have an independent effect on the way that void is and behaves. Spatial autocorrelation is the statistical term used for the relationship between the distribution of a phenomenon and its variation across space; we are interested in what is left over; what is not spatially autocorrelated.

IV. VACANCY AND OPPORTUNITY IN BME MARKETS: THE ROLE OF ETHIC MINORITIES IN BRADFORD'S HOUSING MARKET

Bradford has a significant non-white population. It is second only to Leicester outside London in terms of its concentration of people identifying themselves as from minority ethic groups. The most significant of these groups is Pakistani (14.5 per cent of the district population), and Bradford's

Muslim population is the fourth most concentrated in England and Wales (Census 2001). Asian groups, including Pakistani, have grown significantly in proportional terms since 1991, as has the Black African population. The Pakistan population has grown by nearly 47 per cent, and has more importantly grown in absolute terms, by around 22,700 persons (Table 3.2).

Table 3.2. Population in Bradford by ethnic group, 1991 and 2001.

	2001		1991		Change in
Ethnic group	Number	%	Number	%	% share
White	366041	78.3%	390784	85.4%	-8.4%
Mixed[a]	6937	1.5%	N/A	N/A	N/A
Indian	12504	2.7%	11713	2.6%	4.4%
Pakistani	67994	14.5%	45280	9.9%	46.8%
Bangladeshi	4967	1.1%	3653	0.8%	33.0%
Other Asian	2932	0.6%	1597	0.3%	79.5%
Black Caribbean	3038	0.6%	3323	0.7%	-10.6%
Black African	970	0.2%	610	0.1%	55.5%
Other Black	325	0.1%	1403	0.3%	-77.3%
Other[b]	1957	0.4%	3740	0.8%	-48.8%
All persons	**467665**		**457344**		

[a] The mixed category was not offered in the 1991 Census. A small component of all 1991 counts must therefore be considered to be covered by the mixed category in 2001.
[b] Including Chinese.
Source: 2001 Census; 1991 Census.

The size of the BME population in Bradford is clearly a significant local factor in the structure of the housing market. There is some evidence to suggest that a large BME population can stabilise local housing markets in areas that might otherwise be considered as prone to the risk of demand problems (Cameron & Field 2000; Lee & Nevin 2003). Manningham Housing Association, one of the principal RSLs serving BME client groups in Bradford, reports a negligible void rate and that lettings difficulties were not something that applied to them (Pers. Comm., 2002). However, the experience of demand in these situations sits uncomfortably alongside

policies aimed at increasing diversity and inclusion in neighbourhoods. Areas of large BME populations that measure highly on scores of deprivation but that do not exhibit problematic signs of demand difficulties are often very segregated in terms of their ethnic composition. Community networks are tight; loyalty to the neighbourhood reflects this; and if social housing is sought, RSLs with local connections will find greater favour than the council or, indeed, larger, general-needs RSLs with operations across the region or nationally. Smaller BME housing associations generally have sounder financial futures than larger ones (Marshall *et al.* 1998).

The more favourable voids picture for BME associations thus demonstrates the stark challenge that faces housing investment policy-makers, as well as the urban policy community generally. The central issue remains, is desegregation the most appropriate policy in terms of the sustainability of local housing markets (leaving to one side wider questions of inclusion)?

Tackling social exclusion and poverty sets up households on a trajectory out of constraint and into choice. A critical waypoint occurs when access to this choice materialises. Will the household exhibit loyalty to the neighbourhood, or will it move, possibly to the suburbs or elsewhere where the housing opportunities are more in line with requirements, expectations and aspirations? This is partly to do with the mix of housing opportunities on offer in the current neighbourhood. It is also, however, a function of the nature of the household's demand characteristics. If these impose strict geographic constraints, such as proximity to family or places of worship, then there is a greater chance that even households rising in affluence may well choose to remain in situ.

Households from some ethnic minority backgrounds will tend to exhibit more signs of these geographic constraints than others (e.g., Cameron & Field 2000). High levels of segregation will therefore result in neighbourhoods in a better position to achieve some degree of sustainability.

Even if aims of social inclusion are not fully achieved and poverty persists, then housing (income-based) constraints replace those geographic constraints, and the overall result will be the same: sustainable demand for housing in that area. This goes some distance towards explaining why some deprived areas are not always necessarily low demand areas.

Areas with a wider choice of different housing types, sizes, and ownership patterns will be more resilient to this phenomenon. They permit those households who are newly affluent to more easily continue their social and community ties to their neighbourhood. Those households who can afford to alter their housing consumption to better fit their needs and aspirations can do so whilst moving very short distances, geographically (whilst at the same time traversing submarkets). Whilst short move lengths are demonstrative of internal churning, this cannot be considered as an undesirable symptom of low demand in all circumstances.

Second, and more important is that this sort of 'internal perpetuation' resulting from highly segregated patterns is dependent on a particular form of social and cultural consumption that it could be argued is temporary and will be subject to massive unidirectional change in years to come. What has essentially been argued is that segregated patterns of ethnicity 'artificially' props up the housing market in some areas. Lee & Nevin (2003) make some reference to this with respect to changing demand in Britain. This is based on the assumption that tight support networks and family ties exist in immigrant communities and there is a resultant tendency for such groups to cluster together. However, as third and fourth generation households become less attached to these social networks and less dependent or indeed loyal to ties of kinship and culture, they will begin to move away to occupy housing that is more closely aligned with their needs, quality expectations, and aspirations. These processes are happing now and will continue to do so irreversibly. The impact on areas of poor physical quality housing stock will be large. These areas will become dangerously exposed to low demand;

perhaps more along 'traditional' difficult-to-let lines, but nonetheless the area's function and its housing will become obsolete.

Critics could argue that these observations are tantamount to an attack on policies aimed at ethnic desegregation and fostering inclusion in the housing market. This is not the case. Whilst it is acknowledged that some features of 'segregated' neighbourhoods are contributing to their internal perpetuation and a degree of stability in market outcomes (e.g., prices and turnover) this is much to do with the monolithic supply in those areas and a lack of internal heterogeneity in the housing opportunities that present themselves. The argument, therefore, is that this evidence suggests that the goal should be to diversify neighbourhoods in terms of their housing provision.

There is a problem here, however. Some experiments in this mould have been attempted, and the results are at best underwhelming. Attempts to diversify tenure (e.g., shared ownership, tenure-mixing) have not been wholly successful in achieving balanced communities. Whilst residents do not necessarily perceive of problems in mixing tenure, social interaction between groups of different tenure or wealth is very low and thus goals of reducing social exclusion are not met (Jupp 2000). But creating neighbourhoods with a diverse mixture of housing opportunities is not something that can be left to the unfettered operation of the housing market. Economies of scale in new house construction and the reliance of estate agents on the importance of place-name ('location') are two powerful forces that work to promote the homogeneity of areas. Intervention in the housing market from vehicles such as the Housing Market Renewal Fund must be primarily concerned with supply diversification, rather than mere urban renewal.

V. BLIGHT AND NEIGHBOURHOOD EFFECTS

Long-term vacant properties in the social rented sector do not just represent missing revenue or a reduction in population of an area. The environmental

implications of vacant properties on the streetscape and the lack of security that is normally afforded by constant occupation result in a significant blight effect on surrounding properties and their market viability (or ease of letting in the case of social rented stock). There is as a result an explicit spatial relationship between void properties and the demand expressed for properties nearby. This is one of the few explicit spatially-defined variables that fit our theoretical framework. Others, it may be recalled, will exhibit high spatial autocorrelation with the distribution of other variables or will have no direct causative effect of their own (as is central to the submarkets thesis). In fact, one aspect of blight was neatly characterised in Grigsby and Rapkin's seminal introduction to the submarkets argument (1960). In it, they demonstrate that extremely micro-level spatial effects (i.e., adjacency) exist and as such abandoned (blighted) properties act to suppress not only the chances of sale of neighbouring properties but also to dissuade the owners of neighbouring properties from carrying out modernisations and alterations to the physical fabric. This is an example of the well-known 'prisoner's dilemma,' the dilemma here being that modernisation of the property is unlikely to bring about increased values or rental yields in excess of the invested amount *unless* works to neighbouring properties are carried out simultaneously. This provides some of the justification for enveloping schemes and other forms of area-based renewal of the private sector. There is some evidence to suggest that capital assistance to owner-occupiers, such as through General Improvement Areas (GIAs), Housing Action Areas (HAAs), and later 'enveloping' schemes have been limited in the impact they have subsequently had on the resale values of the properties improved, although their position in the market has been sustained with regard to their popularity (Groves & Niner 1998).

The general implication is that neighbourhood effects related to the prevalence of vacant properties do exist, even if these are limited to immediate environs, such as streets or estates. In terms of hypothesising about the factors that govern demand, the incidence and prevalence of voids

offers us one of the few spatially-differentiated causative variables with which we can find a way into determining the likely demand for properties and small areas. This concurs with processes observed at micro levels, and the literature abounds with examples whereby the concept of blight (in particular, its physical and visual manifestations) lead to a 'spiral of decline' (Power & Mumford 1999); or areas where this has given way to a perceptions-driven market (Cole *et al.* 2000). There is an argument, then, for the inclusion of an area's void rate as an explanatory variable in housing market modelling. This is different from saying that void rates are a good *indicator* of low demand, for example. In this case, it is difficult to differentiate between 'low demand' and 'unpopular housing' (Chartered Institute of Housing 2000). Rather, the assertion is that to account for the neighbourhood effects discussed above, it is necessary to include some measure of area 'blight' in any model that attempts to model future supply-demand interactions—particularly as voids not only represent blight as an externality, but also embody opportunity for mobility and thus a *flow of supply* in the housing market.

Chapter Four.

ANALYSING THE HOUSING MARKET.

Housing market theory and methodology.

SOCIAL HOUSING NO longer enjoys a guaranteed customer base as it once did. The forces that have acted upon areas and neighbourhoods resulting in low demand have overwhelmingly been those of the economy and employment. The markets for housing and for labour are bound together by people and their movements. Low demand is the product of an unfavourable interaction of both these markets. The crevasse between regions of economic prosperity and decline has widened, as has the gap between the housing that people are choosing to live in and the stock that is being left behind. In many situations social housing can no longer be seen embodying a distinct market of its own but rather as an intrinsic part of the housing market itself.

The evidence points to the inevitability, particularly in the context of low demand for housing, that a market approach must be adopted for analysis.

Social housing no longer finds itself isolated from the forces of market provision—whether in its provision, management, consumption, and, increasingly, allocation. There are some more powerful reasons for analytically situating low demand within a market context. This chapter starts by reviewing some of these reasons and exposes some of the arguments for a housing market approach. Then, it introduces an analytical framework that allows the recognition of the particular qualities of housing while developing its linkages to other forces, at different spatial scales and to the macro-economy. To operationalise some of these linkages, the chapter then examines the two related concepts of *filtering* and *sub-markets*. It also examines some alternative strategies for the empirical delineation of the markets, and discusses issues related to the spatial component of sub-markets, in particular *neighbourhoods*. Finally, this chapter will draw together this debate and proffer a working model of the housing market to underpin the project's empirical work.

I. INTRODUCTION: THE MARKET CONTEXT OF SOCIAL HOUSING

To begin with, the question may be posed: what has changed that so invalidates adopting a purely social administrative or bureaucratic approach to the analysis of social housing? To answer this, reference must first be made to a brief history of the changing nature and role of social housing in the UK. Regard must also be had to the macro-economy, which directly impinges on the *users* of housing and hence on demand for housing itself regardless of the nature of the system governing its supply and allocation. Finally, developments in the theory of housing markets and advances in economic analytical techniques will be recognised, both of which contribute directly to making the situation of social housing within a market analytical framework plausible and necessary.

Public provision of housing first arose from an intense concern into the living conditions of the working classes and a clearly expounded link between poor housing stock and health problems. By the end of the First World War a

number of key pieces of legislation had firmly established the role of state intervention in the housing of the population. The Housing and Town Planning Act of 1919 made a mandatory requirement of councils to assess the need for state housing in their area and as such facilitated the widespread subsidy of new housing construction. Just prior to this, dissatisfaction with the level of rents being charged by the then-dominant private-rented sector led to the 1915 Rent and Mortgage Restrictions Act and with it, in effect, demand-side subsidisation. In the mid-1920s a new Labour government and more legislation, notably the 1924 Housing (Financial Provisions) Act (Wheatley Act), meant that by the end of that decade, municipal housing was becoming established as the *de facto* mode of housing provision for working class households.

This pattern of public-sector investment in housing received a second boost by the resurgence of working class influence following the Second World War. This led to another decade or so of sustained state housing provision (Malpass & Murie 1994). By the start of the 1990s, many of the trends that had been set in train during the 1960s and 70s had been reinforced and realised. Strategic policy changes have redefined the housing market, redistributed the tenure pattern, and led to council housing being seen as a 'residual' tenure (Forrest & Murie 1983; Malpass & Murie 1994). Furthermore, Malpass and Murie note that the impact of the macro economy on housing policy has become more marked:

> "Some of the most significant influences on policy have been associated with economic and fiscal policies rather than housing policy change. For example, low inflation and high interest rates have affected housing subsidy and other expenditures and costs. Rates of house price inflation ... have had effects on individuals problems of meeting housing costs, of mobility, maintenance and repair" (Malpass & Murie 1994: 124).

Changes in the extent and direction of public housing intervention have not been independent of shifts in political priorities throughout the course of the

last three decades of the twentieth century. Policies aimed at increasing home ownership were part of an ideological package of instruments concerned with the privatisation of key state industries; a shift in the role of local government away from service provision towards 'enabling'; deregulation of monopolised markets; freeing up international trade restrictions; and promoting individual enterprise and entrepreneurship. All of these measures have had very tangible implications for individual households, particularly as they have affected the employment market. In almost all spheres of public service provision there has been increasing awareness and uptake of alternative private modes, as well as an associated closer interaction between individuals and their choice of service providers. In the case of personal financial products, the wider availability and reliance on credit has let to the situation where personal borrowing is considered *de rigueur* whilst at the same time making the fortunes of individual households more closely linked to the tides of the national and international economy. Interest rate fluctuation, for example, has an instant effect on at least that part of the demand that is expressible by consumers for owner-occupied and market rent housing. The ability for the housing system to adjust its supply to compensate is limited: housing is a fixed commodity with built-in lags (including construction time and administrative procedures such as planning consent) which mutes its responsiveness to changes in demand.

The relationship between social housing and the economy may be even more problematic and difficult to model. On the one hand it may be logical to conclude that there may be an inverse relationship: as personal affordability (including that measured, say, in terms of access to credit) increases and so does demand for private sector housing, this may reduce the effective demand for social housing. Conversely, in constrained markets such as London and the South East, private sector prices may increase and thus lead to high demand for social housing. The risk of financial 'unsustainability' becoming associated with home ownership, and the increasing

'flexibilisation' of the workplace are further muddying the waters for tenure choice (Ford & Burrows 1999).

The extent to which regional variation in economic performance may affect population migration and household formation is well established and forms the basis for a number of established methods for estimating the need for social housing (notably Holmans, etc.). However, regard must also be had to the possible limiting effects that high levels of home ownership has on labour mobility, which may serve to mitigate the migration impact (Henley 1998).

What is clear is that it is crucial that the analysis has regard to housing market *outcomes*, that is, the expressed demand and supply, and measures of price. The concept of *affordability* is one such 'outcome' measure. Social housing cannot be regarded as a separate issue: the instantaneous utility—in principle at least—gained from housing is the same whether it is provided through the public or private sector (notwithstanding long-term capital accumulation). Demand for one is partially related to demand for the other. It is generally the case that all housing is competing for a fixed pool of consumers but this is not always the case, as people can reconfigure their household formation tactics in response to price. Demand for both (as well as supply) is also related to how the wider macroeconomic climate impinges on the prices willing to be paid. A market approach is unavoidable if simply because of the fact that people pay for their housing and are free to make choices regarding the amount they would be willing to pay. Even in situations where one hundred per cent of the housing cost is borne by housing benefit, a market approach is necessary. The fact that households' position in the employment market effectively governs the availability of housing benefit and can be managed by the household to maximise effective income (deciding whether or not to work) cements one particular link between the housing and employment markets (Ford *et al.* 1998; Kemp 1998; Kemp 2000).

Econometric approaches have often in the past come under criticism for being insensitive to the wide myriad of forces acting upon demand for housing, particularly environmental and societal. However a number of techniques have recently improved the ability for a wider variety of things to be treated as externalities and thus endogenous to the system as a whole. Goodman & Thibodeau (1998) and Orford (1999), for example, show how access considerations (such as proximity to amenities and transportation nodes) can be expressed in terms of market valuations.

Social housing as submarket.

Responses to demand problems in social housing have been variable but in general suggest that there is recognition by providers of its shifting market position. Pilots of responsive allocation mechanisms such as Choice Based Lettings have brought social housing a little closer to the market of which, in reality, it is a part of. The first chapters necessarily lead to the conclusion that social housing is not a market but rather is more accurately described as a number of *submarkets* – perhaps even only one submarket.

There are of course problems with this. It presents additional complexity in the analysis of the social housing system that means it must be methodologically integrated into housing market analysis. This circumscribes a unique set of challenges. Not all the accepted measures of market performance can be easily applied to the social—or indeed rented — tenures. Similarly, many of the techniques and conventions deployed in the bureaucratic tradition rely on data that are either non-existent or extremely difficult to collect for the private sector. Moreover, the housing market is not uniformly impacted upon by policy or subsidy. Whilst social housing can be characterised as a submarket from a demand perspective it is clear that the arrangements governing supply to this submarket are quite distinct from the private sector. However, from a demand point of view, the distinctions between the tenures are relatively irrelevant (limited, perhaps, to financial considerations between buying and renting, or between the commodities

that tenure might represent[31]). Therefore, social housing must imperatively be viewed as part of the wider market—it is an option for households in the market rather than an automatic destination—even if that introduces complexities in allowing for differentials in supply strategies and activity.

The primary concern of this study, however, is not with houses or even households *per se*, but with empty houses. Vacant dwellings are tenure-blind and are largely inured to divisions in ownership or administrative arrangements. They do, however, represent a cost. That may be through lost rent, diminished yields or depressed sale prices, if one was to concentrate solely on the financial definition. A wider econometric standpoint might include the external cost of vacant dwellings to the market itself, to the utility of householders and other agents, and in terms of the reduced cost-effectiveness of local service delivery in depopulating neighbourhoods. Wider still, social and environmental costs can be considered. Under-occupied estates are very difficult environments to maintain pride in. Empty homes are symbolic of a breakdown in social cohesion and the destabilising forces that occur when community networks dissipate and fragment, creating conditions in which anti-social behaviour flourishes. It is not only emptiness of the houses, but of the economic opportunities for householders and the reasons that they may have had for once choosing or needing to live there.

The present study then is, essentially, about the problem of what is *not* there: households and demand. But it is also about what is left behind: houses—physical structures and assets—empty because no one wants to live in them. The costs are non-trivial, and they impact on society in every way: on its financial resources, its environment, and its people.

Because the costs are not only financial, but environmental and social too, caution must be exercised in adopting a suitable framework for the analysis

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[31] See, for example, Flint & Rowlands (2003) on the commodification of housing.

of this problem. An accounting framework designed to count properties and voids may offer little opportunity to account for the macroeconomic forces that serve to vary the intrinsic value of 'a property' across space and time. Neither will it be sensitive to the paradox that more is not necessarily best: while there is a national net deficit in the number of houses, a localised over-supply can lead to the sort of blight and neighbourhood breakdown that is sometimes associated with high levels of voids and turnover.

To merely look at the problem 'locally' or in terms of environmental or societal costs (at least, at the local scale) similarly cannot be fully justified. As falling or changing demand for housing, particularly for lower-income housing, affects an area then its local system becomes more vulnerable to activities in the wider housing market, in particular developers offering access to the owner-occupied sector at all but the most marginal of costs. This is mainly through new-build, but the activities of disreputable solicitors and financiers in persuading households to exercise their Right-to-Buy might also be considered here. Regard must then be had to the supply of housing for market (non-social) consumption and the strategies and objectives of suppliers of that housing. Whilst the houses themselves are static, demand for them is not so, and while supply is relatively durable, immobile, and unresponsive to changes in demand, it is not always the case. Households cannot be expected to remain loyal to tenure or neighbourhood when the gap between the price of social housing and private housing narrows to such an extent that there may be in effect two levels of quality available at the same price. This is exactly the sort of outcome that can be expected of economic strategies predicated on rational household behaviour, and is one of Grigsby 's (1963) tests for the existence of submarkets.[32]

Therefore, we need some conception of a market that can deal with the facts that (i) social housing and its consumers find themselves in a market

[32] Grigsby developed his sub-market analysis in 1963 in *Housing markets and public policy* (Grigsby 1963). Galster has recently published a useful review of the development of the sub-markets and filtering literature after Grigsby (Galster 1996).

situation; but that (ii) there exists not one market for housing with continuous price distribution but a situation whereby similar housing can command different prices, or different housing can command similar prices. It is this last scenario that suggests that some form of 'sub-market' analysis is a prerequisite for the low demand context.

II. AN ECONOMIC FRAMEWORK FOR HOUSING

This chapter's introduction, described how the problem under investigation—that of undesirable, unpopular, and consequently empty dwellings—has financial, social, and environmental costs, and that any framework for analysis must be cognisant to these. The gap between renting and buying was considered and in particular it was suggested that, rather than being peripheral to the housing market (or constituting its own market), social housing is best understood as a specific submarket or group of submarkets. To further develop this into an analytical framework it is prudent to first consider the nature of the wider market and particularly its relationship with the macroeconomy. To do this, some basic economic characteristics of housing require expounding. Housing is a unique good in economic terms and thus commands a unique approach to modelling the market within which it is supplied and demanded (Rothenberg *et al.* 1991). It is on one hand the ultimate 'consumer durable,' but it is also modifiable and often performs a secondary (sometimes primary) role of that as an investment commodity. Its immobility means that a large number of extrinsic factors go to make up the 'worth' of a house, including proximity to labour and education markets, and neighbourhood and environmental externalities. The high costs—and durability—of housing mean that it has a particular role as a potential means of investment income over the longer term, and, especially since the deregulation of mortgage markets, as collateral for non-housing borrowing. Miles (1994) also notes that housing plays a special role in the relationship between lending institutions and the economy; that housing is important because of its sheer proportionate size in

household assets; and that this position is aided by favourable taxation rules and the importance of housing in bequests (Miles 1994: 8).

Nevertheless, Meen (1990) suggests that the links between housing and the macroeconomy can be mainly seen through changes in house prices, and the effects that these have on personal wealth and labour market segmentation (Meen 1990). In particular, house price differentials reflect not only the variation in the 'total housing package' on offer in an area, but the differences in the labour market and macro economy *between areas*. This gives further weight to Grigsby's (1963) concept of submarkets and goes some way towards explaining why different prices, in effect, exist for what may, superficially at least, appear to be the same goods. There may also exist, however, more localised explanations for the same phenomenon.

For this we must pay some further regard to the work of Grigsby and the concepts of *filtering* and *neighbourhood*. The latter in particular, however it may be defined, could provide one explanation of the existence of price differentials among similar goods. Neighbourhood as a term readily implies *residence* and some degree of *spatial proximity*. As a concept it is inherently spatial and one that relates to housing in that it is concerned with where people live. That the term refers to residential location and the spatial configuration of this can only be seen a basic common denominator. Further developments of the concept of neighbourhood could for example emphasise the *type* of neighbours over the distance between them; sociologists might use the term to refer to social networks. However, as has already been said, *space* and in particular the location of housing are inescapably wrapped up in the term 'neighbourhood' however one may choose to define it. Galster (2001) reviews the concept of neighbourhood and finds that this over emphasis on space—or, rather, an over-simplistic conceptualisation of role that space plays in neighbourhood dynamics—is a common thread running through many attempts at neighbourhood definition.

While there exists no common consensus on what exactly constitutes a 'neighbourhood'—or even roughly what size one should be[33]—the use of the concept is prevalent in local politics, regeneration, and for the assessment of funding criteria and service provision. Such activities require the 'neighbourhood' to be demarcated by a boundary and so imply some degree of internal homogeneity. The current emphasis of UK government departments on 'neighbourhood renewal' and the collection of 'neighbourhood statistics' confirms that thinking is now very much on the operation of influences at the local scale, where people live, and with a strong element of geography.[34] The insistence of the ODPM that its nine Housing Market Renewal Fund (HMRF) pathfinders must implement their plans through the establishment of Area Development Frameworks indicates the continuing importance of local spatiality within the policy environment.

Notwithstanding the way that neighbourhoods may actually operate, Grigsby *et al.* identify three principle views of 'neighbourhood' (Grigsby *et al.* 1987), that are concomitant with different *purposes* to which definitions of neighbourhood are put. First is a sociological/communitarian view that emphasises the social networks between people and hence defines neighbourhood homogeneity in terms of functional groupings such as income, ethnicity, or interests. Second is the idea that neighbourhoods are essential spatial units for the operation of local politics. They are the most meaningful political units to ensure democracy in matters of *local* concern. Galster (2001), as we have seen, has addressed precisely the question of what a neighbourhood is in this context, and how this might relate to more objective, empirical definitions of the same. Lastly, Grigsby *et al.* note that neighbourhoods can exist as internally homogenous geographic subsections,

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[33] Suttles (1972) goes so far as to suggest a four-level hierarchy based on supervisable areas for childrens' play through to the areas of residents' socio-political participation and relationships with external organisations.

[34] The Social Exclusion Unit in particular has been active in promoting neighbourhood renewal and appropriate research and response at the neighbourhood level Social Exclusion Unit 1998; Social Exclusion Unit 2000.

emphasising geographic location as the characteristic common to all its residents, which in itself may give rise to other similarities. Neighbourhood in the other senses, it is argued, is latent and only comes to the fore when the environment of the residents, or the welfare of the neighbourhood as a geographic entity, is challenged.

Common to all three definitions of neighbourhood is the idea that they are spatially *contiguous*. This is why a neighbourhood cannot necessarily be equated with a sub-market (although in some areas there will be greater coincidence than in others). Accepting the submarkets hypothesis that housing offers services comprising of differing 'bundles' of attributes which are implicitly valued by households, and that demand will vary according to household and stock attributes, then it follows that dwellings in the same sub-market are *not necessarily spatially contiguous*. A sub-markets analysis proposes that different houses are *more or less substitutable* for each other when subjected to search by prospective owners or renters. The housing stock can be sub-divided according to attributes such as dwelling size, building type, construction type, tenure, type of heating, performance of local schools, perceptions of crime, quality of the built environment, distance from economic nodes, and potentially limitless others. Some, but not all, of these attributes may have a clear spatial relationship to the house itself and others may in fact be purely predicated on space. The aggregate relationship of housing and space, and thus the influence of space on the housing market, is therefore complex. Similarly, households (or at least head of household) can be identified by their age, number of dependents, gender, ethnicity, income, and similar attributes—and also by the origin of that household in spatial and other (e.g., tenurial) terms.

The sub-markets hypothesis is necessary to account for these differences and also for the fact that otherwise-'similar' housing may command different prices in different areas, or according to the type of consumer it is aimed at.

There remains, however, that key difficulty alluded to above: that of the *location attribute.*

The question might be put thus: how does 'location' situate itself within the housing mix? In other words, is 'location' an explicitly priced attribute of an area or is it an intrinsic function of that area's other attributes. The example of an 'undesirable location' may be taken: one that is unpopular and where prices are low. (Assume that this is not a chronic 'low demand' situation, i.e., there exists elsewhere nearby a reasonably buoyant part of the housing market and that this area's unpopularity does not merely arise because all areas are unpopular.) In this 'undesirable location,' location is a negative attribute. Does this arise because the area has bad housing, traffic, crime, and air? On the other hand, does this arise because the area is *perceived* as being bad? And, more importantly, does this lead to location as an attribute being double counted in the assessment by the market of that area's price? If the fact that the area has a traffic problem devalues the housing by £10,000 does the fact that this traffic contributes to it being a 'bad location' further affect its price (e.g., through stigmatisation)?

This is an important issue because of the acknowledged popular importance of 'location, location, location' as being an all-pervasive driver of prices, and also because it implies specific spatial attributes of the sort partly rejected by the sub-markets and substitutability arguments. Furthermore, it can importantly provide an explanation for variation in house prices of similar stock below the macro/structural level.

It is likely that both explanations of location attribute importance, in part, hold truth. If perceptions of an area were all that ever mattered, then that area cannot be feasibly expected to change. Total recourse to an area's image or stigma would impede any investment and mobility required for area change dynamics. Areas clearly do change over time. On the other hand, if actors always behaved completely rationally and ignored perceptions,

demand would be elastic with respect to location, and stigmatisation and associated lettings difficulties would not exist where the problems were surmountable. The coexistence of both of these explanations may lead to lags between housing policy implementation and subsequent upturns in popularity or values. Perception will linger but will be overcome in time by diminishing reticence and signs of visible improvement. One can imagine the opposite situation where a bad neighbourhood 'on paper' may inexplicably remain popular for a while.

What this means is that the 'location attribute'—i.e., the intrinsic worth of a house simply *being where it is*—provides one of the few geographically contingent variables in sub-market delineation. Location must not be treated as an all-encompassing hedonic variable (such as price) to avoid the risks of double-counting the intrinsic worth of other attributes. Instead, location will be better dealt with by treating it as a single attribute on its own which, alongside such factors as proximity to schools, and the supply configuration of houses in blocks and estates, may lead to a tendency (not a necessary outcome) towards spatial contiguity. Conversely, the location attribute may just as feasibly articulate households' desire for seclusion and quietness in sub-markets where the associated premium is willing to be paid (e.g., manor houses, farm houses). In such situations a premium on 'location' leads to spatial dispersion rather than contiguity.

By treating those variables with a spatial effect separately—no different from stock attributes, for example—then we are explicitly drawing a distinction between 'the neighbourhood' and 'the sub-market.' Grigsby *et al.* used the neighbourhood as the basis for looking at the operation of *filtering,* referring to the process as 'neighbourhood succession' after the tradition of early urban ecologists such as Park and Burgess (Grigsby *et al.* 1987). If as is suggested, however, neighbourhood effects (as expressed through spatially contingent variables) form only *part* of a sub-market definition, and sub-

market attributes may vary below the neighbourhood level, then there is reason to reject the neighbourhood as the primary unit of analysis.

Grigsby *et al.* assert:

> "Because residential structures in any particular neighbourhood usually have been built at about the same time, have closely comparable locational characteristics, and are of similar construction, capital depreciation and associated filtering are typically neighborhood-wide." (Grigsby *et al.* 1987, 25)

Implicitly, then, neighbourhood-level analysis assumes internal homogeneity and, indeed, is used where such homogeneity can be expected; it *cannot* be extrapolated from this, however, that neighbourhoods are the units at which change occurs or at which market processes operate.

Instead, a sub-market framework which treats the neighbourhood as describing the tendency for certain non-spatial attributes to be clustered together, and as in itself contributing spatial attributes to same sub-market, would naturally lend itself to an analysis of *dwellings* and *households*. This is because variation between these units across important determining variables does not necessarily require spatial contiguity. In this way, 'neighbourhoods' become distinct from 'neighbourhood externalities' and can be derived empirically rather than imposed *a priori*.

Another reason for the focus on individual dwellings and households is because of modes of *access* to housing. If, as Flint and Rowlands (2003) suggest, housing has been commodified (e.g., 'branded') and represents to the consumer not only the intrinsic economic qualities of its utility (even in the widest sense of that word) but allows him/her to buy into a particular lifestyle choice (e.g., city living) then the cultural and symbolic capital bound up in housing must be recognised. As with so many other consumer goods, the consumption of brands and the values attached to them depend on the 'normalising forces' of the demander's situation with respect to social,

cultural and symbolic capital, and the demander's own social and cultural networks define this positionality. These networks, which may work in ways that are very aspatial, accentuate the role of friends, family, work colleagues and other social groups not only in securing housing but in supplying information that in turn shapes search behaviour. This may serve to explain why similar households may tend towards clustering in certain areas (as in processes of gentrification) but emphasises the micro-operation of the housing market, the contingency of these operations on the availability of empty housing of a particular type at a particular time, and non-spatial attributes such as tenure.

Classifying housing sub-markets

Housing sub-markets are an intuitive and widely held concept. They are made operational in many informal ways, perhaps particularly in the way that estate agents and other actors view the market, but also by local authorities and policy makers. More often than not, segmentation of the housing system into sub-markets will be an implicit outcome; usually this will take the form of spatial delineation. The sub-markets that are in this way defined—*a priori*—nonetheless have an important function and are often the basis for housing strategy, policies, and investment. Their application is non-trivial.

There are a number of ways in which housing sub-markets can be defined. An intuitive *a priori* classification, largely based on a mixture of local knowledge, socio-economic evidence, and the constraints of administrative geography, is arguably the most often used approach. Clearly such an approach, whilst convenient, readily makes a number of false assumptions, particularly that housing markets are spatially delineable and that housing market conditions are closely correlated with socio-economic features such as deprivation.

An alternative approach is found in the use of market segmentation models, which have their origins in marketing and are based on improving understanding of the client base and its profile. As such, it is principally a demand-side technique, using characteristics of households to segment the market according to likely sources of demand. It takes as its basis the idea of competition; that different housing providers are in competition with each other for a limited pool of households. In this sense it is particularly suited to a low demand environment where indeed households are largely able to exercise a greater degree of choice. Beevers (1999) applied the principles to attempt to show how the adoption of marketing techniques by social housing providers could enable them to insulate themselves against the effects of low demand. Problems with this approach are that insufficient attention is paid to the characteristics of the housing stock; not all sub-markets may exhibit demand deficiencies;

Bourassa *et al.* have used a number of statistical techniques to define sub-markets from both individual-level and aggregate attribute data (Bourassa *et al.* 1999). They concluded that all attempts at classification into submarkets yielded significant improvements over using *a priori* classification. This conclusion was based on the degree of error in hedonic pricing equations that were calculated for the sub-markets. Regardless of the statistical technique employed, the implication is that empirically deriving a sub-market classification from observed data produces sub-markets that, in terms of describing the operation of the market, out-perform both *a priori* classifications and a treatment of the market as a whole.

More recently, Bourassa *et al.* (2003) have considered the effect of space in the definition of housing submarkets, and question first whether submarkets matter, and second, whether space has anything to do with this. They conclude that spatially delineated submarkets 'perform' better than statistically derived ones. Their measure of success in this respect is the accuracy of hedonic predictions of price. They do however fail to properly

consider the degree to which space and its value is implicit within other variables. They also admit that one of the main reasons behind their claim for the superiority of spatial delineation is that it yields more practically useful results. Furthermore, they are explicit in their statement that one of the main factors in judging the success of submarket definition is the use to which it will be put. In this respect, their analysis is very much concerned with optimising the accuracy of mass-appraisal of financing for owner-occupation. In our case, on the other hand, we emphasise the requirements of substitutability; the effect of fragmented tenure patterns in the UK (and the 'brand' acceptance of tenure); and the need to maximise the internal homogeneity of the submarkets in terms of supply-and demand-characteristics so that mobility can be viewed not in locational terms but in terms of individual dwellings. In many respects, incorporating social renting within a market context violates many of the assumptions made by proponents of hedonic methods. To give an example, one aspect of 'pure' space captured within Bourassa *et al.*'s (2003) model is a variable measuring distance between house and the CBD. The legacy of inter-war social housing development in the UK context is that many social housing estates have been located in peripheral areas and there exists no clear radial spatial patterning of housing sub-markets. Bourassa *et al.*'s methods in this way would have little applicability to the British housing market just as much as the extreme case of Los Angeles would also confound them. Space in the postmodern or 'network' society clearly requires a far more sensitive and subtle understanding.

Classification of sub-markets places a great deal of inherent importance on the selection of variables; that is, on what basis can areas and houses be described as similar, not similar, substitutable, not substitutable? The same selection of variables is necessary in attempts to construct economic models explaining residential location. Muth (1969) for example based his classic model on the trade-off between accessibility (i.e., distance from a central business district, CBD) and housing/land costs, demonstrating how as

incomes rise, there is a tendency to move further out towards the urban fringe. This model has not been particularly successful in describing a variety of cities and situations, leading to a critique by Wheaton (1977) that emphasises the desire for households to gain utility from environmental factors and a desire to homogenise their neighbours and surroundings. He argues that the income elasticity of land consumption is nearly identical to that of travel costs, a position contrary to the central assumption of the Muth model.

Goodman and Thibodeau use education performance data to construct sub-markets, as well as advocating the use of hierarchical linear model to derive sub-markets which take account of dwelling and neighbourhoods characteristics as well as sub-market characteristics (Goodman & Thibodeau 1998).

The context in which sub-markets operate

As was mentioned earlier, the subdivision of the housing market into sub-markets is given credence by the fact that often seemingly similar 'units of housing service' can command different prices, resulting in part from high sensitivity to neighbourhood externalities. Sometimes, however, even given apparent substitutability in all respects (including environmental), houses can command different prices or rents in different parts of the country. This is beyond the scale of the local housing market; the distances involved are greater than the travel-to-work geography.

A possible critique of the sub-markets and filtering literature is that it might be said not to adequately deal with macroeconomic conditions and effects, some of which can *directly* impinge on households, but which will also impact on long run demographic and employment trends. The sub-markets literature does however offer a very powerful way of dealing with neighbourhood externalities, and filtering provides a useful connection to supply and housing policy outcomes. The effects of the economy on the

demand behaviour of households are largely sidestepped, however. There would therefore appear to be a paradox between support for sub-markets and filtering as useful instruments for pursuing housing policy goals and Galster's later assertion that demand-side subsidies are generally superior (Galster 1997). Yates and Whitehead reply that such an approach does not take into account variation in macroeconomic fiscal rules that have an impact on individual behaviour (Yates & Whitehead 1998). However, Galster also warns that supply-side subsidies expected to operate through the 'filtering' mechanism may in actuality fail to reach those on lower incomes. It is becoming clear that we need a model of the housing market that successfully reconciles sub-markets (with their significant strengths) with an appreciation of the direct *and* indirect effects of macroeconomic change on the demand for housing.

One way of achieving this might be by envisaging a two-tiered framework for the analysis of the housing market. This could possibly take the form of a hierarchical linear model of the sort suggested by Goodman & Thibodeau (1998). The first tier would be macro in nature and would largely provide the *conditions* in which the second, micro, tier operated. Feedback from the second to the first tier would be limited in the short run. Effects on demand and supply will have to be distinguished.

A two-tier model allows for the fact that the reasons for moving and the criteria used to base decisions on vary according to the distance of the move. Longer moves are predominantly for reasons related to employment. Shorter moves are 'adjustment' moves through which a household aims to better match their circumstances and income to property attributes. A change of employment does not necessarily predicate such a move (although a change in income might). The dynamics of this variation are quite stark as Gleave & Cordey-Hayes (1977) show.

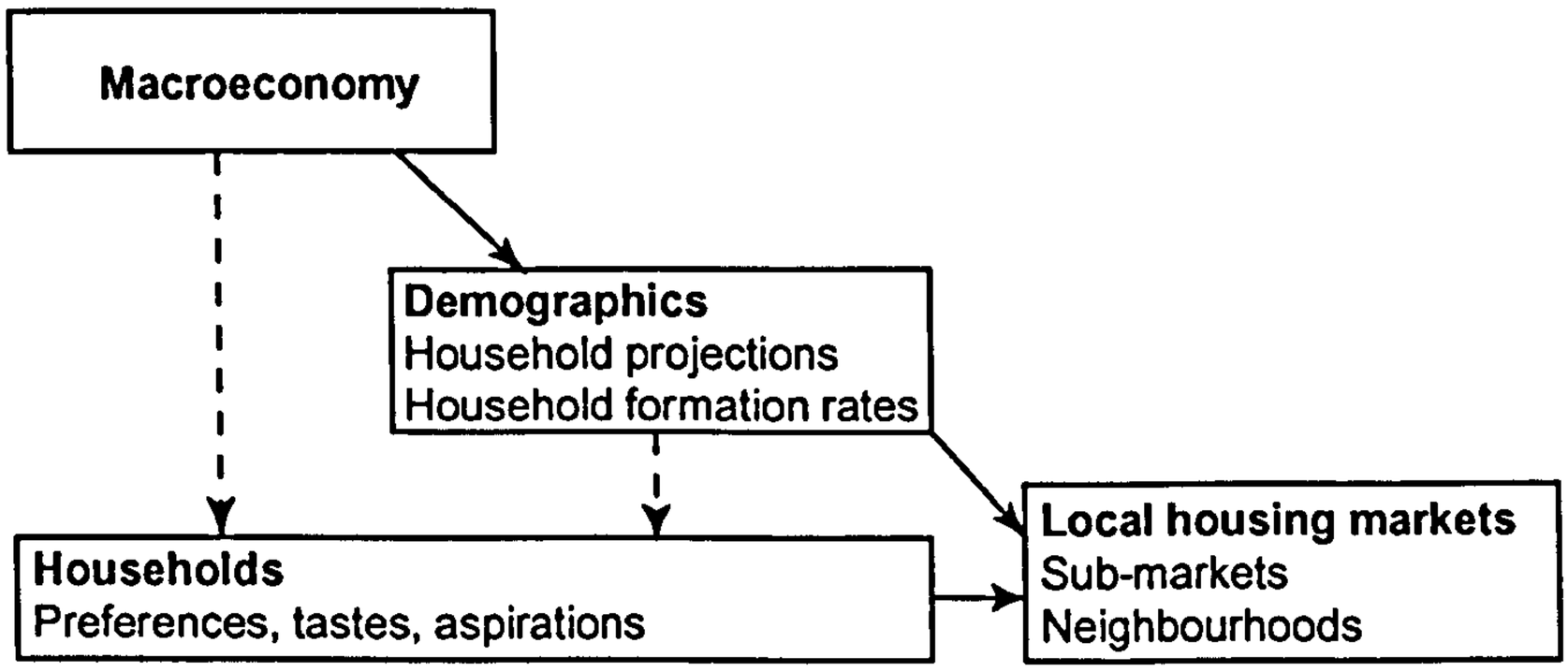


Figure 4.1 Diagram of relationships in markets

A working definition of the housing market

It has become apparent that a working definition of the housing market should also make some distinction between macro/structural effects and neighbourhood/sub-market effects. Wider structural effects may have an impact insofar as they may determine the broad parameters of the housing market. These may be 'fixed' in two senses. First, due to the inhibitive externalities imposed by distance, and the broad need to reside close to the workplace, macro effects may not be felt much below wider spatial scales such as those related to 'travel to work areas' (TTWAs) or similar. Second, they impose broad climate conditions which may influence general trends (towards buying, for example, or to live in smaller properties) but which will not react to the local operation of the housing market.

Structural demographic effects are stable in the short term and provide much of the parameter context (care must be taken however to account for latent demographic effects, such as hidden households). Macroeconomic factors such as the performance of the national economy, the setting of interest rates, and inflation can have effects that relate to inter-regional industrial performance and the employment market, as well as directly on the ability of households to finance housing and particularly their ability to treat housing as an investment good.

In broad terms, then, one could expect that the housing market—insofar as it serves as a mechanism for distributing households among dwellings—might work like this:

(i) Demographic trends which are inelastic in the short run to change in other factors will determine the aggregate number of households which will be in the market for housing at a wider (say, regional) level. This will be partly influenced by macroeconomic conditions as they affect regional economies. The income structure of the population at this level compared to the price distribution of the supply of housing will also determine the gross need for affordable housing.

(ii) At a more localised level, and certainly within an area *accessible* to the employment base, the particular structure of housing supply will vary, and—since all the houses are within accessible distance—will be more or less substitutable for one another in the eyes of demanders. Sub-markets will exist at this localised level and will cater for housing preferences, environment considerations and location perceptions, but it is the wider (macro) level that will explain the existence of major price differentials between similar goods (as in the pressurised South East housing market).

III. REVIEWING APPROACHES TO HOUSING MARKET MODELLING

The remainder of this chapter will consolidate the economic framework that has been developed for this project. By reviewing several other approaches to housing market modelling, each of which holds subtle differences in their underlying conceptions of the market, the suitability of the current framework will hopefully be reinforced. Affordability models, hedonic price models, and methods based on the principal of spatial arbitrage are here considered in turn.

Affordability models

It may be that affordability models of the housing market are currently enjoying increasing popularity. The establishment of regional housing forums to take forward the preparation of regional housing strategies has provided a new opportunity for strategic, cross-tenure work into housing market conditions in England. Affordability is a central concern of many housing markets in the south, but these models are not only confined to these areas. Clearly it is difficult at first to see the logic of affordability models in areas of low demand. That is not to completely dismiss their utility. Affordability, especially across regions, is a complex issue. Regions often traverse many Housing Market Areas and cover a wide diversity of demand situations. Qualitative facets to the affordability equation may be more important in these areas, although models are probably ill-equipped to deal with these.

The basis for most affordability models is some form of comparison between earnings, or income, and the cost of housing – normally house prices in the owner-occupied sector. There is usually an implicit assumption that most households will seek owner-occupation if at all possible and in this way other tenures are often relegated to varying degrees of a residual role. Clearly this is not the case in all situations and more sophisticated conceptions of affordability are probably required in large metropolitan markets, especially London, where rented tenures are more compatible with the flexibility of the labour market in these locales. At their most basic, affordability models represent an accounting construct that attempts to estimate the size of a materialising population (whether through demographic or migratory processes) and an existing backlog who are unable to afford the housing they require. More sophistication can be added by looking at flows instead of stocks and thus allowing the affordability model to more easily be converted into a housing programme with the aim of achieving equilibrium over time.

One of the fundamental flaws in affordability models—or at least, a characteristic which limits their ability to inform strategic housing programmes or Regional Planning Guidance—is in their economic predications. Such models appear to largely ignore the special economic qualities of housing, which have been rehearsed earlier in this chapter. Housing is not a commodity in which demand and supply can be instantaneously matched. Neither is it a commodity where an aggregate match between stocks of supply or demand guarantees its efficient use. Affordability models ignore the knock-on effects of housing investment through residential mobility.

Hedonic price approaches

Hedonic price approaches attempt to disaggregate the subjective price of a service (such as a house) into the constituent prices (implicitly) accorded to each part of that service. This is most usefully translated into an understanding of how much more a consumer would be willing to pay for a particular attribute, for example a utility room or a 'nicer' location. Rosen (1974) introduced the concept, which has since found much favour among housing economists, for understandable reasons, especially given the unique characteristics of houses as an economic good. It has served as the basis of a number of studies and has been extended to include analyses of environmental factors and the use of GIS techniques to attach prices to accessibility measures and locational proximities (Des Rosiers *et al.* 2000; Orford 1999). These touch upon similar ground to this thesis's concerns about space.

However, even when we endeavour to take into account the various components of houses and therefore draw some conclusions about the market impacts of these components—as those interested in hedonic pricing techniques do—and even when we treat space as an independent variable in this fashion, we can still discern differentials in markets outcomes (e.g., price) for what appear to be broadly similar goods.

Critique of hedonic models

Other problems with the use of hedonic price model can be envisaged. Ermisch (1990) suggests that sharp fluctuations in real house prices (of the sort associated with house price cycles) are caused more by changes in the expectations of capital gain in their asset by owner-occupying households that by changes in income levels and numbers of households, which are less volatile. This complicates the specification of the hedonic function. First, with fluctuation in a time-series such as house price comes the associated problem of heteroscedasticity, where variance in the error term of the least-squares regression model is not constant for all observations. This violates the assumptions of conventional parametric estimations of the hedonic function, but may be mitigated by adopting other forms, such as Least Absolute Deviations (Yoo 2001). Second, and more important, if the overall price of housing fluctuates, do the constituent prices fluctuate *pro rata* in synchrony? Or, do entrenched consumer expectations of valuations placed on various attributes of the housing 'bundle' hold still, making these less elastic to fluctuations in real prices and thus skewing the hedonic equation? This may only have an effect on the magnitude of the constant term in the equation while the ratios of the coefficients to each other remain stable, but this would not be true if some valuable components were more elastic to real price change than others. For example, households may always implicitly value house size in relation to the overall house price, but may value environmental amenities in a different way, for example as a ratio of income.

A final identifiable problem with hedonic price models is that they fail to take account of the role of contingency in the housing market. Unlike many other commodities, housing is not uniformly available to all demanders all the time. There must exist a vacancy for a transaction to take place. Prices will reflect this, but it would require a very rich and complex source of information to allow the identification of this effect as separate from other components of the total price.

Migration and spatial arbitrage

Building on a tradition of using migration patterns as the basis for defining local housing market areas, Jones (2002) suggests the use of the concept of spatial arbitrage. Such a position suggests that as buyers are free to shop around spatially, limited only by the extent of their physical ability to do this, then within that area prices will tend to even out as suppliers act to adjust their supply strategies with reference to competition within that area. Because housing is a fixed commodity then the spatial expression of these dynamics is largely left to the consumer and thus two processes are exposed: the process of housing market search, and the actual move itself. Migration patterns in aggregate account for the empirical outcomes of these processes, but there remains some consideration whether an analysis of search behaviour or of migration provides the best platform on which to define and test for market extent. Jones (2002) is highly suspicious of the practical feasibility of analysing housing search patterns and furthermore suggests that it violates the spatial arbitrage principle because it treats potential moves (and the search area) as transactions in their own right when in fact only the final move (if it occurs) represents an arbitrage-causing transaction.

Having made a case against the use of search behaviour, both on the grounds of practicality and logic, Jones contests that the definition of housing markets must be made on the basis of the *interaction* of supply and demand, in other words market outcomes. Migration in this sense, as he notes, is 'expressed' demand. This is of course quite different from demand in the purer economic sense, and might for the purposes of this research be equated with contingent demand—in other words the demand that is able to be satisfied contingent on there being a vacant dwelling to absorb it. Alternatively, at the level of Housing Market Areas—those higher-order spatial units over which migration patterns may be expected to be largely internalised—this element of 'contingency' could also be seen in terms of regional supply constraints. In pressurised housing markets like the south-east of England, few opportunities exist for certain groups to be able to move (although search

activity might remain high). The result in terms of HMAs defined by migration would be to expand the spatial extent of the HMA as extended commuting patterns begin to demonstrate how more distant houses become market substitutes, and thus the sphere within which arbitrage occurs enlarges.

It would appear that the migration-containment approach to defining housing market areas holds some promise. However it does little to explain why, within the HMA, the incidence of price differentials, or submarkets, persists. Spatial arbitrage would suggest that in the long run prices would converge and be directly related to attributes of the housing, thus maximising the accuracy of the hedonic function. This suggests why the use of hedonic pricing techniques have proved popular in testing for submarkets as it generally fails to correctly account for the operation of markets as a whole. Consideration now returns to the hedonic techniques already reviewed, this time with particular reference to their application in *submarkets* analysis.

As part of the justification for adopting the methodology we must look to our underlying theories of the housing market. For Maclennan & Tu (1996) housing markets differ in such important respects that the application of neo-classical microeconomic approaches becomes misleading and serves to underplay, in particular, the temporal dimension. They argue that the signals and processes of the housing market over time, coupled with the temporal frictions that exist in the housing market, lead to disequilibrium and adjustments occurring at the microeconomic level. Whereas traditional microeconomic models are concerned with the coherency of markets, Maclennan & Tu argue this is the spatial scale at which discordance and dysfunction more usually associated with macroeconomics (unemployment, inflation, ...) is actually occurring in housing market terms. This implies the existence of submarkets as a way of accounting for the imperfections that exist, and the fact that the market at any one time can be seen to be as "out of

equilibrium and in the process of adjustment" (Maclennan & Tu 1996) rather than at a describable single state. This therefore calls not for static, snapshot measures of housing market outcomes (as characterized by traditional vacancy, turnover, and price measures) but of dynamic, linked models. Above all, it shifts the onus on the researcher to make sure that what he/she is trying to study is sufficiently responsive to the vector of processes rather than just their magnitude. Snaphots and census-style statistics are likely to fail in this respect. They can neither account sufficiently for the links and frictions that exist in the housing market, nor can they be used to classify activity in the housing market (into submarkets for example) if those classifications are dependent on, and characterized by, processes which are not captured by temporal aggregations.

With respect to submarket classification, the same responsibility remains with the researcher. For the same reasons as those just stated, any attempt to classify the market purely on the basis of the stock and its attributes ignores the effects of persistent disparities in market outcomes and the demand function. Maclennan & Tu (1996) refer to such classifications as representing "housing product groups" and note that they are sometimes mistakenly used as submarkets.

Notwithstanding what has already been said about the limitations of market outcome measures, there are more problems with the hedonic price approach. The housing market operates in a climate of very imperfect information, further complicated by the complexity of the attribute mix on offer. Given that it is highly unlikely that demanders will perfectly satisfy their particular attribute mix desires, the price for specific attributes will be distorted as sellers raise the price to match their perception of successful bids without full knowledge of either the attribute mix on offer or how closely this fits preferences of the successful bidder (Maclennan & Tu 1996).

Chapter Five.

PREREQUISITES FOR MODELLING.

VACANCY CHAIN MODELS are ambitious in scale. They attempt to model a complex dynamic process over a large geographic area. The prerequisites for modelling are therefore relatively onerous, especially in terms of data. This chapter considers these prerequisites from two perspectives. First, it examines first the precise nature and extent of the data required to support a vacancy chain model. It then looks at the selection of Bradford as a suitable 'laboratory' for the construction of the model. In selecting Bradford, four basic criteria were used, ranging from the pragmatic considerations of securing the cooperation of organisations, to the compatibility of the selected area with the housing market analytical framework that has been defined.

I. DATA REQUIREMENTS

Because this project aims to fully exploit data relating to the individual atoms of the housing market (dwellings, households, and the moves between them), it is completely dependent on this data being available. In order to operationalise the type of analysis outlined, there is inevitably a significant reliance on the availability and quality of data. Data is required on two basic entities:

- dwellings (their location and characteristics);
- lettings (including characteristics both of the tenants and of the letting itself).

This information is required on a pan-market area basis for a variety of tenures and landlords. This represented a major challenge, and the associated risks were high. Vacancy chain analyses are very sensitive to the problem of incomplete data because the goal at every stage is to compute probabilities of transfer. It is impossible to properly derive these if only a partial record of movements is known. Yet at the same time the data were being supplied by a large number of different organisations, mainly housing associations. The degree to which the data that it was practical to collect falls below the requisite quantity and quality determines not only the sophistication of the resultant analyses, but whether the project can feasibly fulfil its aims at all. This having been said, however, it was known that data of the form and quantity sought was collected by local authorities and housing associations. There were remaining issues of securing access negotiation and other technical issues, mainly related to comparability across multiple datasets. There was a high confidence that both of these could be satisfactorily overcome. Preliminary enquiries made with housing research officers and the Northern Consortium of Housing Authorities revealed a degree of enthusiasm among potential collaborators. It was realised and decided upon at an early stage that the risks would have only been acceptable if the geographic focus of the study were constrained to a single

local authority area. It was therefore important that this local authority could be considered as far as possible as occupying its own housing market area. This thus formed one of the criteria for the selection of Bradford as the project's 'laboratory.'

Data access

The main data source was expected to be a local authority. Data relating to the management of that authority's own stock was considered to be relatively easily accessible, and would in most cases account for the majority of moves within the social rented sector. However, there were a number of important considerations that inevitably impacted upon the selection of Bradford as the case-study authority. First is obviously the availability of that data. There is no prescribed standard on the operation of local authority housing systems, save for the requirement for aggregate statistical returns to the ODPM. A variety of computerised systems of varying scope and complexity have been developed, both by third-party developers (such as *Saffron*) and by local authorities themselves. It was realised that organisations that use systems based on a modern relational database (e.g. a system based on *Oracle, Informix,* or similar) would be ideal, although care was taken to ensure that if such a system had been newly implemented that sufficient historical data was available.

The key prerequisites for the use of local authority data sets were:

- *Institutional access.* Once the co-operation of the local authority had been secured in principle this was straightforward. However, it was anticipated that data protection administrators and the restrictions they impose could be significant, even though the provisions of the legislation make provisions for access for *bona fide* research purposes.
- *Detail.* Name anonymisation of the data would only present any problems if only one tenure were being analysed (unless other, say

numerical, codes were consistent between landlords, specifically RSLs and the local authority). Spatial anonymisation (e.g., by post-code) would not be acceptable because individual vacancies and chains would be lost. Our conception of the low demand problem holds that very small areas of housing can be affected and that the reasons that individual properties or small groups are problematically vacant is of crucial importance.

- *Archive data.* The system must be able to retrieve archived data for a considerable historical period in order that vacancy chains can be reconstructed.

Data on RSL activity was also necessary, which required individual approaches to be made to individual housing associations. Where it was expected that RSLs could not be persuaded to contribute data directly, analysis of the Housing Corporation's CORE (Continuous Recording) data as well as any returns made to LAs where this occurs were identified as backups.

Data structures

Using an ideal database structure, the key identification fields in a property (stock) database were identified as in Table 5.1 below.

Table 5.1. Key identification fields for property database

Field	Description
Unit number	Flat number, street number, etc.
Street name	
Post code	Full postcode
Dwelling code	Unique identifier. Landlord's own code for the property. *This could be used as a complete replacement for all address fields if the database includes spatial co-ordinates, e.g. from a GIS.*

Likewise, the key identification fields for households might be as in Table 5.2 below.

Table 5.2. Key identification fields for applicants database

Field	Description
Previous dwelling code	Dwelling code of dwelling previously occupied
Current dwelling code	Dwelling code of dwelling currently occupied.
Tenant number	Unique identifier. Landlord's own code for the household. Most usefully will be situations where the number is retained throughout a housing career even if the tenure is left. A tenant code will normally refer specifically to the *head of household*. Therefore, it will be very difficult to track dissolving households using such a unique identifier. Electoral rolls or council tax records would be a useful supplement.

It should be noted that these tables are based on an 'ideal scenario' whereby households only move within the stock of one landlord (the local authority). The same data requirements applied to housing associations as well as the local authority. However, as will be described in the next chapter, it is pragmatic from a data point of view to treat the private sector monolithically as a as a large pool of non-public sector households.

Lastly, data is required that links the stock and households together. Specifically, what is required is a comprehensive list of moves that took place. It was more likely that this data would need to be reconstructed or inferred from a lettings file or other transactional record which showed *property* utilisation. By using the tenant reference number and also information on rehousing or tenancy termination reasons it was seen as possible to work out where households came from and went to. Dates of such events (e.g., lettings and terminations) were also necessary such that vacancy events could be identified. The *start date of tenancy* and *void date of tenancy* would allow for this as well as allowing vacancy duration to be calculated.

Attribute data and variables

Such data mentioned so far, however, would only allow the construction of the vacancy chains but could not serve to construct the *sectors* used to analyse inter-sectoral transfer probabilities. For this purpose, landlords' stock and applicants files must also yield contextual (attribute) information about dwelling and households. The problem with such data is that it is usually captured when the record is created (i.e., a dwelling is constructed[35] or a household applies to be housed). Information of this sort may quickly become out of date, particularly information pertaining to individuals within the households. This is a problem that it is difficult to assess the extent or effect of. It is also uniquely related to the vacancy chain models of the type that is the subject of this project. Models based on census information or survey data by definition are more current but of course suffer the problems previously discussed about their scope and extent. In constructing a model looking at the related contingent effects of mobility across an entire housing market it is probably the better of two evils to make do with complete information that is perhaps less accurate than use only partial information of known quality.

Of course such problems do not in themselves detract from the fundamental structure and use of vacancy chain models. In societies where more complete information on housing occupants is routinely collected with a statutory basis (e.g., the Netherlands) then these data problems are minimised and best use can be made of this type of market modelling. If the potential of vacancy chain models can be demonstrated then this supports the need for the continued collection of detailed administrative data from tenants than can be used anonymously Notwithstanding these problems that could lead

[35] except, of course, for stock condition surveys and the like which may or may not link back to master stock files.

to out of data information, the sorts of standard information collected by local authorities[36] will probably be as in Table 5.3.

It is the aim of the project however to include variables outside the normal scope of housing management systems. These can be derived in a number of ways:

Table 5.3. Standard dwelling and household attribute data

Field	Description
Dwellings	
♦ Dwelling type	House, flat, maisonette, bungalow, etc.
♦ Construction date	Perhaps stratified: pre-1919; Inter-war; to 1969; 1970-present day, etc.
♦ Construction type	Traditional, system-build, pre-fabricated, etc.
♦ Rent	Weekly rent including service charges
♦ Floor space	Net floor space (sometimes used as a rent multiplier)
♦ Floor level	(Flats and maisonettes) 0 = ground level.
Households	
♦ Age of household head	Perhaps stratified
♦ Number of members of household	
♦ Single parent household?	yes/no
♦ Disabled member of household?	yes/no
♦ Ethnicity of household head	Own classification where collected
♦ Benefit status of household	HB status from rent system; other benefits from Income Benefit system.

- Cross-referencing from other data files, e.g. benefits, council tax, utility records, electoral roll.
- Spatial derivation, e.g. on the basis of proximity or clustering;
- Statistical imputation, e.g. from Census and other small-area data;

The major variable groups that it was proposed to use to classify intersectoral transfers in probabilities derivation are detailed in Table 5.4.

[36] this will often include RSLs where the local authority (as strategic housing authority) collects information on RSL lettings as monitoring information.

Cross-referenced data sets

It is expected that in the case study authority, data on the main analytical entities (households, dwellings, vacancies) will be held in a connected ('relational') system. In such a system, unique identifier codes will allow the matching of records in one data table to records in another - allowing the dwellings to be cross-referenced with all the household records that have ever been associated with that dwelling, for example.

However, information was identified in other databases that could be of some use, particularly those maintained by other agencies or other local authority departments. This is withstanding the fact that use of LA-wide common identifying codes not to be expected. It cannot be assumed, for example, that a property on the Council Tax database will have the same code as the same property on the stock system. However, particularly for 'static' entities (like properties) data can be matched from other sources using other fields or semi-manual techniques. Addresses can be matched with surprisingly high 'hit-rates' now that postcodes are in common usage. Even where postcodes are incomplete or addresses poorly maintained, the use of Natural Language Processing[37] offered a fall back position. Composite identifiers, such as a concatenation of surname, first initial, and year of birth, can be easily reconstructed from most databases and used to match records and track individuals through a system. Of course, this is subject to full access rights being granted to individual-level records on the database.

[37] See for example Bibby & Shepherd (2000).

Table 5.4. Major variable sought from data providers.

Measure	Possible source	Notes
Household characteristics		
♦ Size	Lettings file	e.g., number of persons
♦ Composition	Lettings file	e.g., number of children
♦ Ethnicity	Lettings file where available/completed	
♦ Marital status	Lettings file	
♦ Income	Imputation from 3rd party demography data	
♦ Income proxies	From benefits records	
♦ HB recipient?	From rent file	
♦ Employment status	Benefit file? Lettings file?	
♦ Employer/location	Daytime tel. no.'s, benefits files?	
Dwelling characteristics		
♦ Type	Stock file	House/bungalow/flat/ maisonette etc
♦ Age	Stock file	Pre 1919, interwar, 60's etc
♦ Construction	Stock file	Trad./non-trad./pre-fab. etc
♦ Size	Stock file	Number of bedrooms
♦ Floor-space	Rent file/stock file?	Often used to calculate LA rents structures.
♦ Neighbourhood name	Waiting list management codes; survey-derived boundaries, e.g. from housing needs survey?	
♦ Actual neighbourhood	PAF	
♦ Property value	Rating/CT file	
♦ Property value (area aggregate)	Land Registry	Available for postcode sectors (NE12 3xx, S10 2xx, etc.)
♦ Condition	Stock condition survey	If in existence.
♦ Facilities/ modifications	As recorded on stock file, repairs records	
♦ Local school popularity	Education dept	Applicant numbers. Spatial relation using GIS
♦ Local school performance	Education dept./ DfES	National Curriculum 'Key Stage' performance tables. Spatial relation using GIS
♦ Local area shopping/facilities	Planning dept?	GIS
♦ Proximity to public transport	Passenger transport executive (e.g., Nexus, SYPTE).	Spatial relation using GIS

Two sorts of useful database were identified:

- Benefits system. Often the local authority will maintain benefits information in-house; where this is not the case, the local authority should be able to negotiate access through its subcontractor. Benefit status of households is an important variable, especially given the current policy discussion on changes to the benefits system and the way it has been found to act as a 'shopping disincentive' for tenants (Kemp 1998). Benefit status could also be used to generalise about household income.

- Council Tax system. The local authority will maintain such a system which will be based on rateable values from the District Valuer's office. It is debatable whether such valuations will have been updated to reflect current property values. The value of the council tax system is that it should represent a relatively current and accurate list of all residential property in the district, and may in addition be able to distinguish tenure.

Statistical imputation

A wide range of data was also available as part of other data sets of national and local surveys and censuses. It is possible to impute variable values for individual dwellings and households on the basis of these data. This is particularly the case for data collected by small areas, like the decennial Census of population, or data only available at postcode aggregates. Commercial databases that report lifestyle and demographic information for individual postcodes could be useful, although access to these would of course be subject to identifying a suitable resource. In practice, data of the sport described here was used principally to derive estimates of the model parameters. Those represent, in other words, estimates of phenomena such as migration and demographic processes that need to be disaggregated by housing submarkets to allow the vacancy chain model to correctly estimate when vacancy chain start and end.

Because surveys and censuses are conducted at a specific point in time, often on an *ad-hoc* basis, information derived from these sources will only be useful in describing attributes of dwellings, which are relatively fixed. It should also be noted that much of the modelling work reported in this thesis predated the release of detailed results from the 2001 Census (i.e., the Census Area Statistics and Key Statistics series) in August and September of 2003.

II. SELECTING A 'LABORATORY'

One of the distinguishing features of this project is its attempt to comprehensively and holistically analyse household movements for a distinct local geographic area that constitutes a local housing market. The tradition of vacancy chain analysis as a means of studying mobility in housing markets has tended to favour national or regional markets by using aggregate statistical data, or be otherwise based on samples of interviewed households. It has been the intention of this study from the outset to track vacancies—and thus *individual* movements—around what might be closely approximated to a Housing Market Area. Issues relating to the conception and definition of a Housing Market area have been widely discussed elsewhere in this thesis, mainly in the preceding chapter. For the purposes of recap, it is sufficient to say that the scale of analysis could in some (but not all) cases usefully be that of a single local authority area. While not perfectly matching market criteria such as functional independence (Scottish Homes 1993) or internal migration (Jones 2002), the use of such an area greatly simplifies—indeed, makes possible—the task of collecting the data necessary to perform the desired analyses.

This section is chiefly concerned with the selection of the study area. This term is used to refer to the distinct geographic and organisational entity that forms the laboratory for the application of the project's methodology. It is not, by way of contrast, treated as a 'case study' area. It was not chosen because it offered specifically unique or extreme characteristics. Neither, however, does the selected area purport to be a sample of a greater

population. The purpose is not to make inferential estimates of the characteristics of a wider population. It is important to make explicit these distinctions because assumptions concerning the *replicability* of the methodology and the resulting demand model would seem to partially lend themselves to the application of sampling theory. This is not the case, and while it would appear that the selected study area might indeed offer some useful benchmark characteristics, the methodology is predicated on more fundamental assumptions concerning micro-behaviour that would imply a far wider replicability than treatment as a 'case study' would allow.

Likening the study area to a 'laboratory' has some degree of power since it allows for the testing and calibration of a particular model within specific parameters. Because variability in these parameters partially governs the degree to which the study area is 'like' or 'unlike' other areas, the response of the model to such parameters will give important insights to the validity of replicating the model in other circumstances. This of course requires specific knowledge related to the 'laboratory conditions.' To this end, this chapter will continue by describing the selection criteria and process in more detail. Chapter three has already described key features of the housing market of Bradford and the socio-economic terrain in which it operates. Later chapters will formalise these conditions and also other external factors into parameters for the vacancy chain model.

Selection criteria

From the start it was known that there would be few constraints on the selection of a study area other than the pragmatic concerns of the Housing Corporation, co-funders of the project. In effect, this only meant that the area under study should falls within the geographic remit of the Housing Corporation's North Eastern Regional Office (which includes Yorkshire and Humberside). Other features of the specific geographic (indeed, organisational) focus of the project were unfixed. Initially it was the intention that the project should focus on the low demand phenomenon as it impacted

on the North East of England, for example the conurbations of Tyne and Wear and Teesside, the former coalfield communities of County Durham, and the coastal areas between the Tyne and Tees estuaries.

It was soon clear, however, that the North East was not the only obvious candidate worthy of investigation. Over and above locally specific collapses of demand for certain types of accommodation, there is a general lack of demand for social-rented stock in many parts of the North and Midlands of England. In addition, a great deal of the key low demand studies that have been published are concerned with the North East (notable among them, Keenan 1998; Power & Mumford 1999; Cameron & Field 2000; CURS 2002). Media interest in particular has been heavily concentrated on problems in Newcastle. By the time that this project was finalising its proposed research questions and methodology in June 2000, it was clear that its geographical remit could usefully be widened to include Yorkshire and Humberside, and senior Housing Corporation staff were in agreement with this.

Housing Market Areas

The final research aim of the project is to derive a model that can be used to help predict demand for social housing: first by type (and in relation to the characteristics of its occupants); and second, from the mobility of these occupants in relation to stock supply patterns, by geographical area. In order to accurately and empirically derive the propensities for certain types of mobility, it is necessary to know as much as possible about *all* moves. If a move takes place to a type of house not represented by those under study, then it is impossible to state confidently what the probability of such a move taking place is. Similarly, if a move takes place to an area not covered by the study, then the final model cannot be expected to predict demand for that area.

In a housing market (by which we may mean 'system' insofar that social housing may be allocated according to non-monetary prices), strata will not

necessarily be geographically contiguous. Whilst urban processes through history have given rise to situations where geographic contiguity will predominate (for example, concentric-ring models), these are not models that can fully account for the wide diversity of market processes that have been shown to have affect on prices and demand. The extremes are perhaps highlighted by the fragmented nature of the 'post-modern' city, where 'city centre' no longer equates to low-income, and salubrious neighbourhoods often lie cheek-by-jowl with those with a more negative reputation. The importance of 'neighbourhood name'—or notions of 'place' rather than physical location—embodies this fragmentation. In writing about that archetypal post-modern metropolis, Los Angeles, Mike Davis recounts the story of the fall from power of a city councillor, vehemently vilified for her refusal to allow an affluent 'community' to demarcate themselves (by means of road-sign) as "West Hills". A completely non-legal entity, the place name's chief function appeared to distinguish the area from a neighbouring (less well-off) neighbourhood, and add an estimated—or rumoured—$20,000 to property values. As Davis notes,

> "The most powerful 'social movement' in contemporary Southern California is that of affluent homeowners, organized by notional community designations or tract names, engaged in the defence of home values and neighbourhood exclusivity."
> (Davis 1998: 153)

There are plenty indications that this type of mentality or, indeed, approach to marketing, is entrenched in the UK housing system. It is most clearly seen in our use—or abuse—of postal addressing, which in itself is probably due in no small measure to insurance companies' fixation with postcodes. There are also less tangible elements, however. In a survey for the Birmingham Housing Requirements Study, respondents were asked for their name for the area they lived in. By plotting on a map their *actual* locations, but in a colour related to the area they said they lived in, interesting patterns emerged. Households clearly aspired to the affluent suburbs of Sutton Coldfield: responses of 'Sutton' were identifiable for households whose actual living

circumstances were so removed from that leafy suburb that a six-lane motorway was among the more conspicuous boundaries.

In short, while conceptions of 'place' may carry with them all kinds of un-measurables, they are in themselves evidence of the multiplicity of factors that go into determining the popularity of an area. Some of these will be related to the physical condition of the stock itself (and this was probably the most pressing concern of those managers who traditionally identified their properties as 'difficult to let'). However, it is now realized that a much wider range of influences are responsible for peoples' decisions to stay away from an area—and these are much more visible, manifesting themselves much more potently, in situations where there is an overall surplus of supply. If consumers are given the freedom and ability to choose, then the consequences of their choices become apparent. In the more traditional setting of social housing—not enough to go round—choice and its ramifications were not the issue.

In the light of all this, what emerges is not necessarily the notion of contiguous housing market areas rather than areas, or even individual properties, which may be regarded as substitutable for each other. Geographic contiguity places undue emphasis on accessibility (to labour markets) and will serve to underplay social networks, schooling, localised environmental conditions, and other factors. Boundaries can be drawn around areas of similar housing—albeit fuzzily—but beyond this there is no automatic spatial logic.

That is not, however to belittle the spatial component. It is of crucial importance. But space should not be regarded as an intrinsic factor in itself (concepts of place are more successful) and more as a unifying framework. Within this, spatial *scale* becomes paramount—national policies and measures may not have a direct effect on local demand, for example, but

may create the right regional or sub-regional conditions for an uncovering of localised demand problems.

It is important, therefore, that the selected study area satisfies the criteria of being—as far as is possible—an independent housing market area. Possibly what is of even greater importance is choosing an area which will allow the capture of data across the entirety of that area and across as much of the housing system as is possible. This is likely to embody organizational willing and technical competence on the part of the target area as much as its strict conformance to pure measures of market independence.

Low demand 'symptoms'

It would, of course, be folly to attempt to apply the methodology to an area which was not experiencing significant demand problems of the type under investigation. This serves to preclude significant numbers of local authority areas where the private housing market is buoyant and there is a parallel demand for what social housing there is. The reader must however remain of the understanding that it is not the design of the methodology and its fundamentals that necessitate such a preclusion: such is the micro level focus of the data under analysis—the 'atoms'—and such is the fundamental simplicity of its underpinning assumptions concerning mobility, that the methodology should be equally at home given a variety of market typologies.

What tend to be lacking in those areas which might not be labelled 'low demand areas' are any superlatives in the size or variety of mobility patterns. Large metropolitan areas are of course not the only areas that suffer from low demand—witness the problems of many coastal areas. But they do offer the researcher the great and inexorable benefit of a large number of observable moves. The resulting probabilistic estimates can thus be made more accurately, or for more detailed strata, or both.

Furthermore, to ensure the widest possible dissemination of the findings of this study it is important that it is seen to produce credible results which are calibrated and tested for an area with known demand issues. Large metropolitan areas—mainly those unitary authorities within the counties of Tyne and Wear, South Yorkshire, and West Yorkshire—are also home to significant numbers of Registered Social Landlords (RSL's) which are actively grappling with low demand. That their funding body, the Housing Corporation, is also sponsoring this work is of no little significance.

The methodology, the study's aims, and its chosen study area must all have relevance to RSL's and be capable of being translated into 'good practice' for their use. It is vital that the pragmatic goal of producing viable results for an interested group of champions is not lost in the search for academic 'purity' or, indeed, simplicity at the data collection stage. The fact that this very data collection needs to rely on the participation of not just one monolithic organisation (such as a local authority) but a plethora of quasi-competitive associations means that a degree of bilateralism is required. RSL's can only be reasonably expected to give of their time and commercially sensitive data if they feel that the final report will be advantageous to them. It was expected that it should be, insofar as it may provide them with a new type of forecasting tool and a pertinent set of results for their operational area. This 'organisational willingness' on the part of RSL's and local authorities will be discussed in more detail later in this chapter.

As already mentioned, metropolitan local authorities tend to significantly experience low demand problems, but they are not alone. A problem arises, however, when trying to define areas which may be 'suffering from low demand,' even if we assume a focal distance corresponding to district level. Even the study by Bramley *et al.* (2000)—arguably the most complete work on low demand in the UK to date—seems to succumb to this difficulty. Whilst it openly admits to the subjectivity of the methodology used, it reports that over half of local authorities in London, and some 41 per cent in

the South East, say that they have low demand problems with their own (council) stock. This is paradoxically coincident with indisputable overall pressure for housing in London and the South East. The fact is that the survey incidentally allows responding local authorities to declare a 'low demand problem' for localised estate problems or 'difficult-to-let' stock, both conditions quite symptomatic of all areas in England, not just London. This distinction – between 'low demand' and 'unpopularity'—is one which Bramley *et al.* recognise, but one which is not operationalised with respect to their statistical conclusions.

As Cole *et al.* (1999) suggest,

> "attention has often focused on the 'council estate' as an emblem of unpopular housing but in regions suffering economic decline the trend has pervaded the entire housing system" (p.7).

London clearly does not fit the characteristics of a region in "economic decline," nor could unpopularity in London be described as 'pervasive,' but far would it be to suggest that the capital did not have some desperately unpopular housing. Thus Cole *et al.* 's test can be applied back to the results of the Bramley survey. And, indeed, even though some 54 per cent of London authorities think they have a 'low demand' problem with their own stock, no more than 9 per cent of them thought that this extended to private sector housing, and only 3 per cent thought that both problems coexisted (Bramley *et al.* 2000).

So, allowing for the fact that local authorities in the high-pressure south appear to confuse 'low demand' with the fact that some estates are desperately unpopular even among those in need, the Bramley survey reveals the north and midlands as the seat of entrenched demand shortfalls.

Low demand is a problem analytically married to geographic scale. It is the way that district-level or sub-regional market conditions relate to specific

neighbourhoods; and it is the way that good housing in what would otherwise be 'nice' neighbourhoods cannot attract or retain residents because there are not enough of those residents to go round. It is quite different from 'difficult-to-let'—it is not just a housing management problem (Cole *et al.* 1999).

IT systems and competence

The proposed methodology is not only computationally intensive but relies on very detailed records of individual dwellings and tenancies for a large area. The study thus needs the sort of information that is usually kept for operational or statutory reasons: the records of individual transactions which are of great importance for rent accounting and tenant management, but which are only ever reported or analysed for strategic purposes in their aggregate form.

The existence of these data represents a major missed opportunity. Since landlords in the everyday execution of their functions need to maintain detailed records—using increasingly sophisticated computerised systems—why rely on this data when it has been crudely aggregated to value-loaded *a priori* study areas? Would it not be better to observe movements and the interaction between people and houses in all its minutiae and richness, thus allowing the actual interaction between supply and demand to be analysed? Rather than allow preconceived notions of markets and expectations obfuscate the story, the detail should be allowed to speak for itself. The technology exists; the blockage is in organisational willing or capacity.

The present study is a timely and well-placed attempt to exploit that missed opportunity. Working under the dual framework of strategic-level backing by a major regulatory body and as a detailed personal investigation, it can circumvent some of the traditional obstacles that would hinder a similar enquiry. It would probably be successfully argued, for example, that the willing for results is there, but that the flesh is not geared for delivery. Social

housing organisations understandably have staff and resources that are better equipped to deal with the pressing issues of the day, with the strategic direction of their 'business,' with the stock management that needs to be done rather than perform detailed data analysis on the computerised equivalent of a dusty stack of archives in the corner. This, by comparison, is a risky and technically specialised activity and not a core function.

But it is an activity that could yield significant results and which, properly constructed and specified, could have an immensely useful input to strategic decision-making. The combination, therefore, of strategic goals—backed by an organisation set up to advance such goals—and the time and resources that specialisation demands and which can be supplied by academia, is very powerful.

It has a number of prerequisites, however. One of these is data: the existence, in the first place, of the data needed for the proposed analysis. Another prerequisite is the technical means of accessing and extracting this data. Overriding both are institutional capacity constraints and a necessary agreement of vision on the behalf of the custodians of that data. This final requirement is herein termed 'organisational willing' and will be discussed in more depth shortly. Before then, we need to be clear exactly what demands this places on organisations, and how this impinges on the selection of a study area.

The data requirements are huge—if not in ambition, then certainly in terms of raw numbers. It was important not to shy away from this, and both the researcher and the researched must realise that the scope of the data sought equates to practically every housing record maintained by that organisation for the last five or so years. Only those local authorities and housing associations with well-maintained computerised systems can hope to be able to supply this. These systems are only now making possible a type of

analysis first seriously advanced for housing policy in the 1960's (see Kristof 1965; Lansing *et al.* 1969; White 1970).

Reconstructing vacancy chains involves matching tenants to properties to find out who was where, when. This means that there needs to be explicit relationships between the data in the form of common *keys*. The most satisfactory of such scenarios would be the existence of unique reference numbers for tenants and properties. This is therefore one of the selection criteria.

Most critical of all is the ability to retrieve information on tenancies and dwellings that are no longer active; i.e., archived information. It was thought that around five years' worth of archived records would be suitable for the analysis. Five years is an indicator of the magnitude rather than a precise value. In the end, it represents a pragmatic compromise between the availability of data from systems and the fact that areas with high numbers of relets will generate a number of moves even in this short time.

Organisational willingness

With such an ambitious scale of data collection, it was essential that the project had the full backing of the local authority of the proposed area. The local authority (particularly the housing department) had to be expected to be able to provide the vast majority of any data required, and their commitment to the project would send positive signals to other organisations that were to be approached (especially RSLs).

Notwithstanding the degree to which an authority felt it was technically competent to be able to contribute data, it was important that the local authority felt some degree of ownership or stake in the project. It was realised that this would be helped where the project's aims dovetailed with the priorities of the local authority's housing and research strategy. Finally, the selected local authority would need to be confident of supplying staff

resources in terms of time and expertise in both housing strategy/research and IT/systems functions.

Another potential impediment to organisational willingness that was identified was local interpretation of Data Protection legislation. This tends to vary between organisations. While the Acts make clear provision for the use of data for bona fide research purposes where individual details will not be disclosed, experience has shown that some officers have in the past interpreted this as a blanket ban on the use of data for any purpose, particularly where a third party organisation is involved. In any event, these problems were not encountered.

The approach

Although the criteria for selection were explicit enough, the difficulty remained that the only way of finding those authorities which met the criteria was to speak to them directly. This could have proved an onerous task: there are 42 local authorities in the North East and Yorkshire and Humberside regions. Furthermore, speaking to the organisations themselves too early may have given a misleading picture of feasibility: it would be tempting to deem those interviewed early as feasible without the benefit of the wider knowledge gained from speaking to more authorities.

A more 'hierarchical' approach was adopted, although this was only loosely structured. A number of 'strategic stakeholders' were approached for discussion. These included:[38]

- Government Office for Yorkshire & the Humber;
- The Housing Corporation (Headquarters);
- The Housing Corporation (North Eastern regional office);
- Northern Consortium of Housing Authorities;

[38] See appendix for a full list of contacts in these organisations.

- Academic departments.

In particular, the Northern Consortium of Housing Authorities ('the Northern Consortium'[39]) was regarded as a key stakeholder to direct future enquiries. Their position as independent representatives for most of the Northern local authorities and RSL's was extremely useful, as was their research capacity. It was expected that, in all strands of their work, they would have built up a detailed picture of issues facing districts around the region, and of the capacity of local authorities to engage with a research project such as this one.

In short, discussions with these stakeholders were centred on their perceptions of the demand problems being faced by local authorities; key individuals in these authorities with a strategic research or policy role; and the technical capacity or motivation for involvement in a detailed study. Crucially, however, the main use of these meetings was in identifying key personnel who had a good grasp of the issues and the technical competence and organisational positionality to be able to further the project.

The end result was essentially a 'shortlist' of local authority candidates and key individuals in them who were subsequently contacted directly by telephone. Often, these telephone calls were followed up either by a meeting or a letter explaining the project, its methodology, and its requirements of prospective collaborators.

Four city councils in particular were targeted for the first tier of enquiries: Newcastle; Sheffield; Leeds; and Bradford. Of these, initial discussions with Newcastle and Sheffield revealed significant and insurmountable barriers to any co-operation. These were both related to organisational problems and the timing of the project. In the case of Newcastle, the city council was experiencing severe criticism over its handling of a regeneration strategy

[39]The Northern Consortium will *not* be referred to as NCHA to avoid confusion with Northern Counties Housing Association.

specifically related to its low demand problems in the West End. Its 'Going for Growth' proposals were (and still are) proving to be highly controversial and were the subject of significant public feeling and demonstrations. At the time of contact, the council was involved in an 'all hands' damage-limitation exercise and could not envisage having the resources available to contribute to the project in the short or medium term. The political sensitivity of the low demand issue at the time (particularly Newcastle's responses to it) meant that involvement with a project of this kind might not have found many internal champions.

Sheffield's problems were different. In contrast to Newcastle, the city council were extremely keen to be involved with the project. Their research section had appointed a researcher to specialise in 'low demand' issues at the same time that this project commenced, and it therefore seemed logical to maintain close contact with work that was being done there. However, there were several organisational barriers due to the way that their Housing Department IT function had been outsourced to a private supplier, CSL (also in charge of Benefits and Council Tax administration). Internal staff were not permitted to produce custom computer reports of the sort needed by this project without recourse to CSL. The system was such that the data requirements could only be met by writing specific, customised computer programs, a task which was contractually the domain of CSL. Based on previous work, the research team estimated that work of the scale required would necessitate outside funding and could not be absorbed into the standard research budget. One estimate put the likely cost in the order of £10,000 for program writing and data extraction. Furthermore, it was unclear whether enough archived data were present to permit reconstruction of vacancy chains. These were two insurmountable problems and it was with some regret that Sheffield City Council stated that they were unable to help.

This left Leeds and Bradford, two adjacent authorities who, in the eyes of the interviewed stakeholders, were regarded as progressive in their strategic

responses to demand problems. Bradford in particular were known to be seriously approaching the low demand issue with a battery of innovative research projects, including use of Geographical Information Systems (GIS) and statistical approaches to modelling future demand. It was clear from the outset that this project had some significant parallels with the work being proposed in Bradford.

A meeting with Bradford City Council was held to explain the project and its methodology in some detail and to ascertain whether resources were available to allow cooperation. At the meeting, enthusiasm for the project was shown as was the technical suitability of the IT system. At around the same time, Leeds City Council also demonstrated a technical ability to contribute towards the project objectives. However, the significant compatibility of the project with Bradford's research priorities meant that collaboration with Bradford was eventually favoured over Leeds.

Registered Social Landlords

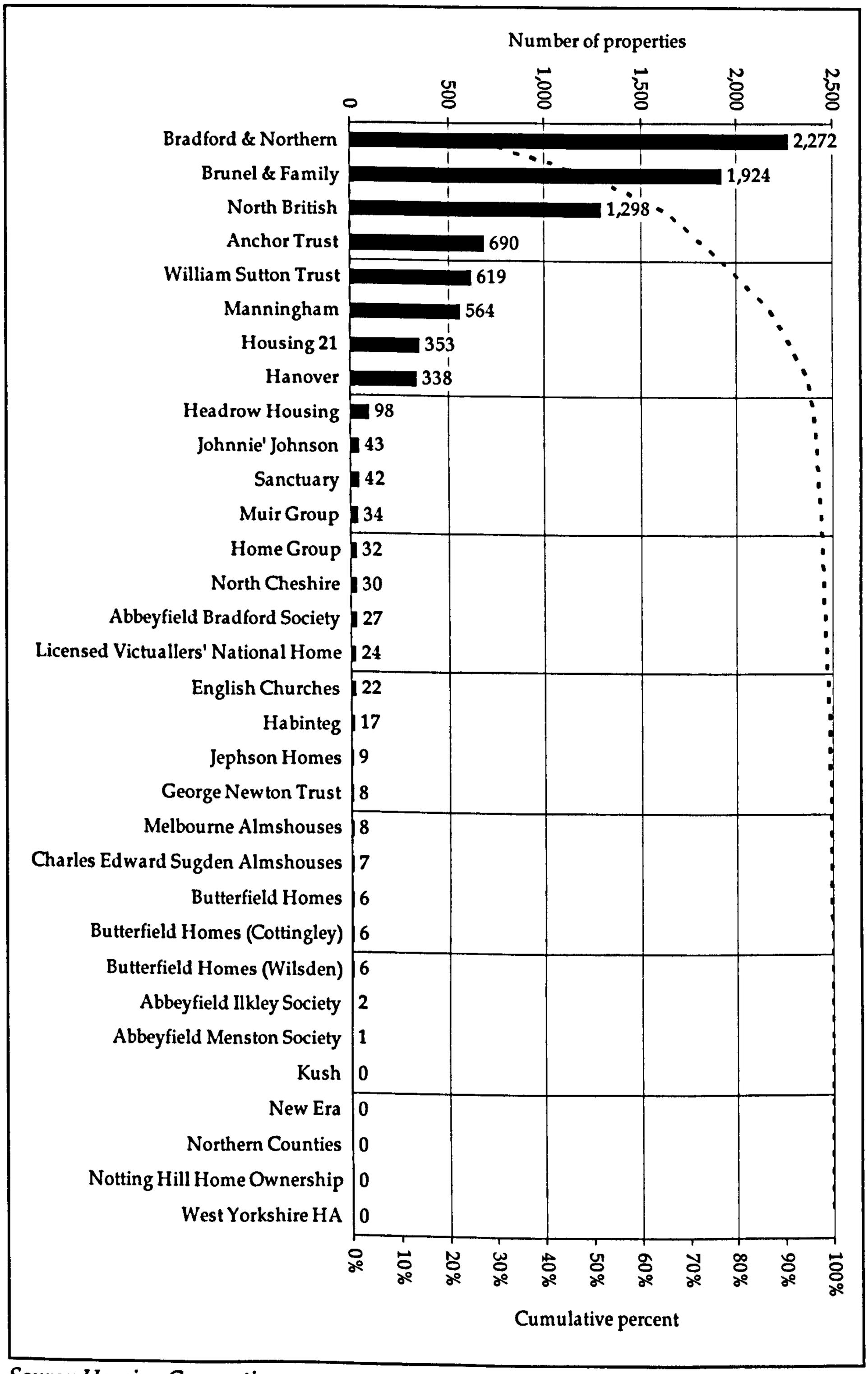
Involving RSL's was especially important in that it is necessary to fully account for all social rented stock in the city. It was equally important from the point of view that RSL stock may be significantly composed of properties targeted at particular needs groups. Furthermore, the characteristics of RSL stock are known to differ significantly from that of the local authority, even for general needs stock. Therefore, both in terms of quantitative and cross-sectional completeness, it was essential to involve the RSL sector.

Such involvement was potentially complicated, however. A large number of RSLs are active in the city, some of them being national housing associations with stock throughout the country. All RSLs were expected to use different computer systems, although the situation was eased somewhat by the uniform requirements across all RSLs of CORE (Continuous Recording) returns to the Housing Corporation.

The Housing Corporation supplied a list of the RSLs active in the Bradford area. There were 32 RSLs owning stock in the Bradford MDC area, accounting for some 8,480 properties. A simple analysis of these revealed that 95 per cent of the RSL stock was owned by the eight biggest associations. All RSLs, and their cumulative contribution towards the RSL stock, can be seen in Figure 5.1.

The 95 per cent cut-off was chosen on the basis that it is a natural break point for the data, which can be seen as a kink in the cumulative percentage curve. Furthermore, after this point, the individual sizes of RSLs become very small. Given the anticipated nature and complexity of RSL involvement, there are significant gains to be made by minimising the number of organisations to be approached. Each prospective RSL, should they cooperate, would need to have individual assessment, transfer, conversion, and 'clean-up' of their databases. This is no insignificant task.

Having identified the candidates for involvement, the approach was that of preparing a standard letter to be directly sent to the most suitable person in each RSL. By 'most suitable person' it was decided that persons involved in investment strategy or research would be targeted. This would not necessarily be possible or suitable for all RSLs, depending on their company structure, and initial telephone calls were made to quickly identify the most relevant department. For some RSLs, for example, it was realised that the regional manager with particular knowledge of the Bradford context and their local office systems may be more helpful than a national strategic officer. It was also hoped that RSLs would themselves internally direct the query to their most suitable officer should mis-targeting occur.



Source: Housing Corporation.

Figure 5.1. Size of Bradford RSL's in 2000.

The standard letter heavily stressed the potential strategic benefits to the RSL as well as emphasising close Housing Corporation involvement. In retrospect this was a slight gamble that appears to have paid off. Since RSLs are dependent on the Housing Corporation's investment decisions for their share of Social Housing Grant (SHG), they will be painfully aware of the importance of any research or investment appraisal tools that the Housing Corporation may use. But, at the same time as being investment agents, they as landlords—in effect competing for the same tenants and money as other landlords. There was a danger that this may cause them to place a greater premium on their own data reserves as 'commercially sensitive' and thus preclude their intention to share their information.

Initial contact with responsive RSL's was followed by a meeting to introduce the project in greater detail and answer any questions that may be outstanding. It was at this meeting that further information on the organisational structure was sought, as well as outline details on the IT systems that were in use. This was with a view to then canvassing the suitability of the RSLs involvement and then asking for that involvement. Should this be agreed in principle, further meetings or communications ensued to agree data exchange standards and related matters.

The process was arduous, taking over a year to complete. Securing cooperation in principle from an RSL proved to be only the first step in most cases. Clarification was required on definitions and the expertise of database administrators sought to extract the data. This latter task in particular often had to fit into more pressing resource schedules, and often the returned data was unsuitable because of either misspecification or misinterpretation of the initial request and had to be re-requested.

In the case of one housing association no historic computerised records of the type required were maintained. Due to the fact that the association in question were very active in housing BME households, it was considered

essential that their data was included so that a significant part of Bradford's housing market was not omitted. The association kindly allowed access to their paper files, and with the generous support of the Housing Corporation, administrative support was identified to computerise the records.

That data was eventually collected from six of the eight RSLs approached is considered a very successful outcome. Some 6,141 RSLs dwellings are represented in the project data file. This, together with the other collected data on households and lettings, represents a significant resource in itself. It is as close as was possible under the circumstances to an entire ledger of household moves involving the social rented sector in Bradford for the five years 1996–2001.

Chapter Six.

DEVELOPING A VACANCY TRANSFER MODEL OF THE HOUSING MARKET.

WITH THE DATA in place, the next step was to begin development of a vacancy chain model. This chapter briefly reviews the justification for such a model before describing in more detail its actual design. Chapter two identified some key theories that underpin the research motives and the approach to be taken. These were based in large part on what has been framed as the 'problem' of low demand, its relationship to wider housing and regeneration strategy (particularly for social housing), and the development of the capacity of organisations to understand and respond to it. Cole *et al.* (1999), in particular, conceptualised this evolution by charting the learning curve of social landlords as low demand emerged from its sole, underground preserve of an instinct or a worry to having a greater acceptance and attention paid to it. Chapter two also presented a set of research questions that form the objectives of this project. The discussion

presented in this thesis then moved towards arguing that social housing could not be discussed or analysed in isolation from the housing market as a whole. Low demand, it was claimed, to a large degree 'crept up' on a unsuspecting sector because there was a large gap between the market processes that were dangerously exposing social housing and the willing and capacity to respond in commensurate terms to such market (mal)functioning.

Necessarily so, the thesis then considered the literature on housing markets research, focusing in some depth on the definition of housing markets and submarkets, including the treatment of space, and why it is necessary to construct such an analytical framework around low demand for social housing. The conclusion was that although there were several competing and subtly different strategies for the definition of submarkets, it was most likely that social housing, by the very nature of its tenure and the 'commodification' of housing, occupied one or more discreet submarkets within the wider Housing Market Area. Evolving the spatial-scalar framework that emerged from the introductory chapters of this thesis, it was demonstrated that in essence there are two pertinent geographies: a wider Housing Market Area which was largely defined by migration processes and employment constraints; and a local housing market consisting of non-spatially-contiguous submarkets that accommodated housing pathways, preference, adjustment, and other micro-level behaviour.

With such a framework in mind, and whilst it has already many times been alluded to, this chapter devotes its attention proper to the actual design of the research and the methodology. In other words, *how* the project will go about finding answers to the questions it has deemed interesting and pertinent. Choices relating to the research design will themselves affect how these questions are answered and may affect the validity of the findings. The choice of method holds within it implicit theories of research. The choice of variables and their treatment reflect that there are certain values and assumptions held by the researcher, rendering quantitative models equally

as prone to direct researcher bias as qualitative methods. The hope can only be that by bedding the selection and operation of a particular research design within the literature, that the effect of the researcher's values will be minimised. Nevertheless, it is important that details of design and method are made as explicit as possible so that the results can be confidently related back to the starting knowledge and assumptions.

Before developing the methodological design of this research in more detail, it is important to justify the broad approach adopted. The first section of this chapter therefore considers why a computational approach involving the analysis of large secondary data sets was chosen over alternative methods.

I. JUSTIFYING THE RESEARCH DESIGN

There remains a tension between the requirements of analysing a housing market in its entirety (and the geographic coverage that entails) and having sufficiently rich information at the micro-level to be able to reconstruct the submarkets component of the system. Clearly, computational research methods are called for if the two are to be successfully reconciled in a model. This carries with it all sort of limitations; primarily that any model must henceforth rely on secondary data sets rather than primary data collection, imposing serious limitations on the precise attributes that can be analysed. Many early vacancy chain models, as already seen, overcame this limitation by following and reconstructing chains using primary collection, mainly surveys. Their scope however would not permit the analysis of any more than a part of the housing market.

There are a number of different general methodological approaches that were considered:

- Qualitative interviews/ethnographic research;
- Social survey, using a panel or population sample;
- Longitudinal study, following housing 'careers' of individuals;

- Secondary analysis of data, and statistical modelling.

All of these, of course, have particular strengths and weaknesses. Most of the work that has been done regarding low demand has been of two types: qualitative case-study approaches, or survey-based approaches. The qualitative tradition has been most active in studying low demand. Work such as Power & Mumford (1999); Cole *et al.* (1999); DETR (1999b); and Chartered Institute of Housing (2000) have all been significantly informed by case-study observation and interviews. Such studies have been invaluable in advancing the concept of low demand as a new and serious policy concern; emphasising the national, regional and local contributors to low demand and the combination of structural and local factors; scoping the range of housing and non-housing related factors; and informing interim policy responses. If the present study was to be another of this kind there would be a danger that it may only serve to reaffirm what is already known or what has already been tried. Also, a qualitative approach would not be geared towards modelling future demand, which is an immediate requirement of social housing landlords and funders.

Where secondary analysis of data sets has occurred, this has normally been of large sample surveys such as the Survey of English Housing (Burrows 1997; Burrows & Rhodes 1998), or specific data sets such as aggregate house prices (Murie *et al.* 1998). These studies have normally concentrated on one aspect of low demand, rather than wider explorations of explanation.

The low demand debate has also been substantially informed by survey work. Notable contributions have been Crook *et al.* 's (1996) survey of housing association investment on difficult-to-let estates; Pawson *et al.* 's (1997) wide ranging study of voids and difficult-to-lets; and Bramley *et al.* 's (2000) survey of all English local authorities and large RSLs.

The research documented in this thesis adopts a quantitative approach, more specifically a *large-scale secondary analysis of management data sets*. This is being

proposed for four main reasons. First, as aforementioned, the work that has predominated has tended to fall short of looking for explanation. Description of the problem and the measurement of certain trends have abounded, but there have been few large-scale attempts to find out which factors actually do have an effect on where people move to and why properties become empty. However, more importantly, there appear to have been no systematic attempts to analyse multivariate contingency of household actions and dwelling occupancy that are based on the empirical observations of *actual households and the dwellings they move between.*

Second, social household landlords collect a large body of operational data relating to properties, tenants, moves and vacancies. These data are often only used to quantify demand in crude ways, using measurements that make little sense in the light of the low demand problem. These data, where they exist, represent a huge untapped resource, the exploitation of which is a primary concern of this project.

Third, other methodologies would be more resource-intensive if they were to yield results at the same scale of ambition. The sample sizes for interviewing individual households about their housing histories and aspirations would be beyond the scope of the present study. This is especially the case considering the potential number of variables of interest, and the requirement for spatial disaggregation.

Fourth, the ability of other methodologies to produce a predictive model would be limited. Many of the input parameters that relate to policy are highly quantitative (e.g., new-build rates, migration, rent levels, benefit rates) and thus require a quantitative model to test scenarios based on them.

II. METHODOLOGICAL SUMMARY

The previous section of this chapter presented a justification for a large-scale secondary analysis of management data sets, resting mainly on the facts that the approach:

- is detailed in its scope, yet is realisable within the confines of this project;
- challenges conventional ways of detecting, measuring and modelling demand which may not be suitable for the specific challenges associated with low demand;
- exploits the wealth of data that exist, and proposes to use it in new ways;
- and is geared towards modelling future demand probabilities.

A more detailed discussion of the actual methods of data collection and analysis is the subject of the remainder of this chapter. In addition, the data collection process is singled out as the subject for a chapter of its own as it was a particularly complex process that both (a) reveals much about the interface between policy-based research and the wider political environment, and (b) has important ramifications for the replicability of the research and the subsequent conclusions that this thesis makes regarding the role of vacancy chain analysis in the housing policy research arena.

First, however, it is probably sensible to outline a few more detailed characteristics of the approach that was taken. As has already been made plain, this study does not attempt the collection of any new primary data on the subject. It exclusively relies—for all the faults that this may engender—on secondary data sets. Some of these data are in the public domain, but the majority are extracted from the operational information systems of social landlords and were therefore subject to a relatively convoluted process of negotiation and acquisition.

The data were collected with the aim of reconstructing a complete ledger of 'episodes' of vacant housing and their sequential relationship to other such episodes in the study area over the period 1995/96–2000/01. It was soon apparent that this could only be practically done by inferring these vacancies from records of lettings and of tenancies. The detailed empirical work was therefore restricted to the social rented sector. A number of other data sources were considered but were adjudged only to be of auxiliary benefit., mainly because they could not supply information on the previous and subsequent location of 'transferring' vacancies. Principal among such sources was the council tax register.

Once the data were collected, the process of identifying linked cases in vacancy chains began, and subsequently to this, calculations of the empirical probabilities of transfer were obtained. There could then be used as the basis on which to estimate the inter-sectoral movement of new vacancies as these arose either through new investment, death, or other processes. Such a brief précis of the method glosses over the importance of the definition of these sectors—the 'bins,' be they spatial or functional, into which vacancy episodes are assigned. In fact, to ignore this process or to starve it of the attention that its criticality merits renders susceptible to internal weakness the entire superstructure upon which the model hangs. Probabilistic estimates—of any phenomenon—tell us nothing if we cannot be sure precisely what it is that we are measuring the probability of. All probabilistic estimates require that objects are categorised beforehand.

III. THE RESEARCH METHOD

The methodology that was proposed, and adopted, was a statistical analysis of social landlords' management data relating to stock, tenants, moves (applications and transfers) and vacancies ('voids'). Using attributes of the dwellings and households, the observed probabilities of vacant properties being occupied by certain types of households was derived. The housing market is thus sectored according to these attributes of dwellings and

households. The probabilities of inter-sector moves vary according to the way they are defined. The sectors are expressed in terms of *dwelling-household states* (analogous to submarkets, as chapter four suggests), which describe the state of a dwelling of particular attributes being occupied by a household of particular attributes. (It is probably easier to evolve this logic through the course of the example given later.)

Vacancies as the analytical object

Given this, the analysis focuses on *vacancies* in the system. There are a number of good reasons why vacancies are proposed as the main analytical entity, not least that they are at the same time the very embodiment of the problem (vacancy problems are the result of low demand) and the evidence of the moves through which these problems are transmitted. Moves are dependent on the existence of vacancies; moves themselves create vacancies; thus vacancies are a prerequisite of the proper functioning of the housing market. Yet at the same time vacancies can be problematic. Too many vacancies remain the most overt symbol of a malfunctioning housing market, representing economic, social and environmental costs, as described in chapter three. Persistent vacancies, particularly in a weak market, reveal much about preferences for components of the housing 'bundle' (although separating these remains a problem), or can highlight more structural gaps between supply and demand.

By tracking vacancies the phenomenon under observation is the mobility of households *in reverse*. A move by a household in one direction means that there will be a 'move' by a vacancy in the opposite direction. The logic behind this is related to the notion of *vacancy chains* (White 1970; 1971; Chase 1991; Emmi & Magnusson 1994; 1995a; 1995b). If vacancies can be followed through the system (in connected chains) then it should be possible to study the effects not only of individual household moves on the system, but of changes to supply, such as new-build and demolition. Simply following households through a system would not allow supply-side effects to be

detected. When a house is built or demolished, no household is involved. Household involvement in these cases only extends as far as the first (or last) household that occupied the property prior to the change. On the other hand, stock adjustment necessitates the creation or absorption of a vacancy immediately. Similarly, changes in demand (such as a net reduction in the numbers of households through out-migration or death, for example) also have an impact on vacancies. The death of a single-person household immediately creates a vacancy. The analysis of vacancies therefore allows a more effective reconciliation of supply and demand within the analytic framework than would an analysis of households. The foremost benefit is that the effects of structural changes in supply can be more readily assimilated. This permits a more effective response to the research questions identified in chapter two, which asked what the effects would be of new social housing investment, and what characteristics best predict housing movement around the ensuing vacancies.

Another principle advantage of using vacancies is that they offer the opportunity for *temporality* of the low demand problem to be taken into account, particularly the problematic nature of long-duration vacancies. Since the generation of vacancies is symptomatic of household moves, and the perpetuation of 'problematic' vacancies is a result of supply-demand mismatch, the analysis of vacancies offers a natural way of tracking the functioning of the housing market. As vacancies as related to fixed dwellings, they offer a better way of looking at the changing fortunes of houses and their streets and areas, rather than tracing households. To an extent, changes in the fortunes of household are somewhat less interesting and less revealing. For example, it is unsurprising that if the economic circumstances of a household improve that they are likely to seek to improve their housing situation. Conversely, however, dwellings are fixed yet their popularity fluctuates. Indeed, low demand areas are often characterised by unusual or surprising vacancies, especially where modern or renovated stock is concerned. This, as we have seen, is as much a function of the

characteristics of households in that local market as it is of attributes intrinsic to that dwelling. It is dwellings without a household that are the problem (insofar that households without a dwelling constitute the separate and very different policy problem of homelessness).

Interconnectedness of dwelling and inhabitant

Although housing provision has generally been made in monolithic, precisely demarcated chunks (particularly social housing), why is it that soon the city nearly always appears to us in fragmented, fleeting ways; as a jumble of trajectories—those on their way to places, passing through; those with nowhere to go; those with little choice but to slip down the rungs? It is because we are not independent from the houses we live in; nor are the houses unconnected from our own life stories. Houses are not static except in terms of absolute-space. They are mobile in every other sense, and we affect where they go next.

Housing developments—estates, blocks, compounds, terraces, towers—become ladders, in one sense; containers in another. The dwellings inside these developments are mobile, just as the people who live inside them are. As households jostle for position on these ladders and move up and down them, they are at the same time affecting the trajectory of the houses. In particular, they leave the imprint of their lifestyle and aspirations. Just as the houses we live in indelibly mark our relationship to and expectations of space (in the Bauchelardian sense), so we alter the relationships of houses to other houses and other households. We leave bits of our existence in that house behind. This is perhaps expressed through physical modifications we make to the house, but these are less important than the socio-legal positions we leave our houses in. The ownership of the house for example may have changed. The vacancy will certainly provide the opportunity for a repositioning of the dwelling and its tenure arrangements in the market. Such are the dynamics of that market that this year's rented dwelling may not occupy the same position, nor fulfil the same requirements, as last year's.

It is more, or it is less, just for being a rented dwelling at a time when such a tenure is a more or less economically attractive proposition. These at times imperceptible shifts nonetheless add up to important differential utility values in tenures as a whole (from an investment and affordability point of view) and, as such, contribute to the attractiveness or substitutability of individual dwellings. To summarise, because it is not just the households that move around, but the dwellings too (remember that in terms of *relative space* dwellings can move even if their coordinates do not) we cannot analyse one in isolation from the other. Vacancies, in effect, become the *product* of household movement and house movement and as such are the only remaining outlet for quantitative description and prediction of the housing market. Chapter seven will return to this point—the interconnectedness of dwelling and inhabitant—when they consider methods of sectoring the housing market. For the time being, and for the purposes for expounding the general method, it is sufficient to consider dwellings as fixed receptacles through which vacancies and households pass.

Vacancy transfer models

Therefore, in essence this research wants to track mobility in the housing system, principally from the viewpoint of supply. Knowledge about this mobility and the drivers of it will yield many clues about demand and will provide a powerful way of answering a variety of demand-related questions, but at the same time can be used to predict effects on supply and relate back to planned housing supply.

Vacancy transfer models are the discreet class of mathematical model that have evolved with this purpose in mind. They were first seriously applied in the field of employment to study mobility in organisations and between jobs (especially White 1970). These pioneering analyses treated vacancies in the system (vacant jobs, empty houses) as *evidence of mobility*, and the way that these vacancies moved around the system (as people depart and embark) offered insights into behaviour, choice and opportunity of individuals. This

resonates with an early assertion of this thesis that households must be considered as consumers in a market. This in itself may yield the question of why it was not considered more fruitful to explicitly analyse household and individual behaviour, and a brief diversion is necessary to answer this.

Vacancies vs. household behaviour

The answer to this hypothetical question has already been partly answered. Analysing vacancies is more powerful and indeed conceptually simpler if the goal is to understand the effect of changes on supply. In addition, an analysis of behaviour seems broadly incompatible with the goals of this research for three further reasons. First is scale. Behaviour—choice and preference, both latent and revealed—pertains to localised events (even if these events have a large geographic footprint). In other words, the factors that influence a particular decision may be quite specific to the individual case, be those property attributes of origin or destination, household attributes, or socio-temporal circumstances. It would be necessary to aggregate these decisions to allow their implications and meaning to be observed within the context of the wider housing market. In effect, looking at vacancies does precisely this (albeit for revealed preferences only), only choosing to concentrate on the structural pattern of many collective decisions rather than teasing out recurring causative themes. It is these structural effects that have more to say about investment decisions relating to the quantity, type, and location of changes to the housing stock. As Emmi & Magnusson (1995b) put it,

> "The activity of human actors is regarded stochastically as the indirect outcome of the socially structured processes governing the diffusion of housing opportunities. Mobility is treated as an analytical by-product of the vacancy transfer process. Instead of seeking to explain, vacancy transfer models seek only to simulate" (Emmi & Magnusson 1995b, 9).

Whilst their last point is true, it is perhaps worth pointing out that the necessary prerequisite of a vacancy transfer model, the process of constructing submarkets, can nonetheless yield useful explanatory evidence.

The second reason, which is closely related to the first, comes back to Jones (2002) and his point that analysing housing *search* is incompatible with the broader theory of spatial arbitrage. He argues that only actual, revealed movement can be used to define the (geographic) extent of a housing market and that there is no automatic relationship between a 'search area' and a housing market area. There are therefore serious problems in extrapolating the findings from analyses of household movement behaviour to the housing market as a whole.

The third reason is that it is easier using vacancies as analytic objects to equip ourselves theoretically for a system based on *contingency*. Conventional sociological positions hypothesise about the attainment of individuals; and an economist's view of the same position might be expressed through the open market, which aims to match the most suitable candidate for an available position. Chase (1991) refers to these as "systems with 'open positions'." A purely matching-based housing market model (such as that emphasised by hedonic approaches to price estimation) is an example. This thesis views the world differently. Instead—what the vacancy chain model contends—the advancement of an object through the system is dependent on the availability of a vacancy for that object. Movement is thus conditional on vacancy creation. At any one time, a move can only occur if there is a vacancy available to receive it. Thus, allocation of objects to positions is not always perfect, simply because the optimal position may not be vacant at the required time. The creation of vacancies is interdependent on other movements in the system combining to create vacancies in certain places at certain times. A very obvious example is the employment market: the most suitable candidate for a job is not always available to fill that post. Models that try to aggregate mobility patterns must be cognisant of the contingent nature of the vacancies that arise to facilitate that mobility. If the 'rules' determining this contingency can be recreated then we will have a much better idea of what is likely to go where. These 'rules' empirically manifest themselves through the observations of vacancy transition in a linked

system. The resulting probabilistic estimates therefore tell us the likely *vector* of a move—conditional on a move being able to take place.

The basic structure of vacancy transfer models

Attention now returns to the specification of the vacancy transfer model as the appropriate research method for this project's purposes. Vacancy transfer models principally rely on the fact that the system under observation (i.e., the housing market) has been segmented into meaningful, internally homogenous, mutually exclusive sectors. It is between these sectors that 'movement' is observed. This of course places a large debt of responsibility on the researcher to ensure that whatever segmentation strategy is employed accurately represents real compartments within the market. This requirement is revisited in the following paragraphs, and much greater attention to the problem is given in chapter seven. Movement is observed and expressed in terms of the conditional probabilities of transfer between submarkets. These inter-sectoral probabilities are derived empirically from historic records of lettings, transfers and exits in the social rented sector. They can then be applied to existing and newly-emerging vacancies to model the likely outcome in the future as households move in, around and out of the system.

Assumptions and constraints

Evidently, this makes several assumptions as to the nature of housing market processes. The first assumption is that the destination of a move at any time is probabilistically independent from previous moves: i.e., *any* vacancy in submarket p has the same chance of moving to submarket q, regardless of which submarket it was in previously. This is known as the assumption of first-order Markovicity, and the whole process is an embedded, first-order Markov process (Chase 1991). 'Embedded' in this context refers to fact that the process is measured longitudinally not in terms of time but rather in terms of transitions, regardless of the length of time between them. 'First-order' reiterates the fact that transition probabilities are only dependent on

the current position of the vacancy, and not where it might have been previously. Emmi & Magnusson (1995b) posit that it is this quality of 'memorylessness' in vacancies (as opposed to households) and their consequent compatibility with the Markov assumption that originally motivated researchers' concern with vacancies over people.

The second and third assumptions are related to the behaviour of the sectors in the model (the submarkets). Specifically, these are the assumptions of stationarity and homogeneity (Emmi & Magnusson 1995b). Emmi & Magnusson have expended considerable effort (1991; 1993; 1994; 1995a) in assessing the impact of sectoral design and homogeneity on Markov chain models and they conclude that while perfect homogeneity can never be achieved, the models stand up well to some degree of violation of this assumption. In any case they find that appropriate use of data reduction techniques can minimise heterogeneity such that *"with good practice*, the issue can be reduced to limited significance" (Emmi & Magnusson 1995b, 35, emphasis added). The message is clearly that the need to maximise homogeneity should not be considered as a stumbling block in the application of vacancy chain models, but that the onus is very much on the researcher to make serious consideration of the issue and adopt the appropriate techniques. Not specifically writing about Markov chain models, but nonetheless related to the assumption of sectoral stationarity, Jones *et al.* (2002) find that submarkets display a high level of temporal resilience and can be reasonably expected to remain constant through time.

A further critical aspect in ascertaining the success of vacancy chain models lies in the estimation of parameter variance at the margins of the model. For example, how is migration expected to impact on the area in the future?; how many new completions will there be?; A key question which cannot be tested in this project due to data limitations is how demand might be affected by a change in Housing Benefit rules.

The model must also be able to cope with the fact that vacancies sometimes do not simply transfer in the opposite direction to a move. If a household splits (for example) then the resultant household 'created' is analytically assimilated in the process of a vacant property elsewhere becoming not vacant. Hence, we need to allow for *absorption* of vacancies, thus capturing the tendency for households to split and combine. For this, use is made of a development of Smith & Merrett's (1987) four 'stock and flow' concepts of *rotation, conversion, subtraction,* and *new-build* to allow for changes to the supply pattern. These four concepts can be equated to either the beginning of a vacancy chain (creation of a vacancy), a link in the chain (transfer of a vacancy) or the termination of such a chain (absorption of a vacancy). Table 6.1 below summarises the relationship between Smith & Merrett's stock and flow concepts and stages in a vacancy chain.

Table 6.1. Stock flow concepts and vacancy chain stages.

Stock-flow concept[a]	Descriptive example	Vacancy-chain stage
Rotation	Wholesale household move	Vacancy transfer
Subtraction	Demolition	Vacancy absorption
Conversion	Amalgamation of properties	Vacancy absorption
Conversion	Subdivision of a large property	Vacancy creation
New-build	Construction of new dwellings	Vacancy creation

[a] after Smith & Merrett (1987).

Finally, the model needs to take account of moves to or from outside the system. This can mean both moves from or to outside of the geographically-delimited Housing Market Area, and it can mean moves involving sectors or submarkets that cannot be fully internalised within the model due to data constraints. This latter situation is of distinct concern because case-wise

management information (e.g., lettings; sales) is not easily obtainable for all housing tenures in the UK context. The private sector therefore had to be treated as one large and homogenous vacancy 'pool' that vacancies flow into or out of from the social rented sector. Both in this case and in the problem of accounting for extra-HMA migration, the best way of dealing with these is through the parametric estimates that inform the margins of the model. These manifest themselves as estimated of the number of vacancy creations and absorptions (net changes to the stock of vacancies) that can be expected to materialise as a result of processes such as migration, death, new-build, and demolition.

Conventional indicators of demand

The methodology, as has been seen, holds with it a conception of *vacancies* as dynamic and linked entities, concomitantly implying the rejection (or at the very least, reinterpretation) of conventional demand indicators. Analysis of the low demand problem has hitherto relied heavily on management indicators, particularly *vacancy rates* (or void rates), *turnover*, and the *housing register* (the 'waiting lists'). Implicit in the use of these indicators (and their benchmarks) are the notion that vacancies are undesirable. These are therefore value-laden indicators. It can be argued that they are too crude to fully account for the diversity of the causes of demand, and as social attitudes and lifestyles change (and hence so do housing needs and aspirations), they may not be as unambiguously 'bad' as they were in the past. A higher level of turnover, for example, may indicate a buoyant, healthy market for some types of property and households. This relates to an understanding of the function of neighbourhoods and their trajectories over time.[40]

Use of the waiting lists as a demand indicator is usually flawed in many respects. Most obviously, they are often out of date. Not all social landlords

[40] See for example the current EU project "Measuring Neighbourhood Trajectories in Understanding Process of Social Exclusion."

maintain dynamic waiting lists, which are typically a feature of the more sophisticated management information systems found in larger metropolitan local authorities. Second, the accuracy of the data can be questionable. In many cases, unless the list is purged frequently, applicants on the list may no longer be in a position to take up an offer of housing. They may have secured alternative accommodation; their needs may have changed; or they may have moved out of the area. Prescott-Clarke *et al.* (1994) found that each year about 40 per cent of applicants would not be in a position to accept an offer if one was made. Third, the information may not fully communicate either *need* or *aspiration* satisfactorily. Households may speculatively play the waiting list in the hope of being offered better accommodation when their present circumstances are not 'needy.' For the reasons spelled out here, audits of housing demand that heavily rely on waiting lists can give out misleading signals.

IV. METHODS, DATA, AND ANALYSIS

The research method is based on the application of a vacancy chain model to individual-level transactional data for a specified housing market area. There are several parts of the methodology that need to be treated specifically. This section will deal more practically with the development of vacancy chain analytical techniques and how they can be computationally operationalised using probability tables and matrix algebra. This will necessitate some consideration of the likely data sources for the project and issues relating to accessing raw data.

Using empirical data on dwellings, households and moves (mainly extracted from landlord information systems), a vacancy chain model can be constructed by selecting (and discarding) attribute variables to sector the housing market. The aim, once mobility in the system between these sectors has been simulated, is to apply the model to project the future mobility of vacancies given some estimated parameters related to construction and death, and other Housing Market Area parameters.

General strategy

The general strategy for the model, then, is as follows. First, a matrix of probabilities for certain types of vacancy transfer can be created from a linked database of vacancy transfer events. These types of vacancy transfer and the submarkets they move between will be defined by the choice of variables included. Some theoretical examples, which are dependent on data availability, are: the probability of a maisonette being demolished; or of a poor family moving from a cheap house to a more expensive one; or of a local authority tenant becoming a private sector tenant, or of a family near a 'bad' school moving to be near a 'good' school. Once these probabilities have been empirically derived, the model can be iteratively stepped forward to project future demand schedules, given some estimation of future parameters for migration, stock change, and demographic change. Alternatively, the sequence-end of the model can be calibrated to demographic projections (for, say, 20 years' time) then stepped back to estimate how 'filtering' and the *multiplier effect*[41] might impact on current policies and programmes. For example, what amount of new build is required, and where (given the spatial pattern of non-housing facilities and planned land-use change)? This general design can be seen in Figure 6.1.

[41] The idea that every new unit of supply will facilitate multiple moves in the market as the chain of vacancies is started. See for example White (1971).

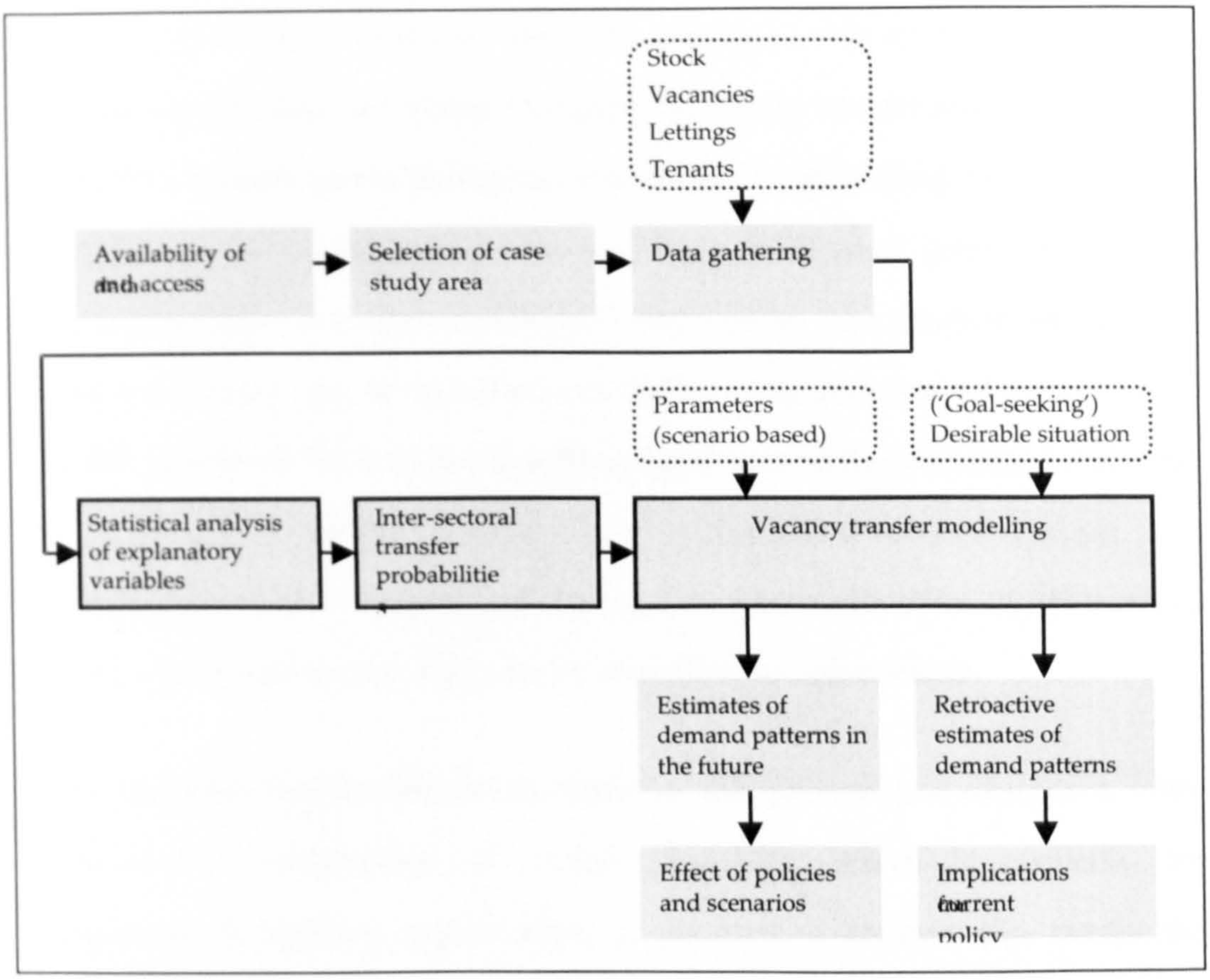


Figure 6.1. General model design.

Inter-sector transfer probabilities

Central to the model itself are the probabilities that a vacancy in one submarket of the housing market will transfer to another submarket, stay in the same submarket, or be absorbed (through demolition, household dissolution, in-migrating household, or another cause[42]). These probabilities, when stepped iteratively through a vacancy *chain,* are used to determine the likely length of a chain that commences in a given sectoral state, and where it is likely to terminate (White 1970). This of course is only useful given meaningful and analytically viable market sectors: for example, it would be helpful to know how many moves on average it takes for a vacancy in an 'expensive' dwelling to become a vacancy in a 'cheap' dwelling. This implies

[42] White (1970; 1971) and others specify 'abandonment' as a vacancy-absorbing state, although this requires more careful thought in the UK context, and also given that low demand is a process that leads to abandonment in some cases and is thus one of the phenomena under scrutiny.

the market process of 'filtering' whereby successive moves combine to result in houses eventually becoming occupied by lower-income families (Grigsby 1963). This in turn gives rise to the feasibility of calculating multipliers that describe how many household moves will be facilitated 'down the line' by the construction of a new dwelling (White 1971). The market sectors that vacancies occupy can be specified via both *supply* and *demand* processes, in that the attributes of both the dwelling itself and of the vacating household can be used to locate the ensuing vacancy chain in a sectoral stratum. It is this interplay of both supply and demand in the specification of the model's sectors which means that they can be described as submarkets.

Two examples may be helpful to reinforce this process just described. First, consider the construction of a new dwelling, which is available for occupation. A housing opportunity, or vacancy, is created; this marks the beginning of a chain of vacancies in the future (if this dwelling was demolished without anybody ever living in it, the chain would be of singular length, 1). Imagine that this dwelling's price is in the top bracket in terms of the local housing market area. Empirically, it may have been found that the probability of a vacancy in an expensive dwelling becoming a vacancy in a medium-priced dwelling (a household moves up the price scale) is .41 (ignore for the moment the length and 'type' of vacancy). It may also be known that the probability for such a vacancy leaving the system (for the types of reasons previously mentioned) is, say, .18 each time. So, there is a 41 per cent chance that a medium-priced vacancy will be created by the construction of this new dwelling. Assuming that the probabilities are the same each time, then the likelihood of vacancy chains following a particular pattern can be tracked, so theoretically it is possible to calculate the likelihood that an expensive dwelling will end up a cheap dwelling after 3 moves, for example.

The other example is similar except that it is the *household* that initiates the start of a vacancy chain. For example, at the commencement of the chain

(e.g., one households merges with another when two single-person households marry), the household creating the vacancy was single. After the next move, that household was married. The probabilities, therefore, can be found for the chances of a vacancy transferring because of change in marital status from single to married.

Now, the examples above require detailed data on the sale price of individual transactions and changes in household composition. Such data was not collectable for Bradford, and it is hard to see in any case how such detailed data could be assembled for an entire housing market area. This project is able only to use a limited number of variables, and this remains one of the principal limitations of any attempt to build a vacancy chain model of an entire housing market area, using the full population of moves rather than sample or snapshot data.

Example

A series of example steps may facilitate greater understanding of the method. Using the variables of *dwelling: number of bedrooms* and *household: number of children,* a contingency table can be imagined showing the empirical probabilities of households moving (Table 6.2).

Table 6.2. Probabilities of dwelling being occupied by households of varying sizes, by number of bedrooms in dwelling.

Number of children in household	Number of bedrooms in dwelling			
	1	2	3+	All
None	.34	.53	.13	*1.00*
1	.11	.65	.24	*1.00*
2+	.07	.70	.23	*1.00*

But movement probabilities can also be expressed in another way. Consider a vacant dwelling. When a household moves into it, that household will (in most cases) leave another dwelling elsewhere vacant. What is the probability

that the new vacancy is in a different sector of the housing market, thus describing the move of the vacating household in reverse? In this example, house prices are used to define these sectors. Table 6.3 demonstrates this.

Table 6.3 Probability of a vacancy moving from one price range to another after a household move.[a]

Price range of old vacancy	Price range of new vacancy			Outside[b]	All
	High	Medium	Low		
High	.46	.33	.03	.18	*1.00*
Medium	.08	.44	.11	.37	*1.00*
Low	.06	.20	.22	.53	*1.00*

[a] Adapted from White (1971, 92).

[b] 'Outside' refers to a vacancy moving outside the Housing Market Area, for example the household moving in from another part of the country.

Now, imagine that the system was sectored not just by dwelling attribute, but by a combination of dwelling and household attributes, called *states*. These states are formed by all possible combinations of the dwelling and household attributes. Table 6.4 shows some example variables.

Table 6.4. An example of constructing *household-dwelling states* from variables.

Variable	Example categories	
	Values	Number[a]
Households		
Household size (persons)	1, 2, 3, 4+	*4*
On 100% Housing Benefit?	Yes, No	*2*
Dwellings		
Rent	Quartiles	*4*
Distance from school	Near, medium, far	*3*
Dwelling type	House, flat, maisonette, other	*4*

[a] In this example, there would be $(4\times2)\times(4\times3\times4)=384$ possible dwelling-household states.

If there were 384 dwelling-household states, then the construction of a table (a matrix) showing the probabilities of a vacancy in one state becoming a

vacancy in another state can be imagined. It would look something like Table 6.5.

Table 6.5. Example of probabilities of a vacancy transferring from one dwelling-household state to another.

Origin state of vacancy after one move	Destination state of vacancy after one move					All
	1	2	3	...	384	
1	.012	.000	.000		.220	*1.000*
2	.115	.210	.650		.000	*1.000*
3	0.07	.000	.000		0.23	*1.000*
⋮						
384	.000	.000	.031		.540	*1.000*

Or, expressed as a matrix,

$$\mathbf{P}^T = \begin{bmatrix} \mathbf{p}_{11}^T & \cdots & \mathbf{p}_{1384}^T \\ \vdots & \ddots & \vdots \\ \mathbf{p}_{3841}^T & \cdots & \mathbf{p}_{384384}^T \end{bmatrix} \tag{6.1}$$

Naturally, given the large number of dwelling-household states, some probabilities will be found to be statistically insignificant and that state can be discarded from the model. Variables that seem to have no explanatory power can likewise be discarded (i.e., if all states that comprise that variable yield insignificant probabilities).

If there was no aggregation to sectors (submarkets), the matrix would be of dimensions $r \times r$, where r is the total number of cases in the data file (observations). Each row would consist of zeroes, except for the cell that represents the column to which the destination was made, which would be 1. The converse extreme would be that of complete aggregation to one sector, where the probability of transition would again be 1. Both these examples assume that all moves occurred within the system.

Although these are extreme examples, they serve to highlight one of the dangers of poorly specifying the sectors. If the sectors are too small, most of

the cells in the transition probability matrix will contain zeroes, leading to difficulties in interpreting the data and problems of statistical reliability. This moves the model away from macro-structural predictive capacity and towards that of micro-behavioural observation. This violates the use to which the model will be put: it is fallacy to say that, for example, *all* vacancies that are exactly the same as one previously observed will behave in exactly the same way. Similarly, at the other end of the scale, if the sectors are too large we cannot safely assume that all the vacancies that each sector represents will behave in the same way. The assumption of sectoral homogeneity will not hold. Because the sectors poorly represent actual submarkets (and may in fact partially represent many submarkets), it is invalid to assume that the empirically derived probabilities will apply to all vacancies arising in that sector.

Although the goals are slightly different, many techniques developed for the analysis of residential mobility can be applied. Clustering techniques are particularly relevant. In his analysis of mobility, Deurloo (1987) uses both logistic regression analysis and cluster analysis on the attributes of households. Emmi & Magnusson have meanwhile preferred an approach that combines, from a list of all possible sectors, those sectors which have similar transition probabilities (Emmi & Magnusson 1993). They argue that clustering by sector attributes ignores the transition *relationships* between sectors. For this reason, observations of mobility as well as of the vacancies themselves are used to distinguish between sectors. However, there may be a danger in assuming that just because sectors have similar transition probabilities they play a similar role in the housing system. Such a stance would ignore the value of building the model from individual observations in the first place: houses may be part of different chains (and thus linked to different sectors) at different times.

A simple example may illuminate this. The probability of a vacancy transferring from sector 1 to sector 2, $\mathbf{p}_{12}^{T}$ may be .34. The probability of a

transfer from sector 3 to sector 4, $\mathbf{p}_{34}^{T}$ may be .33. Clustering by similar transition probabilities would probably group these two cases even though the two pairs of sectors may be otherwise completely unrelated. Sectors 1 and 2 could represent starter homes and housing association flats respectively; sectors 3 and 4 could be retirement bungalows and suburban villas. The probabilities of transfers *across* these pairing (e.g., from 2 to 4) are likely to be very low. This thesis will return to the problem of sectoral classification in chapter seven. Meanwhile, it continues with a formal mathematic description of the model.

Scenario 1: private sector treated externally

For this first derivation of the model, use is made of the project data file to obtain the observed transition counts. A simple *a priori* schema based on property type and size will be used. It should perhaps be noted that this schema, while useful, falls short of describing submarkets because it fails to account for demand characteristics alongside supply characteristics.

Given a matrix, $\mathbf{P}$ describing the probabilities previously found empirically, forward projections are achieved by iterating the model forward in steps relating to moves in a chain. White (1971) has shown how this can be done by raising the probabilities to the j^{th} power, where j is a number of moves.

The first step is a data table showing observed transition counts between sectors, and between sectors and absorptive and creative states. This is reproduced in the appendix. The shaded area of this table shows the inter-sectoral counts. The marginal cells (excluding the total column) show absorptive state counts (the marginal destination columns) and creative state counts (the marginal origin rows). This fully-specified table can be simplified such that it is represented as a supermatrix, $\mathbf{N}$ — made up of four submatrices (one of which is a null matrix)—and appropriate sum vectors. This is shown in Figure 6.2:

	Destination housing market sectors $1,\ldots,r$	Vacancy absorbing states $s,\ldots,q$	Sum
Origin housing market sectors $1,\ldots,r$	Vacancy transfers $\mathbf{N}^T$	Vacancy absorptions $\mathbf{N}^A$	**n**
Vacancy creation states $s,\ldots,r$	Vacancy creations $\mathbf{N}^C$	Null $\mathbf{N}^O$	
Sum	$\mathbf{n}'$		

Source: adapted from Emmi & Magnusson (1995b).

Figure 6.2 Matrix and vector components of the fully-specified table.

Following Emmi & Magnusson (1995b) and using the horizontal concatenation operator (:) and vertical concatenation operator (//), it can be seen that the row and column sum vectors are

$$\mathbf{n} = \left[\left(\mathbf{N}^T\right):\left(\mathbf{N}^A\right)\right]\mathbf{1} \tag{6.2}$$

and

$$\mathbf{n}' = \mathbf{1}'\left[\left(\mathbf{N}^T\right)//\left(\mathbf{N}^C\right)\right] \tag{6.3}$$

respectively.

So, letting $\mathbf{N}^T$ be the intersectoral counts, $\mathbf{N}^A$ the absorptive state counts, and $\mathbf{N}^C$ the creative state counts, from the table the matrices become:

$$\mathbf{N}^T = \begin{bmatrix}
87 & 22 & 3 & 5 & 7 & 2 & 1 & 0 & 5 & 2 & 4 & 4 & 13 & 5 & 7 & 6 \\
28 & 239 & 12 & 5 & 13 & 7 & 1 & 1 & 2 & 9 & 2 & 0 & 1 & 14 & 15 & 4 \\
2 & 9 & 7 & 1 & 0 & 3 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
5 & 8 & 0 & 74 & 0 & 1 & 0 & 1 & 6 & 2 & 21 & 3 & 0 & 6 & 5 & 15 \\
8 & 13 & 0 & 0 & 55 & 20 & 6 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\
3 & 15 & 1 & 0 & 17 & 54 & 8 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 4 & 0 & 0 & 4 & 8 & 12 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 1 & 0 & 1 & 2 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
2 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 483 & 158 & 66 & 65 & 47 & 67 & 41 & 29 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 142 & 277 & 92 & 45 & 27 & 98 & 50 & 28 \\
1 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 60 & 99 & 558 & 173 & 11 & 49 & 94 & 50 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 69 & 46 & 196 & 563 & 12 & 36 & 57 & 139 \\
1 & 1 & 0 & 0 & 2 & 1 & 0 & 0 & 69 & 52 & 25 & 14 & 190 & 90 & 43 & 24 \\
4 & 6 & 0 & 1 & 2 & 2 & 0 & 0 & 85 & 161 & 95 & 36 & 97 & 378 & 107 & 53 \\
2 & 3 & 0 & 2 & 1 & 2 & 1 & 0 & 34 & 88 & 207 & 105 & 49 & 136 & 290 & 84 \\
1 & 3 & 2 & 0 & 1 & 0 & 0 & 0 & 25 & 39 & 64 & 257 & 31 & 79 & 77 & 345
\end{bmatrix} \tag{6.4}$$

$$\mathbf{N}^4 = \begin{bmatrix}
437 & 21 & 0 \\
366 & 11 & 0 \\
46 & 0 & 0 \\
294 & 14 & 0 \\
200 & 4 & 0 \\
60 & 2 & 0 \\
48 & 3 & 0 \\
5 & 2 & 0 \\
3995 & 116 & 16 \\
3052 & 104 & 199 \\
4182 & 116 & 434 \\
3945 & 154 & 606 \\
2177 & 48 & 1 \\
3660 & 126 & 237 \\
3214 & 89 & 16 \\
2600 & 74 & 141
\end{bmatrix} \tag{6.5}$$

and,

$$\left(\mathbf{N}^{C}\right)' = \begin{bmatrix} 187 & 44 & 20 & 13 \\ 115 & 60 & 11 & 17 \\ 16 & 11 & 23 & 0 \\ 58 & 20 & 10 & 6 \\ 106 & 3 & 15 & 10 \\ 40 & 7 & 44 & 4 \\ 8 & 0 & 16 & 1 \\ 7 & 0 & 19 & 0 \\ 1153 & 188 & 0 & 86 \\ 843 & 126 & 0 & 61 \\ 1141 & 137 & 0 & 91 \\ 1252 & 216 & 4 & 145 \\ 555 & 43 & 0 & 35 \\ 1061 & 109 & 1 & 58 \\ 886 & 100 & 0 & 69 \\ 859 & 0 & 0 & 75 \end{bmatrix}. \tag{6.6}$$

The observed probability of a transition is the count of that type of transition divided by the total of all vacancy events originating in the same sector. The probability p of a move from sector j to sector k is therefore:

$$p_{jk} = \frac{\mathbf{n}^{T}_{jk}}{\sum \mathbf{n}^{T}_{j} + \sum \mathbf{n}^{A}_{j}} \tag{6.7}$$

where $\mathbf{n}^{T}_{jk}$ is the corresponding cell of the transition counts submatrix $\mathbf{N}^{T}$;

$\sum \mathbf{n}^{T}_{j}$ is the sum of all cells in row j of $\mathbf{N}^{T}$; and

$\sum \mathbf{n}^{A}_{j}$ is the sum of all cells in row j of the absorptions submatrix $\mathbf{N}^{A}$.

Formally expressing this using matrix notation, if the column vector $\mathbf{n}$ represents the row sums of the whole transition table, then

$$\mathbf{n} = \left[\mathbf{N}^{T} : \mathbf{N}^{A}\right]\mathbf{1} \tag{6.8}$$

which is the concatenation of the transition matrix and the absorption matrix multiplied by unit column vector $\mathbf{1}$. This results in

$$\mathbf{n} = \begin{bmatrix} 631 \\ 730 \\ 68 \\ 455 \\ 308 \\ 160 \\ 82 \\ 14 \\ 5087 \\ 4115 \\ 5829 \\ 5823 \\ 2738 \\ 5050 \\ 4323 \\ 3739 \end{bmatrix} \tag{6.9}$$

which, as can be seen, are the row sums of the original fully-specified table of transition counts. It follows therefore, that a matrix of transition probabilities is simply the counts divided by the row totals:

$$\mathbf{P} = \text{«}\mathbf{n}\text{»}^{-1}\mathbf{N}^{t} \tag{6.10}$$

where «**n**» is the vector to diagonal matrix transformation[43] of **n**.

The probabilities represented in **P** can be iterated forward to simulate the transfer of vacancies between states as time progresses. If the probability of a vacancy transferring from sector j to k in one move is $\mathbf{p}_{jk}$, then the probability of it transferring in two moves is $\mathbf{p}^{2}_{jk}$. These probabilities added

---

[43] It may be helpful to point out that in order to scale the individual elements of a matrix by the corresponding element of a vector, it is first necessary to transform that vector into a diagonal matrix. This is denoted by enclosing the vector to be transformed in double chevrons, thus: if

$$\mathbf{N} = \begin{bmatrix} \mathbf{n}_1 \\ \mathbf{n}_2 \\ \mathbf{n}_3 \end{bmatrix}$$

then

$$\text{«}\mathbf{N}\text{»} = \mathbf{N}(\mathbf{I}) = \begin{bmatrix} \mathbf{n}_1 & 0 & 0 \\ 0 & \mathbf{n}_2 & 0 \\ 0 & 0 & \mathbf{n}_3 \end{bmatrix}.$$

See also footnote 44 on page 212.

together for every move give the total probability of a vacancy transferring to sector k after *any* number of moves. Hence,

$$\mathbf{P}_{t=\infty} = \mathbf{P} + \mathbf{P}^2 + \mathbf{P}^3 + \ldots \tag{6.11}$$

See the appendix for the full matrix. In normal algebraic notation, this power expansion series can be expressed as

$$\begin{aligned} P_{t=\infty} &= \frac{1}{1-P} - 1 \\ &= (1-P)^{-1} - 1 \end{aligned} \tag{6.12}$$

Of course, the actual process must take into account the initial vacancy. Therefore the probability of a vacancy transferring to the original sector after any number of moves is always $1+P$. So, for transfers from one sector to another, $P_{jk} = (1-P)^{-1} - 1$, and for transfers between the same sector, $P_{jj} = (1-P)^{-1}$. This can be represented more simply in matrix algebra using the identity matrix[44], $\mathbf{I}$. If we go back to the original power expansion series, adding $\mathbf{I}$ will add 1 to each of the elements on the diagonal. The result is a matrix which says how many times a vacancy created in sector j can expect to enter sector k before being absorbed. (Remember that the rows of $\mathbf{P}$ do not sum to 1 because at every stage some vacancies will move to an absorbing state.) This matrix, $\mathbf{M}$, is also known as the Markov multiplier matrix, or fundamental matrix.

$$\begin{aligned} \mathbf{M} &= \mathbf{I} + \mathbf{P} + \mathbf{P}^2 + \mathbf{P}^3 + \ldots \\ &= (\mathbf{I} - \mathbf{P})^{-1} \end{aligned} \tag{6.13}$$

---

[44] The identity matrix, $\mathbf{I}$ is simply a square matrix of the appropriate dimensions where the diagonal cells are all 1, and the off-diagonal cells are all zero. Hence,

$$\mathbf{I} = \begin{bmatrix} 1 & 0 & \cdots & 0 \\ 0 & 1 & & 0 \\ \vdots & & \ddots & \vdots \\ 0 & 0 & \cdots & 1 \end{bmatrix}.$$

The cells of **M** describe the expected number of times that a vacancy created in sector j will be in state j before being absorbed. The 'multiplier effects,' or expected chain lengths for vacancy starting in each sector, **m**, are given as the row sums of **M**, i.e., $\mathbf{m} = \mathbf{M1}$. While these multiplier effects have been the object of interest in other studies (especially to compare the expected outcome of Markov chain models versus those observed), they are also useful in analysing the effects on mobility of introducing new vacancies (such as through a house-building programme).

M is reproduced in the appendix. For clarity, only the multipliers, **M1** are summarised in the model output, Table 6.6.

Table 6.6. Scenario 1 summary of model outputs.

Sector	Expected chain length (multiplier), **M1**
HA/FLT/1	1.393
HA/FLT/2	1.821
HA/FLT/3	1.561
HA/FLT/4	1.454
HA/HSE/1	1.579
HA/HSE/2	2.202
HA/HSE/3	1.691
HA/HSE/4	1.874
LA/FLT/1	1.234
LA/FLT/2	1.230
LA/FLT/3	1.234
LA/FLT/4	1.240
LA/HSE/1	1.234
LA/HSE/2	1.256
LA/HSE/3	1.294
LA/HSE/4	1.315

Expected chain lengths are a measure of how many transitions a vacancy can be expected to go through before it is absorbed, and the chain consequently ends. It should be remembered that in this run of the model, the private sector has been treated as marginal, thus representing an absorbing or

creating state depending on the direction of household movement. The effect of this is that the chain lengths do not take into account any the situation whereby a vacancy can repeatedly switch between the private and public sectors. Clearly this is a severe limitation in the context of low demand and, particularly, the associated high levels of 'churn' that occur between tenures in these environments (Keenan 1998). Whilst this is addressed in subsequent chapters, it means that the chain lengths here must be interpreted with this in mind. A high chain length therefore means that the net effect of creating vacancies (thinking here primarily of new construction) is that more opportunities for mobility arise (and a greater chance for the efficient matching of needs and supply). On the basis of the evidence collected by this project in Bradford, it would seem that the net effect on opportunity of building housing association properties is generally greater than would be local authority dwellings, but that, perhaps more importantly, the construction of houses (rather than flats) generally results in longer chain lengths, regardless of tenure.

Once the observed data have been used with equation 6.13 to calculate the transition probabilities and the fundamental matrix, the model can be used further to estimate the impact of changing the number and distribution of vacancy creations, $\mathbf{N}^{C}$. Note, however, that in this crude initial example, all creative and absorptive events are being treated together as exogenous to the system. There is no distinction, for example, between death and new-build as vacancy creations. Eventually, a system will need to be considered that allows these event types to be treated differently. This is particularly important because different types of event are more or less variable over time, or are more or less sensitive to policy changes. The general propensity for vacancy creation through death is likely to remain relatively stable *ceteris paribus*, whereas the amount and intensity of new social housing construction is will vary as programmes are initiated and completed, or as policy favours it or not.

The current formulation of the model offers us little. Chapter seven extends the model to consider the effects of varying $\mathbf{N}^{C}$, thus providing a more useful and intuitive tool for considering the effects of proposed policy interventions on demand for social housing.

Chapter Seven.

SETTING THE MODEL IN CONTEXT.

FEW MARKETS EXIST that are completely internal and isolated from exogenous pressures. The housing market in particular is uniquely positioned at the junction of national (macro) economic forces and local supply and demand considerations. Vacancy chain models are particularly adept at accounting for and projecting dynamic processes in what could be considered as closed systems. The only opportunity afforded to assimilate exogenous variables is in the forms of the margins of the model. It is at these margins that the phenomenon of net changes in vacancies are accounted for—in terms of creations and absorptions. Therefore, the framework that needs to be adopted is one whereby exogenous effects can be expressed in terms of their anticipated effects on the creation or absorption of vacancies in the system. This chapter considers this task in some detail and develops

approaches to these marginal parametric estimates, thus allowing the model to be set within the wider economic context.

I. NEW VACANCIES

Vacancy creation: new construction and completions.

One of the main elements of new vacancy creation in the housing system is that which results from investment in new housing stock. Principally, three agents are responsible for such investment. The first, most significant and yet most problematic is the private sector. The bulk of the remainder of new housing construction is funded through social housing programmes. Local authorities have seen their role in new housing provision seriously and consistently retrenched over last decades. The main builder and provider of social rented accommodation is now the RSL sector, mainly housing associations.

Data are available on the precise location and nature of the social sector's new provision, even if these data must be actively sought and interpreted from the relevant bodies. Data on the private sector may be more difficult to obtain, although the task is made somewhat easier by information collected by local planning authorities as part of the land-use planning process.

More significant, perhaps, is the degree to which future estimates of housing provision can be made. This is important to test the likely effects of investment on the resultant quantity and distribution of vacant housing. Investment is an activity which can both cause things and react to them. One of the principal aims of this study, it should be remembered, is to devise a method of testing the multi-sectoral and contingent effects of investment on the problem of low demand, as encapsulated through vacant housing. The investment activities, both historic and programmed, of private housebuilders and social landlords alike have been steadily introducing vacancies into the housing system, and will continue to do so. It is the

secondary, tertiary, and further, effects of these new vacancies that result in patterns of household mobility which, in turn, systematically lead to configurations of vacancies elsewhere (sectorally and spatially). But it must also be remembered that investment in housing remains the primary tool to redress market imbalances. If we can better understand the contingent nature of dynamic adjustment of vacancy pattern in response to new construction, then we can better plan for the long term achievement of a market in equilibrium, and sustainability of demand for social housing (or all housing) and the consequent stability so required to effectively plan for neighbourhood renewal.

What has just been said should not be taken as a straightforward justification for continued housebuilding programmes; nor is it pretending that the answer lies in large-scale stock reduction measures. The difference is more subtle. It is calling for a better understanding of the fit between the *distribution* of investment and the impacts this has on demand—not just instantaneously, but in the future as the system adjusts. It is likely, particularly as headship rates continue to fall, that there will be a continued increase in aggregate demand for housing, even in those areas of 'low demand.' The specifics of this demand have been changing, and will continue to do so. The question is how? And where are the opportunities to restructure the pattern of supply to best fit changing demand?

New construction, in the model, is one of the few parameters that can be actively influenced: it can, more than others, be *set* rather than merely projected. (Demolition of housing is another market intervention that can probably be even more easily dealt with in this way.)

Figure 7.1 shows various measures of new construction during the model time period and for several years prior. The main source of data is local authorities' P2 statistical returns, which are made to the ODPM. Two other measures which are shown are those from the Land Use Change Statistics

(LUCS) and from the Housing Corporation's Continuous Recording (CORE) system. The LUCS data refer to all completions; CORE is, rather, a measure of new lettings made. Both measures are potentially very useful because of the rich attribute information contained in the source data and subsequent scope for sectoral disaggregation. However, a number of caveats need to be borne in mind.

Land Use Change Statistics are collected by the ODPM as a by-product of the Ordnance Survey's process of updating large scale maps (ODPM 2002b). Changes to and from residential land use are identified as part of this and where this is the case the number of units involved are also recorded. National grid references are available for each land use change episode. Two of the main outstanding impediments to the accurate use of LUCS data are the extent to which conversions are recorded and the accuracy of the recorded date (ODPM 2002b). The former problem arises because residential conversions or, indeed, other small scale works may not generate any necessary change in large scale maps. The latter relates to the cyclical nature of map revision which means that field surveyors must use their own judgement to estimate the date of construction of new schemes that they encounter.

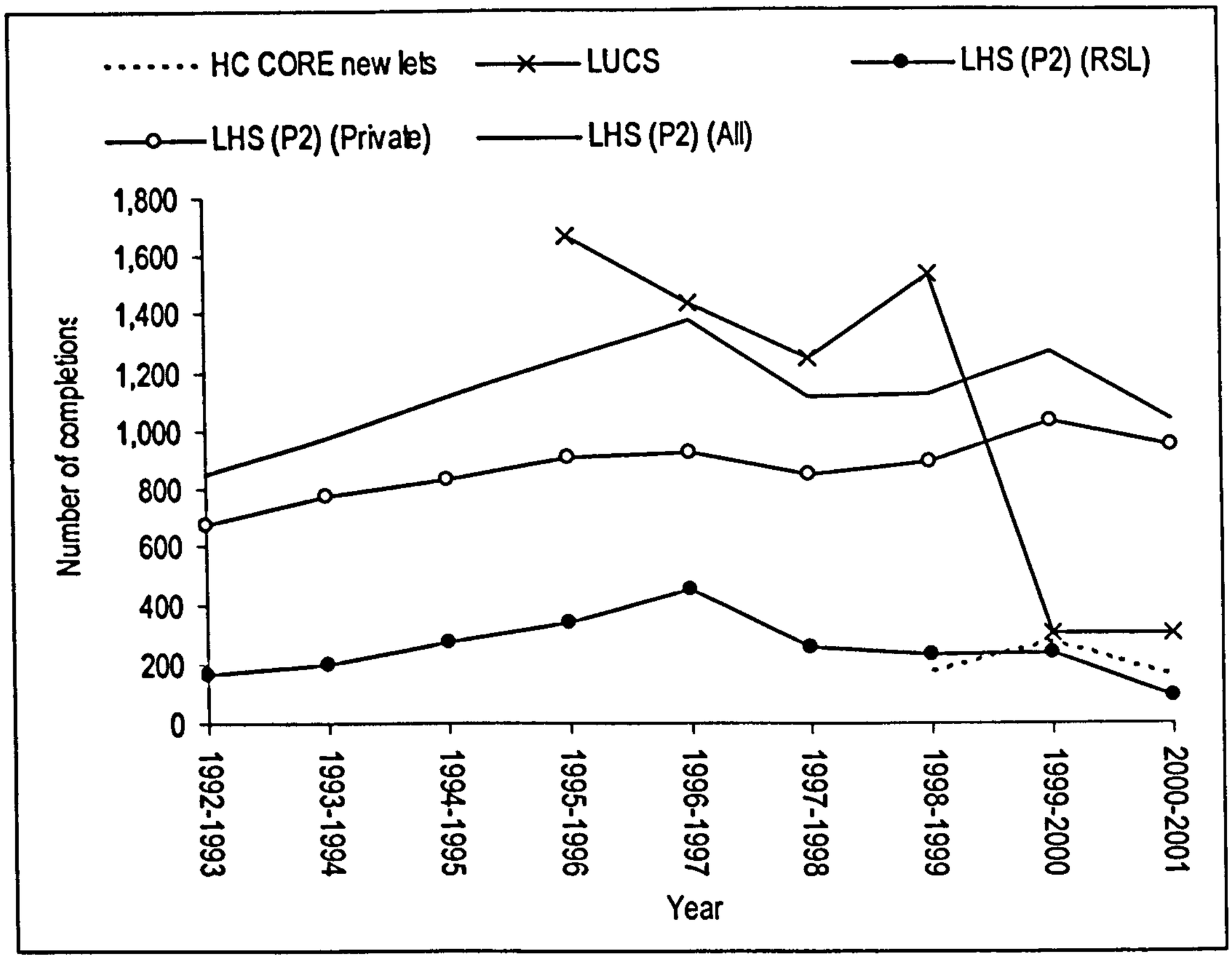


Figure 7.1 Comparison of measures of new construction in Bradford, 1992–2001.

There appears to be a sharp fall in the number of residential completions captured by LUCS after 1999. This is because not all completions that have happened since will be recorded yet. They may not be captured until the next planned cyclical revision or until the number of changes notified to OS by the local authority triggers an earlier update of a particular map tile.

CORE data hold a very wide-ranging and detailed set of information about all lettings that are made by RSLs. It is possible to distinguish lettings made to a property that has been newly constructed or rehabilitated from those which are normal re-lettings. As can be seen from the chart, this tallies quite closely with the LHS data. The small differences exist because: not all newly constructed properties may be immediately let; not all 'new lettings' are to newly constructed properties (they may be rehabilitated); and normal problems related to non-receipt of CORE log forms.

Although it is accepted that there may be some problems with the accuracy of statistical reports based on returns made by local authorities (HC 240-I, para. 9; DTLR 2000), it is clear from the graph that the data are more complete and robust than using alternative sources. It is not possible to obtain the total number of completions from the data collected from each housing association because not all housing associations supplied data, and some were not able to supply information on construction dates for stock.

Future housebuilding

Regional Planning Guidance (RPG) 12 sets out target house-building allocations for local authority districts in Yorkshire and the Humber. The draft RPG, published in October 1999, initially allocated 25,000 new dwellings over the period 1998–2016, equating to an average yearly requirement of 1,390 dwellings. This figure has been ratified by the Secretary of State in the revised RPG (DTLR 2001, 67) after a period of consultation when there was a possibility the targets would be revised upwards. It is clear from reading the Secretary of State's proposed modifications and the resultant revised RPG that the current figure of 1,390 should be considered as a minimum and that local authorities in West Yorkshire should be prepared for an upwards revision in the next RPG cycle (GOYH 2001a).

These targets include new houses by private house-builders for owner-occupation and buy-to-let, and housing association building. Table 7.1 shows the level of current and expected regional cash limits for Housing Corporation funding. As can be seen, it is expected to rise over the three years to 2003/04, in line with a national increase in ADP. In 2001/02, final ADP outturn for Bradford for homes for rent was 212 units, and allocations were made for 150 units in 2002/03.

Table 7.1 Housing Corporation funding in Yorkshire & Humberside to 2003/04

£ millions

	Actual 2001/02	Indicative 2002/03	Indicative 2003/04
Regional Cash Limit	46.0	53.1	69.7
Allocations to be issued	59.0	65.0	80.0

Note: £18 million of pre-allocations were issued for 2002/03.
Source: Housing Corporation (2001b)

II. THE FULLY-SPECIFIED MODEL: A DEMONSTRATION

Notwithstanding this, however, we can first go ahead and demonstrate the effects of increasing the number of vacancy creations in one sector (representing the construction of a new housing estate, for example). If **M** describes the fractional number of times that a vacancy can be expected to enter a vacancy, then multiplying this by both the number of new vacancies and the probabilities of eventual absorption in any of the states will yield the expected distribution of absorptions resulting from these new vacancies, $\mathbf{n}'_a$.

$$\mathbf{n}'_a = \mathbf{n}'_c \mathbf{M} \langle\langle \mathbf{p}_a \rangle\rangle \tag{7.1}$$

To simulate the effect of 100 newly built housing association flats in an area of low house prices, we will let,

$$\mathbf{n}_c = [100 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0].$$

This yields:

$$\mathbf{n}_a = [84.5 \quad 3.4 \quad 0.5 \quad 0.8 \quad 1.2 \quad 0.4 \quad 0.2 \quad 0.0 \quad 1.0 \quad 0.6 \quad 0.9 \quad 0.9 \quad 2.2 \quad 1.1 \quad 1.3 \quad 1.1]$$

Clearly, levels of cross-sectoral transfer are low. Nearly 85 of the 100 new vacancies are eventually absorbed from the same state. (The key question then becomes, how? To answer this, different absorptive states need to be treated exogenously.)

To convert the vector $\mathbf{n}_a$ into information related to the expected resulting destination of vacancies, it is necessary to first subtract the *projected* values for certain absorptive states, notably the size and distribution of the demolition programme and the expected pattern of in-migration and moves from the private sector.

Scenario 2: private sector treated internally

To demonstrate this, a system divided into 14 states representing local authority housing according to its type and number of bedrooms. Housing association dwellings comprise a 15th, endogenous, state. The private sector is being similarly treated, as the 16th, endogenous, state. (Note that the data do not permit the disaggregation of private sector moves into renting or ownership tenures. This is a weakness in the model. However, it is not considered that attempts to proxy the tenure split would result in reliable improvements in the models performance.) Given no programmed construction in the local authority sectors, and an expected completion schedule of HA dwellings, it should be possible to determine where the vacancies will arise.

Imputing private sector counts

Since the private sector is being treated endogenously, we must make some assessment of the numbers of vacancies involved in intra-private sector transition, and also to and from the marginal states. Recourse must be had to a variety of national statistics, some of which have to be modelled down to the local authority level. This, of course, is bound to introduce significant error into these assessments. However, to treat the private (rented) sector as exogenous is to ignore its role as a transitory stage in the housing careers of many households. It is not a one-way process. Vacancies do not just transfer out of the private sector, churn around the social sector, then become absorbed. Particularly as our crude definition of the private sector includes both renters and owners, vacancies can move to the private sector in significant numbers. It is important to recognise that vacancies may enter a

sector, leave it, and then enter it again before being eventually absorbed. Treating a sector as exogenous (i.e., not transitory) does not allow for this possibility. Therefore, it is more important to have some understanding of the magnitude of the counts involved, even if it is recognised that these are likely to be prone to significant error.

Intra-private sector moves and in-migrating households

The first objective is to quantify the number of moves that occur within the district involving wholesale household moves from one private sector dwelling to another.

Table 7.2 Whether households moved in the last year by tenure, England 2000/1.

All heads of household *Thousands*

Current tenure	Whether moved in the last year		
	Yes	No	Total
All owners	1 001	13 418	14 419
All private rented sector tenants	831	1 171	2 001
All private sector owners and tenants	**1 832**	**14 589**	**16 420**
	11.2%	*88.8%*	*100.0%*
All social rented sector tenants	**485**	**3 732**	**4 217**
	11.5%	*88.5%*	*100.0%*
All tenures	**2 316**	**18 321**	**20 636**
	11.2%	*88.8%*	*100.0%*

Source: SEH, table A2.4.

Bradford accounts for just under one per cent of England's houses (there were 164,159 private sector dwellings at April 2001[45] and a national total[46] of 16,959,033, which is 0.97 per cent). The 2000/1 Survey of English Housing

[45] Bradford MDC 2001b

[46] Housing Investment Programme national statistics available on ODPM website at www.housing.odpm.gov.uk.

(SEH) provides a national estimate of the proportion of households moving in a year, by tenure. 11.2 per cent of household heads in private dwellings moved in the year previous (Table 7.2). Of these, 77.9 per cent moved from a private sector dwelling (Table 7.3).

Table 7.3 Previous tenure by current tenure, England 2000/1.

All heads of household resident less than one year *Thousands*

Current tenure	**Previous tenure**			
	New households	All private sector	All social rented sector	Total
Owners	136	829	33	998
Private rented sector tenants	175	586	58	819
All private sector owners and tenants	**311**	**1 415**	**91**	**1 817**
	17.1%	*77.9%*	*5.0%*	*100.0%*
Rented from local authority	73	90	142	305
Rented from RSL	32	60	83	175
All social rented sector tenants	**105**	**150**	**225**	**480**
	21.9%	*31.2%*	*46.9%*	*100.0%*
All tenures	**416**	**1 565**	**316**	**2 297**
	18.1%	*68.1%*	*13.8%*	*100.0%*

Source: SEH, table A2.3.

The total number of intra-private sector moves in Bradford over the study period can be very crudely estimated by calculating a pro-rata volume based on the national figures, then multiplying by five for each of the years in the study period.

$$moves = 164159 \times \frac{11.2}{100} \times \frac{77.9}{100} \times 5$$
$$= 71615$$

These can then be split between those who have moved into Bradford from outside, and those who have stayed in the area. To do this, the total known in-migration to the social rented sector is subtracted from a forecast increase in unconcealed households in Bradford in the period 1996–2001. On the basis of a sample survey of 2,500 households in Bradford in 1999, the Northern Consortium of Housing Authorities has estimated an average in-flow of households to the district per year of 981, equivalent to 4,905 households over the five-year study period. 863 moves from outside the district were made into local authority dwellings.

From CORE data, approximately 5.5 per cent of RSL lettings were to households who had moved from outside the district. 7,606 lettings were made in the period 1996/97 to 2000/1 (Table 7.4). This equates to an estimated number of 418 moves from outside the district.

Table 7.4 RSL lettings and LA nominations, 1996/7–2000/1

Lettings *Bradford*

Year	Total RSL lettings[a]	LA nominations to RSL dwellings		
		All	to homeless households in priority need	to LA tenants transferring
1996/97	1 331	504	113	0
1997/98	1 613	443	53	4
1998/99	1 554	368	45	0
1999/00	1 658	419	32	0
2000/01	1 450	1 701	26	219
	7 606	**3 435**	**269**	**223**

[a] Including nominations but excluding transfers.
Source: HIP returns.

Therefore, an estimate of the number of moves into private sector accommodation from outside the district over the five years is:

$$moves\_in = 4905 - (863 + 498)$$
$$= 4905 - 1361$$
$$= 3544$$

This can be deducted from the estimated total of intra-sector moves arrived at earlier (71615) to give the number of those intra-sector moves which occurred exclusively from within the district ($71615 - 3544 = 68071$).

Demolition and clearance

It would appear that there is a paucity of data on private sector demolition, and the conclusion must be drawn that in reality the numbers involved are very low. Two recent studies carried out by or for Bradford MDC do not take into account private sector clearance (Northern Consortium; BMDC local needs assessment). HIP data on private sector clearance shows only 19 dwellings cleared in the period 1997/8 – 2000/1 (data were not available for 1996/7). In the absence of any further information, this figure is used to account for private sector demolitions in the absorptions sub-matrix.

Out-migration from the district

The Northern Consortium study estimates an annual outflow from the district of whole households of the order of 1,100 per year, which equates to 5,500 over the study period. If all known out-migration from the social rented sector (from the collected data sets) is deducted, the estimated private sector out-migration is $5500 - 715 = 4785$.

This estimate of 4,785 is therefore used as part of the private sector component of the vacancy creation sub-matrix.

Death causing a vacancy

Estimates calculated by the Northern Consortium (2001) as part of its recent market study for Bradford MDC are again used, this time to account for vacancies arising in private sector stock through death. A total of 5,372 deaths over 10 years were estimated, resulting in a five year average of 2,686. Again, the social rented sector component of this, known from the collected data sets, is deducted as follows: $2686 - 1260 = 1426$.

The matrix as it is currently specified can be used to model the effects of the *status quo*. It assumes that both RSL and private sector house-building will continue at current levels and that they will continue to build the same kinds of properties as before. In this version of the model, both the RSL and private sectors, while considered as endogenous, are only specified as monolithic sectors. No account is taken of differential probabilities pertaining to property type (for example) within these sectors. A move to an RSL dwelling can be predicted, but beyond this there is no attempt to predict the characteristics of the dwelling. Of course, in order that the model be capable of testing public sector investment scenarios, it is essential that more sensitivity to changes in the *form* of investment, rather than crude quantities, is built in. Due to the partial incompleteness of the RSL data this cannot be attempted in the present study, but for now it is sufficient to get an idea of the effect on local authority vacancies of investment continuing in line with levels prescribed by Regional Planning Guidance.

The gross requirement is for 1,390 dwellings yearly, equalling 6,960 dwellings over the five year time frame of the model. A yearly average of 200 new RSL dwellings will be assumed, in line with recent building activity and an expected rise in ADP over the coming years in real terms.

Table 7.5, which represents $\mathbf{N}^C$, shows the schedule of projected vacancy creations on the basis of the aforementioned assumptions of *status quo*. Note, however, that the private sector completions have been estimated along the lines of the minimum RPG requirement, which represents an increase of 1,309 dwellings over the reported completions[47] for the period 1996-2001.

[47] Source: P2 returns made by local authorities and reported in the ODPM series *Local housing statistics*.

Table 7.5 Schedule of projected vacancy creations.

Sector	Vacancy creation states		
	Moves out of Bradford	Deaths	Housing completions
HA ALL	53	167	1 000
LA/BSR	46	110	0
LA/BUN/1	59	173	0
LA/BUN/2	0	7	0
LA/BUN/3	0	0	0
LA/FLT/1	243	488	0
LA/FLT/2	82	91	0
LA/FLT/3	6	5	0
LA/FLT/4	0	0	0
LA/HSE/1	1	3	0
LA/HSE/2	71	83	0
LA/HSE/3	101	119	0
LA/HSE/4+	9	2	0
LA/MAI/2	32	11	0
LA/MAI/3	12	1	0
PRIVATE	4 785	1 426	5 960

From Table 7.5, the total vacancy creations, $\mathbf{n}_c$ becomes

$$\mathbf{n}_c = [1220 \quad 156 \quad 232 \quad 7 \quad 0 \quad 731 \quad 173 \quad 11 \quad 0 \quad 4 \quad 154 \quad 220 \quad 11 \quad 43 \quad 13 \quad 12171]$$

Table 9.8 on page 1 shows the fully specified transition events matrix, $\mathbf{N}$. The resulting transition probability matrix, $\mathbf{P}$ is shown in Table 9.9, while the fundamental (Markov) matrix, $\mathbf{M}$ is in Table 9.10.

Using equation 7.1, the expected eventual pattern of vacancy absorptions, $\mathbf{n}_a$ can be calculated. The model inputs and outputs are summarised in Table 7.6.

Table 7.6 Scenario 2 summary of model outputs

Sector	Input vacancy creations, n'_c	Output vacancy absorptions, n'_a	Change in vacancies	Percentage change
HA ALL	1,220	144	-1,076	-88.2%
LA/BSR	156	637	481	308.3%
LA/BUN/1	232	172	-60	-26.0%
LA/BUN/2	7	2	-5	-72.6%
LA/BUN/3	-	-	0	0!
LA/FLT/1	731	1,019	288	39.4%
LA/FLT/2	173	1,246	1,073	620.2%
LA/FLT/3	11	468	457	4152.0%
LA/FLT/4	-	5	5	
LA/HSE/1	4	-	-4	-100.0%
LA/HSE/2	154	204	50	32.4%
LA/HSE/3	220	1,850	1,630	740.9%
LA/HSE/4+	11	53	42	386.1%
LA/MAI/2	43	1,843	1,800	4186.5%
LA/MAI/3	13	458	445	3425.7%
PRIVATE	12,171	7,045	-5,126	-42.1%
All	**15,146**	**15,146**	**0**	

It should be noted that four of the sectors contain account for very few events and should be ignored. These are: LA/BUN/2; LA/BUN/3; LA/FLT/4; and LA/HSE/1. Three sectors in particular however appear to account for a large proportion of the eventual absorption of the created vacancies. These are LA/FLT/3 (three-bedroom local authority flats) and LA/MAI/2 and LA/MAI/3 (local authority maisonettes).

The only sectors which can expect to reduce the number of vacancies in them (because they systematically transfer to other sectors) are the HA ALL (all housing association dwellings), PRIVATE (all private sector dwellings), and LA/BUN/1 and 2 (local authority bungalows, which are normally allocated to elderly or special needs households and are relatively popular).

Chapter Eight.

PARTITIONING SPACE.

Options for the further development of vacancy chain models.

MUCH HAS ALREADY been said about the structure of the housing market, particularly in terms of the need to come to a consistent view of how best to partition it. This chapter deals with this problem specifically with a view to improving the vacancy chain model proposed in the preceding chapters so that it can more accurately be used to analyse mobility between true housing submarkets. It should be pointed out that much of this work was beyond the scope of the present study in anything more than a cursory fashion. Therefore, this chapter exists as a brief review of the options that exist for the future development of vacancy chain models of the housing market that adequately and accurately describe submarket interactions in a wider Housing Market Area. While some use is made of the project data, the intention of this chapter is more in the mould of an agenda for future

research. Limitations in the data file did not, in any case, permit as full an exploration of the techniques than required.

I. THE IMPORTANCE OF SECTORAL DEFINITION

The choice of method and model is grounded in our view of the world; specifically in two ways. First, we may ask, what things constitute the world (or the world under observation)? Second, we may also ask, what happens to these things? These may be identifiable actions, perhaps mechanisms linking these actions to other things, but also perhaps phenomena more generally—in that some types of things seem to act in identifiable ways (we know which things are involved, and how they act) but we are not clear why.

From the outset, we must separate these 'things' and 'happenings' from the values or ethics that we hold as researchers. We will be able to see some things as constructs—socially defined, culturally defined, or defined simply by our own insights, experiences, prejudices, values. But we can also think of things that can be more successfully divorced from such constructions. An atom remains an atom regardless. More contentiously, but equally importantly, a house remains a house (although they may *appear* quite diverse) given a definition that a house provides some sort of service. Anything else is just an attribute of a house. Attributes do not define things, but describe them.

To say that, because a house (in the childlike imagination) has four windows and a door, all buildings with four windows and a door are houses is clearly a fallacy. On the other hand, because a house is something in which people live, then it is valid to say that all buildings in which people live are houses. By recasting the definition of a house in terms of the function it performs, it is possible to successfully evade specific constructions or localised interpretations of what a house is. Such localised interpretations are better seen as attributes of function. For example, in Scottish cities, houses are more likely to be found in tenements, and are more likely to be rented. They are

still houses. We may think of them as flats—but is a flat not more fundamentally a house with some particular attributes? They both still perform the same function. A person cannot live in both things at exactly the same time.

The values of the researcher may bias or force selectivity upon the way some objects are treated. For example, different researchers will see 'neighbourhoods' in different ways, as Galster (2001) pointed out. Some may not see them at all. A neighbourhood is an aggregate construct that is comprised of many things with particular attributes in a particular structure. For some, that may be the proximity clustering of houses. For others, patterns of social interaction are more successful in describing what a neighbourhood is.

The role of geography

The question is: how should geography be used to delineate the transition sectors? The three options are: (a) by area (such as pre-existing administrative units like electoral wards); (b) by geographically varying attributes, such as crime or education performance of local schools; and (c) by only retrieving geography on the basis of post-hoc clustering of sectors once defined.

Option (b) has the advantage that it avoids any collinearity between the explanatory power of the areas themselves and the factors that go to make up the perception of an area. Option (b) therefore is additive: it adds further area-specific attributes to the sectors whilst avoiding any 'double-counting' of stock types. Option (a) has this double-counting problem. Option (c) could also be used in addition to option (b) after the (non-geographical) sector transition probabilities have been computed. Analysis of the transition probabilities could then reveal whether there existed any significant geographical clusters of market type. The dictum that 'location' is the most important attribute of housing markets is not being ignored; rather it is

recognising that location's prime importance is as a result of the attributes of areas rather than the areas themselves. (People do not have a preference to live at 400,230m east, 275,440m north -- but they may want to live in a low-crime, environmentally amenable area with the sort of properties that they desire.) Therefore it is suggested here that option (c) should form the basis of any further attempts to develop vacancy chain models of the housing market.

It is important to be clear that—despite appearances—vacancy chain models are not explicitly concerned with the micro-level decisions of households. As has already been state, the aim is not to model household behaviour, but to model the aggregate structural effects of household decisions on the housing system (Emmi & Magnusson 1993). To reconstruct chains of moves, however, does require detailed data on observations of movement at the individual household level. This class of model has at its core the problem of trying to discern macro-structural patterns from a vast set of minute observations. The immense variety of moves that the data describe mean that the problem becomes one of data reduction while at the same time retaining a case-wise level of disaggregation. In other words, it is imperative not only from the point of view of market segmentation but of pragmatics to find some way of splitting the data into meaningful groups by combining variables and categories.

II. EXPLORING THE DATA

The data file presents quite a significant problem in terms both of its length (number of cases) and the potential for confusion arising from the variety and number of variables. While the actual number of variables might not be considered that large, they represent a large number of categorical variables, the permutations of which would result in a massive and unwieldy matrix should they be directly converted into 'states.' As an example, a test schema comprising only 10 variables describing both the properties and the resident households would have resulted in some 46,656 discreet states—nearly one

for every case in the analysis. When used to describe origin-destination pairs, the resulting matrix would have had over 2 billion cells ($46{,}656^2$).

It is therefore imperative to devise some method of cutting down on the number of states without sacrificing the potential explanatory power of the variables. It was first thought that many of the 46,000 or so states could be instantly discarded because they would not describe any actual cases. Further investigation showed that the vast majority of these states were in fact populated by one (and usually only one) case. The states were almost perfectly describing the individual data cases, almost as if one had run a cluster analysis looking for 46,656 clusters.

There were a number of options to proceed. First, is to adopt some form of *a posterior* method to define submarket. Following the example of Emmi & Magnusson (1997) it was thought that a staged clustering approach may be possible. Instead of simply removing empty cells, as described above, the idea is to somehow first identify those attributes that do not seem to have any effect on the internal homogeneity of clusters. This is like finding homogenous dwelling group sectors (in the case of the property attributes) or perhaps homogenous client groups (in the case of the households). (The interaction between these homogenous sectors of supply and demand might give rise to homogenous housing market sectors; indeed, it is the hope that in this way the internal homogeneity of transition probability clusters is analogous to homogenous housing submarkets.)

The second broad option, which is also explored, is to decide on sector classifications *a priori* using a combination of intuitive knowledge, expectation, and curiosity. This is elaborated upon later in the chapter.

Returning to the 'staged clustering approach,' there remain a number of options on how to proceed in identifying those variables with any explanatory power. The use of Cluster Analysis or Discriminant Analysis at this stage was rejected because of their stringent data assumptions, including

the requirement for continuous, quantitative data. It was thought that the explanatory power of variables would be revealed by their use in predicting outcomes. Although the *outcomes* of the data are ultimately the transition probabilities between sectors, it is also possible to derive other measures. For example, the number of vacancies generated in a property (or, conversely, the number of times a household moves). Which variables can be used to predict one of these outcomes? That was the goal of this part of the analysis; the tool was Binomial Logistic Regression.

Binomial logistic regression

While ordinary linear regression tries to fit an equation which models a continuous variable, Logistic Regression can be used to determine the probability of a case belonging to one of two groups (a dichotomous variable). Linear Regression was of dubious value because of the skewness of the dependent variable, and the problem of heteroscedasticity. For the Logistic Regression, then, two variables were imagined: for dwellings, whether the property 'received' a vacancy more than once in the five-year period or not; for households, whether the household moved more than once in the same period. The 'more than once' measure was chosen because it may go some way towards minimising the effect of wrongly treating a single instance as problematic (it may have been the only instance in 50 years but just so happened since 1996).

For the households the results are presented in Table 8.1. The final equation predicts whether a household was a multi-mover (more than once) in the five-year study period or not. The unstandardised coefficients (B) suggest that households that were tenants of the council or Brunel are more likely to multi-move. Date of birth appears to be an insignificant factor (p = .958), as does gender. Overall, the logistic regression results appear to be unreliable and — apart from the landlord difference — suggest that problems with the data file, mainly missing values, are heavily distorting the results.

Table 8.2 presents the results for the variable predicting a multi-vacated property. Again, there are a large number of insignificant results ($p > .05$). Interestingly, there appears to be a geographical effect. An area variable was entered experimentally and it would appear that a property being in Keighley rather than Bradford significantly ($p = .017$) reduces the odds of it being vacated twice in the study period. The table also suggests that council stock 'behaves' significantly differently to RSL stock. Other variables do not seem to yield significant explanatory power.

Table 8.1. Variables in the equation predicting a multi-moving household (binomial logistic regression)

Variable	Category	B	S.E.	df	Sig.	Exp(B)
LL_REF				5	.043	
LL_REF(1)	BMDC	1.495	.682	1	.028	4.458
LL_REF(2)	Brunel	1.790	.623	1	.004	5.991
LL_REF(3)	Anchor	-3.860	4.418	1	.382	.021
LL_REF(4)	Housing21	-3.017	5.452	1	.580	.049
LL_REF(5)	Hanover	-3.976	21.229	1	.851	.019
DOB		.000	.000	1	.958	1.000
ETHRECOD				10	.004	
ETHRECOD(1)	British	5.576	11.475	1	.627	264.003
ETHRECOD(2)	Asian	.350	15.327	1	.982	1.419
ETHRECOD(3)	N/K	4.477	11.480	1	.697	87.948
ETHRECOD(4)	Blank	.187	39.362	1	.996	1.205
ETHRECOD(5)	Indian	5.484	11.497	1	.633	240.744
ETHRECOD(6)	Other	4.610	11.497	1	.688	100.511
ETHRECOD(7)	Pakistani	4.730	11.479	1	.680	113.293
ETHRECOD(8)	Caribbean	5.995	11.480	1	.602	401.324
ETHRECOD(9)	African	.145	16.066	1	.993	1.156
ETHRECOD(10)	Irish	6.616	11.484	1	.565	746.740
DEPS_NUM		.078	.031	1	.011	1.081
SEX				3	.408	
SEX(1)	Male	-.053	99.726	1	1.000	.948
SEX(2)	Female	.043	99.726	1	1.000	1.044
SEX(3)	N/K	.677	99.727	1	.995	1.968
Constant		-10.884	100.389	1	.914	.000

Note: Variables entered on step 1: LL_REF, DOB, ETHRECOD, DEPS_NUM, SEX.

Table 8.2. Variables in the equation predicting a multi-vacated property (binomial logistic regression).

Variable and category	B	S.E.	df	Sig.	Exp(B)
NO_BEDRM	.078	.064	1	.223	1.081
LL_ANC	-.624	.506	1	.218	.536
LL_BMC	.831	.362	1	.022	2.296
LL_H21	.008	.557	1	.988	1.008
LL_BRU	-.571	.422	1	.176	.565
PTYP_BSR	3.220	12.221	1	.792	25.030
PTYP_BUN	1.983	12.222	1	.871	7.267
PTYP_FLT	2.885	12.221	1	.813	17.897
PTYP_HSE	1.935	12.223	1	.874	6.924
PTYP_MAI	3.716	12.222	1	.761	41.105
FLRLEVEL	-.023	.021	1	.270	.978
AREAWECE	.116	.089	1	.194	1.123
AREASHNO	.011	.092	1	.903	1.011
AREAKEIG	-.252	.105	1	.017	.777
Constant	-6.746	12.227	1	.581	.001

Note. Variables entered on step 1: NO_BEDRM, LL_ANC, LL_BMC, LL_H21, LL_BRU, PTYP_BSR, PTYP_BUN, PTYP_FLT, PTYP_HSE, PTYP_MAI, FLRLEVEL, AREAWECE, AREASHNO, AREAKEIG.

General log-linear analysis

The general log-linear analysis of multidimensional contingency tables can be used to assess the relationship between independent variables and a dependent variable. Specifically, the null hypothesis that there is no relationship between the variables is tested. A dependent variables needs to be defined. A simple example may be a particular housing market outcome: e.g., does a vacancy move to a flat, and what variables are related to this outcome?

A major problem here is that the model that we are trying to derive needs to fit both origin and destination. If the model fits well (say for example there is a strong relationship between property size and vacancies moving to a flat) then that tells us about the unidirectional relationship, but not that the specific combination of 2 bedrooms and flats for example may constitute a submarket.

We are defining submarkets conceptually on their ability to maximise the number of moves internal to them. This is because properties within a submarket will be close substitutes for each other. The goal of any analysis therefore should be find some way of partitioning our data such that moves between sectors are minimised.

One could imagine an iterative process. Sectors could be created in a massive, but finite, number of different ways through inclusion or exclusion of variables, and combinations of categories both within and across variables. Each time this was done, a contingency table was produced to show the frequencies of vacancies moving between sectors. The diagonal cells in this table would represent the frequencies of within-sector moves, and off-diagonal cells would represent moves where the destination sector was different from the origin sector. Ideally, the proportion of moves represented by the diagonal cells will be greater than those represented by the off-diagonal cells. The process would continue iteratively until such time as all possible ways of defining the sectors has been tested. The optimal solution would be the one where the proportion of frequencies on the diagonal was biggest. Clearly, this is not a feasible approach. It would be extremely computationally intensive. However it does provide a solid and intuitive framework for the application of more focused methods, as well as a clear idea of the assumed process.

Chapter Nine.

CONCLUSIONS.

IN THE MAIN, the power of a model lies not in the model itself, but in the way that its outputs are used to better understand the impacts of our actions on meeting our goals and objectives. On some other occasions, the value of the exercise lies in the endeavour itself; from deepening our understanding of a process through trial and test, wrong turnings and right. Both are of immense intrinsic value but sometimes the pursuit of one can be to the detriment of the other. In the course of this project, this feat of balancing has at times become precarious, with the weight of attention given to issues of epistemology threatening to obfuscate the value of the output for the purposes to which it was originally intended.

The conclusions of this work must therefore, of necessity, be many and varied. Yes, some policy conclusions can be reached. The model has been operated and this thesis can, at the very least, make some assertions about the effects of certain forms of intervention in the housing system in Bradford. We may also hazard that some of these conclusions may be relevant in other cities and other contexts, and these can importantly be tested against the work that others have done and the also against the experience and opinion of those whose responsibility it is to implement those interventions. But the struggle of producing the model—the endeavour itself —should also be capitalised upon, to enrich and to validate the findings, to qualify the assertions, and, critically, to describe a pathway which others may wish to follow in the future in developing our further understanding of the processes of the housing market and its sensitivities to the actions of both structure and agency alike.

It is the intention, in this final chapter, to offer conclusions in four principal areas. The model (and specifically the process of producing and calibrating the model) has a lot to say about the structure of the housing market and the ways that we can better understand it by segmenting it into meaningful and robust submarkets. For some findings, the power of the model—its validity, indeed—is critically dependent on the partitioning methods we use to achieve this and the theories we adopt to underpin that action. In other cases, it can be shown that our conclusions are sufficiently robust that it matters less how we view the market and compartmentalise its objects. The differences that can be observed here can be instructive in themselves. Therefore, the first set of conclusions that will be drawn will look at the effectiveness of methods used to delineate housing submarkets as an analytic requirement and by-product of the modelling process. These will not only chart a course for the continued development of this type of housing market model (and for the definition of housing submarkets), but will assist in the later interpretation of substantive policy conclusions by reminding the

reader of the limitations of the model, its analytic framework, and central assumptions.

Second, the policy conclusions will be explored. Specifically, the outputs of several runs of the model will be related to options for investment and intervention in the social housing sector given parameter estimates. Furthermore, an analysis of voids in a dynamic matching model in this way gives some important insights about entrenched assumptions as to the mid- to long-term future for certain property types and tenures, and for the way that demand conditions are measured and monitored.

Third, it is timely to consider the implications of these policy conclusions for the Housing Market Renewal Fund and the future of investment in resuscitating housing markets which are in decline or whose sustainability is in question.

Last, there is a requirement to assess the methodology and difficulties associated with its replication, particularly with respect to data collection both for the empirical estimation of transactional probabilities and for the model parameters. The scope for extension of the model to more adequately deal with the private sector, for example, has important implications for the way that housing data are collected in the future and the compatibility of this model with the existing and planned housing research infrastructure within the Housing Corporation and beyond.

I. HOUSING SUBMARKETS

It is not always necessary to agree with someone to recognise the strength of their argument. So it is that Lowry[48] expressed scepticism at the way that filtering became to be used as a potent justification for the subsidisation of higher-income housing while at the same time acknowledging the analytic power that became of this particular way of understanding the housing

[48] Lowry, I. S. (1970) 'Filtering and housing standards: a conceptual analysis' in Page, A. N. and Seyfried, W. R. (Eds.) (1970) Urban analysis, Scott, Foresmon, Glenview, Ill., pp. 339-347.

system. Notwithstanding the view that such a stance was supportive of Conservative housing policy in the 1980s (Jones *et al.* 2001), the potential of the filtering process as an analytic framework is not lost in Jones *et al.*'s suggestion that the process itself is impervious to its policy applications and their interest "lies in the theory's power as a starting point for modelling housing market behaviour" (Jones *et al.* 2001). In a similar vein, it will hopefully be possible to see the potential of the vacancy chain modelling presented in this thesis even if the conclusions reached through its operation on a selective set of scenarios and parameters are received with caution and with a specific purpose in mind. Through a careful exposition of the *method* and the problems it raised, it is hoped that a valuable contribution to the debate on the nature and understanding of the housing market can be made.

It is thus through reasons of self interest that we first turn our attentions to what can be concluded from the process of creating the model before making explicit what this might mean for the problems faced by investment planners, policy makers, and housing managers. This allows the reader to be better equipped to approach the ensuing policy conclusions and normative contentions with a critical and constructive mind.

The model is conceptually simple. At its heart is one matrix, representing the probabilities that a vacancy arising in one submarket will transfer to another submarket—conditional on a transfer occurring. There is essentially no more, or less, to the model than this. By iterating the model forward, to simulate successive transfers, the eventual destination of vacancies can be probabilistically estimated.

The price that is paid for this simplicity is uncertainty in the way that the submarkets should be defined to maximise the fit of the model to the context and data. Another price is paid in the reliability of parameter estimates for demographic trends, such as deaths and extra-HMA migration, and the expected future activities of private sector providers.

At this point, should there be a danger of imbuing a sense of overt pessimism, it should perhaps be made clear that many of the obstacles have been overcome in the course of this project, some very successfully so. There do remain, as always, inadequacies. But it should not be concluded that the model is any less valid for these. In most respects, the model relies on data and assumptions that are, for the most part, no worse than those forming the bedrock of other studies. Furthermore, this project has expended considerable time and effort in the bespoke collection of data sets directly from the landlords concerned, to a specification that fits the particular needs of this model. Whilst there have been problems with some aspects of the data collection exercise, the end product can still be seen as the most complete ledger of social-rented sector movement activity in Bradford that it was possible to compile. What it lacks in terms of attribute data, it makes up for in completeness. The final product—as well as the experience of collecting it—represents a significant value-added resource.

Classifying the market

The act of defining submarkets, as we have seen, is essentially a process of compartmentalisation. The goal is to group similar events; to separate distinct ones. Much academic energy has been expended in pursuit of the holy grail of submarket classification. It is natural to think of a trajectory of increasing 'sophistication' in this field, but there remain some opposing viewpoints. Perhaps the principal schism—a central contention of this thesis—is in the treatment of space. It is almost irresistible to talk or think about submarkets in terms of their Euclidian geometry. We wish to bound them, perhaps even fuzzily, such that we can entertain our natural desire to immediately relate submarkets to the areas we know and experience. That is not to say that we necessarily know what we are thinking of in this respect. What are these areas we think of? This relates to a very closely related inquiry: that of the definition of neighbourhoods.

The contrary position is to view space not in absolute geometric terms but as a relative extensional attribute of the objects within it. In this case, those are dwellings. This is a natural development of the submarkets thesis of Grigsby (1963), whereby similar objects are grouped not spatially but according to their suitability as *substitutes* for one another. This point of view can of course be extended: some neighbourhoods are indeed substitutes for others, but in this respect the neighbourhood merely becomes an attribute of the houses it contains. The houses themselves still need to be close substitutes for them to be considered by housing searchers and allocaters alike as alternatives. In the social housing context it is true that the Euclidian paradigm, with its emphasis on spatial *contiguity* had, historically, some meaning. Housing provision was monolithic, on large estates of groups of similar housing. The Right to Buy has, however, only been the largest of a constellation of policies and interventions that have had the effect of fragmenting the map of social housing.

Even if the Grigsbian meaning—that location is but a part of the bundle of services that a house embodies—is accepted, there is then a variety of potential ways in which this can be operationalised. Care must be taken here. Maclennan and Tu (1996) remind us that classifying similar houses constitutes nothing more than the definition of product groups. These are not submarkets, for they take no account of either the variation among demanders or systematic patterns in the vector of moves of certain household types to particular properties, for example.

Rather, submarkets must surely represent similarities in *transactions* rather than origins or destinations. Thus movements of households themselves (or their analytic transpose, vacancies) should be the basis on which to start looking for the systematic appearance of submarkets. One conclusion of this research is therefore that, because conventional measures of market 'health' have often neglected to simultaneously reconcile supply *and* demand, any attempt to classify the housing market (or system) must be proceed on the

basis of *dynamic activity* rather than static groupings of the objects which comprise supply and demand.

For these reasons, developmental work in the area of vacancy chain modelling must move beyond 'product grouping' or 'demand profiling' and begin to observe the interactions between them. While Emmi and Magnusson (1994, 1995) recognise this, their attempts to proceed along these lines appear to be flawed. In what is arguably the most comprehensive application of vacancy chain modelling in recent years, their attempt to cluster *activity* on the basis of the inter-sectoral transition probabilities themselves actually would appear to have the effect of grouping similar *magnitudes* rather than the *vectors* of movement. In other words, their analytic by-product of sub-market definition appears to be saying that if two types of movement are the result of similar probabilities, then they are related. While the aggregate effect of this is of little consequence in terms of the Markov formulation, it does limit the scope of their model in defining submarkets. Such submarkets are of indisputable analytic significance because they are they objects for which policy conclusions can be drawn.

This highlights a tension. The most useful segmentation of the market may not—will probably not—be that which most accurately describes the underlying structure of the market and which most successfully accounts for the scale and direction of the movement patterns. *A priori* housing submarkets in this respect (including geographically-delimited markets) are likely to be of the greatest use in formulating a policy response and guiding investment strategies. It is helpful, for example, to know that two-bedroom local authority flats can expect to have an increasing vacancy generation rate, but this conclusion presumes that this type of property exclusively constitutes a submarket. Similarly, it would be an ideal scenario if a submarkets classification based on or coterminous with existing social housing management areas proved to fit the data well. A submarket

classification that is empirically derived rather than imposed *a priori* will yield a better fit.

Testing these propositions requires a measurement of this 'fit.' A suitable measure would be one that maximises the proportion of activity internal to a submarket as opposed to across submarket 'boundaries.' (The assumption with such a formulation, however, is that most movers seek to remain in the same submarket, probably due to some budgetary constraint. This represents a limitation of the model, which further work could seek to address.)

In terms of the transition probability matrix, $\mathbf{N}$, the ratio of the diagonal elements $\mathbf{n}_{jk}$ (where $j = k = 1,2,\ldots,n.$) against the off-diagonal elements should be maximised. Table 9.1 summarises this measure for both scenarios run.

Table 9.1. Summary of proportion of internalised moves.

	Number of cases in transition matrix, $\sum_{1}^{k}\mathbf{n}_{k}^{T}\mathbf{1}$	Number of cases on diagonal of transition matrix, $\sum_{j=1}^{k}\mathbf{n}_{jj}^{T}$	Proportion of internalised moves, $\frac{\sum_{j=1}^{k}\mathbf{n}_{jj}^{T}}{\sum_{j=1}^{k}\mathbf{n}_{j}^{T}\mathbf{1}}$
Schema 1	8337	3612	0.43
Schema 2	142823	84387	0.59

The conclusions we can draw from this comparison are limited but suggest that, significantly, it *does* matter how we divide up the transaction observations. A simple, 'product grouping' schema based only on property type and size (number of bedrooms) and which treats the private and housing association sectors as monolithic, endogenous sectors is a significant improvement on one which excludes the private sector. This confirms that the bilateral interaction between the social rented sector and the private

sector is significant, and that the social rented sector cannot be viewed in isolated terms.

A classification schema that is built exclusively from electoral wards (i.e., is exclusively an arbitrary[49] division of Euclidian space) shows a very low proportion of internal sector activity against all activity and is therefore represents a poor substitute for submarkets.

Implications for monitoring

The data file also permits an analysis of the incidence of voids and their subsequent durations.

Although the overall void rate for all local authority stock has remained relatively constant at just over five per cent, there has been an inexorable rise in the void rate of bed-sits, and a gradual increase in the void rate of flats generally. The trend in the void rate of local authority maisonettes is interesting and demonstrates the effect of stock reduction. The void rate is seen to be falling until around 1998, when it sharply reverses and starts increasing. There was a sustained period of disposal of maisonettes until 1998/99, at which time the number of maisonettes left in council management remained at just under 2,000. The effect of stock reduction was a concurrent reduction in the void rate of those properties. However, difficulties in reletting the remaining stock are evident in the later falling levels of stock occupancy (proportion let) as incumbent tenants in the remaining stock continue to move out (see Figure 3.14 and Figure 3.15 on page 103 and 105 respectively).

This situation is demonstrative of a wider conclusion. The lesson here is that intervention on the basis of snapshot indicators—in other words to try to equalise supply and demand on the basis of current levels—does not

[49] Arbitrary in the sense that electoral wards are large units that do not reflect the housing profile within them and are unrelated to housing management and the housing strategic process except in terms of their frequent adoption as statistical output units.

guarantee anything other than short-term reduction in void levels. Whilst the data do not extend back before 1996/97, it would appear that the same phenomenon may be observed in the case of local authority flats.

It must be stressed, however, that the conclusion is not necessarily that stock-reduction has little long-term benefit. What we can say with confidence, however, is that intervention of this form must only proceed on the basis of a demonstrable, *medium- to long-term* reduction in likely demand as a result of the interaction between submarkets (or product groupings) over this future period, combined with demographic estimates and what is known about investment activity in other submarkets.

II. MODEL OUTPUTS AND POLICY IMPLICATIONS

To proceed along these lines requires the outputs of the fully-specified Markov vacancy chain model, which is the analytic centrepiece of the methodology. As has already been discussed, the model can be flexibly specified to the extent that there are several different runs and corresponding outputs. The inherent tension here between the usefulness of the model sectors and the maximisation of their internal homogeneity has already been exposed. To draw immediate conclusions about the compatibility of existing policies and programmes against the long term strategy of a sustainable social rented sector, a simple product grouping strategy is followed which segments properties by their type and size (for local authority stock) and treats the housing association and private sectors as single endogenous groups. The limitations of this approach have already been mentioned but it does allow us to see some stark contrasts in the differing fortunes of property types.

One of the most striking observations is the similarity between the housing association sector and the (combined) private sector in the rates that they transfer their vacancies to other sectors. Assuming that private housebuilders are willing and able to complete all the units that the RPG requires

allocations for, and that HA completions continue at the rate of approximately 200 per year, these vacancies will eventually be absorbed from local authority stock. (The assumption of the model is that all vacancies are eventually absorbed as the chain ends through in-migration or demolition.)

The sectors particularly expected to take the brunt of new vacancies are local authority maisonettes and larger flats. The implications of this are that the findings support the view that increasing provision of smaller properties is seen as an important policy goal. However, in a context of low demand, the smaller properties that are available do not necessarily match the aspiration of those seeking them. Bed-sits, as we have seen, are already unpopular, with high void rates, and cannot expect to reduce these vacancies on the basis of the expected vacancy transfer probabilities. The aspiration here is for properties for smaller households but those that are, nevertheless, larger than may have been seen as 'efficient' in the past. The telling statistic is that 3 bed flats by far account for the lion's share of vacancies that are expected to move to flats. The Regional Housing Statement concords with this (GOYH 2001). It refers to household projections where one-person households are expected to increase by 40 per cent over the next 20 years. In the local authority tenure, it is only larger local authority houses that move against this presumption in favour of smaller properties, as they will continue to be relatively popular.

Perhaps the broad brush conclusion here is that, although the Right to Buy did erode local authority stock both in absolute terms of numbers but also biased towards larger houses, the fit between what the social rented sector has left and what will be required in the future is actually quite good. What the local authority has left—in crude terms, smaller flats—should be considered to be an asset in areas of low demand where those requiring larger properties are more readily able to source them from the private sector due to regional house price differentials. While houses with three or more bedrooms account for just under 45 per cent for the local authority stock,

they tend to accommodate more stable households but, particularly, a group of the population which is expected to make up a diminishing proportion of the population. Just as the age structure of social renters is bi-polar, so there is a distinction between modes of tenancy. Some households age with their houses, while some areas' see a higher turnover of similarly-aged households.

Housing association properties tend to be smaller properties also and are protected from tenant purchase. Given the government's long term aims of increasing home ownership for those who want it, this would suggest that housing association stock would perhaps be a better candidate for continuing right-to-buy and that consideration should be given to retrenching the right among local authority tenants, particularly in areas of high demand such as the south-east. Housing associations are in a better position to use their relaxed fiscal constraints to fund a higher-quality sector of larger houses and become the principal source of affordable homes secured amongst other ways using section 106 agreements.

Furthermore, it is precisely the sort of household—smaller, younger, more mobile—who benefits from the flexibility of renting. In the local authority context, this may of course cause the problem to shift back to 'difficult-to-let'—the condition and facilities of local authority properties are problematic—but this is a more one-dimensional problem. Improving the smaller properties could be financed by selective stock transfer of larger, more costly to maintain, houses to housing associations.

Implications for large-scale stock transfer

Recent events have added an interesting pause for thought in terms of future investment in the country's social housing. Just when it was looking like a clear and steady trajectory of risk transferral to the housing associated sector was being accepted *de facto,* a number of high-profile rejections of the large-scale transfer route have appeared to soften the government's line. An

emphatic and potentially embarrassing rejection of stock transfer by tenants of Birmingham City Council, and, more recently, further set-backs to other local authorities' transfer plans, have demonstrated that LSVT is not necessarily going to be a feasible vehicle for levering modernisation and development investment in all cases. In September of 2002, Sheffield City Council confirmed this line of thinking when it announced that "stock transfer was not necessarily the right solution for a large and diverse city"[50] and that the ODPM were in broad acceptance of this view.

Whether or not this represents a stay of execution for mass-provided council housing remains unknown. Certainly, some councils have recently made very small investments in new-build housing; that these depart from a baseline of almost zero is quite significant in itself. But it remains the case that the vast majority of new social housing provision will continue to be made by registered social landlords, whether this is under the guise of affordable housing agreements or general ADP expenditure. Even where stock transfer is no longer on the cards, plans for Arms Length Management Organisations (ALMOs) will keep the need to critically evaluate stock options and the future of the local authority sector. There is a need for plans for such investment to be critically evaluated in the light of studies like this one conclude *vis a vis* stock sustainability; needs and aspirations; the transmission of voids; and demography and mobility.

III. REGENERATION AND RENEWAL

The Housing Markets Renewal Fund is the most recent central government initiative aimed at the resuscitation of what it sees as 'failing' housing markets. Nine 'pathfinder' areas have been established for this. The government's seeming commitment to tackling the problems of housing market differentials should be viewed as a positive step towards ensuring the maximal future efficiency in the use of the country's housing assets.

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[50] Council leader Jan Wilson, quoted in *Housing today*, October 31, 2002.

There are a number of clear lessons, however. This research adds fuel to the argument that suggests that area-based initiatives are of less relevance than thematic priorities. The fragmentation of social housing estates and the expected differential fortunes of stock types points to a need to realign not areas, but the stock towards the needs and aspirations of the key client groups that social housing aims to serve. It must continue to try to broaden these groups, specifically to include those smaller, mobile households that would otherwise consider private renting or perhaps even entry-level home ownership. Stock transfer where appropriate should continue to be used as a vehicle for levering investment in larger properties. This could help towards realignment of rents, reducing rent differentials. Housing associations, which are able to charge higher rents, should concentrate on high-quality affordable housing for larger households and families, and particular needs groups. Local authorities should be freed to capitalise on a hidden asset of smaller properties, with investment flowing from the savings made by divesting itself of responsibility for larger houses at capped rents.

In the context of what has just been said, it is somewhat worrying to note that whilst Pathfinders are obliged consider a wide array of evidence on both housing and non-housing issues and think strategically, emerging intervention prospectuses based on 'area development frameworks'[51] may serve to undermine this. For a programme that upholds best practice in the scope and innovation of its evidence base and strategic thinking to be straitjacketed into a more conventional area-based mould could be counter-productive. The implementation of the Pathfinders' programmes, when finalised, should be closely evaluated against the way that they tackle the fundamental, cross-boundary causes of low demand in addition to localised area-based improvements. The Audit Commission should use as part of its

[51] See for example the minutes of Manchester City Council Community Regeneration Overview and Scrutiny Committee, 18 June 2003; Report of the Deputy Chief Executive/Director of Planning and Economic Development, Metropolitan Borough Of Wirral Economic Regeneration and Planning Strategy Select Committee, 2nd June 2003; and other accounts of local authority requirements *vis a vis* HMRF programme implementation.

criteria in judging the performance of Pathfinders considerations such as this.

A recurring theme of this thesis has been that some phenomena associated with low demand (turnover in particular) are not necessarily a bad thing. No significant relationship, for example, was found between the length of a tenancy and the length of subsequent void. The growth of smaller households, shifts towards flexible working practices, reduction in security of employment, increasing travel costs and congestion are all adding up to a society that needs—in the normal course of things —to adjust its housing consumption more frequently and in more subtle ways. Social housing is now treated as a market alternative in the views of demanders, and will only be chosen if the numbers add up. Choice Based Lettings and other responsive allocation mechanisms have brought to the tenure flavours of the marketplace, but these can only be viewed as reactive measures, ultimately futile if social housing continues to occupy a strategic bubble away from the wider housing market.

In this way, pathfinder strategic housing authorities must look for ways of facing up to the core structural challenges of the regional economy while recognising that sustainable neighbourhoods do not just have to be those with constant faces. The 'sustainability' argument, in this respect, has been misguided.

There is another set of conclusions that can be drawn, however. These relate to the information and methods themselves, the application of which social housing investment decisions are grounded in. Since the move towards devolved structures of sub-regional grant allocation, there has emerged considerable opportunity for the exercise of local debates and analyses to underpin the investment process. Like much else, this can be considered a double-edged sword, but as a tool for cutting the cash cake must be regarded as sharper than its predecessors were. The down-side, of course, is that there

is scope for the application of measures and the analysis of information in more variable ways. The opportunity for increased sensitivity towards local and regional conditions is a considerable strength of the regional housing statement, but to properly capitalise on this, better access to information and appropriates methods for analyses must be sourced. The implications of this kind of task become more complex as more people are expected to perform it.

The final section will consider these two parallel issues related to the future of social housing investment in turn. Namely, what do the *findings* of the study regarding the operation of submarkets and the transmission of housing opportunities say about the need to invest in particular types of housing or in particular ways? Second, what is the scope for replication of the methods developed in this research for informing social investment decisions in other markets and contexts, and how does this fit within a wider social housing 'information strategy,' if such a concept can be identified?

IV. FURTHER RESEARCH AND REPLICABILITY.

In 1999, the Housing Corporation started a process of consultation on proposals to replace funding distribution mechanisms that were based on a rigid application of the Housing Needs Indicator (HNI) formula (HC 1999). The centrepiece of the proposals could be seen to be the introduction of a regionally-determined, strategy-led element which was to be built up from local authorities' evidence and submissions. The resulting Regional Housing Statement synthesises the requirements of the local housing strategies into a strategy for investment which is commensurate with regional market conditions and also the overall size of the regional budget. This combination of top-down and local strategy-led approaches builds in an important opportunity for sensitivity to local conditions, and, indeed, differences in regional economic and demographic patterns.

Such an investment structure naturally places greater responsibility on individual local authorities and the regional offices of the Housing Corporation in determining their own investment priorities in response to robust assessments of local needs and demand. Due mainly to variations in the economic and demographic landscape around the country, the way in which such assessments are performed will differ or must at least take cognisance of different factors. The use of emerging analytic technologies such as GIS are seen as of great potential in this area—when, traditionally, the applications of such technologies has been seen to lie in detailed planning and operational matters. The strategic possibilities of GIS in measuring housing need (as opposed to locating lamp-posts, to take a flippant example) have been steadily gaining appreciation. A report by Bibby and Chowdry for the Housing Corporation (Housing Corporation 2001a) set out to compare some contrasting approaches to using GIS as an analytical tool in the investment planning process. Their conclusions, based on a detailed study of two quite different systems, were that GIS did indeed offer significant benefits but that a step-change in the approach of GIS professionals was required if they were to make the conceptual leap from a systems and data-led mindset to one that emphasised method and analysis. This shifts the burden of resource from one that involved expensive data and hardware to one where a premium was placed on assembling the correct mixture of housing, statistical, and GIS skills among research personnel.

'Strategic' is often mistaken, in terms of resolution, for 'small scale.' When there is a need to underpin strategic thinking with evidence, it is too often translated to mean broad-brush statistics collected on the basis of large spatial units, like wards and local authority areas. Bibby and Chowdry in Housing Corporation (2001a) remind us of the innovative uses to which 'free' data, such as administrative records at relatively fine geographic resolutions can be put. Elsewhere in this thesis there has been advocacy of the use of 'fine-grained' data, such as address-referenced data and individual household records, for wider strategic purposes. The argument briefly

summarised is that although the eventual aim is aggregation, only disaggregate data can be manipulated in ways that can accommodate the exploration of dynamism and interlinkage in the system under observation.

Of course, such data sources are 'free' to organisations holding them and granted access to them, but may have significant resource requirements in the collection, standardisation, manipulation, and analysis of the information. Furthermore, because the data tend not to be collected on a consistent basis across different organisations (notwithstanding the eventual requirements for standardised aggregate outputs, e.g. for statutory returns) the are particular problems in collecting data across wider areas that may be thought to more accurately represent a housing market.

APPENDICES.

APPENDIX A

SUPPLEMENTARY TABLES REFERRED TO IN THE TEXT

Table 9.2. Quarterly stock numbers by property type, 1996–2001.

Quarter	Total properties [a]	Bed-sits	Bungalows	Flats	Houses	Maisonettes
Q2 1996	29548	1371	1857	11460	12709	2108
Q3 1996	29259	1322	1857	11409	12668	1960
Q4 1996	29098	1315	1857	11363	12625	1897
Q1 1997	28997	1305	1857	11343	12585	1868
Q2 1997	28931	1303	1857	11324	12555	1855
Q3 1997	28751	1295	1857	11298	12505	1760
Q4 1997	28581	1282	1857	11282	12427	1697
Q1 1998	28423	1269	1857	11238	12389	1634
Q2 1998	28294	1266	1857	11222	12349	1564
Q3 1998	28016	1184	1857	11153	12313	1473
Q4 1998	27749	1162	1857	11037	12267	1390
Q1 1999	27523	1153	1857	10963	12180	1334
Q2 1999	27424	1147	1857	10931	12128	1325
Q3 1999	27335	1135	1857	10924	12076	1307
Q4 1999	27238	1135	1857	10914	11995	1301
Q1 2000	27115	1122	1857	10879	11929	1292
Q2 2000	26948	1115	1857	10855	11823	1262
Q3 2000	26834	1102	1857	10838	11746	1255
Q4 2000	26669	1098	1857	10798	11657	1223
Q1 2001	26520	1098	1857	10741	11566	1222

[a] Rows do not sum to the *total properties* column because there is a small number of cases in the data file of indeterminate property type. These have been included in the total.

Source: Project data file.

Table 9.3. Quarterly stock distribution by property type, 1996–2001.

Percentages

Quarter	Bed-sits	Bungalows	Flats	Houses	Maisonettes
Q2 1996	4.64	6.28	38.78	43.01	7.13
Q3 1996	4.52	6.35	38.99	43.30	6.70
Q4 1996	4.52	6.38	39.05	43.39	6.52
Q1 1997	4.50	6.40	39.12	43.40	6.44
Q2 1997	4.50	6.42	39.14	43.40	6.41
Q3 1997	4.50	6.46	39.30	43.49	6.12
Q4 1997	4.49	6.50	39.47	43.48	5.94
Q1 1998	4.46	6.53	39.54	43.59	5.75
Q2 1998	4.47	6.56	39.66	43.65	5.53
Q3 1998	4.23	6.63	39.81	43.95	5.26
Q4 1998	4.19	6.69	39.77	44.21	5.01
Q1 1999	4.19	6.75	39.83	44.25	4.85
Q2 1999	4.18	6.77	39.86	44.22	4.83
Q3 1999	4.15	6.79	39.96	44.18	4.78
Q4 1999	4.17	6.82	40.07	44.04	4.78
Q1 2000	4.14	6.85	40.12	43.99	4.76
Q2 2000	4.14	6.89	40.28	43.87	4.68
Q3 2000	4.11	6.92	40.39	43.77	4.68
Q4 2000	4.12	6.96	40.49	43.71	4.59
Q1 2001	4.14	7.00	40.50	43.61	4.61

Source: Project data file.

Table 9.4. Quarterly void rates by property type, 1996/97–2000/01.

Percentages

Quarter	All properties	Bed-sits	Bungalows	Flats	Houses	Maisonettes
Q2 1996	10.2%	26.5%	3.5%	7.3%	6.5%	42.1%
Q3 1996	9.4%	23.2%	3.8%	7.2%	6.2%	37.4%
Q4 1996	9.1%	23.0%	3.6%	7.1%	5.9%	36.4%
Q1 1997	8.9%	22.6%	3.8%	7.0%	5.7%	35.0%
Q2 1997	8.9%	23.9%	3.6%	7.3%	5.3%	36.4%
Q3 1997	8.5%	24.9%	2.8%	7.3%	5.1%	33.2%
Q4 1997	8.2%	25.8%	2.3%	7.5%	4.7%	31.1%
Q1 1998	8.1%	25.0%	2.9%	7.8%	4.3%	29.9%
Q2 1998	8.2%	27.2%	2.8%	8.2%	4.3%	28.1%
Q3 1998	7.8%	21.5%	3.2%	8.4%	4.1%	25.9%
Q4 1998	7.4%	22.1%	3.2%	7.7%	4.3%	23.3%
Q1 1999	7.7%	24.6%	3.0%	8.1%	4.2%	24.1%
Q2 1999	7.6%	26.4%	3.3%	7.9%	3.9%	26.5%
Q3 1999	7.9%	27.2%	3.2%	8.1%	4.4%	26.3%
Q4 1999	8.0%	27.2%	3.3%	8.4%	4.3%	27.0%
Q1 2000	8.4%	26.7%	3.3%	8.6%	4.9%	28.6%
Q2 2000	8.3%	27.1%	3.1%	8.5%	4.7%	27.7%
Q3 2000	8.7%	27.6%	3.4%	8.8%	5.1%	29.7%
Q4 2000	8.8%	27.4%	3.4%	9.4%	4.8%	29.4%
Q1 2001	8.7%	29.1%	2.7%	9.2%	4.6%	31.7%

Source: Project data file.

Table 9.5. Scenario 1 matrix of transition events (N).

			$\mathbf{N}^T$														$\mathbf{N}^A$			$\mathbf{n}^A$	$\mathbf{n}$
			Vacancy transfer destination state														Vacancy absorption state				
			HA/FLT/1	HA/FLT/2	HA/FLT/3	HA/FLT/4	HA/HSE/1	HA/HSE/2	HA/HSE/3	HA/HSE/4	LA/FLT/1	LA/FLT/2	LA/FLT/3	LA/FLT/4	LA/HSE/1	LA/HSE/2	LA/HSE/3	LA/HSE/4	PRIVATE SECTOR	MOVE IN	DEMOLISH	ALL	Row sum
$\mathbf{N}^T$	Vacancy transfer origin state	HA/FLT/1	87	22	3	5	7	2	1	0	5	2	4	4	13	5	7	6	437	21	0	458	**631**
		HA/FLT/2	28	239	12	5	13	7	1	1	2	9	2	0	1	14	15	4	366	11	0	377	**730**
		HA/FLT/3	2	9	7	1	0	3	0	0	0	0	0	0	0	0	0	0	46	0	0	46	**68**
		HA/FLT/4	5	8	0	74	0	1	0	1	6	2	21	3	0	6	5	15	294	14	0	308	**455**
		HA/HSE/1	8	13	0	0	55	20	6	0	1	0	0	0	0	1	0	0	200	4	0	204	**308**
		HA/HSE/2	3	15	1	0	17	54	8	0	0	0	0	0	0	0	0	0	60	2	0	62	**160**
		HA/HSE/3	1	4	0	0	4	8	12	2	0	0	0	0	0	0	0	0	48	3	0	51	**82**
		HA/HSE/4	1	1	0	1	2	2	0	0	0	0	0	0	0	0	0	0	5	2	0	7	**14**
		LA/FLT/1	2	1	0	0	0	1	0	0	483	158	66	65	47	67	41	29	3995	116	16	4127	**5087**
		LA/FLT/2	0	1	0	0	0	0	0	0	142	277	92	45	27	98	50	28	3052	104	199	3355	**4115**
		LA/FLT/3	1	2	0	0	0	0	0	0	60	99	558	173	11	49	94	50	4182	116	434	4732	**5829**
		LA/FLT/4	0	0	0	0	0	0	0	0	69	46	196	563	12	36	57	139	3945	154	606	4705	**5823**
		LA/HSE/1	1	1	0	0	2	1	0	0	69	52	25	14	190	90	43	24	2177	48	1	2226	**2738**
		LA/HSE/2	4	6	0	1	2	2	0	0	85	161	95	36	97	378	107	53	3660	126	237	4023	**5050**
		LA/HSE/3	2	3	0	2	1	2	1	0	34	88	207	105	49	136	290	84	3214	89	16	3319	**4323**
		LA/HSE/4	1	3	2	0	1	0	0	0	25	39	64	257	31	79	77	345	2600	74	141	2815	**3739**
$\mathbf{N}^C$	Vacancy creation state	PRIVATE	187	115	16	58	106	40	8	7	1153	843	1141	1252	555	1061	886	859					**8287**
		DEATH	44	60	11	20	3	7	0	0	188	126	137	216	43	109	100	0					**1064**
		NEW BUILD	20	11	23	10	15	44	16	19	0	0	0	4	0	1	0	0					**163**
		MOVE OUT	13	17	0	6	10	4	1	0	86	61	91	145	35	58	69	75					**671**
$\mathbf{n}^C$		ALL	**264**	**203**	**50**	**94**	**134**	**95**	**25**	**26**	**1427**	**1030**	**1369**	**1617**	**633**	**1229**	**1055**	**934**					**10185**

Table 9.6. Scenario 1 matrix of transition propbabilities (P).

			P^T															P^A			p^A	p
			Vacancy transfer destination state															Vacancy absorption state				
			HA/FLT/1	HA/FLT/2	HA/FLT/3	HA/FLT/4	HA/HSE/1	HA/HSE/2	HA/HSE/3	HA/HSE/4	LA/FLT/1	LA/FLT/2	LA/FLT/3	LA/FLT/4	LA/HSE/1	LA/HSE/2	LA/HSE/3	LA/HSE/4	PRIVATE SEC	MOVE IN	DEMOLISH	ALL	Row sum
P^T	Vacancy transfer origin state	HA/FLT/1	.138	.035	.005	.008	.011	.003	.002	.000	.008	.003	.006	.006	.021	.008	.011	.010	.693	.033	.000	.726	1.000
		HA/FLT/2	.038	.327	.016	.007	.018	.010	.001	.001	.003	.012	.003	.000	.001	.019	.021	.005	.501	.015	.000	.516	1.000
		HA/FLT/3	.029	.132	.103	.015	.000	.044	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.676	.000	.000	.676	1.000
		HA/FLT/4	.011	.018	.000	.163	.000	.002	.000	.002	.013	.004	.046	.007	.000	.013	.011	.033	.646	.031	.000	.677	1.000
		HA/HSE/1	.026	.042	.000	.000	.179	.065	.019	.000	.003	.000	.000	.000	.000	.003	.000	.000	.649	.013	.000	.662	1.000
		HA/HSE/2	.019	.094	.006	.000	.106	.338	.050	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.013	.000	.388	1.000
		HA/HSE/3	.012	.049	.000	.000	.049	.098	.146	.024	.000	.000	.000	.000	.000	.000	.000	.000	.585	.037	.000	.622	1.000
		HA/HSE/4	.071	.071	.000	.071	.143	.143	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.357	.143	.000	.500	1.000
		LA/FLT/1	.000	.000	.000	.000	.000	.000	.000	.000	.095	.031	.013	.013	.009	.013	.008	.006	.785	.023	.003	.811	1.000
		LA/FLT/2	.000	.000	.000	.000	.000	.000	.000	.000	.035	.067	.022	.011	.007	.024	.012	.007	.742	.025	.048	.815	1.000
		LA/FLT/3	.000	.000	.000	.000	.000	.000	.000	.000	.010	.017	.096	.030	.002	.008	.016	.009	.717	.020	.074	.812	1.000
		LA/FLT/4	.000	.000	.000	.000	.000	.000	.000	.000	.012	.008	.034	.097	.002	.006	.010	.024	.677	.026	.104	.808	1.000
		LA/HSE/1	.000	.000	.000	.000	.000	.000	.000	.000	.025	.019	.009	.005	.069	.033	.016	.009	.795	.018	.000	.813	1.000
		LA/HSE/2	.000	.000	.000	.000	.001	.000	.000	.000	.017	.032	.019	.007	.019	.075	.021	.010	.725	.025	.047	.797	1.000
		LA/HSE/3	.001	.001	.000	.000	.000	.000	.000	.000	.008	.020	.048	.024	.011	.031	.067	.019	.743	.021	.004	.768	1.000
		LA/HSE/4	.000	.001	.000	.000	.000	.000	.000	.000	.007	.010	.017	.069	.008	.021	.021	.092	.695	.020	.038	.753	1.000
P^C	Vacancy creation state	PRIVATE	.023	.014	.002	.007	.013	.005	.001	.001	.139	.102	.138	.151	.067	.128	.107	.104					1.000
		DEATH	.041	.056	.010	.019	.003	.007	.000	.000	.177	.118	.129	.203	.040	.102	.094	.000					1.000
		NEW BUILD	.123	.067	.141	.061	.092	.270	.098	.117	.000	.000	.000	.025	.000	.006	.000	.000					1.000
		MOVE OUT	.019	.025	.000	.009	.015	.006	.001	.000	.128	.091	.136	.216	.052	.086	.103	.112					1.000
p^C		ALL	026	.020	.005	009	.013	.009	.002	.003	.140	.101	.134	.159	.062	.121	.104	.092					1.000

Table 9.7. Scenario 1 fundamental matrix (M) and expected chain lengths (M1).

M

Vacancy transfer origin state		Vacancy transfer destination state																**M1**
		HA ALL	LA/BSR	LA/BUN/1	LA/BUN/2	LA/BUN/3	LA/FLT/1	LA/FLT/2	LA/FLT/3	LA/FLT/4	LA/HSE/1	LA/HSE/2	LA/HSE/3	LA/HSE/4+	LA/MAI/2	LA/MAI/3	PRIVATE	Multiplier (expected chain length)
M	HA/FLT/1	1.164	.065	.007	.012	.019	.009	.003	.000	.012	.007	.011	.011	.027	.014	.017	.014	**1.393**
	HA/FLT/2	.070	1.503	.028	.014	.038	.029	.005	.002	.008	.023	.009	.003	.005	.035	.036	.012	**1.821**
	HA/FLT/3	.051	.236	1.120	.022	.017	.081	.006	.001	.002	.004	.003	.001	.002	.006	.006	.003	**1.561**
	HA/FLT/4	.017	.034	.001	1.195	.002	.005	.000	.003	.020	.010	.065	.016	.002	.021	.018	.046	**1.454**
	HA/HSE/1	.045	.101	.003	.001	1.239	.129	.036	.001	.005	.002	.001	.001	.001	.007	.003	.001	**1.579**
	HA/HSE/2	.053	.243	.016	.003	.213	1.550	.096	.003	.002	.004	.002	.001	.002	.007	.006	.002	**2.202**
	HA/HSE/3	.032	.125	.004	.004	.104	.193	1.185	.029	.001	.002	.001	.001	.001	.004	.003	.001	**1.691**
	HA/HSE/4	.103	.164	.005	.088	.212	.243	.020	1.001	.004	.004	.007	.002	.003	.007	.006	.006	**1.874**
	LA/FLT/1	.001	.001	.000	.000	.000	.000	.000	.000	1.108	.039	.019	.018	.012	.018	.011	.008	**1.234**
	LA/FLT/2	.000	.001	.000	.000	.000	.000	.000	.000	.043	1.076	.030	.016	.009	.030	.016	.010	**1.230**
	LA/FLT/3	.000	.001	.000	.000	.000	.000	.000	.000	.015	.022	1.110	.039	.003	.012	.021	.012	**1.234**
	LA/FLT/4	.000	.000	.000	.000	.000	.000	.000	.000	.016	.012	.043	1.112	.003	.010	.014	.030	**1.240**
	LA/HSE/1	.001	.001	.000	.000	.001	.001	.000	.000	.032	.025	.014	.009	1.076	.041	.020	.012	**1.234**
	LA/HSE/2	.001	.002	.000	.000	.001	.001	.000	.000	.023	.040	.026	.012	.023	1.085	.027	.014	**1.256**
	LA/HSE/3	.001	.002	.000	.001	.001	.001	.000	.000	.013	.027	.061	.034	.015	.039	1.076	.025	**1.294**
	LA/HSE/4	.001	.002	.001	.000	.000	.000	.000	.000	.011	.016	.027	.086	.011	.028	.027	1.105	**1.315**

Table 9.8. Scenario 2 matrix of transition events (N).

			N^T															N^A		n^A	n
			Vacancy transfer destination state															Vacancy absorption state			Row sum
			HA ALL	LA/BSR	LA/BUN/1	LA/BUN/2	LA/BUN/3	LA/FLT/1	LA/FLT/2	LA/FLT/3	LA/FLT/4	LA/HSE/1	LA/HSE/2	LA/HSE/3	LA/HSE/4+	LA/MAI/2	LA/MAI/3	PRIVATE	MOVE IN	DEMOLISH	ALL	
N^T	Vacancy transfer origin state	HA ALL	1056	28	55	0	0	189	78	4	0	0	51	204	11	30	7	3771	100	0	100	5584
		LA/BSR	28	576	56	3	0	343	73	3	0	0	66	137	13	43	25	933	57	183	240	2539
		LA/BUN/1	41	52	612	2	0	607	161	5	0	0	209	349	25	39	18	614	91	0	91	2825
		LA/BUN/2	1	0	7	2	0	6	9	0	0	0	4	5	0	2	0	11	1	0	1	48
		LA/BUN/3	0	0	0	0	1	0	0	0	0	0	1	5	0	0	0	1	0	0	0	8
		LA/FLT/1	187	445	321	7	4	4348	704	49	0	4	440	1085	111	324	76	4042	288	116	404	12551
		LA/FLT/2	79	71	71	1	0	666	2161	85	0	3	312	903	79	366	136	1950	120	297	417	7300
		LA/FLT/3	6	13	3	0	0	59	77	249	0	0	38	142	8	27	22	238	16	113	129	1011
		LA/FLT/4	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	1	1	6
		LA/HSE/1	0	1	0	0	0	0	2	0	0	1	0	7	1	4	0	12	0	0	0	28
		LA/HSE/2	76	43	41	0	0	246	496	107	0	1	1267	855	60	306	51	1174	55	13	68	4791
		LA/HSE/3	195	47	42	1	0	300	858	279	3	4	920	4869	224	480	230	2582	180	377	557	11591
		LA/HSE/4+	10	2	3	0	0	21	22	16	2	0	36	366	201	12	19	135	10	6	16	861
		LA/MAI/2	44	60	10	0	0	198	167	29	0	0	98	305	26	730	69	814	35	450	485	3035
		LA/MAI/3	12	16	15	0	0	30	106	19	0	0	33	125	6	83	242	241	10	102	112	1040
		PRIVATE	1663	1490	1162	23	4	6439	3545	436	4	17	1970	4724	254	1806	618	68071	3544	19	3563	95789
N^C	Vacancy creation state	MOVE OUT	53	46	59	0	0	243	82	6	0	1	71	101	9	32	12	4785				
		DEATH	167	110	173	7	0	488	91	5	0	3	83	119	2	11	1	1426				
		NEWBUILD	179	0	0	0	0	4	0	0	0	0	0	1	0	0	0	4651				
n^C		ALL	399	156	232	7	0	735	173	11	0	4	154	221	11	43	13	10862				

Table 9.9. Scenario 2 matrix of transition probabilities (P).

			P^T															P^A		p^A	p
			Vacancy transfer destination state															Vacancy absorption state			
			HA ALL	LA/BSR	LA/BUN/1	LA/BUN/2	LA/BUN/3	LA/FLT/1	LA/FLT/2	LA/FLT/3	LA/FLT/4	LA/HSE/1	LA/HSE/2	LA/HSE/3	LA/HSE/4+	LA/MAI/2	LA/MAI/3	PRIVATE	MOVE IN	DEMOLISH	ALL	Row sum
P^T	Vacancy transfer origin state	HA ALL	.189	.005	.010	.000	.000	.034	.014	.001	.000	.000	.009	.037	.002	.005	.001	.675	.018	.000	.018	1.000
		LA/BSR	.011	.227	.022	.001	.000	.135	.029	.001	.000	.000	.026	.054	.005	.017	.010	.367	.022	.072	.095	1.000
		LA/BUN/1	.015	.018	.217	.001	.000	.215	.057	.002	.000	.000	.074	.124	.009	.014	.006	.217	.032	.000	.032	1.000
		LA/BUN/2	.021	.000	.146	.042	.000	.125	.188	.000	.000	.000	.083	.104	.000	.042	.000	.229	.021	.000	.021	1.000
		LA/BUN/3	.000	.000	.000	.000	.125	.000	.000	.000	.000	.000	.125	.625	.000	.000	.000	.125	.000	.000	.000	1.000
		LA/FLT/1	.015	.035	.026	.001	.000	.346	.056	.004	.000	.000	.035	.086	.009	.026	.006	.322	.023	.009	.032	1.000
		LA/FLT/2	.011	.010	.010	.000	.000	.091	.296	.012	.000	.000	.043	.124	.011	.050	.019	.267	.016	.041	.057	1.000
		LA/FLT/3	.006	.013	.003	.000	.000	.058	.076	.246	.000	.000	.038	.140	.008	.027	.022	.235	.016	.112	.128	1.000
		LA/FLT/4	.000	.000	.000	.000	.000	.000	.167	.000	.167	.000	.167	.000	.000	.000	.000	.333	.000	.167	.167	1.000
		LA/HSE/1	.000	.036	.000	.000	.000	.000	.071	.000	.000	.036	.000	.250	.036	.143	.000	.429	.000	.000	.000	1.000
		LA/HSE/2	.016	.009	.009	.000	.000	.051	.104	.022	.000	.000	.264	.178	.013	.064	.011	.245	.011	.003	.014	1.000
		LA/HSE/3	.017	.004	.004	.000	.000	.026	.074	.024	.000	.000	.079	.420	.019	.041	.020	.223	.016	.033	.048	1.000
		LA/HSE/4+	.012	.002	.003	.000	.000	.024	.026	.019	.002	.000	.042	.425	.233	.014	.022	.157	.012	.007	.019	1.000
		LA/MAI/2	.014	.020	.003	.000	.000	.065	.055	.010	.000	.000	.032	.100	.009	.241	.023	.268	.012	.148	.160	1.000
		LA/MAI/3	.012	.015	.014	.000	.000	.029	.102	.018	.000	.000	.032	.120	.006	.080	.233	.232	.010	.098	.108	1.000
		PRIVATE	.017	.016	.012	.000	.000	.067	.037	.005	.000	.000	.021	.049	.003	.019	.006	.711	.037	.000	.037	1.000
P^C	Vacancy creation state	MOVE OUT	.010	.008	.011	.000	.000	.044	.015	.001	.000	.000	.013	.018	.002	.006	.002	.870				1.000
		DEATH	.062	.041	.064	.003	.000	.182	.034	.002	.000	.001	.031	.044	.001	.004	.000	.531				1.000
		NEWBUILD	.037	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.962				1.000
p^C		ALL	.031	.012	.018	.001	.000	.056	.013	.001	.000	.000	.012	.017	.001	.003	.001	.834				1.000

Table 9.10. Scenario 2 fundamental matrix (M) and expected chain lengths (M1).

M

Vacancy transfer origin state	HA ALL	LA/BSR	LA/BUN/1	LA/BUN/2	LA/BUN/3	LA/FLT/1	LA/FLT/2	LA/FLT/3	LA/FLT/4	LA/HSE/1	LA/HSE/2	LA/HSE/3	LA/HSE/4+	LA/MAI/2	LA/MAI/3	PRIVATE
HA ALL	1.655	.428	.338	.005	.001	2.028	1.418	.238	.002	.005	.932	2.533	.189	.751	.277	12.193
LA/BSR	.392	1.672	.326	.006	.001	1.999	1.312	.218	.002	.004	.878	2.349	.179	.701	.265	10.422
LA/BUN/1	.430	.440	1.592	.006	.001	2.278	1.489	.245	.002	.005	1.047	2.723	.207	.769	.286	10.917
LA/BUN/2	.439	.414	.508	1.049	.001	2.153	1.675	.246	.002	.005	1.062	2.708	.196	.815	.282	10.986
LA/BUN/3	.422	.400	.308	.005	1.144	1.900	1.483	.276	.002	.005	1.199	3.685	.215	.799	.301	10.890
LA/FLT/1	.429	.465	.355	.006	.002	3.414	1.469	.244	.002	.005	.971	2.618	.202	.777	.283	11.121
LA/FLT/2	.405	.402	.312	.005	.001	1.972	2.736	.251	.002	.005	.952	2.605	.200	.793	.296	10.521
LA/FLT/3	.359	.367	.270	.004	.001	1.729	1.326	1.537	.002	.004	.860	2.406	.178	.687	.276	9.452
LA/FLT/4	.341	.337	.260	.004	.001	1.602	1.431	.203	1.202	.004	1.021	2.093	.158	.632	.231	9.414
LA/HSE/1	.414	.454	.311	.005	.001	1.919	1.502	.249	.002	1.042	.943	2.906	.243	.941	.286	11.321
LA/HSE/2	.433	.418	.322	.005	.001	1.991	1.576	.285	.002	.005	2.292	2.849	.215	.857	.300	10.986
LA/HSE/3	.418	.390	.300	.005	.001	1.857	1.477	.282	.002	.005	1.034	4.088	.220	.795	.305	10.493
LA/HSE/4+	.427	.397	.307	.005	.001	1.900	1.465	.291	.006	.005	1.036	3.337	1.507	.787	.324	10.704
LA/MAI/2	.357	.365	.261	.004	.001	1.676	1.231	.215	.002	.004	.809	2.222	.170	1.926	.264	9.166
LA/MAI/3	.374	.378	.293	.005	.001	1.718	1.391	.245	.002	.004	.864	2.409	.178	.785	1.549	9.630
PRIVATE	.434	.432	.332	.006	.001	2.023	1.421	.240	.002	.005	.930	2.505	.187	.756	.279	12.781

M1

Multiplier (expected chain length)
22.994
20.727
22.436
22.541
23.033
22.362
21.459
19.458
18.933
22.539
22.538
21.671
22.499
18.673
19.824
22.334

APPENDIX B

LIST OF CONTACTS

Organisation	Contact	Position	Telephone
Government Office for Yorkshire & the Humber	Alison Biddulph	Local Government & Housing Team Leader	0113 283 6402
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	Adrian Moran	Head of IGP	
Housing Corporation (North Eastern)	Rick Elliot	Assistant Director (Investment)	0113 233 7100
	Sarah Bull	Investment Planning Team	
	John Quail	Regulation Manager	
Northern Consortium of Housing Authorities	Michael Bullock	Research Manager	0191 566 1000
Sheffield City Council (Housing Department)	Mel Steer	Research Officer	0114 273 5148
Sheffield Hallam University Centre for Regional Economic & Social Research (CRESR)	Prof. Ian Cole	Professor	0114 225 3073
	Dr. David Robinson	Research Fellow	
	Dr. Paul Hickman	Research Fellow	
York University Centre for Housing Policy (CHP)	Prof. Roger Burrows	Assistant Director	01904 433691
Birmingham University Centre for Urban and Regional Studies (CURS)	Peter Lee	Senior Lecturer	0121 414 3645
	Prof. Alan Murie	Professor	0121 414 5021
Cambridge University Property Research Unit	Prof. Alan Holmans	Senior Halifax Research Fellow	01223 337147

APPENDIX C

THE HOUSING MARKET RENEWAL FUND.

During the course of this research, the Government announced its Communities Plan (ODPM 2003), an overall strategic vision and associated regional plans aimed at promoting the creation of 'sustainable communities' throughout England. As part of the package, a newly-created Housing Market Renewal Fund (HMRF) was established to directly address the problems of low and changing demand for housing in weak housing markets in the North and Midlands. £500 million of funding has been made available to nine Pathfinders, collections of local authorities in areas of the most entrenched low demand problems. The establishment of the fund was one of the key recommendations of the ODPM select committee report into empty homes (HC 240-I), and the selection of the nine Pathfinders was significantly informed by the Heriot-Watt low demand study (Bramley *et al.* 2000) and work initiated by the publication of a Birmingham University report into low demand in the 'M62 corridor' (Nevin *et al.* 2000).

Details of the nine HMRF Pathfinder projects are given in Table 9.11 overleaf.

Table 9.11. Housing Market Renewal Fund Pathfinder projects.

Pathfinder	Local authorities involved
Birmingham and Sandwell	♦ Birmingham ♦ Sandwell
East Lancashire	♦ Blackburn ♦ Burnley ♦ Hyndburn ♦ Pendle ♦ Rossendale
Humberside	♦ Hull
Manchester	♦ Manchester ♦ Salford
Merseyside	♦ Liverpool ♦ Sefton ♦ Wirral
North Staffordshire	♦ Newcastle-under-lyme ♦ Stoke-on-Trent
Oldham and Rochdale	♦ Oldham ♦ Rochdale
South Yorkshire	♦ Barnsley ♦ Doncaster ♦ Rotherham ♦ Sheffield
Tyneside	♦ Gateshead ♦ Newcastle-upon-Tyne

APPENDIX D

ANALYSING HOUSE SALE PRICES.

There are various sources of data for the analysis of house sale prices. The main sources are data collected from mortgage lenders (of which the Halifax and Nationwide banks are the principal sources), and information on transactions collected by Her Majesty's Land Registry (HMLR) in the course of its statutory duties of land registration. The HMLR data represent a near 100% sample, with only a small number of transactions omitted for various reasons, including non-reporting and confidentiality constraints. Due to this large sample size, the data can be successfully used to analyse relatively localised trends in house sale prices. The data are normally made publicly available at postcode sector level, and are released on a quarterly basis. Updates to the data are made to reflect late registrations; for this reason it is best not to use the data until at least one year has elapsed since the time under scrutiny. The data used in this project are originally from HMLR, but have been made available under license from Experian through the terms of the Experian Limited Postal Sector Data, ESRC/JISC Agreement.

UK postal geography

The term 'postal geography' is something of a misnomer when applied to the British system of post codes. The use of post codes has evolved from a pragmatic need for the efficient sorting of mail, and is therefore a system governed principally by operational considerations. That post codes have a geographic expression is by-and-large of secondary consequence. Some post codes, for example, do not have an explicitly geographic translation. (G1R 0AA is not a Glasgow post code as it may appear at first glance; rather, it is the code for the Girobank processing centre in Bootle.) Other full (unit) post codes describe the destination of sorted mail and may therefore refer to a

building or buildings, a street or streets, or an organisation. It is not possible to automatically deduce boundaries for these. Consequently, while it is possible to derive (e.g., by tessellation) a set of boundaries describing post code sectors, there are some problems in their use. First, they are apt to change as the demand for unit post codes changes. Second, they do not correspond in any way to existing electoral or administrative divisions in Britain (although increasingly such divisions are respecting post code boundaries). Third, post code sectors may be non-contiguous.

Allocating post codes sectors to target areas

These problems do not, however, preclude the successful use of statistics on a post code sector base, as long as we are cognisant to these caveats and take the necessary analytic precautions. The remainder of this appendix will concentrate on the method used to analyse house price data using post code sector boundaries.

Post code sectors were assigned to target statistical areas on a best-fit basis. What this meant in practice was a 'by eye' allocation of post code sectors to local authority and housing market boundaries using information on the internal density of unit post codes as a guide. If the majority of a post code sector's constituent post codes fell inside a target boundary, it was allocated to that boundary regardless of the proportion of areal overlap. Using this logic, such a procedure could be automated for a larger number of target areas, but it in this case the number of target areas was low. Figure D.1 gives an example. In the figure, it can be seen that at least one Leeds post code sector (LS29 8) falls completely within Bradford's local authority area. In this case it is clear that LS29 8 should be allocated to the Bradford target area. LS29 6 could be arbitrarily attributed to either Leeds or Bradford on an area basis. However, it is clear that the majority of the post codes within (and therefore the majority of residential addresses) fall within Bradford. Using internal post codes as a guide it is therefore obvious that LS29 6 should also be attributed to Bradford.

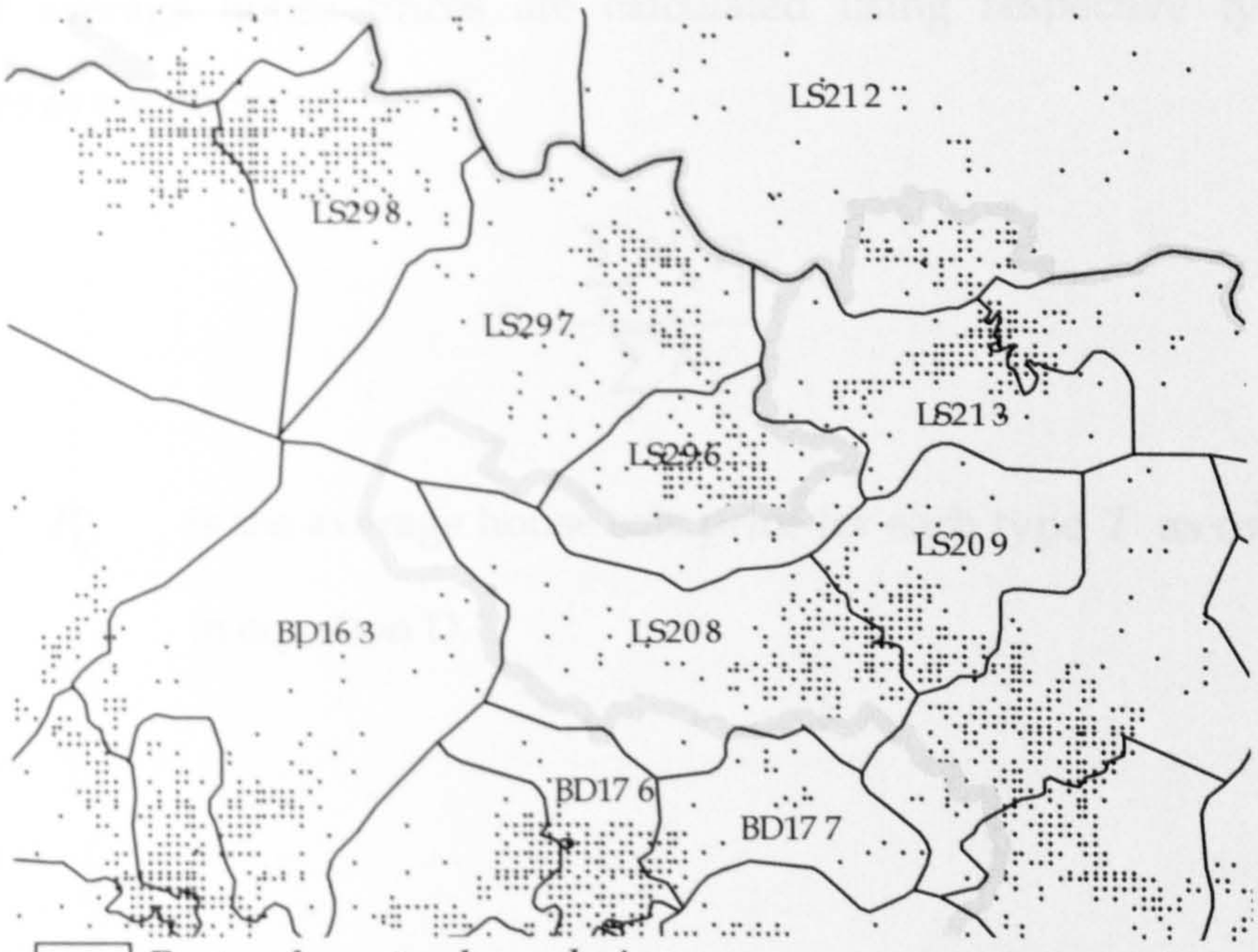


Figure D.1 Example of allocating post code sectors to target areas.

Once it is known which post code sectors should be allocated to which target statistical areas, aggregations of total house sale values and volumes can be calculated for each dwelling type (detached, semi-detached, terraced, and flat/maisonettes). So for each target area i, the average sale price of houses of type t is

$$P_{i_T} = \frac{\sum V_{j_T}}{\sum N_{j_T}} \qquad \text{(D.1)}$$

where V_{j_T} is the total volume of sales (in money terms) of house type T in post code sector j;

N_{j_T} is the total number of sales of house type T in post code sector j; and

$i \supseteq j$.

Overall average house prices are calculated using respective type sale volumes as weights:

$$P = \frac{\sum_{T} N_{i_T} P_{i_T}}{\sum_{T} N_{i_T}} \qquad \text{(D.2)}$$

where P_{i_T} is the average house sale price for each type T as calculated in equation D.1.

APPENDIX E

MODELLING VERY LOCALISED STATISTICS FROM SMALL AREA DATA

One of the principal problems with area statistics, even for small areas, is the Modifiable Areal Unit Problem whereby statistics are highly sensitive to the arbitrary spatial units by which they are reported (Openshaw 1977). The problem has three distinct components, of which the most serious is that of aggregation. This, a form of the ecological fallacy, states that an area statistic will vary according to how basic spatial units are aggregated up into regions, and that the resulting statistic may be very weakly related to the objects it purports to describe. A simple example illuminates this. A set of households are surveyed about their incomes. The data are reported by small area aggregations. A systematic 'split' in households' incomes are reflected in the tenure and type of housing they live in: a local authority estate is bordered closely by an area of owner-occupied housing. However, the area units may not reflect this and may in fact completely ignore it. Figure E.1 shows how two aggregation schemes, one which respects the local authority estate and one which does not, can falsely give the impression of average incomes. To say that the average income in area 1(a) is similar to that in area 2(a) is misleading: in fact the average income is likely to be a lot higher or a lot lower depending on where *inside* area 1(a) or 2(a) you are looking at. To say that the average income of households in areas 1(b) and 2(b) is different is more truthful. Merely reporting the average statistics however leaves the reader unable to deduce the validity of the underlying aggregation scheme.

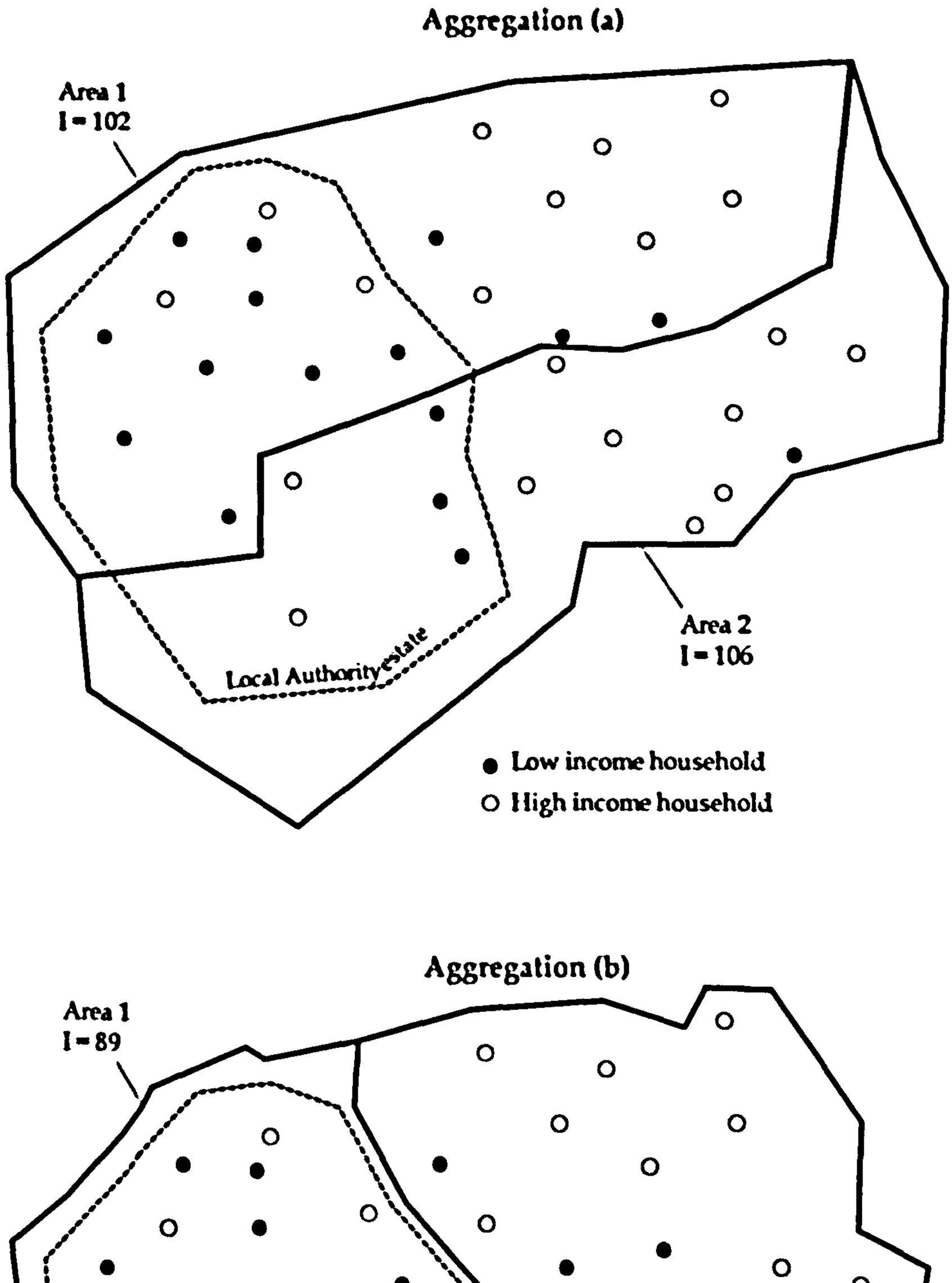


Figure E.1 **The Modifiable Areal Unit Problem: the effect of arbitrary aggregation schemes**

There are a number of ways round the problem. One of the most important methods is to ensure that when dealing with area aggregate statistics that these are only attributed to those areas to which they can logically pertain. Using a point data set on the location of households, for example, can help to increase the accuracy for which aggregate data on households is attributed to space. Data on average house sale prices for a post code sector, for example, is not valid for those parts of the sector where there are no houses (for example, an industrial area).

The remainder of this appendix gives details of a method used to model local surfaces of a phenomenon using area aggregates statistics and a more detailed point data set representing the denominator. The example used will be that of modelling crime rates per household.

Creating weighted surfaces

The primary goal is to create a grid-cell representation of a spatially-variable phenomenon such that it respects internal variation in the smallest unit for which the phenomenon is reported. This is done by creating a grid that represents this basic spatial unit geography then weighting each cell according to some measure of internal importance within that basic spatial unit. An enumeration district (ED) which covers an area of high density housing, an area of low density housing, and a park may have three such weightings. The park might be zero weighted since there are no houses there and the phenomenon is reported as a rate per household. If 1,000 burglaries are reported in an ED then, all other things being equal, it could be expected that sub-areas (grid cells in this case) with more housing can expect to have a greater number of burglaries. (Of course, the analyst is also able to adjust these internal weights to take account of some other phenomenon—for example, if it is known that the design of certain high-density housing schemes influences the propensity for burglaries to occur.)

To put this into operation, a geographic information system (GIS) is required. The GIS in this case must be able to use a grid or raster-based data model. For this example, ESRI ArcView 3.2 was used, although nearly all desktop GIS could be used with varying degrees of effort. The task breaks down into eight discreet steps. There is a diagrammatic representation of these in Figure E.2.

a. The variable is made an attribute of a polygon representation of the basic spatial unit (b.s.u.) geography (in this case, burglary rates are attributed to EDs);

b. A point or polygon data set representing sub-b.s.u. variation in the denominator is created. (Here, a sub-set of OS's Address-POINT database is used to create points for every residential address in the study area. This is used as a crude proxy for households.);

c. The EDs with burglary rate attribute are converted into a hectare grid representation. The burglary rate becomes the z value.

d. A hectare cell representation of the household points is created using a point-in-cell function. The z value is equal to the count of the number of points falling within that grid cell.

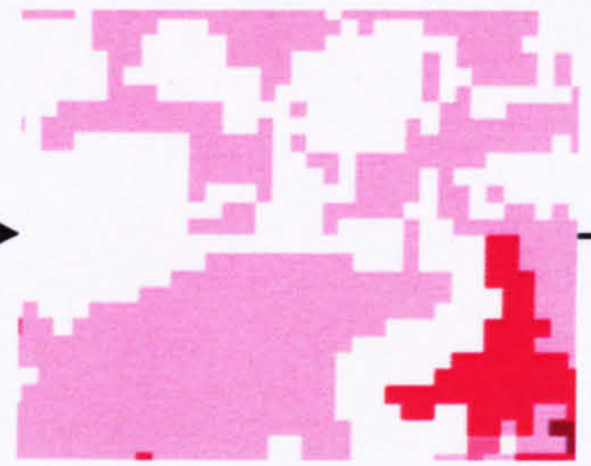
e. The household points are also aggregated to the b.s.u.'s and converted into a hectare grid representation, as in (c.) above. In this case, the ED count of households becomes the z value for every cell falling within that ED;

f. Internal weights for each hectare cell are produced which reflect the proportion of the ED households that are in that cell. This is obtained by dividing (d.) by (e.);

g. A hectare cell representation of the localised burglary rate is produced by multiplying the internal weights derived in (f.) above by the burglary rate for the ED as a whole (c.);

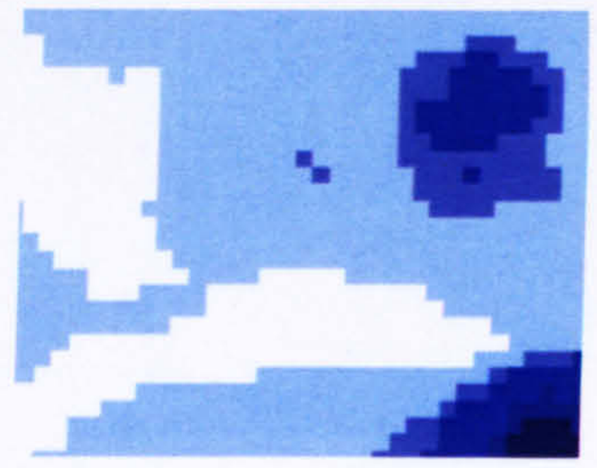
h. Finally, the resulting grid can be smoothed to mitigate against the edge effects caused by the arbitrary overlay of a hectare grid, while at the same time producing a more readable map. Each cell in (g.) is recalculated as the mean of the cell's value plus all other cells in a 500m radius.

Burglary rate by ED

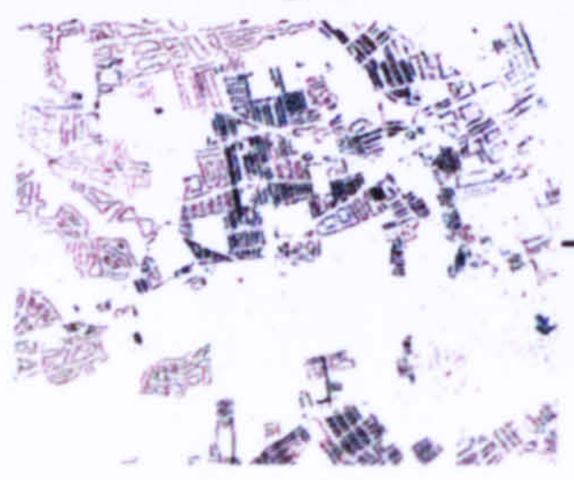


Burglary rate by ED: hectare cell representation

Modelled localised burglary rate by ED $(c \times f)$



Localised burglary rate, smoothed by mean rate within 500m radius.



Location of individual addresses

Density of addresses by hectare cell

Count of addresses by ED: hectare cell representation

Internal weights $\left(\frac{d}{e}\right)$

Figure E.2 Modelling surfaces from small area data

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