London's Housing Crisis

A perspective based on the role of financial markets and the UK's economic growth model

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Abstract

In London, the gap between house prices and incomes has been continuously widening over the past few decades. In the vast literature on this topic, relatively little attention has paid to the demand side, and in particular, the role of unregulated investment demand. We argue that this demand is fuelled by the mortgage market, and encouraged implicitly by government policies, as a growth model for the UK economy through housing equity withdrawal, and as a privatised pension provision strategy. The financial industry, left at its own devices to create and allocate money in the form of debt in line with its short-term remit of maximising stakeholder value, issues loans and allocates it towards the highest expected return-to-risk ratio. The intrinsically low risk of housing mortgages gives housing a permanent advantage in absorbing credit, if remained unregulated. This allocation, besides being undemocratic, is not in the long-term interest of economic stability and equality.

In this paper, we present an initial model built on existing literature and statistical data that serves as a first step towards an integrated model of London's house price dynamics since 1980, with a particular focus on the role of the financial markets. The model, even though at an early stage, shows promise in endogenously replicating past trends in some variables key to the current housing crisis. A more comprehensive qualitative model is also presented in the form of a causal loop diagram, which will be the basis of further refinement of the formal quantitative model[1].

1. Crisis? What Crisis?

Over the past 40 years, real house prices – but not real incomes – have grown faster in the UK than in any other OECD country (Edwards 2015). Median house prices are now ten to sixteen times medium incomes in London, the worst affordability level since data became available (Figure 1). This, chief among various other statistics, has brought observers to virtually unanimous agreement on that England is facing a housing crisis, centred on and particularly severe in London (Gallent, Durrant, & May, 2017). Echoing Danny Dorling's (2014) seminal *All That Is Solid*, housing is the defining issue of our times.
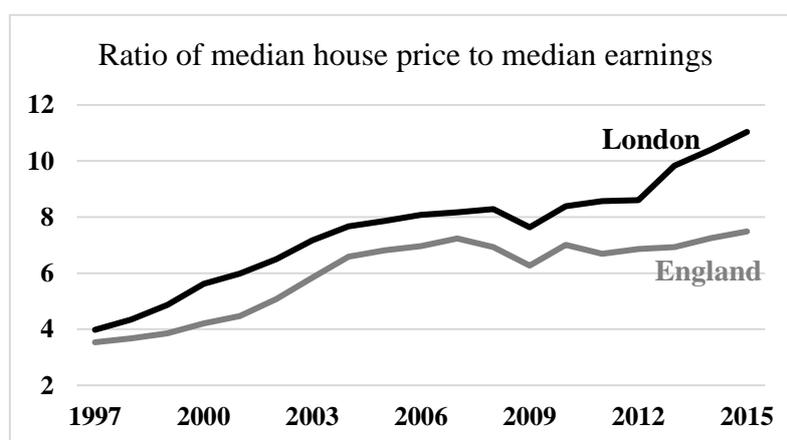

Figure 1 - Declining affordability of housing in London and in England

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[1] This work reports on the mid-way progress of a PhD. Kaveh Dianati is the PhD candidate. Nici Zimmermann and Mike Davies are his supervisors.

The nature of the crisis, however, is a matter of intense debate, and depends on perspectives and even on ideologies. In this introduction, we set out by attempting to elaborate on the main current perspectives to London's housing crisis.

The prevailing characterisation of the crisis is one which sees the chief – and perhaps even only – root cause as the shortage in supply (Gallent et al., 2017). This view transcends political divisions and is so ubiquitous that is held as almost synonymous to the housing crisis in much of today's media discourse on housing. This view rests on a simple but compelling comparison of the supply of new housing, versus new housing completions. According to statistics supplied by the UK's Department for Communities and Local Government (DCLG), total housing completions in 2015 was in the order of 24,000, while net growth in the number of households was 66,000; close to three times higher. If we equate these two figures with housing supply and demand, this imbalance undoubtedly characterises the housing crisis as one of under-supply.

Among this prevailing interpretation, a vocal stream of literature, championed by scholars at the London School of Economics (Hilber, 2015) among others, blames the failure of planning in releasing sufficient parcels of land quickly enough as the root cause for the shortage in supply. London's Metropolitan Green Belt has been blamed for house price inflation as a brake on land supply and therefore a driver of rising house prices (Gallent et al., 2017).

However, crucially, this view does not take into account the fact the housing market is a predominantly second-hand market, with new build accounting for less than 1% of housing supply per year (Gallent et al., 2017). Therefore, housing prices are mainly driven by demand rather than supply (Hwang, Park, & Lee, 2013, p. 2108).

More recently, a different discourse has been emerging, majorly led by Dorling (2014), which frames the housing crisis as a crisis of unequal distribution of housing rather than a shortage in supply. Historical analysis carried out by Tunstall (2015) has shown that, over the hundred year period of 1911 2011, UK population grew by half while the number of rooms has tripled. Tunstall (2015) demonstrates that housing space inequality, which reduced steadily from the 1920s to the 1980s, has been steadily growing since the 1980s, and by 2011 inequality returned to levels not seen for fifty years or more. Gallent (2015) asserts that this inequality is a direct outcome of over-reliance on market allocation of housing. Dorling argues that housing inequality demands a dramatic reorientation of housing policy away from increasing supply and towards redistribution (Dorling, 2014). In the words of Piketty's seminal *Capital in the 21st Century* (Piketty, 2014, pp. 16–21) "the process by which wealth is accumulated and distributed contains powerful forces pushing towards […] an extremely high level of inequality. […] There is no natural, spontaneous process to prevent destabilizing, inegalitarian forces from prevailing permanently. […] It is long since past the time when we should have put the question of inequality back at the center of economic analysis."

Others, yet, view the housing crisis within a wider framework of the UK's approach to welfare provision. Very commonly, the British population relies on housing wealth for funding their retirement years, effectively turning it into the UK's unofficial pension scheme. Montgomerie and Büdenbender (2015), in an incisive critique of the UK's housing-based welfare strategies, argue that current gains from residential housing are a one-off wealth windfall to particular (lucky) groups within society. The temporal and spatial limits of gains from residential housing mean that the same conditions cannot be repeated (often enough) for residential housing to provide a generalizable welfare function. According to this study, The problem of *asset-based welfare* is that it depends on a continuous upward trajectory of house prices and, in doing so, simply reinforces existing social inequalities. (Montgomerie & Büdenbender, 2015).

Besides serving as a welfare safety net, housing also serves the function of wealth creation as well as inter-generational wealth transfer (Gallent et al., 2017). A dwelling is not only a roof over one's head,

but by general reputation, has often been by far the best investment for UK households (Muellbauer & Murphy, 1997). In the predominantly supply-side-focused literature, where demand is mentioned discussion tends to revolve only around the growing number of households. On the other hand, Gallent (2015) as well as Gallent et al. (2017) (works from which the present article borrows heavily), draw attention to the unappreciated role of investment demand, both domestic and international, in pushing prices farther and farther beyond the means of would-be first-time buyers.

A series of major institutional and legislative changes has continuously liberalized retail financial markets in the United Kingdom since 1979. This involved majorly, and among various other measures, gradually lifting restrictions on building societies (the largest mortgage lenders in the UK), allowing them to fund themselves with wholesale deposits, so that their status essentially shifted from mutuals to banks (Aoki, Proudman, & Vlieghe, 2002). Another major change is allowing building societies to set interest rates so that mortgage rationing no longer generally occurs (Meen, 1990). Kept unchecked, increased competition has made a wider range of products available. Moreover, it has become easier for consumers to withdraw housing equity to finance consumption (Aoki et al., 2002).

Gallent et al. (2017), as well as Rowbotham (1998), assert that banks have played a central role in the financialisation of housing, while their lending has decoupled the value of property from earnings. It is this deregulated and abundant flow of money into housing by banks and the disconnect between loans and deposits, and therefore the abundant supply of money relative to the inelastic supply of homes (that is, the supply of *existing properties* coming onto the market plus *new-build*,) that places financialisation at the heart of the current housing crisis. (Gallent 2017) The damages caused by this sort of liberal approach to banking are too recent to have been forgotten about. Favilukis et al. (2012) demonstrate that the main driver of the 2008 US financial crisis, by a significant margin, was the liberalisation of financial markets liberalization. They also find that changes in credit standards and credit supply (as opposed to changes in demand) continue to be the most important variable related to future home price fluctuations (Favilukis, Kohn, Ludvigson, & Stijn van Nieuwerburgh, 2012).

Hay (2009) argues that the UK's growth strategy in recent decades has rested heavily on consumption fuelled by equity release in a rising housing market, which has been sustained by historically low interest rates. From the point of view of the government, therefore, as far as house prices are growing, this is not necessarily seen as a problem. Hence, not only the nature of the crisis, but even acknowledgement of the existence of a crisis depends on the commentator's standpoint. While this initially served to improve affordability within the housing market, over the years it has led to the development of boom-and-bust cycles. As Montgomerie & Büdenbender (2015) do for welfare, Hay (2009) assesses the viability, sustainability and reproducibility of the private debt-financed consumer boom that house price inflation has generated. He summarises his interpretation of the government's standpoint regarding inflation as: 'retail price inflation bad, house price inflation good'.

The clear danger here is that a self-sustaining and mutually reinforcing virtuous circle could, under sufficient pressure from counteracting forces, threaten to become a vicious circle. Growth in the UK is dangerously linked with credit and housing-based equity withdrawal, making the situation highly sensitive to interest rate variations. The first casualty in a context of credit austerity would be discretionary service-sector consumption, which would have catastrophic consequences for the UK's service-based economy. If the service sector contracts in response to falling demand, "a series of self-reinforcing dynamics are unleashed—as those laid off fail to keep up with their mortgage repayments, cut back their consumption to the bare essentials and, in the process, contribute further both to the shortfall of demand in the economy and to a falling housing market. This is precisely the situation in which the UK economy found itself by mid-2008" (Gallent et al., 2017).

In summary, although the literature on London's/UK's housing crisis tends to be fragmented, it is rife with causal insights into the underlying structure responsible for the crisis. those which attempt to take a more integrated approach draw conclusions based on 'mental simulation', whilst it has been established that the human mind cannot be trusted with inferring the behaviours of complex systems with multiple feedback loops (J. Sterman, 2000). This gap in the research motivates our choice of topic and methodology.

Having defined the dynamic problem in this introduction, the next step is to describe our dynamic hypothesis, which is the focus of the next section. Section 3 then presents some initial simulations comparing them against historical data. Section 4 concludes with a discussion of past and present housing policies.

2. Stock and Flow Model

A simplified version of the preliminary London housing model developed so far is shown in Figure 2[2]. Note that this is by no means a comprehensive model, and as shown in the model boundary diagram in the next section, there are still several key variables that need to be endogenized before the model can be deemed useful for policy analysis.

The central variable of interest is perhaps *house prices.* Gallent et al. (2017) assert that, while households projections provide a useful indication of the scale and trend of housing requirement, they are inadequate as an aggregate expression of housing need and demand. Similarly, whilst demand in current housing debates is often assumed to be restricted to that generated by household formation, this overlooks the significance of investment demand (Gallent et al., 2017).

Therefore, in our conceptualisation, we formulate *house prices* as partly driven partly by such conventional proxies of supply and demand, but also substantially by other factors referred to in the literature, including *net lending*, *rental* yield, *transaction* activity in the market, as well as *speculative transactions. Net change in number of households* over each year is taken as a proxy for 'utility demand' (demand for housing as home). Favilukis et al. (2012) find that countries with more residential investment experience lower house price growth, supporting the idea that residential investment drives up the expected housing stock and drives down the expected future growth rate on the dividend to housing (rent). New housing construction is therefore a key driver of price, even though it constitutes only a tiny portion of supply in the housing market. In our model, every year, the gap between this value and total *housing construction* during that year (comprising private construction as well as construction of local governments or housing associations[3]) accumulates in a stock of *backlog of housing need.* Rate of growth in this backlog, as an indicator of shifting balance between supply and demand, is assumed to be a key driver of growth in house prices. *Speculative transactions ratio*, defined as one minus the ratio of first-time buyer purchases to total housing sales, is taken as an indicator of investment demand, which drives prices together with *net lending*, a determinant of the amount of money flowing into the housing market. Easier access to mortgage reduces the risk premium households require to invest in risky assets like houses (Favilukis et al., 2012), and therefore stimulate investment demand. In addition, Muellbauer & Murphy's (1997) econometric model shows that recently experienced rates of return play an important part in driving housing demand. Therefore, *rental yield* is taken as another determinant of house prices. The cumulative total of these effects, weighted according to respective elasticities that have been estimated via calibration against historical data, is then multiplied in the model by an effect from the volume of transaction activity. Trends in housing transaction volumes tend to follow the herd behaviour normally associated with non-fixed assets. In the real estate market, properties may change hands before they are built (or even before construction starts), potentially contributing to price volatility (Gallent et al., 2017; Muellbauer & Murphy, 1997). Ling, Marcato, & McAllister (2009) find

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[2] The model, along with its associated data spreadsheet, will be made available as supporting material.
[3] Distinguished in the actual modelled but not shown here for simplicity

evidence supporting the idea that asset turnover provides increased price revelation which, in turn, reduces investment risk and increases property values. According to our formulation, the higher the volume of transactions, the quicker the changes in price (in any direction dictated by the cumulative effect of the previously described factors).
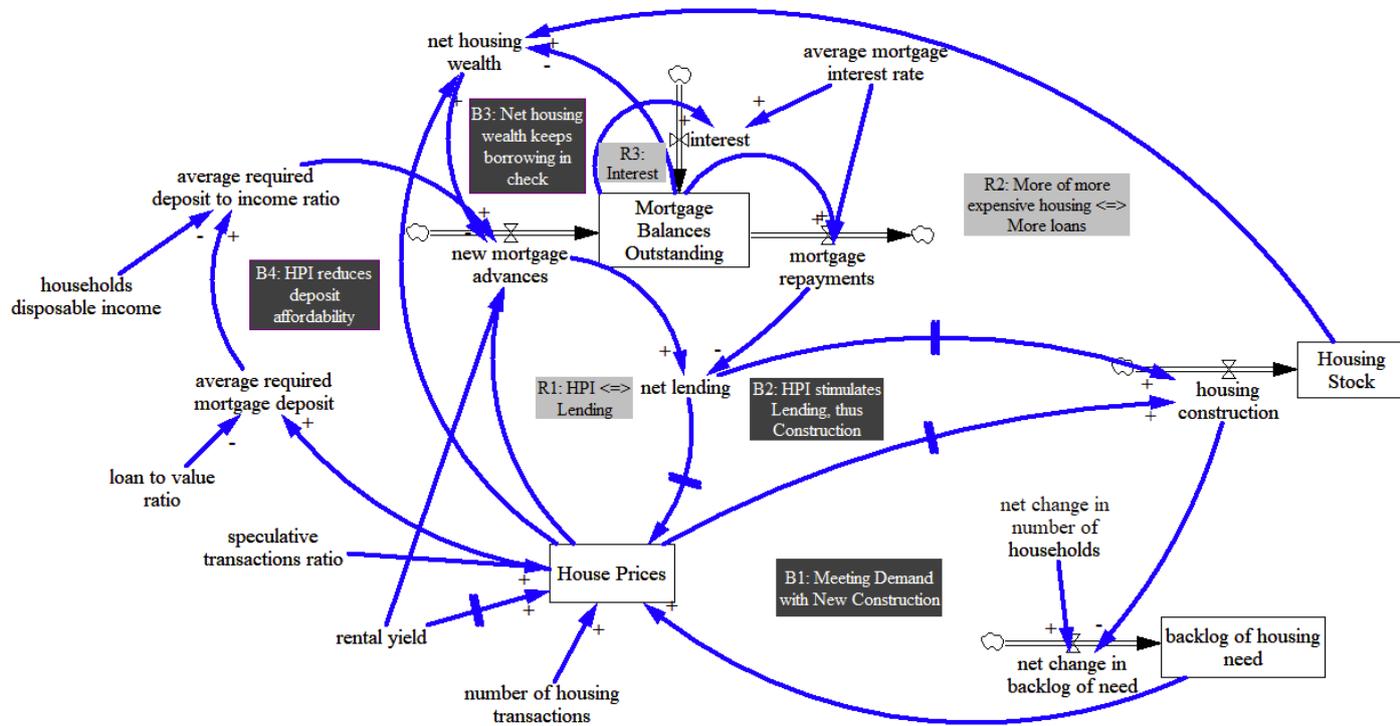

Figure 2 - Stock and Flow diagram

The rate of private *housing construction* is heavily influenced by trends in price, closing the first balancing feedback loop *B1: meeting demand with new construction. Housing construction is also assumed to be affected by* net lending*, as the availability of loans determines the confidence of the building sector in selling what they start building: loop B2: HPI stimulates Lending, thus Construction.*

Another central endogenous variable is *new mortgage advances*, which is driven by changes in *house prices*, *rental yield*, factors determining the profitability of housing investment and hence lowering risk for lenders. This closes the first reinforcing feedback loop *R1: HPI[4] ⇔ Net lending. Average required deposit to income ratio* is another driver which is an indicator of the extent to which households can on average afford to take out housing loans. Gallent et al. (2017) maintain that since the financial crisis, new patterns of consumption have gained traction, including the leverage of existing investment housing wealth to purchase additional property, which has contributed to the hike in prices, as well as growing inequalities in wealth distribution. In the model, *New advances* is importantly influenced by *net housing wealth*, representing households' communal collateral for taking out loans. This formulation ensures an endogenous increase/decrease in borrowing capacity as collateral values rise/fall (Favilukis et al., 2012). *Net housing wealth* is formulated as the total *housing stock* multiplied by average *house prices*, minus *mortgage balances outstanding*. This also establish an important self-reinforcing dynamic, where an increase in *house prices* raises *net housing* wealth, both directly and indirectly via stimulating further *construction*, which encourages lenders to issue mortgages more aggressively if left unregulated, driving *house prices* higher yet, a potentially self-sustaining escalation of *house prices* and *debt* (loop *R2: More of more expensive housing ⇔ More loans*). Tsatsaronis & Zhu (2004) find through econometric analysis that the positive feedback between credit and property cycles

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[4] HPI: House Price Inflation

is reinforced when bank lending is closely dependent upon collateral values due to market-based property valuation practices, as is the case in the UK.

Here, there is also a balancing force involved where accumulating *mortgage balances outstanding* forces *net housing wealth* downward, as captured by loop *B3: Net housing wealth keeps borrowing in check.*

Note that when rising *house prices* instigates *construction,* this is not necessarily a step towards mitigating the housing crisis as the market allocation mechanism in this case favours existing landlords who own the existing housing collateral. The inflow of *interest* and the outflow of *mortgage repayments* are added as simple accounting entities to make *mortgage balances outstanding* a fully endogenous element (with the only exogenous influences being *average mortgage interest rate*, and *average mortgage period* not shown here for simplicity). This also closes the simple *R3: Interest* reinforcing feedback loop, an all too familiar systems construct for households in dire financial straits.

Finally, an increase in *house prices* naturally increases *average required mortgage deposit*, assuming *loan to value ratio* stays constant, which reduces the affordability of loans and therefore demand for *new mortgage advances.* This closes the stabilising loop *B4: HPI reduces deposit affordability.*

Note that small dashes crossing some of the links denote delays, which are the main sources of instability and oscillation in complex systems, such as those often observed in housing market cycles.

2.1. Model Boundaries: A Critical Review

A model boundary diagram of the formal System Dynamics model developed so far in this project is shown in Figure 3. The innermost circle contains variables endogenously (or mostly endogenously) represented variables which are mainly driven by internal dynamics of the model. The middle circle contains exogenous data-driven variables, and the outer circles are important concepts excluded from this model. The underlined exogenous variables are those that we believe must be made endogenous before the model could be reliably used for policy analysis. Similarly, the underlined excluded variables are those which are essential to include in the final version of the model, either endogenously or exogenously. These are changes which we intend to implement in the model (time-permitting within the timeframe of this PhD).

The ratio of speculative transactions to total transactions, for instance, is exogenous at the moment. The volume of speculation in the market, however, is not independent of developments in price and other potentially endogenous to our framework. Speculation can be proxied by the growth of the 'buy-to-let' phenomenon, "which is predominantly a domestic phenomenon fuelled by the desire to have secure and risk-free wealth for retirement (Gallent et al., 2017)."

Another key factor treated exogenously at this stage is the volume of transactions, while studies have found evidence of 'return chasing' behaviour in real-estate markets, which entails that transaction frequency is typically greater when property prices are relatively high and/or rising, and lower when prices are relatively low and/or falling (Ling et al., 2009). Therefore, transaction frequency has been characterized as pro-cyclical (Fisher, Gatzlaff, Geltner, & Haurin, 2004), pointing to the existence of a reinforcing feedback between transactions and prices. This leads to real estate markets typically showing serially correlated returns (Fisher et al., 2004). Fisher et al. (2004) find that changes in transaction frequency are most affected by fluctuations in the performance of real estate and stock markets.

Even *net change in households* is not independent of developments in house prices, as the level of household affordability can improve or suppress household formation (Gallent et al., 2017). Therefore, we should consider endogenizing this concept as well, although the underlined variables in the diagram are our primary priorities for endogenous formulation.
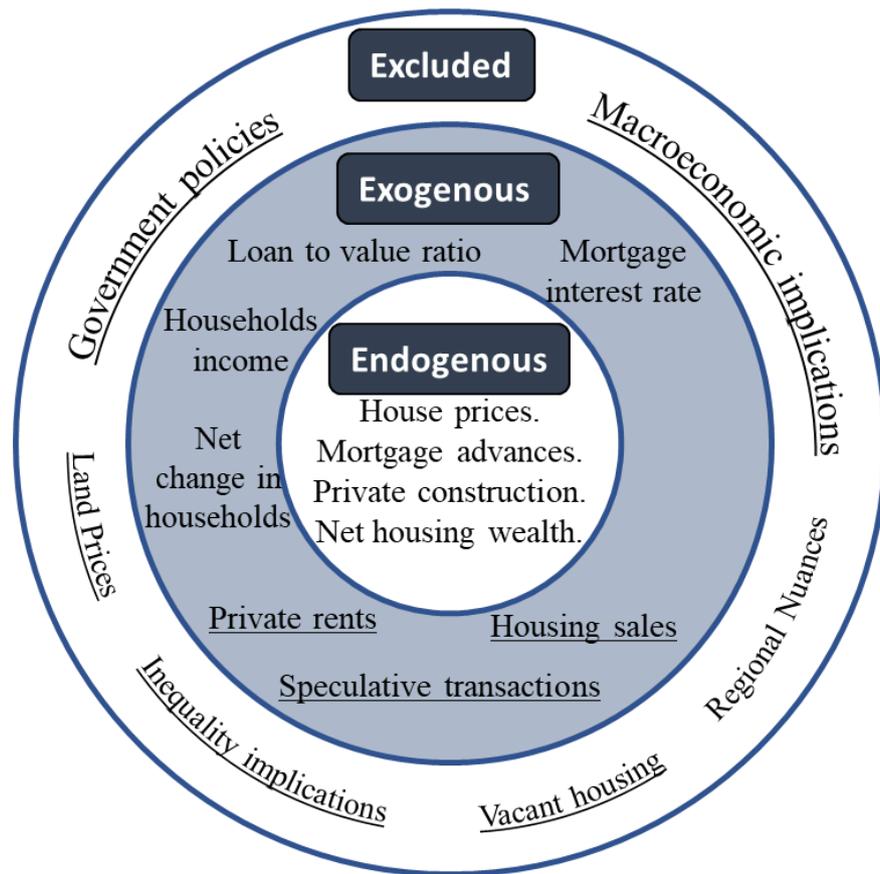
Figure 3 - Model Boundary diagram

3. Analysis: Reference Mode Replication Tests

In this section, we present the result of simulations of the calibrated model against historical data for the most central variables which are endogenously captured in the model. These can be seen in Figure 4Figure 5Figure 6Figure 7. As can be seen, in all cases the model shows capable of capturing the general trends in historical data, even if missing some short-term fluctuations. As the focus of this project is to help foster understanding for long-term policymaking, we only care about capturing long-term trends and behaviour patterns, particularly long-term cycles where present.

In the case of inflation-adjusted house prices, the model successfully follows historical trends from average prices of around £100K in the beginning of 1980s to almost five times higher prices in 2015. In this graph, as in the subsequent ones, the black curve shows actual historical data while the lighter curve represents model simulation. This hyper-inflation which is the root of the current affordability crisis is the central focus of this work.
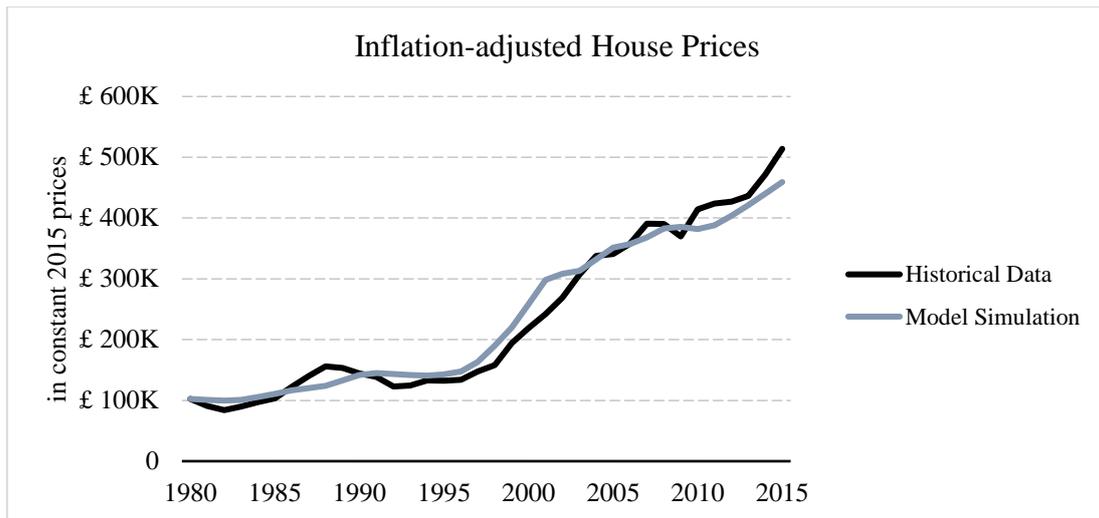
Figure 4 - Inflation-adjusted house prices: Simulation vs. Data

The second variable, shown in Figure 5, is new mortgage loans issued every year, which, as a result of financial market liberalisation, grows almost exponentially from £bn 3.6 to £bn 36 in 2007, an enormous ten-fold increase, before a spectacular collapse down to £bn 13.9 in 2009 at the peak of the global financial crisis. One major driver of the exponential growth since 1980s is the self-reinforcing coupling of house prices and mortgage advances, absent any regulations that could help keep this inflation in check. This is revealed by a test simulation where we reduce the elasticity of new mortgage advances to house prices from 0.3 down to half (0.15), depicted with a dashed curve in the figure. This is in line with Gallent's (2017) assertion that the self-reinforcing inflationary process, involving the increase in demand for housing assets driving up their price, coupling with extensive borrowing which has generated an upward spiral of borrowing and price inflation.

As seen in the figure, the model captures the growth and collapse fairly well, although the collapse is chiefly caused by the exogenous fall in loan to value ratios in the wake of the financial crisis.
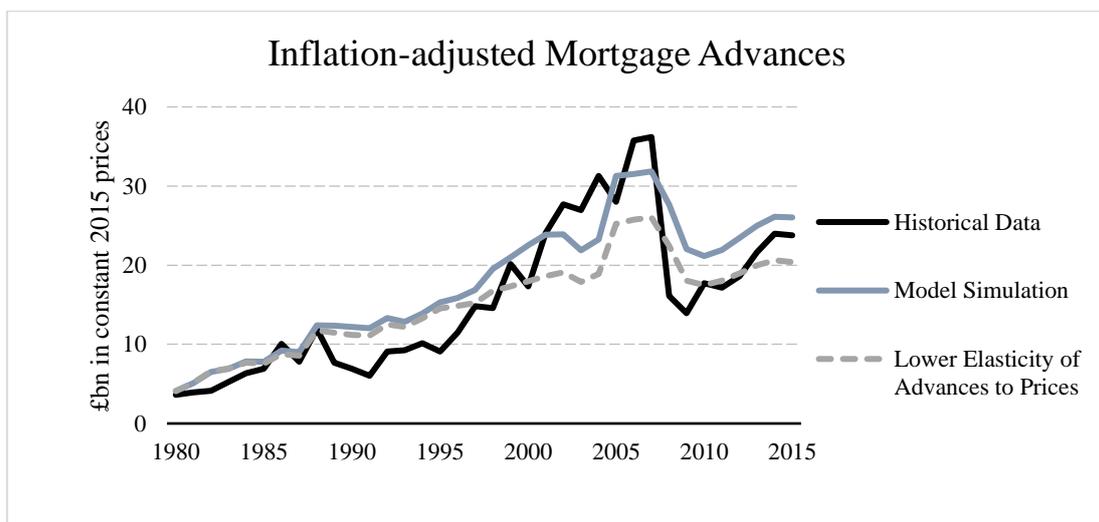

Figure 5 - Inflation-adjusted mortgage advances: Simulations vs. Data

Next, Figure 6 compares simulation results and historical data for private construction starts. It must be made clear that this excludes housing construction by local authorities and by housing associations, which are separately modelled as exogenous inputs to the housing stock. These would be eventually used for running policy simulations. At any rate, with the shift in housing policy starting with the Thatcher administration in the 1980s from subsidising supply (through construction of social housing)

to subsidising demand (e.g. *Help-to-Buy*, or housing benefits), the government is no longer a substantial housebuilder, leaving supply completely dominated by private construction firms. Once more, the model captures developments in construction fairly well, including some of the oscillations and the post-financial crisis bust, mainly a result of the drying out of credit and loss of confidence in the housing market. Nevertheless, the current model fails to capture the boldly visible boom-and-bust in construction during the 1980s[5]. If this were successfully captured, the model would have also been able to track the slight fall in house prices in the beginning of the 1980s, as seen previously in Figure 4. We are currently testing an alternative formulation for private construction, where we are trying to model the development stocks of SME and large housebuilders, which will allow us to capture housebuilding as the product of these firms multiplied by their respective productivities; a more 'operational' formulation in System Dynamics terms. However, this trial has not yet produced reliable results.
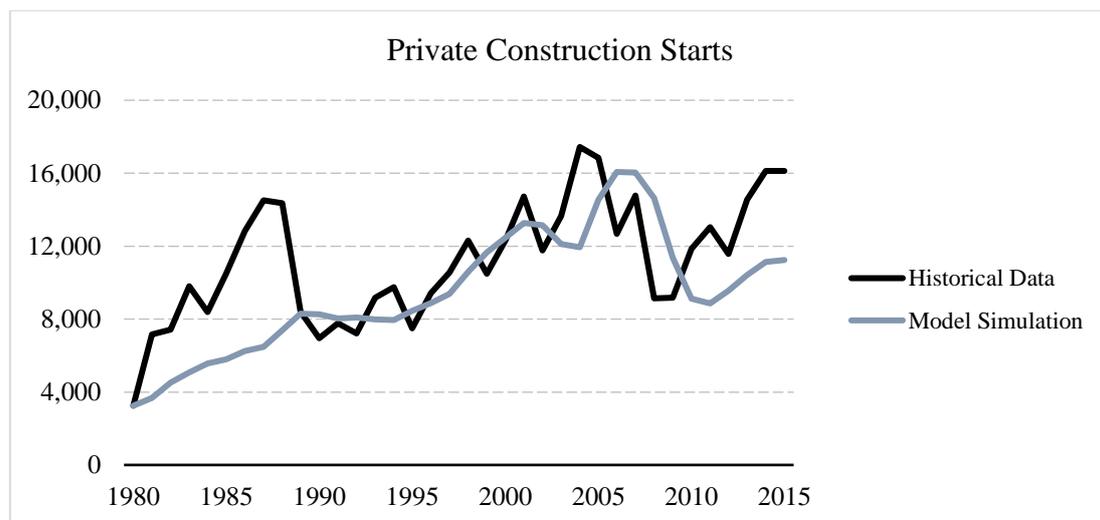

Figure 6 - Private construction starts: Simulation vs. Data

Finally, Figure 7 portrays the troubling growth in the ratio of households' housing debt to income, measured in the number of years of income it would take to fully repay that debt. As a result of the liberalisation of financial markets since 1979 (Aoki et al., 2002), this ratio has grown almost three-fold during our time frame of over three decades. It should be noted that stock-level data for mortgage debt is scarce except for very recent years. Much of this data is estimated a constant share of country-level data for London, based on data for few existing years. Therefore, it is futile to aspire to meticulously replicate this data with all its peculiarities, and it is therefore considered sufficient that our model captures the general upward trend. In any case, the pressing issue with regard to debt levels is the unsustainability of this trend of private debt-driven growth, as a growth model for London's (and the UK's) economy. The powerful concept of credit which has historically been the source of astounding economic growth since the Industrial Revolution is fundamentally based on collective trust in the borrowers' future ability to repay their debts (Harari & Perkins, 2017). This trust however is majorly affected by indicators such the debt to income ratio presented here. This credit expansion ⇔ trust relationship is the root cause of repeated boom-and-bust cycles in housing (J. D. Sterman, 1986).

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[5] Our search of the literature in search of the mechanisms clearly explaining this rise and fall did not find compelling answers. We would very much welcome any insights from reviewers on this matter.
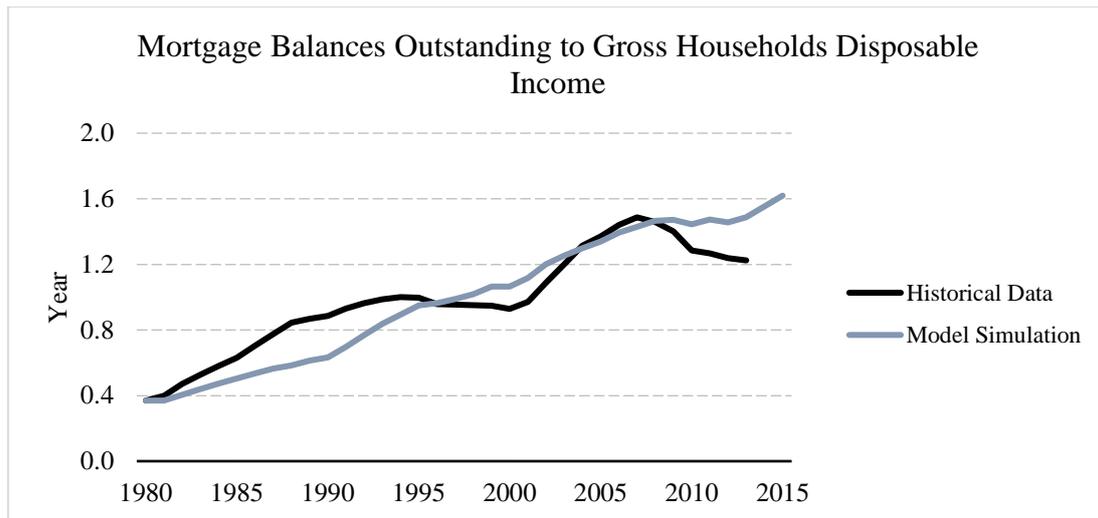
Figure 7 - Mortgage balances outstanding to GHDI ratio: Simulation vs. Data

Since several of the critical concepts at the heart of the housing crisis are still either not included in this version of the model or included only exogenously (as seen previously in the model boundary diagram), this model at this stage cannot yet be used for policy or scenario analysis.

4. Comprehensive Conceptual Model[6]

The Causal Loop Diagram in Figure 8 depicts the conceptual model which was the point of departure for the formal quantitative model, an initial version of which was presented in the previous section. It must be pointed out, however, that once the formalisation of the model was underway it turned out that the quantitative model is not fully identical to the qualitative one in terms of model boundaries and included variables and loops, as the development of the quantitative model was greatly affected by the availability of data in certain domains, as well as our recent focus on the financial aspects of the housing crisis. In other words, the CLD contains a lot more information and insights, still not included in the stock and flow model, while the stock and flow model also inevitably revealed a few loops not previously foreseen in the CLD.

Nevertheless, we find it useful to show the full conceptual model to stress that the expanse of the housing crisis stretches far wider than the current model. In the following CLD, the links in black are those already included in the SD model, and the blue arrows which outnumber the black ones are ones that we plan to include in the future, provided sufficient data is found on such relationships.

As *house prices* go up, *return on housing investment* rises, leading to an increase in *investment demand*. This heightened demand puts further upward pressure on *house prices* (Gallent, 2015), closing the first reinforcing feedback loop *R1*. An increase in *investment demand* incites more *speculative behaviour*, which is known to lead to *market volatility* (Eskinasi, 2014, p. 54). This unpredictability of the market has led to a prevalent aversion to risk within the housebuilding industry, which tends to restrict housing output (Payne, 2016, p. 4), putting another upwards pressure on *house prices* (loop *R2*). *Market volatility* also encourages accumulating larger land banks as buffer (KPMG and Shelter, 2015, p. 37). *Speculative behaviour* within the housing market stimulates speculation within the land market, and thus further *land banking* (KPMG and Shelter, 2015, p. 32). This works hand in hand with the general risk aversion within the housebuilding industry to further limit the supply of new housing (loop *R3*).

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[6] This section is mainly borrowed from the paper we submitted to last year's ISDC.
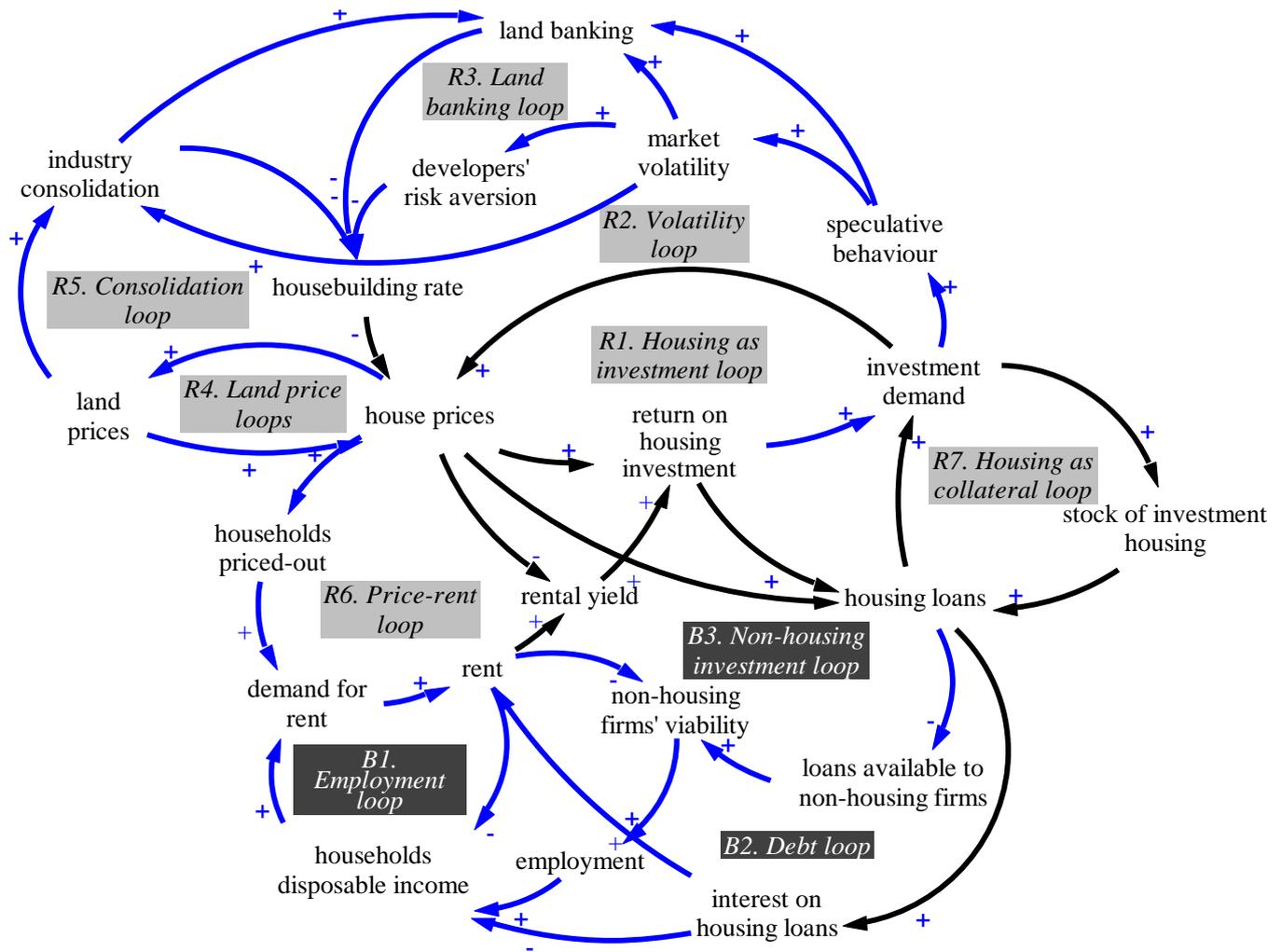
Figure 8 - Comprehensive causal loop diagram

land prices are very tightly linked to *house prices* (loop *R4*). From the estimated selling prices of houses to be built on a particular site, the costs of production and the profit margin are deducted, giving the ceiling price that the builder would pay for land (KPMG and Shelter, 2015, p. 34; White, 1986), making land prices dependent on house prices. This process is known as 'residual land pricing'. As the single most costly input to housebuilding, house prices are also majorly influenced by land prices.

Planning authorities in the UK tend to release land in large parcels. This, together with rising prices of land, increasingly drives smaller developers out of business, leading to *industry consolidation*. *Market volatility* is also known to be a driver of consolidation in the housebuilding industry (KPMG and Shelter, 2015). Larger developers are better-resourced and more prone to engage in strategic *land banking* (White, 1986, p. 108), aggravating supply constraints and house price inflation (loop *R5*).

Higher *house prices* push up *rents* and higher *rents* push up *house prices*, coupling the two together in a tight and crippling union. More and more households – especially younger ones – are failing to get onto the 'housing ladder' and having to resort to the largely under-regulated private rented sector (Gallent et al., 2017). Higher *rents* further improve *return on housing investment* and further stimulate *investment demand* (loop *R6*).

The higher *investment demand* and the purchase of more and more houses as investment vehicles, builds up a larger and larger *stock of investment housing* that can be an ideal collateral for applying for more *housing loans* (Gallent, 2015, p. 9). Higher *return on housing investment* also instigates an even higher

availability of *housing loans.* This expanding possibility helps *investment demand* grow further. This is loop *R7* which corresponds with loop *R1* already described in the stock and flow diagram.

The hypothesis is that all these reinforcing mechanisms have formed a self-accelerating engine of growth, with soaring *house prices* and *investment demand* at its centre; a formidable machine that seems to have a 'will' of its own. In the absence of stabilising forces, such mechanisms tend to generate exponential growth (as seen during every boom period in *house prices*). Of course, in the real-world, there are always counteracting forces that hold growth processes in check, and eventually bring growth to a halt. A couple of such balancing forces are shown in the CLD. An increase in rents increases the cost of doing business for London businesses both directly, and indirectly, through putting an upward pressure on wages. Moreover, in an example of the 'success-to-the-successful' archetype, the success of the housing sector has increasingly deprived productive sectors of the economy of much needed loans. In today's economy, the vast majority of the money in circulation is created by commercial banks issuing loans. In an unregulated banking environment, banks allocate this money to maximise profits, and in this, they always weigh expected returns against risk. As housing loans are issued against a collateral, this provides substantial risk mitigation for this sort of credit. If a business fails, then money lent by a bank to support it is lost. If, on the other hand, a homebuyer defaults on a mortgage, the bank recovers and sells on the property in a market, potentially even profiting from the default (Gallent et al., 2017). In fact, business loans are given a 100% risk weighting whereas mortgage loans' risks are typically weighted at 35% (Ryan-Collins, J., Greenham, T., Werner, R., & Jackson, 2012).

Capital accumulation in, and through, housing often signals a decline in more productive economic activities (Gallent et al., 2017). Rising rents are believed to be threatening the viability of economic firms in London, by raising the bar on wages that employers must offer to attract necessary labour (KPMG and Shelter, 2015, p. 47). In addition, rents eat into household savings (Shelter, 2013), reducing available funds for investment in productive sectors of the economy. On top of that, whatever funds available tend to be poured mostly into the inflated housing market, further depriving non-housing firms of investment (Gallent, 2015). This trend makes the economy reliant to a large extent on rising house prices, and makes it vulnerable to the inherent volatility of housing markets. This concern is in line with Forrester's thesis in Urban Dynamics, which states that a city's economic vitality depends on a healthy ratio of housing to businesses (Forrester, 1969, p. 118).

A scenario can be envisioned where, because of increasing rents as well as decreasing availability of bank loans, firm competitiveness in London would have declined to such an extent that the city's economy would start to stagnate and perhaps decline. Employment would slow down, negatively impacting on households' disposable income. The inflating burden of interest to be paid on housing loans brings disposable incomes further down. Demand for housing would stagnate and rents would stop growing. It is at that point where more and more landlords would face difficulty paying back their mortgages, both because of the economic slowdown and due to the subsequent slowdown in rents. Consequently, arrears and defaults on housing loans would pose a threat to the financial sector, making housing loans riskier and scarcer, which further brings down demand for housing. Any potential subsequent fall in prices could cause panic and over-reaction in the market, setting in motion every single one of the reinforcing loops described in the above diagram, this time in the opposite direction, generating an 'overshoot and collapse' pattern of behaviour, also known as a 'boom and bust' in the context of housing markets. Similar dynamics have happened in the past, such as the one causing the global financial crisis towards the end of the past decade. In Sterman's words (1986, p. 116), "in the extreme, the debt/deflation spiral can cause the collapse of the banking system and the economy. The greater the degree of speculation during the expansion, the more likely is a panic during the downturn".

The concern is that London's housing context comprises all necessary ingredients for repeated boom and bust cycles, i.e. reinforcing mechanisms coupled with balancing loops involving delays, and that as seen historically, such dramatic boom and bust patterns are not only likely, they are in essence structurally embedded and almost inevitable.

5. Discussion: A Critical Review on the Current Housing Policy Debate

This paper presents work that is very much in progress at present, with the formal model only beginning to take shape. However, there are certain implications already made clear at this early stage. Chief among those is that, the described theory of London's housing crisis demonstrates above all that disparate measures taken here and there, aimed at incremental increases in the supply of new build or the provision of affordable housing, do not address the underlying dynamics central to the emergence of the crisis, and are therefore unlikely to solve the crisis in the long-term. We argue that London's housing crisis goes beyond the housing domain and is rooted in the prevailing paradigm of political economics in the UK, the country's implicitly envisioned model of economic growth, and its neo-liberal system of asset-based welfare. Therefore, the conversation on the housing crisis, whether on the media or in the social sciences circles, needs to fundamentally shift from an exclusive 'supply-side fetish' (Gallent et al., 2017) and an emphasis on 'making more affordable housing' towards the more fundamental quandary of 'making housing more affordable'. The literature supporting this view suggests this could be done through a broader framing of the problem encompassing practically infinite investment demand (Gallent et al., 2017), the free rein of commercial banks in creating and allocating money (Rowbotham, 1998), and the UK's unsustainable model debt-based economic growth (Hay, 2009) and private asset-based model of welfare provision (Montgomerie & Büdenbender, 2015).

In the heated debate on the most effective housing policies, those on the left have called for a renewed stronger public sector presence in housebuilding (council houses), while sympathisers of the Conservative cause have tended to blame land-use policy as the cause of the housing undersupply, and therefore the root cause of the failure of the market to build enough homes (Gallent et al., 2017; Hilber, 2015).

Ironically, almost all government housing policies are adding fuel to the fire by further feeding demand. Chief among such policies is the recent *Help to Buy* scheme aimed to 'boost housing supply' via stimulating demand through an equity loan scheme for first-time buyers and a mortgage guarantee scheme which applies to existing housing as well (Archer & Cole, 2014; Hilber, 2015). Help to Buy has been very widely criticised for contributing to the rise in house prices (Edwards, 2016; Hilber, 2015), and worse yet, denounced by the harshest critiques as 'homes for votes' or 'help to bubble' (Dorling, 2015). Another important policy which essentially promotes housing as an investment vehicle is the provision housing benefits for those unable to afford their rents, which has been said to be effectively subsidising windfall gains for landlords (Edwards, 2015a).

Existing policies appear to be solely addressing the symptoms of the crisis rather than the underlying causes, which brings to mind the systems archetype of '*shifting the burden*'. Under business-as-usual, the gap between house prices and household incomes is likely to continue to grow while the stock of housing-related debt is left unattended to rise to debilitating levels. A major 'side effect' of the current approach is a soaring housing benefit bill, as well as an increasing burden of *Help-to-Buy* related loan guarantees on the public purse.

In line with this view of the current policy context as an example of the '*shifting the burden*' archetype, Gallent et al. (2017) suggest that the supply preoccupation is a distraction, limiting consideration of policy measures that might mediate demand, wean the economy off its reliance on house price growth, redirecting credit towards the productive sectors of the economy, and refocus upon the desired function of housing (as a social as well as an economic good). They argue that in today's policy housing discourse, "the elimination of barriers to increased housing supply appear to be the only show in town, supported by a partial political economy that frames housing as an investment choice shackled by bureaucracy in the form of land-use planning. That perspective underplays the significance of capital flows, credit liberalisation, monetary policy, and government support for housing demand in producing housing outcomes (Gallent et al., 2017, p. 2209)."

The emphasis on removing barriers to supply might appear harmless, but it translates into an extension of neoliberal policies from financial deregulation to planning systems and land-use policy. Rydin (1984) asserts that, when large developers lobby for a more efficient more liberalised release of land and planning permission, "in fact what is being sought is a shift in the control of land release, such a shift not necessarily resulting in large scale land release at all" (Rydin, 1984). According to Gallent et al. (2017), this view ignores the concentration of power in the hands of property owners and the way such concentration, as well as flows of unregulated capital, drive prices out of the reach of an increasing proportion of the population (Gallent et al., 2017).

The current 'supply fetish' comes in a bundle with a relaxed attitude to external demand pressures and, until recently, generous tax relief for those investing in buy-to-let property. However, housing supply is necessarily finite and inelastic, while, as a result of globalisation of trade, housing demand is not spatially bounded. Therefore, theoretically, measures suggested by proponents of accelerating supply, such as land-use deregulation, seem unlikely to enable supply to catch up with the hyper-inflated, domestic as well as international, investment demand (Gallent et al., 2017). In addition to that, the private construction industry seems incapable and unwilling to increase supply so much as to catch up with demand, as their business models are traditionally based on increasing profit margins rather than output in times of great demand (Edwards, 2015b; Payne, 2016). Since housebuilding in the UK follows a speculative model, there is an underlying rationale for builders to trickle supply onto the market and release it when market conditions are most favourable - increasing profit at the expense of construction volumes (Payne, 2016; White, 1986).

In countries with increasing property prices, which entail increasing rents in the future, homeownership is the tenure of choice because households want to secure their prevailing housing costs (Voigtländer, 2009). Throughout the past four decades, particularly since the 1980s, the government has gradually reduced its involvement on the supply side of housing, and policy has switched its focus to the promotion of home-ownership through via demand-side subsidies. This is a textbook example of *policy resistance*, since these exact same policies have led to a situation where the growth in owner-occupation has gradually slowed-down, peaked, and started declining since 2008, as seen in Figure 9, with more and more households being priced out into private rental accommodation.
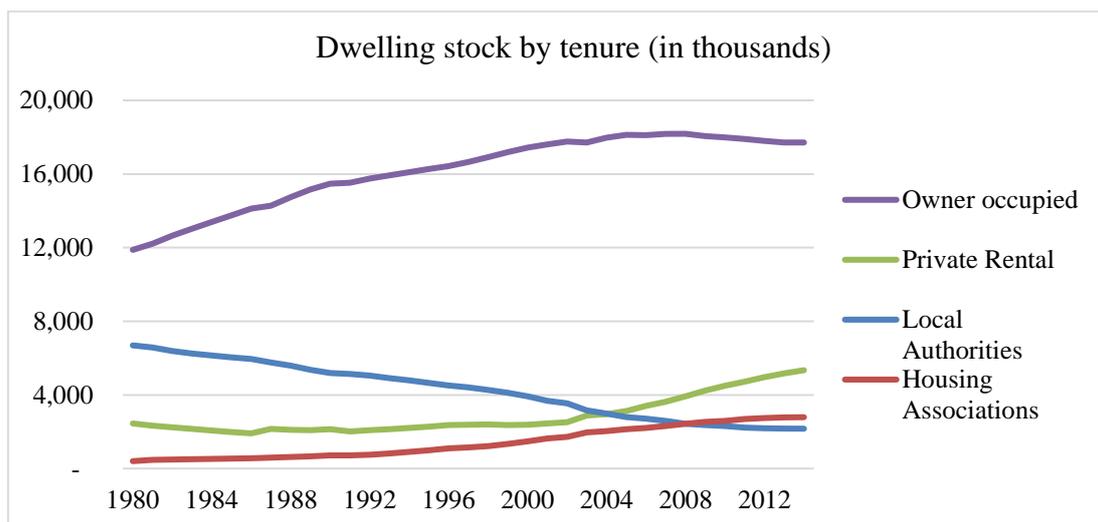

Figure 9 - Developments in housing tenure, London

In conclusion, policies implemented during the past four decades in the housing domain seem to have only helped to make matters worse in terms of affordability. Surprisingly, however, no political party has so far addressed what increasingly seems to be at the root of the crisis, namely the financialisation and virtually unbounded flow of money into housing. No discernible voices are heard in the policy

domain supporting the radical solution of "making housing more affordable" via slowing down growth in real house prices for real incomes to catch up for a few years or decades.

Moreover, in terms of the overall economy, the growing stock of household debt is a legitimate cause for concern over the long-term economic stability and sustainability of this model of running the economy. Credit has been the basis of spectacular human development since the Industrial Revolution. However, credit is entirely based on trust in the future (Harari & Perkins, 2017), and in that sense it is a very fragile construct. In the context of UK housing, when house prices stop growing a state of panic prevails. Lenders stop lending and builders stop building. The destructive force of all the reinforcing loops contributing initially to house price inflation now set in the opposite direction is disconcerting. "A sudden crash in prices would plunge many households into negative equity, triggering personal, political and economic turmoil" (Gallent et al., 2017).

What is more, it is astounding that almost all money in today's economy is entirely created and allocated in the form of debt by commercial banks, whose managers are not chosen by the public, and do not necessarily have the interest of the public on top of their agenda. "One wonders whether greater freedom from that debt […] would not release more money into the economy for other sorts of spending and productive lending (Gallent et al., 2017, p. 2213)."

References

Aoki, K., Proudman, J., & Vlieghe, G. (2002). Houses as Collateral: Has the Link between House Prices and Consumption in the UK changed? *Federal Reserve Bank of New York …*, (May), 1–15. Retrieved from http://www.ny.frb.org/research/epr/02v08n1/0205aoki.pdf

Archer, T., & Cole, I. (2014). Still not plannable? Housing supply and the changing structure of the housebuilding industry in the UK in "austere" times. *People, Place and Policy Online*, *8*(2), 97–112. https://doi.org/10.3351/ppp.0008.0002.0002

Dorling, D. (2014). *All that is solid: How the great housing disaster defines our times, and what we can do about it.* Penguin UK.

Dorling, D. (2015). Policy, politics, health and housing in the UK. *Policy and Politics*, *43*(2), 163–180. https://doi.org/10.1332/030557315X14259845316193

Edwards, M. (2015a). *Prospects for land, rent and housing in UK cities*. *Future of Cities*.

Edwards, M. (2015b). Prospects for land, rent and housing in UK cities (Foresight Future of Cities: working paper).

Edwards, M. (2016). The housing crisis: too difficult or a great opportunity? *Soundings: A Journal of Politics and Culture*, *62*, 23–42.

Eskinasi, M. (2014). *Towards Housing System Dynamics*. Radboud Universiteit Nijmegen. Retrieved from http://hdl.handle.net/2066/129859

Favilukis, J., Kohn, D., Ludvigson, S., & Stijn van Nieuwerburgh. (2012). *International Capital Flows and House Prices: Theory and Evidence* (NBER Working Paper Series No. 17751). Cambridge, MA.

Fisher, J., Gatzlaff, D., Geltner, D., & Haurin, D. (2004). An Analysis of the Determinants of Transaction Frequency of Institutional Commercial Real Estate Investment Property. *Journal Of Real Estate Economics*, *32*(2), 239–264.

Gallent, N. (2015). Over-investment, global capital and other drivers of England's housing crisis.

Gallent, N., Durrant, D., & May, N. (2017). Housing supply, investment demand and money creation: A comment on the drivers of London's housing crisis. *Urban Studies*, *54*(10), 2204–2216. https://doi.org/10.1177/0042098017705828

Harari, Y. N., & Perkins, D. (2017). *Sapiens: A brief history of humankind*. HarperCollins.

Hay, C. (2009). Good inflation, bad inflation: The housing boom, economic growth and the disaggregation of inflationary preferences in the UK and Ireland. *British Journal of Politics and International Relations*, *11*(3), 461–478. https://doi.org/10.1111/j.1467-856X.2009.00380.x

Hilber, C. A. L. (2015). UK Housing and Planning Policies: the evidence from economic research. *Centre for Economic Performance 2015 Election Analyses Series*. Retrieved from http://cep.lse.ac.uk/pubs/download/EA033.pdf

Hwang, S., Park, M., & Lee, H.-S. (2013). Dynamic analysis of the effects of mortgage-lending policies in a real estate market. *Mathematical and Computer Modelling*, *57*, 2106–2120.

KPMG and Shelter. (2015). *Building the Homes We Need; A Program for the 2015 Government*.

Ling, D. C., Marcato, G., & McAllister, P. (2009). Dynamics of asset prices and transaction activity in illiquid markets: The case of private commercial real estate. *Journal of Real Estate Finance and Economics*, *39*(3), 359–383. https://doi.org/10.1007/s11146-009-9182-2

Meen, G. (1990). Oxford Bulletin of Economics and Statistics, *52*(1).

Montgomerie, J., & Büdenbender, M. (2015). Round the Houses: Homeownership and Failures of Asset-Based Welfare in the United Kingdom. *New Political Economy*, *20*(3), 386–405. https://doi.org/10.1080/13563467.2014.951429

Muellbauer, J., & Murphy, A. (1997). Booms and busts in the UK housing market. *The Economic Journal*, *107*(445), 1701–1727. https://doi.org/10.1111/j.1468-0297.1997.tb00076.x, 10.1111/j.1468-0297.1997.tb00076.x

Payne, S. (2016). Examining Housebuilder Behaviour in a Recovering Housing Market. The University of Sheffield.

Piketty, T. (2014). *Capital in the 21st Century*. Harvard University Press.

Rowbotham, M. (1998). *The Grip of Death* (Fourth pri). Jon Carpenter Publishing.

Ryan-Collins, J., Greenham, T., Werner, R., & Jackson, A. (2012). *Where does money come from. A guide to the UK monetary and banking system*. London: New Economics Foundation.

Rydin, Y. (1984). The Struggle for Housing Land: A Case of Confused Interests. *Policy and Politics*, *12*(4), 431–446.

Sterman, J. (2000). *Business Dynamics : systems thinking and modeling for a complex world*. McGraw Hill.

Sterman, J. D. (1986). The economic long wave: theory and evidence. *System Dynamics Review*, *2*(2), 87–125.

Tsatsaronis, K., & Zhu, H. (2004). What drives housing price dynamics: cross-country evidence. *BIS Quarterly Review*.

Tunstall, B. (2015). Relative housing space inequality in England and Wales, and its recent rapid resurgence. *International Journal of Housing Policy*, *6718*(January), 105–126. https://doi.org/10.1080/14616718.2014.984826

Voigtländer, M. (2009). Why is the German homeownership Rate so Low? *Housing Studies*, *24*(3), 355–372. https://doi.org/10.1080/02673030902875011

White, P. (1986). Land availability, land banking and the price of land for housing: a review of recent debates. *Land Development Studioes*, *3*(2), 101–111. https://doi.org/10.1080/02640828608723904