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Introduction

A growing literature has provided many and novel insights into the nature and workings of financialisation. However, it has also been subject to considerable criticism for its tendencies to a-historicism and meso-analysis, its conceptual overreach, its limited empirical base and its failure to link adequately the everyday world with the world of high finance (Christophers, 2012; French *et al*, 2011; Froud *et al*, 2006; Hall, 2013; Pike & Pollard, 2012). We are applied economists engaged in the interstice between these worlds and many accounts of what goes on there lack detailed substance. One significant exception to this is evolving work on the calculative technologies and practices of finance capital, originally associated with the critical social accountancy school (French *et al*, 2011). Its conceptual framework, established by Callon, Miller and others, focuses on the institutional activities and arrangements that underpin markets.

In order to make goods tradable, their properties must be stabilised and singularised: they must become defined, distinct objects and, consequently, calculable ones. The work of qualifying and quantifying goods is shared between suppliers and consumers who develop mutual understandings within market settings (Callon & Muniesa, 2005). Many different processes, such as design, production, marketing and purchasing, support these relations. In turn, these processes embody calculations of various forms (for example, performance metrics, market analysis, valuation) (Araujo, 2007). The assemblages of people, organisations, theories, technologies, tools, beliefs

and so on that undertake and apply these calculations make up competing agencements (Callon, 2007) or financial ecologies (French *et al*, 2011) that shape and are shaped by markets (Mackenzie, 2003).

It follows that "... different types of markets will differ in the specific configurations of calculative agencies mobilized and the distribution of power amongst these agencies." (Araujo, 2007, p. 221). Some markets have powerful actors on the supply side vying for influence (for example, retailers and manufacturers in consumer sectors), while in business markets demand side actors are better equipped to promote their calculative practices (Araujo, 2007). Whatever the setting, actors format markets through their combined efforts and markets' particular institutional structures become established. In support of this formatting process "...counting, control and calculation ... [have] ... evolved into highly institutionalized forms (Araujo, 2007: pp216-217; citing Callon *et al*, 2002; Miller, 2001; Power, 2004). The status of these forms reinforces existing, dominant calculative practices, the calculative agencies that deploy them and the markets within which they operate. However, extant forms of qualification, quantification and calculation are always open to challenge from new forms that may re-format markets.

The above work in critical social accountancy is empirically grounded but largely ignores space (French *et al*, 2011). Nor does it engage with the urban built environment. As Lovell & Smith (2010) note, the existing literature "... is concerned mainly with teasing out the social and material content of [...] abstract, virtual, financial, markets ..." (ibid, p457) and has largely failed to deal with one of the most material of markets, housing. The same holds for the commercial property market.

Some work has demonstrated how, once established and dominant, specific calculative practices have traction on urban form by 'locking-in' particular means of investing in or producing the built environment (Henneberry & Roberts, 2008; Lovell & Smith, 2010). Other work has revealed the selectivity and unevenness of financial geographies from global to local levels and their implications for urban development (for example, Aalbers, 2009; David & Halbert, 2014; Dorry, 2011; Gotham, 2009; Halbert & Rouanet, 2014). However, such accounts do not engage with the detail of monetary calculations or with how the calculations may affect their subjects - land and buildings. Consequently, they cannot demonstrate the agency of these practices and their impact on the built environment.

The paper addresses this lacuna by examining property valuation in the UK. Our attention is on calculative technologies and their rationales (Miller, 1994). Different results arise from different calculations that, in turn, are conditioned by their institutional and social contexts. Consequently, "norms of calculation can ... be seen as always potentially threatened by the existence of alternative and competing norms." (Miller, 1994, p13). Developments in calculative practices are not simply the result of technical advances but are also an indication of whose techniques and rationales are being articulated. The rise and establishment of new practices may, therefore, provide evidence of which practitioners have successfully promoted 'their' practices (Miller, 2001; Lovell & Smith, 2010). However, histories of the UK property sector (see, for example, Marriott, 1967; Rose, 1985; Scott, 1996) pay relatively little attention to changes in calculative practices such as valuation. Consideration of valuation has focused on the technical merits of alternative

approaches and is rooted predominantly in positive economics and finance (Black *et al*, 2003; Henneberry, 2006).

In the main, the UK property literature adopts the same conceptual and theoretical positions and utilises the same methodologies and methods as the sector. With a few exceptions (for example, Henneberry & Roberts, 2008; Munro & Smith, 2008), academics tend to “accept uncritically the specific technical rationale for [a particular method] but do not consider the wider logic underpinning it” (Henneberry and Roberts, 2008, p1229). Thus at the technical / operational level there is a dialectic between academe and practice with each influencing and being influenced by the other¹. However, because both groups accept the mainstream economics, rationalist paradigm, that paradigm is not challenged to any great extent – and virtually no questions are raised about the wider implications of applying and developing those techniques, such as their effects on the form of the urban built environment or on the pattern of regional development.

The close identification of the property literature with the dominant perspectives and practices of the property sector provides a window on those shifting views and behaviours. The paper examines changes in the practice of one type of valuation - investment valuation - from an historical cultural economy point of view. The practice has been influenced by financial economics (as we discuss below), whose techniques support the process of financialisation. The use of the historical method to examine the evolution of investment valuation avoids overstating the degree to which financialisation “... is both quantitatively and qualitatively different from what preceded it.” (Christopherson *et al*, 2013, p352). The acceleration of financialisation

since the 1980s and its effect upon the (re) production of the urban built environment are important. However, earlier experience also needs to be taken into account. This prepared the ground for recent change because it created an established, accepted market for direct and indirect property investments and for the development industry to supply such assets. From this perspective, there is nothing millenarian about financialisation. Rather, it represents the latest chapter in a much longer story and many of its supposedly new and different features are neither. In addition, the adoption of a cultural economy approach avoids the danger of reifying rational economic calculation (Engelen & Faulconbridge, 2009; Hall, 2011).

The argument is pursued in five stages. First, we consider the market context within which valuation is undertaken in the UK. Next, the research methodology is described. Particular attention is given to the relation between different valuation methods and the actors that promote them. Professional valuers and their main professional body the Royal Institution of Chartered Surveyors (RICS) support one method, while the client body - in particular the financial institutions and major property companies and their advisors, with the support of the academic property community - argue for the wider application of an alternative approach. In the third section, we trace the history of investment valuation practice in the UK. Traditional methods using relatively simple financial techniques were not found to have been displaced by more advanced approaches derived from financial economics. The picture is more nuanced and complex than this. Then, the implications of these findings for the way that the market is formatted, for building design and for the spatial structure of the commercial property stock are considered. Our conclusions are presented in the final section.

The market context of investment valuation practice in the UK

The UK has a long-established, highly developed, mature market economy (D’Arcy and Keogh, 1998) where finance capital is unusually prominent (Lizieri, 2009). Its commercial property market exhibits similar characteristics. They are the outcome of a long period of structural changes in the demand and supply sides of the market and in the character of market intermediaries (Scott, 1996). These changes underpinned “the emergence of a national market in commercial property ... [with] ... a substantial flow of attractive, secure, investment properties” (Scott, 1996, p3).

While many of the actors and practices associated with the financialisation of the urban built environment have a long provenanceⁱⁱ, widespread substantive change occurred predominantly in the post-war period. Marriott (1967), Rose (1985) and others recount the activity of a growing band of major property companies. From the 1960s they were joined by the financial institutions. Between 1964 and 1982 institutional investment in commercial property increased from less than £1 billion to £17.5 Billion (Baum & Crosby, 1988, pp88-89). By the end of 2010, the estimated capital value of commercial property in the UK was £561 billion (Property Industry Alliance, 2011). Of that total, £488 billion was in the form of retail, office and industrial property and investors held 61% of the commercial stock, so rent relations are dominant in this market sector. Around £150 billion of commercial investment properties are owned by financial institutions and are subject to detailed quarterly performance measurement within the Investment Property Databank (IPD).

While the distribution of the stock of non-residential property approximates the pattern of economic activity in the UK, concentration is a distinctive feature of important elements of the commercial property market. Institutional investment is strongly focused on southern England in general and London in particular. In 2003, these areas accounted for just over a third of the UK commercial stock (by floor area and number of buildings) but for almost two-thirds of institutional investment (by the same measures; Byrne et al, 2013). At the extreme, holdings of offices in Central London constituted 50.3% by value of all institutional UK office investment (ibid). London is the dominant operational base for the leading commercial property agents and contains an overwhelming share of these firms' senior staff (Leyshon et al, 1990). Apart from, *inter alia*, fund management and investment analysis, such companies offer appraisal and valuation services to major property investors. The top five valuation firms valued 69% of property in the IPD annual index by capital value in 2008 (Crosby et al, 2010). The organisational and spatial concentration of institutional investors (UK pension, life assurance and general insurance companies) in London and the South East is similarly marked (Blake & Timmermann, 2002; Martin & Minns, 1995). These actors, together with banks (retail and other UK and overseas), property finance intermediaries and property companies have developed a dense web of social interrelations (Pryke, 1994) that constitute 'the London property nexus' (Rowley & Henneberry, 1999).

Valuations are used to inform three main decisions in the property market: what rent to offer/accept/agree for the use of accommodation (rental valuation); what price to offer/accept/agree for the purchase of a property asset (investment valuation); and

whether to proceed with a development project – that is, whether such a project is viable (development appraisal). The valuer may act for the purchaser, the vendor, the developer or some interested third party (for example, the funder, insurer or regulator of the transaction). To simplify matters, we will focus on the *purchase* of an *asset*: in other words, on investment valuation. In this case, the standard texts (see, for example, Baum & Crosby, 2007) identify three main tasks for the valuer. The first is to estimate the current and future cash flows the asset will produce, the second is to assess the risk incurred and the return required on that cash flow and the third is to assess the price at which the asset is expected to transactⁱⁱⁱ. A normative, economically rational assumption is made that the greater is the risk, the higher is the rate of return (the yield) required to compensate the purchaser and the lower is the capital value (price) of the asset (again, see standard investment valuation texts). The way that these tasks are performed – the way that valuers treat returns, risks and prices and the assumptions that they make – differ between investment valuation methods and may have a significant effect on the results.

There are two main approaches to investment valuation. The first is to apply a yield or capitalisation rate to the current income flow (that is, the rent being paid by the tenant under the terms of the extant lease). No explicit assumptions are made regarding future value changes (that might occur at a rent review, for example). The exception is that, when the lease comes to an end, the valuer assumes that the income will revert to current open market rental value (the ‘reversionary value’ or ‘reversion’). The yield is derived from the analysis of similar transactions and implicitly incorporates assumptions about future rental growth and risk. It is the conventional method of valuation. The second approach is to estimate the present value of the future rental

income by discounting it at an appropriate rate. The method requires assessments of growth in return (in the rental income) and of risk (in the discount rate) and assumptions about future lease and other events. This has been termed the ‘explicit DCF’ method to distinguish it from the implicit nature of the conventional approach.

Both approaches evolved from a common base, a financial model of the present value of a future cash flow. However, in practice, the explicit DCF approach is derived from the implementation of financial economics models, while the conventional approach is essentially based on comparison, using the rent and yield components as the units of comparison. Changing perceptions of investors in the mid-20th century influenced the evolution of the two applications of the model (Baum & Crosby, 1988; see the extended discussion below). It is to this history that we now turn.

Research methodology

The financialisation literature argues that financial rationales and practices are now predominant in economies like that of the UK (Christopherson et al, 2013). Much attention has been given to high finance and to the development and application of complex financial processes and instruments (cf. Lovell & Smith, 2010, above; see, for example, Mackenzie, 2003). Yet emerging empirical evidence questions the extent of the sway that financialisation exerts, even in its leading economies of the USA and the UK (Christophers, 2012; French *et al*, 2011; Pike & Pollard, 2012). We have stressed (above) the way that earlier experience underpins later developments of the role of finance in the economy. We examine this evolution by analyzing the differences between the origins, methods, developments and applications of two

approaches to investment valuation. This allows a consideration of the degree to which more advanced financial techniques have displaced more conventional, basic ones in the latest chapter of financialisation. Within this framework we construct a historiography using the following mixed methodology (after Munslow, 1997).

The treatment of the period from 1900 to the early 1980s is based upon the previous work of one of the authors (Crosby, 1985). It draws on a combination of direct and indirect, primary and secondary sources (Jordanova, 2000) including valuation textbooks, tribunal and court cases and research into the records of an individual firm of commercial property valuers and agents. It provides a comprehensive review of the historical development of the investment valuation technique in the UK. Our consideration of developments since the early 1980s is substantively based on indirect, secondary sources (Howell & Prevenier, 2001) - mainly academic and practitioner authored books, articles and papers. A number of these sources also include surveys of valuation practice, such as Crosby (1989) and French (1996). In addition, the authors draw on their personal involvement in these developments both through authorship and through membership of professional committees, working parties and so on. While we have made every effort to be objective, the narrative is inevitably influenced by our adopted position (Iggers, 1997).

The evolution of the practice of investment appraisal and valuation

The period up to 1970

Up to 1960, the valuation of standing investments showed little change (Sykes, 1983; Trott, 1980). It was undertaken using a conventional model set out in all the basic UK property valuation texts (for a critique see Baum & Crosby, 1988; Crosby, 1985, which covers the 20th century up to the early 1980s). The approach was rooted in the financial mathematics of discounted cash flow that was developed over many centuries (see, for example, Leonardo's 1202 *Book of Calculations*; or, more recently, Fisher, 1930) and most 20th century textbooks discussed the investment market origin of discount rates. However, applications in texts, cases and practice concentrated solely on the derivation of yields from comparative analysis of transactions of similar properties. Consequently, despite its origins, the conventional approach displays little relation to the calculative technologies of high finance.

Prior to 1960, the conventional approach was practiced primarily within local markets by local practitioners advising local clients. It was only after the UK commercial property market was subject to significant structural change that the traditional approach to investment valuation, based upon comparison, was the focus of substantive critical review. Two factors prompted this reflection. The first was the establishment of institutional investors as major market actors (see above). The second was the interaction between economic trends and the form of property investments.

In the first half of the 20th Century the pattern of investment yields in bonds and property suggests that inflation was seen as a fluctuating rather than a persistent phenomenon. However, following sustained post-war inflation, bond yields rose from the late 1950s to counter the lack of inflation proofing in these fixed income

investments. Property capitalisation rates also rose in the 1960s for the same reason: long leases had no provision for rent review. The introduction of rent reviews and the reduction of review periods followed rapidly. By the early 1970s reviews were present in most long leases and their periods fell from 21 and 14 years in the 1960s to 7 and 5 years by the early 1970s (Baum & Crosby, 1988).

It could be argued that the period from 1945 to 1970 was a pivotal one in the UK commercial property market. In the context of the changing ownership structure, the wider perspective of institutional investors and their advisors, changing market awareness and the rise of property education, it was inevitable that all asset classes, including commercial property, would begin to be exposed to more rigorous analysis. In particular, the application of the conventional, comparable based investment valuation was challenged by the alternative explicit cash flow approach from which it had originally developed. The proponents of the former were practising valuers supported by their professional body, the RICS. The advocates of the latter were institutional investors and their advisors, and the academic community. The scene was set for the critique of conventional valuation that was pursued for the next 10 years^{iv}.

1970 to 1990

The catalyst that precipitated the discussion on valuation technique was the 1970s property crash. As part of counter inflation measures, the Conservative Government in the UK introduced a commercial property rent freeze. This restricted landlords to the receipt of existing rents only, even where the original lease allowed for increased rents. Investors/valuers realised that current income was more secure than prospective

increases at a rent review and the risk differential between the current income and the potential reversionary uplift^v was highlighted. This led to the introduction of the standard institutional lease in the 1970s. Historically, UK leases had always been very long (providing bond-type stability of cash flows). Occupational leases of 21 years, 42 years and even 99 years were not uncommon, especially for “prime” property assets. The length of such leases was standardized at 25 years. Other lease terms protected the landlord from rising repair costs (by placing full responsibility for repairs and insurance on the tenant), tenants leaving (through restrictive assignment and sub-letting provisions and privity of contract) and falling rental values (through upwards-only 5 year rent reviews).

In turn, this precipitated some minor changes to the conventional valuation method. The valuer distinguished between income derived from the existing rent and any prospective increases in rent (for example, at review or upon reversion at the end of the lease). Subsequently, valuers sliced these incomes horizontally, rather than vertically^{vi}. This was not a fundamental change in the conventional, comparison based approach. However, it reflected the changing perspectives of investors and valuers on the risk differential between actual agreed rents and the less certain level of those rents in the future (caused by the current open market rental value being different from the rent passing under the lease). The techniques remained comparative and differences in perceived risk between comparable property transactions and subject properties were applied intuitively by adjusting the yield. In those circumstances, the more similar are the properties, the easier is the valuation. Consequently, the growth in the use of standard lease terms reinforced significantly the advantages of the conventional, comparative valuation model.

Academe first considered the conventional approach in the early 1970s with both Greaves (1972) and Wood (1972) examining explicit property investment valuation methods in growth environments. White (1977) also criticised valuers for following ‘cook book’ routines and Marshall (1976) set out simple explicit cash flow examples for freeholds. Fraser (1977) followed suit by considering leasehold investments. Crosby (1985) sought to reconcile the different approaches to what were essentially market valuation models that took growth prospects more explicitly into account. There was a concerted and strong argument from the academic community for a move away from the conventional approach (be it horizontally or vertically sliced) to investment valuation that continued until the end of the century.

These discussions found their way into basic texts on valuation. Explicit DCF based techniques, not included in texts before 1970 (Lawrence *et al*, 1971), were covered in most of the texts produced later in the 1970s (see, for example, Enever, 1977; Baum & Mackmin, 1979). By the 1980s, the same texts normally featured DCF (Enever, 1981; Baum & Mackmin, 1981; Darlow, 1983). Chapters on discounted cash flow and developments in valuation methods appear in the 7th edition of *Modern Methods of Valuation*, the standard valuation text of the previous 35 years (Britton *et al*, 1980).

Increased institutional investment in commercial property exposed property values and valuations to scrutiny by investment advisors who had had little previous interest in property. The advisors were critical of the implicit nature of conventional valuations (see Greenwell and Co (Walls, 1977) for a typical example). Valuers had responded to the crash with the introduction of formal Valuation Standards by the

RICS in 1974 and, to address these investment industry criticisms, they subsequently initiated a high profile research project into valuation technique (Trott, 1980) that highlighted alternatives to the conventional valuation approach. However, Valuation Standards do not address technique, only process and procedures, so they have little impact on methods utilised in practice. The Trott report focused on methods but there is no evidence that it had any impact on valuation practice despite being published by the RICS.

In summary, by 1990 the conventional, comparative approach had adapted to changing market circumstances and to the changing nature of occupational leases. However, the basic form of this calculative practice had not changed. Despite the criticism of academics and other commentators, including those acting within client bodies, and the return to significant rental and asset price growth in the 1980s, estimates of future value changes were not incorporated into the model. Valuation standards had been introduced by the profession but did not contain any advice on method, only on process, and there was no discussion of how technique affected valuations^{vii}.

Post 1990

In the early 1990s, following a substantial and sustained fall in rental values, the UK property industry was faced, for the first time, with mass over-renting. This presented a technical problem for valuation and, in particular, for the conventional approach.

Practicing valuers attempted to adapt their newly adopted horizontally sliced approach by reversing the layers^{viii}. Both academics (Crosby, French, Ward, Booth and Adams) - individually and in collaboration - and practitioners (Goodchild, Epstein, Martin, Rich)^{ix} were quick to point out that this was problematic because part of the top layer was valued twice; once in the capitalisation of the top slice income until lease expiry and once within the capitalisation rate of the bottom slice. This double counting rendered the approach technically incorrect (Baum and Crosby, 2007). The academics suggested that a growth explicit cash flow approach solved some of the problems regardless of whether the cash flow was over or under-rented. The above practitioners all advocated a form of explicit cash flow as a viable solution to the over-rented problem and these solutions were introduced into standard valuation software packages (such as KEL, Circle). This was a direct consequence of the industry's search for solutions.

However, in 1995, a survey of practice (French, 1996) found that 95% of valuers used conventional investment valuation techniques for reversionary properties and only 10% used cash flow based techniques (5% used both). For over-rented properties the latter proportion was higher, with 15% using cash flow based approaches (again 5% used both). This was the closest that UK property practice came to reconciling the explicit DCF and the conventional approaches to investment valuation. The demise of over-renting in the late 1990s and most of the 2000s saw valuation practice revert to its pre-1990 position: the application of the conventional, horizontally sliced capitalisation rate model based on comparison.

The latest catalyst for changes to valuation technique is the commercial property recession that commenced in the second half of 2007 in the UK and continued into 2009. Questions arising from the latest recession included: How can valuers use comparable methods in markets with few transactions? Can valuers use information from outside direct property markets such as indirect property based stock prices? Can they use explicit DCF techniques to undertake market valuations? (Crosby *et al*, 2009; RICS, 2010) Valuation debates took centre stage at the major UK practitioner conference in 2008 and its mainland European counterpart in 2009 (EG Capital, 2008; IPE Real Estate, 2009). But the discussion was short-lived because the 2007/08 crisis was initially asset driven rather than being related to a downturn in occupier markets, so the consequent technical valuation problems were different. They were based on a dearth of transactions and this dearth was relatively brief. But the fact that a lack of comparables was a major issue reinforces the point that, despite 40 years of technical debate, the conventional, comparison-based technique remained the mainstay of property investment valuation.

The long established form of this calculative practice that is undertaken by valuers with the backing of their professional body has therefore successfully resisted the introduction of a new form supported by other calculative agencies such as investors, advisors and academics. This might result from the quantity of transactions in the market^x The level of liquidity in the UK exceeds many international markets and provides a particularly good basis for the operation of a comparative approach. In some countries with more limited availability of relevant comparable evidence, valuers try to reconcile more than one approach to assess Market Value (for example, the USA) and, in other countries, a cash flow approach takes centre stage (for

example, Sweden (Lundstrom and Gustafsson, 2009) and some CBD valuations in Australia (Parker and Robinson, 2000)).

Market valuation and investment appraisal

However, this is not the end of the matter. To appreciate why, the market context of transactions in commercial property in the UK is relevant. When a property is placed on the market the price at which it sells - the exchange price or market value – may differ from its worth to potential purchasers. The latter will have estimated its value to them (its use value or worth) and used this to inform their bids/offers – which may be lower, similar to or higher than the achieved sale price. Use value accrues to the (potential) owner of the property. Only in case of owner-occupation will the benefits of direct use (the ‘operational objectives’ quoted below) be fully incorporated in the estimate of the property’s worth. Empirically, the bulk of the UK commercial property stock by value is rented (see above), so its worth to an investor is the more likely calculation. This is strongly but indirectly related to its operational value (otherwise the property would not let), but the requirements of the investor must also be taken into account.

Exchange and use value were reviewed by Baum *et al.* (1996) in response to an information paper by the RICS and the Investment Property Forum (RICS/IPF, 1996). Formal definitions that clearly distinguish between the two concepts have since been incorporated in the International Valuation Standards and the RICS’s Valuation – Professional Standards (RICS, 2014; the *Red Book*). Market Value is “the estimated amount for which an asset or liability should exchange on the *valuation date* between

a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion" (RICS, 2014). It is an estimation of what needs to be paid to purchase an asset or, conversely, of the price that an asset might achieve if traded in a market place. Investment Value is "the value of an asset to the owner or a prospective owner for individual investment or operational objectives. (May also be known as *worth*.)" (RICS, 2014) It is the price that should be paid for the asset by a particular owner (or type or group of owners).

The distinction between exchange and use value underlay a debate concerning the most appropriate application of two valuation approaches. The outcome was the acceptance by the UK valuation profession (RICS, 2010) that each calculative practice should be applied separately to one of the two bases: conventional comparative investment valuation for Market Value and Explicit DCF for Investment Value. The reasoning for this is that the best evidence of exchange prices is other exchange prices of similar assets; and that the worth of a property asset is best found by discounting the estimated future cash flows at a financially based target rate of return determined by the existing or potential owner^{xi}. Consequently, the use of explicit DCF for the determination of Market Value is minimal. However, it is commonly applied in buy/sell decision-making to compare the Market Value or price with the worth or Investment Value of an investment property to the purchaser (Baum, et al, 2000).

Thus the picture that emerges is more nuanced than a simple competition between the conventional and explicit DCF approaches that the former has 'won'. Rather we find

that while the primary means of estimating Market Value (exchange value) is the conventional comparative approach, the prices that are bid by potential purchasers are informed by their estimates of a property's worth to them (its use value), commonly derived from the application of the explicit DCF technique. Thus the more advanced financial approach has an influence, albeit secondary, on price. This is important for the consideration of the potential impact of valuation on the urban built environment that follows.

Valuation and the form of the urban built environment

In moving from economic theory to business practice, professions translate and apply economic concepts through particular techniques. Miller (1994; 2001) characterises the latter as interventions: devices for transforming the world through action upon activities, individuals and objects. Techniques such as valuations are not just the passive tools of active agents (Law, 2002). The procedures themselves homogenise, quantify, simplify and centre information; they include and exclude data through the development and application of permissible and impermissible categories; and, in so doing, they influence the nature of their subjects. However, Svetlova (2012) warns against the assumption that calculative techniques are automatically performative. Their impact will depend upon how they are applied within their institutional settings: applications and settings may reinforce or limit techniques' performativity.

In this section we explore how two techniques - conventional and explicit DCF investment valuations – may affect the form of the urban built environment. We focus on the potential performativity of these techniques, whose evolution and extant

relationship were the subject of the preceding historiography.

The conventional approach dominates the practice of estimating the Market Value of investment property. The process of comparison is fundamental to this approach (see above). Comparator characteristics include the nature and qualities of the location, building, tenant covenant and lease terms (see, for example, Jackson and Orr, 2011; Wyatt, 2013). Such sources suggest that rental values are predominantly determined by location, building attributes like age, condition, layout and services, and lease terms; and that yields are also influenced by tenant covenant strength coupled with expectations over variation in future cash flows arising from changes in values and from future lease events. Tenant covenant strength can influence capitalisation rates, so it may also prompt landlords to let to better quality tenants at lower rents in some circumstances.

Because valuations are comparison based, a minimum quantity and quality of comparables is essential to underpin the conventional investment valuation method (Baum & Crosby, 2007). Baum & Crosby (2007, p122) suggest that “objectivity and accuracy in the use of transaction evidence became the key to their acceptance”. They also note that “as the quality of comparables diminishes, the lack of rationality leads to valuations that are not soundly based”. They identify the changing and more diverse lease structures of the 1990s as an example of the increasing diversity of attributes within an asset class causing valuations to come under pressure (Baum & Crosby, 2007, p112 and p122).

Thus robust estimates of market value require substantial comparable evidence and, conversely, properties must possess attributes that conform to the requirements of the calculation if a robust valuation is to be performed. Consequently, one likely effect of the widespread application of comparison-based valuations is that they will exert an inherently conservative, standardising and centralising influence on both the subject of valuations (interests in real property) and those performing them (professional valuers).

Attributes that depart from the norm will have fewer appropriate comparators and present more significant adjustment issues than those that do not. For example, buildings in locations where there are other similar buildings will offer more comparators than buildings that are remote from others; and innovative designs may suffer from a dearth of comparators, as will non-standard property uses. Normative texts maintain that valuations supported by many pieces of closely related comparative evidence are more accurate and less risky than those supported by fewer, less relevant comparisons (see Blackledge, 2009; Wyatt, 2013). If applied in practice, this criterion will affect the building's value: *ceteris paribus*, a higher value will be attributed to the former than to the latter.

The above argument is also likely to apply to the estimation of worth using the explicit DCF method. As Svetlova (2012) notes, in order to operationalize the use of this technique to inform investment decisions, appropriate values for the various inputs (incomes, growth expectations, risk as reflected in discount rates and so on) must be identified. Standard property texts suggest that the main source of these input values is comparison. In other words, comparison is integral to explicit DCF

calculations. Furthermore, again following Svetlova (2012), there are aspects of the institutional context of explicit DCF valuation that may facilitate and reinforce the effects of comparative valuation on urban form.

As the property investment market has matured, so investors have defined and formalised the characteristics of properties that are of interest to them. Buildings should be designed to minimise initial costs and maximise overall return; and to appeal to as wide a market as possible to minimise the risk of lengthy (re)letting periods and to maximise the comparable evidence available for estimating these variables – and for use at rent review. To achieve the best balance between return and risk, these financial requirements have been translated into physical form through the evolution of an ‘institutional specification’ that covers most aspects of design and construction, including (depending on the building type): layout, floor loading, floor plate (depth, planning grid), frame, cladding/fenestration, roof, floor-to-ceiling height, offices and toilets, lighting, heating services, loading doors, site coverage, forecourt, car parking and so on (see, for example, Darlow, 1983; Morley *et al*, 1989). “Any building that departs from this specification to any significant degree will not be funded by an institution...” (Henneberry, 1988, p246).

The institutional building specification may therefore extend the influence of comparison on built form. However, its impact is not limited to the investment market. It may also affect the owner occupied sector. Companies need to maximise their asset value because of its use as security for raising loans and, for listed companies, its impact on share prices. Put simply, compliance of designs with other similar types of building and with institutional specifications maximises the re-sale

market for the firm's building. Clearly, institutional specifications that support better investment performance may reinforce the effects of the application of conventional investment valuation based on comparison.

Comparison and the rendering of real property in forms that support this calculative technique have a potentially fundamental influence on the urban built environment. They may underpin parallel tendencies to homogenise built form and geographically to concentrate investment activity. The latter effect is articulated across the urban scale. International investors' holdings of property assets are focused on London (Lizieri *et al*, 2011) and other world cities (Lizieri, 2009). Large scale UK investors' main holdings lie in the major urban centres of London and the South East, Birmingham, Bristol, Edinburgh, Leeds and Manchester (Byrne *et al*, 2013). Regional and local entrepreneurs are the main players in other provincial centres. This pattern of activity is partly a function of (minimising) the cost of gaining knowledge of the sub-markets within which the assets comprising property portfolios are set (Scofield, 2011). The portfolio management advantages are enhanced by the concentration of information relating to properties that are held in particular locations, one of which is the more accurate valuations derived from a greater quantity of data.

The same forces may be posited to underpin the formalisation of specific types of development, such as retail warehouse parks (Swain, 2004), business parks, regional shopping centres and so on. This is a necessary precursor to their widespread development, which is underpinned by long term institutional funding. At the intra-urban level, this combination of practices relating to location and building specification has shaped development trends. Perhaps the most noticeable is the

emergence of distinct, homogeneous ‘islands of development’ in city centres, such as prime office cores, whose character is so well defined that they can be mapped (see Guy and Henneberry, 2004).

Conclusions

The urban built environment is shaped by a myriad of influences. Some of the most powerful lie within the realm of economics and finance. If the institutional context allows – and in the UK commercial property investment market this seems to be so - assets are formatted by the conforming effects of the calculations to which they are subjected. They must be so qualified and quantified as to render them calculable in the ways required by those calculations.

Changes in calculative practices may prompt related changes in assets’ characteristics. Conversely, the evolution of new forms of asset may challenge extant methods of calculation, from which arise new calculative technologies. The paper has considered the relations between one type of calculation, investment valuation, and one type of asset, commercial property in the UK - one of the world’s most mature, liquid and transparent property markets. In Araujo’s (2007) terms this is a business market populated by powerful calculative agencies. These include large scale property owners (initially, in the UK, institutions such as insurance companies and pension funds, but latterly joined by sovereign wealth funds, multi-national/global companies, high net worth individuals and other overseas investors), valuation firms (that have become larger and more industrially concentrated), a strong professional body – the RICS – that is well integrated into global valuation networks, and the academic

community.

Since the 1960s, professional valuers and the RICS, and institutional investors (aided by academics) have been engaged in a contested negotiation over the way that investment valuations should be undertaken. The historiography of investment valuation indicates that the conventional approach, originally rooted in financial mathematics but effectively applied as a comparative analysis of transactions, remains the dominant method of estimating Market Value. It has proved resilient to the challenge of an alternative. Individual investors' decisions about what price to bid or to accept for property are informed by explicit DCF analyses of Investment Value or worth. But, despite its influence on price and its incorporation by the academic community into the education of the last few generations of valuers, explicit DCF has not supplanted conventional, comparison-based practice in investment valuation in this particular market.

This finding is important because it undermines some of the totalizing and simplifying tendencies of the financialisation literature. It highlights the need for a fine-grained, historically informed understanding of the evolution of calculative practices. Without this it would not be possible to unravel the complex of influences upon the built environment that are articulated through valuations. In our case, both of the calculative techniques that we examined embody procedures with strong conservative, centralizing tendencies. Comparison, on the one hand, and the translation of return and risk into institutional specifications, on the other. Their potential to format the built environment is clear.

What is not clear is the way that these similar but different influences interact with one another. Why has the approach that complies with the normative financial model of investment appraisal not supplanted the empirically driven conventional approach? The obvious answer is that the latter nevertheless fulfills its purpose, given the market conditions in which it operates. Despite its possible conforming influences, the accuracy of the valuations that it produces more than make up for its theoretical inadequacies. On this basis, the pre-eminence of the conventional method of investment valuation to estimate an asset's Market Value will be maintained as long as transaction information of sufficient quantity and quality exists in the UK commercial property market.

We must end with two methodological qualifications. First, the UK case is distinguished by the transparency and maturity of its property market; the industrial and geographic concentration of its actors; its integration into the global capital market through the City; the influence of the RICS on valuation practice; and its relatively developed academic property community. All these characteristics vary between national markets. It is, therefore, difficult to translate our findings to other contexts. Second, we have used the historic method of research. Our main source was documents of various kinds. They provide detailed evidence of investment valuation methods. However, rather more may be learned about the relation of the various actors to the alternative approaches to investment valuation and to one another. We are currently pursuing research that addresses these issues.

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Notes

ⁱFor example, the seminal work of Wood (1972) and Greaves (1972) on technique was communicated through practitioner outlets but critiques of applications in practice did not gain any major momentum.

ⁱⁱThe first large, specialist property investment companies were established in London in 1864 (Scott, 1996, p22). Basic property portfolio management techniques were reported in the early 20th century (Prudential Insurance Company (1912) Annual Report; cited in Scott, 1996, p29). It was in the 1930s that "...many basic features of Britain's modern property investment market emerged, including the growth of market intermediaries covering the National property market, the 'securitisation' of investment property and the development of funding links between financial institutions and property developers." (Scott, 1996, p38)

ⁱⁱⁱ A possible fourth task is the lending valuation – an estimate of the value of the asset as a security for a loan. This can have a major impact on the funding of the transaction and is normally a conservative estimate.

^{iv}However, international investment in commercial property markets was in its infancy so there were few international influences at this stage.

^v That is, the difference between the rent passing and the (higher) rent that might be achieved if the property was re-let on the open market at the end of the extant lease.

^{vi} That is, from a vertically sliced term and reversion approach to a horizontally sliced layer approach (see Wyatt, 2013). For example, using vertical slicing, a property with a rental income of £2,000 with 2 years remaining to the end of the lease would have been valued by (i) capitalising the passing rent for two years and then (ii) adding a “reversion”. The latter is the value of the rental income achieved after re-letting on a new lease, capitalised into infinity and discounted back to the present value. After the 1970s, using horizontal slicing, the property would be valued by (i) capitalising the passing rent into infinity and (ii) capitalising the increase in rent in 2 years time into infinity and then discounting back 2 years. The discount rate on the base rent (i) would be lower than that on the rental increase (or top slice, (ii)) to reflect their relative risk.

^{vii} There is evidence that not dissimilar changes were taking place internationally. Examples include, the emerging 1980s literature on valuation in the USA and Australasia, significant cross-border investment, and the development of national valuation standards (followed by the search for agreement on Global Valuation Standards) in the UK, the USA and Australasia.

^{viii} The Core and Top Slice model values the core rental value into infinity at the property cap rate derived by comparison with other market transactions. The additional income above the market rental value caused by the property being over-rented under a lease, probably with upwards only reviews, is capitalised normally until the end of the lease at a bond-type fixed target rate of return, adjusted for default risk.

^{ix}See, for example, Booth and Adams (1996); Crosby (1992); Crosby *et al.* (1997); Crosby & Goodchild (1992); Epstein (1993); French and Ward (1995; 1996); Goodchild (1992); Martin (1991); and Rich (1992).

^x For example, IPD annual digest indicates transactions within its database running at around an average of 8.5% of stock for purchases and 6.5% of stock for sales between 1981 and 2012.

^{xi} This position is formalised by the RICS in its professional valuation standards that are set out in the *Red Book* and delivered on-line to Chartered Surveyors. The contents are divided into Practice Statements and Guidance Notes. The Statements cover, *inter alia*, bases of value: market value, market rent, worth or investment value and fair value. The Notes cover the application of valuations to particular types of property or in certain circumstances. There is also a set of Valuation Information Papers that covers valuation methodology related to specific types of property and issues.