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Property Market Purpose Efficiency: An Exploratory Analysis From an Institutional Economics Perspective

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Theme: New frontiers in regional science: theory and methodology

Property market purpose efficiency: an exploratory analysis from an institutional economics perspective*

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Abstract

Over the last few years the issue of property market efficiency has attracted increasing attention in both academic and professional research, yet, the concept of property market efficiency is poorly developed and inadequately theorised. The conventional approaches of allocative and informational efficiency provide problematic and ambiguous judgements, whereas institutionalist conceptualisations remain incomplete or methodologically underdeveloped. Building on the latter approaches, the current paper explores a possible way to evaluate the effectiveness of the property market in delivering a combination of outcomes that will generate and/or sustain urban economic potential. This provides the basis for the development of the idea of a 'purpose efficient property market'. To achieve this, two theoretical devices are developed: 'institutional uncertainty', and 'institutionalised variety'. Institutional uncertainty assesses the quality of the wider (urban) institutional arrangements and reflects how effectively the urban socioeconomy adapts to pressures. Institutionalised variety evaluates particular institutions, in this case the property market, in terms of diversity in institutions and products provided. Putting the arguments together, property market purpose efficiency is understood with reference to the market's ability to match 'institutionalised variety' to the level of 'institutional uncertainty' exhibited by the wider urban institutional environment. In this sense, a purpose efficient property market allocates optimal resources to institutionalised variety, given the level of uncertainty the wider institutional environment carries, and thereby delivers the property products that the economy requires at the prevailing price.

Keywords*: property market, efficiency, institutional economics, uncertainty, variety*

* I am grateful to Geoff Keogh for helpful comments and discussions. Nevertheless, the usual disclaimer applies.

1. Introduction

In the attempt to evaluate the quality of market mechanisms conventional economics have put forward notions of efficiency. Yet, the concept of property market efficiency is poorly developed and inadequately theorised in the literature, as "…many researchers and most participants in real estate markets would consider the idea of an efficient real estate market to be a paradox – a statement that is seemingly contradictory and opposed to common sense", due to the number of peculiarities and imperfections that the market exhibits (Gau, 1987: 1-2; Evans, 1995). However, over the last few years the issue of property market efficiency has attracted increasing attention in both academic and professional research, generating a growing body of empirical research (e.g. Guntermann and Norrbin, 1991; Darrat and Glascock, 1993; Graff and Webb, 1997; Clayton, 1998; Keogh and D'Arcy, 1999; Anderson *et al*, 2000; Meen, 2000; Wang, 2000; for a review see Gatzlaff and Tirtiroglu, 1995).

The current paper reassesses the debate around property market efficiency and draws on institutional economics to introduce a new perspective. In particular, it explores a possible way to evaluate the effectiveness of the property market in delivering a combination of outcomes that will generate and/or sustain urban economic potential. This provides the basis for the development of the notion of 'property market purpose efficiency'.

The argument of the paper is developed in three further sections. Sections 2 and 3 provide a critical review of the conventional and institutionalist approaches to property market efficiency. Section 4 lays the grounds on which the concept of property market purpose efficiency is fully developed in section 5. Finally, section 6 summarises the key arguments to conclude the paper.

2. Conventional approaches to property market efficiency

The mainstream economics and property literature approaches the issue of market efficiency from two distinct perspectives: allocative efficiency and informational efficiency. Allocative or Pareto efficiency is about making the best use of resources to produce the maximum amount of output. A market is efficient when it is not possible to reallocate available resources so as to achieve more of one objective without accepting less of another (or to make at least one person better off without making anyone else worse off). Such a conception presupposes a perfectly competitive market in equilibrium; that is a market characterised by a large number of rational actors, homogeneous products, freedom of entry and exit, and perfect information. However, the property market is subject to structural imperfections. Standard property literature (e.g. Fraser, 1993; Harvey, 1996;

Ball *et al*, 1998; Evans, 2004) and other studies on the subject (Keogh and D'Arcy, 1999) make such a case in terms of heterogeneity, indivisibility and illiquidity of real property, the externalities associated with land and property markets, as well as the transaction costs and information deficiencies associated with trade in property. On this basis it is asserted that the property market should at best be seen as a ninety percent efficient market (Evans, 1995).

One particular market failure that had special attention in the literature is related to information. This is because information is costly, asymmetrically distributed and, generally, it is not possible to assess its full value before its acquisition (Keogh and D'Arcy, 1999). The consequence is that information is always imperfect and participants enter the market with only some part of the potentially available market knowledge. To take this situation into account, a more realistic conception of market efficiency has been put forward, where optimality is envisaged even when perfect information is missing. Thus, an organised market can be considered as efficient as long as relevant information is effectively capitalised into market prices (Jensen, 1978; Grossman and Stiglitz, 1980). Moreover, such informational efficiency is regarded necessary to achieve allocative efficiency, as prices which reflect fully the available information provide meaningful representation of values and thus are accurate signals for the efficient allocation of resources (Fama, 1970).

This concept of informational efficiency, which is generally known as the efficient market hypothesis (EMH), was originally developed by Fama (1970) to examine efficiency in financial markets, and is categorised into three forms (Ball *et al*, 1998; Evans, 2004). 'Weak form' efficiency requires all information to be capitalised into the price of the asset immediately and without any time lag. Accordingly, a market that does not exhibit significant correlation between price movements in one period and price movements in a preceding period is regarded as weak-form efficient. 'Semi-strong' efficiency concerns the way in which the market anticipates future events and capitalises all publicly available information, such as company accounts and reports, agent's reports and economic forecasts. Evidence in this case rests on the smooth path of price movements as they absorb relevant market signals. 'Strong form' efficiency requires that prices reflect all information whether publicly available or not, including insider information. Evidence here rests on the inability of insiders to yield above-normal risk-adjusted returns. The EMH has been extensively tested in stock markets. Empirical studies in the 1970s have provided supporting results, although more recent evidence has questioned these findings, disputing the conventional use of EMH (Ball *et al*, 1998). Some researchers (e.g. Shiller, 1990; Evans, 1995) have argued that behavioural aspects, such as participants' sentiments, psychology and negotiating ability, rather than economic rationality, play an important role in pricing, and should be taken into account for more realistic results to be obtained.

With particular focus on the property market, two main approaches to informational efficiency have been adopted (Evans, 1995; Ball *et al*, 1998)). The forecasting approach asserts that evidence for the support of EMH lies in the inability to predict future prices. Alternatively, other studies focus on the existence of discernible rules or strategies for trading property. In this case the ability to outperform the market, once transaction costs are taken into account, is regarded as evidence rejecting market efficiency. However, studies are fewer and results are less conclusive (if not contradictory) compared to those dealing with the financial markets (Ball *et al*, 1998). On these grounds, it is impossible to make a clear judgement whether the EMH constitutes a robust approach in considering property market efficiency.

Criticism of the application of both conventional measurements of efficiency to the property market has come from a number of sources (e.g. Gau, 1987; Evans, 1995; Gatzlaff and Tirtiroglu, 1995; Keogh and D'Arcy, 1999). Pareto efficiency is considered ambiguous because of the multiple optima which it implies. Further, the costs involved in shifting the market towards a more 'efficient' situation are substantially downplayed, if not totally ignored. As regards the EMH, it focuses on informational efficiency to the exclusion of an explicit treatment of the operational and allocative aspects. In addition, substantial objections refer to the intrinsic characteristics of the property market as well as the overall methodology of the EMH. With reference to the former, it is argued that the approach is rather inconclusive, as it does not take into appropriate consideration the transaction costs and information deficiencies[1] which are the norm in the market. The latter criticism focuses on the fact that any test of EMH is a joint test with market equilibrium. This creates a number of problems in terms of interpretation of the results and the inability to provide definite measures of the degree of market efficiency, even in the context of financial markets. The situation becomes much more severe in the property market where the assumption of equilibrium is undermined due to decentralised trade, costly information, and long time lags in the production of property. Last, but not least, two general shortcomings present in both traditional notions of efficiency could be added. These refer to the use of naive and ideal benchmarks to judge market efficiency and to the failure to address properly the issue of property market process (Keogh and D'Arcy, 1999). As a result of the latter the essential characteristics of property as a physical, legal and social entity are substantially disregarded.

[1] In regard to the information deficiencies, for instance, Keogh and D'Arcy (1999) outline the situation where evidence to support EMH could reflect a false consensus in the market where participants share the same, but nevertheless inaccurate, information.

3. Institutionalist approaches to property market efficiency

Discontented with the conventional understanding and superficial treatment of market efficiency described above, the institutionalist literature attempts to provide a more refined and pragmatic conceptualisation of property market efficiency taking into account the process through which the market operates. Generally three notions are put forward. The first is that of bounded efficiency developed by Keogh and D'Arcy (1994, 1996). This is actually a static assessment, where the degree of efficiency of the market in question is evaluated in comparison to a feasible frontier, which represents its best potential outcome (i.e. optimum in a sense) in the inevitable presence of the idiosyncratic property market characteristics and its institutional and organisational aspects. A significant achievement of this concept is that it elaborates the idea of an institutional environment, with all the constraints that it imposes on the efficient operation of the market. However, specific methodological directions, in terms, for example, of what empirical forms such an institutionalist judgement of market efficiency would take, are not given, something that renders the approach incomplete and ambiguous. Moreover, efficiency is primarily defined in economic terms while social, cultural and political institutions are regarded only as constraining attributes of market operation.

It is important to highlight at this point that bounded efficiency is a contingent notion of efficiency. It asserts that, instead of seeking a judgement on whether the 'property market' as an entity is efficient, the assessment of market efficiency should be constructed with reference to 'efficiency for a purpose', or 'efficiency for a person'. However an explicit value, welfare or focus criterion to support this judgement is missing from the approach.

Van der Krabben (1995) on the other hand, attempts to provide such a criterion in his study of the property development process in the Netherlands. A dual assessment of property market operation is envisaged comprising two interrelated but distinguishable concepts of market efficiency. The first, which is called 'allocative efficacy', assesses the outcomes of the development process on the basis of a value criterion set up by the public policy to reflect social considerations. On these grounds optimality is attained both when there is sufficient supply at relatively stable property prices and when property rights are socially acceptable and equally distributed. The second, called 'productive efficiency', concerns the way these outcomes are provided and is judged on the basis of profitability from the property producers' point of view. Issues of their organisational structure, behaviour and strategies are taken into account in such an assessment. Evidently, these notions, although they elaborate on the idea of 'efficiency for a person' or 'efficiency for a purpose' and introduce an explicit value criterion, remain too close to the traditional perception of efficiency. They are basically static in nature and practically neglect the institutional character of the property

market. Moreover, van der Krabben (1995) acknowledges that problems appear in the empirical application of this twofold assessment, as the criteria that are proposed are open to various interpretations and are often contradictory.

The third institutionalist approach to market efficiency confronts the issue from a dynamic point of view considering the process of institutional change and the ability of the market system to cope with and meet the challenges that the evolving socioeconomy places on it. In these terms the notion of adaptive efficiency is introduced asserting that a (property) market can be seen as efficient if it displays tendencies to eliminate transaction costs and generally provides an environment hospitable to economic growth (Keogh and D'Arcy, 1999). The initial development of this conceptualisation is attributed to North (1990: 80) who, in a wider context, views adaptive efficiency as concerned with the willingness of the system "…to acquire knowledge and learning, to include innovation, to undertake risks and creative activity of all sorts, as well as to resolve problems and bottlenecks of the society through time". In these terms an adaptive efficient economy is defined as the one which, over time, supports and is based upon an institutional framework which provides a wide menu of alternative choices for organisational innovation so that smooth adaptation to changing economic and social circumstances is achieved (North, 1993). This quite general concept, despite introducing a dynamic assessment of institutional (and market) qualities, remains largely underdeveloped and presents operational difficulties.

4. Property market operation and efficiency considerations

The discussion up to now has brought forward a number of important points with regard to property market efficiency. Starting with the conventional approaches, judgements of market efficiency are deemed flawed and ambiguous. This is because, first, efficiency is assessed with reference to idealised benchmarks, second, the intrinsic characteristics[2] and dynamic process of the property market are not taken into account, third, these is an artificial dissociation from important operational issues.

In turn, institutionalist attempts to articulate more refined and pragmatic conceptualisations of property market efficiency, though remaining methodologically underdeveloped and incomplete, have provided useful insights. First, as the property market structure emerges out of dominant economic and social interests, an appropriate response to market efficiency requires reference to an

[2] Such a case is made in terms of heterogeneity, indivisibility and illiquidity of the property product, the externalities associated with land and property markets, as well as the transaction costs and information deficiencies associated with trade in property (Fraser, 1993; Harvey, 1996).

explicit value or focus criterion. Thus, instead of trying to seek a judgement on whether the property market as a whole is efficient, the assessment of market efficiency should be constructed with reference to 'efficiency for a purpose', or 'efficiency for a person'. Second, emphasis is shifted towards consideration of the property market process, while the central question becomes how well that process works in terms of a specific objective or from the viewpoint of a particular group of actors. Third, a dynamic aspect of the market is emphasised suggesting the need to assess the adaptability of property market process as economic, political, legal, and social conditions change.

Expanding upon these arguments, the efficiency of the property market is perceived here with reference to the accomplishment of a particular purpose: the achievement and maintenance of urban economic potential. This addresses the *purpose efficiency* of the property market as the 'serviceability', 'credible commitment' or 'effectiveness' of the market to generate or sustain economic development and to promote urban competitiveness by providing those property outcomes that the urban economy requires. An efficient property market is expected to deliver a sufficient supply of property to meet requirements at the prevailing price level. In that sense, substantial time-lags in property development, erratic market behaviour, or lack of the information base necessary to support comprehensive market choice, which give rise to mismatch and volatility of land and property values, could be interpreted as indicators of market inability to respond to economic imperatives, and so as 'stylised facts' of purpose inefficiency.

For clarity it is important to point out a number of general qualifications to the notion of purpose efficiency and to emphasise its contingent nature. First, property market purpose efficiency is a necessary but not sufficient condition for the realisation of economic potential. Other factors besides the property market can affect, although to a different degree and in a different direction, the course of the urban economy. Second, property market institutional mechanisms mediate between the economic requirements for property and the actual products provided. On these grounds the concept of purpose efficiency shifts emphasis from property products to the property market process, while the central question becomes how well that process works in providing what the economy requires. Third, the notion of property market purpose efficiency does not prescribe a specific institutional configuration. It proposes, however, a conceptual point of reference to determine whether 'problematic' property market institutions exist, and if so, directions for their revision. Any proposed institutional transformation will of course advance some interests and disadvantage others. In that sense, the purpose efficiency might not coincide with the perceptions

of efficiency held by different actors in the property market[3] (called 'person efficiency'), as the latter is specified by their own objectives and needs. Finally, regarding property market institutions as part and product of the wider institutional environment implies that property market purpose efficiency should be seen in relation to the overall urban institutional framework. On the basis of all these considerations purpose efficiency is conceptualised in terms of the ability of the market institutional structure to respond appropriately to the wider institutional conditions. An appropriate response refers to provision of such quantity and quality of institutions and products that the overall institutional environment allows and requires.

In examining the essential implications of the last qualification and developing further the approach, two interrelated notions prove helpful. These are the concepts of 'uncertainty' and 'flexibility'.

4.1. Uncertainty

Questions of uncertainty are central to economic theorising, as uncertainty is a pervasive fact of economic reality and life as a whole (Keynes, 1921; Knight, 1921; Lawson, 1985; Schmidt, 1996). Uncertainty refers not only to lack of information regarding the parameters of a problem, but also to lack of knowledge about the fundamental nature of a problem and the type of outcomes that are possible. The former is called 'parametric uncertainty' or risk, and pertains to a situation where the determination of the likelihood of an event is possible, though costly, either through calculation *a priori* (i.e. based on purely general principles), or from statistics of past experience. The latter, which is called 'structural', 'true uncertainty', or plainly 'uncertainty *per se*', refers to the case where there is no scientific basis to form any calculable probabilities. This is because these are numerically indeterminate, or, simply, do not exist, or because agents lack the ability to decipher all of the complexity of the environment and thus to account for each and every future contingency.

As such, uncertainty refers not only to ignorance of what can be known with study of collected data, but also to ignorance tied to the unknowable. "It is a world of change in which we live, and a world of uncertainty. We live only by knowing *something* about the future; while the problems of life, or of conduct at least, arise from the fact that we know so little" (Knight, 1921: 199, emphasis in the original). The reasons for this are manifold. To start with, it is the open-ended, dynamic and contingent nature of the socioeconomic reality – on account of the instability, multiplicity, and complexity of both external conditions and internal elements – that precludes the predictability of

[3] The property market actors are defined as the main organisations involved in use, development, investment and service provision related to property.

events and aspects of reality (Lawson, 1985). Moreover, the situation becomes more complicated when the human element is taken into account. Agents' behaviour is not only constrained by the limited computational, cognitive or perceptual abilities of the human mind (Simon, 1982), but also by the unacknowledged and unintended consequences of the actions of other purposeful (and perhaps 'irrational') agents (Schmidt, 1996).

From this perspective, where uncertainty is seen as ubiquitous as well as inherent and structural to the system, it becomes clear that the future can never be fully anticipated or known. Certainly, this has significant implications regarding our confidence in the future, the formation of expectations, and the overall course and working of the socioeconomy, something which is evident in the appearance of 'irrational' instances of optimism or pessimism even in cases where there are no solid, formal reasons for such views (Hodgson, 1988). On these grounds it can be asserted that uncertainty reflects the conditions under which economic dynamics are understood, appreciated, expressed and, thus, developed, and, in that sense, mirrors the overall climate of the socioeconomy. To put it in simple words, it is argued here that the level of uncertainty reflects the degree of agents' confidence with regard to the conditions and processes of the socioeconomic system.

In this world of uncertainty, wherein agents have nevertheless to act, 'conventions', 'norms' and 'rules of thumb' are used as substitutes for the knowledge that cannot be attained (Heiner, 1983; Lawson, 1985; Hodgson, 1998). "Without these 'rigidities', without social routine and habit to reproduce them, and without institutionally conditioned conceptual frameworks, an uncertain world would present a chaos of sense data…" in which it would be practically impossible for agents to make decisions, act and interact with each other (Hodgson, 1988: 205). On that basis, it is argued that institutional structures play a functional role in the reduction of uncertainty by providing a basis for belief, perception, expectation and decision-making, and thus a degree of stability and predictability in human affairs (Hamilton, 1932; Ayres, 1962; Lawson, 1985; Hodgson, 1988, 1998a; North, 1990; Searle, 2005).

Some qualifications on the above conceptualisation should however be underlined. Although any institutional configuration reduces uncertainty to a degree, different institutional structures reduce uncertainty with different degrees of success. As a rule, uncertainty can never be totally eliminated. This is due to three reasons. First, institutional structure can never be 'perfect', partly because institutions are the result of human limited mental ability and power relations, and partly because they are products of processes and circumstances of the past and subject to institutional lock-in and path dependence (North, 1990). Second, because of the complexity and dynamic character of the socioeconomic reality and the unpredictable nature of human behaviour, fortuitous changes (external or internal) are always possible. Third, uncertainty (and especially other people's

uncertainty) may be beneficial for some groups as it can generate opportunities for profits (Knight, 1921). Finally, it is important to keep two further things in mind. First, institutions generally reduce uncertainty, but they probably do so for some groups and not for others. This, of course, is related to the power relations between agents. Second, sometimes the cost of reducing uncertainty may be higher than the value of reducing uncertainty.

The degree of uncertainty that exists in an institutional environment is determined by both external and internal conditions. In particular three dimensions can be considered. One is the conformity between the exogenous changes-conditions (e.g. technological changes, wars, economic upheavals, etc.) and the associated institutional-organisational adjustment. Important parameters here are the complexity and degree of volatility of the external conditions and the ability of the institutional structures to adjust to these conditions. Another is the harmony between the institutional structures (e.g. between political, economic, social, etc.). This refers to the situation where institutional changes in one level necessitate changes in another (or others). Last is the harmony within institutional structures (e.g. the economic or political or social, etc.). This refers to congruity between the institutions of the structure as for example between formal and informal institutions (North, 1990).

On this basis it is argued that the degree of uncertainty in a socioeconomic system reflects the quality of its institutional structures and, in particular, (a) the degree of institutional adaptability to the external conditions and pressures (in short their potential to adapt), and (b) the degree of congruity between and within the institutional structures and dynamics (or how well institutions adjust). To put it plainly, the degree of adaptability and congruity of the institutional structures determines the level of uncertainty within the socioeconomic system.

4.2. Flexibility

Economies are generally in a state of flux, buffeted constantly by developments in the rest of the world, shifts in the composition of demand, technological and institutional changes, or by other external and/or internal shocks. This complexity and constant volatility of external conditions generates uncertainty in the institutional environment and justifies the necessity for institutional adaptability (Hamilton, 1932; North, 1990; Killick, 1995). The qualities necessary for the successful adjustment of institutions to the changing conditions and opportunities are institutional diversity. In other words, it is argued that an appropriate degree of institutional ‘variety’ is essential

to cope with the external and internal volatility and complexity and thus to reduce uncertainty (Heiner, 1983; Nelson and Sampat, 2001; Hodgson, 1988[4], 1996).

Variety here refers to the 'widening' of institutions in response to change. This is the case where the need for adaptability is achieved not only by the creation of a new institution, or by replacing an old by a new one, but also by broadening the existing institutional structure in such a way that it can serve new interests without upsetting the ones that have so far made use of it.

Generally, institutional variety is positively associated with economic development (Dosi, 1988; Killick, 1995; Gibson and Lizieri, 2001); however, it should not be taken as desirable without reservations. Certainly it has a cost, since resources are required to achieve and maintain it. Moreover, although variety is always desirable when volatility of the environment increases, excessive variety produces increased complexity, undermining institutional stability and inducing uncertainty. Undue lack of variety, on the other hand, is also detrimental because it fosters inertia and encourages long-term rigidities hampering necessary flexibility. However, it must be acknowledged that rigidities are not always detrimental and certain rigidities are necessary for the existence and running of complex systems such as the urban socioeconomy. In that sense, desirable institutions are those creating sufficient stability for growth while not obstructing change. To achieve this very delicate and friable situation, it can be argued that a system (such as the property market) should exhibit the degree of variety sufficient to deal with all the potential variation (uncertainty) in its environment. In that sense, macroeconomic order and relative stability are reinforced alongside, and arise from, variety and diversity at the micro-level (Langlois 1986; Hodgson, 1988). In addition, such heterogeneity at a micro-level is deemed necessary both for the system to renew itself through time and for macro dynamics to be successfully sustained. On that basis, stability is related more closely to the general levels of institutional structure, whereas variety and flexibility pertain to more narrow and specific contexts, such as the property market itself.

In these terms the role of market (including property market) institutions in relation to urban economic development should be seen as an attempt to manage and buffer the effects of uncertainty at the urban level, by providing a sound, flexible and secure framework that enables easy adjustment to the contingencies and exigencies of economic processes. A prospective way to accomplish this is through the development of 'institutionalised variety'. This refers to plurality in

[4] Hodgson's (1988: 168, 256-8) 'law of requisite variety' state that if a stable outcome is to be attained, then the variety of a system must be at least equal to that of the activity which it is directing. Consequently, to minimise the chances of disruption, an open system has to contain sufficient variety to deal with all the potential variation in its environment.

property market institutions[5] and provides the necessary flexibility and diversity for the property market to manoeuvre successfully, both exploiting and contributing to overall institutional certainty and stability. The same caveat applies as with the concept of variety, institutionalised variety comes at a cost, and thus its appropriate degree is defined on the basis of the uncertainty that it faces.

5. Institutionalised variety and purpose efficiency of the property market

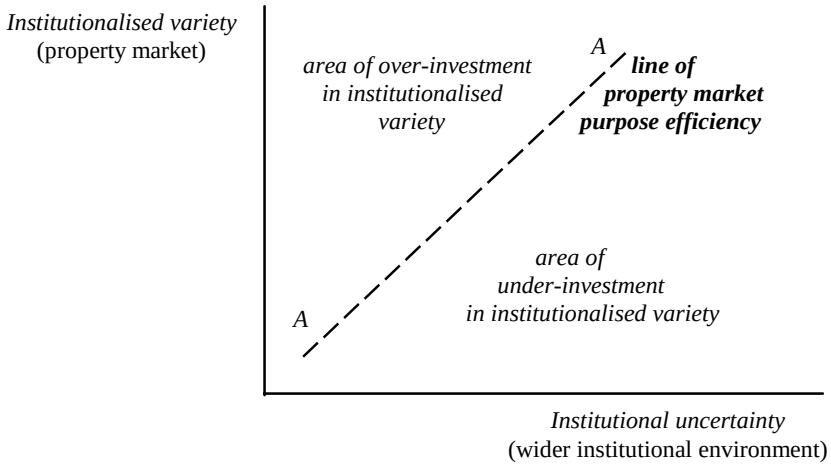
On the basis of the arguments developed in the previous section, it is possible to evaluate the institutional structure of the property market in terms of how efficiently it operates in providing the right quality and quantity of institutions and outcomes, so that urban economic potential can be generated, sustained or even enhanced. It is argued that a property market is purpose efficient when it allocates optimal resources to develop an institutional structure that maximises the productivity of the market in delivering property outcomes. However, this institution-building should be seen with reference to the wider institutional structures and dynamics. Thus, based on the assumption that each urban economy, subject to its institutional volatility and incongruity, exhibits a certain amount of institutional uncertainty, the purpose efficiency of the property market is conceptualised in terms of the market's ability to respond appropriately to these wider institutional conditions by providing whatever degree of institutionalised variety the overall institutional environment allows and requires. The ability to explore the efficient allocation of resources to property market institution-building with reference to the wider institutional conditions and dynamics constitutes the main strength and novelty of the concept.

Figure 1 illustrates diagrammatically the notion of property market purpose efficiency. A purpose efficient property market delivers the property products that the economy requires at the prevailing price, by allocating optimal resources to institutionalised variety given the level of uncertainty which the wider institutional environment carries. This is represented conceptually by the line *AA*. In particular, for a specified level of institutional uncertainty, the line indicates the respective level of institutionalised variety that is most appropriate in supporting economic potential. Less institutionalised variety (area of under-investment in Figure 1) creates undesirable rigidity in the operation of the property market. This means that the market cannot respond effectively to economic circumstances and institutional changes by providing the property products that are required. This weakens urban economic potential. Examples of such urban property markets can be found in countries which have recently open up their economies (e.g. eastern European cities) and

[5] It is quite difficult (almost impossible in some cases) to dissociate institutions from organisations, as organisations can be perceived as institutions in a different context (Menard, 1995). On that basis, the notion of property market institution(s) as it is used here incorporates the concepts of property market organisations and the property market products that are produced by them.

on that basis exhibit considerable institutional uncertainty, while their property markets have not yet developed the appropriate institutional framework which is required to facilitate economic adjustment (e.g. because property rights are not clearly defined).

Figure 1: Purpose efficiency of the property market



Source: Own construction

From a similar perspective, the achievement and maintenance of excess property market institutionalised variety, i.e. more than is required by the overall institutional conditions (area of over-investment in Figure 1), can be seen as a misuse of resources. Such excessive variety impairs urban economic potential by causing needless costs and expenditure of society's resources, and also by creating unnecessary complexity potentially detrimental to the requisite level of certainty and flexibility. Examples of such urban property markets could be found in mature economies which have developed market structures that are highly sophisticated but rigid and resistant to adjustment or reformation in response to changing socio-economic conditions (for example due to powerful vested interests established).

The graphical representation in Figure 1 should be seen as a conceptual device demonstrating the intrinsic relation between the property market as an institution and its wider institutional environment, where the notional balance of their qualities is hypothesised to be a necessary condition for purpose efficient property markets. Theory suggests that there is a positive relationship between institutional uncertainty and institutionalised variety: i.e. that greater institutional uncertainty demands greater institutionalised variety to achieve purpose efficiency in the property market. Clearly the detailed characteristics of the line *AA* (e.g. form, position, slope, etc.) will depend on the specific features of the market in question.

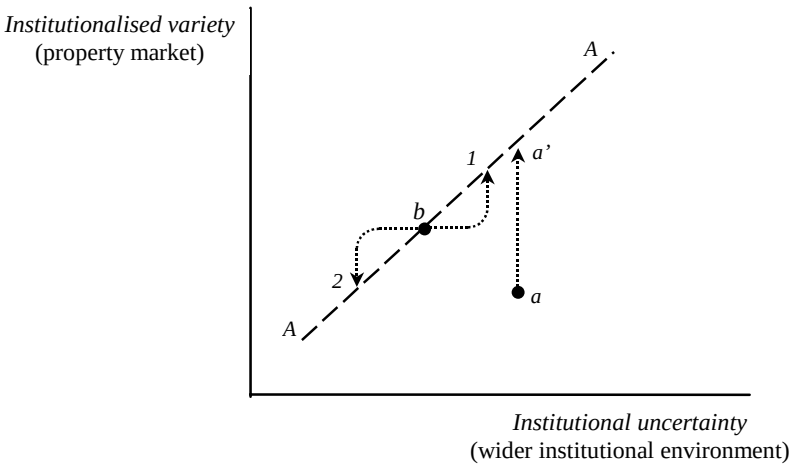
The characteristics of institutional balance may change with time, circumstances and location. This is because each socioeconomy has its own culture, institutions, organisational networks and power relations that are temporally and spatially defined and require time-specific, locally determined explanations and solutions. This means that the optimal degree of institutionalised variety for a given level of institutional uncertainty may be different across time and space owing to the quality of the available institutional base (i.e. the institutionalised variety already built), and the costs associated (and benefits foregone) with this particular institutional configuration. For example, emerging markets might lack some fundamental property market institutions (e.g. related to property rights definition or information provision) and so even 'small' changes in institutional uncertainty will necessitate substantial developments in institutionalised variety in order for required property products to be provided. As the markets become more mature, they develop a substantial institutional base which makes it possible to compensate changes in institutional uncertainty with relatively smaller changes in institutionalised variety. On that basis, property markets which are at the initial stages of institution-building or those characterised as 'emergent' in cross-sectional analysis, might be represented conceptually by a steeper purpose efficiency relationship (steeper line *AA* in Figure 1) than the same markets in the long-run and to 'mature' markets respectively.

The notion of purpose efficiency also provides a conceptual basis for the consideration of the evolutionary dynamics of the property market. Here emphasis is placed on the market's ability to continuously readjust its institutional structures in response to changing conditions in the wider institutional environment. A truly purpose efficient property market should be allocating optimal resources to a degree of institutionalised variety that matches its wider institutional uncertainty. However, even in the case of a market which is purpose efficient (i.e. on the line *AA*) at a point in time, conditions might change requiring a movement to a new position. In particular, it is argued that overall institutional changes which increase uncertainty in the urban environment should be accompanied by such changes in the property market that deliver greater degrees of diversity of institutions, in order for market productivity to be maximised and economic potential to be supported (case *b1* in Figure 2). An example here might be a property market that, in response to internationalisation and the increased institutional uncertainty it bears, develops a robust framework of property rights that accommodates a wide variety of objectives in property use, investment, and development.

Likewise, where overall institutional changes reduce uncertainty, surplus property market institutionalised variety generates unnecessary complexity, waste of resources and excessive opportunity costs, and thus an appropriate response should be to decrease institutionalised variety (case *b2* in Figure 2). An example in this case is a property market that, in response to falling

institutional uncertainty as a flexible but reliable legal framework develops, manages to restrain certain institutional aspects of the property market (e.g. the informal, non-professional networks that affect the market process) impairing its ability to effectively deliver the required property products.

Figure 2: The relative conception of property market purpose efficiency



Source: Own construction

Questions arise regarding the institutional adjustment process as conditions change. If the market is initially purpose efficient (e.g. at *b* in Figure 2) and there is a change in the degree of uncertainty in the wider institutional environment, we should be interested in the speed and path of institutional adjustment, and whether or not it is capable of restoring the market to purpose efficiency. If the market is initially purpose inefficient (e.g. at *a* in Figure 2), and this is the more likely case, we might again ask whether this is a temporary phenomenon and whether there is likely to be an institutional adjustment process that will secure purpose efficiency.

Various factors may restrict the efficient allocation of resources to institutionalised variety in the short-run. For instance, the property market as an institution carries a strong path dependency (that is a tendency towards 'lock-in'), where the scope for change is constrained by the existing institutional structure. The situation becomes more complicated when power relations and vested interests are taken into account. In a sense, as property market institutions crystallise into reputable usages, they create in their defence "…vested interest, vested habit and vested ideas and claim allegiance in [their] own right" (Hamilton, 1932: 87), making them difficult to change. This also suggests that developed property market institutions (actual institutionalised variety) and market possibilities (purpose efficiency) become contextualised, necessitating solutions that are political and policy oriented in nature, and lie in the hands of politicians and other power brokers.

However, apart from the speed (or the time-lag) with which property market institutions may adjust in response to changes in institutional uncertainty, one should also take into account the nature of decisions associated with institution-building. Since the costs and benefits of institutional change cannot be known in advance[6] any investment in institutionalised variety must always be 'speculative'. This implies that the appropriate mix of institutions maximising property market productivity might not be delivered simply because the actors have a distorted perception of what its actual costs and benefits would be.

Undeniably, history and dynamic processes cannot conform to any simple graphical representation. In that sense the notional balance between institutionalised variety and institutional uncertainty is not teleological, and so it should not be supposed that any suggested movement would or is 'bound' to occur. The dynamic process of institutional change might not, therefore, result in purpose efficiency. Institutionalised variety might fall short of, or overshoot, the efficient uncertainty-variety balance (lying above or below *AA*), while the range of purpose efficient solutions might itself change (i.e. a shift in *AA*).

The overall progress and positioning of the market is affected by various, contingent, conditions. This has certain implications in terms of policy directions. It has been argued that the conceptual device of purpose efficiency can shed light on the nature of the property market institutions and their intrinsic relation with the overall institutional environment, as well as on the market's ability to efficiently (re)allocate resources to institutionalised variety in response to changing conditions. This helps to clarify thinking in terms of what policy decisions can be made to shift the market towards a desired position. With reference to public policy, two sets of choices are available. The first, targets directly the property market institutional structure attempting to bring its institutionalised variety in line with the prevailing level of institutional uncertainty (in Figure 2 operating to move from a point like *a* towards the line *AA*). Such policies could include, for example, setting up agencies to facilitate property-related information provision, or the redefinition of legal interests in property use, investment and development. The second set of choices targets the overall institutional environment within which property market institutions operate. Here policies focus on the reconfiguration and realignment of institutional structures, paying attention to the implications these would have on the operation of the property market (indirect effects, represented by a shift in the purpose efficiency relationship *AA* in Figure 2). Such policies may be designed, for instance, to strengthen legal efficiency and enforceability, to encourage international economic activity, or to infuse flexibility alongside security in the financial and investment sectors.

[6] A similar case is investment in information, where it is not possible to know its actual value before the information itself is acquired (Keogh and D'Arcy, 1999).

Obviously the latter set of policies has a very wide scope and far-reaching implications not only for the property market but also for other areas of economic significance.

In conclusion it must be emphasised that the notion of property market purpose efficiency is an important conceptual device which enables the consideration of efficient resource allocation to property market institution-building with reference to the wider institutional conditions and dynamics. The operationalisation of the concept, however, faces substantial problems. This is because it is difficult to observe directly what a purpose efficient property market would look like in reality and so to identify criteria that give an objective fix to the concept. However, purpose efficiency might be indirectly measured through indicators that reflect the mismatch between property requirements and property delivered, like the degree of property market volatility in otherwise matched property market institutional structures, compared across markets or across time. Yet lack of long runs of reliable data (even for the most mature markets), or consistent data across markets, makes it difficult to empirically verify the conditions of purpose efficiency in the current state of knowledge. Moreover, the place and time dependent nature of the balance between institutionalised variety and institutional uncertainty creates an additional complication for any attempt to explore their relation through comparative, cross-sectional research.

On these grounds it is appropriate to focus attention on analytical indicators of the concepts of institutionalised variety and institutional uncertainty that would enable a concisely description of the property market as an institution and the wider institutional environment within which it operates, facilitating analysis, further exploration and understanding of their intrinsic relation. Such indicators can provide a basis for the evaluation of the quality of the property market process with reference to the wider institutional structures at various points in time, as well as for comparative assessment between different markets. However, when they are used as comparable analytical devices they should mindfully, thoroughly and sensitively take notice of the local circumstances. This is because the same external forces and institutional conditions could, in different urban contexts, lead to different types of institutional uncertainty giving rise to different property market configurations in terms of the mix of institutions developed.

6. Overview and conclusions

The paper has challenged the available notions of property market efficiency to put forward a new concept, called ‘property market purpose efficiency’.

The argument started with a critical review of the conventional measures of market efficiency. It has been argued that both allocative efficiency across the property market as a whole, and the narrower treatment of informational efficiency in the investment market, provide flawed and ambiguous judgements of market efficiency. This is because, first, they assess efficiency with reference to idealised benchmarks (Pareto optimality and full information, respectively), second, they do not take into account the intrinsic characteristics and dynamic process of the property market and, third, they are artificially dissociated from important operational issues. Institutionalist attempts to articulate more refined and pragmatic conceptualisations of property market efficiency, while they have provided useful insights, are found to be incomplete or methodologically underdeveloped.

However, institutionalist analysis offers three important conclusions. First, instead of trying to seek a judgement on whether the property market as a whole is efficient, the assessment of market efficiency should be constructed with reference to 'efficiency for a purpose', or 'efficiency for a person'. Second, emphasis should be placed not only on property market outcomes but also on the property market process[7]. Third, the dynamic dimension of the property market should be given due consideration, in terms of its adaptability to changing economic, political, legal and social conditions. Expanding upon these arguments, the efficiency of the property market has been approached with reference to the accomplishment of a particular purpose, which is the achievement and maintenance of urban economic potential. This addresses the purpose efficiency of the property market as the 'effectiveness' or 'credible commitment' of the property market to support economic potential and promote urban competitiveness, by providing those property outcomes that the economy requires. In plain terms, an efficient property market is expected to deliver a sufficient supply of property to meet requirements at the prevailing price level.

In an attempt to avoid possible misconceptions, a number of general qualifications were formulated. First, property market purpose efficiency is a necessary but not sufficient condition for the realisation of economic potential. Other factors alongside the property market can intervene in or affect, in various degrees and directions, the course of the urban economy. Second, the notion of property market purpose efficiency does not prescribe a specific institutional configuration. It provides, however, a conceptual point of reference to determine whether 'problematic' property market institutions exist, and if so, directions for their revision. However, it is inevitable that any subsequent institutional transformation will of course advance some interests and disadvantage others. Third, the concept of property market purpose efficiency takes into appropriate

[7] This is the process which, amongst other things, specifies property values, generates information, defines legal interests, allocates uses, stimulates development and redevelopment, and generally determines the effectiveness of the urban system to provide these spatial structures (real property) and legal interests (property rights) that are required for economic development.

consideration the structural peculiarities and idiosyncratic imperfections that the market exhibits and puts forward a conceptual benchmark for efficiency that is realistic, pragmatic and feasible. In that sense, a property market can be purpose efficient, even in the inevitable presence of high transaction costs and information deficiencies, which are conventionally seen as classic causes of market failure. Finally, conceptualising the property market as part and product of the wider institutional environment suggests that property market purpose efficiency be seen holistically. Thus, the purpose efficiency of the property market is conceptualised in terms of the ability of the market to develop such institutional mechanisms and qualities as the overall urban institutional environment allows and requires.

Development of the notion of purpose efficiency required reflection on the purpose, function and qualities of the institutional structures. It is argued that economic potential is generated when a micro-system exhibits such degree of institutional variety sufficient to cope with all the potential variation and uncertainty of its wider environment. In these terms, macroeconomic order, stability and adaptability are reinforced alongside, and arise from, variety and diversity at the micro level. Applying this conceptualisation to the subject-matter of this study, two theoretical devices have been developed: 'institutional uncertainty' and 'institutionalised variety'. Institutional uncertainty assesses the quality of the wider (urban) institutional arrangements[8] and reflects how effectively the urban socioeconomy adapts to the external pressures, resolves internal incongruities, and provides a secure economic environment. Institutionalised variety evaluates particular institutions, in this case the property market, in terms of diversity and plurality in institutions, organisations, and products provided. Putting the arguments together, the property market purpose efficiency is understood with reference to the market's ability to match 'institutionalised variety' to the level of 'institutional uncertainty' exhibited by the wider urban institutional environment. It was argued that this affords the market the necessary flexibility, diversity, and manoeuvrability without compromising overall institutional certainty and stability.

A purpose efficient property market allocates optimal resources to institutionalised variety, given the level of uncertainty the wider institutional environment carries, and thereby delivers the property products that the economy requires at the prevailing price. Less institutionalised variety creates undesirable rigidity in the property market process, constraining its ability to provide the required property outcomes and thus weakening urban economic potential. Similarly, the achievement and maintenance of excess institutionalised variety in the property market can be seen as a misuse of resources to the detriment of the economy. Such excessive variety impairs urban

[8] As has been argued, institutions' functional role is to reduce uncertainty. On these grounds, the level of remaining uncertainty becomes the yardstick to evaluate their quality.

economic potential by incurring needless costs and expenditure, and creating unnecessary complexity potentially damaging to the requisite level of certainty and flexibility.

The strength and novelty of the concept of purpose efficiency reside on its ability to view property market efficiency in both holistic and dynamic terms. The former highlights property market institutions as part and product of the overall institutional environment implying any comprehensive discussion on efficiency takes these issues into account. The latter introduces a time dimension, arguing that changing external or internal conditions shifts the level of uncertainty that the institutional environment embodies, prejudicing the prevailing degree of institutionalised variety in the property market, and thus influencing its quality as an institution as well as its evolutionary dynamics. A truly purpose efficient property market through time is able to effectively re-allocate resources to maintain optimal institutionalised variety in line with changes in wider institutional uncertainty. Yet the property market as an institution carries a strong path dependency, a tendency towards 'lock-in', where existing institutional complexity limits the scope for change. This situation becomes more complicated when power relations, vested interests, and the 'bounded' rationality (due to limited information on the costs and benefits of choices, as well as to the incapability of human mind) of various market players are taken into account. This leaves a number of important questions unanswered: will market adjustment take place, if so, how quickly, and what must happen to allow it to occur? A fundamental position here is that, market possibilities (purpose efficiency) and current institutional aspects of the market (realised institutionalised variety) become contextualised, necessitating solutions that are political in nature and lie in the hands of politicians or other power brokers.

In conclusion it must be stressed that the current approach sheds light on the institutional mechanisms and processes of the property market and clarifies thinking in terms of the nature of choices available to shift the market towards a desired position. These have certain implications in terms of policy directions. In particular, the conceptual device of property market purpose efficiency provides a theoretical basis for considering enhancement of urban competitiveness through intervention in the property market, providing a more efficient allocation of resources to institutionalised variety. However, as the relationship between the property market and the urban socioeconomy is not a simple or straightforward one, it can be argued that such a policy should be particularly sensitive to local conditions and institutional peculiarities.

The arguments developed in this paper for application to the property market can be generalised to efficiency debates around other markets. At its simplest it can be stated that even in markets where high levels of efficiency, as conventionally understood, are expected (e.g. the equity market), an institutional approach substantially changes the meaning attached to efficiency. It adds valuable

insights into the relative nature of efficiency judgements and the whole process that accounts for the provision of observed market outcomes.

References

Anderson, R. I., Lewis, D. and Springer, T. M. (2000) "Operating Efficiencies in Real Estate: A Critical Review of the Literature", *Journal of Real Estate Literature*, **8**(1), pp. 3-18.

Ayres, C. E. (1962) *The Theory of Economic Progress: a Study of the Fundamental Economic Development and Cultural Change*, 2nd ed., New York: Schocken.

Ball, M., Lizieri, C. and MacGregor, B. D. (1998) *The Economics of Commercial Property Markets*, London: Routledge.

Clayton, J. (1998) "Further Evidence on Real Estate Efficiency", *Journal of Real Estate Research*, **15**(1/2), pp. 41-57.

Darrat, A. F. and Glascock, J. L. (1993) "On the Real Estate Market Efficiency", *Journal of Real Estate Finance and Economics*, **7**(1), pp. 55-72.

Dosi, G. (1988) "Institutions and Markets in a Dynamic World", *The Manchester School*, **LVI**(2), pp. 119-146.

Evans, A. W. (1995) "The Property Market: Ninety Per Cent Efficient?", *Urban Studies*, **32**(1), pp. 5-29.

Evans, A. W. (2004) *Economics, Real Estate and Supply of Land*, Oxford: Blackwell

Fama, E. F. (1970) "Efficient Capital Markets: A Review of Theory and Empirical Work", *Journal of Finance*, **25**(2), pp. 383-417.

Fraser, W. D. (1993) *Principles of Property Investment and Pricing*, 2nd ed., Basingstoke: Macmillan.

Gatzlaff, D. H. and Tirtiroglu, D. (1995) "Real Estate Market Efficiency: Issues and Evidence", *Journal of Real Estate Literature*, **3**, pp. 157-189.

Gau, G. W. (1987) "Efficient Real Estate Markets: Paradox or Paradigm?", *Journal of American Real Estate and Urban Economics Association*, **15**(2), pp. 1-12.

Gibson, V. and Lizieri, C. (2001) "Friction and Inertia: Business Change, Corporate Real Estate Portfolios and the U.K. Office Market", *Journal of Real Estate Research*, **22**(1/2), pp. 59-79.

Graff, R. A. and Webb, J. R. (1997) "Agency Costs and Inefficiency in Commercial Real Estate", *Journal of Real Estate Portfolio Management*, **3**(1), pp. 19-36.

Grossman, S. J. and Stiglitz, J. E. (1980) "On the Impossibility of Informationally Efficient Markets", *American Economic Review*, **70**(2), pp. 393-408.

Guntermann, K. L. and Norrbin, S. C. (1991) "Empirical Tests of Real Estate Market Efficiency", *Journal of Real Estate Finance and Economics*, **4**(3), pp. 297-313.

Hamilton, W. H. (1932) "Institution" in Seligman, E. R. A. and Johnson, A. (eds.) *Encyclopaedia of the Social Sciences*, Vol. 7, New York: Macmillan, pp. 84-89.

Harvey, J. (1996) *Urban Land Economics*, 4th ed., London: Macmillan.

Heiner, R. A. (1983) “The Origin of Predicable Behavior”, *American Economic Review*, **73**(4), pp. 560-595.

Hodgson, G. M. (1988) *Economics and Institutions*, Oxford: Polity.

Hodgson, G. M. (1996) “An Evolutionary Theory of Long-Term Economic Growth”, *International Studies Quarterly*, **40**(3), pp. 391-410.

Hodgson, G. M. (1998) “The Approach of Institutional Economics”, *Journal of Economic Literature*, **XXXVI**(1), pp. 166-192.

Jensen, M. C. (1978) “Some Anomalous Evidence Regarding Market Efficiency”, *Journal of Financial Economics*, **6**(2), pp. 95-101.

Keogh, G. and D’Arcy, E. (1994) “Market maturity and property market behaviour: a European comparison of mature and emergent markets”, *Journal of Property Research*, **11**(3), pp. 215-235.

Keogh, G. and D’Arcy, E. (1996) “Maturity and efficiency in commercial property markets: a bounded efficiency approach”, Discussion Papers in Urban and Regional Economics, C, No 113, Department of Economics, University of Reading.

Keogh, G. and D’Arcy, E. (1999) “Property Market Efficiency: An Institutional Economics Perspective”, *Urban Studies*, **36**(13), pp. 2401-2414.

Keynes, J. M. (1921) [1973] *A Treatise on Probability*, London: Macmillan.

Killick, T. (ed.) (1995) *The Flexible Economy*, London: Routledge.

Knight, F. H. (1921) *Risk, Uncertainty and Profit*, Boston: Houghton Mifflin.

Krabben van der, E. (1995) *Urban Dynamics: A Real Estate Perspective, An institutional analysis of the production of the built environment*, Amsterdam: Tilburg University.

Langlois, R. N. (1986) “Coherence and Flexibility: Social Institutions in a World of Radical Uncertainty” in Kirzner, I. M. (ed.) *Subjectivism, Intelligibility, and Economic Understanding*, Basingstoke: Macmillan, pp. 171-191.

Lawson, T. (1985) “Uncertainty and Economic Analysis”, *The Economic Journal*, **95**, pp. 909-927.

Meen, G. (2000) “Housing Cycles and Efficiency”, *Scottish Journal of Political Economy*, **47**(2), pp. 114-140.

Menard, C. (1995) “Markets as institutions versus organisations as markets? Disentangling some fundamental concepts”, *Journal of Economic Behavior and Organization*, **28**(2), pp. 161-182.

Nelson, R. R. and Sampat, B. N. (2001) “Making sense of institutions as a factor shaping economic performance”, *Journal of Economic Behavior and Organization*, **44**(1), pp. 31-54.

North, D. C. (1990) *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

North, D. C. (1993) “Institutions and Economic Performance” in Maki, U., Gustafsson, B. and Knudsen, C. (eds.) *Rationality, Institutions and Economic Methodology*, London: Routledge, pp. 242-261.

Schmidt, C. (ed.) (1996) *Uncertainty in Economic Thought*, Cheltenham: Edward Elgar.

Searle, R. J. (2005) "What is an institution?", *Journal of Institutional Economics*, **1**(1), pp.1-22

Shiller, R. J. (1990) "Market Volatility and Investor Behaviour", *The American Economic Review, Supplement, Papers and Proceedings*, **80**(1), pp. 58-62.

Simon, H. A. (1982) *Models of Bounded Rationality*, Cambridge M.A.: Massachusetts Institute of Technology Press.

Wang, P. (2000) "Market Efficiency and Rationality in Property Investment", *Journal of Real Estate Finance and Economics*, **21**(2), pp. 185-201.