INCOME INEQUALITY AS A BARRIER TO HOMEOWNERSHIP: A COMPREHENSIVE EXAMINATION OF ACCESS CHALLENGES IN A GLOBAL CONTEXT

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Key words: *The robust standard errors method proposed by Driscoll and Kraay, GDP growth and urbanization dynamics the GINI index, homeownership rates*

Abstract

This paper examines the multifaceted relationship between income inequality and homeownership rates across global contexts, with a particular focus on European countries from 2003 to 2019. Drawing on a comprehensive analysis of 35 European nations, the study investigates how income inequality, as measured by the GINI index, influences access to housing. The study employs the robust standard errors method proposed by Driscoll and Kraay. The findings reveal a significant negative correlation between income inequality and homeownership rates, indicating that heightened inequality exacerbates disparities, particularly for economically disadvantaged individuals. Furthermore, macroeconomic factors such as GDP growth and urbanization dynamics are shown to impact homeownership patterns. The analysis underscores the intricate interplay between income inequality, economic dynamics, demographic trends, and homeownership outcomes.

Introduction

The historical trajectory of human habitation demonstrates a persistent interest with securing a place to live, progressing from primitive shelters in ancient times to the modern emphasis on homeownership. Throughout history, the search for shelter has been inextricably linked to cultural, social, and economic factors, creating the collective consciousness of cultures all over the world.

The importance of homeownership as we know it today may be traced back to the establishment of agrarian communities. Land ownership came to be associated with stability, agricultural productivity, and power consolidation. The manor house, for example, acted as both a dwelling and a symbol of feudal authority in medieval Europe. Land and housing ownership was not only a practical issue, but also a social marker, establishing hierarchies and sustaining societal institutions.

Fast forward to the current day, and homeownership has evolved into a critical component of both individual and societal well-being. In modern civilizations, owning a home has become an actual indicator of financial success, stability, and personal achievement, in addition to the utilitarian requirement for shelter.

Owning or renting?

In contemporary times, the concept of homeownership has evolved significantly from ancient times. Unlike in the past, not everyone can afford to own a home outright due to various economic factors. As a result, the housing market has adapted to meet the diverse needs and financial capabilities of individuals by offering alternative options such as renting.

Saunders (1990) explains in his book "A Nation of Homeowners" why people tend to prefer owning their homes rather than renting them. He argues that this preference should shape government housing policies to encourage more people to become homeowners. Saunders believes this inclination towards homeownership is rooted in our natural desire to possess and control our own space.

Apart from this instinct, there are other reasons why owning a home is often seen as better than renting. For one, it's often thought to be a smarter financial decision in the long run. Owning a home can also give you a sense of independence, stability, and a stronger sense of identity. Saunders also points out that this preference for homeownership is especially strong in countries where English is spoken.

To explain why this preference is so prevalent, Saunders looks back in history. He suggests that the English have valued individualism and private property for

centuries, long before the Enlightenment in the 18th century. In essence, he argues that owning a home has deep cultural roots that go back hundreds of years.

Rohe et al. (2001) have gathered research from American and Australian sources about the advantages of owning a home. They don't just give an overview but also explain why homeownership is believed to be beneficial. According to their findings, owning a home can be good for both individuals and communities. It can make people healthier, happier, and more involved in their communities.

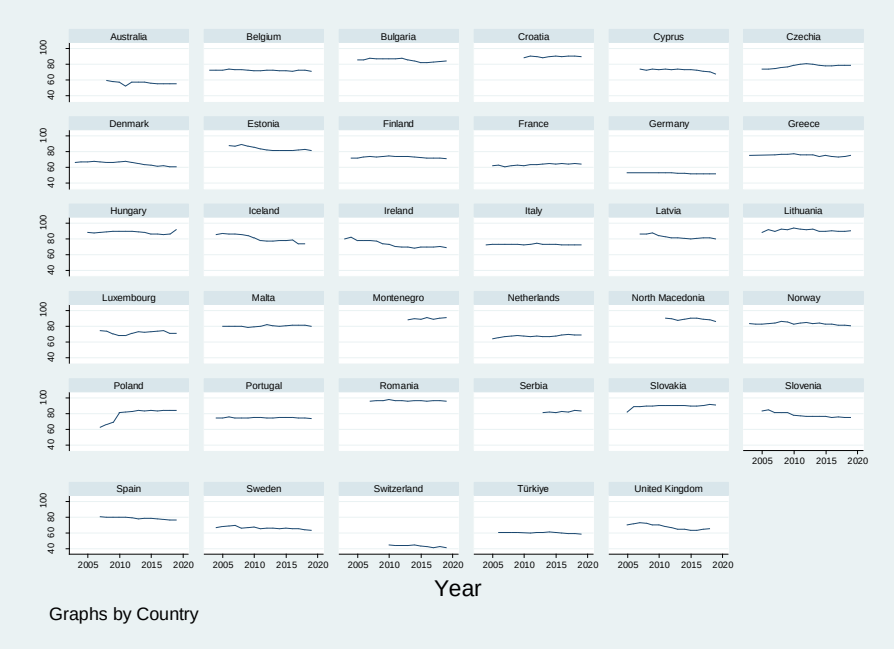
The research suggests that owning a home can boost self-esteem. This might be because homeowners are often seen as having higher social status. Also, buying a home is seen as a big achievement, which can make people feel good about themselves. Feeling good about yourself can also make you happier with your home and your life in general. There is an argument in favor of promoting increased homeownership based on efficiency grounds. Some evidence suggests that homeowners tend to take better care of their homes and local neighborhoods, which benefits society as a whole rather than just the individual homeowner.

Homeownership in Europe

Homeownership is often seen as part of the "American Dream," which makes people feel satisfied with their living situation. Being able to customize and improve your home to fit your tastes is also a big part of why homeowners are usually happy with their homes.Lastly, owning a home can be a good investment because property values often go up over time. Plus, as you pay off your mortgage, you build wealth. So, owning a home isn't just good for your happiness, it can also be good for your financial future.

In countries like Spain, Italy, and Greece, many people own their homes rather than renting, and there aren't as many rental options available. Some experts say this preference for owning comes from long-standing cultural traditions, while others point to specific laws and policies that make it easier to buy a home than to rent.

These countries have made laws that protect tenants, but they haven't given landlords as much support as in other places like Germany. Because of this, investing in rental properties isn't as attractive in Southern Europe. It seems like the culture and the laws work together to encourage homeownership. In Spain, for example, owning a home is pretty common. Even though it's not as wealthy as some other countries, families often rely on each other to help buy houses. So, in Southern Europe, owning a home isn't just a choice—it's often a tradition passed down through families.



Similarly, homeownership rates have varied across countries. While Belgium and Sweden have demonstrated stable homeownership rates, others like Bulgaria and Cyprus have experienced fluctuations due to economic instability and housing market dynamics. Countries like Denmark and Ireland have witnessed declines in homeownership rates, influenced by factors such as high property prices and economic cycles.

Barriers to homeownership

Over the past two decades, there has been a significant decline in the rate of homeownership among young adults. According to John Healey MP, the Shadow Secretary of State for Housing, in an interview in Autumn 2017, the number of

individuals under 45 owning their own homes has decreased by 900,000 since 2010. This trend has led to homeownership reaching a 30-year low, affecting many who aspire to own their own homes. In 2017, only 35% of 25- to 34-year-olds were homeowners, down from 55% in 1997. Particularly striking is the decline among middle-income young adults, who now resemble the poorest groups in terms of housing tenure rather than their wealthier peers. (Cribb and Simpson, 2018)

Numerous scholars have posited a direct correlation between challenges in accessing homeownership and the broader issues of income and wealth inequality. This contention underscores a central concern within academic discourse surrounding housing dynamics. It elucidates the intricate interplay between economic disparities and the ability of individuals to attain property ownership, a fundamental aspect of societal participation and financial stability.

Within this scholarly framework, the discourse often delves into the structural barriers and systemic inequalities that impede certain segments of the population from realizing homeownership aspirations. These barriers can manifest in various forms, including limited access to affordable housing, unequal access to credit and mortgage financing, and disparities in income distribution.

Furthermore, the academic dialogue emphasizes the multifaceted nature of wealth accumulation and its pivotal role in shaping homeownership patterns. Scholars highlight how disparities in wealth accumulation, influenced by factors such as inheritance, intergenerational transfers, and investment opportunities, perpetuate inequalities in access to homeownership across different socioeconomic strata. (Kaas, Kocharkov and Preugschat, 2019)

Owner-occupation as it relates to housing is not universally understood. Nonetheless, the housing economics theory of tenure choice generally stays away from depending on institutional justifications for variations in the rates of homeownership around the world. The objective of this study is to examine the empirical factors that

influence homeownership rates and fluctuations worldwide. Our main goal is to evaluate the possible effects of income inequality on homeownership across the globe.

Access to homeownership is becoming increasingly challenging. To address this issue and achieve stability, it is crucial to understand the factors influencing it. Researchers are actively investigating the determinants of homeownership, aiming to uncover the complexities surrounding this issue. While the concept of a connection between income inequality and housing outcomes is intriguing, the mechanisms at play are intricate. The lack of studies in this field emphasizes the urgency and relevance of ongoing research efforts. Based on observed literature we generate following research question. “How income inequality effect on homeownership rate around the world?”

Literature review

Relative shifts between income categories are generally reflected by developments in income disparity. These might occur along the entire income spectrum (the wealthiest getting richer, the poor getting poorer). Low-income households are more affected by income inequality because of its effect on housing markets. The study, conducted by Dewilde and Lancee in 2013, utilizes multilevel models for 28 countries, revealing several key findings: Higher income inequality increases the likelihood of affordability problems for low-income renters. There is a positive correlation between income inequality and housing crowding. Higher income inequality is associated with lower housing quality.

The analysis employs variables such as affordability, quantity, and quality to measure 'access to housing.' Affordability is operationalized as housing costs being less than 40% of disposable income. For quality, 'housing deprivation' is identified when a dwelling experiences at least two adverse conditions, including a leaking roof, lack of bath or toilet, inadequate lighting or noise, absence of hot running water, and an inability to maintain adequate warmth. The Gini coefficient serves as the independent variable. To account for economic affluence, the study includes control variables such

as GDP per capita, disposable household income, household size, age of the oldest household member (and its squared term), highest educational attainment, and indicators for unemployment or being born outside the country of residence. The methodology involves the use of ordinary least squares and random intercept models. The research concludes that while income inequality hampers access to housing for low-income households, the relationship is intricate and not mediated solely by national house prices.

The study by Sato, Sicular, and Yue in 2011 delves into estimates of housing wealth and imputed rental income for the years 2002 and 2007, using data from the CHIP dataset. While acknowledging data constraints, the authors highlight key aspects and estimation methods, employing cross-checks to identify potential biases. Their focus includes measuring inequality in housing wealth and income distribution in China, examining urban and rural sectors separately. The analysis also explores factors influencing housing tenure and levels of housing wealth, revealing significant differences between urban and rural areas and changes over the study period.

The study investigates the distribution of housing wealth in China, noting unusual characteristics. While inequality is relatively high among homeowners by international standards, China faces reducing in homeownership rate. Multinomial logit and regression analyses explore factors associated with homeownership and housing wealth for urban and rural households. Institutional factors, income, family size, and investment demands for housing are found to be significant, with notable distinctions between urban and rural homeowners. The study also observes unconventional life-cycle effects, with housing wealth not following the typical pattern of increasing through middle age and declining in old age.

The findings shed light on the complex dynamics of housing wealth and tenure in China, considering both urban and rural contexts. The study's reliance on cross-sectional data acknowledges the impact of recent housing privatization and the evolving economic environment on housing choices and investments.

In a 2019 study by Kaas, Kocharkov, and Preugschat, the Household Finance and Consumption Survey uncovered significant wealth inequality variations among Euro area countries. The research reveals a robust negative correlation between wealth inequality and homeownership rates across nations. This correlation persists even after accounting for other factors through a counterfactual decomposition analysis. By breaking down the Gini coefficient among homeowners and renters, the study emphasizes that the negative relationship primarily stems from substantial inequality between these two groups. Notably, the lower half of the wealth distribution plays a crucial role in driving cross-country differences in homeownership rates and their correlation with wealth inequality.

To delve into the relationship between wealth inequality and homeownership, the study employs a decomposition analysis. Initially, it dissects the Gini coefficient of net wealth into within-group components of homeowners and renters and a between-group component. While both homeowner and between-group components contribute significantly to Gini coefficients in all countries, only the between-group component is relevant to the negative correlation with homeownership rates. This is attributed to the consistent finding that renters tend to be much less affluent than homeowners in all countries.

The study further employs a counterfactual decomposition using the recentered influence function (RIF) of the Gini coefficient, which isolates the contribution of individual controls. Results indicate that the regression coefficients on homeownership are pivotal, exhibiting a substantial negative effect on the Gini coefficient across all countries, with similar magnitudes. This analysis confirms that the homeownership rate is the most influential factor in explaining differences in the Gini coefficient across countries.

Fisher and Jaffe (2003) conducted an analysis on the determinants of homeownership rates, utilizing a comprehensive dataset from the United Nations Center for Human Settlements Statistical Database. Their study involved macro-level

information gathered from various sources, including the World Bank Development Indicators. To mitigate potential endogeneity issues, they averaged independent variables (excluding categorical ones) over a ten-year period preceding the reported homeownership rates.

The initial focus of their multivariate analysis was on variables of interest identified in prior cross-sectional studies. Notably, their Ordinary Least Squares (OLS) regression results revealed intriguing findings. Contrary to previous studies, the univariate results suggested that income (measured by GDP per capita) was not statistically significant in explaining homeownership rates, with a seemingly contradictory negative coefficient.

Upon closer examination, the relationship between income and homeownership rates proved to be more nuanced. After accounting for other factors, GDP per capita exhibited a positive, though statistically insignificant, association with homeownership. The inclusion of the square of GDP per capita revealed explanatory power, with a negative coefficient suggesting that at very high income levels, national homeownership rates tended to be lower. This non-linear relationship was attributed to the notably low homeownership rates observed in affluent Scandinavian and German countries.

The study identified other determinants of homeownership as well. The percentage of a country's population residing in urban areas showed a significant and negative relationship with homeownership rates, consistent with previous research. Similarly, government consumption as a percentage of GDP was found to be significantly and negatively linked to homeownership rates. This variable was interpreted as a proxy for the likelihood of public provision of housing services or rental subsidies, affecting the comparative user costs of renting versus owning.

Interestingly, inflation was not found to be statistically related to homeownership rates in both univariate and multivariate analyses. Although household size exhibited a positive correlation with homeownership rates, it did not maintain

statistical significance when considered alongside other explanatory variables in regression analysis.

In their 2011 article, Norris and Winston conduct a comprehensive analysis of home-ownership systems in the European Union 15 (EU15) countries, focusing on structural features such as home-ownership rates, mortgages, and public subsidization. The study aims to evaluate the ongoing debate surrounding the convergence and divergence of housing systems, a central theme in comparative housing literature.

The authors find that, depending on the level of analysis and specific variables considered, elements of both convergence and divergence are evident in Western European home-ownership systems. Moreover, the comparative housing literature falls short in capturing crucial inter-country cleavages, particularly between the Northern and Southern EU15 countries.

The study also explores the relationship between income inequality and access to home-ownership, risk, and housing outcomes in Western Europe using data from the 2007 European Quality of Life Survey (EQLS). The findings reveal a general trend where home-ownership increases with income across most EU15 countries, with Greece being the sole exception. However, substantial inter-country differences exist in the extent to which lower-income households can access home-ownership, as well as variations in access between the highest and lowest income groups.

Analyzing Kemeny's hypothesis that access to home-ownership should be more equally distributed in unitary regimes, the data supports this notion in Austria, France, and Sweden but not in The Netherlands, Denmark, and notably Germany. In dual regimes, differences in access to home-ownership are observed in the UK and Ireland, while Finland, Belgium, and Italy show relatively high levels of home-ownership among the lowest income households. The Southern European countries, especially Greece, Italy, and Spain, stand out for their relatively equal access to home-ownership across income groups and very high rates of owner occupation, exceeding 70% among low-income households.

In their 2011 paper, Andrews and Sánchez investigate the significant increase in homeownership rates across many OECD countries in recent decades. Employing micro-econometric decomposition techniques, the study reveals that changes in household characteristics, such as age, household structure, incomes, and education, explain part of this increase. However, a substantial portion of the shift in homeownership rates remains unexplained by these household shifts, indicating a potential role for public policy in influencing homeownership trends.

The analysis suggests that the relaxation of down-payment constraints on mortgage loans has contributed to the rise in homeownership rates, particularly among credit-constrained households. This impact is comparable to the influence of population ageing. However, in countries where tax relief on mortgage debt financing is generous, the expansionary effect of mortgage market innovations on homeownership is mitigated. This is attributed to the tendency for housing tax reliefs to be capitalized into real house prices, potentially hindering financially constrained households from entering homeownership.

The paper also explores the impact of housing policies regulating the rental market, such as rent regulation and provisions for tenure security, on tenure choice. The study finds that a household's tenure choice decision is influenced by demographic and socio-economic factors. For instance, homeownership probability increases with age, higher income, and education levels. Couple households are more likely to be homeowners than single-person households, while immigrant households and those facing health issues tend to have lower homeownership rates.

The research reveals that changes in household characteristics can explain a significant portion of the increase in aggregate homeownership rates in Austria and the United Kingdom, but only a third of the increase in Canada, Germany, Spain, Switzerland, and the United States. Population ageing has, on average, boosted aggregate homeownership rates, with varying impacts across countries. Changes in real household incomes, household size, and structure also play roles in shaping

homeownership patterns. However, a notable proportion of the change in aggregate homeownership rates remains unexplained, suggesting a shift in the attractiveness of owner-occupied housing and potential influences from public policy settings. The study highlights the need to consider various factors, including mortgage market innovations, tax relief, and rental market regulations, in understanding the dynamics of homeownership rates.

The last paper addresses two significant gaps identified by Dietz and Haurin in the homeownership literature: the exploration of homeownership in less developed countries and the examination of how race, ethnicity, and income impact tenure choice. By utilizing United Nations data from 1993 and 1998, the study offers a cross-country analysis of the determinants of homeownership rates.

The findings of the study validate previous literature by confirming the influence of price-to-rent ratios and income levels on tenure choice, particularly in higher-income developed countries. However, the study deviates from past research by revealing that race and ethnicity do not account for differences in homeownership rates across countries. Instead, the study finds that the rule of law is closely correlated with income measures, suggesting that stronger legal frameworks may encourage higher rates of homeownership. Additionally, the paper highlights the role of factors such as GDP per capita, household consumption, population above 65, credit availability, and the rule of law in shaping homeownership rates. It emphasizes the importance of housing policy interventions aimed at increasing the supply of affordable housing and improving mortgage availability, particularly for minority households.

An intriguing finding of the study is the relatively higher homeownership rates among low-income individuals in less developed countries compared to high-income countries. This challenges previous research conducted in the United States and prompts further inquiry into the reasons behind this discrepancy. Furthermore, the study reveals minimal differences in homeownership rates across continents, suggesting that immigration to Europe or North America from countries in Africa,

Asia, or South America may not necessarily result in increased homeownership in the new country. This has significant political implications and underscores the importance of understanding stakeholder motivations in homeownership programs. (Gwin and Ong, 2008)

Summarizing the existing literature, a consensus emerges that high income inequality contributes to affordability challenges in housing, subsequently leading to a reduction in homeownership rates. Researchers have consistently identified a negative relationship between income inequality and homeownership rates. When scrutinizing household-level analyses, key factors influencing homeownership rates include positive correlations with income, age, rent prices, house prices, and education levels. Conversely, migration and urban population growth exhibit negative effects on homeownership rates. At the macroeconomic level, the analysis reveals a positive impact of GDP and GDP growth on the housing market, indicating that a robust and expanding economy corresponds with favorable conditions for housing. Conversely, inflation and urbanization are identified as factors exerting a negative influence on homeownership rate.

Methodology

Data description

To analyze the impact of income inequality on access to housing, we will adopt a country-level approach, employing the homeownership rate as the dependent variable. The primary independent variable representing income inequality will be the GINI index. Additionally, we will incorporate several control variables, namely GDP growth, urban population growth rate, house price index Age dependency ratio, final consumption expenditure per capita and proportion of population above 65. Over the 2003-2019 timeframe, an extensive analysis was conducted on 35 European countries.

A specialized unbalanced panel data set, accounting for longitude variations, was meticulously constructed for this purpose.

To derive a comprehensive overview, annual data on homeownership rates was extracted from the World Bank. Concurrently, housing price data was sourced from the Organization for Economic Co-operation and Development (OECD). The synthesis of these datasets was achieved by leveraging information from the World Bank Development Indicators and pertinent working papers, facilitating the compilation of macro-level insights for countries with accessible homeownership data

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
homeownershiprate	481	75.671	11.149	41.3	97.6
GINIindex	530	31.914	4.185	23.2	42.9
GDPgrowth	595	2.528	3.502	-14.839	24.475
housepriceindex	464	104.952	19.647	50.301	169.242
urbanpopulationgro~e	595	.644	.97	-2.282	5.388
Agedependencyratio	595	49.374	4.518	38.658	62.28
Finalconsexppc	576	16008.768	10077.518	2428.594	44823.39
Pop65above	595	16.312	3.229	5.636	23.063

Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) homeownershipr~e	1.000							
(2) GINIindex	-0.003	1.000						
(3) GDPgrowth	0.001	-0.006	1.000					
(4) housepriceindex	0.201	0.152	0.027	1.000				
(5) urbanpopulatio~e	-0.464	-0.117	0.068	0.003	1.000			
(6) Agedependencyr~o	-0.309	0.020	-0.048	-0.145	0.013	1.000		
(7) Finalconsexppc	-0.622	-0.261	-0.031	-0.231	0.633	0.260	1.000	
(8) Pop65above	-0.009	0.043	-0.204	0.105	-0.449	0.617	-0.095	1.000

The homeownership rate is a dependent indicator that reflects the percentage of households within a specific geographic area, such as a country or region, that own their own homes. It is calculated by dividing the number of owner-occupied housing units by the total number of occupied housing units and then multiplying by 100 to express the result as a percentage. The resulting percentage provides an indication of the proportion of households that have achieved homeownership within a given area. A higher homeownership rate is often associated with greater stability in communities, as homeowners tend to have a long-term investment in their properties. In our dataset, the average homeownership rate stands at 76%, indicating a predominant trend towards property ownership across the examined European countries. This mean value serves as a central point, around which the individual rates fluctuate.

Diving into the specifics, we observe a range of homeownership rates spanning from a minimum of 41.3% to a maximum of 97.6%. This variance underscores the diversity in homeownership patterns, reflecting both regions with a lower prevalence of property ownership and those where a significant majority of households are homeowners. Furthermore, the standard deviation, a measure of the dispersion of these rates from the mean, is calculated at 11.1%. This statistic provides insights into the degree of variability within the dataset. A higher standard deviation suggests a wider spread of homeownership rates, indicating a more diverse landscape of property ownership trends among the analyzed countries.

The main independent variable of our model is Gini index. The Gini index, or Gini coefficient, is a measure of statistical dispersion that is commonly used to quantify income or wealth inequality within a population. It is named after the Italian statistician Corrado Gini, who developed the concept. The Gini index ranges between 0 and 1, where 0 represents perfect equality (everyone has the same income or wealth), and 1 represents perfect inequality (one person or household has all the income or wealth, while others have none). The Gini index is calculated based on the Lorenz curve, which is a graphical representation of the cumulative distribution of income or wealth across the population. In our dataset, the Gini index has a mean of 32%, ranging from a minimum of 23.2% to a maximum of 42.9%.

In terms of income inequality, countries like Australia and Bulgaria have seen significant fluctuations in their GINI index, reflecting economic challenges and policy responses. On the other hand, countries like Belgium and Switzerland have maintained relatively stable GINI index values, indicating robust welfare systems and effective social policies.

Another independent variable is HPI. The House Price Index (HPI) is a measure that reflects the changes in the prices of residential properties over time. It provides a

quantitative assessment of the relative changes in the cost of housing in a specific geographic area, allowing for the analysis of trends in the real estate market. The resulting House Price Index provides a standardized measure that allows for the comparison of property price changes over time. An increase in the index indicates rising housing prices, while a decrease suggests a decline. The House Price Index (HPI) in our dataset exhibits a notable range, fluctuating between 50.3 and 169.2. The average HPI, represented by the mean value, stands at 105.

The control variable the Urban Population Growth Rate measures the rate at which the urban population of an area, such as a city, country, or region, is increasing or decreasing over a specific period. It reflects the pace of urbanization, indicating the percentage change in the urban population compared to a reference point. The Urban Population Growth Rate in our dataset is characterized by a mean of 0.64, indicating the average percentage change in urban population over the specified period. The dataset showcases a range of growth rates, from a minimum of -2.28 to a maximum of 5.39, emphasizing the diversity in urbanization trends across the observed regions or time frames.

Another control variable Gross Domestic Product (GDP) growth refers to the percentage increase in the value of goods and services produced within a country's borders over a specific period. It is a key indicator of a nation's economic health and is often used to assess the overall performance and direction of an economy. In our dataset, the GDP growth rate averages at 2.5%, reflecting the typical percentage increase in the value of goods and services produced within the examined regions or time frames. The dataset reveals a spectrum of growth rates, ranging from a minimum of -14.8% to a maximum of 24.5%.

The age dependency ratio is a demographic indicator that measures the number of dependent individuals (typically those under the age of 15 and over the age of 65)

relative to the working-age population (typically those between 15 and 64 years old) in a given population. It is calculated by dividing the total number of dependent individuals by the total number of working-age individuals and multiplying the result by 100 to express it as a percentage. In our dataset the age dependency ratio has a mean of 49.3, a standard deviation of 4.5, a minimum of 38.7, and a maximum of 62.2. This suggests that, on average, around 49.3% of the population is dependent on the working-age population.

Final consumption expenditure per capita is a key economic indicator that measures the average amount of money spent by individuals in a population on goods and services for personal consumption over a specific period, typically a year. It is calculated by dividing the total final consumption expenditure by the population size. Final consumption expenditure includes spending on various items such as food, housing, transportation, healthcare, education, and recreation, among others. This expenditure does not include investments or government spending. The final consumption expenditure per capita has a mean of 16,008 units, a standard deviation of 10,077 units, a minimum value of 2,428 units, and a maximum value of 44,823 units.

The last control variable the population proportion aged above 65 is a demographic measure that reflects the percentage of individuals within a population who are 65 years old or older. It is an important indicator for understanding the age distribution of a population and assessing factors such as healthcare needs, pension systems, and workforce dynamics. The measure is calculated by dividing the number of individuals aged 65 and above by the total population size and then multiplying by 100 to express it as a percentage. The population proportion aged above 65 has a mean of 16.3%, a standard deviation of 3.2%, a minimum value of 5.6%, and a maximum value of 23.06%.

Model selection criteria

In the realm of social sciences, particularly in economics, the analysis of extensive microeconometric panel datasets has become a common practice. Panels, in contrast to purely cross-sectional data, offer a compelling advantage due to their richer information content, allowing for more precise estimations. However, it is essential to acknowledge that the actual information derived from microeconometric panels can be exaggerated. This is because such data often exhibits various cross-sectional and temporal dependencies.

The presence of these dependencies necessitates careful consideration, as overlooking the potential correlation of regression disturbances over time and among subjects can result in biased statistical inference. Therefore, a crucial step involves scrutinizing the data for heteroscedasticity, autocorrelation, and cross-sectional or "spatial" dependence to ensure the integrity of the analysis.

To assess heteroscedasticity, we employ the Breusch-Pagan test. The outcome indicates the presence of a heteroscedasticity issue within our dataset. This means that the variability of the errors in our regression model is not constant across all levels of the independent variable, suggesting a need for further examination and potential adjustments to ensure the robustness of our analysis.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of homeownershiprate

chi2(1) = 8922.71

Prob > chi2 = 0.0000

The empirical literature has indicated that variables related to time series exhibit various properties, such as stationarity or non-stationarity. These properties can be assessed through first- or second-generation tests of unit root, chosen based on an assumption of cross-section independence. Typically, in panel data analysis, variables from different countries are interrelated due to regional and global linkages between them. Failure to account for cross-section independence could lead to biased estimations. Therefore, we incorporate the Lagrange Multiplier (LM) test, as suggested by Breusch and Pagan, to examine cross-sectional dependence. The LM test assesses whether variables are related across different dimensions of cross-sections and time periods, using the equation yit = αi + βixit + μit, where i and t represent the cross-sectional and time dimensions, respectively. These tests formulate null and alternative hypotheses regarding cross-sectional independence and dependence. Additionally, to investigate cross-sectional dependence further, we employ the cross-sectional dependence (CD) test proposed by Pesaran. The CD test equation, CD = s^2T N(N − 1) ∑_{i=1}^{N−1} ∑_{k=i+1}^{N} ρik, evaluates correlations among errors of different cross-sections (countries), where N represents the sample size, T denotes the time period, and ρik signifies the correlation between errors of cross-sections i and k. The test result indicates the existence of cross-sectional dependence. In the presence of such dependence, Hoechle recommends employing Driscoll and Kraay standard errors as a suitable approach for addressing this aspect in the analysis. (Hoechle, 2007)

Pesaran's test of cross sectional independence = -0.152, Pr = 0.0000
Average absolute value of the off-diagonal elements = 0.423

Driscoll and Kraay (1998) introduce a nonparametric covariance matrix estimator designed to produce robust standard errors in the presence of heteroskedasticity and autocorrelation. This article presents a Stata implementation of their estimator, tailored for use with pooled OLS and fixed effects (FE) regression. Unlike the original formulation, which only considers balanced panels, this

implementation accommodates unbalanced panels and assesses its performance through Monte Carlo simulations. The findings reveal that neglecting spatial correlation in panel regressions can lead to overly optimistic standard error estimates. Driscoll and Kraay's approach, however, demonstrates better small-sample properties, particularly when cross-sectional dependence exists. By modifying the nonparametric time-series covariance matrix estimator, they ensure robustness to both cross-sectional and temporal dependence, making it suitable for panels with large cross-sectional dimensions. The xtscc program provides a practical tool for estimating coefficients with Driscoll and Kraay standard errors, enhancing the robustness of panel data analysis. (Hoechle, 2007)

Fixed or random?

$$\text{Homeownership rate}_{it} = B_0 + \beta_1 \text{Gini index}_{it} + \beta_2 \text{HPI}_{it} + \beta_3 \text{Urban population growth}_{it} + \beta_4 \text{GDP growth}_{it} + \beta_5 Age\ dependency\ ratio_{it} + \beta_6 \text{Final consumption expenditure per capita}_{it} + \beta_7 \text{Population above 65}_{it} + \alpha_i + u_{it}$$

-α_i −is the unknown intercept for each entity

$\text{Homeownership rate}_{it}$ − is the dependent variable

i = country and t = time.

(gini, HPI, Urban population growth, GDP growth, age dependency ratio, final consumption

− represents independent variable

β_n −is the coefficient for that independent variable

u_{it} −is the error term

β_0 −is the intercept

Fixed Effects (FE) analysis investigates the connection between predictor and outcome variables within

individual entities such as countries, persons, or companies. Each entity

possesses distinctive characteristics that may influence predictor variables, such as gender, political systems, or business practices impacting opinions, trade, GDP, or stock prices. In employing FE, we assume that individual-specific factors may introduce bias to predictor or outcome variables, necessitating control. This assumption underscores the correlation between an entity's error term and predictor variables. FE effectively eliminates the impact of time-invariant characteristics, enabling an assessment of the net effect of predictors on the outcome variable. Another crucial FE assumption is that these time-invariant features are unique to each individual and should not correlate with other individual characteristics. The entity's error term and the constant (capturing individual characteristics) should remain uncorrelated with others. If error terms are correlated, FE may not be suitable, leading to incorrect inferences, and necessitating modeling that relationship, possibly using random-effects.

The rationale behind the random effects model is distinct from fixed effects, assuming that the variation across entities is random and uncorrelated with included predictor or independent variables. An advantage of random effects is the ability to include time-invariant variables like gender, absorbed by the intercept in the fixed effects model. Random effects assume the entity's error term is uncorrelated with predictors, allowing time-invariant variables as explanatory variables. However, specifying these characteristics may be challenging if certain variables are unavailable, potentially leading to omitted variable bias. Random effects permit generalizing inferences beyond the model's sample.

To choose between fixed or random effects, a Hausman test can be conducted, testing whether the unique errors are correlated with regressors. The test compares fixed and random effect models under the null hypothesis that individual effects are uncorrelated with any regressor. If rejected, it suggests the random effect model is problematic, and a fixed effect model should be preferred (Hoechle, 2007)

Hausman (1978) specification test

	Coef.
Chi-square test value	10.947
P-value	.975

The Hausman test yields a value of 0.975, which does not fall within the rejection region. Despite the small chi-squared score, which is insufficient to reject the null hypothesis, we cannot definitively assert that the random effect model outperforms the fixed effect model. Therefore, the fixed effect model would be selected .

Result and discussion

The robust standard errors method proposed by Driscoll and Kraay yields significant results indicating that our primary variable of interest, the GINI index, exerts a negative influence on homeownership at a 1% significance level, signifying high statistical significance. This implies that as income inequality increases, there is a corresponding decrease in the rate of homeownership. This aligns with existing literature which suggests that heightened income inequality exacerbates disparities, leading to a scenario where the economically disadvantaged struggle to afford homeownership, while the affluent further consolidate their wealth. Thus, the findings corroborate our alternative hypothesis positing that income inequality indeed impacts homeownership rates.

Similarly, the analysis reveals that GDP growth has a significant negative impact on homeownership, as evidenced by a coefficient of -0.165. This suggests that economic development may pose another obstacle to homeownership attainment. Conversely, the urban population growth rate demonstrates a positive effect with a coefficient of 0.563, indicating that the process of urbanization could contribute to an increase in homeownership rates. Moreover, the age dependency ratio emerges as a

noteworthy negative predictor, with a coefficient of -0.505 , implying that an aging population might lead to a decline in homeownership rates. In contrast, the population aged 65 and above positively influences homeownership, with a coefficient of 2.094 . This suggests that the older generation, often more financially stable, is more likely to afford homeownership. Furthermore, the inclusion of year indicators spanning from 2004 to 2019 reveals a consistent pattern of decreasing homeownership rates over the specified period, as evidenced by the negative coefficients associated with each year. This trend suggests a gradual decline in homeownership prevalence over the years under consideration. Moreover, the statistical significance of the constant term underscores its importance as it represents the baseline homeownership rate in the absence of any other explanatory variables. Notably, the regression model, with all its included variables, accounts for approximately 23% of the variation observed in homeownership rates, indicating a moderate level of explanatory power in understanding the factors influencing homeownership dynamics over time.

VARIABLES	(1) Homeownershi prate
GINIindex	-0.201***
	(0.0612)
GDPgrowth	-0.165***
	(0.0430)
housepriceindex	-0.00572
	(0.0137)
urbanpopulationgrowthrat e	0.563**
	(0.215)

Agedependencyratio	-0.505***
	(0.147)
Finalconsexppc	0.000396
	(0.000338)
Pop65above	2.094***
	(0.425)
2004.Year	0.605***
	(0.186)
2005.Year	-1.473***
	(0.253)
2006.Year	-0.613
	(0.383)
2007.Year	-1.989***
	(0.521)
2008.Year	-2.695***
	(0.482)
2009.Year	-4.160***
	(0.469)
2010.Year	-3.254***
	(0.509)
2011.Year	-3.847***
	(0.588)
2012.Year	-4.542***
	(0.697)
2013.Year	-5.086***
	(0.783)
2014.Year	-5.512***

	(0.907)
2015.Year	-6.180***
	(1.045)
2016.Year	-7.005***
	(1.193)
2017.Year	-7.329***
	(1.316)
2018.Year	-7.681***
	(1.409)
2019.Year	-8.301***
	(1.488)
Constant	69.87***
	(7.350)
Observations	406
Number of groups	30

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression findings align with several key themes identified in the literature review. Notably, the negative coefficient associated with the GINI index in the regression model mirrors findings from previous studies, indicating that higher income inequality, as reflected by the GINI index, negatively affects homeownership rates. This corroborates the notion that income disparity poses significant barriers to homeownership, particularly for low-income households, as observed by Dewilde and Lancee (2013). Moreover, consistent with their findings, the regression results indicate that urban population growth rate has a positive effect on homeownership, suggesting that urbanization processes may drive an increase in homeownership rates. Additionally, the negative coefficient for the age dependency ratio supports the idea

that an aging population may dampen homeownership rates, as older individuals may be less likely to purchase homes. This finding is in line with existing literature highlighting the impact of demographic factors on housing dynamics. Conversely, the positive coefficient for the population aged 65 and above underscores the potential for older generations, typically more affluent, to contribute positively to homeownership rates, as noted by Sato, Sicular, and Yue (2011) in their study on housing wealth distribution in China.

Conclusion

The discourse surrounding homeownership highlights its crucial role in individual and societal well-being, with historical, cultural, and economic factors shaping its significance. Despite enduring preferences for homeownership, contemporary challenges such as income and wealth inequality present barriers to access globally. Empirical investigations reveal a nuanced relationship between income inequality and homeownership rates, with higher inequality exacerbating affordability issues, compounded by structural barriers like limited affordable housing and unequal credit access. Additionally, macroeconomic factors like GDP growth and urbanization dynamics influence homeownership patterns. Ongoing research endeavors aim to inform policy interventions for fostering inclusive homeownership opportunities worldwide, recognizing its importance in stability and prosperity.

In a comprehensive analysis of income inequality's impact on housing access across 35 European countries from 2003 to 2019, key insights emerge. Heightened income inequality, as measured by the GINI index, correlates negatively with homeownership rates, hindering access for economically disadvantaged individuals. GDP growth negatively impacts homeownership rates, while urban population growth has a positive effect, potentially driving increased homeownership. Demographic factors like the age dependency ratio and the population aged 65 and above further influence homeownership rates. The fixed effects model highlights individual-specific

factors' influence on predictor variables, emphasizing the complex interplay between income inequality, economic dynamics, demographic trends, and homeownership outcomes. Overall, the analysis offers valuable insights for policymakers aiming to address housing affordability challenges and promote inclusive homeownership opportunities across Europe.

Reference list

1. Andrews, D. and Sánchez, A.C. (2011). Drivers of Homeownership Rates in Selected OECD Countries. *OECD iLibrary*. Available from https://www.oecd-ilibrary.org/economics/drivers-of-homeownership-rates-in-selected-oecd-countries_5kgg9mcwc7jf-en [Accessed 7 December 2023].

2. Cribb, J. and Simpson, P. (2018). *Barriers to homeownership for young adults © Institute for Fiscal Studies 1 9. Barriers to homeownership for young adults*. Available from https://thinkhouse.org.uk/site/assets/files/1547/ifshome.pdf.

3. Dewilde, C. and Lancee, B. (2013). Income Inequality and Access to Housing in Europe. *European Sociological Review*, 29 (6), 1189–1200. Available from https://www.jstor.org/stable/pdf/24480015.pdf [Accessed 30 November 2023].

4. Fisher, L. and Jaffe, A. (2003). Determinants of International Home Ownership Rates . *INTERNATIONAL HOMEOWNERSHIP RATES*.

5. Gwin, C.R. and Ong, S. (2008). Do we really understand homeownership rates? An international study. *International Journal of Housing Markets and Analysis*, 1 (1), 52–67. Available from https://doi.org/10.1108/17538270810861157 [Accessed 25 November 2019].

6. Hoechle, D. (2007). *Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence*. Available from http://fmwww.bc.edu/repec/bocode/x/xtscc_paper.pdf [Accessed 19 June 2022].

7. Kaas, Kocharkov and Preugschat. (2019). Wealth Inequality and Homeownership in Europe. *Annals of Economics and Statistics*, (136), 27. Available from https://doi.org/10.15609/annaeconstat2009.136.0027 [Accessed 26 July 2020].

8. Norris, M. and Winston, N. (2011). Home-ownership, housing regimes and income inequalities in Western Europe. *International Journal of Social Welfare*, 21 (2), 127–138. Available from https://doi.org/10.1111/j.1468-2397.2011.00811.x [Accessed 9 May 2019].

9. Sato, H., Sicular, T. and Yue, X. (2011). Housing ownership, incomes, and inequality in China: 2002 - 2007. *www.econstor.eu*. Available from http://hdl.handle.net/10419/70322 [Accessed 1 December 2023].