Housebuilders' landbanks: Inventory, asset or hoard?

Article

Published Version

McAllister, P. (2025) Housebuilders' landbanks: Inventory, asset or hoard? Land Use Policy, 152. 107503. ISSN 1873-5754 doi: 10.1016/j.landusepol.2025.107503 Available at https://centaur.reading.ac.uk/122154/

To link to this article DOI: http://dx.doi.org/10.1016/j.landusepol.2025.107503

Publisher: Elsevier

Land Use Policy 152 (2025) 107503

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Housebuilders' landbanks: Inventory, asset or hoard?

Pat McAllister

Real Estate and Planning, University of Reading, UK

ARTICLE INFO

Keywords:
Landbanking
Housebuilder
Option agreement
Strategic

ABSTRACT

In the context of longstanding allegations of land hoarding and/or speculation, this paper examines the land holdings of major housebuilders. The paper discusses the concept of landbanking and potential motives for and consequences of holding land inventories. Through a descriptive analysis of quantitative, temporal data of the landbanks of leading, listed housebuilders, the paper analyses the land holdings of residential developers in both the US and UK. The analysis encompasses various aspects including the relative scale of their land holdings, the extent of land ownership compared to control (typically through options) and the evolution of these patterns over time. It is found that the main motives for holding significant land inventories could be operational, investment or anti-competitive but that holding land also comes with opportunity costs and risks. Despite operating in a highly imperfect land market and restrictive planning regime, the large UK housebuilders have been able to maintain significant and relatively stable landbanks. In comparison, the US has seen a major shift towards land-light strategies. US housebuilders increasingly rely upon relatively short-term options, rather than outright land ownership, to secure their pipeline of development plots. The shift primarily aims to hedge risks associated with holding land. Although the comparative evidence is limited and imperfect, it generally indicates that UK housebuilders tend to maintain smaller land inventories compared to their counterparts in the US, Australia, and Ireland.

1. Introduction

In the post-war period, claims of landbanking, speculation or hoarding by the UK's large residential developers has been a repeated refrain from politicians and academics. In recent years, linked to a widely perceived housing crisis centred around affordability, the issue has become, if anything, even more politically salient. In the latest regulatory investigation of their practices, the housebuilders' landbanks have been described as "of a very significant scale" by the UK's Competition and Markets Authority (2023), 66). Although similar claims about the behaviour of residential developers and major land owners have frequently been made in other housing markets where there are similar challenges around housing supply, there has been limited comparative analysis of the behaviours of residential developers across different markets. For the UK and US, the fact that the major suppliers of new housing are publicly listed companies that regularly disclose information on their land holdings as well as broader financial and operational performance provides an opportunity to examine and contrast the nature and extent of their land holdings. This analysis can help us to understand how these holdings have evolved over time in response to changing market conditions and institutional structures.

The paper begins by providing an overview of the historical and contemporary contexts of the landbanking debate in the British residential development sector. Drawing upon related academic and grey literature, the concept of landbanking is 'unpacked', the potential rationales that might explain why housebuilders maintain such apparently extensive land inventories are evaluated and previous empirical findings on the nature of the volume housebuilders' landbanks are discussed. In the following section, data on the landbanks of prominent, publicly listed, British housebuilding firms is presented and analysed. The analysis of data on their landbanks extracted from their annual reports is complemented by brief excerpts from these documents. The size, value and composition of their landbanks are analysed for the period from 2007 until 2022. The primary research objective is to offer empirical evidence for a deeper understanding of the market context and institutional landscape surrounding the landbanking controversy. The size, value and composition of their landbanks are analysed for the period from 2007 until 2022. In the next section, to provide a comparative perspective, the focus shifts to the three largest US listed residential developers. For the period from 2006 until 2022, the changing size and composition of their landbanks is analysed and compared to the British firms. Some evidence of the landbanks of Australian and Irish

E-mail address: p.m.mcallister@reading.ac.uk.

https://doi.org/10.1016/j.landusepol.2025.107503
Received 13 October 2023; Received in revised form 4 February 2025; Accepted 6 February 2025
Available online 12 February 2025

housebuilding firms is also briefly noted. Finally, the paper draws conclusions based on the findings of this analysis

It is important to note that the research does not intend to conduct causal analyses that isolate and measure the impacts of variables like planning regulations or market structures on the composition and size of landbanks. Similarly, it does not aim to isolate and measure the effects of landbank size and composition on outcomes such as housing supply and market prices. The analysis examines factors such as the relative scale of their land holdings, the extent of land ownership compared to control (through options) and how their landbanks have evolved. In essence, this research is predominantly exploratory in nature, seeking to shed light on the different dimensions of the landbanking controversy through a detailed examination of quantitative, temporal data.

2. The landbanking controversy in britain: the historical and contemporary contexts

Using some of Adam Smith's phrasing, since the 1980s the UK's housing (albeit not housing land) supply has mainly been left to the 'invisible hand' with private housebuilders producing new dwellings in their own financial interests rather than from their benevolence. As Callcutt set out explicitly in 2007 in one of many government-commissioned reports relating to housing supply,

> "Housebuilders are not in business to serve the public interest, except incidentally. Their primary concern is to deliver profits for their investors, now and in the future – in other words, to ensure that their business is a good investment. Housebuilding executives are answerable to their investors, not to Ministers or the wider public…It follows that Government is not in a position to place general delivery obligations on housebuilders…" (Callcutt, 2007, 4)

Adam Smith also recognised that businesses could also be inclined towards conspiracies "against the publick, or in some contrivance to raise prices" through monopolistic or oligopolistic behaviours (Smith, 1776, 660). It is the latter which has been a recurring theme in most analyses of sector.

In the last two decades, possibly more than any other business sector, the activities of the volume housebuilders have been subject to a great deal of political scrutiny. Much of this scrutiny has focussed on a long-standing suspicion of market manipulation through land hoarding. This has been a longstanding concern. As long ago as 1947, the Lewis Silkin, then Minister for Town and Country Planning justified a development charge on land value uplifts arising from planning consent in the following terms

> "…the reputable builder does not normally look for his profits to the sale of land. He expects to make a profit out of his building operations…In so far as he does look to making his profits out of the sale of land, this is a practice which I regard as undesirable,"[1]

White (1986) identified the popular perception during the early 1970s boom/bust period that the volume housebuilders made windfall gains from rising land prices through speculative hoarding. In 1974, it was pointed out in the *Investors Chronicle* that,

> "Despite appearances, housebuilding is only partially the business of putting up houses. The houses are the socially acceptable side of making profits out of land appreciation. In extreme cases…no houses were built at all and the profit was taken in the disposal of land bought at much lower cost". (Investors Chronicle, 8 January, 1974 quoted in White, 1986, 108).

The increasing consolidation of the sector and growing controversy about the land market stimulated a body of academic research on the issues (see Rydin, 1984; Smyth, 1982; Ball and Cullen, 1980). Rydin (1984) identified the dual role of landbanks in meeting the "production interests" of volume housebuilders as well as generating "financial interests in land". However, following the publication of the Barker and Callcutt reviews in 2004 and 2007 respectively, an investigation by the Office of Fair Trading (2008) largely confirmed the broad findings of the previous reviews.

In 2008, the Office of Fair Trading concluded that there was little evidence of competition problems in the housebuilding sector or persistent or widespread market power. It found that barriers to market entry seemed to be low concluding that landbanking reflects the need for firms to have a pipeline of land at different stages in the development process. Nevertheless, possibly fuelled by the Local Government Association's periodic claims over the last decade about unimplemented planning consents and the Home Builders Federation's periodic forceful rebuttals, the landbanking issue has remained controversial. When Prime Minister, Theresa May stated in a speech[2] in 2018

> "I want to see planning permissions going to people who are actually going to build houses, not just sit on land and watch its value rise…I expect developers to do their duty to Britain and build the homes our country needs."

However, the Letwin review in 2018, which her government had commissioned in late 2017, also found little evidence of market power by the large housebuilders. The most recent research on the issue for the Scottish Land Commission published in 2020, concluded that

> "…overall, the evidence suggests that commercial housebuilders and other builders in Scotland are only 'landbanking' permissioned land in a way that is necessary to support their production process. They are not doing so in a profiteering sense." (Chamberlain and Walker, 2019, 6)

Nevertheless, in November 2022 the Minister at the Department for Levelling-Up, Housing and Communities wrote[3] to the Competition and Markets Authority (CMA) urging them to consider another study into the housebuilding sector. In its subsequent Update Report in August 2023, the CMA (2023, 61) concluded that the "housebuilders' practice of holding large 'landbanks'" merited a market investigation reference.[4]

The landbanking debate in the UK has mainly been centred on whether large housebuilding firms hold land inventories that are larger than required for efficient supply chain operations. However, hoarding tends to be presumed rather than evidenced. The housebuilders' motives for owning and controlling potential development sites more than the quantity required for operational purposes are then assumed to be for a range of interlinked anti-competitive and/or speculative reasons. The ownership and/or control of prospective housing development sites by housebuilders can potentially serve several purposes for housebuilders. In addition to inventory management, it ensures that their competitors cannot develop these sites. Secondly, development sites are investment assets in their own right with the potential to generate both significant financial gains and losses for their owners.

[1] Details of this speech can be viewed at TOWN AND COUNTRY PLANNING BILL (Hansard, 29 January 1947) (parliament.uk)

[2] Details of the speech can be found at https://www.gov.uk/government/news/pm-speech-on-housing-to-set-out-changes-to-planning-rules. In a similar vein, in an earlier speech in 2017, the Minister for Communities and Local Government stated "I've been very clear about the need for an end to unjustifiable land banking…It's a time of national shortage, and in this kind of time British people will not look kindly on anyone who hoards land and speculates on its value, rather than freeing it up for the homes our children and grandchildren need." (See https://www.gov.uk/government/speeches/sajid-javids-speech-on-the-housing-market.)

[3] The letter can be viewed at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1121939/Nov_-_Letter_to_CMA_CEO_from_SoS_DLUHC.pdf

[4] Details of the Competition and Markets Authority's investigation can be found at https://www.gov.uk/cma-cases/housebuilding-market-study

An almost inescapable consequence of owning or controlling potential development sites is that actual or potential competitors are unable to develop them. In a housing market where land supply is constrained, the argument is that reduced competition from other housing suppliers can enable housebuilders to gain dominant positions in local markets and, to some degree, 'make' rather than 'take' sale prices. At a site level, there are repeated claims that developers attempt to manage build out rates to ensure that the quantity supplied does not result in falls in price levels. The presence and rationale for the latter aspect of land-banking behaviour is implicitly conceded in the most recent report on land-banking by Paul Chamberlain and Chris Walker for the Scottish Land Commission.

The central argument in this report posits that winning bidders for development sites must assume a combination of expected lower costs, higher sale prices and/or lower minimum required return compared to their competitors to remain competitive in the land market. If developers subsequently flood the market with completed houses, causing prices to drop, not only will early homebuyers find themselves in negative equity, but developers themselves will struggle to achieve their minimum rate of return. This implies that housebuilders have a strong incentive to, *where there is limited competition from other suppliers and they have some control over the level of supply*, try to manage supply to prevent price declines. As they put it,

> "To increase sales rates, housebuilders would need to sell into the market at a lower price than envisaged when purchasing the site. This would simply serve to reduce profitability (possibly to loss) and so damaging investment. The residual land value that housebuilders use means that the initial land outlay is made before the production starts and is calculated on the basis of estimating sales values and production costs." (Chamberlain and Walker, 2019, 17)

With the implication that it is the rate of build-out at which initial sale price levels are at least maintained, the Letwin review[5] (2018, 8–9) described the market absorption rate as a "binding constraint" and argued that

> "…forcing the major housebuilders to reduce the prices at which they sell…would, in my view, create very serious problems not only for the major housebuilders but also, potentially, for prices and financing in the housing market, and hence for the economy as a whole".

An additional potential incentive to delay development of vacant sites can also be found in the real options literature on investment timing. Drawing Titman (1985), there is a body of literature applying insights from real options theory to analyse the behaviour of owners of undeveloped sites. Essentially, such studies assess the trade-offs between the costs of owners' decisions on whether to sell a site to a developer are analysed in terms of weighing the opportunity costs associated with keeping plots undeveloped and the anticipated gains from delaying a sale until more favourable market conditions emerge. This body of research indicates that the value of the effect call option to wait (i.e., hold back land from development) increases in more volatile market conditions potentially shedding light on why some sites remain undeveloped. Research into optimal phasing and inventory management in real estate development suggests that, especially for owners of large and/or multiple sites, it can be economically rational to release land gradually over time (Hughen et al., 2012). More recently, building on the extensive literature applying real options theory to development decisions, Guthrie (2020), (2022) has drawn up investment timing models to derive equilibrium development policies and land values to generate recommendations for policy makers. In this context, a notable conclusion based on real options modelling is that, in contrast to the conventional wisdom, a monopolist landowner may develop land faster, with lower building density, than a welfare-maximizing urban planner.

One of the costs and risks associated with land inventories is that, typically, many sites cannot be developed immediately following acquisition tying up capital for extended periods and exposing owners decreases in values. It may be possible to commence housing construction soon after acquisition in only a relatively small proportion of plots in short-term landbanks. In terms of the level of 'shovel readiness' and 'implementable consents', plots may be on sites where: build-out is underway; on-site and off-site hard and soft infrastructure is still required; mobilisation is still occurring; the developer does not yet own the site and; there are outstanding planning conditions and issues to be resolved. In addition, short-term landbanks will contain some sites where development is no longer financially viable due changes in market conditions and/or where the developer is attempting to renegotiate the terms of the original planning consent.

It is important but difficult to avoid conflating motives with the consequences of holding landbanks. The challenge is then to identify the housebuilders' dominant motive for owning and controlling development land. Perhaps too obviously, it should be pointed out that these land strategies are not mutually exclusive. Obtaining the various potential benefits and costs of land ownership are unavoidable consequences of holding land. Owning development land provides the pipeline of plots essential for future operations, excludes competitors from developing those sites, enables developers to try to influence sale prices through their build-out rate and provides an opportunity to generate returns from land investment. Controlling land without planning consent through option agreements provides the opportunity both to manage 'planning risk', to acquire development land in the future and to prevent competitors from acquiring sites.

Despite the investigations and numerous reports on housing supply cited above that were looking for evidence of such behaviours, some of the recent academic literature has tended to be largely concerned with perceived market rigging and excess profits. Despite the fact that the volume housebuilders generate the vast majority of their revenues from the sale of completed dwellings, there seems to be continuing inference that land speculation is, in some respect, a key component of their business model. For instance, echoing the comment quoted above made in 1974 in the Investors Chronicle, in 2012 researchers continued to assert that the "overriding concern for UK housebuilders is with the trading of land as a source of profit" (Moore and Adams, 2012, 214). Archer and Cole (2021), (1384) focus quite narrowly on the growth of dividend payments by the volume housebuilders in the market recovery between 2014 and 2017 emphasising "…the pervasiveness of global finance, and the scale of capital extracted through the housing production process". Colenutt (2020) framed the problems of the contemporary UK housing market in terms of the power of a finance-housebuilding complex and associated property lobby that was argued to be the main source of the crises in affordability, choice, design, quality and location. In contrast, in international comparisons of the structure of the residential development sectors, Ball (2003), (2013) has drawn a tentative or speculative conclusion that it is the impacts of a restrictive planning system on the land market in the UK have resulted in oligopolistic tendencies manifested in vertical integration and concentration in the private housebuilding sector.

As discussed above, one of the most controversial and contested issues in the housing supply debate has been a common refrain that the large volume housebuilders act in an oligopolistic manner in the land market. McAllister, Shepherd and Wyatt (2022) examined the market participants granted planning permission. Using one year of Glenigan data (June 2018 – June 2019), the research found that in this period, of a total of 453,277 units granted outline consent on sites of 100 units or more. With no distinction made between different sizes of housebuilders, it was found that housebuilders were not dominant players in the *strategic* land market during the sample period accounting for 35 % of plots granted outline consent in sites with over 100 units in this

[5] In 2018, a Conservative Member of Parliament, Sir Oliver Letwin, led an investigation into the delivery of housing on large development sites.

period. Similarly, Lichfields and LPDF (2018) estimated that, as of January 2018, there were 541,000 total dwellings on 'live' sites of over 100 units outside London. Housebuilders were the applicant for outline planning permission for 175,000 units (32 %). It was the larger housebuilders who tended to have the majority – consent for 121,500 units (22 % of the total; 69 % of all housebuilders) were obtained by the top 25 housebuilders.

Many of the issues discussed above were incorporated in a wide-ranging paper focusing on profitability of the leading housebuilders in the UK, Foye and Shepherd (2023) drew upon a blend of quantitative and qualitative data to provide a descriptive analysis of their financial and operational performance since the GFC. The paper emphasises the role of housebuilders' oligopsonistic power in the housing land market in acquiring their landbanks. Data on their landbanks is illustrated with the discussion focussing mainly on the strategic landbanks. It is concluded that the size of the housebuilders landbanks is broadly correlated with their number of completions implying that "the main reason why the VHBs buy more land is to build more homes" (Foye and Shepherd, 2023,10). In addition, it is argued that the planning risks and opportunity costs of holding land mean that there is limited incentive to hold land for speculative motives. Nevertheless, other aspects of landbanking are also emphasised and it is argued that it is "certainly the case that housebuilders benefit from the asset value of the land they own increasing over time, and that…they are incentivised to manage build-out rates to maximise the value of the land component of the price of new homes." (Foye and Shepherd, 2023, 10). Given that the housebuilders' landbanks were not the focus of the research, it is perhaps expected that the level of analysis of this specific issue lacks depth.

In the most recent research at time of writing, the market study of the housebuilding sector by the Competition and Markets Authority in the UK has generated a body of rather inconclusive analysis on the large housebuilders' land banks. Using their "information-gathering powers", the CMA were able to produce a working paper based on data on more than 5800 individual sites held in the land banks of 11 of the largest housebuilders and to obtain a more detailed overview of land banks across Great Britain than is possible from public data alone (CMA, 2023). The working paper reported that the 11 largest housebuilders own or control land equivalent to around 1.17 million plots of which strategic land represented an estimated 658,000 plots, while the short-term land banks consisted of approximately 522,000 plots. However, the CMA struggled to draw any firm conclusions from their analysis of the data. On the central question of the appropriate size of land banks required for housebuilders' operational purposes, they stated that they were still considering how the size of these housebuilders' land banks compares to what would be expected if the primary purpose of the land banks is to allow housebuilders to manage their development pipelines. They identified about 10–15 (out of 340) local authorities where there were some concerns that there is potentially too much concentration of land ownership and/or control by a small number of firms. Overall, they were quite tentative about inferring too much from these findings as local authority boundaries may not always reflect housing submarkets and/or there may be local circumstances that have led to local concentration.

3. Analysis of the landbanks of the leading listed British housebuilders

Accounting for approximately half of new build completions by private enterprises in the UK, the seven largest listed housebuilders normally provide data on their landbanks in their annual reports. This is usually expressed in terms of number of plots, number of years' supply at the current completions rate and estimated value of the land holdings (reported at the lower of net realisable value or cost). Consequently, data on the land holdings of the leading listed housebuilders has been obtained from the companies' annual reports. A legal requirement, a publicly listed company's annual report is a publicly available document that sets out the company's financial condition and operations over the previous year. Typically, their land holdings are reported both as key financial (value of assets) and non-financial indicators (typically number of plots or years' supply at prevailing completion rates).[6] The reporting of the size of the land bank in terms of plots or year's supply tends to have a prominent position in the listed housebuilders' annual reports due to its operational as well as financial importance. However, detailed data on the location and other attributes of sites is not published and there can be inconsistencies in the classification of sites.

The companies use different labels and classification to distinguish between sites that can be developed in the short-term and sites that are expected to only become available in the longer term. A range of criteria are used by different housebuilders to categorise sites – with detailed planning permission, outline consent, resolution to grant, owned, controlled, under conditional contract, allocated in an emerging plan etc. Nearly all of the companies have categorised their land into one of two 'buckets' that can broadly be defined as short-term or strategic.[7] Fig. 1 presents the number of short-term land plots. The total number of plots held by the seven leading listed housebuilders in 2022 is 415,715. This is broadly consistent with the figure of 522,000 estimated by the CMA for the leading 11 housebuilders in later 2023.

There is little evidence here to suggest that the volume housebuilders have been significantly increasing the absolute size of their land holdings in the last fifteen years. Broadly, in terms of holdings of plots of short-term land, in absolute terms the leading listed housebuilders decreased their land inventory between 2007 and 2012 by approximately 35 %. As the housebuilders themselves and the housing market recovered from the GFC, both their completions and landbanks have expanded. A notable outlier here is the Berkeley Group. Whilst their land holdings decreased from c30,000 units in 2007 to c24,000 units by 2014, there has been a dramatic expansion since then to over 66,000 units in 2022. This has not been accompanied by any comparable increase in completions. The Berkeley Group reported 3742 completions in 2014 compared to 4632 in 2022.

Fig. 2 illustrates the ratio of completions to plots of short-term land in a specific year. It is worth noting that spikes in the ratios can be caused by relatively short-term drops in completions as well as short-term increases in the landbank. This is illustrated in 2020 when the fall in completions due to the pandemic led to an increase in the ratio of plots in the land inventory to completions. The increase in the relative size of the landbank (as by measured by number of plots per completion) can increase without any change in the absolute number of plots. In a market downturn, depending on the difference between decrease in completions and decrease in number of plots in the land bank, it is possible that the land bank can grow in relative terms and fall in absolute terms. For instance, in June 2019, Barratt reported 17,856 completions in the preceding year and a short-term landbank consisting of 80,022 plots representing 4.48 plots for every completion. In June 2020, completions had fallen to 12,604 with the land bank consisting of a similar number of plots (80,324) representing nearly 6.4 plots for every completion in that year. It is likely that the relative 'stickiness' of the size of the land

[6] In this context, there is no reason to suspect that the information on their land holdings provided by the listed companies is unreliable. Incorporating misleading statements and/or creating false or misleading impressions would be classified as market abuse and could involve a criminal offence. A great deal of academic research on the performance, attributes, structure etc., of individual companies or market sectors is based upon data (much of it subject to audit) included in corporate financial reports.

[7] An exception here is Bellway who categorise their sites into three 'categories - sites with detailed planning consent, 'pipeline' sites which do not have a detailed planning consent but where development is expected to commence in the next three years and strategic sites, typically held under option, which are expected to become available in the long term. In the absence of more detailed data, all Bellway's plots classified as 'pipeline' have been included in the short-term landbank estimates.

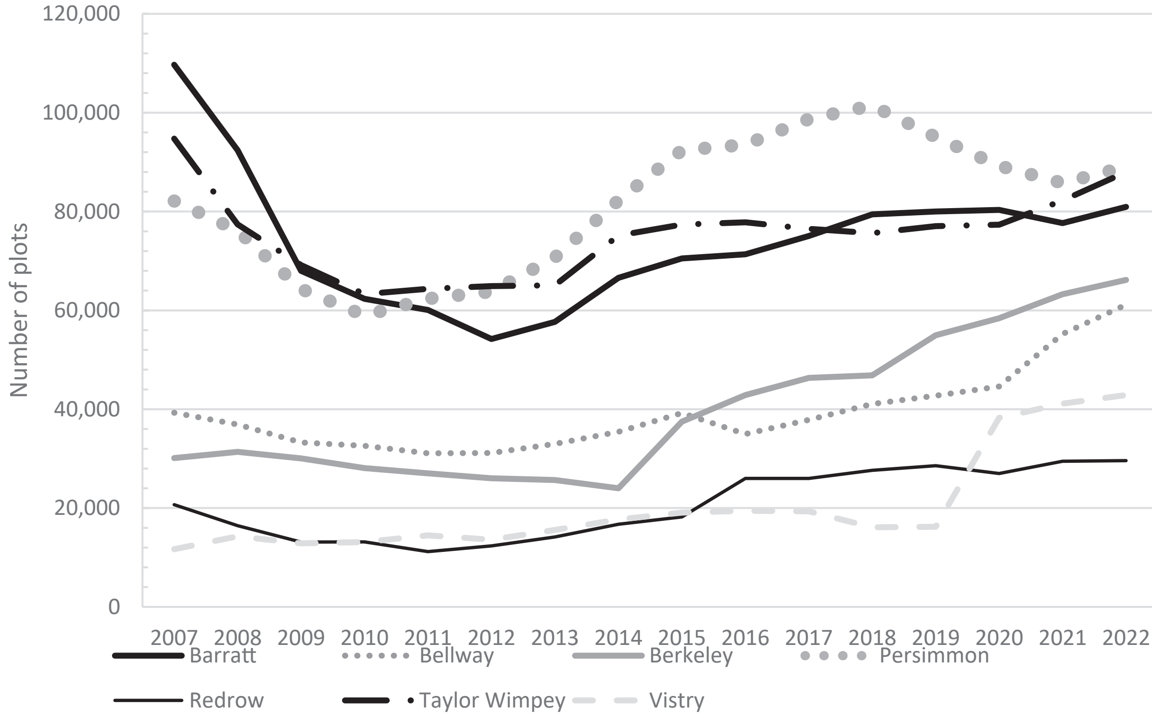

Fig. 1. Listed Housebuilders (Short-term land plots).

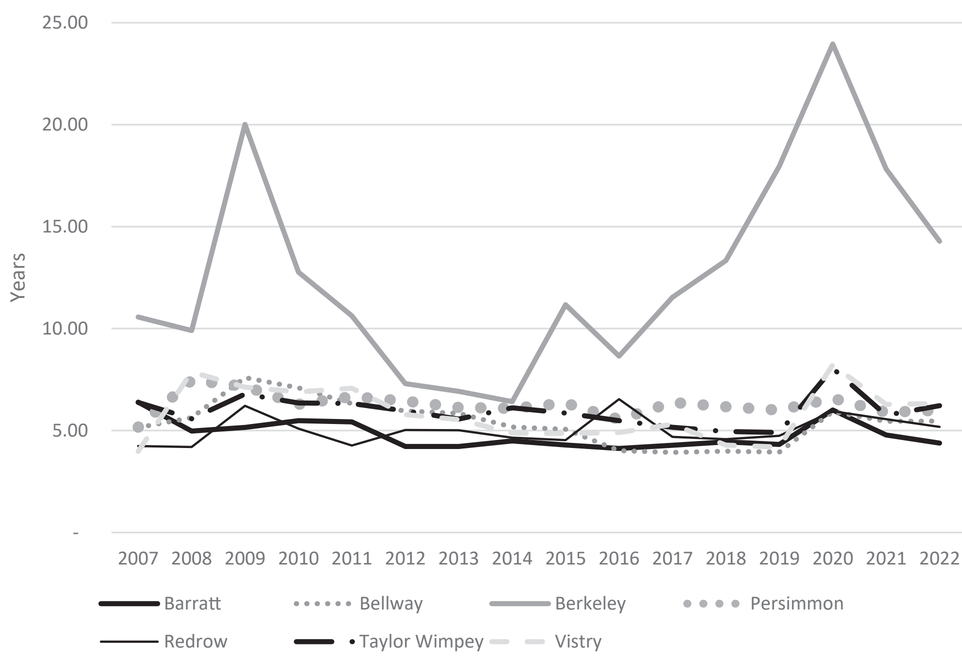

Fig. 2. Short-term Landbanks (Years).

inventory compared to housing completions constricts the ability of housebuilders to adjust their land inventories at the same speed as their output. A similar fall in completions relative to the fall in land holdings led to increases in the ratio of land plot holdings to completions following the GFC in 2008–9. The pattern is broadly consistent with the data on number of plots. On average, for this metric there has been little change in the size of the short-term land holdings over the last 15 years. In 2007, the average land inventory was 5.98 years of completions. This had increased to 6.83 years in 2022. However, it is worth noting that Berkeley is an outlier here and tends to distort the figures. If excluded, the comparable figures are 5.21 and 5.59. However, the relationship between in changes in output and landbanks is not necessarily always pro-cyclical. For instance, in 2020, like Berkeley Homes's strategy following the GFC, Taylor Wimpey issued new shares in order to raise capital to invest in the land market. Their 'contrarian' rationale was that,

> "While the Company, with its strong fundamentals, is proving its resilience and seeing positive forward indicators, there are already signs of dislocation within the land market resulting from the pandemic. There are a significantly reduced number of potential land

buyers able and willing to transact, already resulting in the availability of more opportunities at lower prices." (Taylor Wimpey, 2020, 2)

The clarity of reporting regarding the strategic land inventories of listed housebuilders is less consistent compared to data on short-term land holdings. In addition to the issues with the short-term landbanks such as variation in reporting dates, definitions, and labels, given that strategic land by definition does not yet have a planning consent, a density assumption needs to be made in order to estimate the number of plots. Several annual reports explicitly set out the proportion of the strategic landbank that is *controlled* through options rather than being *owned* by the housebuilder (typically a significant majority is controlled through options when this is reported). A few annual reports also indicate the progress of sites in the planning pipeline, differentiating between those allocated for housing in an adopted or emerging plan and those that are not yet allocated. The units used for reporting can vary; for example, Barratt and Persimmon typically report their strategic land holdings in acres, while most other listed housebuilders use the number of plots as their metric. Bellway shifted to reporting the total number of strategic land plots from 2018 onward but previously reported only on strategic land plots with a "positive planning status." Nevertheless, across all the leading listed housebuilders, except Berkeley, there is a consistent emphasis in their annual reports on the proportion of their plots that come from their strategic land portfolios. Typically, this accounts for 25–50 % of their completions.

The acquisition by Barratt of the Gladman (previously the UK's largest independent land promotion business in January 2022) has changed the market landscape and introduced a new category into Barratt's land inventory – promotional plots. Barratt's 2022 annual report stated that "Following the acquisition of Gladman, the Group now holds a significant promotional land portfolio, encompassing some 93,696 promotional plots." To be clear, these 93,696 promotional land plots should be considered separately from their 91,440 strategic land plots. Nevertheless, Barratt view the promotional land portfolio as part of their pipeline. The 2022 annual report states that

> "Reflecting the changing needs and aspirations of land promotion partners, Gladman now offers the ability to convert promotional agreements into option, hybrid or freehold sale arrangements for all, or part, of their land promotion partners' holdings." (Barratt, 2022, 37)

In Fig. 3 Taylor Wimpey stands out as having the largest strategic landbank. They had 102,892 strategic land plots in 2007 which increased to more than 144,000 as of 31 December 2022. The data are *broadly* in line with CMA here (see CMA, 2023). A slight increase from previous years, Taylor Wimpey reported that 52 % of their completions come from strategically sourced land in 2022. It is notable that Taylor Wimpey's main competitors – Barratt and Persimmon – report comparable figures of 26 % and 36 % respectively for 2022. It is also reported that the net book value of the short-term landbank was £ 2.9 billion whilst, although the number of plots is much higher, the value of "long-term owned land" was £ 311 million representing 36,646 plots excluding a further total *controlled* strategic pipeline of 107,739 plots. It is expected that the option agreements are the most important approach used to 'control' sites.[8]

Turning to the other large, listed housebuilders, Bellway have also provided quite inconsistent data on their strategic land holdings. Their annual reports state that they had 3000 acres of strategic land in 2010 and 2011. Assuming six dwellings per acre of gross developable land, this would equate to 18,000 plots. At the end of July 2022, they reported that there were 35,600 plots in their strategic landbank. In contrast, Berkeley seems to have a relatively minor focus on strategic land. In their annual reports, they do not distinguish between short-term and strategic land as clearly as the other firms. Similarly, the CMA data is minimal for Berkeley.[9] In their 2023 annual report, it is stated that 91 % of their plots have an outline planning consent and, therefore, would not be classified as strategic land.

Apart from two of the largest, most of the private equity owned housebuilders do not report on their landbanks. At first sight, there seems to be an interesting distinction between Miller (owned by Apollo Capital Management, a large US private equity company) and CALA (owned by Legal and General, the UK's largest asset management company). At the last reporting period in 2022, having completed 3.027 dwellings CALA reported 21,678 plots (7.16 plots for every completion) in their short-term landbank and 11,150 plots in their strategic land portfolio. Miller (who completed 3, 921 homes 2022) had a smaller short-term landbank (13,914 plots representing 3.5 plots for every completion) but had a strategic landbank of over 39,000 plots. However, this large strategic landbank is largely attributable to Miller's acquisition of Wallace Land (an independent specialist land promotion business) in 2021 which nearly doubled the size of their strategic land inventory. Indicative of an increase in the market power of the leading housebuilders in the land market, like Barratt, Miller expect conversions of strategic land to short-term land from Wallace Land's portfolio of strategic sites to supplement the supply of short-term land.

Fig. 4 illustrates the *value* (adjusted for consumer price inflation) of the total land inventories of the largest seven listed housebuilders. Both owned strategic[10] and short-term land holdings are included. It is also worth noting that a substantial proportion of the land inventory will be the land component of dwellings which are under construction. As noted earlier, the value of the land holdings is reported at the lower of cost or net realisable value. This will mean that there may be a downward bias in the figures. However, it is notable that the Knight Frank Residential Development Land Price index reports around no growth in nominal terms in 'English Greenfield' land values since the start of the index in 2011 until March 2023. Starting in 2007, Savills' Residential Development Land Index,[11] illustrates how 'UK greenfield land values' nearly halved between June 2007 and 2009. Between 2011 and 2023, their index suggests that UK greenfield residential land values have grown on average by 2.5 %-3 % per annum. This is roughly the same as the annual

[8] Option agreements have been used for many decades by developers wishing to secure the right to purchase development land following the granting of a planning consent. Typically, the developer pays a relatively small cash payment to the landowner when an option agreement is signed. The option to purchase typically expires within five years from signing the agreement. The developer undertakes to execute and pay for the costs associated with the planning promotion of the site. If a planning consent is obtained, the developer has the right to purchase the site at a discount to its market value. Typically, the developer will pay 85 %-90 % of the site's market value.

[9] Reading from the line graph in the CMA Update report, only two data points are provided. For 2013 and 2014, a long-term landbank of around 10,000 plots is indicated. Berkeley's 2014 annual report states that "Berkeley's pipeline now comprises some 11,000 plots on 13 sites where delivery is dependent on resolving technical constraints, challenges surrounding vacant possession and/or securing planning consent." Its 2013 annual report states that "[T]here remain approximately 10,000 plots in Berkeley's longer-term land bank. This includes land under option which requires promotion through the planning system and long-term regeneration land under contract." It is possible that the sharp increase in the short-term land bank between 2014 and 2015 illustrated above may be due to a reclassification of some of the longer-term land bank.

[10] Where it is reported, a significant majority of strategic land is held under option and is classified as work-in-progress rather than as current assets in the financial reports.

[11] Details of the two residential land value indices can be found at https://www.savills.co.uk/insight-and-opinion/research-consultancy/residential-indices.aspx#development-land and https://www.knightfrank.com/research/report-library/uk-res-dev-land-index-q2-2023–10458.aspx

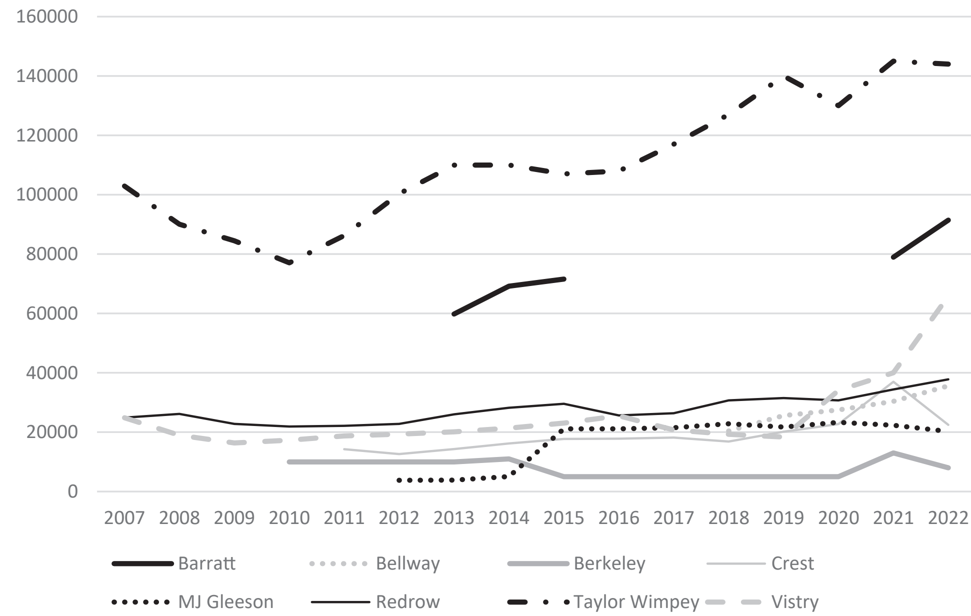

Fig. 3. Housebuilders' Strategic Landbanks (Plots).

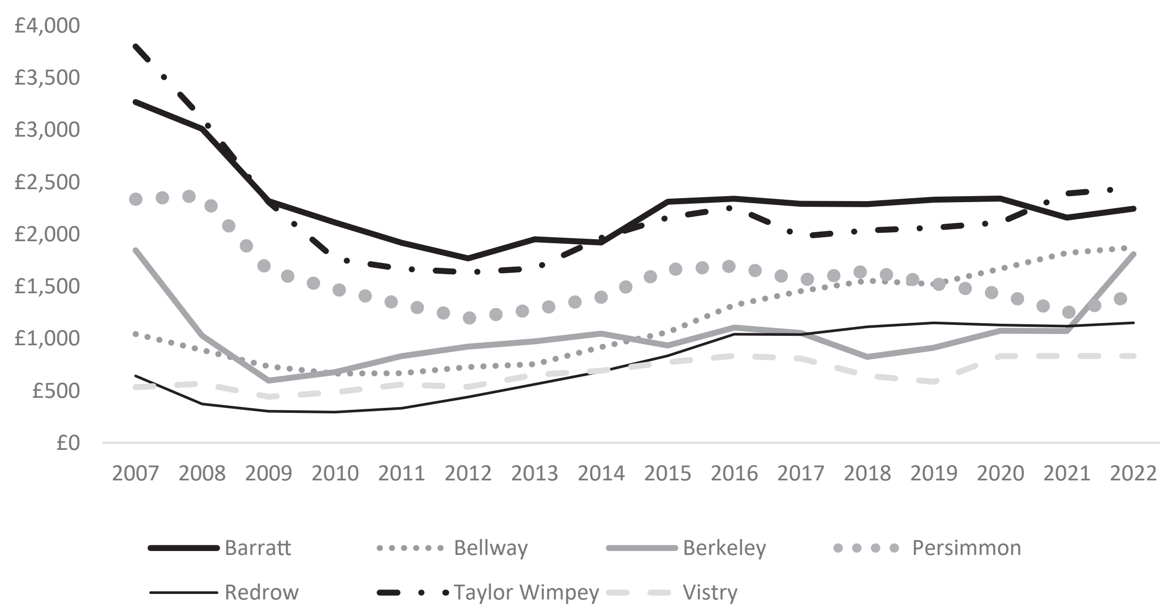

Fig. 4. Landbanks (Value in £m 2007 prices).

growth rate in consumer prices over this period. Whilst such averages conceal relatively short-term price falls and increases, at an aggregate level they are not consistent with significant speculative gains from holding large land holdings.

In 2007 prices, the leading listed housebuilders had land holdings valued at £ 13.5 billion. In 2012, the equivalent figure had fallen to £ 7.2 billion increasing to £ 11.8 billion in 2022 as output also increased. The three largest listed housebuilders in terms of annual completions have seen little change or falls in the nominal and real values of their land inventory over the whole period. Following the sharp falls in values and holdings after the GFC, they have remained broadly stable in real terms since 2012. In contrast to the three largest housebuilders (as measured by completions), the most significant changes have been in the smaller listed housebuilders (Redrow, Bellway and Vistry). As their numbers of completions have grown since 2007, their land inventories have also expanded. For Vistry, this has occurred through acquisition of smaller housebuilders. For Bellway, the growth in its land inventory is in line with the growth in its completions. Given the scale of their short-term land holdings compared to their completions, the Berkeley Group, the largest listed housebuilder in terms of market capitalisation, stated in their annual report that their operating model is "land-led". However, their relatively high focus on large, long-term regeneration sites in brownfield locations also differentiates them from the other volume housebuilders.

4. Analysis of the landbanks of the leading listed US housebuilders

Turning to the experience of the large US housebuilders, there is evidence that they increasingly perceive the inventory risks associated with tying up capital in their land holdings as a drag on their financial performance. Nathanson and Zwick (2018) have shown that most of the losses incurred by the leading US housebuilders during the global financial crisis were due to speculative investment in land. Between 2001 and 2005, the eight leading listed homebuilding firms in their study almost tripled their landholdings. Whilst their home sales increased by around 120,000, the number of lots in their landbanks increased by around 1,000,000.

> "The majority of the losses borne by home builders arose from losses on the land portfolios they accumulated from 2001 to 2005. In 2006, these firms began reporting write-downs to their land portfolios. At $24 billion, the value of the land losses between 2006 and 2010 accounts for 61 % of the market equity losses over this time period." (Nathanson and Zwick, 2018, 2614–5)

Subsequently, in the US, there seems to be a shift by the largest volume housebuilders towards, what are termed, 'land light' or 'asset light' strategies. Having sold 81,965 dwellings in 2021 accounting for approximately 10 % of total completions in the US, DR Horton owned 127,800 land lots (and *controlled* 402,400 plots representing 1.6 years of land required at prevailing sales rates. In 2013, the equivalent figure was 5.2 years of land required at prevailing sales rates. DR Horton set out the risks of their land inventory which is worth quoting at length in this context.

> "Inventory risks are substantial for our…businesses. There are risks inherent in controlling, owning and developing land. If housing demand declines, we may not be able to build, sell and rent homes profitably in some of our communities, and we may not be able to fully recover the costs of some of the land and lots we own. Also, the values of our owned undeveloped land, lots and inventories may fluctuate significantly due to changes in market conditions. As a result, our deposits for lots controlled through purchase contracts may be put at risk, we may have to sell or rent homes or land for a lower profit margin or record inventory impairment charges on our land and lots. A significant deterioration in economic or homebuilding industry conditions may result in substantial inventory impairment charges." (DR Horton, 2022, 16)

Albeit a similar statement has been included in every annual report since 2006, this provides some context for the major changes in the composition of their landbanks.

This pivot towards 'land light' operating models by the US leading volume housebuilders (DR Horton, Lennar and Pulte) has been facilitated by and, in turn, stimulated the growth of new intermediaries in the housing land market known as lot bankers. This relatively new kind of participant in the US housing land market has emerged to supply the demand from US volume housebuilders for, what could be characterised as, 'just-in-time' delivery of serviced development lots or parcels. Following payment of an option premium by the housebuilder to the lot banker, housebuilders have options to purchase serviced development plots from lot bankers at fixed prices and fixed dates. Private equity funds such as Jen Partners and Terra Firma are present in the lot banking sector. For Terra Firma,

> "US Land/Lot Banking represents a large and growing market opportunity for TFCC to take advantage of public and large private homebuilders' desire for asset-light balance sheets, just-in-time inventory and efficient use of debt facilities."[12]

Illustrating the interlinkages between institutional investors and private equity funds, following previous investments in JEN Partners' lot banking funds, in August 2022 MassPrim[13] invested $100 million in one of JEN Partners' new lot banking funds.

This market innovation in the housing land market has been associated with a significant shift in the land strategies and inventories of the largest, listed US housebuilders. As noted earlier, a structural trend in the US residential development sector has been the increasing market dominance of both Lennar and DR Horton. Including Pulte (the third largest developer), changes in the land inventories of the three US largest listed housebuilders are assessed in the context of changes in their output. Drawing upon data extracted from their annual reports, Fig. 5 displays the numbers of completions per annum for these firms since 2006. Fig. 5 is consistent with the market shares of two largest residential developers diverging from the others in the last decade. The familiar pattern of supply peaking prior to the global financial crisis in 2005–2006 is illustrated. However, a notable trend has been how DR Horton and Lennar have substantially exceeded their pre-global financial crisis output in the last decade. In contrast, Pulte's output peaked at nearly 46,000 closings in 2005 and was still 36 % below this peak in 2022. This is consistent with Ahluwalia et al. (2022) who found that DR Horton and Lennar had increased their share of the output of the largest 10 housebuilders from around one third to approximately one half. In the UK, by 2022 the output of the three leading housebuilders (Barratt, Persimmon and Taylor Wimpey) was slightly lower than its pre-global financial crisis peak in 2007. In contrast, in the UK, the proportion of completions by the largest three housebuilders as a proportion of completion has slowly decreased since 2009 from 77 % to 63 % of completions by the leading seven listed housebuilders. Echoing Barratt's acquisition of Gladman Land and Miller Homes' acquisition of Wallace Land Investments, it is also notable that in 2018 DR Horton acquired Forestar, a publicly traded master development company with operations in 56 markets across 23 states. The rationale seems clear given that, of the 15,915 lots that Forestar sold in 2021, 14,839 were sold to DR Horton.

In their annual reports, when reporting on their land inventories, it is notable that US housebuilders do not make the same distinction between short-term and strategic land holdings that is standard for the large, listed housebuilders in the UK. In the UK, whether a site has planning consent tends to be the key criterion. For US housebuilders, in their annual reports the main binary distinction is whether land lots are owned or controlled. It is notable that the planning status of lots is rarely commented upon in the annual reports of the US housebuilders.[14] Like the UK, controlled land or lots are typically lots on

which the housebuilder has an option to purchase in the future. However, following the discussion above, in the US the use of option agreements seems to be very different compared to the UK. In the UK, the housebuilder typically exercises their option to buy sites when an outline planning consent is obtained with an option period of five years being common. In the US, housebuilders typically can exercise their option to buy lots just before the commencement of construction according to pre-agreed take-down schedules. If sites were controlled in

[12] This quotation was extracted from a Terra Firma presentation. The presentation can be viewed at https://www.tfcc.ca/wp-content/uploads/2021/07/TFCC-Marketing-Presentation-June-2021–7.20.21.pdf

[13] Massachusetts Pension Reserves Investment Management (PRIM) Board manages the assets of a public employees' pension scheme. As of June 2022, it had approximately $92 billion of assets under management.

[14] In the annual reports of the US housebuilders, occasionally reference is made to the proportion of lots that are 'developed'. This seems to refer to whether the lots have appropriate services and site preparation for construction. DR Horton describe their options in the following terms "We also enter into land/lot contracts, in which we obtain the right, but generally not the obligation, to buy land or lots at predetermined prices on a defined schedule commensurate with anticipated home closings or planned development. These contracts generally are non-recourse, which limits our financial exposure to our earnest money deposited into escrow under the terms of the contract and any pre-acquisition due diligence costs we incur. This enables us to control land and lot positions with limited capital investment, which substantially reduces the risks associated with landownership." (DR Horton, 2022, 6)

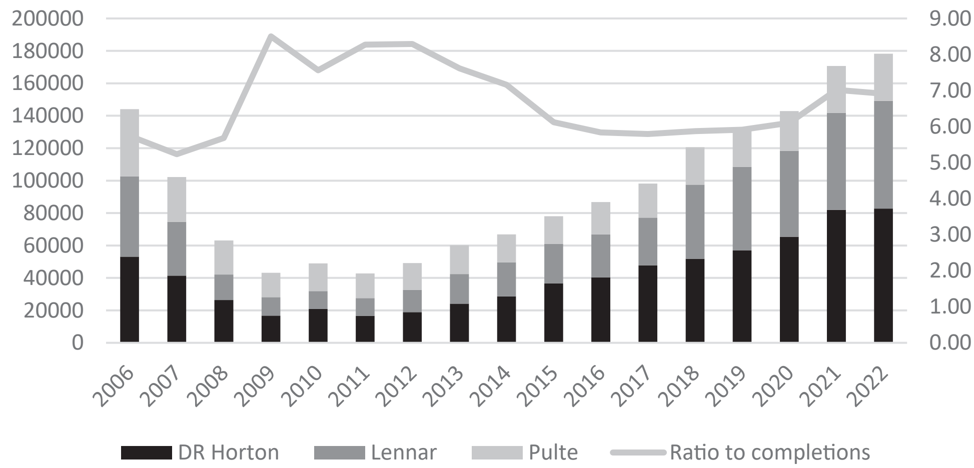

Fig. 5. Top 3 US Housebuilders: Total Completions and Lots Owned or Controlled.[15]

[15] For Figs. 5–7, all charts are based on data extracted from the companies' annual reports.

this way in the UK, they would be classified as short- term land holdings. In the US, development sites controlled by housebuilders through option agreements typically tend to have planning consent and be serviced. In the UK, typically they do not.

From the US housebuilder's perspective, there are two main advantages to acquiring development sites using options. Much of the inventory risk associated with market volatility, particularly downside risk, is transferred to a third party (often a lot banker) since housebuilders can decide not to exercise their option to acquire lots in the event of falling house prices and/or demand. In addition, option agreements provide for payments for land are phased and paid later as sites are built out rather than in advance of the commencement of build-out. The cost for these benefits to housebuilders is the price of the option payments which will, all else equal, increase their total development costs. When making this trade-off between the additional costs of option payments and delayed land payments and the option not to exercise, the US housebuilders repeatedly assert that, in addition to reducing their inventory risks, their rate of return on investment is increased. The option payment can be framed as the price that US housebuilders are prepared to pay to avoid the inventory costs associated with committing capital to owning land prior to build out. Consequently, a significant residential land market trend in the US over the last two decades has been a major shift from owning to controlling their development land pipeline through option agreements with lot bankers.

Figs. 6 and 7 display the numbers of lots owned and controlled by leading three US housebuilders between 2006 and 2022. As stated, the broad trend has been a shift from owning lots in their land inventories to controlling them through option contracts. DR Horton have been at the forefront of this shift. At the time of the global financial crisis and its short-term aftermath, they typically owned 75 %-80 % of their land lots. Since 2016, this proportion has fallen steadily and, by 2021 and 2022, their portfolio of owned land lots accounted for less than a quarter of their land inventory. In 2006, the leading three US housebuilders owned just over 53 % of the lots in their land banks. This figure peaked at nearly 84 % in 2011. Since this peak, the proportion of lots owned rather than controlled has been falling steadily and, by 2022, the leading three US housebuilders owned just under one third of their lots representing 2.28 plots for every dwelling completed in that year. In contrast, they controlled through options 4.63 plots for every dwelling completed in 2022 representing just over two thirds of their land holdings.

As noted earlier, the size of land inventories in the UK has been and continues to be a source of debate and considerable controversy. However, the data in Fig. 5 would suggest that the *short-term* land inventories held by US housebuilders have been and are often significantly larger as a proportion of their output than their counterparts in the UK. The divergence between the short-term land inventories of the US and UK volume housebuilders in the period following the GFC can be largely explained by the higher rate of decrease in completions by US housebuilders during the global financial crisis. Between peak supply in 2006 and its lowest point in 2011, total closings by the US 'Top 3' fell by 70 % whilst their total number of lots owned and controlled fell by 57 %. Illustrating the increased flexibility offered by optioned compared to owned plots, the former decreased by 85 % and the latter by 33 % between 2006 and 2011. With a different supply peak and trough, completions by the 'Top 3' UK volume housebuilders fell by 30 % between 2008 and 2012 with the number of plots in their short-term landbanks also falling by 34 %.

Data on the land holdings of housebuilders outside of the US and UK tends to be thinner. There has been research published on the landbanks of the listed Australian residential developers. Drawing upon the annual reports of the eight largest publicly-listed residential developers, Murray (2020) analysed data on their stock of residential lots approved or zoned for residential use for the period 2004–2018. With quite a lot of variation between the eight listed residential developers, Murray (2020) estimates that the average landbanks contained 13 lots for every completion. This ratio ranged quite widely among individual companies from an average of six years' supply to 17 years. Such large landbanks in relative terms are not unique to Australia. For instance, according to their annual reports both of Ireland's largest listed housebuilders, Cairn and Glenveagh completed 1526 and 1358 units in 2022 reporting landbanks with 16,800 and 15,000 plots respectively. The use of terms such as 'available' to describe the plots suggests that they would be classified as short-term rather than strategic land in a UK context. Compared to the approximately ten years' supply of plots in the landbanks of the largest Irish developers, the landbanks of the UK housebuilders seem relatively low rather than abnormally high in comparison.

5. Conclusion

Given the inescapable influence of prior beliefs and knowledge on observation, the empirical findings presented above are cautiously interpreted below. The landbanking debate in the UK essentially has been centred on whether housebuilders hold excessive land inventories for potentially anti-competitive or speculative reasons, or if their land holdings are necessary for efficient supply chain operations. Broadly, the landbanking charges are that housebuilders hold more land than

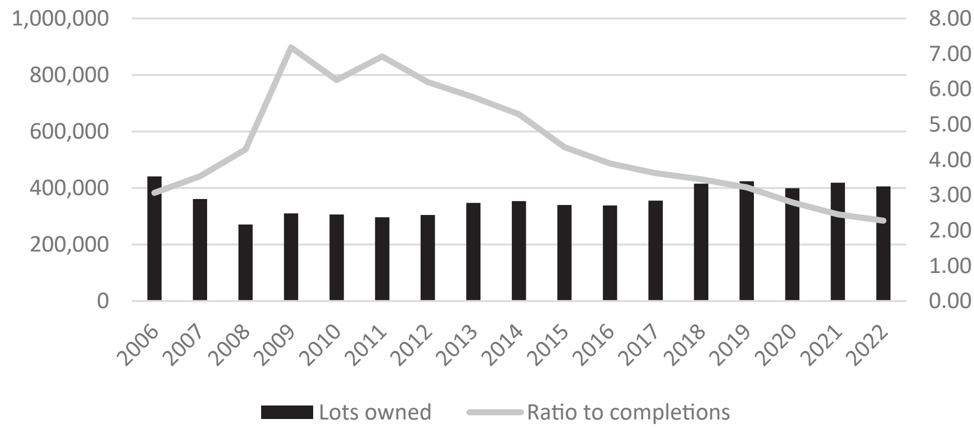

Fig. 6. Top 3 US Housebuilders: Lots Owned.

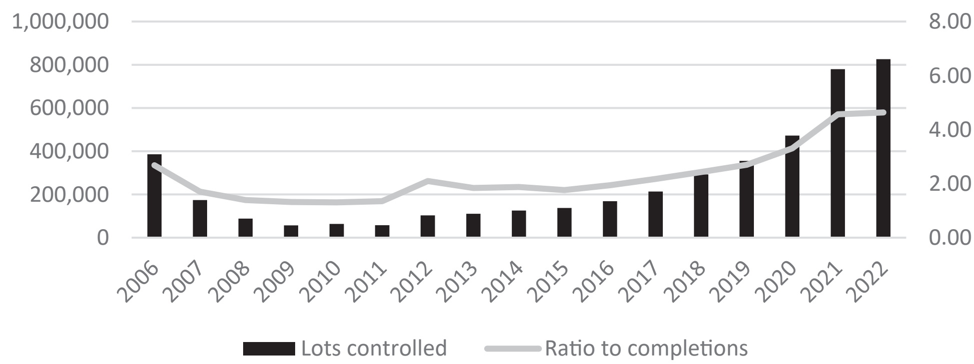

Fig. 7. Top3 US Housebuilders: Lots Controlled.

required for operational reasons in order prevent competitors from, entering the local market, increasing supply, introducing price and product competition, and taking market share. In addition to providing some ability to build out at market absorption rates that maintain sale prices at stable levels, a linked charge is that excessively large land holdings reflect land speculation or investment by the housebuilders who expect to benefit from increasing land prices as well as reduced competition. It is also important to bear in mind that these strategies or motivations can co-exist. Whilst it would be naive to assume that large volume housebuilders would not leverage their power in the land market to boost their financial performance and outperform competitors, the key challenge then is to disentangle consequence from motive.

It is operationally and logistically necessary for residential developers to have an inventory of sites that can be developed in the short-term. Acquiring housing development sites can often be a lengthy, competitive, complex, and uncertain process. Search costs are high as land markets tends to be thin and opaque. Typically, many sites cannot be developed and built out immediately following acquisition tying up capital for extended periods. Despite the fact that it is commonly labelled as 'immediate land', much of the land inventory of the UK housebuilders may effectively described as partly finished, intermediate goods that will often need further transformation before being suitable for use in the housing production process. The speed of build out on a site of fully serviced plots with implementable consents may be also constrained by a market absorption rate with oversupply potentially leading to negative equity for previous buyers and poor financial performance for developers and lenders. However, a single housebuilder's ability to control the pace of supply may be limited if other housebuilders are able to meet demand first. Holding an inventory of sites whether for operational, investment or anti-competitive motives comes with opportunity costs and risks.

The evolving structural change in the land holdings of US housebuilders towards strategies that require less capital, known as capital-light or land-light strategies, seems to indicate that land investment or speculation is no longer part of their business models. Although the relative size of their land inventories is typically larger than that of the leading UK housebuilders, the US housebuilders have increasingly relied upon relatively short-term option agreements, rather than owning land outright, to secure their pipeline of development land. While it is possible that the scale of their land inventories held through options could be driven by anti-competitive motives, this seems unlikely due to the costs associated with securing option agreements. Since the GFC, the primary shift seems to have been from a land strategy incorporating some land investment or speculation to a strategy that attempts to hedge risks associated with holding land.

Although the comparative evidence is limited and imperfect, it generally indicates that UK housebuilders tend to have smaller land inventories compared to residential developers in the US, Australia, and Ireland. Although far from conclusive, this finding is not supportive of arguments that there are specific features of the UK planning system that compel housebuilders to hold excessively large land inventories. Except for Berkeley, most UK housebuilders have maintained relatively stable short-term landbanks since 2007. Changes in the absolute size of their landbanks have largely tracked their completions. Indeed, all the main suppliers of new housing - large listed and unlisted housebuilders – seem to have been able to secure significant landbanks despite a highly imperfect land market and, what is commonly claimed to be, a restrictive planning regime. In a situation where their main competitors by far tend to be other large-scale private and listed housebuilders, it is hard to see how a significant purpose of the landbanks of the volume housebuilders is to deter competition from small and medium sized firms. The latter tend to focus on smaller sites and have a relatively small market share. If the motive for holding land inventories is speculation, the data on price growth in greenfield development land suggests that the profit margins have been relatively low compared to the profit margins achieved from building out and selling completed dwellings.

Since 2007, it is notable that the UK volume housebuilding firms have been reporting more detail of their strategic landbanks. Their annual reports show a clear trend of them emphasising and tracking the growing share of their land supply pipeline coming from strategic land portfolios. There seems to be more variation between the firms in terms of their focus on strategic land. However, it seems that most of the strategic land is controlled through relatively long-term option agreements rather than owned. In the context of an option agreement, higher land prices are not in the interest of housebuilders who have the option to purchase land at a discount to its future market value. Whilst such long-term option agreements also prevent competitors from acquiring these sites, it is also important to bear in mind that these sites invariably lack planning consent, which is why the housebuilders use option agreements to secure them with low initial capital outlay rather than risk buying them outright without a consent in place. However, despite this growing emphasis on strategic landbanks, the market for strategic land remains comparatively opaque. Good quality data on the proportion of strategic land controlled by housebuilders through option agreements, as opposed to ownership, is not readily available. Indeed, there have been repeated calls for greater transparency regarding the prevalence of option agreements in the land market.

It is striking that the two largest housebuilders in both the UK and the US (Barratt and DR Horton) have, in the last five years, both acquired major independent companies specialising in land promotion and/or master development (Gladman Land and Forestar) in their respective national markets. The largest private equity owned housebuilder in the UK (Miller Homes) has also acquired a significant land promotion business (Wallace Land) in that period. The acquisitions have certainly increased their market share in their respective strategic land markets. If this represents a trend, such vertical integration effectively represents an increased emphasis on 'making' developable plots rather than 'buying' them and would be expected to reduce the number of participants in the land market. The same consequences and motives issues emerge in terms of interpreting the acquisitions of specialist land development businesses. Such acquisitions will contribute to the housebuilders' pipelines of plots needed for operational purposes, they also have the potential to provide income streams to the housebuilders' as going concerns in their own right and, if developable plots are sold to competitors, such acquisitions may also provide competitive advantages in the land market.

Envisioning a housing land market transformation in the UK, where housebuilders can quickly and reliably acquire sufficient plots for immediate construction, remains challenging. From the perspective of US housebuilders, to a significant extent the growth of a specialist lot banking sector has transformed the residential land market. Nevertheless, it is notable that, even with the lot banking sector's transformative emergence and expansion, US housebuilders still seem to require ownership or control of six or seven plots for every completed unit that they sell. If similar intermediaries were to emerge in the UK market, there is a high likelihood of accusations of hoarding, speculation etc. In the context of significant growth in the output of the volume housebuilders in the last decade and widespread political opposition to residential development on greenfield sites, the large, listed firms repeatedly seem to be perennially viewed as a suitable scapegoat for both local and central government as well as housing activists at least some of whom are inherently sceptical of market solutions. Whilst the fall in local government's contribution to supply is glaring in the data, the focus on housebuilders' alleged behaviours may also be a distraction from the withdrawal of the state from the direct provision of housing as a key pillar of social policy. However, this is not to imply that the large, listed housebuilders would not abuse their market power. Ongoing enforcement action by the Competition and Market Authority to address mis-selling of leasehold properties and problems faced by homeowners from high and increasing ground rents has involved most of the UK's large, listed housebuilders.

Declaration of Competing Interest

The authors have no competing interests to declare.

Data availability

Data will be made available on request.

References

Ahluwalia, G., Baker, K. and Colton, K. (2022) *Concentration in the Homebuilding Industry: Trends, Strategies, and Prospects*. Joint Center for Housing Studies Harvard University Working Paper.

Archer, T., Cole, I., 2021. The financialisation of housing production: exploring capital flows and value extraction among major housebuilders in the UK. J. Hous. Built Environ. 1–21.

Ball, M., 2013. Spatial regulation and international differences in the housebuilding industries. J. Prop. Res. 30 (3), 189–204.

Ball, M. and Cullen, A. 1980. Mergers and Accumulation in the British Construction Industry 1960-79, Birkbeck discussion paper No 73, UCL, London.

Callcutt, J. (2007) *The Callcutt Review of Housebuilding.*

Chamberlain, P., and Walker, C. 2019 *An Investigation into Land Banking in Scotland*, Scottish Land Commission, Commissioned Report.

Colenutt, B., 2020. The Property Lobby: The Hidden Reality Behind the Housing Crisis. Policy Press.

Competition and Markets Authority. 2023. *Housebuilding market study: Update report and consultation on a market investigation reference*. Can be downloaded at ⟨https://www.gov.uk/cma-cases/housebuilding-market-study⟩.

DR Horton. 2022. *Annual Report*. Can be viewed at ⟨https://investor.drhorton.com/~/media/Files/D/D-R-Horton-IR/reports-and-presentations/reports/2022-dhi-annual-report.pdf⟩.

Foye, C. and Shepherd, E., 2023. Why have the volume housebuilders been so profitable? The power of volume housebuilders and what this tells us about housing supply, the land and the state. UK Collaborative Centre for Housing Evidence. ⟨https://housingevidence.ac.uk/publications/why-have-the-volume-housebuilders-been-so-profitable/⟩.

Guthrie, G., 2020. Incentivizing residential land development. Hous. Stud. 35, 820–838.

Guthrie, G., 2022. Land Hoarding and Urban Development. J. Real. Estate Financ. Econ. 1–41.

Hughen, K., Ott, S., Read, D., 2012. Optimal phasing and inventory decisions for large-scale residential developments. J. Real. Estate Financ. Econ. 45, 888–918.

Letwin, O. (2018) *Independent Review of Build Out: Final Report*. Report by the Rt Hon Sir Oliver Letwin MP. Available at: ⟨https://www.gov.uk/government/publications/independent-review-of-build-out⟩.

Lichfields and LPDF. (Land Promoters and Developers Federation). 2018. *Realising potential: The scale and role of specialist land promoters in housing delivery* (March 2018). https://lichfields. uk/content/insights/realising-potential-the-scale-and-role-of-specialist-land-promoters-in- housing-delivery/.

McAllister, P., Shepherd, E., Wyatt, P., 2022. An exploration of the role and significance of specialist land promoters in the housing land development market in the UK. J. Prop. Res. 21, 1–23.

Moore, C., Adams, D., 2012. House building industries: Western Europe and North America. Int. Encycl. Hous. Home 211–216.

Murray, C.K., 2020. Time is money: How landbanking constrains housing supply. J. Hous. Econ. 49, 101708.

Nathanson, C.G., Zwick, E., 2018. Arrested Development: Theory and Evidence of Supply-Side Speculation in the Housing Market. J. Financ. 73, 2587–2633.

Office of Fair Trading/ 2008. *Homebuilding in the UK: a market study*. OFT, London.

Rydin, Y., 1984. The Struggle for Housing Land: A Case of Confused Interests. Policy Polit. 12 (4), 436.

Smith, A. 1776. *The Wealth of Nations: An inquiry into the nature and causes of the Wealth of Nations*.

Smyth, H. 1982. Land Banking, Land Availability and Planning for Private Housebuilding, Working Paper No 23, School for Advanced Urban Studies, University of Bristol.

Taylor Wimpey. 2020. Proposed placing of ordinary shares to raise approximately £ 500 million, see ⟨https://www.taylorwimpey.co.uk/corporate/investors/2020-equity-raise⟩.

Titman, S. 1985. Urban land prices under uncertainty. *American Economic Review*, 75, 505–514.

White, P., 1986. Land availability, land banking and the price of land for housing: a review of recent debates. Land Dev. Stud. 3, 101–111.