Community banks' capital requirements and regional housing tenure

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Community banks' capital requirements and regional housing tenure

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Abstract

Bank capital requirements aim at reducing the likelihood of banks' failure. However, these policies may generate externalities on the overall economy. By investigating the pathways from capital requirements to housing tenure using structural equation modelling, we show that community banks' capital requirements increase the gap between the regional real estate loans-based and non-real estate loans-based housing purchase rate and act as driving factors of housing market imbalance. The drop in residential real estate loans caused by the increase in capital requirements has two opposite effects: the direct effect motivates residents to rent properties, while the indirect effect motivates residents to purchase them due to the fall in housing prices. When both effects exist in housing purchases with real estate loans, the former effect is more influential than the latter one. Our findings suggest that the impact of capital requirements on housing tenure will depend on residents' reliance on real estate loans. If a housing purchase requires real estate loans, capital requirements will have a negative impact on the housing purchase, and vice versa.

KEYWORDS

housing prices, housing tenure, minimum capital requirements, real estate loans

JEL CLASSIFICATION

G18, G21, R21

1 | INTRODUCTION

Homeownership is essential for both households and the overall economy, since owning a house acts as a significant source of security. Considerable housing ownership diversity exists in the United States as well as in other countries and regions in the world (Boehm & Schlottmann, 2014). In the United States, we observe a higher share of owner-occupied housing compared with rented housing, with 68.5% for owner-occupied housing, 21.8% for renter-occupied housing, and 9.7% for vacant housing, according to estimates in 2020 (US Census Bureau, 2020). The homeownership was described as "a religion, a right, and a moral obligation" for any US upstanding members (Drew, 2014).

Housing purchase is typically the largest transaction in households among other consumptions and investments, and how this purchase is financed is equally crucial for expenditure patterns and asset accumulation (Isaac & Chairman, 1984). Chambers et al. (2009) pointed out that housing investment takes up nearly half of all gross private investment, and the liabilities from home mortgages stand for roughly two thirds of gross domestic product. The development of the real estate market is largely attributed to the support of credit, and the expansion of credit is closely related to bank capital (Gambacorta & Mistrulli, 2004; Schwert, 2018), which plays a critical role in absorbing losses and meeting long-term funding needs for continuous operations. An increase in bank capital requirements may have a negative impact on credit business, which might change banks' attitude towards real estate, affect the market price of real estate, and impact the market demand and housing ownership to a large extent (Chambers et al., 2009; Mustilli et al., 2017). Other possible channels or contributing factors to credit supply have been investigated in previous studies. Evidence that financial liberalisation, financial integration, and the depth of the securitization market can also greatly impact the housing market and economic outcomes through the expansion of credit (e.g., Favara & Imbs, 2015; Kroszner et al., 2007; Levine, 2005; Loutskina & Strahan, 2009; Loutskina & Strahan, 2015). However, the relationship between capital requirements and housing ownership has not yet been investigated for community banks. In our article, we seek to find answers to the following questions: does a relationship exist between capital requirements and housing tenure (the choice between owning or renting)? If so, what is the mechanism behind it?

Community banks play an important part in the financial system and in our economy. In this context, community bank mortgage lending is vital to the strength and breadth of the US housing market. These banks represent ~20% of the US mortgage market. Their mortgage lending is often centred in the small areas, which are not effectively serviced by large banks. In other words, a community bank mortgage loan is the only choice for the majority of rural and small-town borrowers (ICBA, 2019). On the one hand, national banks may offer a larger network across the country, but their devotion to local communities is always changing. For instance, Bank of America shut down 1720 retail branches across the United States between

2008 and 2018, leaving many customers to merely rely on mobile banking (First State Community Bank [FSCB], 2019). On the other hand, residents are just nameless body looking for funding in large banks. Being based in specific areas, community banks can put more time and resources into building local business customers relations, take into account residents' local reputation and past interactions with the bank, and are therefore in a good position to satisfy personal demands (FSCB, 2019). In the United States, community banks (banks with total assets under $10 billion) are located within all 50 states. They represent nearly 97% of the banks in the United States, operate in more than 52,000 locations across the country, and hold over $5 trillion in assets (FDIC, 2019). Considering the large number of these banks in the United States, the community banking system's stability is a prerequisite and fundamental condition for the healthy and sustainable development of the economy. The minimum capital requirements on community banks have become an important aspect of bank management and operation in the United States. However, few studies have considered the topic of capital requirements in the context of community banks. Our article focuses on community banks' capital requirements, because a credit crunch of community banks normally has a more evident and profound effect on local housing prices and demand than a credit crunch of commercial banks would have. Large commercial banks tend to focus on large companies and governments and pay more attention to obtaining dividends from short-term market targets. Their customers usually seek hundreds of millions of dollars in loans for construction projects, expansion plans, acquisitions, and other activities (Harms, 2017). Community banks, whose customers are from local small businesses and households, mainly gain income from mortgages and different types of consumer loans in their regions and give priority to mid- and long-term goals (Harms, 2017).

This article investigates the role of capital requirements on housing ownership in the states where community banks are located through the channel of residential real estate loans and housing prices. Using data on 4294 US community banks from 2013 to 2019, we find evidence that, in housing financing without real estate loans, the increase in capital requirements is related to a move towards housing purchase instead of renting. On the other hand, in housing purchases that rely on real estate loans, the requirements for higher capital levels correlate with a decrease in the housing ownership rate. Our main contributions are as follows. (1) The investigations of the existing literature in the area of bank capital requirements (see, e.g., Aiyar et al., 2014; Chiuri et al., 2002) have focused on the bank-level and country-level impacts, because the macro impact cannot reach the state level due to the cross-regional nature of large commercial banks. However, a direct synergy exists between community banks and local economic development. By investigating the relationship between community banks' minimum capital requirements and regional housing tenure, which has not been studied before, this article not only contributes new insights into the community banking business, but also investigates the close relationship between macro-economic variables and the financial system at the state level, an area that is under-represented in the existing literature. (2) Previous studies that have investigated housing tenure were normally restricted to non-causal measures (see, e.g., Fitzpatrick & Watts, 2017). By applying the structural equation modelling (SEM) model, we propose a framework with three hypotheses and make a more precise judgement on the potential causal relationship between capital requirements and housing tenure and the influence mechanism. (3) We challenge the conventional idea that real estate loans will increase housing ownership (see, e.g., Chambers et al., 2005). By dividing the sample into two categories and investigating the pathways from capital requirements to housing tenure through the real estate loans and housing price channel, we show that capital requirements will have two opposite effects: capital requirements are related to the reduction of real estate loans first of all, and

the drop in real estate loans reduces the housing ownership rate by cutting financing availability. On the other hand, the drop in real estate loans is associated with the increase in the housing ownership rate by reducing housing prices. Moreover, we also discuss and compare the interactions between real estate loans, housing prices, and housing tenure. Our findings deepen the current understanding of banks' macro-influence mechanism (see, e.g., Malherbe, 2020).

This study has important implications for research and practice. For academics, our bank–housing discussions supplement and improve the current understanding of housing tenure preferences. The classification of households based on their reliance on real estate loans has significance in relation to understanding the impact of capital requirements on the macroeconomy. For community bank managers, we put forward the importance of bank support in housing purchases. Our results show that real estate loan is the main mediating variable influencing the housing price and capital requirements' effect, and the discrimination in granting loans will cause fewer housing purchases and more homeless. Bank managers should be socially responsible when making loan decisions when the efficiency of bank operations is inconsistent with social benefits. For the government, this study indicates that the real estate market's structural imbalance can be adjusted through bank capital requirements. Regulators can contribute to less housing purchase inequality and more housing rental by putting lenient restrictions on bank capital requirements, which would give those who cannot afford properties more home options.

The rest of the article is organised as follows. Section 2 provides a brief overview of the relevant literature, while Section 3 outlines the development and justification of hypotheses. Section 4 details the data and methods used in this study. Section 5 presents empirical results and analyses, and Section 6 presents our robustness tests. Section 7 concludes the article.

2 | LITERATURE REVIEW

2.1 | The impact of capital regulation on credit and real estate loans

Capital regulation sets a high-risk weight coefficient for credit assets, and banks will adjust their credit structure in order to increase their capital adequacy ratio and meet the minimum requirements of capital regulation. Kim and Santomero (1988) showed that, when facing the same credit-asset risk-weight coefficients, banks were more willing to hold credit assets with high risk and high return under capital regulation. Banks under pressure from capital regulation would be willing not only to hold a higher proportion of low-risk assets, but also to have reduced credit provision to a certain extent, resulting in a credit crunch (Keeley & Furlong, 1990). Freixas and Rochet (2008) showed that the minimum capital adequacy ratio requirements of capital regulation had caused banks to reduce credit allocation, and to reduce the number of high-risk and high-capital consumption assets. Loan financing produced a specific crowding effect and also caused a certain degree of loss of economic growth. Some scholars have held the opposite view, claiming that capital regulation forces banks to increase their investments in high-risk and high-yield credit assets to compensate for the cost of raising capital levels.

Some studies have claimed that risky real estate loans would be vastly reduced when banks reduced credit in order to meet the requirements of capital regulation (Bernanke et al., 1991). Bernanke et al. (1991) suggested that banks significantly reduced the issuance of high-risk real estate loans in order to meet the strict minimum capital adequacy requirements, which might cause a shrink in the real estate industry. Hancock and Wilcox (1997) also showed that capital

regulation would lead to a reduction in the issuance of real estate loans. Hoesli et al. (2017) looked at the impacts of three international regulations undertaken in the aftermath of the global financial crisis on the returns of European real estate companies. They claimed that even though Basel III (Basel III is a 2009 international agreed set of regulation that introduced measures designed to mitigate bank risk, by requiring banks to keep certain leverage ratios and reserve capitals.) did not regulate real estate companies directly, it could affect property company returns through the bank lending channel. Basel III tightened capital requirements for certain categories of real estate loans, such as some development loans and project loans. Hence, banks could decide to bring down their credit provision or expand the credit costs for those borrowers.

2.2 | The relationship between bank credit and housing

The existing literature has provided evidence of the impact of bank credit on housing prices and consumption. Using bank credit to invest in the real estate industry would have the risk of loans defaulting, and investors would transfer the risk by raising housing prices (Allen & Gale, 2000). Davis and Zhu (2011) analysed 17 countries and concluded that bankers' loan attitudes had a significant impact on real estate investment and transaction behaviour. Agnello et al. (2019) revealed that more liberalised mortgage sector was correlated with longer housing booms, while an increase in securitization was associated with shorter housing busts. The type of loans also matters. Bao and Ding (2016) pointed out that compared with recourse mortgages, non-recourse mortgages sped up the price growing during economic boom, price reduction during economic recession and price recovery in a rebound period after a crisis. Using a 1999–2019 sample from the Panel Study of Income Dynamics (PSID) in the United States, Bian and Lin (2022) found that a higher loan-to-value ratio substantially reduced elderly homeowners' homeownership rate. Financial constraints and long-term indebtedness were the main reason for elderly homeowners exiting homeownership.

Other studies have illustrated the reverse or long-term mutually reinforcing relationship between bank credit and house price (Fitzpatrick & McQuinn, 2007). Significant consistency between bank loans and asset price inflation was also found in East Asian real estate markets (Senhadji & Collyns, 2002). Collyns and Senhadji (2003) examined the correlation between lending booms, asset price cycles, and financial crises in some East Asian countries and indicated a strong relationship between bank lending and asset price inflation, particularly in the real estate market. Brissimis and Vlassopoulos (2009) found evidence of a contemporaneous bidirectional dependence of housing prices and housing loans in the short term in the Greek economy. But, the results also indicated that the causality did not run from mortgage lending to housing prices in the long term. Employing mortgage data and housing price data in the United States, Shan (2011) showed that the house prices expansion explained nearly one-third of the overall growth in the reverse mortgage market from 2003 to 2007. Using data from the US commercial property and mortgage markets over the 1991–2011 period, Arsenault et al. (2013) found a positive feedback loop between property prices and mortgage supply. The dynamics between housing prices and reverse mortgage demand were investigated by Chen and Yang (2020), who showed that higher housing prices induced higher demand for reverse mortgages among elderly homeowners.

Although the existing literature has shown the importance of credit support in determining housing prices (see, e.g., Arsenault et al., 2013; Fitzpatrick & McQuinn, 2007),

there is still a lack of academic research on the impact of credit support on housing tenure, especially with respect to community banks. To fill this gap, we investigate the relationship between community banks' capital requirements and state-level housing tenure for the first time.

2.3 | The impact of capital requirements on economic development

This article discusses the impact of capital requirements on community banks at a macroeconomic level. There is an ongoing debate among economists regarding the effects of capital requirements on economic growth. While some argue that higher capital requirements can reduce bank lending, leading to a decline in economic growth (Lambertini & Uysal, 2014), Admati et al. (2013) suggest that such requirements can also have negative effects on economic growth by increasing the cost of bank capital and reducing lending, thereby compromising the benefits of higher capital requirements. They advocate for other policy measures such as improved supervision and resolution frameworks to promote financial stability.

Repullo and Suarez (2013) developed models to examine the procyclical effects of bank capital regulation. In times of recession, banks' capital reduces, while risk-based capital requirements increase, leading to reduced bank lending capacity and possibly a credit crunch if banks cannot quickly raise new capital. Suarez and Sussman (2015) found that higher capital requirements can diminish lending and investment, especially in countries with less advanced financial systems, thereby decreasing economic growth. Martynova (2015) demonstrated that higher bank capital requirements could affect economic growth indirectly through credit supply, bank asset risk, and the cost of bank capital. Higher capital requirements could lead to a reduction in credit supply and demand, ultimately slowing down economic growth by increasing lending rates. D'Erasmo (2018) showed that a 1% increase in minimum capital ratios could raise lending rates by 5–15 basis points and decrease economic output by 0.15%–0.6%. Corbae and D'Erasmo (2019) presented a quantitative model that demonstrated that elevated capital requirements may escalate the expenses on banking funds, diminish lending and profits, and eventually decrease the count of banks in the industry.

Other authors claim that higher capital requirements can enhance financial stability, which can lead to higher economic growth (Cohen, 2013). There is a correlation between increased capital requirements and lower probabilities of bank failure, which enhances financial stability (International Monetary Fund, 2008). The Bank for International Settlements (BIS) found that higher capital requirements are linked to lower levels of short-term economic growth but higher levels of long-term economic growth (Basel Committee, 2010). Adrian and Shin (2010) showed that higher capital requirements could reduce the adverse effects of risk-taking behaviour on financial stability and that effective supervision is essential to ensure compliance with capital requirements.

In general, while there is ample research on the effects of capital regulation on the broad economy, few studies in this area have focused on regional economics, which could have a more specific impact on the everyday lives of local inhabitants. The unique characteristics of community banks mean that any effect they have on the economy is likely to be most noticeable at a regional level.

3 | DEVELOPMENT AND JUSTIFICATION OF HYPOTHESES

3.1 | The linkage between capital requirements and residential real estate loans

The minimum capital requirements specify a minimum capital-to-asset ratio required to establish or to continue operating (Berger et al., 1995; Kane, 1995). Because the deposit level (and thus capital level) maximises the amount that the banker can promise to the outside investors, requiring more capital will make the bank safer but will also reduce the amount the bank can pledge to outsiders. Most existing literature indicates that banks would reduce credit supply in order to meet the requirements of capital regulation (Chami & Cosimano, 2010; Holmstrom & Tirole, 1997). An increase in the stringency of bank capital requirements will put clear restrictions on bank loan quotas and ratios, and will strictly control loan conditions, leading banks to set more stringent acceptance standard for granting new loans (Bolt & Tieman, 2004). This is particularly true for real estate loans. Some studies claim that risky real estate loans will be vastly reduced when banks reduce credit in order to meet the requirements of capital regulation (Bernanke et al., 1991). Based on these analyses, this study's first hypothesis postulates that:

> **Hypothesis 1.** *A significant negative association exists between capital requirements and the value of residential real estate loans granted by banks.*

3.2 | The linkage between residential real estate loans and housing tenure for non-real estate loans housing purchase

The reduction in residential real estate loans may increase the housing ownership rate through the drop in housing prices. Housing prices are influenced by the state of the economy, interest rates, real income, and changes in the size and structure of the population (Choi et al., 2019; Pettinger, 2019). Considering the positive impact of real estate lending on housing prices (see, e.g., Arsenault et al., 2013; Fitzpatrick & McQuinn, 2007) and the negative impact of housing prices on housing ownership (see, e.g., Wachter & Acolin, 2016) are well established in the literature, we can assume that there might exist an indirect effect that links real estate loans with the ownership rate through housing prices. Since the supply of real estate is almost fixed in the short term, credit growth will tend to shoot real estate prices up. Moreover, abundant credit will motivate investment and consumption spending, increasing economic activity and creating pleasing expectations for future income flows, thus heightening property valuations (Brissimis & Vlassopoulos, 2009). Based on these arguments, this study's second hypothesis postulates that:

> **Hypothesis 2.** *Housing purchase without real estate loans will be positively influenced through the capital requirements → real estate loans → housing price → housing tenure channel.*

3.3 | The linkage between residential real estate loans and housing tenure for real estate loans housing purchase

Apart from the aforementioned channel, for household that financed by real estate loans, the drop in residential real estate loans will also have a negative impact on the housing ownership rate directly. The housing market imbalance between supply and demand leads to differences between potential and effective housing demand (Maliene et al., 2008). Limited access to financing may cause most low- and middle-income groups who want to buy a house to have insufficient purchasing power to do so, which reduces the effective housing purchase demand in the society (Tsatsaronis & Zhu, 2004). A real estate loan is one of the least expensive and most commonly used ways for a household to finance real estate. The drop in real estate loans makes it harder for borrowers to get access to real estate loans, reducing the effective residential housing demand. Hence, residential real estate loans may influence housing ownership rates through two channels and the direct effect channel exists only when households are financed/partially financed by real estate loans. Based on these arguments, this study's final hypotheses postulate that:

> **Hypothesis 3a.** *There exist both a direct and an indirect channel between real estate loans and housing ownership for housing purchases financed by real estate loans.*

> **Hypothesis 3b.** *The two channels (capital requirements → real estate loans → price → housing tenure and capital requirements → real estate loans → housing tenure) have opposite effects (a negative impact for the direct channel and a positive impact for the indirect channel).*

Based on the above hypotheses, two conceptual models of causal relationships are separately constructed for real estate loans-based housing purchase and non-real estate loans-based housing purchase. Figures 1 and 2 show the potential causal relationship between capital requirements and housing tenure rate for the two categories (houses without and with real estate loans); the arrows indicate the direction of potential impact across the variables studied. We also consider the reverse relationships, from housing prices to real estate loans (Fitzpatrick & McQuinn, 2007) and from housing tenure to housing prices (Pettinger, 2019). The cost of mortgage credit is important in shaping the pattern of house price dynamics, while

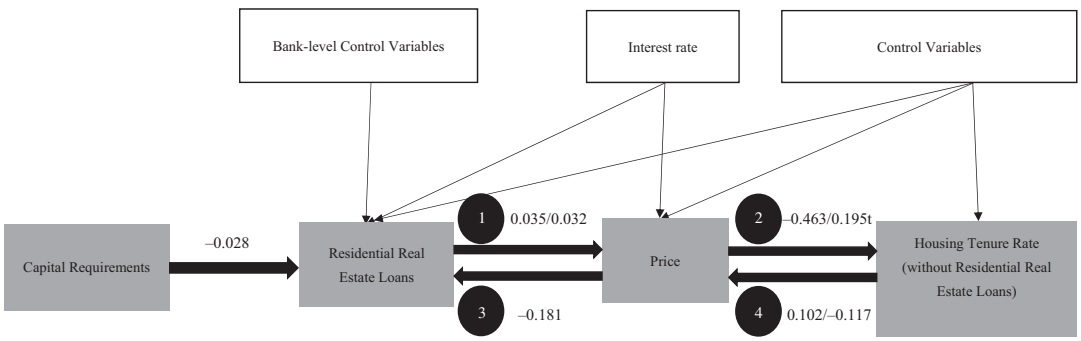

FIGURE 1 Potential causal relationships based upon Hypotheses 1 and 2 (for housing owner rate without residential real estate loans and rental rate).

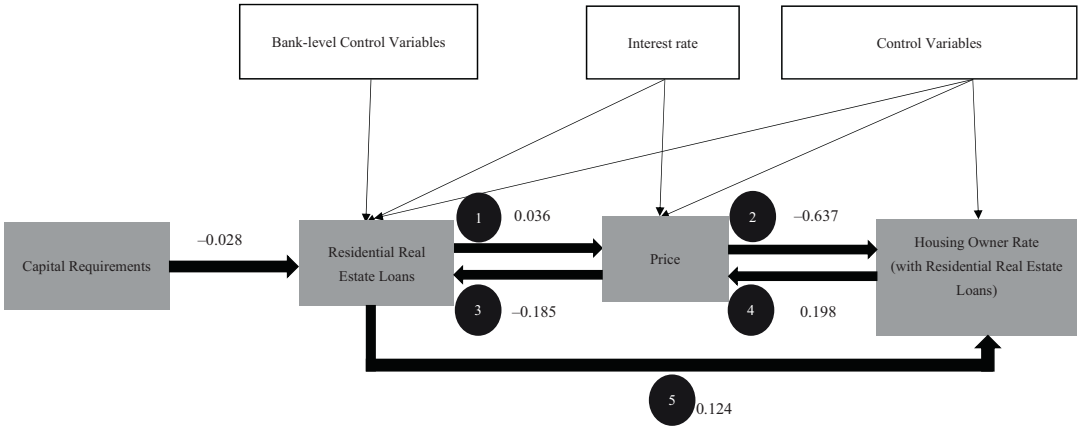

FIGURE 2 Potential causal relationships based upon hypotheses Hypotheses 1, 3a, and 3b (for housing owner rate with residential real estate loans).

the servicing of outstanding mortgages has an impact on the banks' capability and willingness to expand credit (Tsatsaronis & Zhu, 2004). Total assets, capital, deposits, interest, population, housing units, income, age, and housing value are our control variables (to be discussed later).

4 | DATA AND METHODS

4.1 | Data

In the United States, community banks are not clearly defined. Most agencies base this term on aggregate assets size, with varying definitions, such as <US$1 billion according to the Office of the Comptroller of the Currency, or up to US$10 billion as defined by the Federal Reserve Board and the Government Accountability Office (FDIC, 2004). We use the standard set by the Federal Reserve Board and the Government Accountability Office (<US$10 billion) to select 4294 operating US community banks to use for our baseline analysis.

All the data in the sample is annual and covers the period 2013–2019. Our full data set comprises 23,308 bank-year observations. Before 2013, housing prices were affected by the financial crises caused by the United States housing bubble, which reached over half of the United States and contributed to the subprime mortgage crisis. Housing prices peaked in early 2006 and started to decline in 2006 and 2007, and the housing market crash ended in 2012. After 2019, the community bank capital requirements were simplified. To reduce the regulatory burden of calculation and compliance costs and expenses, a new leverage capital framework for community banks became effective on 1 January 2020 (FDIC, 2019). From the first quarter of 2020, banks can choose to maintain at a 9% Tier 1 Leverage Ratio without calculating and reporting risk-based capital ratios (Reichert & Sheriff, 2020). Thus, we choose the period 2013–2019 to avoid the impact of the Global Financial Crisis and the newly released community bank leverage ratio (CBLR) framework.

For the US minimum capital requirements for community banks, we use the information compiled by Barth and Miller (2018). Similar to Rappaport (2007) and Davis (2011), we use housing prices based on US Census Bureau data. The remaining data, such as Tier 1 risk-based

capital ratio and real estate loans, are downloaded from the Market Intelligence Platform. For all the continuous variables, values smaller than the 1st percentile are replaced by the 1st percentile, and values larger than the 99th percentile are replaced by the 99th percentile.

4.2 | Variables selection

All the variables in our models are observed variables. Capital requirements are our main independent variable. The regulatory minimum requirements are the amount of capital needed for a bank to be regarded as operable by creditors and counterparties. Most of the existing literature uses the Tier 1 capital ratio held by banks as the proxy for capital requirements, because it has been shown that banks, prompted by stronger regulatory requirements, have steadily increased their Tier 1 capital ratios (Francis & Osborne, 2012; Hussain & Hassan, 2005; Krüger et al., 2018). However, most banks hold a Tier 1 capital risk ratio well above the required minimum to get rid of the costs related to capital regulation (Nguyen, 2015). To have an accurate measure of regulation stringency, following Baker and Wurgler (2013), we use the minimum Tier 1 capital requirements as proxies of capital requirements.

The main explained variable is the housing owner/rental rate. An inverse relationship between owner-occupied rate and renter-occupied rate does not exist in our article because the housing vacancy rate is also included in the ownership structure (although this is not discussed in this article). We use the owner-occupied housing rate to measure the housing purchase rate, and the renter-occupied housing rate to measure the housing rental rate. In our regressions, we divide the sample into houses that do not have a mortgage and houses that are financed based on mortgage and home equity loans. A housing unit is considered as owner-occupied if the owner or co-owner lives in the unit. Residential real estate loans and housing prices are the mediating variables, where the previous ones include 1–4 family and other family residential mortgage-backed securities.

Furthermore, we control for several bank level, state level socio-demographic, and economic variables that, according to the literature (see details below), are related to residential real estate loans, house prices, and housing tenure preferences. These controls help mitigate bias in the SEM analyses, leading to a more accurate representation of the underlying structure. The controls also help minimise the omitted variable bias and enhance predictive accuracy.

For residential real estate loans, we control both supply and demand sides. Kishan and Opiela (2000) found that banks' ability to raise funds and maintain loan growth depends on bank size and capital. Banks collect savings from households and businesses and use these funds to grant loans to borrowers; hence, real estate loans will also be influenced by core deposits. If interest rates rise, the cost of mortgages will increase (Pettinger, 2019), which influences the number of real estate loans banks are willing to provide. Hence, we use total assets, equity, interest rate, and core deposits to control the supply of real estate loans. For the demand side, the control variables include individual conditions (age, marital status, and race/ethnicity) and housing purchase constraints (household income, total population, and total housing units), which are basically in line with the variables that will influence housing tenure. Most of the academic literature on individual tenure decisions emphasises economic and socio-demographic characteristics (Fu, 2013). The majority of literature on economic factors is grounded in the neoclassical economic theory of consumer behaviour (Hubert, 2007; Megbolugbe et al., 1991), which suggests that decisions about housing tenure are determined by the combination of individual demands and constraints on an individual's ability (Drew, 2014). Davidoff (2006) showed that an increase in the income-house

price ratio linked with a decrease in the value of owner-occupied housing. Wang et al. (2015) claimed that population aging could restrain housing demand. According to the US Census Bureau, of all family households in 2017, female householders with no husband, married couple and male householders represented 12.7%, 48.4%, and 4.8% of all occupied housing units, respectively (NAWRB, 2019). Painter et al. (2001) showed the gap in homeownership attainment across minority and white households. In addition to these factors, we also take into account the ratio of average real estate loans to total loans within a state. This can help mitigate the impact of real estate loans from other banks on housing tenure.

In our model, housing price is treated as an endogenous variable, and, again, both the supply side and the demand side of money are controlled. The housing supply side is measured by total housing units, while the demand side includes individual conditions (age, marital status, and race/ethnicity) and housing purchase constraints (household income, total population; Pettinger, 2019). Interest rate is also considered. Interest rates represent the cost of mortgage payments, which influence the mortgage demand and real housing price. Hence, high interest rates make renting more preferred compared to buying (Pettinger, 2019). The data are retrieved from the Market Intelligence Platform and the International Monetary Fund (IMF) Data Portal. Table 1 presents the names and descriptions of the variables used in our models.

4.3 | Modelling procedure

Following a growing body of literature (e.g., Moreira & Zhao, 2018; Morgan & Winship, 2007; Mulaik, 2009; Pearl, 2009), we use structural equation modelling (SEM) to test and evaluate multivariate causal relationships between the variables of interest. This covariance-based approach is a combination of factor analysis and multiple regression analysis, and it is used to analyse the structural relationship between measured variables and latent constructs. Although this approach is often applied in issues with latent variables, it can also be used to study observed variables alone (Moreira & Zhao, 2018).

Following Moreira and Zhao (2018), four steps are conducted in this article. First, we construct models based on previous investigations. Second, we check whether the models are over-identified. Overidentification means that the models do not fit the data well and are not adequate to conclude the presumed relationships. The calculation formula is as follows:

$$\left(\frac{a(a+1)}{2}\right)-\left(\frac{b(b+1)}{2}\right)-c-d>0,$$

where a is the total number of variables, b is the number of exogenous variables, c is the number of estimated coefficients, and d is the number of endogenous variables. Third, the model parameters are estimated. The regression coefficients are estimated using the 'maximum likelihood with missing values' method since our database has missing values. The fourth step is related to the goodness-of-fit tests. Three criteria are used in this article (see Table 2). Chi-square test is affected by the size of the sample in the model. For models with 400 or more cases, the chi-square is almost always statistically significant and cannot be a reasonable measure of fit (Kenny, 2020). Since the sample size in our model is rather large (26,219 observations), we do not consider the chi-square statistic as a sign of fitness, but we still have the LR (likelihood ratio) test value reported. The Akaike information criteria (AIC) and the Bayesian information criteria (BIC) approach are applied to select the best one if more than one

TABLE 1 Formal description of the main variables.

Variable	Notation	Description
Independent variables		
Minimum Tier 1 capital requirements	*Req*	US minimum Tier 1 capital requirements. *Source*: Barth and Miller (2018)
Minimum CET 1 capital requirements	*CET*1	US minimum CET 1 capital requirements. *Source*: Barth and Miller (2018)
Dependent variables		
Owner-occupied housing rate	*Owner*	The number of owner-occupied housing units/total housing units in the state where the bank is headquartered. *Source:* US Census Bureau
Renter-occupied housing rate	*Renter*	The number of renter-occupied housing units/total housing units in the state where the bank is headquartered. *Source:* US Census Bureau
Mediating variables		
Residential real estate loans	*RRel*	The logarithm of total loan secured by residential properties. *Source:* Market Intelligence Platform
Housing price	*Price*	The logarithm of the housing price. *Source:* US Census Bureau
Control variables		
Total assets	*Size*	The logarithm of the total assets in a bank. *Source:* Market Intelligence Platform
Total capital	*Capital*	The logarithm of the total equity in a bank. *Source:* Market Intelligence Platform
Core deposit	*Deposit*	Deposits in domestic offices excluding time deposits over $250,000 and brokered deposits of $250,000 or less. *Source:* Market Intelligence Platform
Interest rate	*Int*	Interest rates, discount rate for US. Source: International Monetary Fund (IMF)
Total population	*Population*	The logarithm of the total population in the state where the bank is headquartered. *Source:* Market Intelligence Platform
Total housing units	*Units*	The logarithm of the total housing units in the state where the bank is headquartered. *Source:* Market Intelligence Platform
Average income	*Income*	The logarithm of average income in the state where the bank is headquartered. *Source:* Market Intelligence Platform
Average age	*Age*	The average age of the population in the state where the bank is headquartered. *Source:* Market Intelligence Platform
Black population rate	*Race*	Black population/ total population in the state where the bank is headquartered. Source: Market Intelligence Platform
Marriage rate	*Marital*	The population aged 15 and older who are married/total population aged 15 and older in the state where the bank is headquartered. *Source:* Market Intelligence Platform
Average loans	*AvgRel*	Average real estate loans/Total loans and leases. *Source:* Market Intelligence Platform.

TABLE 1 (Continued)

Variable	Notation	Description
Z-score	Z_{score}	Bank *Z*-score = (ROA+(equity/assets))/sd(ROA). *Source:* Bankscope (2000–2014) and Orbis (2015–2020), Bureau van Dijk (BvD)
Non-performing loans ratio	*NPL*	Total bank non-performing loans/gross loans. *Source:* Financial Soundness Indicators Database (fsi.imf.org), International Monetary Fund (IMF)
Capital ratio	*Capital*	Total capital/total assets. *Source:* Financial Soundness Indicators Database (fsi.imf.org), International Monetary Fund (IMF)
Credit ratio	*Credit*	Total credit/total bank deposits. *Source:* International Financial Statistics (IFS), International Monetary Fund (IMF)

Note: ROA stands for the return on assets while sd(ROA) stands for the standard deviation of the return on assets in the calculation of *Z*-score.

TABLE 2 Model goodness-of-fit criteria.

Criteria	Notation	Acceptable level
Absolute fit measures		
Root mean square error approximation	RMSEA	≤0.05[a]; ≤0.08[b]
Incremental fit measures		
Comparative Fit index	CFI	≥0.90[a]; ≥0.80[b]
Tucker–Lewis index	TLI	≥0.90[a]; ≥0.80[b]

Source: Awang (2012) and Forza and Filippini (1998).
[a]Satisfactory fit.
[b]Means acceptable fit.

model passes the goodness-of-fit tests. Here, we use AIC and BIC to make a comparison between baseline regression and the robustness test to find out the better fit, where the lower values of AIC and BIC indicate the better fit.

It is essential to make clear that we cannot derive causal links from SEM analyses since SEM represents and relies on causal assumptions (Bollen & Pearl, 2013). The hypothetical links from cause to effect determine the set of equations (variance–covariance matrix) of the variables contained in the model. If the goodness-of-fit statistics indicates that the variance–covariance matrix and actual data are close enough, we cannot reject the fact that the variables studied may have a causal relationship (Moreira & Zhao, 2018).

5 | RESULTS ANALYSIS

5.1 | Baseline regression results analysis

The main descriptive statistics concerning the variables used in our empirical analyses are reported in Table 3. We drop the households with an average income lower than 10% of the overall sample to avoid bias due to the fact that the housing tenure for people in poverty is less

TABLE 3 Summary statistics of the main variables.

Variable	*N*	Mean	SD	Min	Max
Owner	23,238	58.435	3.067	49.67	64.13
Renter	23,222	27.941	3.788	17.480	32.715
Req	23,238	5.753	0.495	4.500	6.000
*CET*1	23,238	4.314	0.345	3.500	4.500
Int	23,238	0.053	0.013	0.001	0.952
RRel	23,179	15.051	1.290	10.943	17.449
Size	23,238	12.046	0.929	9.424	13.815
Capital	23,238	14.451	0.934	12.149	17.171
Deposit	23,081	11.787	0.908	9.541	13.497
Price	23,238	12.467	0.346	11.903	13.436
Population	23,238	15.204	1.050	13.343	17.488
Units	23,238	14.393	0.996	12.693	16.491
Income	23,238	11.251	0.165	10.989	11.639
Age	23,238	39.437	1.500	33.800	42.300
Marital	23,238	0.740	0.022	0.690	0.792
Race	23,222	12.087	8.369	0.740	37.390
AvgRel	23,238	69.857	10.473	42.193	89.281
z_{score}	23,238	34.270	0.561	33.677	35.094
NPL	23,238	1.386	0.506	0.855	2.452
Capital	23,238	11.691	0.064	11.585	11.776
Credit	23,238	61.646	1.264	59.881	63.515

Note: This table presents the descriptive statistics for bank-year and state-year observations. *N* represents the number of observations for each variable. Mean, SD, Min, and Max are the mean, standard deviation, minimum and maximum of each variable, respectively. The variables are winsorised at the 1st and 99th percentiles. Variable Capital, Size, Deposit, Units, Income Population, Value, and Income have been taken logarithm. Definitions of all variables are listed in Table 1.

sensitive to housing price changes. This is the case because poverty and low income prevent people from accessing potential housing choices (Tunstall et al., 2013).

The mediation tests in Table 4 shed light on the causal relationships implied in the discussion above. Columns (1–3) in Table 4 refer to the non-real estate loans-based ownership rate, the real estate loans-based ownership rate, and the rental rate results for minimum requirements as a proxy. Parameter estimates in Columns (1 and 3) in Table 4 present the results of our structural equations specified according to Figure 1, and parameter estimates in Column (2) present the results of our structural equations specified according to Figure 2. Bear in mind that, in principle, changing the housing ownership rate to the rental rate would not considerably influence the relationship between residential real estate loans and capital requirements or other control variables too much. Thus, for all coefficients related to residential real estate loans, the values are similar for the two outcomes. To check the relative strength of the two possible channels, we estimate standardised coefficients for all variables in the SEM models.

TABLE 4 Structural equation modelling (SEM) baseline regression results.

	(1) *Owner* (without real estate loans)	(2) *Owner* (with real estate loans)	(3) *Renter*
Panel A: The impact of capital requirement and housing price on residential real estate loans			
→ RRel			
Price	−0.181*** (0.011)	−0.185*** (0.011)	−0.181*** (0.011)
Race	0.029*** (0.005)	0.028*** (0.005)	0.029*** (0.005)
Size	0.628*** (0.031)	0.630*** (0.031)	0.628*** (0.031)
Population	0.715*** (0.124)	0.748*** (0.123)	0.715*** (0.124)
Capital	−0.217*** (0.014)	−0.217*** (0.014)	−0.217*** (0.014)
Marital	−0.017*** (0.005)	−0.018*** (0.005)	−0.017*** (0.005)
Int	−0.050*** (0.004)	−0.050*** (0.004)	−0.050*** (0.004)
Age	0.072*** (0.008)	0.074*** (0.008)	0.072*** (0.008)
Income	0.066*** (0.008)	0.068*** (0.008)	0.066*** (0.008)
Req	−0.028*** (0.004)	−0.028*** (0.004)	−0.028*** (0.004)
Units	−0.752*** (0.122)	−0.785*** (0.121)	−0.752*** (0.122)
Deposit	0.320*** (0.024)	0.319*** (0.024)	0.320*** (0.024)
AvgRel	0.238*** (0.005)	0.239*** (0.005)	0.238*** (0.005)
Constant	2.829*** (0.467)	2.794*** (0.466)	2.829*** (0.467)
Panel B: The impact of residential real estate loans and housing tenure on housing price			
→ Price			
RRel	0.035*** (0.004)	0.036*** (0.004)	0.032*** (0.004)
Owner (without real estate loans)	0.102** (0.047)		
Owner (with real estate loans)		0.198*** (0.053)	
Renter			−0.117** (0.054)
Race	−0.077*** (0.008)	−0.063*** (0.009)	−0.107*** (0.008)
Population	7.316*** (0.274)	6.805*** (0.300)	8.628*** (0.358)
Marital	−0.164*** (0.012)	−0.189*** (0.014)	−0.122*** (0.009)
Int	0.051*** (0.003)	0.054*** (0.004)	0.048*** (0.003)
Age	0.460*** (0.006)	0.461*** (0.006)	0.442*** (0.011)
Income	0.495*** (0.005)	0.500*** (0.005)	0.508*** (0.010)
Units	−7.345*** (0.239)	−6.909*** (0.261)	−8.507*** (0.325)
AvgRel	0.202*** (0.008)	0.188*** (0.009)	0.227*** (0.006)
Constant	−5.105*** (1.263)	−7.970*** (0.401)	−9.300*** (0.810)
Panel C: The impact of housing price and residential real estate loans on housing tenure			
→Housing tenure rate			
RRel		0.124*** (0.005)	
Price	−0.463*** (0.082)	−0.637*** (0.087)	0.195*** (0.063)
Race	0.198*** (0.008)	−0.211*** (0.009)	−0.141*** (0.006)

(Continues)

TABLE 4 (Continued)

	(1) *Owner* (without real estate loans)	(2) *Owner* (with real estate loans)	(3) *Renter*
Population	−9.159*** (0.649)	10.448*** (0.694)	7.972*** (0.496)
Marital	−0.185*** (0.013)	0.163*** (0.014)	0.118*** (0.010)
Age	−0.217*** (0.038)	0.292*** (0.041)	−0.073** (0.029)
Income	0.167*** (0.041)	0.255*** (0.043)	0.26*** (0.031)
Units	8.361*** (0.645)	−9.642*** (0.690)	−7.353*** (0.493)
AvgRel	−0.261*** (0.019)	0.284*** (0.019)	0.118*** (0.014)
Constant	29.266*** (0.779)	−3.721*** (0.823)	−15.038*** (0.590)
Panel D: Statistics			
No. of Obs	23,238	23,238	23,238
χ^2	1028.188	1010.465	1074.813
Prob > χ^2	0.000	0.000	0.000
RMSEA	0.074	0.079	0.076
CFI	0.989	0.989	0.990
TLI	0.946	0.939	0.953

Note: This table presents the SEM results with housing price as mediating variable between residential real estate loans and housing tenure. Standard errors are in parentheses. Goodness-of-fit test criteria, including the root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI) are displayed in Table 2. ** and ***indicate statistical significance at the 5% and 1% levels, respectively. Definitions and sources of all variables are listed in Table 1.

The results in Table 4 (Panel A) present a significant negative relationship between capital requirements stringency and residential real estate loans in all three columns, which is in line with our hypotheses. For the non-real estate loan owners in Column (1) and the renters in Column (3), the results in Table 4 (Panel B) present that residential real estate loans are associated with an increase in housing price (Path 1 in Figure 1), whereas Table 4 (Panel C) presents that housing price is negatively (positively) correlated with the housing owner (rental) rate (Path 2 in Figure 1). Hence, the drop in residential real estate loans will boost housing purchase (0.035*−0.463 = −0.016; see Table 4, Panels B and C, Column (1), Paths 1 and 2 in Figure 1; Bear in mind that we can draw this conclusion because all coefficients are standardised.) while hindering housing rental rate growth (0.032*0.195 = 0.006; see Table 4, Panels B and C, Column (3), Paths 1 and 2 in Figure 1). Given that in the short term the demand for living accommodation is relatively fixed, it is expected that the increase in housing prices will prevent low- and middle-income residents from buying properties instead of renting them. Taking the above three connections in Table 4 (Panels A–C) into consideration, the capital requirements are positively (negatively) related to the non-real estate loans housing ownership (rental) rate.

On the other hand, for the rate of real estate loans-based ownership in Column (2), the results in Table 4 (Panel B) present that residential real estate loans are associated with the increase in housing prices (Path 1 in Figure 2), whereas Table 4 (Panel C) presents that housing prices and real estate loans impact the housing owner rate in ways that are negative (Path 2 in Figure 2) and positive (Path 5 in Figure 2), respectively. These results indicate that the real estate loans-based ownership rate can be influenced by two opposite effects: in the direct

channel (from real estate loans to ownership rate), the increase in capital requirements will possibly reduce the housing ownership rate; in the indirect channel (from real estate loans to ownership rate through housing price), the increase in capital requirements will raise the housing ownership rate by pushing housing prices down. By comparing the magnitude of the coefficients estimated, we conclude that the direct impact (0.124; see Table 4, Panel C, Column (2) and Path 5 in Figure 2) is more than the indirect impact (0.036*−0.637 = −0.022; see Table 4, Panels B and C, Column (2) and Paths 1 and 2 in Figure 2). This indicates that, for real estate loans-based housing purchases, the increase in funding availability outweighs the drop in housing affordability driven by high prices so that the decrease in real estate loans ends up driving the ownership (with real estate loans) rate down.

It is worth noticing that there is also a negative relationship between housing prices and residential real estate loans (−0.181 and −0.185; see Table 4, Panel A, Columns (1 and 2) and Path 3 in Figures 1 and 2, respectively) and a positive relationship between housing ownership rate and housing price (0.102 and 0.198; see Table 4, Panel B, Columns (1 and 2) and Path 4 in Figures 1 and 2, respectively). These results show that the ownership rate is negatively correlated with real estate loans through the reverse path in both non-loan and loan-based cases (−0.181*0.102 = −0.018 and −0.185*0.198 = −0.037; see Table 4, Panels A and B, Column (1 and 2) and Paths 3 and 4 in Figures 1 and 2, respectively). Nevertheless, this reverse effect would not distort our conclusions: for the housing ownership rate without real estate loans, this reverse effect via price (−0.181*0.102 = −0.018; Paths 3 and 4 in Figure 1) reinforces the effect of loans on housing ownership via price (0.035*−0.463 = −0.016; Paths 1 and 2 in Figure 1). Hence, the aggregate relationship between real estate loans and the non-loans ownership rate is negative (−0.016 + (−0.018) < 0; Paths 1–4 in Figure 1). For the real estate loans-based ownership rate, this reverse effect via price (−0.185*0.198 = −0.037; Paths 3 and 4 in Figure 2) also reinforces the effect of loans on housing ownership via price (0.036*−0.637 = −0.023; Paths 1 and 2 in Figure 2). As a result, the drop in real estate loans would bring the ownership rate up through the indirect channel (−0.023 + (−0.037) < 0; Paths 1–4 in Figure 2). However, as the direct effect (0.024; Path 5 in Figure 2) from loans to ownership is positive and bigger in magnitude than the addition of the two indirect effects, the relationship between real estate loans and the real estate loans-based ownership rate is positive through the combined effect of the direct and indirect channels for the effect of loans on housing ownership, and the reverse indirect channel (−0.023 + (−0.037) + 0.124 > 0; Paths 1–5 in Figure 2).

To sum up, the association between capital requirements and regional housing owner-occupancy rates will depend on whether the housing purchase relies on real estate loans. If housing purchase generally requires external financing in a specific region, community banks' capital requirements will possibly cause a reduction in the overall housing ownership rate. If the housing purchases rely on the households themselves, community banks' capital requirements will possibly cause an increase in the overall housing ownership rate. As the increase in capital requirements reduce the housing rental rate and housing purchase without real estate loans at the same time, our finding suggest that community banks' capital requirements not only widen the housing purchase gap between the household with and without real estate loans, but also causing more homelessness when the poor can neither get loans nor rent a house. The latter circumstance usually happens in less developed areas or areas with serious discrimination and less active mortgage markets, where higher capital requirements will lead to more real estate inequality and lower social welfare, such as South Africa (Gunter & Manuel, 2016).

The parameter estimate results for the control variables are consistent with the findings in previous research (e.g., Fu, 2013; Kishan & Opiela, 2000; Vickery, 2012; Wang et al., 2015). The

increase in bank size improves banks' ability to absorb risk; hence, the supply of real estate loans increases. Interest rate increases the cost of residents to generate funds, which reduces the demand for loans. Average income increases the demand for housing, while housing prices reduce purchasing affordability. The limited housing supply makes it hard to rent or purchase properties. Married couples are less inclined to purchase housing without a mortgage, while black people are more likely to do it (see Table 4, Panel C).

To check the models' predictive power, relevant goodness-of-fit tests were conducted, which are reported in Table 4 (Panel D). All the standardised root mean square error of approximation indexes fall within the correct range ($\leq$0.08), which indicates an acceptable fit for these models. The results of the comparative fit index and the Tucker–Lewis index also confirm that the proposed models have satisfactory predictive powers (>0.90), thereby demonstrating that this study's empirical results are congruent with our conjectures.

5.2 | The influence of bank variables on capital requirements

Bank regulators tighten bank regulation to bring down the likelihood and depth of financial crises. Hence, the design of the capital requirements policies may be based on the current risk status of the banking system (Kress & Turk, 2020). Taking this issue into consideration, we control for four additional variables to check the potential influence of bank market risk on our main conclusion. These four variables are generated from the World Bank Global Financial Development Database to measure the stability of the US banking system on an aggregate level (before 2019, community banks were under the same capital requirements as the other banks), among which bank *Z*-score captures the probability of default of a country's commercial banking system; Bank non-performing loans to gross loans (%) captures the banks' probability of defaulting; bank capital to total assets (%) captures banks' ability to absorb risk; bank credit to bank deposits (%) measures the financial resources provided to the private sector by domestic banks.

Figures S1 and S2 show the potential causal relationship between capital requirements and housing tenure rate with additional control variables for capital requirements; the arrows indicate the potential effect direction among variables. As we can see in Table S1, the coefficients estimated for the bank control variables are all significant. After adding more control variables to the capital requirements, the coefficient signs do not change in any of the models, suggesting that our main results are still valid, and bank risk could influence governments' decision on capital requirements.

According to the goodness-of-fit test results in Table S2, the AIC and BIC statistics in the later test are smaller than those in the baseline regression, indicating that the model becomes more realistic after we consider the impact of bank risk on capital requirements (see Table S2A,B).

6 | ROBUSTNESS TESTS AND MODEL IMPROVEMENTS

In order to test the robustness of the main models, several checks and improvements were conducted. First, recall that in baseline regression, we replace values smaller (larger) than the 1st (99th) percentile of all continuous variables with their respective 1st (99th) percentile. Nevertheless, the inclusion of these outliers with a view to using the whole data set could possibly change the results. For example, due to the high concentration in the US banking system as

noted by Corbae and D'Erasmo (2021), the distribution of banks' total assets may be highly skewed in the raw data. By excluding the outliers of total assets, we reduce the potential effect of this issue on the results. Hence, we re-estimate all the regressions using the original data. As given in Table S3, the results do not change any of the conclusions.

Second, bank capital structure mainly includes common equity Tier 1 capital (CET1), Tier 1 capital, and Tier 2 capital. CET1 represents the bank's core capital, which includes ordinary shares, retained earnings, and stock surpluses from common shares. Nevertheless, only minimum Tier 1 capital is considered in our baseline regression. In this robustness test, we adopt the CET1 capital ratio, introduced in 2009 in the United States, as a proxy of capital requirements. The results regarding minimum CET1 requirements in Table S4 also indicate that the capital requirements have a positive impact on residential real estate loans (Table S4, Panel A) and have a similar effect on housing ownership through the direct and indirect channels (Table S4, Panels B and C).

Third, Loutskina and Strahan (2015) found that financial integration amplifies the effect of housing price shocks on local economics through bank branch networking and flow of capital from low-growth areas into booming areas. In order to rule out the effect of banks' concentration on the local economy, we dropped states with extreme high number of branches (over 90%) to check whether the presence of centralised branch networks has contaminated our original results. The total number of branches in the state where the bank is headquartered is retrieved from Capital IQ Pro. As expected, the effect of capital requirements on real estate loans and housing tenures remains statistically significant across various specifications (see Table S5).

Fourth, unlike most other goods that consumers purchase, the investment component plays a significant role in home purchase (Dusansky & Koç, 2007). By observing the continuous expansion of real estate loans, investors in the market will generally expect to see housing prices rising. Driven by speculation, investors may use various channels to finance and participate in the real estate market, and the influx of large amounts of funds will push up housing prices, further strengthening the expectation of rising housing prices. Hence, we dropped states with households that have a real estate investment value that is lower than average to check whether the investment incentive of the residents would influence our results. As we can see in Table S6, all parameters in the test are still significant, and the signs do not change in any of the models compared with the baseline regression.

Fifth, housing ownership rate and other key macro variables are measured on the state level in the baseline regression. However, Berger et al. (2005) found that small banks interact more personally with their borrowers than large banks and lend within shorter distance. Thus, we choose a narrower region (county level) to measure variables in robustness test. As we can see in Table S7, the results shown across various specifications and sample dimensions suggest that the effects of the capital requirements led to a change in households' housing tenure choice in county level.

Finally, our main findings might suffer from the issue of sample bias because our analyses only consider operating banks. Failed banks may manage their mortgage portfolios in a different way as compared to surviving banks, which could impact housing tenure. Nevertheless, our SEM regressions do not converge to a solution when a large sample size including acquired and defunct community banks is considered. Hence, we run a bank- and year-fixed effects regression of all banks to check the validity of our main results. As given in Table S8, capital requirements will increase the non-real estate loans-based housing purchase rate while reduce the real estate loans-based housing purchase rate and rental rate, which is in line with our main conclusions.

In general, our results are robust to the inclusion of extreme values, an alternative capital requirements proxy, a reduced sample according to branch networking and investment preference, county-level data and the inclusion of failed banks in the sample.

7 | CONCLUSIONS

This article uses SEM to test the possibility of causal links between community banks' capital requirements and housing tenure in the state where the bank is headquartered. By proposing a framework with three main hypotheses, we find that capital requirements promote housing purchases not funded by loans while hindering loans-based housing ownership and the development of the rental rate. Capital requirements influence housing tenure through the mediation of residential real estate loans and housing prices. More specifically, capital requirements have a negative impact on residential real estate loans, and the drop in real estate loans directly reduces the rate of housing purchases funded by loans while indirectly boosting housing ownership rates by reducing housing prices. Our findings suggest that the impact of bank capital requirements on housing purchases will depend on residents' reliance on real estate loans. If housing purchase relies on real estate loans, capital requirements will have a negative impact on housing purchase, and vice versa. Hence, the increased capital requirements widen the gap between these two categories.

These findings challenge the deeply flawed conventional idea that real estate loans will always increase housing affordability and purchase preference. Our research has potential implications for the design of housing purchase assistance policies to maintain social welfare because of the significant role housing costs play in the daily lives and budgets of people living in poverty (Stephens & Whitehead, 2014). If housing purchase generally requires external financing in a specific region, we can expect a reduction in housing ownership rate if community banks' capital requirements increase. Also, house prices could be controlled by implementing macroprudential regulatory policies to restrict the core capital community banks hold. The government should pay attention to the role of banks when regulating the housing market and should prudently formulate relevant policies taking into consideration regional conditions to achieve the goal of macroeconomic control. They could implement stricter regulations on mortgage lending practices including setting limits on loan-to-value ratios, debt-to-income ratios, and credit score requirements and ensure transparency in real estate transactions and lending practices to promote fair lending standards.

It is worth noting that due to the nature of the SEM model we apply, our conclusions are based on assumed hypothetical models, and are limited to the sample and the variables present in our data set. The findings in our study should be seen as an initial work to inspire other researchers to investigate the complicated causal mechanisms that link capital requirements with housing tenure using alternative approaches. The models have not incorporated the interactive behaviours of different agents such as the state, local government, enterprises, and residents. In addition, we face the risk of omitted variable bias, given that there could be some omitted common factors that may drive both residential real estate loans and housing tenure. Although we focus merely on the mediating effect of residential real estate loans, other transmission mechanisms between capital requirements and housing tenure could also be studied in the future. An interesting extension of this research would be to establish a theoretical model based on more micro-agents to carry out an equilibrium analysis and investigate the mechanisms involved in the relationships considered.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in Capital IQ at https://platform.marketintelligence.spglobal.com. These data were derived from the following resources available in the public domain: Market Intelligence Platform, https://platform.marketintelligence.spglobal.com/w.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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