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Bias or rationality? The case of UK commercial real estate investment

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1. Introduction

Modern Portfolio Theory (MPT) provides a framework for the determination of optimal investment portfolio structures (see the work of Markowitz, 1952, Sharpe, 1964 and Lintner, 1965, for example). It provides an intuitive logic for portfolio construction, providing estimates of the structure of the optimum (efficient) portfolio for any given risk-return utility. However, a number of simplifying assumptions underpin the theory. These are that there is perfect competition and equilibrium; no taxes or transaction costs; free information that is simultaneously available to all investors; infinitely divisible securities; a market price that cannot be affected by an individual buying or selling; and rational investors seeking utility maximisation (Rutterford and Davison, 2007). As Lizieri (2009, p. 150) notes, the assumptions underpinning portfolio theory "are predicated on [economic] rationality and market efficiency". Variants of MPT and CAPM are now often used across alternative, distinct, asset classes to guide portfolio construction. One of these is direct property. This market differs from other asset classes in that, for example, it is characterised by heterogeneous stock, opaque information - often not widely or publicly available, large lot sizes, indivisibility, high transaction costs and illiquidity (see, for example, Hoesli and MacGregor, 2000; Bond *et al*., 2004). These characteristics clearly violate the assumptions underlying portfolio theory and therefore present challenges for investors.

This paper, focusing on the UK direct property market, investigates the outcome of investor decision-making, by exploring observed patterns of investment and relating them to the tenets of portfolio theory. It has been suggested that bias can be seen in geographical patterns of investment across the UK (Henneberry *et al*., 2004, in the office sector, for example), but research has not yet explored whether this apparent bias can be explained through reference to the fundamental investment characteristics of property and local economies across the UK. The paper investigates whether investment decision-making, as evidenced by geographical patterns of aggregate investment, corresponds to what might be considered rational, as evidenced by underlying local economic and market characteristics.

Henneberry and Roberts (2008) lament that "the interplay between the behaviour of property investors and the geography of property investment has received relativity little academic attention" (p. 1219). It is important to try to address this for two reasons. First, an explicit analysis of geographical patterns of investment and geographical patterns of 'investible' property and markets will provide insights into the motivating factors underpinning observed investment. If investment weightings are found to accord with market fundamentals, then this will provide evidence of (economic) rationality underpinning investor behaviour. If, however, this link is absent or weak, then this provides evidence that investors are not seen to behave with (economic) rationality, further distancing the direct investment property market from portfolio optimisation theory. Secondly, a healthy and vibrant investor market will provide conditions that can lead to a supply of new property which, in turn, can provide occupiers with significant functional efficiency and cost effectiveness gains (Henneberry and Rowley, 2000). If bias is found to exist in geographical patterns of investment, this may indicate that investor behaviour is reducing the vitality of the market. This is important because the role of new (good quality) property in local economic development is important in attracting inward investment, flexibility in the function of cities and wider physical revitalisation (Turok, 1992).

By examining and challenging the assumption of rationality from mainstream economics, through the use of observed behaviour, this paper seeks to contribute to the body of evidence within a (more recent) behavioural real estate paradigm. In the behavioural tradition, "facts drive a renewal of theory or the creation of new theory" (Forbes, 2009, p. 2) and researchers seek "to convert suspected beliefs into knowledge by the identification of supporting evidence" (Diaz and Hansz, 2007, p. 17). Investor behaviour is an area where the application of this behavioural paradigm could combine with traditional research approaches to enhance understanding, representing a continuation of Diaz's (2010, p. 204) "systematic search for evidence of how people making real estate decisions actually do behave and the use of that evidence to help people make better real estate decisions".

The remainder of the paper is structured as follows. In section two the characteristics of the direct investment property market and its wider investment environment are examined in the light of the traditional economic assumptions underlying MPT. This leads to an examination of the emerging behavioural real estate paradigm. Section three explores evidence of the importance of the use of economic and market fundamentals to underpin portfolio diversification strategies. It examines the mechanisms determining investment returns and, subsequently, local market fundamentals underpinning investment returns. Section four identifies and introduces the data used to test empirically the hypothesis. Section five contains empirical analyses of the geographical patterns of institutional investment, relating them to economic and property characteristics and investment performance indicators. The paper concludes by assessing the validity of the hypothesis and reflects on the consequences for theory and practice.

2. Investment theory and practice

The direct property market is complex and exhibits a number of characteristics that provide unique opportunities and challenges for investors. The opportunities centre on the level of direct control by, and the potential for, the investor to add value. This makes direct property the preferred method of exposure to the market for the largest life funds and pension funds and, compared with indirect vehicles, direct property dominates the exposure of UK investing institutions (Mitchell, 2010). The challenges arise from incomplete and imperfect information and high transaction costs, representing barriers to entry to the market. Only the largest (institutional) investors have sufficient capital to diversify using the principles of MPT, because of heterogeneity of stock and large lot sizes.

Relating these challenges and characteristics to the assumptions underpinning investment theory, it is clear that the market does not operate at a strong level of efficiency (see Maier and Herath, 2009, for a review of the literature), while Henneberry and Roberts (2008) review how institutions can be endogenous to markets, shaping the operation of the market and the behaviour of market actors. In terms of investor rationality, mainstream economics assumes that all market actors maximise their utility, subject to exogenously determined constraints, and to maximise is to be rational. However, in the behavioural field, Wofford *et al*. (2010, p. 269) describe how behaviour departs from 'perfect rationality' as actors use mechanisms such as mental shortcuts (primarily heuristics and biases) to cope with information processing. Similarly, challenging the assumption of rationality, investor decision-making has been postulated to be driven "by need for liquidity, political and economic stability, over and above optimal risk-adjusted returns" (Lizieri, 2009, p. 151).

It is apparent, long acknowledged and accepted by investment professionals, that applying MPT to the direct property market violates a number of its underlying theoretical assumptions. However, in terms of assumptions of rationality and utility maximisation, the idea that investors may not be seeking to act with economic rationality, maximising expected utility, should, perhaps, be of concern

to those whose pensions, life assurance and other public and private sector investments are being managed by investment professionals. This is especially so, since Markowitz (1952) himself encouraged the use of professional judgement to ameliorate some of the problems of using historic data to guide future strategy. He argued that statistical estimations of risk and return should be combined with "the judgment of practical men. My feeling is that the statistical computations should be used to arrive at a tentative set of [means and standard deviations]. Judgment should then be used in increasing or decreasing some of these ... on the basis of factors or nuances not taken into account by the formal computations". (Markowitz, 1952, p. 91)

Research into the complex environment in which investors in the direct property market operate, and in particular their cognitive coping mechanisms, has emerged only recently. Following the more established paradigms of behavioural economics and behavioural finance, a behavioural real estate literature is becoming established. One of its leading proponents has commented, "real estate asset pricing is not simply about the investment fundamentals" and, due to limitations in human cognition, "we anchor to the past and to the opinions of others, we herd, we react emotionally, and we are overly averse to loss. We overweight convenient information and discard evidence that does not support our preconceptions. Our ultimate conclusions can be influenced by a frame of reference, and because we need to believe in patterns, we find them where they do not exist and extrapolate into the uncharted dark" (Diaz, 2010, p. 204). These comments echo Thaler (2000) and Thaler and Sunstein (2009) who predict that market agents will be recognised not as homo-economicus, but homo sapiens, and the observation of Wofford *et al*. (2010) that the common themes emerging from behavioural economics, behavioural finance and behavioural real estate, focus on how cognitive processes result in a departure from the behaviour of homo-economicus.

Wofford *et al*. (2010) discuss 'cognitive risk', -an additional risk associated with real estate, arising from human cognitive limitations. To seek to manage this risk, they turn to different disciplines, including (strategic/synoptic) planning. This encompasses developing a strategy, establishing goals and objectives, acting to implement generically the strategy and achieve the goals and objectives and monitoring the results. Clear parallels exist with real estate investment decision-making, as, for example, in the six-stage empirically derived process identified by Roberts and Henneberry (2007). Wofford *et al*. (2010) describe how, within the complex and dynamic real estate market, fraught with time delays and uncertainties, significant risk is a consequence of cognitive limitations. While planning allows emphasis to be placed on factors that are identified as important, "a focus on the metrics related to monitoring a plan may lead to cognitive myopia and stubborn adherence to a strategy that is no longer appropriate" (p. 279).

The investment decision-making process described by Roberts and Henneberry (2007) reveals that, in the UK, the use of a benchmark is embedded of the investment process. Such a benchmark provides a mechanism for monitoring performance, within investment strategy, goals and objectives. Benchmarking, with a strategy of out-performance, appears dominant among investors (Mitchell, 2010). Henneberry and Roberts (2008) describe the extreme influence of benchmarking on investment decisions having an observable impact on investment decision-making and, thus, on investor behaviour. Benchmarking is a calculative practice, intended to enhance organisations' performance and competitiveness (Kyro, 2003, cited by Henneberry and Roberts). However, benchmarking, by its very nature, emphasises following or copying others' approaches, resulting in "inherently conservative and incremental actions for improvement" (Henneberry and Roberts, 2008, p. 1229). They also note Cox *et al*.'s (1997) observations that benchmarking can produce complacency and can be detrimental to performance.

Benchmarking provides a reference point for the assessment of investment performance. Its widespread and long term use appears to be without reappraisal in many institutions.

Interpretation of Henneberry and Roberts' (2008) analysis reveals that it may be likened to a form of collective conservatism, whereby there is a "tendency of groups to stick to established patterns even as new needs arise" (Thaler and Sunstein, 2009, p. 63) and, indeed, involves peer pressure, where individuals go along with the crowd to avoid conflict and gain approval. The growth in benchmarking may be viewed as an 'informational effect'; actions are influenced by seeing the previous choices of (perceived superior) others and, thus, choosing to act in the same way (Forbes, 2009). Jones (2010) notes the apparent impact of benchmarking on institutional investment, including the short-termism that flows from frequent performance evaluation. There remains however a lack of evidence as to whether benchmarking encourages behaviour that is actually at odds with market fundamentals.

The same sort of geographical partiality found by Henneberry *et al*. (2004) in the office sector in the UK, is also evident in the US, with investors concentrating holdings in the largest metro areas (Smith *et al*., 2004; Hess and Liang, 2005a, b) and, accordingly, most affluent areas (Shilton and Stanley, 1995, 1996; Shilton *et al*., 1996; Liang and McIntosh, 2000; and Frost *et al*., 2005). In the UK, as noted by Henneberry and Roberts (2008), investor behaviour and the spatial concentration of investment have received little attention, with the exception of Byrne and Lee (2006; 2009; 2010). They find institutional office investment is concentrated in a very few areas, again distinguished by their size and also employment profile (Byrne and Lee, 2006). Conversely, retail holdings are notably more geographically diffuse, but correlate with the urban hierarchy to focus on urban areas with large and dense populations with a greater stock of property (Byrne and Lee, 2009). Institutional investment in the industrial property sector is less dispersed than retail, concentrating traditionally on areas with high levels of manual employment but more recently also on the distributional (logistic) sector, for which location and accessibility is a principal consideration (Byrne and Lee, 2010).

This concentration may be termed herding, but only if the behaviour "cannot be explained by reference to the facts other than the behaviour of the peers" (Forbes, 2009, p. 230). Lizieri (2009, p. 161), looking at London in particular, suggests that herding may occur because the actors making choices to invest in London are based in London and "that spatial prism distorts decision-making processes and can generate herd behaviour". Further, "common belief systems or herd behaviour may cause excess capital to flow into an asset class or market, raising prices above what might be considered the underlying fundamental asset value" (Lizieri, 2009, p. 171). Thus, there is a need to examine "the facts" by exploring the local economic drivers of investment performance, the characteristics of the stock and the geographical patterns of each, relating them to the patterns of investment, as set out in the next sections. For now, it may be that the concentration witnessed in investment can be termed rational herding, whereby herding appears to occur at an aggregate level, but is simply the sum of individual (possibly rational) behaviours (Forbes, 2009).

In the following sections the data that enable a test of this behaviour are assembled and discussed, and a methodology established to enable an examination of the structure of investment patterns against the hypothesis of rational behaviour.

3. Asset classes and market fundamentals

Asset classes

In terms of the total UK direct property market, it was estimated at the end of 2003 (the date of the empirical data utilised in this study) that the capital value of the commercial property market was £611 billion, with 80 percent (£489 billion) in the largest retail, office and industrial sectors (Key and Law, 2005). More than half of the stock in those sectors (£254 billion) is estimated to be held by

investors (a total of 9,611 properties in the office, retail and industrial sectors, IPD, 2005), with the remaining £225 billion held by owner-occupiers. It is impractical to consider assets individually when seeking diversification strategies, requiring investors to group homogeneous assets into asset classes. Each asset class should, by definition, provide different risk and return opportunities for investors and, therefore, capital allocation across classes will vary according to investors' risk utilities (and investment objectives) (Sharpe, 1964). The UK comprises heterogeneous local areas, providing opportunities for private sector investment. Relatively recently, debates about classifying local areas to guide the diversification of property investment (risk) have emerged. These studies have, variously, used investment performance statistics (for example Hamelink *et al*., 2000; Jackson, 2002; and Lee and Byrne, 1998, in the UK, the latter also using local economic fundamentals) and local economic characteristics. In the US similar studies are found in Hartzell *et al.*, 1986, 1987; Malizia and Simons, 1991; Mueller and Ziering, 1992; Mueller, 1993; Goetzmann and Wachter, 1995; and Ziering and Hess, 1995. This work has consistently challenged investors' use of administrative regions (in the UK) and NCREIF or Salomon Brothers areas (in the US) for the diversification of risk, finding local area characteristics and property market fundamentals important for portfolio strategy.

Investment and market fundamentals

Investment returns are the sum of rental return and capital value growth, taking into account capital expenditure and finance, with capital values derived by applying capitalisation rates to net rental levels. Rental levels are, therefore, a crucial input to investment decisions. Capitalisation rates are also a determinant of total returns, and differ according to perceived risk and growth in rental return. As such, they vary in response to local, national, international factors, as well as returns in other asset classes. Rental levels are determined in the user market and are a function of the stock of space and demand for that space, which is in turn a function of rental levels and the economy. A change in the economy leading to, say, an increase in household income, results in an increase in demand for space. Real estate markets "are profoundly influenced by economic conditions such as employment and income, which vary widely across regions of the [a] country" (DiPasquale and Wheaton, 1996, p. 24).

In the office sector, empirical studies exploring rental determinants are, by and large, limited to the regional level or to the City of London market. These tend to resort to either proxy measures of demand, such as GDP or, in the latter case, have the benefit of data that have limited wider spatial availability. However, Jones (1995) highlights problems with the use of GDP as a demand-side proxy and suggests the use of employment data as a more accurate indicator. Orr and Jones (2003) describe Chaplin's (1999) review of time series models of the office sector. They show that output of the financial and business service sector is a common demand variable, with employment in the sector also incorporated. This is complemented by Jones and Orr (1999; 2004), who look at employment in different categories to assess patterns of demand, citing the growth of services, especially financial and business services, as underpinning demand. Service sector employment dominates in the largest cities, following previous periods of deindustrialisation and decentralisation, but key areas of service sector employment expansion are focused on southern smaller, expanding towns (Jones and Orr, 2004). They explore demand-side drivers in local office markets, taking business services employment as a proxy for the demand for office space. Similarly, in their examination of the City of London office market, Wheaton *et al*. (1997) observe that "considerable evidence indicates the primary instrument driving office space demand is employment in selected sectors of an economy". While the relationship between number of employees and amount of space occupied (and, therefore, demanded) is often observed to vary over time, it is considered to be one of the closest proxies for demand for office space for which data exist. Wheaton *et al*. (1997) use employment in their rental adjustment model, while business and financial services employment in the City of London is also used by Hendershott *et al*. (1999).

However, the City of London office market is widely considered to be a distinct asset class in its own right and as such other, atypical factors must underpin its investment returns, such as the importance of international financial markets over and above the domestic economy (Lizieri, 2009).

In the retail sector, Colwell and Jackson (2004) review studies that establish consumer expenditure as the key demand-side local area determinant of retail rental determination (see, for example, Robertson and Jones, 1999; Jackson, 2001; and McGough and Tsolacos, 2001 for studies at the local level). However, they note that the marginal propensity to consume varies over different stages of the economic cycle and that the relationship between income and spending varies spatially. Empirically, they find that the largest centres, with the highest levels of aggregate expenditure, are most responsive to changes in spending levels.

Studies of the industrial sector at the local level are even sparser than those in the retail sector. Jones and Orr (1999) use employment in manufacturing industries as a measure of demand for space. The sector is more diverse than others, with industrial property ranging from specialist heavy industry, requiring a large and specialist workforce, to lighter, often smaller (or more mechanised) industry, with transportation links more important than the local labour market.

4. Data and preliminary analysis

The data in this study relate as closely as possible to the year 2003. Overall, the choice of data was driven principally by the unique availability of a complete IPD (Investment Property Databank) dataset for this particular year (see below for more details). The relative abundance of other relevant data allows a proper context for this main dataset. These other datasets provide social and economic structures within which the real estate investment decisions sit and are drawn from several sources. Although these data are not now strictly current, the ability to place them together enables the relationships between the data to be examined in a way that would not otherwise be possible.

The UK Office of National Statistics (ONS) Area Classification

The characteristics of 432 UK local authorities were analysed by the ONS, to produce a classification of the whole of the UK (ONS, 2003a). The characteristics relate to six broad dimensions: demographic structure, household composition, housing, socioeconomic character, employment and industry sector (the 42 variables comprising these dimensions are presented in Appendix 1). The result is a set of thirteen different groups of local areas, such as 'manufacturing towns' and 'prospering smaller towns'. As such, it provides comprehensive coverage of the UK in terms of the local economic and population characteristics that underpin rental determination.

The methods used by the ONS to develop this classification are similar to those used by others to develop classifications of local property markets. Hierarchical cluster analysis is used to determine cluster groupings/solutions, based on the 42 variables. The metrics used are Ward's method of clustering and the squared Euclidian distance measure, seeking to maximise both within-cluster homogeneity in area characteristics and between-cluster heterogeneity. These metrics replicate those used to cluster local property markets, proxied by Local Authority (LA) areas, in studies by Jackson (2002) and Jackson and White (2005a, b) and, in part, Hamelink *et al*. (2000) who use Ward's method as the amalgamation rule. The method of analysis begins with 432 separate clusters (each comprising one LA area) and ends with one cluster containing all 432 areas. The stages in this amalgamation process can be viewed in the agglomeration schedule and clear breaks were identified by the ONS at the seven, thirteen and twenty-four group stages, subsequently labelled

respectively as Super-groups, Groups and Sub-groups in the resulting classification. As a final stage in determining the membership of these three scales of groups, k-means cluster analysis (k=7 for the super-groups, k=13 for the groups and k=24 for the sub-groups) was performed to ensure optimum placement of each LA (ONS, 2003a). Table 1 presents details of each of the ONS Groups[1].

Table 1 about here

Employment and Population

The ONS Area Classification is not intended for property investment analysis specifically and, as such, the seven variables used by the ONS to capture employment categories (see Appendix 1) do not fully reflect those underpinning the demand for commercial property. In Table 2, additional employment data have been selected to provide further evidence. Employment variables are from the *Nomis Labour Market Profile* Annual Business Inquiry Employee Analysis (ONS 2003b) and are numbers of employee jobs in each category. These are more closely aligned than those identified earlier. For example, 'agriculture and fishing' has been supplemented by 'distribution', while 'health/social work'" has been broadened to 'public admin, education and health'. Population figures are from the ONS *Neighbourhood Statistics: Topics* database (ONS 2003c) and in Table 3 provide a finer breakdown of categories than in the ONS Area Classification, providing additional insights into variations in population (and therefore, earning and spending power). The statistics shown in Tables 2 and 3 show the characteristics of each ONS Group relative to the national average (national average = 1.0).

Tables 2 and 3 about here

Property characteristics

A prerequisite for institutional investment in standing property is for stock to be available and of "investible" quality (Key and Law, 2005). A definition of 'investible quality' has been largely overlooked, an exception being Jackson and Orr (2008) who note empirically investors' primary concerns associated with, in descending order, location, obsolescence, tenant credit-worthiness, review clause and number of tenants. Data capturing these dimensions are unavailable on a large scale, with IPF (2005) using 'value' to proxy 'investibility'. They note that, although around 46 percent of investable stock by capital value is owner-occupied, this amounts to 80 percent of floor space, indicating that, on average, investors prefer high value property.

Comprehensive stock[2] and value[3] data covering England and Wales have been collected by the Valuation Office Agency (VOA); Office of the Deputy Prime Minister (2005). The data for 2003 show that there were 1,295,443 hereditaments in England and Wales made up of 266,022 offices, 562,712 retail units and 466,709 factories and warehouses (industrial). Total commercial floor space in England and Wales in 2003 was 568 million square metres, made up of 81 million square metres of office space, 110 million square metres of retail space and 377 million square metres of industrial stock. Total rateable value in 2003 was £303 billion, £93 billion in offices, £106 billion in retail and £104 billion in industrial property. These data are used to provide evidence of the proportional distribution of total stock (by number of hereditaments and by floor space) and value (rateable value) across the ONS groups; see Table 4.

Table 4 about here

Institutional property investment

The largest collector and provider of institutional investment holdings data in the UK is the Investment Property Databank (IPD). The most comprehensive of their published indices is the Annual Index, with the largest market coverage (IPD, 2011), providing a detailed view of the performance of institutional real estate investment. The published indices normally include all LAs with four or more properties in institutional ownership, because of commercial confidentiality. However, uniquely in this study, the dataset includes all LAs where the number of properties is non-zero, enabling a comprehensive analysis of institutional investment at that point in time.

The data here comprise the IPD universe in Great Britain in 2003 (IPD, 2004, with modifications). This comprises 9,611 properties: 2,904 office, 4,054 retail and 2,653 industrial. Total floor space amounts to 56 million square metres: 12 million square metres of offices, 18 million square metres of retail and 26 million square metres of industrial stock. The estimated total capital value is approximately £95 billion[4]: £30 billion in offices, £49 billion in retail and £16 billion in industrial property (authors' estimate from the full dataset). Thus, the data represent approximately 37 percent of the entire invested stock (using the estimate provided by Key and Law, 2005). Although it is obvious that there are other investors in the market and their involvement might affect the overall picture to some extent, this dataset represents the most comprehensive coverage of institutional investment published to date. Table 5 shows the proportional institutional investment allocations across the ONS groups.

Table 5 about here

5. Analysis: Local economic and property market characteristics

Employment and Population profiles

The employment and populations profiles of local areas, in Tables 2 and 3, show that while there are a number of striking variations, there are also a number of similarities in the profiles of the groups. Indeed, a lack of diversity in employment and population opportunities would indicate a poorly diversified economic base and, thus, a lack of economic stability. This can exacerbate volatility in investment returns (Lizieri, 2009). The clearest examples of diversified (and, thus, not specialised) economies are the Prospering Smaller Towns and New and Growing Towns groups, with profiles that are by the far the closest to the national average, with notably small proportions of their populations not working or long term unemployed.

Conversely, the most specialised profiles are south-east (and southern) locations. The London Centre group has a concentration of finance, IT and other business activities employment more than twice the national average, with consequent concentration of the population working in high professional jobs and, to a lesser (but still marked) extent, in large employer high managerial work and low managerial/professional work. This broad profile is repeated across the Thriving London Periphery, London Suburbs and London Cosmopolitan groups, extending geographically as far as Prospering Southern England. These groups tend therefore, to have markedly lower levels of manufacturing and construction employment and, thus a lower proportion of the population in low supervisory/technical work, semi-routine work and routine employment. Some distinguishing elements are evident, the most marked being that the London Cosmopolitan group is predominantly characterised by a population that has not worked, is long term unemployed and has almost 50 percent more students than the national average, proportionally.

Other distinguishing employment profiles are, for the Industrial Hinterlands and Manufacturing Towns groups, above average concentrations of manufacturing employment (approaching 50 percent greater than the national average), at the expense of finance employment and tourism. Centres with Industry are distinguished by a concentration of manufacturing employment, but not particularly at the expense of finance, with tourism and construction employment notably below the national average. The populations in these three groups are found predominantly in low supervisory/technical work, semi-routine work and routine employment.

Finally, summarising from the perspective of variation in employment category, location; employment in finance, IT and other business activities, and manufacturing have by far the highest variations across the ONS groups, the former being concentrated in the various London and south-eastern groups (followed by Regional Centres) and the latter in the various geographically diffuse industrial and manufacturing groups (followed by Prospering Smaller Towns). By comparison, distribution has negligible variation, while tourism is clearly concentrated in the Coastal and Countryside group.

Property market characteristics

In Table 4, the clearest variation in the data is that Prospering Smaller Towns contain by far the largest number (greatest proportion) of units in each property sector (19 percent of office units, 22.3 percent of retail units and 25.6 percent of industrial units). This is not unexpected given that the group also contains a quarter of the UK population (ONS, 2003a and Table 1). It is pertinent to examine the data further, analysing the relative size and value of the units (the relative size indicated by the relationship between the number of hereditaments and the total floor space; the relative value taken as the relationship between the total floor space and total value and expressed in terms of pounds per square metre, £psm). Thus, in the Prospering Smaller Towns group the size and value of retail and industrial units are close to the national average but, in the office sector, units are smaller and of disproportionally lower value. Repeating this analysis for the other eleven groups reveals the following property characteristics.

Mirroring the south-east focus discussed in the previous section, the highest value units (both £psm and per hereditament) in the office and retail sectors are found in the London Centre (note: 40.7 percent of UK office value is in the London Centre group, but only 15.2 percent of stock by number and 20.4 percent by floor space), although the retail units are smaller than average while the office units are larger. The next highest value retail stock is in the Thriving London Periphery and Suburbs groups, although the size of the units in the Suburbs is below average. In the office sector, the extreme high values in the London Centre group overwhelm all of the rest to the extent that only stock in Thriving London Suburbs and Prospering Southern England is marginally above national average levels.

The highest value industrial units are in the Thriving London Periphery group, at almost double the national average, followed by the London Suburbs and London Centre, although there is limited stock in these two groups, as would be expected given spatial constraints. The largest industrial properties are found in the Industrial Hinterlands and Manufacturing Towns; containing 16.5 percent of the UK stock between them, although these are among the lowest value. A further 13.6 percent of industrial stock is in the Centres with Industry group, with slightly larger than average units, but lower value.

Institutional investment patterns

Table 5 shows the distribution of institutional investment across the ONS clusters. Given the geographical variations in economic profiles, as drivers of derived-demand underpinning investment returns, and the variations in stock profiles seen in the context of the requirement of institutions for high value property, institutional investment would not be expected to be evenly spread. It is therefore as expected that, for example, the highest allocation by both number and value (16.9 percent and 20.9 percent respectively) is in the London Centre group, given the high value and large size of (office) stock and the high aggregate earning power of the population. Similarly, the highest allocation by floor space is in the Prospering Smaller Towns group which, as established above, contains the greatest proportion of the total stock of property.

This is explored by the use of location quotients (LQs), set out in Table 6. These are standardised measures; a value of 1.0 indicates investment allocation proportional to the measure of interest, a value greater than 1.0 suggests over-representation and a value less than 1.0 suggests relative under-representation.

The LQs are calculated using equation (1), following Isard *et al*., (1960):

$$LQ = \frac{x_i/x}{X_i/X} \qquad (1)$$

Where:

x_i = value of variable in 'location' *i*
x = Total value of variable
X_i = Reference value of variable in location *i*
X = Total reference value of variable

Table 6 shows LQs that consider stock characteristics: first, institutional holdings (as the numerator) relative to the total stock of property (as the denominator) (NLQ) and, secondly, relating to value, the IPD capital value (as the numerator) relative to the rateable value as a proxy for capital value (as the denominator) (CVLQ).[5] The third LQ provides an assessment of institutional capital allocation relative to the underlying demand-side employment driver(s), as discussed above, with capital value (as the numerator) relative to relevant sectoral employment (as the denominator) (ELQ).

Table 6 about here

Table 6 shows that institutional investors tend to 'over-invest' proportionally (LQ>1.0) with a geographical bias; in the London Centre, London Suburbs, Thriving London Periphery, Prospering Southern England and New and Growing Towns, as well as Regional Centres. By sector, investment in offices is heavily focused on just two groups, with considerable over-investment in the London Centre and Thriving London Periphery groups, with more modest over-investment in the Prospering Southern England group, repeating the geographical bias seen above, but with a finer focus. Retail and industrial investment is a little more geographically diverse, as noted by Byrne and Lee (2009; 2010) but still with a tendency towards a southern preference. For example, there is over-investment in retail in the Thriving London Periphery, London Centre, London Suburbs, New and Growing Towns as well as Regional Centres. In the industrial sector, investment is proportionally focused in the London Suburbs, Thriving London Periphery, Prospering Southern England and New and Growing Towns groups.

While these six groups together contain just over a third of all stock in the UK (36.5 percent by number) (Table 4), institutional investors choose to allocate almost two-thirds of their investment to these groups (63.4 percent by number) (Table 5). Where over-investment is seen in each sector, the characteristics of the stock are above average size and/or value, providing the high grade stock required, albeit with marked variations. The employment profile in these groups is biased towards

transport and communications and/or finance, IT and other business activities sectors (Table 2). The employment profile in each group is also clearly orientated to the categories, on the left-hand side of Table 3, giving the greatest earning potential (with the exception of the Regional Centres). The profile of the New and Growing Towns group is a notable exception, with a far broader population base and the second lowest variation from the national average across all sectors. Generally, however, these characteristics indicate a population with high earning (and spending) power, underpinning user demand for property and, in turn, investor demand.

In terms of proportional 'under-investment', the data do reveal a lack of the investible property most often required by institutions, with stock tending to be of low value and/or small. This is evident in the Centres with Industry, Industrial Hinterlands and Manufacturing Towns and the Coastal and Countryside group, largely the inverse of the geographical patterns evident thus far. One statistic stands out, the ELQ for Centres with Industry is markedly higher than for the other comparable (industrial/manufacturing) ONS groups. This group consists of built up areas in or near Manchester and Birmingham (ONS, 2003a), the largest cities in England outside London. This locational concentration brings agglomeration economies, contrasting with the comparable Industrial Hinterlands and Manufacturing Towns groups. On their own these two groups form an ONS Super Group (Mining and Manufacturing), with the constituent LAs described by the ONS (2003) as being located throughout the UK, including in isolated areas, as well as broad established industrial areas (such as north-east England, southern Wales and southern Yorkshire) rather than more tightly focused on the main cities in those areas.

Some further disparities in relative investment are evident. For example, it was noted above that Prospering Smaller Towns contain most stock across all sectors (see Table 4) and that stock in the retail and industrial sectors is largely in line with national averages in terms of unit size and value (the size and value of the office stock is notably below average). However, while this group does attract the highest institutional investment allocation by floor space (Table 5), proportional under-investment is clearly evident (Table 6). The reasons for this are not clear. It may be that institutions prefer a more specialised employment and population base (Tables 2 and 3 establish the group as the most diverse in terms of these characteristics). Additionally, it may be that locational bias is evident, as in the industrial groups, above, with the ONS (2003a) highlighting the fact that the local authorities in the Prospering Smaller Towns group are spread across the UK, with concentration of locations in the middle of England. This is likely to result in higher research, data and asset management costs for investing institutions.

Tables 7a and 7b broaden the evidence base from the user market to the investor market. Investment total returns are shown in Table 7a. Mean total returns are presented for 2003, and annualised returns for the preceding three, five and ten year periods. Table 7b shows variation in total returns and annualised standard deviations for the three, five and ten year periods prior to 2003.

Table 7a about here

Whereas it might be expected that investors would favour markets showing high rates of return, the opposite is seen. Over-investment is found in all sectors in the Thriving London Periphery group, but the mean returns shown in Table 7a are most often lower-quartile, and never above average. By sector, over-investment in the office sector is dominated by the London Centre, but Table 7a shows lower-quartile returns in the two most recent periods of measurement, below average annualised returns over five years, with only upper-quartile returns over the longer term annualised 10 year measure. In the retail sector, over-investment is identified in the Regional Centres (Table 7a shows lower-quartile returns most often and never above average), London Suburbs (inter-quartile returns

across each period of measurement) and New and Growing Towns (most often inter-quartile (and below average) returns, with upper-quartile returns over the 10 year annualised period). Finally, in the industrial sector, over-investment is identified in the London Suburbs (Table 7a shows always inter-quartile returns), New and Growing Towns (always lower-quartile returns) and Prospering Southern England (always below average returns and lower-quartile half of the time).

Table 7b presents standard deviations, providing an assessment of the historic range of returns achieved. Investors' strategies regarding risk vary, although institutions generally favour low risk. As above, focusing on those areas where investors show aggregate patterns of over-investment, standard deviations in returns are most often above average or most risky (upper-quartile) in the office sector. In the retail and industrial sectors the results are more variable.

Table 7b about here

Why then would investors seem to target markets where neither the user market (assessed by stock and economic characteristics) nor investor market (assessed by investment returns) would seem to support such a strategy? This is especially puzzling given the results of Jackson and Orr (2008), who found that investors believe securing investments with high expected returns is most important.

6. Conclusions and consequences

This paper seeks to test the hypothesis that investment decision-making in the direct property market does not conform to the assumption of economic rationality underpinning portfolio theory. While such assumptions are grounded in traditional economic ideas of efficiency and rationality (Lizieri, 2009), evidence is considered which suggests that the direct property market is not efficient. It explores observed institutional investor behaviour in that context. Ideas from the developing behavioural real estate literature, sharing common ground with other behavioural fields, are used to challenge the idea that investor 'man' performs with economic rationality.

Local economic characteristics, namely population and employment profiles, are used as drivers of demand in the user market. Variations in these characteristics are captured using the ONS Local Area Classification (ONS, 2003a) with additional supplementary data for property sector-specific demand-side factors. The entire stock of property in the core retail, office and industrial sectors, from the VOA, provides details of the geographical spread of property, by number, value and size. These data provide the context for an analysis of the geographical spread of aggregate institutional property investment using a unique IPD dataset.

Considerable variation in institutional property holdings is found across diverse areas of the UK. While variation is likely, given the economic and stock characteristics of local areas, the variations are more pronounced than would be expected. The apparent disconnect between market fundamentals and observed aggregate institutional investment holdings is further evidenced through an analysis of performance indicators in the investor market, which appear to suggest that investors largely target funds towards areas showing the poorest levels of (historic) performance.

Over-concentration of investment is most pronounced in the office sector, in the London Centre group, with a wider but still pronounced south-eastern geographical bias across all sectors. This mirrors Lizieri's (2009) exploration of the office sector in international financial cities, such as central London, where he notes that high institutional investment weightings are found in sectors that do not warrant that scale of investment based on analysis of risk and return profiles. He finds that

historic evidence "sit[s] uneasily with observed holdings ... [that are] hard to justify" (p. 181) and questions whether investor expectations are empirically grounded (p. 181).

This appears to provide evidence of irrationality (in the strict traditional economic sense) in the behaviour of institutional investors, with apparent herding producing levels of investment that cannot be explained by reference to the underlying market characteristics. This infers that the concentration in investment holdings can, alternatively, be explained by reference to the behaviour of peers (Forbes, 2009). This can be explained; it is suggested, as a consequence of benchmarking. Indeed, "'if collectively they [institutions comprising the benchmark] have a prejudice against a certain region there will be a very low exposure. The amount by which you might be prepared to take a positive position relative to that benchmark might constrain levels of investment there'" (a respondent quoted in Guy *et al*., 2002, pp. 1186-1187).

In the UK, the principal benchmark is that provided by IPD (either the IPD Universe or a client customised benchmark). The benchmark(s) are comprised of actual institutional investment holdings, and produce a circular system of self-reference, with institutions seeking to (largely) mirror holdings of other institutions and themselves, at an aggregate level. While the most common investment strategy is to out-perform the IPD benchmark (Mitchell, 2010), this will be within explicitly defined boundaries, with defined maximum levels of risk tolerance and limited tracking error.

The decision paradigm of Diaz and Hansz (2007) provides a framework which supports acceptance of the hypothesis that investment decision-making in the direct property market does not conform to the assumption of economic rationality underpinning portfolio theory, within the context and data boundaries set out above. Rather, an 'operational rationality' (Guy *et al*., 2002) dominates. Decisions are framed by "a process of social construction" (Guy and Henneberry, 2000), linked to an adherence to self-referential benchmarking. Thus, these results from the UK direct property market indicate that a reconsideration of the 'simple' economic rationality of portfolio theory may be required to better reflect the complexities of reality.

Turning to practice implications, Henneberry (1999) explores the pricing mechanisms in the investor market, where capitalisation rates are applied to rental levels to derive capital values. He finds evidence in the office market that, while rental levels respond to local factors at different times across regional markets, with rental peaks in diverse regions occurring later than in central (London) markets, the resulting divergence in capital value cycles is dampened by what might be likened to a relatively homogeneous overlying capitalisation rate blanket. The flattening of the capital value cycle in regional markets reduces the opportunities for profit in the development sector disproportionally (Henneberry, 1999). It seems that investors respond predominantly to inter/national (and capital market) factors in their assessment of future risk and growth, with capitalisation rates rising (and capital values falling) far in advance of local rental signals in regional markets. This disconnect between the investor and user markets may suggest anchoring in capitalisation rate determination, given the dominance of London-based investing institutions; an area as yet not investigated in any depth. It also resonates with Lizieri's (2009) "spatial prism" and the comforting importance of market familiarity in investors' decisions found by Guy *et al*. (2002).

In addition to the effect of capitalisation rate determination on local property development, the availability of development finance is also uneven across the regions (Henneberry, 1999). As Jones and Orr (2004, p. 291) note, "it appears that the [office sector] development industry is more responsive in certain areas, notably the South East and East". The consequent low level of 'investible' quality property developed across regional markets deters institutional investment, further dampening capital value levels. These patterns of investment are now being questioned

outside the industry itself (Sarling, Swinney and Coupar, 2012). The inherent conservatism of investors (risk averseness) is the natural driver for their decision making. Their tendency to avoid locations where the benchmarks do not 'perform' is in that sense predictable and understandable, but there seems little incentive or motivation to seek price or performance information for investments in those 'marginal' areas, even if their fundamental performance in yield terms is sometimes quite adequate (see for example Byrne and Lee, 2006, 2009, 2010). What those papers and this work offer are prospective ways for searching for these otherwise marginal locations which may offer opportunities for rational investment, and also showing those places where the market fundamentals do not of themselves suggest substantial investment should be occurring.

There are several aspects of this study that suggest further work. The data used in this study (from 2003) present a snapshot of investment as it was when investors were beginning to ride the wave of perhaps injudicious optimism that characterised that period, well before the recent substantially negative changes in both the national and real estate economies. It can be strongly argued that in the current environment recourse to market fundamentals is even more important. Structural changes occur continuously in national and local economies, and although generally slow, the rates of change vary over time and scales (see Fiorilla *et al.*, (2010) for recent evidence of this in the US). Repeat studies that mirror and extend this and other work done in the US should prove important in sustaining or modifying this paper's central hypothesis.

Further work is also clearly needed to investigate capitalisation rate determination in the investment market, given its apparent impact on local property development and, in turn, economic development. Over time a lack of distinction has developed between the cause and effect of comparatively low levels of development and institutional property investment across the UK. It might be that a critical examination of decision-making and behaviour in practice could break this cycle.

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Appendix 1 Variables underpinning ONS Local Area Classification

Demographic structure	
Age	*percentage of resident population aged 0-4*
	percentage of resident population aged 5-14
	percentage of resident population aged 25-44
	percentage of resident population aged 45-64
Ethnicity	*percentage of people identifying as Indian, Pakistani or Bangladeshi or Other Asian*
	percentage of people identifying as Black African, Black Caribbean or Other Black
Country of Birth	*percentage of people not born in the UK*
Population Density	*number of people per hectare*
Household Composition	
Living Arrangements	*percent of residents over 16 who are not living in a couple and are separated, widowed, divorced, married or re-married*
Size/Family	*percentage of households with one person who is not a pensioner*
	percentage of households which are single pensioner households
	percentage of households which are lone parent households with dependent children
	percentage of households which are cohabiting couple households with no children
Housing	
Tenure	*percent of households that are public sector rented accommodation*
	percent of households that are private/other rented accommodation
Type and size	*percent of all household spaces which are terraced*
	percent of all household spaces which are detached
	percent of all household spaces which are purpose built, converted and communal building flats
Quality/crowding	*percent of occupied household spaces without central heating*
	average number of rooms per household
	average number of people per room
Socio-Economic characteristics	
Education	*percent of people aged between 16 - 74 with a higher education qualification*
Socio-economic class	*percent of people aged 16-74 in employment working in professional or managerial occupations*
	percent of people aged 16-74 in employment working in routine or semi-routine occupations
Ownership/commuting	*percent of households with 2 or more cars*
	percent of people aged 16-74 in employment who usually travel to work by public transport

	percent of people aged 16-74 in employment who work mainly from home
Health and Care	*percentage of working age population with limiting long term illness*
	percent of people who provide unpaid care

Employment

percent of people aged 16-74 who are students
percent of economically active people aged 16-74 who are unemployed
percentage of the unemployed who are long-term unemployed
percentage of male employees aged 16-74 who work part time
percentage of women aged 16-74 who are looking after the home or family
percentage of female employees aged 16-74 who work part time

Industry Sector

percent of all people aged 16-74 in employment working in agriculture and fishing
percent of all people aged 16-74 in employment working in mining, quarrying and construction
percent of all people aged 16-74 in employment working in manufacturing
percent of all people aged 16-74 in employment working in hotel and catering
percent of all people aged 16-74 in employment working in health and social work
percent of all people aged 16-74 in employment working in financial intermediation
percent of all people aged 16-74 in employment working in wholesale/retail trade

Table 1: The Socio-Economic Clusters of England and Wales

ONS Cluster Name	Locations	Pop %	No. of LAs	Exemplar
Regional Centres	Built-up areas throughout England & Wales	9%	20	Plymouth
Centres with Industry	North West and West Midlands	11%	21	Bolton
Thriving London Periphery	London Periphery + Oxford and Cambridge	3%	9	Reading
London Suburbs	Outer London + Slough and Luton	5%	12	Redbridge
London Centre	Inner London	3%	8	Islington
London Cosmopolitan	Inner London, Except Brent	3%	7	Haringey
Prospering Smaller Towns	Throughout England &Wales	24%	113	Stroud
New and Growing Towns	Southern England	6%	24	Dartford
Prospering Southern England	Home Counties	9%	44	Horsham
Coastal and Countryside	Coastal E & W + some inland areas	9%	52	Christchurch
Industrial Hinterlands	South Wales and Northern England	9%	31	Sunderland
Manufacturing Towns	Southern Yorkshire + isolated locations	9%	34	Ellesmere Port

Source: ONS (2003)

Table 2: Group Employment Profile

	% of LA population in employment category							
Local Area Groups	Manufacturing	Construction	Tourism	Distribution	Transport & Communications	Finance, IT, Other Business Activities	Public Admin, Education & Health	Other
Regional Centres	0.63	0.80	0.92	0.97	0.89	1.16	1.22	0.99
Centres with Industry	1.38	0.86	0.83	0.92	1.01	0.91	1.03	0.89
Thriving London Periphery	0.44	0.89	0.91	1.00	1.51	1.30	1.08	0.86
London Suburbs	0.58	1.02	0.84	1.00	1.37	1.29	0.99	1.09
London Centre	0.34	0.40	1.12	0.77	1.08	2.23	0.74	1.55
London Cosmopolitan	0.49	0.78	0.79	0.88	1.36	1.38	1.15	1.22
Prospering Smaller Towns	1.11	1.09	1.00	1.02	1.00	0.89	0.98	0.98
New and Growing Towns	0.83	0.95	0.86	1.09	1.31	1.21	0.87	0.95
Prospering Southern England	0.70	1.01	1.01	0.99	0.93	1.49	0.83	1.18
Coastal and Countryside	0.86	0.98	1.43	1.13	0.74	0.67	1.09	0.99
Industrial Hinterlands	1.44	1.00	0.81	0.87	0.88	0.72	1.17	0.94
Manufacturing Towns	1.48	1.16	0.86	0.97	1.06	0.75	0.96	0.85

Source: Calculated from ONS (2003a,b)

Table 3: Group Population Profile

	% of LA population in population category											
Local Area Groups	Large Employer High Managerial work	High Professional work	Low Managerial/ Professional work	Large Intermediate Employers	Small Employer or Own Business	Low Supervisory/Technical work	Semi-Routine work	Routine employment	Not Worked	Long-term Unemployed	Students population	Not Classified
Regional Centres	0.77	1.00	0.95	1.04	0.80	0.94	1.00	0.96	1.14	1.19	1.55	0.99
Centres with Industry	0.72	0.73	0.82	0.93	0.84	1.03	1.10	1.26	1.92	1.40	1.23	1.01
Thriving London Periphery	1.35	1.77	1.20	1.12	0.84	0.72	0.75	0.62	0.88	0.75	1.84	0.73
London Suburbs	1.22	1.35	1.11	1.17	0.90	0.84	0.87	0.76	1.47	1.00	1.16	0.86
London Centre	1.79	2.40	1.28	0.81	0.78	0.51	0.60	0.52	2.17	1.49	1.54	0.71
London Cosmopolitan	0.91	1.16	1.03	1.07	0.71	0.85	0.94	0.87	2.39	1.90	1.48	0.81
Prospering Smaller Towns	1.09	1.02	1.04	1.01	1.07	1.02	1.00	0.98	0.75	0.77	0.92	0.98
New and Growing Towns	1.02	0.94	1.02	1.16	0.94	1.09	1.08	1.08	0.82	0.89	0.83	0.89
Prospering Southern England	1.54	1.42	1.20	1.13	1.05	0.85	0.82	0.73	0.72	0.62	0.92	0.88
Coastal and Countryside	0.66	0.73	0.89	0.84	1.35	1.04	1.07	1.01	0.83	1.09	0.84	1.19
Industrial Hinterlands	0.69	0.64	0.83	0.95	0.73	1.12	1.10	1.23	1.33	1.51	0.88	1.21
Manufacturing Towns	0.80	0.68	0.88	0.95	0.80	1.17	1.13	1.30	0.98	1.16	0.91	1.07

Source: Calculated from ONS (2003a,c)

Table 4: Distribution of total UK stock and value across ONS Areas (2003)

	Total			Office			Retail			Industrial		
Group Name	**HC%**	**HRV%**	**HFS%**	**HC%**	**HRV%**	**HFS%**	**HC%**	**HRV%**	**HFS%**	**HC%**	**HRV%**	**HFS%**
Regional Centres	9.9	9.1	9.4	10.8	8.0	12.1	10.6	11.3	11.6	8.4	7.7	8.2
Centres with Industry	12.0	9.8	13.9	11.0	6.8	10.3	11.3	9.7	11.1	13.6	12.7	15.5
Thriving London Periphery	2.7	4.3	2.4	3.6	5.0	4.3	3.1	4.5	3.3	1.6	3.5	1.8
London Suburbs	3.5	4.2	2.9	4.5	4.7	4.9	3.7	4.0	3.3	2.8	4.0	2.4
London Centre	6.3	16.9	4.6	15.2	40.7	20.4	5.1	10.7	4.6	2.6	2.1	1.2
London Cosmopolitan	2.0	2.7	2.2	2.9	2.8	3.2	3.1	2.3	2.3	2.7	2.9	2.0
Prospering Smaller Towns	22.8	19.1	23.7	19.0	9.4	14.4	22.3	21.3	22.6	25.6	25.6	26.0
New and Growing Towns	5.3	6.9	6.9	5.2	5.2	6.5	5.0	6.9	6.4	5.8	8.3	7.1
Prospering Southern England	8.8	9.4	7.6	10.7	12.1	11.1	7.7	7.4	7.4	9.0	9.2	7.0
Coastal and Countryside	10.3	5.4	7.7	5.9	1.3	3.5	11.4	7.9	10.2	11.4	6.6	7.8
Industrial Hinterlands	7.9	5.9	9.3	5.6	2.2	5.4	8.8	7.3	9.1	8.0	7.8	10.1
Manufacturing Towns	7.6	6.3	9.4	5.7	1.9	4.0	7.7	6.7	8.1	8.5	9.7	10.9

Source: calculated from ONS (2003) and ODPM (2005)
Note: HC is number of hereditaments, HRV is hereditament Rateable Value, HFS is hereditament floor-space.

Table 5: Distribution of institutional investment across ONS Areas (2003)

	Total			Office			Retail			Industrial		
Group Name	**Num %**	**CV %**	**FS %**	**Num %**	**CV %**	**FS %**	**Num %**	**CV %**	**FS %**	**Num %**	**CV %**	**FS %**
Regional Centres	12.4	11.0	12.8	7.9	5.2	8.6	16.3	15.3	17.7	11.5	8.7	11.4
Centres with Industry	10.0	10.8	12.8	7.2	6.2	8.5	11.0	13.3	15.0	11.5	11.7	13.5
Thriving London Periphery	7.5	8.9	7.1	8.8	10.0	10.9	7.9	8.4	6.7	5.5	8.4	5.5
London Suburbs	6.2	7.3	7.0	4.9	4.6	5.0	5.8	7.3	5.8	8.3	12.0	8.8
London Centre	16.9	20.9	10.6	39.0	50.3	37.7	10.5	9.1	4.2	2.4	2.1	1.5
London Cosmopolitan	2.0	1.8	2.1	2.1	1.6	1.7	1.6	1.6	1.6	2.5	3.0	2.7
Prospering Smaller Towns	14.1	10.9	14.7	7.2	4.9	6.7	16.7	12.7	15.0	17.8	16.4	18.6
New and Growing Towns	9.2	11.4	12.7	6.5	4.9	6.8	6.8	13.4	12.6	15.7	17.1	15.7
Prospering Southern England	11.2	9.1	9.4	14.7	11.7	12.6	8.1	6.3	6.2	11.9	12.6	10.0
Coastal and Countryside	2.7	1.7	1.9	0.2	0.0	0.1	5.6	3.1	3.9	0.9	0.5	1.3
Industrial Hinterlands	3.8	3.7	4.2	1.1	0.5	1.2	4.9	6.1	6.5	5.0	2.4	4.1
Manufacturing Towns	4.0	2.7	4.7	0.4	0.1	0.2	4.7	3.4	4.7	6.9	5.1	7.0

Source: calculated from ONS (2003) and IPD (2004)

Note: Num. is the number of properties; CV is the estimated capital value (£ million) and FS is Floorspace

Table 6: Location Quotients

	Office			Retail			Industrial		
Group Name	**NLQ**	**CVLQ**	**ELQ**	**NLQ**	**CVLQ**	**ELQ**	**NLQ**	**CVLQ**	**ELQ**
Regional Centres	0.52	0.31	0.55	1.76	1.42	1.43	0.90	0.65	0.63
Centres with Industry	0.35	0.26	0.23	0.85	0.82	0.82	0.86	0.79	0.73
Thriving London Periphery	2.64	2.89	2.65	2.55	2.67	2.67	1.54	2.17	2.00
London Suburbs	1.10	0.98	0.90	1.34	1.59	1.59	1.76	2.62	2.41
London Centre	3.51	4.96	4.55	1.21	0.93	0.93	0.49	0.50	0.46
London Cosmopolitan	0.63	0.47	0.43	0.68	0.75	0.75	0.99	1.16	1.07
Prospering Smaller Towns	0.22	0.14	0.13	0.58	0.39	0.42	0.72	0.69	0.65
New and Growing Towns	0.87	0.68	0.62	1.05	2.07	2.01	2.19	2.52	2.32
Prospering Southern England	1.60	1.26	1.15	0.74	0.58	0.62	1.25	1.40	1.29
Coastal and Countryside	0.05	0.01	0.01	0.64	0.27	0.37	0.13	0.06	0.07
Industrial Hinterlands	0.12	0.05	0.05	0.60	0.59	0.59	0.78	0.30	0.43
Manufacturing Towns	0.05	0.01	0.01	0.60	0.51	0.44	0.87	0.67	0.72

Table 7a: Mean returns

	Total				Office				Retail				Industrial			
		Annualised over the last:				*Annualised over the last:*				*Annualised over the last:*				*Annualised over the last:*		
Group Name	2003	3 yrs	5yrs	10 yrs	2003	3 yrs	5yrs	10 yrs	2003	3 yrs	5yrs	10 yrs	2003	3 yrs	5yrs	10 yrs
Regional Centres	13.88	10.92	10.97	9.88	9.77	10.20	10.97	8.63	15.28	14.24	10.36	11.00	12.99	12.31	12.45	11.54
Centres with Industry	14.46	10.49	10.47	10.40	11.93	12.00	11.09	9.28	16.12	15.70	11.06	12.13	12.60	11.70	10.90	10.77
Thriving London Periphery	10.13	8.63	10.21	9.65	3.05	3.08	7.56	8.68	14.54	14.65	11.07	11.45	9.85	9.88	12.31	11.76
London Suburbs	12.18	10.81	12.61	11.62	1.61	1.88	7.60	7.98	15.61	15.72	12.21	12.24	10.76	10.75	13.35	13.06
London Centre	9.84	9.43	12.08	11.91	1.11	0.98	8.81	10.06	11.32	11.18	9.89	12.14	16.76	16.66	16.50	15.03
London Cosmopolitan	13.95	13.17	15.90	13.79	3.25	3.45	13.30	11.63	20.18	20.46	17.09	14.35	14.48	14.01	15.28	13.89
Prospering Smaller Towns	13.00	10.65	10.38	9.74	10.23	10.12	10.00	8.87	14.91	15.45	12.45	11.06	10.59	10.74	10.87	10.50
New and Growing Towns	12.04	10.24	11.14	10.15	4.46	4.53	8.39	9.10	16.22	15.19	11.40	12.35	9.88	10.08	11.78	10.90
Prospering Southern England	8.11	7.89	10.32	10.22	1.98	2.63	7.48	8.68	16.48	16.76	12.06	10.17	9.55	9.55	12.25	11.93
Coastal and Countryside	17.09	11.75	10.14	9.17	9.91	12.85	11.76	9.23	19.36	18.67	12.37	11.07	14.84	12.50	13.56	13.19
Industrial Hinterlands	15.61	12.61	11.90	11.30	8.78	9.33	11.50	10.73	17.54	16.49	12.01	13.25	12.95	12.75	11.82	11.27
Manufacturing Towns	12.80	10.96	11.49	10.62	12.25	11.65	9.64	8.59	17.97	17.04	12.03	11.58	12.02	11.96	11.84	11.27

Source: calculated from ONS (2003a) and IPD (2004)

Table 7b: Standard deviations

	Total			Office			Retail			Industrial		
	Annualised over the last:			*Annualised over the last:*			*Annualised over the last:*			*Annualised over the last:*		
Group Name	3 yrs	5 yrs	10 yrs	3 yrs	5 yrs	10 yrs	3 yrs	5 yrs	10 yrs	3 yrs	5 yrs	10 yrs
Regional Centres	5.31	5.64	5.79	1.27	1.94	3.92	5.80	5.13	5.16	1.45	2.09	3.40
Centres with Industry	4.75	4.97	5.69	1.76	2.09	3.78	5.91	5.08	4.98	2.14	2.34	3.54
Thriving London Periphery	5.54	6.14	5.91	0.42	6.46	5.61	5.45	5.36	4.96	1.66	5.07	4.93
London Suburbs	5.69	6.38	6.65	1.33	6.72	6.54	4.38	4.50	4.68	1.76	5.46	5.80
London Centre	6.97	7.21	7.08	4.45	8.22	6.48	2.95	2.24	5.38	4.06	4.22	5.08
London Cosmopolitan	7.09	8.06	8.07	7.31	9.35	7.33	5.26	4.28	6.58	2.97	4.92	5.84
Prospering Smaller Towns	4.57	5.14	5.43	1.20	1.50	2.98	4.70	4.40	4.53	1.53	1.90	3.48
New and Growing Towns	4.44	5.16	5.58	0.11	5.32	5.58	5.15	4.20	4.30	1.25	3.50	4.36
Prospering Southern England	5.03	6.03	6.16	1.36	5.61	5.15	5.88	5.26	5.18	1.15	4.94	5.08
Coastal and Countryside	6.12	6.93	6.40	4.42	5.09	4.96	6.31	6.26	5.31	3.65	4.74	5.64
Industrial Hinterlands	5.78	5.86	5.42	1.45	3.89	3.99	5.90	5.03	4.97	1.80	1.56	2.49
Manufacturing Towns	4.59	5.04	5.15	5.51	4.87	4.76	5.67	5.05	4.42	2.07	2.70	3.15

Source: calculated from ONS (2003a) and IPD (2004)

NOTES

[1] The Northern Ireland Countryside group is not shown as it is excluded from subsequent analysis due to lack of institutional investment, rendering meaningful analysis impossible.

[2] Stock data analysed here relate to number and total size of hereditaments. A hereditament is an identifiably separate unit, defined to provide the base for taxation through the rating system.

[3] Value data relate to the rateable value of a property, an assessment of the current open market rent of the property, on standardised lease terms.

[4] Key and Law (2005) estimate that, at the end of 2003 (the date of annual valuation of standing stock), IPD covered a total of £128 billion of [all] property investment, accounting for properties with non-December valuation dates. This would give coverage by the IPD Universe in the region of 50 per cent of invested stock at that time.

[5] It should be noted that value measures differ for the total stock (rental values are shown) and institutional investment (capital values are shown). Rental values could be considered as a static assessment of demand at the date of valuation, whereas capital values incorporate an assessment of future rental (and risk) prospects within the capitalisation rate. While both rental levels and capital values are generally observed to be higher in London and south-eastern areas, the effect of lower capitalisation rates in these areas will result in an exaggeration of the resultant CVLQs.