

## **LAND MARKET FRICTIONS – LITERATURE REVIEW**

### **1.1. INTRODUCTION**

The Department for Transport (DfT) has commissioned CEPA to carry out a study on the effect of uncertainties in the delivery, scope and timing of major transport infrastructure, on land development that is substantially contingent upon that infrastructure. This study is delivered substantially through the delivery of a number of case studies. It has subsequently commissioned CEPA to extend one of those case studies to develop a deeper understanding of the effect of land market frictions on development.

The aim is to develop a clearer and fuller picture of what may have contributed to the delay or cancellation of a chosen property scheme, to be able better to distinguish it from the effects of uncertainty in infrastructure development. In the first part of this study extension, we agreed the selection of Barking Riverside as the case study to extend, having considered the potential it provided against alternatives.

The first part of the extension of this case study is to carry out a literature review of friction in the market for development land, better to understand what issues might occur, and what phenomena might be exhibited as a result.

We first consider what is market friction, and the questions about market friction, and varieties of market friction that this literature review will explore. We divide the literature into two parts, first the behaviour of developers operating in the market, and second external factors causing friction in the market. We end by drawing some conclusions.

### **1.2. MARKET FRICTION**

#### **1.2.1. What is market friction**

“Market friction” is generally understood to mean anything that interferes with perfectly efficient trade. Any market friction can be viewed as a market failure, in that the friction introduces inefficiency into the trade. But it is a subset of market failures. We can have frictionless *trade*, despite other market failures such as a monopolistic supply restriction. Market frictions extend to issues that are not necessarily seen as veserious market failures, or at least would lie far from the kind of market detriment that would be seen to demand public policy interventions. Friction can occur in markets with lively competition, in the sense of many buyers and sellers. But friction also commonly arises from institutional and regulatory controls, doubtless intended for good purpose, but which have the side-effect of interfering in trade.

A classic example of friction in an apparently lively market is a thin market. This is a market where there is only intermittent presence of buyers and sellers for specific items. This is often because the items for sale are of unique and varying characteristics, and of only partial substitutability for what would best suit the available buyers. Classic examples would be art works, second-hand goods and parcels of land. Thin markets are characterised by low liquidity, and tendency to display high volatility in price.

Many markets are thin, despite large numbers of buyers, sellers and a high overall volume of trade. Thin markets sometimes gain liquidity of their own accord over time, through the action of competition, innovation and technical change. If the costs of finance and warehousing fall, stockholders can improve market liquidity. New trading platforms that are cheap to operate and easy to access, can improve liquidity market liquidity, such as online auctioneering of second-hand goods.

Competition authorities and public policy would rarely take direct action to rectify a thin market. Interventions can have negative consequences as well as the intended benefits, and the former can outweigh the latter. It is unreasonable to expect any market to accede to theoretical perfect competition, and action is only taken when the market distortions are bad enough, and an intervention can produce an improvement. But that does not mean the

government will never intervene to improve market liquidity. For example, government might design and create a trading platform, and may mandate its use. We can observe this in energy markets.

There are other factors causing friction in lively markets that are routinely addressed by policy intervention, such as informational deficits. Public policy frequently requires traders to disclose specific information about their products for sale, and indeed prevent the sale of certain classes of products on the basis of their characteristics. Consumer right legislation, product safety regulation, etc, common standard, are other market interventions that could be said, in part, to attempt to address market frictions.

But some market frictions can also be seriously detrimental, yet hard to address, even in markets with strong competition in the sense of numerous buyers and sellers. An example is the phenomenon of partial engagement in markets such as utilities and financial services. The problem arises because there is a degree of individualisation of the service. Engaged customers can obtain good outcomes for themselves in such markets. But this does not drive down the price for other, unengaged, customers, as often happens in the market for fast-moving consumer goods. Service providers learn to distinguish and exploit the unengaged. Despite the public interest in this phenomenon there are still no clear public policy recommendations to address it.

### **1.2.2. Questions of friction in the market for residential development land**

There has been sufficient concern about the potential existence of friction in the market for residential development land that there have been a number of governmental studies over the years, such as the Callcutt Review (2007),<sup>1</sup> and Greater London Authority (2012).<sup>2</sup>

Following Callcutt, we can divide land market frictions into two types:

- The actions of numerous competing participants in the market, maximising their economic well-being from their own perspective; and
- Institutional and regulatory issues, which may distort the market.

The Callcutt Review (2007) was clear that he regarded the latter as the only true problem, or at least the only problem worth addressing. The former kind are of the kind we mentioned in the first part of this introduction, and occur despite competition in the sense of numerous buyers and sellers in the market. It is unclear whether Callcutt regarded it as simply inappropriate to attempt to intervene in a market with this kind of issue, or whether he considered the problem as small in comparison to latter.

That leaves us with an unanswered empirical question, what is the relative size of these issues? It is common to believe that institutional issues in the land market are large, as HM Treasury (2015) recited. “[The] planning system [is] regarded by many as one of the most significant constraints facing the economy, bringing delay and inflexibility”.<sup>3</sup> But whilst that is widely believed, and there seem to be many good reasons for assenting to it, it seems difficult to find a reliable attempt at quantification to formally justify that position. And there are other practical difficulties and distortions causing delay, which will be mentioned in this paper, and reflect Callcutt’s position.

On the other side, has Callcutt perhaps failed to appreciate the amount of friction resulting from the non-institutional factors? Are there interventions to improve this kind of address this kind of friction? There appears to be no practical experience of addressing these issues, nor literature making practical proposals to do it, nor indeed a quantification to compare with the similarly unquantified institutional detriments.

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<sup>1</sup> DCLG (Department for Communities and Local Government) (2007) *The Callcutt review of housebuilding delivery*

<sup>2</sup> Greater London Authority (2012), *Barriers to housing delivery: what are the market-perceived barriers to residential development in London?* December 2012, Greater London Authority, report authored by Tom Craine.

<sup>3</sup> HM Treasury (2015), *Fixing the foundations: Creating a more prosperous nation*. The Treasury provide no source or justification for this observation. Whilst it seems very plausible, is much repeated in various forms, and little denied, it seems to be difficult to locate any research which would enable it to be given a firm foundation.

We will first consider how it can be that an apparently competitive market for development land, one with numerous buyers and sellers, where the participants act to maximise their economic advantage, can experience market frictions and hence act in a way that does not reflect the socially desired outcome. We will move on to consider the planning system and other difficulties and distortions.

### **1.3. BEHAVIOUR OF PARTICIPANTS IN MARKETS FOR LAND FOR RESIDENTIAL DEVELOPMENT**

A proper theoretical understanding of development land markets originates in Titman (1985).<sup>4</sup> He was the first to analyse the ownership of a piece of land for development according to its characterisation as option. As long as you hold the land undeveloped, you retain an option to develop it at a later point in time, when it might be more profitable. This is similar to a financial call option, where you have a right to buy something at a specific price, during some time interval. Accordingly, he used a Black-Scholes type model, more generally used for valuing financial derivatives, to explore the likely conclusions of this understanding. The term “real option” is now generally applied to situations, such as this, where practical decisions have properties similar to financial derivatives, and the related similar analytic approach.

The “real options approach” to assessing the land market is therefore to model explicitly as an options market, using the same or similar tools. This contrasts with the “classical” approach to the development land market, which is based on the assumption that developers would proceed with development as soon as the value of project exceeds their hurdle rate.

Whilst the real options approach seems correct in theory, in comparison to the classical approach, it is an empirical question whether the development market in fact behaves in accordance with the real options model, or else the classical mode, or maybe some other behaviour. It can be difficult to test this empirically, because the data requirements are hard to satisfy. But subsequently a number of researchers have been able to construct tests of it, and have widely found that market behaviour is more consistent with the predictions of real option theory than the prior classical approach.

An example of a study which validates that the real option model is more consistent with the practical reality of the market, than the classical model, is in Lu et al (2020)<sup>5</sup> This tested the theory on developments in an expanding area of Taipei. But they find also that developer characteristics affect time to development. For example, developers with more capital, or less development capacity, tended to delay development. This is an example of imperfections in the development market, reflecting that an undercapitalised or capacity constrained firm is less able to take financially optimal decisions to maximise its long-term return.

The recognition of land ownership as a development option has enabled a better understand of the optimal timing to development for the owner of the land. A classic paper exploring the complexities of that is Holland et al (1995).<sup>6</sup> They show that almost any case can occur – development can either be delayed or accelerated relative to a classical description. As with a financial call option, an increase in the amount of the option premium would indicate an increase in the likelihood of the option owner choosing to wait to exercise their option. What increases a call option premium is market volatility, not the size of uncertainty.

Volatility measures the speed of price changes, whereas uncertainty refers to the range of possible future outcomes, without regard to speed of their arrival. Any combination of uncertainty and volatility is in principle possible. The reason that volatility rather than uncertainty drives the value of an option, is that it increases the

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<sup>4</sup> Urban Land Prices Under Uncertainty, Sheridan Titman, *The American Economic Review*, Vol. 75, No. 3 (Jun., 1985), pp. 505-514

<sup>5</sup> Lu Chien-Lin, Liao Wen-Chi, Peng Chien-Wen, (September 2020), *Developers’ perspectives on timing to build: Evidence from microdata of land acquisition and development*, *Journal of Housing Economics*, Volume 49.

<sup>6</sup> A. Steven Holland, Steven H. Ott, Timothy J. Riddiough, (1995), *Uncertainty and the rate of commercial real estate development*, Prepared for the Real Estate Research Institute

probability that an option will become valuable to exercise during its period of exercise. In contrast, pure uncertainty can typically be diversified by actuarial techniques.

This insight carries through to development options. Thus larger development delays are more associated with increases in volatility in the housing market, than changes in the magnitude of uncertainty – though there may well be an increase in volatility at the time such a change occurs. The authors tested this prediction on US development data.

With larger development sites, a key issue is phasing. The possibility of phasing the development in various stages and of different sizes and timings, these numerous options interact with the market uncertainty and volatility in complex ways. Ott et al (2012)<sup>7</sup> explore this from a real options perspective. They find that immediate full development, smooth phased development and lumpy development can all be optimal choices under different market conditions. Each pattern feeds back into inventory levels and pricing. In the next section, we will note other practical issues affecting phasing arising from financing constraints.

Another observation is the potential for super-normal returns from development, because of imperfections in the underlying land market. This factor tends to keep option values high and hence delay development. Developers acquire land with the expectation of such gains, and hence may hold off in the hope of achieving them if not immediately present. Guthrie (2010)<sup>8</sup> shows that the predictions of Holland et al (1995), we described above, are not the whole story, when the potential for super-normal returns is considered. He observes that you would expect competition between developers, each holding separate pieces of development land, would tend to reduce the value of options. But in practice he observes that because super-normal returns are expected, in effect developers hope that competition will later be reduced. So this tends to increase option values and delay development. He validates the prediction using US data.

Murray (2020)<sup>9</sup> explores the extent of “land-banking” of developers in Australia. He observes that the eight largest development companies in the country hold 13 years’ supply of development land, given the rate they develop. He shows that this is consistent with a real options approach. In particular, it differs considerably from a rate of development implied by a classical approach, where the main consideration would be the inventory holding costs, and building when profitable. In Britain, longer-term holdings of development land are mainly held by strategic investors, rather than “developers” in the sense of companies that actually build out these sites. But the effect is similar, and the Australian situation shows that the British situation is not necessarily more or less benign.

In summary, the actions of numerous economic agents acting in their best interests in competition with each other, in the sense of their being numerous buyers and sellers, can nevertheless experience market frictions, which may sometimes result in substantial development delays. We have learned from the general thrust of these studies, and the economic and financial rationality of a real options approach to development. Developers, or other strategic holders of development land, have found it is rational to behave in this way, even if in practice they are largely ignorant of real options theory. We have also seen, as Guthrie (2010) indicates, how this interacts unhelpfully with the imperfections in the land market. The Callcutt Review (2007) argued, with some good reason, that market distortions are more important than the effects of the market acting as a competitive market would. But we see from this survey that the competitive market acting as a competitive market would may be considerably slower than a public authority seeking to enable development might hope for when investing in an infrastructure scheme, or other investments, that seek to unlock development.

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<sup>7</sup> Steven Ott & W. Hughen & Dustin Read, (2012). *Optimal Phasing and Inventory Decisions for Large-Scale Residential Development Projects*, The Journal of Real Estate Finance and Economics, vol. 45(4), pages 888-918, November.

<sup>8</sup> G. Guthrie, (2010), *House Prices, Development Costs, and the Value of Waiting*, Urban Economics & Regional Studies

<sup>9</sup> Cameron K. Murray, (September 2020), *Time is money: How landbanking constrains housing supply*, Journal of Housing Economics, Volume 49.

## 1.4. NON-MARKET CONSTRAINTS ON DEVELOPMENT

A particularly useful summary of non-market constraints and delays to residential development is available in McAllister et al (2016).<sup>10</sup> This paper considers stalled housing projects, by a case study approach. “Stalled housing projects” specifically means delays after planning permission is granted. But as the behaviour of market participants continues to interact strongly with the planning system even after an initial grant of planning permission, in practice the paper also gives a strong indication of difficulties with the planning system.

“Stalled development” is defined as a development unusually slow to occur after planning permission is granted. An earlier study of numerous schemes in London identified “typical delay” to schemes, which enabled the authors to identify schemes with materially more delay than the “typical delay”. They used a case study approach to identify the causes of delay in these schemes with more delay. We can divide these in four main categories:

- The planning system,
- Market and economy,
- Site specific issues, and
- Financing constraints.

The approach of studying schemes that already have planning consent might appear to avoid the problems of gaining planning permission, which are clearly material. But planning issues continue after planning permission is granted. And the issues after it is granted give material insight into the broader issues of planning. This arises because developers frequently try to renegotiate planning permission after it has been granted, especially for large schemes.

Residential planning permissions, especially for large sites, often come with a Section 106 agreement attached. This is an agreement by the developer to give something back in return for the planning gain, the increase in value that arises from granting planning permission. Under such an agreement, the developer might agree to pay sums of money towards particular purposes – often funding infrastructure; and/or build some such infrastructure or other socially beneficial developments, that they would not otherwise fund at their own cost; and/or providing certain quantities of “affordable” or social housing on the site. The authority may also notify that it intends to apply a time-limited specific tax, such as a Community Infrastructure Levy (CIL), to (at least)<sup>11</sup> properties in a development zone, once complete, which might have the effect of reducing their sales value.

A developer often returns to a planning authority to renegotiate the planning permission, especially Section 106 agreements. McAllister et al (2006) mentions anecdotal evidence of landowners accepting a planning permission, knowing it to be unworkable, simply to “bank” land with planning permission, with every intention to renegotiating it later. Such renegotiation happens sufficiently often, especially around the affordable housing requirements of such agreements, that the Growth and Infrastructure Act 2013 was passed making explicit provision in relation to appealing the affordable housing terms of Section 106 agreements. As set out in DCLG (2013),<sup>12</sup> what typically happens is that a developer might argue that the agreement as made is no longer economically viable. The procedure exists in part to stiffen the resolve of the local to avoid giving in too easily to such appeals.

Inevitably, the negotiation between a developer and a local authority over such planning permission is a situation of asymmetric information. A negotiation between two parties, where one holds an informational advantage over the

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<sup>10</sup> McAllister, P., Street, E. and Wyatt, P. (2016) An empirical investigation of stalled residential sites in England. *Planning Practice and Research*, 31 (2). pp. 132-153.

<sup>11</sup> CILs can also apply more widely including to existing properties, typically when those properties will enjoy betterment from infrastructural improvements the local authority is funding.

<sup>12</sup> Department of Communities and Local Government (DCLG), (April 2013), *Section 106 Affordable Housing Requirements, Review and Appeal*.



other, inevitably results in the advantaged party gaining a rent from possession of that information. This follows directly from the standard results of game theory, as set for example in Laffont & Tirole (1993),<sup>13</sup> which are more or less impossible to avoid. We learned above from Guthrie (2010), that the prospect of earning a super-normal rent is a further source of delay in development arising under the real options understanding of development options. The possibility of renegotiation with a local authority presents such a prospect.

Another aspect of negotiations over development situations is that parties to negotiations typically do not exhibit economic rationality, in the sense of maximising their expected financial returns. Zillante et al (2019)<sup>14</sup> studies negotiations between developers and landowners, when the developer is trying to assemble a suitable package of land from multiple landowners to be valuable for development. The situation can be difficult for the developer if some landowners refuse to sell, leaving an undevelopable or much less valuable opportunity. But it can stand also for negotiations with other parties, such as local authorities, who have particular interests of their own in the outcome of the development.

The authors find that the landowners act to minimise their risk, rather than maximise their expected return. We can expect similar behaviour by other parties subject to negotiation with developers. A variety of outcomes can arise from this “economically irrational” behaviour by certain negotiating parties, depending upon the precise situation. One might be that the developer can exploit this to increase its return from the negotiation. But it is also possible that there is no longer such a broad intersection, or any intersection at all, of outcomes from the negotiation which are acceptable to both parties. The result can be prolonged negotiations. It may also explain why from time to time the practical way of proceeding to a development in the public interest is for a council to apply its compulsory purchase powers.

A common origin of developers’ desire to renegotiate is an economic or market downturn, such that the new properties can no longer be sold for what was previously anticipated. Major examples of this occurred with the 1990s construction recession which followed the “Lawson boom”, the global financial crisis from 2008, Brexit uncertainty from 2016, Covid, etc. It is clearly a genuine effect. The extended downturns of the 1990s and the global financial crisis clearly resulted in extended delay to developments previously intended to start in these periods. With numerous projects banked, it can take some time after the end of such a period for a particular development to become attractive to the market again.

Site specific issues which can cause delay, and potentially also reduce the value, including the provision of infrastructure required to facilitate the development, remediation of previous pollution on the site, gaining environmental consents, and so forth.

Basic infrastructure such as water and electricity can be much more of an impediment than simply building the required networks on site. This is usually not a problem at all, and would in effect be funded in some way by the future occupiers of the property. Impediments usually lie further up the network, in terms of sufficient supply and delivery capacity. The problems are most acute in water. The general issue is of sufficient national concern that the National Infrastructure Commission recently carried out a study, NIC (2020),<sup>15</sup> on infrastructure to support housing and how to try and reduce the risk of it becoming a blocking factor.

Financial constraints arise because some large development sites would require very large amounts of capital if the whole site was developed before any sales occurred. This would also result in large financing costs for work in progress. It is much easier to finance developments if they can be delivered in a continuously rolling fashion with each tranche of sales of newly completed properties financing the next tranche. Alternatively, a site might be divided into various explicit phases. Other sources of large amounts of work in progress can be when a site requires large amounts of preparatory works for the whole site – for services and infrastructure for example – rather

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<sup>13</sup> J.-J. Laffont and J. Tirole, (1993), *A Theory of Incentives in Regulation and Procurement*, MIT Press.

<sup>14</sup> A Zillante, DC Read, MJ Seiler, (2019), Using prospect theory to better understand the impact of uncertainty on real estate negotiations, *Journal of Real Estate Research*.

<sup>15</sup> National Infrastructure Commission (NIC) (2020), *Infrastructure to support housing*

than delivering those in a phased fashion. Large apartment blocks are thus harder to finance, especially in coordinated developments which might mean many parts of multiple apartment blocks being developed together.

McAllister et al quote a study by DTZ (2009)<sup>16</sup> suggesting that once the financial crisis had begun, there was not a single location in the country where the market for apartments was sufficiently strong that a large unphased apartment development was financeable. This also makes us realise that movements in the finance market can make such large schemes easier or harder to finance. In 2009, it was especially difficult to obtain finance for any financial scheme, even if profitable, because of liquidity constraints the global financial market. The capacity of the financial markets to finance simultaneous construction projects in one market is also relevant. Large schemes with large work in progress are likely to suffer delay to bring finance together, and the quantity that can occur coincidentally can be limited by financial constraints.

## **1.5. CONCLUSIONS**

The understanding of development land as a “real option” presents a number of economically rational reasons why owners of land suitable for residential development may take time to develop that land, especially when the property market is volatile. This also interacts with the market imperfections of the land market to import further delay, because landowners have good reason to expect super-normal profit from their land and may wait in hope of the situation moving in their favour.

A large source of imperfection in the land market is the planning system. A major source of delay is that planning authorities negotiate with developers to obtain some of the planning gain for public benefit. The prospect of renegotiating these agreements, and the informational advantages they hold, gives developers further reason to delay in the hope of negotiating a better outcome.

Alongside this, a number of external or unpredictable factors can occur to import further delay. These include changes to the property market, site-specific issues including infrastructure, land remediation, and environmental concerns.

The finance markets also present constraints. It is harder to finance schemes with large capital requirements to finance work in progress, and for numerous such schemes to occur simultaneously. Movements in the capital markets can tighten these constraints from time to time.

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<sup>16</sup> DTZ (June 2009) *Assessment of Scope for Affordable Housing Delivery from s106 in a Post Credit Crunch Residential Land Market*, Final Report to the Homes and Communities Agency. We have not been able to locate this study or an abstract of it, except what McAllister et al (2016) say about it.



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