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UK home buyers' search and the representation of spatial markets by information providers

Abstract

Is the dominant housing search method in the UK influencing market boundaries? The relative importance of different information sources in homebuyer's search behaviour has changed over the last two decades. Today, there is a greater reliance upon Internet based property search engines as an information source. Yet, information sources offer varied services and portray different representations of spatial housing markets. Therefore, homebuyers access to information about housing opportunities and markets has changed.

The advice of estate agents, though not impartial, derives from an organic experience embedded in the local geography, whilst property websites tend to utilise digital distinctions created using GIS tools that dissect local area statistics. Yet, websites can offer homebuyers information about a greater number of properties than individual estate agents are able to. Estate agents are able to interpret, extrapolate and in some cases refine the housing attributes (including location) that a household is searching for, whereas at present most property search websites use a binary distinction and hard boundary definitions to select housing opportunities. These variations in spatially embedded 'knowlegde', the number of properties available and interpretability between information sources, represent various strengths and weaknesses. This paper draws together these questions and opens up the implications of changes in the reliance on particular information sources to individual home buyers and the spatial nature of housing markets. These questions form the basis for a new research agenda into home buyers perceptions of Internet based property search engines and their effect upon the housing market.

Introduction

The roles of information, search and demand in housing economics have come under renewed interest (e.g. Ferrari et al., 2010). At the same time a fundamental change in the process of housing search has occurred, particularly in relation to the information sources used (Dunning and Watkins, 2012). Historically in many nations , including in the UK, estate agents have held a privileged position in revealing both housing opprtunities and spatial information to home buyers. Yet, with the growth in Internet based property search engines in the UK (e.g. rightmove.co.uk, zoopla.co.uk, primelocation.co.uk, home.co.uk) and other countries, including to name just a few: New Zealand (realestate.co.nz), America (realtor.com, zillow.com, realestate.com), Germany (immobilienscout24.de), Ireland (daft.ie) and Australia (domain.com.au, property.com.au), estate agents are readdressing their business practice. Many more housing opportunities are available to the home buyer to view online than through their local estate agent, and spatial information, such as average house price in a town, is readily availble online. However, there are problems with representing spatial information such as house price trends. Estate agents and Internet based property search engines process spatial information in different ways and respond to homebuyers' aspirations in alternative ways. These problems have been underrepresented in relation to their impact upon homebuyers search behaviour and consequently upon the housing market and house price trends.

This UK based paper highlights the existing literature on the roles of spatial information in the housing search process and the conceptual problems inherent with many representations of spatial information within that process. It is structured to cover literature on defining spatial boundaries and the reasons location matters in housing search. The paper goes on to explore how spatial boundaries are used by information providers within the housing search process, underlining the ways in which spatial information is defined and utilised by estate agents and Internet based property search engines. We argue, from a UK perspective, that the greater levels of information available through the Internet do not necessarily increase the perspicuity of spatial phenomenon. The paper culminates in a discussion about the impact information sources have on the housing market and the spatial distribution of prices. Finally, we hope to outline an empirical research agenda for policy, academic and housing professionals to help establish potential future projects and develop understanding.

Theoretical Context

Searching for a property is a complex process, with both macro and micro variables influencing the housing search process. At the macro level, inflation levels, interest rates, the availability of finance, the institutional arrangement of information sources, the number of properties available and other factors all play a part in the length and intensity of search. As changes occur at the macro level (whether spatially or temporally), there will be consequential impacts upon the housing market and type of search undertaken (e.g. Priemus and Maclennan, 2011). At the micro level, the aspirations of the household, their available time for searching, the household's local knowledge all have an impact upon search. Depending upon these micro and macro factors, households engage in a search process, gathering information from sources to understand two key elements; neighbourhood information and specific housing opportunities. This search includes neighbourhood price trends as well as specific asking prices, and selecting the appropriate methods for search is in itself a complex decision (Marsh and Gibb, 2011).

Housing characteristics and house price information are inherently spatial, with the purchaser interested in both the features of the specific property and the access and proximity to local services. These attributes include a wide range of spatially embedded phenomena, from the length of commute to work, to access to schools and the kudos associated with particular neighbourhoods. This reveals the socio-spatial nature of housng characteristics and therefore the search for home ownership (Marsh and Gibb, 2011). Galster, in attempting to define neighbourhoods broadens the scope of attributes:

> The bundle of spatially based attributes associated with clusters of residences, sometimes in conjunction with other land uses. This bundle is multi-dimensional, consisting of everything from structures and topography to demography, public services and social interactions. (Galster, 2001, P.21)

The differences between households' searches can also be seen in their understanding of the property locality. Residents' perceptions of the size of a neighbourhood varies widely (Lee and Campbell, 1997) defying the notion that a clear boundary can be created physically or mentally. This lies in part due to the nature of a neighbourhood as a social and not a physical construction (Guest and Lee, 1984). This difficulty in defining precise neighbourhoods, or uniform socio-spatial characteristics, affects both property-searching households and the information sources they use to provide advice and open up housing opportunities .

House prices are also difficult to represent spatially as they combine neighbourhood perceptions with individual characteristics of the property (as well as macro economic 'fundamentals' that alter over time). A large literature has emerged about the defintion of market areas and submarkets (e.g. Jones, 2002 and Watkins, 2001), the complexity of which is beyond the scope of this journal article, but the consensus remains that house price patterns are complex entities that in most cases will not conform to neat spatial patterns (Jones, 2002) and should be considered in relation to housing search and spatial arbitrage rather than administrative boundaries (Hinks and Baker, 2012). Leishman et al (2013) identify two broad methods of identfying submarkets:

> The first uses statistical methods, including for example techniques such as principal components and cluster analysis (exemplified by Bourassa et al., 2003) and the estimation of isotropic semi-variograms (see Tu et al., 2007) while the second uses markets expertes, such as estate agents and valuers, to define segments (see for instance, Keskin, 2010; Bourassa et al., 2003).
> (Leishman et al., 2013, PP.1202)

These two methods for defining housing submarkets use information to create organic boundaries rather than relying on pre-existing independent boundaries such as administrative. This difference is important for the following argument when considering the relationship between information sources, household search and market boundaries.

Openshaw and Taylor (1979) argue that each geographic analysis, whether it is to do with average house prices in an area, submarkets or defining a neighbourhood is inherently dependent upon some

form of boundary to the space. Yet, as we have already seen defining the boundaries of a neighbourhood or housing market is difficult. The spatial complexity of house prices and housing information is developed later in the paper, but first the nature of the boundaries of spatial information needs addressing.

How is spatial information demarcated?

Broadly speaking boundaries can be conceptualised in two ways. First, physical boundaries which help constitute the morphology and topography of landscape; Smith and Varzi (2000) refer to these as *bona fide* boundaries. An example of a physical boundary could be the Pennines which acts to physically separate the villages, towns and cities of north-east England from north-west England. Second, socially constructed, or *fiat* boundaries (ibid) are determined by human convention. A socially constructed boundary could be that of a nation, region, city or a neighbourhood.

Both physically and socially constructed boundaries can be considered alongside the philosophical position offered by Searle (1995) who argues for an ontological recognition between both 'brute facts' and 'institutional facts'. Brute facts are those which do, or would, exist without social convention and as such can be related to physical boundaries. Institutional facts are those relative to the observer, or observers, and are retained through social recognition. This recognition is to a greater or lesser extent embedded in a wider social acceptance and can often be bound to a legislative frameworks, for example local authority boundaries. A neighbourhood can be seen as an 'institutional fact' or construct as concepts of a place work to create imagined boundaries. These boundaries play an important role in the decision-making process of homebuyers and the subsequent actions they take.

This paper suggests institutionally constructed boundaries can over time ‘harden’ whereby they become socially embedded and manifest themselves not only as lines on maps but also through the way we act and interact with physical objects. These boundaries through differing forms of social interaction take on tangible properties and therefore to some extent 'harden'. For example housing policies in England based on Strategic Housing Market Assessments tend to reinforce the use of pre-existing administrative boundaries (Ferrari et al, 2011). These policies go onto inform development decisions and as such to a degree become 'hardened'. Other examples of boundaries shaping development decisions are green belts, conservation areas or housing market renewal areas. As such what is, or is not, deemed appropriate for a neighbourhood often comes down to the administrative boundaries within which it lies. These types of boundaries impose a hardened framework to neighbourhood development and, as is argued in this paper, often to searches for homes within them.

An individual household’s search for property is not bound by socially constructed boundaries by necessity. This paper looks to reinforce the idea that households frequently search, for example, within postcode areas or certain neighbourhoods within a city to provide a reference when searching for a property. However, it is important to stress that the perceptions of place held by households or what they consider to be important in buying a house should not always be thought of as belonging to fixed boundaries. Individuals are able to map their own conceptual boundaries based on a series of personally relevant attributes. The geographic scale of these more personalised boundaries will no doubt be influenced by the preparedness to substitute any initial housing preferences. The ability of a household to develop a personalised boundary to their housing search is contingent upon localised

knowledge. For example intra-market movers are more likely to have refined personalised search boundaries than inter-market migrators, who, hold less localised knowledge of factors such as place or price (e.g. price differential of in-migrants in Simonsohn and Loewenstein, 2006).

How do properties relate to place?

Individual dwellings and housing markets are spatially embedded. The location of a home holds a key place within the decision making process of movers. Hickman et al. (2007) found that notions of place, or in other terms, the local characteristics of an area, are one of four fundamental bundles of issues that shape households' actions. Whilst the conceptualisation of these spaces may be problematic theoretically (Galster, 2001) these perceptions when taken together shape the geographic differential in dwelling prices within markets. Location does have a genuine impact on price.

Housing decisions for multi-person households are inherently social and add to the complex picture of location perceptions (Levy and Lee, 2004, Levy et al., 2008, Chen and Lin, 2012). Conceptualisations and preferences are rarely formed in a vacuum, yet information influencing these preferences and therefore decisions may be flawed or partial. We hypothesise that a household engages within the housing market with two forms of spatial information: first, the neighbourhood characteristics and second, with individual properties. These should not be conceptualised as stages in the housing search process, as the sequence may be iterative and begin with either. Likewise, the two forms are linked, with perceptions of an individual property framed by perceptions of a neighbourhood. Yet, the two may be separated, theoretically, when conceptualising the process of housing search, as a household forms an opinion (or more than one) of a neighbourhood, and discovers individual housing opportunities, within that perceived area. The household may be aware of an individual property and then attempt to understand the characteristics of that property in relation to a neighbourhood, or it may be aware of an area and then search for housing opportunities within that area. In gathering neighbourhood and individual property information, a household may add to their existing understanding by soliciting information from a range of sources, whether those be friends, estate agents, newspapers or the Internet.

How have information sources changed?

The major source of information for households has traditionally been the estate agent. Housing research has developed a narrative surrounding the role of real estate agents in disseminating housing and neighbourhood information to potential buyers, their influence upon the whole decision making process (e.g. Palm, 1976a; Anglin, 1997), and their potential for preventing spatial integration (e.g. Galster, 1990; Ahmed and Hammarstedt, 2008). However, the sources of information used in housing search are changing, and the recent rise of the popularity of Internet based property search engines (IBPSEs) alters the institutional arrangement of information acquisition. The impact of the Internet in marketing and retail was widely predicted and has largely proved correct as the Internet grows and purchasing behaviour alters, even if communicating via the Internet is not a panacea for marketing and retail (e.g. Peterson et al, 1997 and Peterson and Merino). These wider trends are also being seen in housing. In the US and in the UK for example 90% of households now use the Internet to search for a property (National Association of Realtors, 2013; Dunning and Watkins, 2012). In the UK IBPSEs include some of the most frequently viewed websites such as Rightmove and Zoopla. The international literature has begun to address issues surrounding the role of the Internet and housing

markets, including: the viability of estate agents and the role of sellers (e.g. Bean and Guttery, 1997; Ford, Rutherford and Yavas, 2005, Hwa and Isa, 2011), the relationship between Internet use and innovtation amongst estate agents (Bristow et al., 2004), the reduction of transaction costs (e.g. Zumpano, Johnson and Anderson, 2003), home buyer's awareness of online property information (e.g. Littlefield, Bao and Cook, 2000), the amount of information provided by estate agents online (Gwin, 2004), house price prediction (e.g. Wu and Brynjolfsson, 2009) and efficiency and search intensity (e.g. Richardson and Zumpano, 2012). Nevertheless, despite preliminary work (e.g. D'Urso, 2001; Kaesbauer et al., 2012) there has been no systematic theoretical treatment of the Internet's role in shaping buyers spatial information asymmetries and their neighbourhood perceptions.

The estate agent acts as a mediator of local knowledge to enforce and reinforce local perceptions and stereotypes of neighbourhoods (Palm, 1976b). Huff (1986) found that whilst workplace and previous housing location act as significant anchors, the location of estate agents can also influence the properties a household views. The place and ubiquity of estate agent practices has changed over the last decade, with a decline in the number of practices in the UK, in a large part due to the wider economic context and decline in the number of properties being sold each year (Telegraph, 2008). Despite fluctuations in the housing market and consequences for business, UK estate agents have previously held constant cognitive models of practice over time, even with the arrival of new competitors (Hodgkinson, 1997). The behaviour of estate agents is juxtaposed here against the fluctuating market and the arrival of a new information source.

With the genesis of the Internet localised information and perceptions have become more accessible. Use of the Internet has grown by real estate companies and house-buyers in a whole range of geographic contexts (e.g. Benjamin et al., 2006, Carillo, 2005, Sunnika and Bragge, 2006, Xie and Zhang, 2011). In the UK, as with many other nations, information about place and the image of a local area is widely available on the Internet. Frequently indidivuals have the ability to search and sort place according to a wide array of variables as IBPSEs become more accessible and more powerful (Burrows, Ellison and Woods, 2005). Burrows et al. (2005) provide an overview of four types of website that provide information about different characteristics of an area that are geographically associated; commercial, geodemographics industry, policy and research communities, and social software sites. These types of website cover information related to household characteristics, property characteristics, business type information, crime, environmental risks, socio-economic descriptions, public transport links, public participation and others. All of these characteristics arguably contribute to the overall image of a local area, and are accessible remotely and largely indiscriminately, whether the websites are reflecting business, public collective or private individual perceptions of location. The type and form of informatimon provided by IBPSEs and other websites may respond iteratively as search behaviour alters and understanding of marketing online improves.

The common perception and recent literature findings are supported by research undertaken recently by the corresponding author. A postal survey of residential property purchasers in Sheffield in 2010 revealed the search behaviour and preferences of households within the city's housing market (Dunning and Watkins, 2012). Pertinent to this review, the range of sources of information used in the search and decision making process were recorded by households. The survey of 400 owners asked about the respective importance of a series of information sources. The findings revealed that IBPSEs

were the source most frequently cited as 'Very Important' in the search process. Such sources were cited as 'very important' six times more frequently than estate agents in person. Corresponding to this finding, nine times as many households used Internet based property search engines 'Very Often' as estate agents in person, and were over twice as likely to use IBPSEs throughout the search process as estate agents. The importance of the Internet was reflected across all demographic and socio-economic levels available from the survey data, although younger households tended to use the Internet more frequently than older households.

Table 1.1 The relative importance and frequency of use of information sources in housing search

Whilst each of the information sources were very important to some households, estate agents and IBPSEs have been selected for further discussion below because of their historic and contemporary importance respectively.

Representation of spatial markets by information sources

The many sources of information available to a home buyer do not provide uniform services or access to information. The rationale behind information providers in traditional economic theory is to decrease transaction costs and improve the efficiency of searching for a home. However, not all information providers provide the same information and not all seek to decrease transaction costs in the same way. Newspapers, for example, decrease transaction costs by advertising specific housing opportunities, normally within a local or regional geography. This is likely to serve households who are

moving within the circulation of the newspaper, as they have access to the newspaper and are interested in opportunities within the boundaries of circulation. Properties advertised in estate agents windows, likewise reduce transaction costs by providing information about an estate agents interpretation of the most suitable properties for sale in an area. They also reduce transaction costs by being available to view at all hours of the day, including out-of-hours when it is not possible to speak to an estate agent in person. These various sources therefore arise to serve specific needs within the housing search process, and indeed there are trade offs between the appropriateness of different sources for different purposes. Three particular differences between information sources are discussed below; the number of properties available, the spatially embedded 'knowledge' of the information source and the ability of that source to intepret household's aspirations and reveal appropriate opportunities. The final section of this paper will then discuss the impact of changes in the institutional reliance on particular sources on the spatial nature of the housing market.

Number of properties available

The friends and family of a buyer were an important source of information for 47.6% of households in the study quoted above. Yet, the amount of information provided by friends and family (or other trusted contacts) differs substantially from the amount of information available through the Internet. The largest IBPSEs hold information about hundreds of thousands of properties currently being marketed, far beyond the scope of recolletion of a group of friends and relatives However, the friends and relatives may have access to neighbourhood information that is unavailable through Internet sources, and at a scale that corresponds to the needs of the household rather than to available sources of data. This trade off between information sources with detailed intensive local information and aggregated extensive information can be seen in Fig 1 below. Website coverage of housing opportunities varies regionally and therefore, whilst the overall number of properties available to view online may be greater than those shown by any particular estate agent or newspaper, the number of properties available within a particular nieghbourhood may not be larger. This distinction between the scale of search and the number of properties the household is informed of reiterates the importance of households ability to identify the geographic extent of their search.

The appropriate resources for finding housing opportunities and local information will depend upon the social networks available to the household and upon the geographic scale of their housing search. Whilst most households use multiple information sources to build up a rounded picture of the extensive and intensive information available, very little research has been conducted into how households hold these sources together. It is unclear for example how households relate anecdotal evidence from friends about house price trends with the representation of historic and predicted figures at various spatial scales made available on many IBPSEs.

Spatial embeddedness of information source's 'knowledge'

Beyond more informal trusted sources, such as family or colleagues, information about the housing market, neighbourhoods and housing opportunities have traditionally been communicated to potential buyers and renters through local estate agents. Estate agents provide an interpretation of the requirements of a household and their idea of the likely properties and areas that would be suitable. This interpretation therefore places the estate agent, as a local housing expert, in a position to frame the housing choices of the household by selectively revealing information and opportunities about the

area and type of property requested by the household. Also, the estate agent retains the possibility of introducing information about alternative areas and or alternative housing types. As an 'expert', and with the human capacity to consider the requirements of a household, the estate agent is not bound to administrative areas and the information she provides, or the information provided need not necessarily conform to a binary distinction about space or house type as proscribed by the household. The potential buyer, therefore, may find that information provided by the estate agent alters their perception of a local neighbourhood and the specific house types available or even results in considering areas or types of house that had not previously been part of the decision framework. This mediation of information by the estate agent is responsive to the housing needs of the household, rather than the search criteria identified by the household.

The role of the estate agent is in contrast to the emergence and prominence of IBPSEs. Whilst some websites can be categorised into distinct types of information provider, others are hybrids and provide a range of services. As has been hinted at earlier, Burrows et al. (2005) provide a comprehensive review of websites offering geographic based information and conclude that, “software-based information is very much ‘out there’ and is being used to ‘sort places’ and the people who live in them in particular ways” (Burrows et al., 2005, p.35). However, one disadvantage highlighted is that local residents rarely understand the segmentation methods and the sources of geographic information, suggesting that they are susceptible to the spatial trends portrayed on the website.

Despite there being no need for a house search to be restricted by administrative boundaries (e.g. postcodes) the structures of search opportunities provided by IBPSEs could in fact reinforce them. Many IBPSE representations of space are heavily dependent on administrative boundaries irrespective of social neighbourhood constructs, house type and house price trends, and are thus susceptible to errors in representation of markets (see Jones, 2002). Therefore, households that utilise IBPSEs as a primary information source are effectively funnelled into their search choices by selecting information from an inappropriate geographical distinction, and may cause a representative bias. This in turn may serve to reinforce existing administrative boundaries by limiting perceptions to within them; thus having a ‘hardening’ impact.

Figure 1 below explores the relationship between household, information source and housing market, as discussed above, in more detail. It looks particularly to underline the role of local embedded knowledge through to the more abstract knowledge provided by IBPSEs in shaping homebuyer opportunities. The type and technical complexity of spatial information provided on IBPSEs varies widely, with some websites using algorithms to compute travel to work or time on public transport for accessibility scores or layers of crowd-sourced, public services or locational scores such as the walkscore system now more common the America.

Interpretability

Given the increasing importance of IBPSEs, the procedure they use to select housing opportunities and neighbourhood information becomes significant. Estate agents have the capacity to consider the housing needs and then filter the available housing opportunities accordingly. IBPSEs currently require characteristics, with hard boundaries, to select housing opportunities. This is the difference between embedded spatial knowledge and digitally luxated information as underlined in figure 1.

Luxated refers to information that is dislocated from its spatial pattern (i.e. an administrative rather than a housing market or submarket framework is used to harvest price trends of housing opportunities).

An example of the difference between embedded and digital interpretations of housing requirements is the number of bedrooms required by a household. In a conversation with an estate agent, the estate agent may take the household size along with the household's projection of their bedroom need and filter the housing available using multiple criteria., For example, the estate agent may consider properties that could be divided up differently to their current lay out, a study converted into a bedroom or a large bedroom subdivided into two smaller rooms. Most IBPSEs currently do not perform this function, and the number of bedrooms provides a binary distinction, i.e. a 2 bedroom property with a room classified as a study will not be selected in the list of properties where 3 bedrooms is the search criteria. Therefore, when a household searches online they need to understand the possible definitional characteristics that the search engine uses to select opportunities. In the example above of converting a study, they would need to select one bedroom less than they 'need' in order to reveal the property that could be converted to meet their needs. This is likely to be highly counterintuitive for a household.

The selection of housing opportunities and spatial information by estate agents and IBPSEs differs in the method of selection. Where estate agents are able to interpret households needs and suggest alternatives or manipulate binary distinctions about information and criteria, IBPSEs cannot. This places a greater emphasis on the household to know precisely their hard boundaries of housing characteristics at the earliest stage of the housing search, and may result in smaller searches (Chen and Lin, 2012). Herbert Simon's work on bounded rationality suggested that households do not typically possess this type of ability (Simon, 1984). Therefore, in reality, households are more likely to take short cuts in their initial decision making process and satisfice, than to work out the optimal terminology needed for each search engine. In this situation households are likely to revert to spatial indicators that they are familiar with, for example post code districts, even if they do not correspond to homogeneous housing areas. Home buyers do engage in iterations of spatial search as they utilise websites, refining their search criteria (Yuan et al., 2013), however given the tendency of individuals to anchor their preferences around initial values (Tversky and Kahneman, 1974) these amended searches are likely to be anchored around the initial search findings, even if the search is arbitrary (Scott and Lizieri, 2012).

This relationship between online information and administrative boundaries may, over time, begin to impact the spatial nature of housing markets. Embedded knowledge and traditionally recognised boundaries in housing markets known by estate agents are not recognised by IBPSEs, and therefore households that utilise online binary type searchs for information during the house search process may have their perceptions shaped into more formalised boundaries.

This section has shown that there are logical reasons for arguing that information sources have access to different numbers of properties, have significant differences in their type of 'knowledge' on an organic-luxated spectrum and have potentially important distinctions in their interpretation of household's preferences (this spectrum differentiates between organic representations that arise from

the spatial trends and representations which are divorced from the spatial trends that are occurring underneath). The impact of these distinctions upon household's and housing markets has been intimated, but requires a thoroughly applied research agenda to discern the extant impact they are having.

Fig 1. Contrasting the Spatially Embedded 'Knowledge' and number of properties represented by various information sources

What next?

Three broad implications arise from the current adaptation of search behaviour in the housing market. First, the academy needs to readdress the theory behind housing search and form an empirically rich assessment of the use of Internet based property search engines. The importance of information sources in revealing housing opportunities and shaping household perceptions of the spatial nature of markets likewise suggests that further analysis of the type and extent of information provided by different sources is crucial. This affirms the existing call for further empirical research in the area of behavioural economics and housing (e.g. Gibb, 2009, Watkins and McMaster, 2011). Both intensive and extensive research into this relationship, including how households interpret information collected online and through engagement with estate agents, will further refine the theoretical relationship between information sources and the housing market. In addition to direct engagement with households, research should also approach both estate agents and IBPSEs. IBPSEs gather a substantial amount of information about use of their websites from the frequency of search terms to the interconnections between search criteria. Whilst access may be difficult it would provide useful insights about the behaviour of households in gathering information about the housing market and specific housing opportunities. IBPSEs already represent a fundamental change in housing search behaviour, but the present and future development of technological tools, such as mobile phone apps, 'google glasses', and crowd-sourced website, requires an ongoing theoretical and empirical reflection of the institutional forms that information providers take in housing markets.

Second, if IBPSEs continue to channel household's searches through administrative boundaries, then over time housing markets are likely to cohere more closely with those administrative boundaries. Future research should measure changes in boundaries of housing market areas and submarkets and test their relationship to administrative boundaries. The opening up of data sources, such as Land Registry in the UK, provide new opportunities to study the changes to housing markets' spatial boundaries.

Third, estate agents have been quick to utilise the potential for advertising properties online, yet the increasing importance of this mode of engaging with households requires an ongoing reassessment of the most appropriate descriptions of property characteristics for online search criteria. The marketing of property online may also benefit from further understanding of the methods IBPSEs use to reveal individual properties and generate area statistics. There are questions about how estate agents should respond to the 'success' of IBPSEs and their relationship to home buyers. Likewise further research should explore the relationship between estate agents and IBPSEs and possible future symbiosis of locally embedded knowledge and extensively available information.

This agenda setting paper has shown that there have been changes to the information sources used in the housing search process, and that these changes have not yet been adequately theorised or empirically ressearched. There are fundamental differences between organic and luxated spatial interpretations of the housing market, as well as differences between the number of properties 'known' by the information source, and that source's ability to appropriately interpret the household's preferences. The various information sources representations of spatial housing markets is likely to have a significant impact upon the perceptions of house buyers of the key characteristics of housing markets, including trends in house prices. This paper calls for a renewed vigour in studying the impact

of information sources upon household's perceptions and subsequently the spatial impact on housing markets, with a particular emphasis on Internet based property search engines.

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