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**ABSTRACT**

**This paper advances a research agenda on how asset-based welfare policies, residential market volatility, stratified accumulation and vulnerability impinge upon the geography of inequality in property markets. Since the mid-1990s, housing prices have increased faster than the income of buyers, becoming a driver of social polarisation and household vulnerability. Few studies have however explicitly linked socio-spatial inequality to asset capitalisation, instability and vulnerability in residential housing markets. We employ an empirically-grounded investigation of the factors driving and reinforcing these dynamics, what we conceptualise as a feedback loop mediating particular housing finance regimes. Drawing on three French cities (Paris, Lyon, and Avignon) our study develops a comparative framework to interpret the relational effects of price, equity and homeowner vulnerability on the production of inequality across different geographical scales. Our approach puts into conversation debates concerning housing markets, social inequality, and ordinary financialisation in the period since the Global Financial Crisis.**

**Key words: Housing; inequalities; ownership; financialisation; wealth; France**

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## INTRODUCTION

Housing is critical in the reproduction of social inequalities (Piketty 2013), while little evidence exists of the spatial effects of housing market dynamics, and especially ownership, on inequalities (Hochstenbach & Arundel 2019). However, affordability remains a major policy issue for social cohesion across Europe, where housing prices have increased faster than the income of buyers in many post-industrial cities and regions (Wetzstein 2017). In France, the continuous inflation of housing prices after the global financial crisis (GFC) constitutes a paradox: while a widening gap between property prices and households' income (Friggit 2017) should discourage homebuyers and investors in metropolitan areas, housing markets have remained active and the growing price trends have not reversed (Tutin 2014) – what Timbeau (2013) referred to as a 'resilient bubble'.

In France, homeownership rates increased from 35 per cent in 1954 up to 58 per cent in 2018 (Bonvalet & Bringé 2013; INSEE 2019); the real estate sector reached historical records of unaffordability, since 2000, the inflation-adjusted cost of real estate has increased +70 per cent, a record of historic unaffordability (Friggit 2017). In short, households benefited from lower interest rates and longer credit maturities to offset price inflation and maintain purchasing power. However, the effects are diverse. While some middle- and upper-class households have benefited from the rise of housing values, low-income households have become increasingly vulnerable to price fluctuations, with a growing financial burden and corresponding difficulties in reselling their assets (Le Corre 2019). This forms the starting point of our research.

During the massive social movement in France against pension reforms (winter 2019), policy-makers and pundits insisted on that the real-estate market allows the economically active members of the population to attain financial security. In this shift towards asset-based welfare (Doling & Ronald 2010), we question to what extent price growth may actually render homeowners more vulnerable to unstable market trends (Arundel 2017).

The housing sector has played an instrumental role in post-Fordist transitions among major OECD economies. France is no exception. Despite the size of its rental market (now circa 42 per cent of dwellings, a majority being private renters), the country has been strongly influenced by ideology of homeownership. According to national statistics, between 1980 and 2000, the share of first-time buyers has increased (+30%), and has stabilised since. This has significantly increased equity-based financial stress; today only 38 per cent of homeowners are without housing debt (INSEE 2019). Although France is still often viewed as having strong state policies driving supply-side subsidies for social housing, the market has increasingly transitioned to a form of 'privatised Keynesianism' (Wijburg 2019), characterised by tax incentives and subsidies to the building and banking industries, and a growing emphasis on pro-homeownership political narratives (Kemeny 2001; Pollard 2010; Schwartz 2012). Today, the amount of subsidies for private sector rentals and homeownership exceeds public-sector grants (Wijburg 2019).

Crucially, while these changes clearly exacerbate long-standing socio-economic inequities and segregation tendencies, the continued focus on the public-private divide elides an equally important opportunity to interrogate certain assumptions regarding household asset-capitalisation that have underpinned these structural trends in the market. For this reason, our analysis examines the inequities arising from equity-based wealth accumulation.

Since Halbwachs's (1913) seminal study, theorists have sought to explain socio-economic inequality as a function of housing affordability. Transactions data availability is no longer a lock in spatially interpreting the diverging trends of price inflation as a factor of social polarisation (Boulay 2012; Le Goix *et al.* 2019; Hochstenbach & Arundel 2019). Few studies however have explicitly linked socio-spatial inequality to asset capitalisation, instability and vulnerability in residential housing markets. Our study builds on current debates on housing markets, social stratification, and ordinary financialisation in the post-Global Financial Crisis (GFC) period by elaborating upon Piketty's (2013) claim that household investments become instrumental in the dynamics

of asset capitalisation, and thereby wider socio-spatial inequality.

This paper advances a research agenda to interpret the unequal and geographies of ownership markets. Specifically, we ask to what extent contemporary social inequality is shaped by one's relationship to spatially stratified housing markets? We hypothesise that the flow of real estate investments and residential housing production are predicated upon intensifying the financial stratification of urban inequalities at the neighbourhood level. This complex socio-spatial layering is what we refer to as a housing finance regime (HFR), or a system of national and local incentives for accessing credit associated with the spatial variability of income and housing prices. Using disaggregated datasets on property transactions, household surveys, and homeowner insights on residential mobility, we propose to analyse the economic spatial and financial trajectories of households in relation to housing price dynamics among three French cities (Paris, Lyon, Avignon). This research agenda provides a better understanding of how housing finance regimes (HFR) play out 'on the ground' both by linking the financial dynamics of residential markets to the production of socio-spatial inequalities at the local level, and – in turn – how the collective circumstances individual buyers feed back into and impact the wider market.

The contribution is structured in four sections. In the following section, we elaborate upon three approaches to the study of housing-induced inequality in real estate markets: asset based welfare policies (financialisation); price stratification and affordability (econometrics); accumulation volatility and vulnerability (capital switching). We use these debates to build a conceptual framework through which to interpret the production of inequality since the GFC. The next section elaborates on the case of the French housing system and how it relates to asset-based welfare, and then details the methodological entry-point through which we operationalise the framework. The analysis focuses on the multi-scalar, relational linkages between: (i) macro-level interactions (housing policies, capital mobility); (ii) meso-level dynamics (unequal affordability, local housing contexts, submarkets); and (iii) micro-level behaviours and decision-making regarding household wealth accumulation/devaluation, and the effects of such dynamics on the wider coordination of urban planning and development strategies. In so doing, we explicitly seek to understand how and to what extent conditions occurring at one level of the housing market shape and are shaped by processes occurring at other scales. The following section provides an example of the linkages between preliminary analysis to operationalise our conceptual framework and discuss case-studies. Specifically, we explain how the datasets can be compared across different geographical contexts to explain how inequality might be analysed differently, and to explain the ways that asset-accumulation and household vulnerability is embedded in each spatial contexts. The final section discusses the contribution to current debates.

## BACKGROUND: INEQUALITY AND HOMEOWNERSHIP

**Asset-based welfare and financialisation –** The increasing disconnect in France between the real cost of residential housing and buyer incomes since 2000 (Friggit 2017) follows trends identified in other countries. Since the early 2000s, the gap has only widened (Schwartz & Seabrooke 2009). A recent study of 17 countries showed that between 1985–2010 price-to-income ratios increased everywhere – up to +28 per cent in France, +44 per cent in the UK – except in Germany and Japan (Aalbers 2016).

Economists generally consider house price inflation to be the result of a shortage of housing supply relative to high demand, in line with underlying assumptions regarding the dynamics shaping market equilibrium. Such views are framed within an ideology of homeownership and associated governmental housing policy reforms (Ronald 2008; Malpass 2011). There is, however, tangible evidence that housing price inflation does not necessarily restrict demand for residential real estate (Goodman & Thibodeau 2008; Case & Shiller 1988) nor does an increased supply of housing depreciate market prices

(Geniaux *et al.* 2015). Economists usually support supply-side policies that seek to restore market imbalances by expanding housing supply and promoting the deregulation of market controls, but such measures are also likely to stimulate further price inflation by encouraging speculative investment (Aveline 2008).

In France, two factors help to explain the disconnection between property prices and household incomes. The first reason is due to the increasing importance of asset-based welfare, resulting from regulatory reforms in the housing sector. Like many other countries, the public rental housing sector in France is currently being restructured by neoliberal policies, resulting in market divestment and residualisation (Bonneval & Pollard 2017). Meanwhile, housing has also become a potential avenue for wealth accumulation: ownership rates have increased and state reforms have encouraged property investment amid wider retrenchment in public welfare services (Driant 2014). This model of 'privatised keynesianism' promotes debt-financed homeownership as an efficient asset-building strategy for households (Crouch 2009). Since the early 1990s, the dramatic rise of institutional investment in real estate and the associated growth of new financial products and services to expand the purchasing power of buyers has contributed to increasing price inflation and volatility. Such trends are consistent with a path dependency shift observed in almost every nation-state that have embraced neoliberal reforms (Rolnik 2013).

The disconnection between property prices and household income cannot be understood without taking into account the broader financialisation of real estate markets. Macro-economic linkages between increasing property ownership, mortgage debt, and price inflation are well established (Kohl 2018). They have allowed for the large-scale expansion in access to credit ('the great mortgaging') through government programmes and incentives that favour home ownership. Aalbers's (2016) research on real estate financialisation is essential in this regard. For the past decade, financialisation tendencies have contributed to an unprecedented buildup of liquid assets worldwide – that has otherwise been termed a 'wall of money' (Fernandez & Aalbers 2016). In order to avoid the onset of financial crisis, institutional changes have been made to facilitate the productive reinvestment of capital, which, in turn, has affected the structuration of the sector's social and economic valuation (Christophers 2011; French *et al.* 2011; Aalbers 2016).

There are many differences between France and more archetypal models of financialisation observed in the USA and UK, for example, mortgage securitisation (Gotham 2009; Langley 2006; Aalbers 2012). In France, loans are mostly backed by mutual insurance companies and are granted on the basis of household income rather than the assessed property value. Synthetic securitisation is rare, which may explain why French real-estate markets better resisted the external shocks of the GFC (Tutin 2013b). There are, however, convergences with other countries. First, the regulation of mortgage lending has shifted from a state-administered financing system to a system organised by private banks. The injection of capital into the housing sector was made possible by household debt incurred through private bank loans. Household indebtedness increased from 30 per cent of the total annual household income in 2000 to almost 100 per cent in 2017, of which housing debt represented 85 per cent (Banque de France 2019). New loan origination mainly involves international circuits of interbank and financial networks through which refinancing vehicles are traded. Second, while deregulating loans, public policies have maintained instruments that increase the solvency of borrowers (Le Corre 2019) and promote lower-income ownership (Lambert 2015). Third, tax incentives have been instrumental in encouraging wealthier households to invest in the private rental sector formerly dominated by the state (Pollard 2010; Vergriete 2013).

**Prices, inequalities and spatial segmentation of the market –** Financialisation tendencies are geographically uneven and variegated across institutional and cultural contexts (Aveline-Dubach 2020; Fernandez & Aalbers 2016; Pike & Pollard 2010). Research has shown how the distinctive geographies of places shape financialisation processes, such as in the way that

middle-class suburbs were targeted as a valuable market for securitisation of debt in the US (Langley 2006). While theorists have examined the impacts of subprime lending on the stratification of housing markets (Immergluck 2012; Pfeiffer & Molina 2012), much remains unknown as to how financialisation is imbricated within local property markets (i.e. price, volatility and segmentation), that shape the wider production of socio-economic inequality.

A key issue is to identify the extent to which households have contingent and unequal capacities to enter a stratified market – specifically, the different social and spatial opportunities and constraints they face in different market segments. Property prices certainly shape the spatial stratification of housing submarkets. However, the prevailing approach – spatial econometrics – tends to reduce buyers' motivations to price factors alone, in order to control for dependent and independent variables among housing submarkets (McLennan & Tu 1996). To approach this, we need to address the convergence and divergence of property prices across neighbourhoods (Guérois & Le Goix 2009; Hamnett 2009; Hochstenbach & Arundel 2019).

The social relations within which property is embedded shape the numerous ways that individuals value housing in use and exchange as a commodity (Christophers 2016) across different market regimes (Brown & Chung 2008; Migozzi 2019; Wind *et al.* 2017). Complex considerations regarding both the motivations and anticipated uses underlying a transaction, and the scale at which investors operate in property markets, have implications for the geographical pattern of social inequality within and across cities. Identifying these factors helps to clarify the ways that socio-spatial stratification is produced, as initially proposed by Harvey (1974). Geocomputational advancements now make the visualisation of large, disparate datasets possible to apprehend the factors affecting urban inequality (Brown & Chung 2008; Le Goix *et al.* 2019; Migozzi 2019) and economic mobility across geographical contexts (Hochstenbach & Musterd 2018). Thus far, however, the methodological integration of these data remains underdeveloped.

**Volatility, vulnerability and restratification** – In addition to market stratification, another major issue affecting inequality is the way that housing wealth is reinvested and transferred from one place to another, due to the economic strategies and geographical mobilities of homeowners. This transfer of investment between different economic sectors and geographical locations, or 'capital switching', is a tactic employed specifically in response to real or perceived threats to one's capacity to accumulate of capital (Kutz 2016). An important part of this calculus within the housing market is shaped by projected valuation (or price) of the property itself, and the opportunity cost of shifting that investment into other undervalued equity markets. Smith's (1979) rent gap theory, for example, was premised upon this form of rent/price differentiation. Boulay (2012, p.5) further argues that this shift necessarily 'implies the inclusion of both temporal and spatial fluctuations of prices'. Spatial analysis of real estate markets shows the impacts of price inflation on the spillover and leapfrogging of real estate investments across geographical contexts, and reveals the need to better understand the driving forces behind price propagation (Cooper *et al.* 2013).The effects of the displacement of housing demand to adjacent areas (Hamnett 2009) could led to ripple effects, spillover and inflation in other cities or nearby neighbourhood (Hochstenbach & Arundel 2019). Spatially contextualised studies of capital switching however remain scarce. Kutz and Lenhardt (2016), for example, explain how spatio-temporal changes in real estate investment, treated as financial assets, are influenced by the pace and volatility of accumulation between different submarkets.

Our conceptual framework puts these debates into greater conversation with each other in order to better explain the economic geography of social inequality and housing today. Building upon these theoretical observations and exploratory data comparisons, we develop an overarching conceptual framework to explain the feedback loop that constitute a given housing finance regime and the geography of urban inequality (Figure 1): prospective homeowners employ

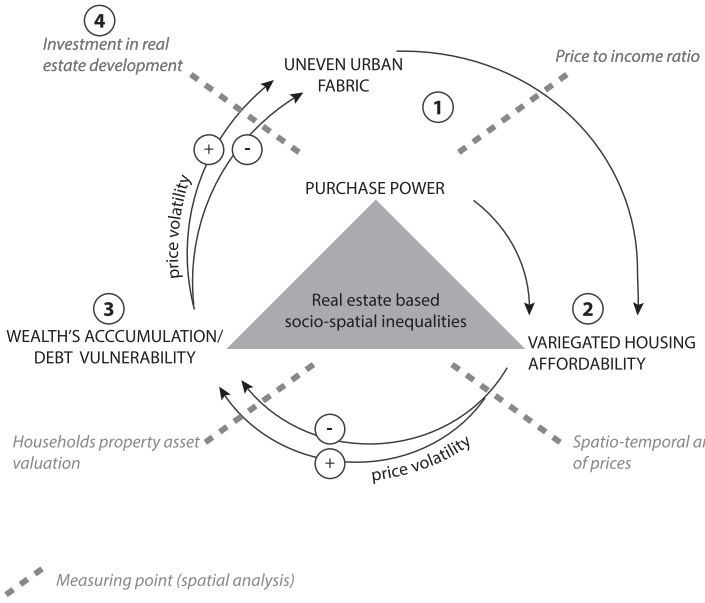


Figure 1. *The feedback loop: housing finance regime and the geography of urban inequality. (© authors, 2019)*

diverse forms of purchasing power defined by their income level, credit score, current assets, and embedded knowledge of market opportunities (1). Buyers and sellers are differentially included – socially and spatially – in the markets through which they operate (2). Housing prices represent the unstable and contingent manner in which the market is continuously restratified within and across neighbourhoods (3). This stems not only from the effects of urban development cycles, but from different policy decisions taken in regard to housing supply (public incentives, subsidies, permissions and restrictions), which influence the local conditions through which household wealth is accumulated or lost (4). This, in turn, shapes the structure of the property's value in the market, where supply and demand interface (5) through the purchasing power of households (1).

## A METHODOLOGICAL FRAMEWORK

Drawing upon our theoretical framing, our methodological approach to interprets housing-based inequalities from three inter-related scales of action (Table 1). To do this, we first explain the justification for our three case studies: (i), then we elaborate upon the three scalar dimensions of inequality under investigation: (ii) urban policies and the production of residential real estate; (iii) local access and affordability in the housing markets, and (iv) associated contextualised investment trajectories and mobilities of households.

**Case studies: a comparison between and within three urban areas –** Our comparative analysis draws upon case studies from Paris, Lyon, and Avignon in order to characterise prices, income, and other variables of interest among the functional urban areas (FUAs, the European standard definition). The case studies are important in that they represent three distinct levels of the French urban hierarchy – the capital city, a regional centre, and a medium-sized city – and therefore provide a representative range of 2,409 municipalities affected by the socio-economic trends we wish to understand more fully.

It is often assumed that metropolitan processes tend to reinforce the growth and concentration of economic wealth at the highest level of an urban hierarchy. However,

Table 1. *Summary of data available and collected, by geographical levels, research question, and targeted indicators.*

| Research question | Geographical level | Key indicators | Type of data | Available | Being collected |
|---|---|---|---|---|---|
| *1. Policies, housing provision and market devices: a spatially selective privatized keyneisianism* | **Macro level** | | | | |
| | - national level | National incentives | Literature review | x | |
| | - local governments and housing planning agencies | Local incentives and discourses promoting homeownership | Semi-directive interviews with key informants | | x |
| | - municipalities | Fiscal incentive zoning, zero interest loan zoning… | Market devices by municipalities ( historical DB 2003-2019): archives, public open data, legal archives | | x |
| *2. The unequal spatial structure of affordability* | **Meso level** | | | | |
| | - municipalities, 1km and 200m grids | price-to-income ratios<br>price change<br>debt-to-value ratios<br>assets accumlated | BIEN and Perval transactions database (annual data 1996-2018); DVF property data (annual 2015-2019); Income (census and fiscal local data 2001-2016) | x | |
| | - definition of target neighborhoods for survey | purchase power of households by category and market segments | | | x |
| *3. Accumulation vs. vulnerability: the financial stratification of urban inequalities* | **Micro level** | | | | |
| | - Households (individual data) | Financial gains or loss, capital switching | - Property tax-related parcel data with houshold ID an property history (DGFIP) | | x |
| | | upward/ downward mobility and type of tenure of moving households | - Family benefits agency data 2014-2019 (CAF) | x | |
| | | Financial strategy of household | - Survey of households in targeted neighorhoods. | | x |

this does not mean that inequalities are not structured by the same processes at different urban scales. The three cities share common characteristics marked by high levels of social-spatial fragmentation, sprawling suburbs, neighbourhood gentrification, and/or urban regeneration. Each case study, nevertheless, represent relatively distinct economic subsystems within the national context. Paris, a global centre, and Lyon, a major national centre, are two metropolitan economies based on the concentration of strategic and innovative activities. They however diverge in that the traditional industrial sector remains important around the greater Lyon region. In contrast, and despite the importance of the local tourism, Avignon evidences a more fragile and declining economic fabric, typical of medium-sized cities throughout France.

**Policies, housing provision and market devices –** These local market dynamics are highly dependent upon national regulatory frameworks that enable households to act as investors seeking future gains, while also exposing them to greater financial risks (volatility of price, loss of property values, risks of bankruptcy and foreclosures, etc.) and systemic shocks (Schwartz 2012). But housing policies and regulations, as well as the interplay between public and private stakeholders, play a defining role in shaping housing inequality across multiple scalar contexts (Grandclement & Boulay 2016; Bonneval & Pollard 2017).

We engage with such policies outright. First, an *inventory* was conducted in Paris, Lyon and Avignon to identify key market infrastructures that both interconnect and influence real estate accumulation strategies at different scales. For example, municipal zero-interest loans, affordable housing instruments, rental investment subsidies and tax incentives, and local building legislation, as well as the diverse land tenure systems (e.g. community land trusts/*organismes fonciers solidaires*). This information was then geospatially analysed, according to the recurring and distinctive features identified in the existing documentation, questionnaires, and stakeholder archives (zoning plans, development project publications) in order to assess the convergence of interests between local governments, developers, real estate agents and homeowner associations. Interviews with the main stakeholders aim to deepen our understanding of local housing policies and their implementation. Specific attention is paid to the relationships between stakeholders and how they structure local conditions in which urban development, land availability, and fiscal policies operate, as well as their impacts on home values and wider patterns of residential market segmentation.

**The unequal spatial structure of affordability –** To inform the local spatial structure of affordability we integrate different spatial datasets and surveys which have so far been studied separately (Table 1). There are plenty of institutional (census records), private (real-estate agents and websites) and national or local datasets (cadastral records, tax rolls). However, few methods have been developed to harmonise this spatial data as a means to study housing market trends (Julliard & Gusarova 2019). While OECD (2018) data allows for comparison between countries (André & Chalaux 2018), it characterises affordability at national aggregates only. This is one reason why current research often focuses on national aggregates to interpret the effects of homeownership on social inequality (Kohl 2018; Walks 2019; Arundel & Ronald 2020). Our proposal is to use disaggregated data (individual transactions) to harmonise temporal and spatial affordability trends, in line with our feedback loop model. Transactions data are collected by the Chamber of Notaries, and stored on the BIEN and PERVAL databases, as well as by the French Department of Public Finance which provides open-source cadastral and property tax data (DVF dataset, see Table 1). A key issue with these datasets is that they differ substantially in their structure, exhaustiveness and content, with variables that do not always compare (Casanova *et al.* 2017). Combining these different elements nevertheless allows us to control for inconsistencies across transaction data, while also enhancing our ability to analyse new relationships between disaggregated data

(between sellers and buyers, for instance). In particular, our focus centres on the local geographies of the market (200 m grid, 1k grid and municipalities) to insure the robustness of our aggregation techniques, and to draw conclusions about spatial stratification at a finer scale of analysis (Boulay 2012; Le Goix *et al.* 2019).

To approach the problem empirically, we observe and measure the feedback loop at four key junctures (Figure 1). The first series of measures describe the geographical structure of affordability through the lens of price-to-income ratios (1), and the spatio-temporal changes in price (2), using propertytransaction data. This information helps to illuminate the social sorting of prospective buyers according to the spatial structure of affordability, within a given market segment. We then characterise the typology of buyers, according to their assets (3) in order to determine the purchasing power of households and their investment capacities (4).

**Accumulation vs. vulnerability** – The last aspect of our analysis examines the social embeddedness of housing finance regimes within residential markets. The flow of investment capital into and out of local housing markets is influenced by the financial stratification of urban inequalities. We assume that stratification operates through the assemblage of different housing and financial policies, market devices, and technologies (Aalbers 2005; Fourcade & Healy 2017) that recursively perpetuate the geographical variegation of urban inequality and vulnerability (Migozzi 2019). This stratification is therefore shaped by two factors: (i) residential access and affordability for buyers; and (ii) the trajectories of accumulated wealth associated with residential real estate.

To analyse the variegated forms of asset accumulation, we classify the profiles of owners according to asset-building proxies, using property tax-related individual data. The importance of ordinary homeowners relative to investors with multiple properties pursuing asset-building strategies can be determined using parcel data. Tax rolls also allow us to examine investment/divestment trajectories of different property owners relative to the tenure status of the assets, over time. Additionally, we use disaggregated data from the French family benefits agency (Caisse d'allocations familiales, with access to individual data for 2.3 millions households), which provides crucial information describing the benefits history of households, and allows to analyse several important dimensions: the upward/downward mobility of households, changes in the life-course (coupling, having children, etc.), or the loss or gain of income over a period of time. Such a dataset helps to explain the wider trends in financial gains and losses across households. This matters because rising house prices do not always affect housing affordability for households. Some might solve the affordability trade-off by downsising or moving out. But lower-income owners confronting a gentrification process may also be able to make large capital gains from the sale of their property, while other financial considerations may compelled them to stay put (Hochstenbach & Musterd 2018). Coupled with individual interviews, this allows to approach capital switching strategies employed by different types of property owners in response to perceived opportunities/threats in the market.

More detailed studies are then being conducted in targeted neighbourhoods, using a household survey. The goal is to document how homeowners' asset trajectories might be affected, and how their strategies might impact urban development and planning (i.e. the 'homevoter hypothesis', Fischel 2001). These conditions are central to analyse decisions to move out and move in, buy, or stay put, the investment capacities of households, the age they enter the market, and their respective relationships to local market regimes. The age they entered the market is crucial in this regard: many households have bought their home under a different price regime and this has been analysed in Paris (Le Corre 2019). Lower price ownership, for a long time, has shielded many households from the recent credit inflation: they do not suffer any negative consequences, and have therefore accumulated enough assets to reinvest (multiple owners). Hence by closing the feedback loop (Figure 1), we demonstrate the material effects of the various housing finance regimes on the constellation of local

policies, developers, real-estate agents, as well as socio-spatial inequalities thereby produced.

## PRELIMINARY ANALYSIS AND FINDINGS: FROM MUNICIPAL AGGREGATES TO NEIGHBOURHOOD CASES

This section operationalises the theoretical framework, to empirically test the interdependency between the several levels of analysis: policies, contexts, households as a driver of social inequality, and for which we can identify possible case-studies for further analysis. In this first phase of the study, we focus only on municipal aggregates from available data for our three case studies (Paris, Lyon, Avignon). We deem important in a research agenda to contextualise where the research is being conducted: the main goal of this section is to identify example neighbourhoods (meso level), given their characterisations, in which to conduct interviews for the household survey (micro level, see Table 1). However, the role of inequalities across space cannot be fully captured at this aggregated level, and recent works also demonstrate the importance of local spatial data to circumscribe the variegated embeddedness of ownership in local trajectories of market dynamics (Le Goix *et al.* 2019; Hochstenbach & Arundel 2020), and further work will focus on fine grain data analysis. Data presented in this section does not include relevant information for outer suburbs municipalities, mostly because of statistical secret and sampling issues (number of records not significant to aggregate).

**Price-to-income ratio –** First, we characterise affordability for median households as an entry point to assess socio-economic inequality in the feedback loop, starting with price-to-income ratio (PIR) metric (Friggit 2017). Household purchasing power is estimated as the ratio between local (municipal) and national median income. The question we pose is: to what extent would a 'median income household' anywhere in France have the purchasing power to access a given neighbourhood? We measure affordability as the monthly income required to buy 1 sq. metre of real estate; we define the financial accessibility of neighbourhoods by median households. Everything being equal in terms of income, the structure of housing markets heavily constrains the ability of households to access a property. For apartments only, for example, our results show that the city centre and many inner suburbs of the Paris region rank up to 3 times the median price-to-income ratio, if not more. This is also true in the urban centre and north-western suburbs of Lyon. The effect of the French urban hierarchy between Paris and other second- and third-tier cities is also significant, as 'affordable' urban markets are more widespread further down the hierarchy. For example, an average household could access residential real estate in any area of Avignon FUA, but would be restricted to the suburbs in Lyon, and only a few locations in the outer-suburbs in Paris.

**Annual growth of home prices –** Second, we analyse the context in which affordability constrains the residential trajectories of households through home price inflation and market volatility. In our case studies, the local effects of inflation seem more diverse, and show diverging trajectories under more generalised inflation. Figure 3 highlights the annual growth of housing according to three categories of real-estate price dynamics at the municipal level: depreciation; slow, or average performance, and above average increases. As expected, the centre of Paris and Lyon together show price increase dynamics that reinforce the economic importance of central neighbourhoods. Upward trends were also identified in the eastern suburbs of Lyon traditionally characterised by ethnically-mixed neighbourhoods and an overrepresentation of public housing and sluggish property markets. Elsewhere within all FUAs, however, depreciative trends are more randomly distributed. For example, before 2008, the French housing market was affected by ubiquitous price inflation, especially in low-end markets, which narrowed the gap between high-end and low-end neighbourhoods (Boulay *et al.* 2011; Le Corre 2019). This homogenisation process *within* urban areas did not impact the socio-economic hierarchy *between* neighbourhoods (Guérois & Le Goix 2009). Since 2008, however, price dynamics have become


Figure 2. *Price-to-income ratio, 2012.*

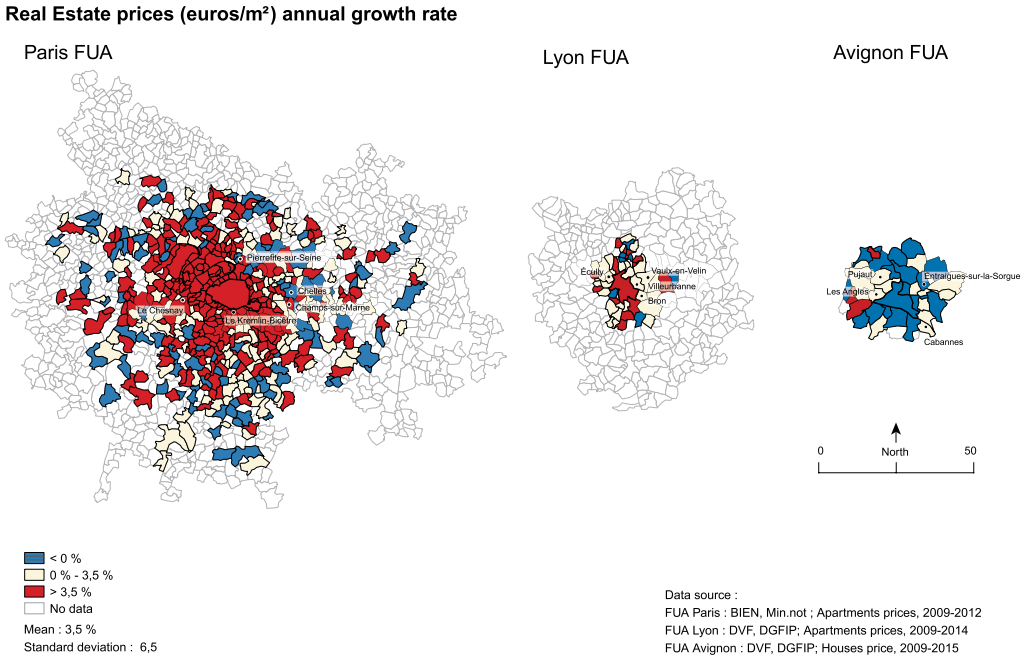


Figure 3. *Home price annual growth rates (in of price/ sq.m).*

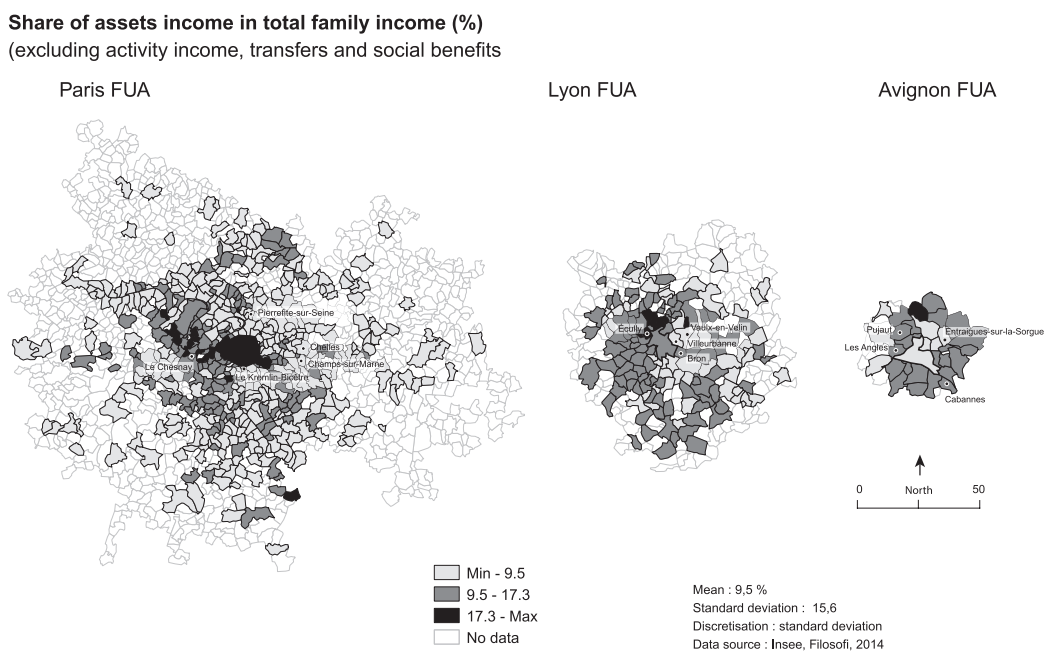


Figure 4. *Share of revenues from capital investment.*

more heterogeneous, as there is less catching-up occurring between neighbourhoods. The price hierarchy is also now more volatile, with a majority of municipalities shifting between upper quintiles and lower quintiles in the period between 2009 and 2012.

A third stage of the analysis consists in describing the spatially contextualised stratification of homeownership: the local conditions of wealth accumulation – whether in the form of asset capitalisation in property values, or in household vulnerability – determines buyer investment capacities and its attendant effects on the built environment (e.g. new-built gentrification, neighbourhood renewal).

**Share of revenues from capital investment** – We use the share of revenues from capital investment in a household's income as a proxy to observe the local conditions of wealth accumulation (Figure 4). The spatial structure of the case studies show clear patterns of concentrated investment accumulation in central Paris, its western suburbs, and some remote suburban contexts (Chantilly in the north; and Essonne to the south). The situation is different in Lyon, where areas of concentrated investment are found especially in the city's central, western and southern districts. Finally, Avignon evidences a unique doughnut pattern of investment that disproportionately targets suburban areas. This spatial distribution of assets determines some of the patterns of spatial fixity in rental and speculative real-estate investment: higher yield investments are located in the suburbs, correlated with subsidised rental investment by households.

**Poverty rates** – Household vulnerability is the final factor to understand the unequal patterns of housing inequality in France. For the present study we only examine one aspect of vulnerability: the poverty rates of owner-occupied households (Figure 5). In France, low-income households are often tenants of private or public rental housing units. Some however might also be homeowners. This has been documented in two contexts. On the one hand in large condominiums built during the Fordist-era, often in the urban centre or close to public housing projects. Often caught in a spiral debt and they are highly vulnerable to declining property values and urban

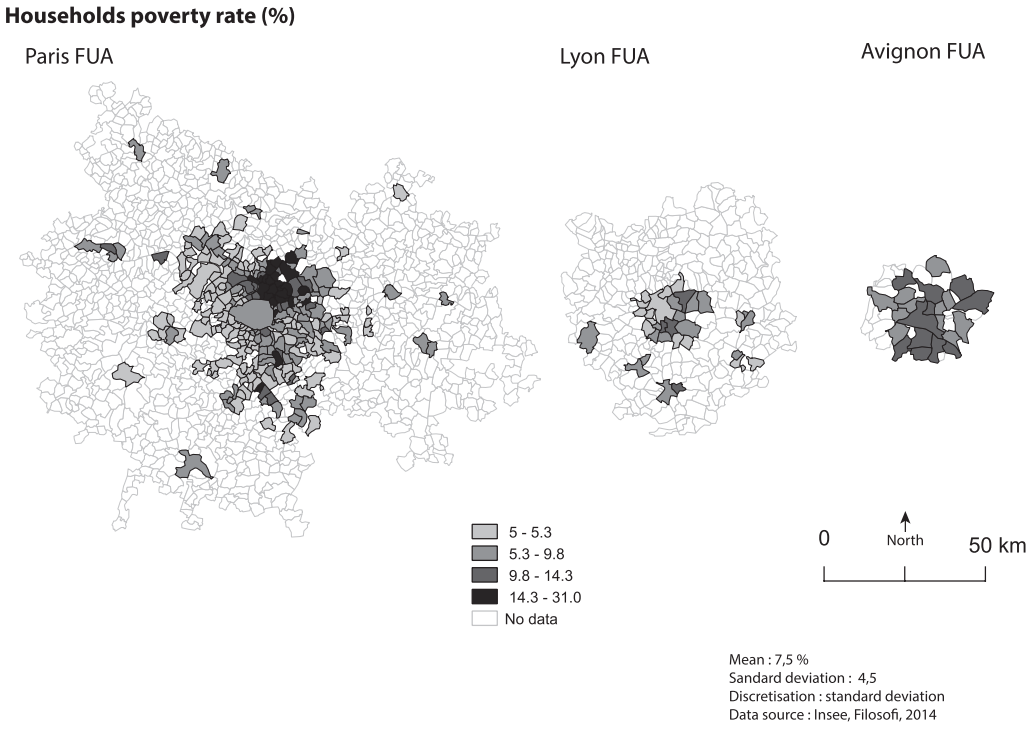


Figure 5. *Poverty rates of owner-occupied households (%).*

Table 2. *Principle trends across French housing finance regimes, some examples (municipalities)*

| Commune | FUA | Price-to-Income | Price Growth | Share of RE investment | Poverty rate of owners |
|---|---|---|---|---|---|
| Pierrefitte-sur-Seine | Paris | + | - | – | ++ |
| Vaulx-en-Velin | Lyon | | | | |
| Chelles | Paris | – | – | - | + |
| Bron | Lyon | | | | |
| Noves | Avignon | | | | |
| Champs-sur-Marne | Paris | – | + | - | - |
| Villeurbanne | Lyon | | | | |
| Cabannes | Avignon | | | | |
| Le-Kremlin-Bicêtre | Paris | ++ | ++ | - | - |
| Le Chesnais | Paris | ++ | ++ | ++ | – |
| Ecully | Lyon | | | | |
| Pujaut | Avignon | | | | |

*Note:* breakdowns refer to Figures 2 to 5.

decay or on the other hand, in suburban single-family homes where buyers previously benefited from subsidised loans. In both cases, vulnerability can be a delayed effect of policies enacted over the past decades, or embedded in declining neighbourhood property values (Figure 3). The spatial patterns of poverty we identified in our case studies among homeowner households do not directly overlay onto previously mapped tendencies, but they are affected by risk of price decline or below average price inflation.

This contradicts the asset-based welfare hypothesis for poorer households. The case studies support the view that vulnerability is a multifaceted process, one that is shaped by a combination of high debt-to-value ratios, risk to declining property values, social or racial discrimination of households leading to high-risk assessment (high cost of insurance and subprime mortgages), as well as increased precarity of a household's employment status.

**Preliminary findings for further targeted research –** The optics through which we assess housing inequality underscores how price volatility has distinctly local characteristics and dynamics which are crucial to understanding the structure and embeddedness of housing finance regimes, as well as how these regimes are experienced by households themselves. These forms of spatial stratification identified across residential submarkets allow us to chart where to address further qualitative research targeting micro-level analysis, that is to say homeowners' narratives of their asset trajectories and also the impact of these strategies on wider urban development.

Table 2 provides a breakdown of the key trends for further development in this regard. The group are constructed relative to housing wealth, assets, and the local conditions of inclusion into the ownership market (the exploration is conducted by means of a hierarchical cluster analysis). Municipalities designated in Table 2 are typical of the trends identified (class centroids), with a synthetic presentation. The first trend represents areas with above-average price-to-income ratios, sluggish price growth, a low share of residential investment, and a higher concentrations of poor homeowners (Pierrefitte and Vaulx-en-Velin): they constitute markets at risk for increased household vulnerability, especially when we consider that high price-to-income ratios coincide with high debt-to-value and/or debt-to-income ratios, and low asset-building opportunities for residential investment (Le Corre 2019). Another category is structured by compound disadvantages: low price-to-income ratios, falling residential prices, a low share of investment revenue, and high rate of low-income homeowners, like that found in the mixed suburbs of Chelles (Paris), Bron (Lyon), Noves, (Avignon). More affordable areas, such as Champs-sur-Marne (Paris), Villeurbannes (Lyon), or Cabannes (Avignon) offer the potential for price growth and asset accumulation, but the trends do not correlate with higher capital investment, and low-income homeowners are largely excluded from such submarkets. Wealthier areas such as the western suburbs of Paris (Le Chesnais) or Lyon (Ecully), and some western suburbs of Avignon (Pujaut) show clear patterns of investment accumulation fueled by price inflation.

## DISCUSSION AND CONCLUSION

**Categories to analyse inequalities –** On the basis of these preliminary insights, the mixed-methodology approach we envision (Table 1) allows us to address some of the long-standing limitations to the study of the relationships between segregation, inequality and housing prices – both in how such metrics are employed and what their data might bring to understanding the geography of property markets more broadly. In particular, the approach helps to shed light on the spatial sorting effects of financial metrics (e.g. based on wealth, assets, income), in the constant large-scale monitoring of sellers and buyers' behaviours and characteristics that are employed in credit scoring (Langley 2006; Fourcade & Healy 2017; Migozzi 2019).

Most of the literature on housing inequality is based on the fact that asset differences between households depend upon the value of the property itself. Conversely, standard approaches to housing markets analysis tend to assume that the primary factor shaping differences in real estate values depend upon societal circumstances – such as the socio-economic composition of the neighbourhood. Simply put, property values are in one approach treated as an independent variable, and in the other they are a dependent variable. Our analysis pushes for an integrative, multilevel framework to analyse the factors at stake in local affordability, price dynamics and urban planning.

**Data and methods –** Innovations in data analysis provide important opportunities to integrate micro-scalar dimensions of urban inequality to broader structural and institutional research in

the post-GFC period (Table 1). As mentioned in the methodological framework section, many such datasets remain incomplete as few countries make data on individual-level property transactions widely available. This poses major challenges for comparison.

Our approach seeks that not only *should* these data be integrated for stronger, more comprehensive analysis across geographical scales, but also *how* to go about doing it, conceptually and methodologically. As in Table 1, we bridge local data aggregates with qualitative information on the households *actually* involved in market transactions while moving in and out (recent buyers identified by new addresses declared at the family benefits agencies and at the postal services). We link these trends to wider geographical attributes and socio-economic characterisations among the properties and households. Nevertheless, our approach is not without limitations, and therefore should be considered simply a first important step in working through how to better integrate and interpret the breadth of existing data. Our approach enables us to answer a number of questions including (but not limited to) the purchasing power of homebuyers across different socio-professional categories and residential submarkets, as well as the geographical access and inclusion of these buyers across different housing finance regimes (Le Corre 2019), and the mobility spatial patterns correlated to the buying process.

**Final claims** – Research agendas recently published on property markets engage with a series of approaches on the issues of affordability and access to ownership. For instance, Walks (2019) discusses how inequalities stems from a context of pro-ownership policies and housing bubble. Wijburg (2020) analyses the local contestations of financial-led accumulation and alternative approach to ownership. In this research context, the article demonstrates how the constellation of asset-based welfare policies, residential market volatility and stratified accumulation and vulnerability impinge upon the geography of housing-based inequality today.

Preliminary analysis shows that inflation and local instability can accommodate investment accumulation in residential real estate, while also increasing the vulnerability of property owners. These are counter-arguments to prevailing assumptions regarding asset-based welfare, which views real-estate investment as the primary way to secure a household's economic well-being. In fact, market dynamics have enabled some households in more affordable neighbourhoods to benefit from housing price inflation, but only in highly localised and specific circumstances. These variegated, uneven, and disjointed movements reflect the complexity of the ways that housing-finance regimes are enacted and maintained through diverse systemic and individual factors we have sought to frame for further analysis.

Our approach enables us to capture how households secure their economic trajectories by capitalising on real-estate opportunities and/or engaging in increasingly risky financial behaviour (Driant 2014). The wealth effects caused by housing price inflation are controversial (Bonnet *et al.* 2014): local divergences in price vs. income do not necessarily indicate increased unaffordability, as cheaper mortgage increase the ability to pay (Damen *et al.* 2016). Nevertheless, the social and spatial differences of such effects among property owners have not yet been fully analysed. As a result, it remains unclear how the localised accumulation of housing wealth influences homeowners to become *de facto* strategic investors who actively reshape the urban fabric, despite the large body of research on the effects of this transformation (urban renewal, gentrification, BIMBYsm, Airbnb investments). Our approach helps to integrate these various trends – as distinct housing finance regimes – and using the outcomes of these various data and research findings to develop a more comprehensive picture of the geography of housing inequality today.

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