JUE Insights: Macroprudential policies and homeownership

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Abstract

Macroprudential policies are a key policy tool for financial regulators, but concerns persist that these policies restrict access to homeownership. I examine this concern using cross-country data on homeownership for 28 countries. I find little evidence that macroprudential policies reduce homeownership rates in aggregate or for select groups such as low-income households. The estimates are precise enough to rule out large negative effects of macroprudential policies on homeownership rates. The null effects are consistent with models where credit shocks primarily affect prices rather than quantities. My results alleviate concerns that macroprudential policies systematically exclude certain households from ownership, but also indicate that relaxing such policies is unlikely to increase access to homeownership.

JEL Classification: R21, G28

Keywords: Macroprudential policy; Homeownership; Household credit; Housing affordability

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1 Introduction

The decline in homeownership rates has generated significant concern among policymakers and media commentators. A particular concern is the role of macroprudential policies in limiting access to housing. While macroprudential policies, such as loan-to-value constraints, appear successful in limiting credit growth and reducing house price growth (Arena *et al.* , 2020), the concern is that these policies may inadvertently exclude first-time buyers and low-income households from homeownership opportunities. There are consequently calls in many countries to provide relief to buyers by loosening loan-to-value constraints or other macroprudential measures. There is, however, limited evidence on the effect of macroprudential policies on homeownership rates, and it remains an open question whether these policies have any effect on the homeownership rate. Instead, studies on the impact of macroprudential policies almost exclusively focus on house prices and mortgage credit growth instead of homeownership rates. Araujo *et al.* (2024) collect data from 58 empirical studies and 6,000 estimates on the effect of macroprudential policies, but do not mention homeownership once.[1]

This article studies how macroprudential policies affect the homeownership rate, showing that such policies appear to have a very limited impact on homeownership rates. Underlying the main result is a well-known fact: homeownership rates vary little over time, in contrast to what is often implied in policy discussions. Using country-level panel data and a narrative approach to identifying macroprudential policy shocks, I find no evidence that macroprudential policies reduce homeownership rates in aggregate or for select groups, either at the time of implementation or up to five years after. The sample includes data from 28 European countries and spans the period 2003–2017. I use the Macroprudential Policies Evaluation Database

[1] A large number of studies have examined the impact of macroprudential policies on credit and house price growth (see Galati & Moessner, 2013, 2018; Araujo *et al.* , 2024, for an overview). Kuttner & Shim (2016) find significant negative effects of policy tightening on housing credit and house price growth. Lim *et al.* (2011) show that various macroprudential tools affect the cyclicality of private sector credit and leverage. Alam *et al.* (2019) demonstrate that tighter Loan-to-Value (LTV) constraints have non-linear effects on credit. Igan & Kang (2011) find that transactions and house prices drop significantly after debt-to-income (DTI) and LTV tightening. Other studies include Cerutti *et al.* (2017), Akinci & Olmstead-Rumsey (2018), and Poghosyan (2020). Tzur-Ilan (2023) show that higher LTV limits resulted in borrowers choosing more affordable housing units. Laufer & Tzur-Ilan (2021) find that higher risk-weights on high-LTV mortgages slow house price growth. Peydró *et al.* (2024) show that caps on high loan-to-income mortgages reduced credit supply and house price growth. To my knowledge, none of these studies have linked macroprudential policies to homeownership rates.

(MaPPED) provided by the European Central Bank (Budnik & Kleibl, 2018) to identify macroprudential policy shocks and data from the Survey of Income and Living Conditions to collect cross-country homeownership data for all households and for select groups. The identification strategy is based on the narrative approach of Fernández-Gallardo *et al.* (2025), where I select policies that do not have a counter-cyclical motive.

The null results are precisely estimated and hold across multiple specifications, including aggregate homeownership rates and rates for specific demographic groups such as low-income households and mortgagors. The estimates are precise enough to rule out economically large effects of macroprudential policies on homeownership rates. The findings are robust across different policy instruments, such as borrower-based measures like loan-to-value and debt-service-to-income ratios that directly target household credit access. I also examine the evolution of homeownership rates around borrower-based policies where the previous literature has found large effects on either credit or house prices.[2] Although these are significant policy changes where one could reasonably expect an effect on the homeownership rate, the results in aggregate and across groups are still precisely estimated null effects.

This paper relates to the literature on the effect of credit on housing markets. A large number of papers have studied the causal effect of credit and interest rates on house prices (Glaeser *et al.* , 2012; Adelino *et al.* , 2025; Favara & Imbs, 2015; Loutskina & Strahan, 2015; Di Maggio & Kermani, 2017; Mian & Sufi, 2019), but these papers have not studied the effect of credit on homeownership rates. The question of how credit shocks affect homeownership rates and house prices has recently been studied by Greenwald & Guren (2025), who use US data to show that while house prices respond to credit, homeownership rates do not. Greenwald and Guren show that the lack of response can be understood as a result of segmentation between the rental market and the market for owner-occupied housing. Intuitively, for the homeownership rate to decline, existing homeowners must exit the ownership market by selling to landlords who rent them out, or they must themselves convert their property to rental units. In models with no rental

[2]The policies I study in this section are the introduction of LTV and LTI constraints in Ireland in 2015 (Acharya *et al.* , 2022), the Swedish amortization requirement in 2016 (Bäckman *et al.* , 2024), the introduction of LTI limits in the UK (Peydró *et al.* , 2024), LTV restrictions in Norway (Aastveit *et al.* , 2023), the Netherlands (Van Bekkum *et al.* , 2024), Switzerland (Bolliger *et al.* , 2025) and Finland (Eerola *et al.* , 2023).

market segmentation, such as Kaplan *et al.* (2020), deep-pocketed landlords will absorb shocks to credit by offering to sell housing at a price equal to the present value of future rents. Since credit does not impact the present value of future rents, changes in credit conditions will instead affect the share of households who are able to purchase housing. For example, a relaxation of PTI and LTV constraints generate a 3% increase in the homeownership rate in the model of Kaplan *et al.* (2020). Several recent papers have studied house prices and homeownership in general equilibrium, heterogeneous agent models. For example, the model in Garriga & Hedlund (2020) generates a 2.8 percentage point decline in the homeownership rate due to a tighter LTV limit. Castellanos *et al.* (2024) construct a model with endogenous landlords, and so represents a different mechanism than the model of Kaplan *et al.* (2020). However, their result indicate that the tightening of the loan-to-value plus loan-to-income constraint in 2016 would cause a long-run decrease in the homeownership rate of 1.8% for Ireland, which is not apparent in the data. Similarly, Balke *et al.* (2023) study how downpayment requirements change portfolio choice, finding large effects on the transition into homeownership. The results in this paper complements Greenwald & Guren (2025) by showing that the results for credit shocks to local US markets extends to the cross-country setting with macroprudential policies. The null results for different groups, such as low-income households and mortgagors, suggest that there is segmentation within these markets.

A criticism of the setup and the results in this paper is that aggregate data hides important dynamics at the borrower level. I argue, however, that understanding the effect of macroprudential policies on homeownership *requires* aggregate data. Homeownership rates are fundamentally an equilibrium object determined by supply and demand interactions in the housing market. Randomized controlled trials or micro-level studies cannot capture general equilibrium effects, and thus miss market-level responses such as price adjustments, supply responses, or rental market changes that determine aggregate ownership rates. While transaction volumes may change in response to macroprudential policies (Bolliger *et al.* , 2025; Eerola *et al.* , 2023) or housing downturns (Fischer *et al.* , 2024), they may not affect the aggregate homeownership rate, as existing homeowners may choose to simply remain in their homes. For the homeownership rate

to decline, existing homeowners must exit the ownership market by selling to landlords who rent them out, or they must themselves convert their property to rental units. This represents a different mechanism than changes in transaction activity.

In sum, the results suggest that macroprudential policies do not change homeownership rates in aggregate. This is a key piece of evidence for policymakers evaluating the consequences of macroprudential policies and for academics seeking to discipline models where credit shocks affect housing markets (e.g. Greenwald & Guren, 2025; Castellanos *et al.* , 2024; Cima & Kopecky, 2024). The findings suggest that concerns about macroprudential policies creating unintended barriers to homeownership may be overstated, while also indicating that such policies may not be effective tools for increasing homeownership rates among disadvantaged groups. Note that there could well be other concerns with macroprudential policies, and that these results do not speak towards e.g. potential reductions in liquidity caused by macroprudential policies (see, e.g., Aastveit *et al.* , 2023). The results also inform the debate about homeownership access for young and first-time buyers. Across developed countries, concerns about housing affordability have led to policy proposals aimed at helping certain households enter the housing market. Many involve relaxing macroprudential policies, such as lowering downpayment requirements. The findings suggest that such demand-side policies may not effectively increase homeownership rates. Instead, the combination of these results with existing literature showing that macroprudential policies affect house prices suggests that demand-side interventions may primarily lead to wealth transfers to existing homeowners through higher house prices, rather than expanding homeownership access. This highlights the importance of considering supply-side factors when designing policies to address housing market access concerns.

2 Conceptual framework

I begin by discussing a simple framework for how macroprudential policies affect the homeownership rate. The framework closely follows the intuition in Greenwald & Guren (2025), who present a simple supply and demand framework for how changes in credit affect the homeownership rate.

Imagine that there is a market for owner-occupied housing but that households could also choose to rent. Following the literature using user-cost models (Poterba, 1984; Himmelberg *et al.* , 2005), the price of owning will be determined by an arbitrage relationship between the cost of renting and the cost of owning, commonly referred to as the user cost. Prices will adjust to equalize the user cost of owning and renting, $P = r/u$, where P is the price of housing, r is the rental price and u is the user cost. We can rewrite this as $P/r = 1/u$, giving us that the price-to-rent ratio equals the user cost. As the price-to-rent ratio increases, more households prefer to rent than to own, which creates a downward-sloping demand for ownership. Assuming that households require credit to own housing—a reasonable assumption given that most households use credit to purchase housing or are competing with other buyers who require credit—a reduction in credit supply will shift the demand for housing inward.

Note that this model says nothing about the homeownership rate, only about the equilibrium price-to-rent ratio. The ownership rate could in principle range from 0 to 100 percent, depending on the relative cost of owning and renting. In principle, if house prices adjust more rapidly than the supply of owner-occupied housing, the market can reach a new equilibrium where the price-rent ratio adjusts to maintain the user cost equality. In addition, rental markets could also adjust to maintain the user cost equality (Castellanos *et al.* , 2024). In these scenarios, the homeownership rate remains unchanged because the relative cost of owning versus renting is preserved through price adjustments rather than quantity changes. This would imply that the supply curve is perfectly inelastic. This mechanism explains why macroprudential policies can affect house prices without necessarily altering the extensive margin of homeownership participation.

A key insight from Greenwald & Guren (2025) is that the slope of the supply curve maps to different assumptions in macroeconomic models. For instance, in Kaplan *et al.* (2020), identical, risk-neutral and deep-pocketed landlords buy and sell housing. In this setup, the price for housing is set by the present value of future rents, at which landlords are willing to buy and sell an unlimited amount. In contrast, in Greenwald (2017) and Favilukis *et al.* (2017), households cannot rent housing. This creates a perfectly inelastic supply curve, where

any demand shock will be fully reflected in prices.

The supply curve is not the general supply curve for housing, but the supply curve for owner-occupied housing relative to renting. Intuitively, the slope of the supply curve comes either from new construction of owner-occupied housing or from landlords or owners who decide to convert rental units to owner-occupied housing. The slope of the supply curve therefore represents (a) the willingness of construction companies to expand the share of owner-occupied housing in their total construction when prices increase and (b) the willingness of landlords to convert existing supply from rental to owner-occupied housing.

What will be the impact of a change in demand on prices and the homeownership rate? As in standard supply and demand frameworks, the answer depends on the slope of the supply curve. If the supply curve is perfectly inelastic, the price will increase by the same amount as the demand shock. If the supply curve is perfectly elastic, the price will not change. If the supply curve is somewhere in between, the price will change by less than the demand shock. This simple analysis shows the main intuition behind how macroprudential policies affect the homeownership rate. The slope of the supply function will determine the response of both the homeownership rate and house prices to a change in credit. Previous studies have found that macroprudential policies affect both credit and house prices. This suggests that we are not in the world where the supply of owner-occupied housing is perfectly elastic: if supply were perfectly elastic, macroprudential policies could affect credit but not house prices.

However, simple supply and demand frameworks do not make predictions on the composition of ownership. Even if the aggregate homeownership rate is unchanged, specific groups could be affected. The empirical results suggest that the composition of ownership is not affected by macroprudential policies. One way to understand this is if housing markets are segmented, and if buyers in one segment compete against similar buyers.

3 Data and variables

The empirical analysis combines homeownership data from the European Union Statistics on Income and Living Conditions (EU-SILC), macroprudential policy actions from the Macroprudential Policies Evaluation Database (MaPPED) provided by the European Central Bank (Budnik & Kleibl, 2018), macroeconomic time series from Eurostat, and house price, interest rate and credit data from the Bank for International Settlements (BIS). All data are collected or collapsed to the annual level to match the frequency of homeownership data. Below I describe the homeownership and macroprudential data and the criteria used for selecting time periods and countries. The description of the macro data is available in Appendix C.

3.1 Homeownership data

I collect homeownership data from the European Union Statistics on Income and Living Conditions (EU-SILC). Aggregate homeownership data are available for 35 countries, with the earliest series starting in 2003. In addition to aggregate homeownership rates, I collect data on the share of the population that own their property with or without a mortgage, and all categories for households above or below 60 percent of median equivalized income. In the empirical analysis, I use the homeownership rate in levels.

3.2 Macroprudential policies

I use the Macroprudential Policies Evaluation Database to construct a country-specific macroprudential policy index. The database contains 1,417 policy actions undertaken in 28 countries after 1995.[3] The database covers 11 policy instruments including capital buffers, lending standards restrictions, leverage ratios, and liquidity requirements. The last update was the fourth quarter of 2017, which marked the end of the sample period.

The MaPPED data have several advantages compared to other datasets (Fernández-Gallardo *et al.* , 2025). The data are based on surveys of national regulators, allowing comparison of

[3]The database contains several policies enacted before 1995, if they are still in place in 1995. In total, the database contains 1,925 policies.

policy actions across countries. The data contain information about each policy action, including announcement and implementation dates, and whether the policy involved tightening, loosening or ambiguous effects. Importantly for identification, the survey asks if the policy had a countercyclical motivation or design.

Following Fernández-Gallardo *et al.* (2025) and Fernandez-Gallardo (2023), I construct an overall index of macroprudential policies using all non-countercyclical policies. I use the announcement date to assign a value to each policy, using a positive value for tightening, a negative value for loosening and a zero for ambiguous actions.[4] Following (Meuleman & Vander Vennet, 2020), I account for differences in scope between new and existing policies by assigning different weights. The weighting scheme gives higher weight to activations and deactivations, compared to changes in scope or level. The weighting scheme is provided in Table B2.

For each country, I then construct a series as the weighted average of macroprudential policy actions active for a given year. The variable of interest is then the year-over-year change in the index, denoted $\Delta MaPP_{i,t}$.

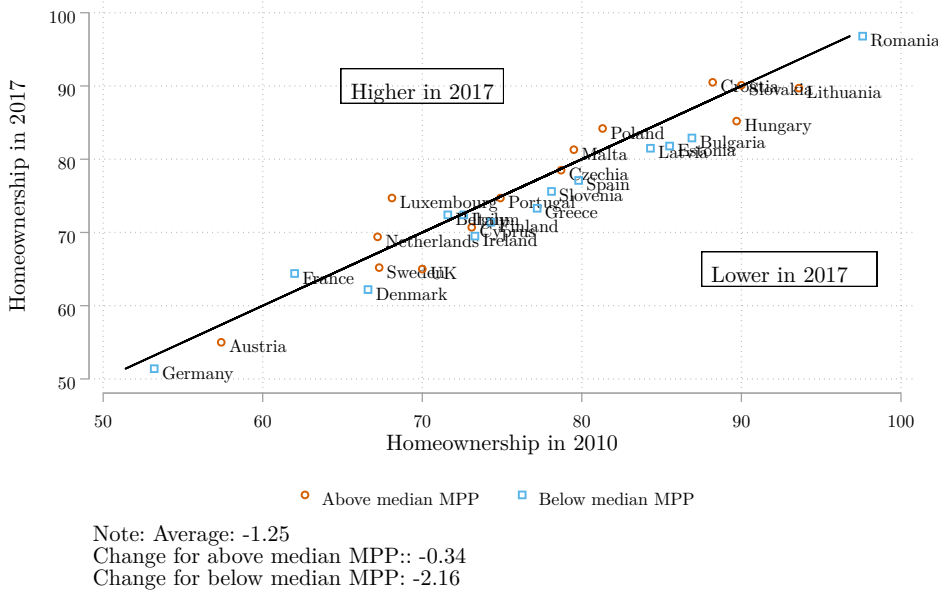
3.3 Sample selection and summary statistics

The sample selection is guided by data availability for homeownership rates and macroprudential policies. The final sample includes 28 countries. Homeownership data begins in 2003, but with many missing observations. The start and end dates for all countries with available homeownership data are listed in Table B3, along with homeownership rates in the first year, last year and on average for all years.

4 Stylized facts on homeownership and macroprudential policies

A striking feature of homeownership rates is their slow-moving nature and apparent insensitivity to major economic shocks. Figure 1 shows that the homeownership rate declined in many

[4]The implementation date is also noted in the dataset. The median difference between announcement and implementation is 1 month, and the average difference is 5 months.



Note: Average: -1.25
Change for above median MPP:: -0.34
Change for below median MPP: -2.16

Figure 1: Change in homeownership rates 2010-2017 and macroprudential policies

Notes: The figure shows the homeownership rate in 2010 on the x-axis and the homeownership rate in 2017 on the y-axis. The color of the points indicates if the country had an above-median number of macroprudential policies since 2010. The solid line marks the 45-degree line, showing whether homeownership rates increased or decreased between 2010 and 2017.

countries between 2010 and 2017. Appendix Figure A1 plots the full time-series for all countries. The average decline was 1.25 percentage points. The decline was larger, however, for countries that used *fewer* macroprudential policies. A naive regression of the change in macroprudential policies between 2010 and 2017 and the change in homeownership yields a positive but insignificant coefficient of 0.2.

Even during periods of significant economic turmoil, such as the European debt crisis of 2010-2012, homeownership rates show little response. This persistence suggests that homeownership decisions are driven by long-term factors rather than short-term economic conditions or policy changes. The gradual nature of the decline indicates that changes in homeownership rates reflect structural shifts in housing markets and demographic trends rather than cyclical fluctuations.

Another notable feature is the substantial variation in homeownership rates across countries. A striking fact is that the homeownership rates for Central European countries, such as Romania,

Lithuania, and Slovakia, are so high today. Tenants in these countries were able to buy their properties at large discounts after the fall of the Soviet Union (Broulíková *et al.* , 2020). Some differences may reflect cultural preferences (Huber & Schmidt, 2022) or institutional factors such as rental market regulations (Kaas *et al.* , 2021). For the Eastern European countries to still have such high rates today is remarkable, and suggests that the homeownership rate is a slow-moving variable not overly affected by economic policies or economic development.

5 Empirical strategy

This section describes the empirical strategy designed to identify how changes in macroprudential policies affect the homeownership rate in aggregate and for different groups. The analysis follows the literature on macroprudential policies and homeownership rates (Fernández-Gallardo *et al.* , 2025; Fernandez-Gallardo, 2023; Kuttner & Shim, 2016; Cerutti *et al.* , 2017). I use a narrative approach to identify macroprudential policy shocks, and a local projection (LP) framework to estimate the effect of macroprudential policies on the homeownership rate.

5.1 Identifying macroprudential policy shocks

To identify the effect of macroprudential policies on the homeownership rate, it is necessary to measure only exogenous components of macroprudential policy. In this setting, that involves identifying policies that do not systematically respond to changes in the homeownership rate or economic fluctuations that may drive changes in the homeownership rate. Overall, this is a challenge that arises because macroprudential policies are not introduced randomly, but instead often respond to the state of the economy. For example, macroprudential policies may be introduced in response to overheating of the economy. If policy tightening occurs at housing market peaks, the homeownership rate could decline for reasons unrelated to the policy.

To address this challenge, I use the narrative approach of Fernández-Gallardo *et al.* (2025) to identify macroprudential policy actions that do not have a counter-cyclical motive. The MaPPED database contains a variable about the motivation for introducing a specific policy action. I use this variable to identify policies that do not have a counter-cyclical motive. A

measure has a countercyclical design when the instrument automatically tightens when systemic risk intensifies and loosens when systemic risk decreases (Budnik & Kleibl, 2018). I remove all policy actions with this characteristic. The main variable of interest represents a shock to the aggregate macroprudential policy stance for each country.

A common approach in the literature is to include variables that could motivate the introduction of macroprudential policies, such as credit growth or house prices. The narrative approach addresses this concern by excluding counter-cyclical policies from the outset. However, macroprudential policies may still be correlated with the state of the economy. To address this concern, I include control variables for the change in credit to the private non-financial sector, the change in the house price index, and the change in the central bank policy rate.

5.2 Threats to identification

There are several other threats to identification, beyond the potentially endogenous implementation of macroprudential policies. I now discuss these in more detail.

Omitted variable bias. If macroprudential policy moves together with the macro and housing cycle, there may be an omitted variable bias. For instance, loose monetary policy could increase housing demand or change expectations over future house prices, which may influence both the homeownership rate and the introduction of macroprudential policies. To address this concern, I include a number of control variables.

Measurement error. Finally, measurement error in policy indicators may mean that I assign a high weight to a policy that has a limited impact or scope. To address this concern, note that the weighting scheme of the MaPPED database allows me to give a lower weight to policies that have a limited impact or scope. In robustness checks, I also use another macroprudential policy database, and run results using no weighting. In unreported results, I find no differences in results.

Anticipation effects. The MaPPED database contains information about both the announcement and implementation of macroprudential policies. If macroprudential policies are announced and implemented at different times, it may be the case that the implementation of a policy does not affect the homeownership rate, but the announcement does. To address this concern, I use the announcement date as the date of the policy. Overall, the difference between the announcement and implementation date is small, with an average difference of five months and a median difference of one month. Since I use annual data, the difference between the announcement and implementation date is unlikely to be a major concern.

Data frequency. Statistical power is potentially a concern with annual data. However, unlike financial variables such as credit growth or house prices, which can respond quickly to policy changes, homeownership rates reflect long-term household decisions about tenure choice that are typically made infrequently and with considerable deliberation. Even if macroprudential policies do affect the attractiveness of homeownership, these effects may take several years to materialize as households gradually adjust their housing tenure decisions. For this reason, using annual data is appropriate in this setting.

5.3 Empirical specification

I investigate the relationship between homeownership and macroprudential policies using local projections (LP) following Jordà (2005), Richter *et al.* (2019) and Coulier *et al.* (2022). I use this methodology as it enables me to estimate the effect of macroprudential policies over time, which is particularly relevant for a slow-moving variable such as homeownership rates. I estimate the following baseline model:

$$\text{Owner}^{j}_{i,t+h} = \alpha^{h}_{i} + \gamma^{h}_{t} + \beta_{h}\Delta MaPP_{i,t} + \phi^{h}\Delta X_{i,t-1} + \epsilon_{i,t+h}, \tag{1}$$

for $h = 1, \ldots, 5$. The dependent variable is the homeownership rate for country i and group j in year t. The variable of interest, $\Delta MaPP_{i,t}$, is the change in the cumulative index of macroprudential actions. I include a vector of controls in $X_{i,t-1}$. Control variables are all

lagged one year, and include GDP growth rate per capita, inflation, the change in the house price index, the change in credit to the private non-financial sector relative to GDP, the change in the central bank interest rate, and the sum of macroprudential policies. α_i^h and γ_t^h are country and time dummies that account for cross-country differences in the average homeownership rate and for general time trends in the homeownership rate, respectively. However, the results are generally not sensitive to the inclusion of these controls or to different lag lengths.

I examine several measures of homeownership. All homeownership measures are expressed as percentages of total households. First, I use the aggregate homeownership rate. Then, I also examine effects for households with and without a mortgage. This distinction is particularly relevant for macroprudential policies that directly target mortgage lending. To examine potential distributional effects, I also analyze homeownership rates for different income groups. The data includes homeownership rates for households above and below 60 percent of median equivalized income. Macroprudential policies may disproportionately affect households that rely more heavily on credit to purchase housing, which could include lower-income households.

6 Results

I estimate the effect of macroprudential policies on homeownership rates using local projections as specified in Equation (1). The results consistently show no statistically significant effects of macroprudential policy changes on homeownership rates across all specifications and time horizons. Figure 2 presents the impulse response functions for borrower-based macroprudential policies over a five-year horizon, with and without control variables. The results are also available in Table B4. The point estimates are close to zero and remain statistically insignificant throughout the entire horizon, with 95 percent confidence intervals that include zero at all time periods. Moreover, the estimates are not economically significant, and reject the presence of large shocks. Using the result for the regression with control variables in period three, the data rule out declines larger than roughly 0.23 percentage points in the homeownership rate following a macroprudential tightening. The lower bound of the 95% confidence interval shows that a one unit increase in macroprudential policies reduces the homeownership rate by -0.23 percentage

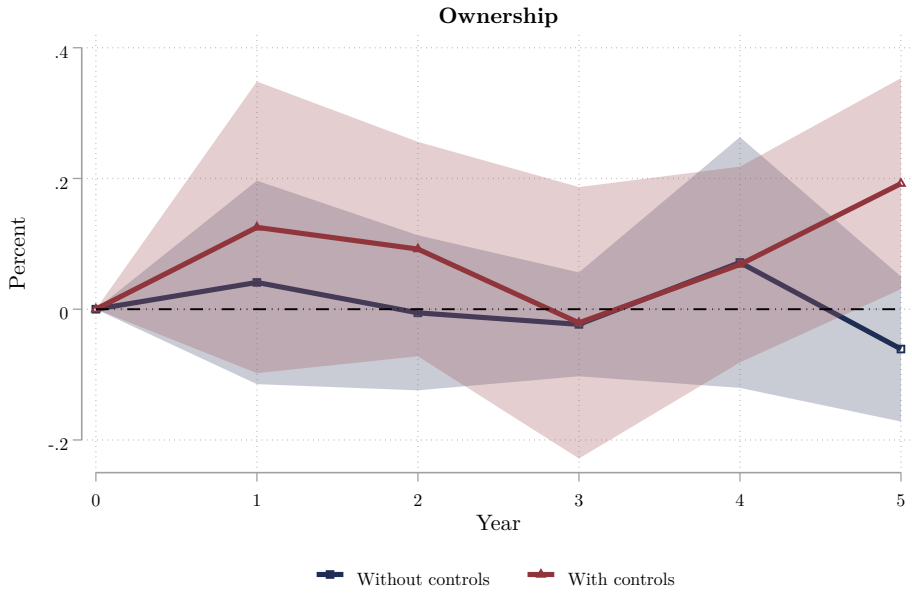


Figure 2: Linear projection for homeownership rates and macroprudential policies

Note: The figure shows the impulse response functions for borrower-based macroprudential policies over a five-year horizon, estimated using equation (1). The dependent variable is the homeownership rate, and the independent variable is the change in the cumulative index of macroprudential policies. The red line represents the specification with control variables included, and the blue line represents the specification with control variables excluded. Ninety-five percent confidence intervals are marked in shaded areas. Control variables are all lagged one year and include GDP growth rate per capita, inflation, the change in the house price index, the change in credit to the private non-financial sector relative to GDP, the change in the central bank interest rate, and the sum of macroprudential policies.

points. This result is clearly not representative, however, and simply represents the largest estimated negative effect. Even so, the effect is not economically significant and is far from the effect in macroeconomic models, which are typically an order of magnitude larger.

To formally rule out the presence of large effects, I report results from the equivalence testing using the Two One-Sided Tests (TOST) procedure in Table B4. Intuitively, equivalence holds at the 5% significance level if the 90% confidence interval for β lies strictly within $[-\delta, \delta]$. I choose a value of 0.5 percentage points as the equivalence margin δ. The choice is admittedly somewhat arbitrary but tight enough to rule out large effects. Recall that LTV restrictions lowered the homeownership rate by 2.8 and 3 percentage points in the baseline models in Kaplan *et al.* (2020) and Garriga & Hedlund (2020), respectively. The test results can rule out that the effect of macroprudential policies on homeownership rates is larger than 0.5 percentage points at the 5% significance level for all horizons.

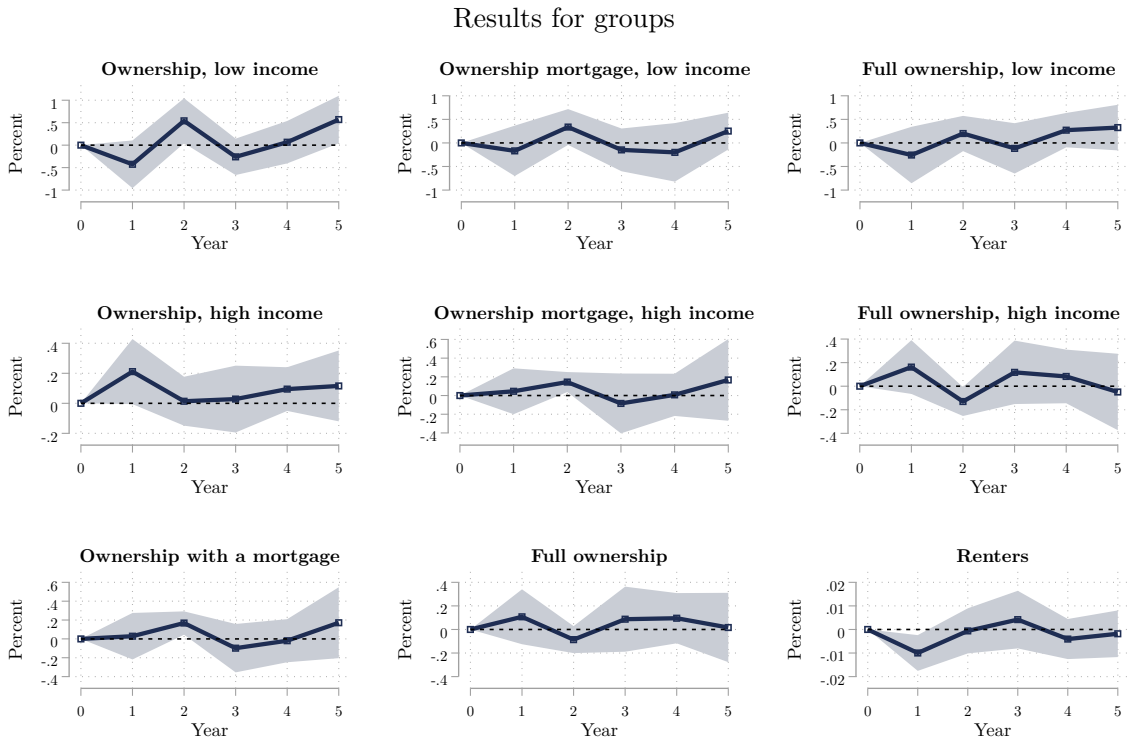


Figure 3: Linear projection of homeownership rates and macroprudential policies

Notes: The figure shows the impulse response functions for borrower-based macroprudential policies over a five-year horizon, estimated using equation (1). The dependent variable is the homeownership rate for different groups, and the independent variable is the change in the cumulative index of macroprudential policies. The red line represents the specification with control variables included, and the blue line represents the specification with control variables excluded. Control variables are all lagged one year, and include GDP growth rate per capita, inflation, the change in the house price index, the change in credit to the private non-financial sector relative to GDP, the change in the central bank interest rate, and the sum of macroprudential policies. 95 percent confidence intervals are marked in shaded areas.

This null result on the aggregate homeownership rate stands in sharp contrast to the well-documented effects of macroprudential policies on other housing market variables. A large literature has established that macroprudential policies are effective in reducing credit growth and moderating house price appreciation (Cerutti *et al.* , 2017; Kuttner & Shim, 2016; Alam *et al.* , 2019). These policies appear to work precisely as intended in affecting the intensive margin of housing market activity—reducing the volume of credit and the pace of price increases. However, the extensive margin of housing market participation appears largely unaffected by these same policy interventions.

Next, I examine the effect of macroprudential policies on homeownership rates for different

groups of households. A key concern for policymakers is that macroprudential policies may disproportionately affect certain groups of households, such as low-income households or households with a mortgage. Figure 3 shows the impulse response functions for different groups of households, including low-income and high-income households, as well as for households with and without mortgages. The results are also available in Table B5. The results are consistent with the main results, showing no statistically significant effects of macroprudential policies on homeownership rates for any group. The effect for high-income households is marginally significant, but the effect is small and is only present in year $t+1$. Moreover, the equivalence tests show that the confidence intervals around the estimated coefficients are fully inside the margin of 0.5 percentage points for almost all groups and horizons. Consequently, there is little support for the concern that macroprudential policies may disproportionately affect certain groups of households on the aggregate level.

The next set of results focuses on lending standard restrictions. These restrictions, which include LTV and debt-service-to-income (DSTI) constraints, are a common tool for macroprudential policies that directly affect households. I therefore select only these policies, create an index of lending standard restrictions, and estimate the effect of this index on homeownership rates. The results in Figure 4 show that the effect of lending standard restrictions on homeownership rates is also small and statistically insignificant for most periods. For low-income households in the first row, the effect is actually positive. However, the effect is only present in year $t+1$. It is therefore not the case that macroprudential policies affect homeownership rates through lending standard restrictions in the long run. Conversely, the results also suggest that removing lending standards will not help the homeownership situation for low-income households or in aggregate. The results are also robust to examining other select policies.

Finally, Appendix Figure A3 shows that the results are robust to using an alternative macroprudential policy database, the IMF's integrated Macroprudential Policy (iMaPP) Database, originally constructed by Alam *et al.* (2019).

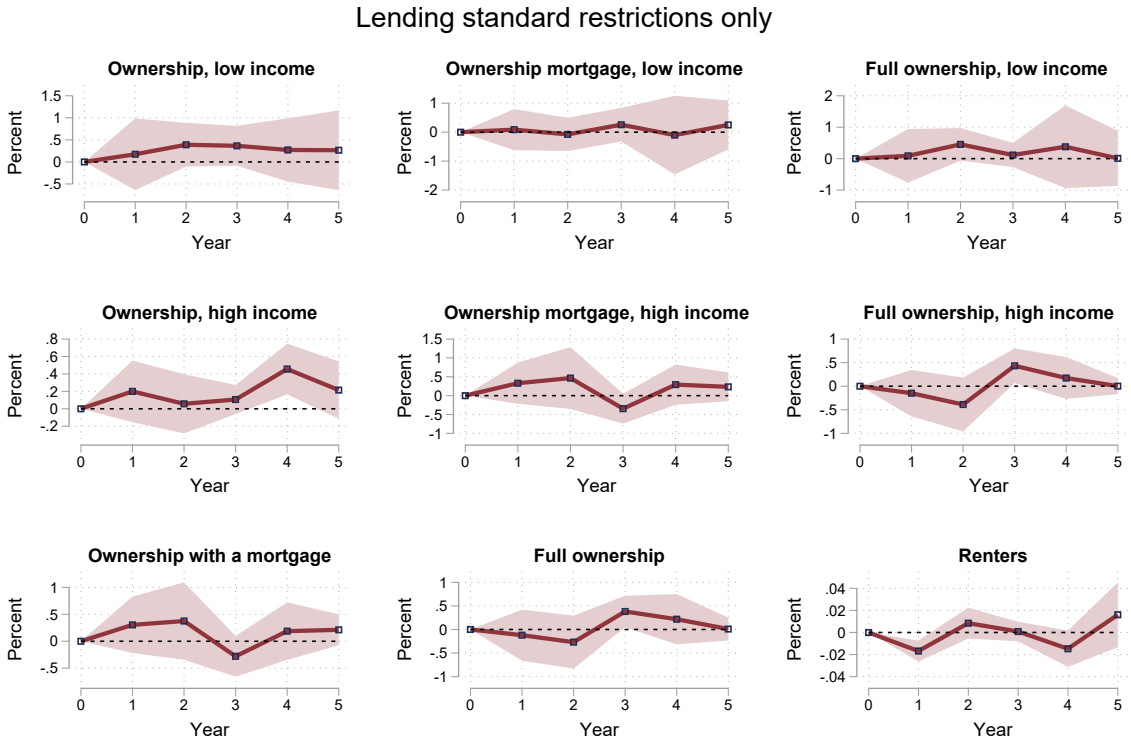


Figure 4: Linear projection for homeownership rates and lending standard restrictions

Notes: The figure shows the impulse response functions for lending standard restrictions over a five-year horizon, estimated using equation (1). The dependent variable is the homeownership rate for different groups, and the independent variable is the change in the cumulative index of lending standard restrictions. The red line represents the specification with control variables included, and the blue line represents the specification with control variables excluded. Control variables are all lagged one year, and include GDP growth rate per capita, inflation, the change in the house price index, the change in credit to the private non-financial sector relative to GDP, the change in the central bank interest rate, and the sum of macroprudential policies up until a given year. 95 percent confidence intervals are marked in shaded areas.

6.1 Examining large macroprudential policy shocks

Now, a discerning reader may be wondering whether the null results are derived from the fact that macroprudential policies are not effective in reducing credit growth and moderating house price appreciation. It may be the case that the macroprudential policy shock is not sufficiently large to move credit markets, in which case the null results are not surprising. To address this concern, I examine the effect of macroprudential policies on homeownership rates around policies where the previous literature has found large credit effects. Specifically, I examine the impact of the introduction of LTV and LTI constraints in Ireland in 2015 (Acharya *et al.* , 2022), the Swedish amortization requirement in 2016 (Bäckman *et al.* , 2024), the introduction

of LTI limits in the UK in 2014 (Peydró *et al.* , 2024), as well as LTV restrictions in Norway in 2010 (Aastveit *et al.* , 2023), the Netherlands (Van Bekkum *et al.* , 2024) in 2011, Finland in 2016 (Eerola *et al.* , 2023) and Switzerland in 2012 (Bolliger *et al.* , 2025).

To summarize the effect across all countries with large shocks, I estimate the following equation:

$$\text{Owner}_{it} = \alpha_i + \sum_{k=-3}^{4} \beta_k Policy_{it} + \delta_t + \epsilon_{it} \tag{2}$$

where Owner_{it} is the aggregate homeownership rate. Standard errors are clustered at the country level. The equation simply summarizes the average developments in the homeownership rate before and after macroprudential policies were introduced. I include country fixed effects and year fixed effects in this regression, as the goal is simply to examine how homeownership evolved after large shocks. The evolution of homeownership for all different groups and countries separately in the years prior to and after a large macroprudential shock is available in Figure A4, and the regression results for all groups are available in Figure A5.

The main findings from the regressions are summarized in Figure 5. Overall, the results are very similar to the previous estimates from the linear projections. If anything, the results suggest a positive effect of macroprudential policies on homeownership rates in the long run. However, the standard errors are large and the effects are not statistically significant. The 95% confidence intervals rule out negative effects larger than 78 basis points.

Overall, all results point a consistent picture of no effect of macroprudential policies on homeownership rates. Whether we use all policies, borrower-based policies or examine large shocks, there is very little evidence of a negative effect of macroprudential policies on homeownership rates for any group. The standard errors are typically tight enough to rule out large negative effects. Going back to the conceptual framework, the results in this paper are consistent with segmented housing markets, where macroprudential policies affect credit and house prices, but not homeownership rates. These results are also consistent with the previous literature showing a large effect of macroprudential policies on house prices.

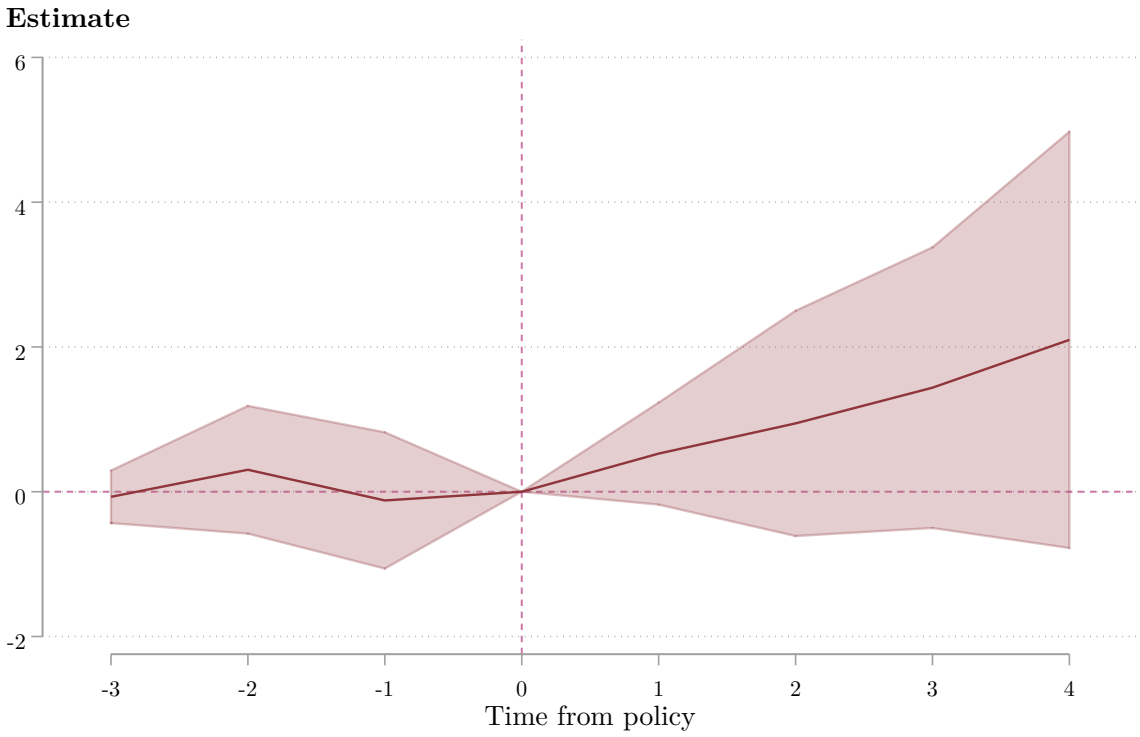


Figure 5: Event study on homeownership rates before and after large shocks

Notes: The figure plots the coefficients from estimating Equation (2). The countries (year of policy) are Ireland (2015), the UK (2014), Sweden (2016), the Netherlands (2011), Portugal (2018), Norway (2010), Finland (2016) and Switzerland (2012). The time from event measures the time from the large macroprudential shock. Standard errors are clustered at the country level. Ninety-five percent confidence intervals are marked in shaded areas.

7 Conclusion

This paper examines whether macroprudential policies reduce homeownership rates, a question of significant policy relevance given widespread concerns about housing market access and financial stability. Using country-level panel data and local projection methods with a narrative approach to identification, I find no evidence that macroprudential policies reduce homeownership rates either at implementation or up to five years after. The null results are precisely estimated and hold across multiple specifications, including aggregate homeownership rates and rates for specific demographic groups such as low-income households. The null effects are consistent with an inelastic relative supply of owner-occupied housing, where credit shocks primarily affect prices rather than quantities.

The absence of effects on homeownership rates suggests that macroprudential policies may not create unintended barriers to homeownership access, addressing a key concern among policymakers. Based on the previous literature, macroprudential policy tightening instead lowers house prices and credit, which may lead to a wealth transfer from existing homeowners. The results also have broader implications for the ongoing debate about housing market access and affordability. Many policy proposals aimed at helping young and first-time buyers involve relaxing macroprudential policies, such as lowering downpayment requirements or providing subsidized savings accounts. The findings from this paper suggest that such demand-side interventions may not effectively increase homeownership rates among target groups in aggregate.

Finally, these findings should not be interpreted as an endorsement of macroprudential policies more broadly. While the evidence suggests that such policies do not systematically reduce homeownership rates, they may still have other unintended consequences or welfare effects. For instance, macroprudential policies could lead to a shift in credit activity to less regulated sectors such as shadow banking, alternative lenders or cross-border lending. Alternatively, households could reduce their liquid savings to comply with macroprudential policies, with ambiguous effects on financial stability (Aastveit *et al.* , 2023). The null effect on homeownership rates reflects an equilibrium outcome that may mask heterogeneous effects across different market segments or geographic areas. Future research should continue to examine these and other potential consequences of macroprudential regulation to provide a more complete picture of their overall impact on household welfare and financial stability.

References

Aastveit, Knut Are, Juelsrud, Ragnar Enger, & Wold, Ella Getz. 2023. Does mortgage regulation stabilize household consumption? 2, 4, 18, 20

Acharya, Viral V, Bergant, Katharina, Crosignani, Matteo, Eisert, Tim, & McCann, Fergal. 2022. The anatomy of the transmission of macroprudential policies. *The Journal of Finance*, **77**(5), 2533–2575. 2, 17

Adelino, Manuel, Schoar, Antoinette, & Severino, Felipe. 2025. Credit supply and house prices: Evidence from mortgage market segmentation. *Journal of Financial Economics*, **163**, 103958. 2

Akinci, Ozge, & Olmstead-Rumsey, Jane. 2018. How effective are macroprudential policies? An empirical investigation. *Journal of Financial Intermediation*, **33**, 33–57. 1, 39

Alam, Zohair, Alter, Mr Adrian, Eiseman, Jesse, Gelos, Mr RG, Kang, Mr Heedon, Narita, Mr Machiko, Nier, Erlend, & Wang, Naixi. 2019. *Digging deeper–Evidence on the effects of macroprudential policies from a new database.* International Monetary Fund. 1, 15, 16, 38

Araujo, Juliana, Patnam, Manasa, Popescu, Adina, Valencia, Fabian, & Yao, Weijia. 2024. Effects of macroprudential policy: Evidence from over 6000 estimates. *Journal of Banking & Finance*, **169**, 107273. 1

Arena, Mr Marco, Chen, Tingyun, Choi, Mr Seung M, Geng, Ms Nan, Gueye, Cheikh A, Lybek, Mr Tonny, Papageorgiou, Mr Evan, & Zhang, Yuanyan Sophia. 2020. *Macroprudential policies and house prices in europe.* International Monetary Fund. 1

Bäckman, Claes, Moran, Patrick, & van Santen, Peter. 2024. *Mortgage design, repayment schedules, and household borrowing.* Tech. rept. SAFE Working Paper. 2, 17

Balke, Kasper Kragh, Karlman, Markus, & Kinnerud, Karin. 2023. *Down-payment requirements: Implications for portfolio choice and consumption.* Tech. rept. Working Paper. 3

Bolliger, Elio, Bruhin, Adrian, Fuster, Andreas, & Ganarin, Maja. 2025. The effect of macropru-

dential policies on homeownership: Evidence from Switzerland. *Journal of Urban Economics*, **146**, 103749. 2, 3, 18

Broulíková, Hana M, Huber, Peter, Montag, Josef, & Sunega, Petr. 2020. Homeownership, mobility, and unemployment: evidence from housing privatization. *Journal of Housing Economics*, **50**, 101728. 10

Budnik, Katarzyna Barbara, & Kleibl, Johannes. 2018. *Macroprudential regulation in the European Union in 1995-2014: introducing a new data set on policy actions of a macroprudential nature*. Tech. rept. 2, 7, 11

Castellanos, Juan, Hannon, Andrew, & Paz-Pardo, Gonzalo. 2024. *The aggregate and distributional implications of credit shocks on housing and rental markets*. Tech. rept. 3, 4, 5

Cerutti, Eugenio, Claessens, Stijn, & Laeven, Luc. 2017. The use and effectiveness of macroprudential policies: New evidence. *Journal of Financial Stability*, **28**, 203–224. 1, 10, 15

Cima, Simone, & Kopecky, Joseph. 2024. Housing policy, homeownership, and inequality. 4

Coulier, Lara, De Schryder, Selien, *et al.* . 2022. *Assessing the Effects of Borrower-Based Macroprudential Policy on Credit in the EU Using Intensity-Based Indices*. Tech. rept. Ghent University, Faculty of Economics and Business Administration. 12

Di Maggio, Marco, & Kermani, Amir. 2017. Credit-induced boom and bust. *The Review of Financial Studies*, **30**(11), 3711–3758. 2

Eerola, Essi, Lyytikäinen, Teemu, & Ramboer, Sander. 2023. *The impact of mortgage regulation on homeownership and household leverage*. Tech. rept. 2, 3, 18

Favara, Giovanni, & Imbs, Jean. 2015. Credit supply and the price of housing. *The American Economic Review*, **105**(3), 958–992. 2

Favilukis, Jack, Ludvigson, Sydney C, & Van Nieuwerburgh, Stijn. 2017. The macroeconomic effects of housing wealth, housing finance, and limited risk sharing in general equilibrium. *Journal of Political Economy*, **125**(1), 140–223. 5

Fernandez-Gallardo, Alvaro. 2023. Preventing financial disasters: Macroprudential policy and financial crises. *European Economic Review*, **151**, 104350. 8, 10

Fernández-Gallardo, Álvaro, Lloyd, Simon, & Manuel, Ed. 2025. The Transmission of Macroprudential Policy in the Tails: Evidence from a Narrative Approach. *Documentos de trabajo-Banco de España*, 1. 2, 7, 8, 10

Fischer, Marcel, Khorunzhina, Natalia, & Marx, Julie. 2024. Homeownership Decisions in the Bust. *The Journal of Real Estate Finance and Economics*, 1–39. 3

Galati, Gabriele, & Moessner, Richhild. 2013. Macroprudential policy–a literature review. *Journal of Economic Surveys*, **27**(5), 846–878. 1

Galati, Gabriele, & Moessner, Richhild. 2018. What do we know about the effects of macroprudential policy? *Economica*, **85**(340), 735–770. 1

Garriga, Carlos, & Hedlund, Aaron. 2020. Mortgage debt, consumption, and illiquid housing markets in the Great Recession. *American Economic Review*, **110**(6), 1603–34. 3, 14

Glaeser, Edward L, Gottlieb, Joshua D, & Gyourko, Joseph. 2012. Can cheap credit explain the housing boom? *Pages 301–359 of: Housing and the financial crisis*. University of Chicago Press. 2

Greenwald, Daniel L. 2017. *The Mortgage Credit Channel of Macroeconomic Transmission*. Working Paper, MIT Sloan. 5

Greenwald, Daniel L, & Guren, Adam. 2025. Do credit conditions move house prices? *American Economic Review*, **115**(10), 3559–3596. 2, 3, 4, 5

Himmelberg, Charles, Mayer, Christopher, & Sinai, Todd. 2005. *Assessing high house prices: Bubbles, fundamentals, and misperceptions*. Tech. rept. National Bureau of Economic Research. Cited by 0568. 5

Huber, Stefanie J, & Schmidt, Tobias. 2022. Nevertheless, they persist: Cross-country differences in homeownership behavior. *Journal of Housing Economics*, **55**, 101804. 10

Igan, Deniz, & Kang, Heedon. 2011. Do loan-to-value and debt-to-income limits work? Evidence from Korea. *IMF Working Papers*, 1–34. 1

Jordà, Òscar. 2005. Estimation and inference of impulse responses by local projections. *American economic review*, **95**(1), 161–182. 12

Kaas, Leo, Kocharkov, Georgi, Preugschat, Edgar, & Siassi, Nawid. 2021. Low homeownership in Germany—A quantitative exploration. *Journal of the European Economic Association*, **19**(1), 128–164. 10

Kaplan, Greg, Mitman, Kurt, & Violante, Giovanni L. 2020. The Housing Boom and Bust: Model Meets Evidence. *Journal of Political Economy*, **128**(9), 3285–3345. 3, 5, 14

Kuttner, Kenneth N, & Shim, Ilhyock. 2016. Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies. *Journal of Financial Stability*, **26**, 31–44. 1, 10, 15, 39

Laufer, Steven, & Tzur-Ilan, Nitzan. 2021. The effect of LTV-based risk weights on house prices: Evidence from an Israeli macroprudential policy. *Journal of Urban Economics*, **124**, 103349. 1

Lim, Cheng Hoon, Costa, Alejo, Columba, Francesco, Kongsamut, Piyabha, Otani, Akira, Saiyid, Mustafa, Wezel, Torsten, & Wu, Xiaoyong. 2011. Macroprudential policy: what instruments and how to use them? Lessons from country experiences. *IMF working papers*, 1–85. 1

Loutskina, Elena, & Strahan, Philip E. 2015. Financial integration, housing, and economic volatility. *Journal of Financial Economics*, **115**(1), 25–41. 2

Meuleman, Elien, & Vander Vennet, Rudi. 2020. Macroprudential policy and bank systemic risk. *Journal of Financial Stability*, **47**, 100724. 8, 33

Mian, Atif, & Sufi, Amir. 2019. *Credit supply and housing speculation*. Tech. rept. National Bureau of Economic Research. 2

Peydró, José-Luis, Rodriguez-Tous, Francesc, Tripathy, Jagdish, & Uluc, Arzu. 2024. Macroprudential policy, mortgage cycles, and distributional effects: Evidence from the United Kingdom. *The Review of Financial Studies*, **37**(3), 727–760. 1, 2, 18

Poghosyan, Tigran. 2020. How effective is macroprudential policy? Evidence from lending restriction measures in EU countries. *Journal of Housing Economics*, 101694. 1

Poterba, James M. 1984. Tax subsidies to owner-occupied housing: an asset-market approach. *The quarterly journal of economics*, 729–752. 5

Richter, Björn, Schularick, Moritz, & Shim, Ilhyock. 2019. The costs of macroprudential policy. *Journal of International Economics*, **118**, 263–282. 12

Tzur-Ilan, Nitzan. 2023. Adjusting to macroprudential policies: Loan-to-value limits and housing choice. *The Review of Financial Studies*, **36**(10), 3999–4044. 1

Van Bekkum, Sjoerd, Gabarro, Marc, Irani, Rustom M, & Peydró, José-Luis. 2024. The real effects of borrower-based macroprudential policy: Evidence from administrative household-level data. *Journal of Monetary Economics*, **147**, 103574. 2, 18

Online Appendixes

A Online Appendix: Figures

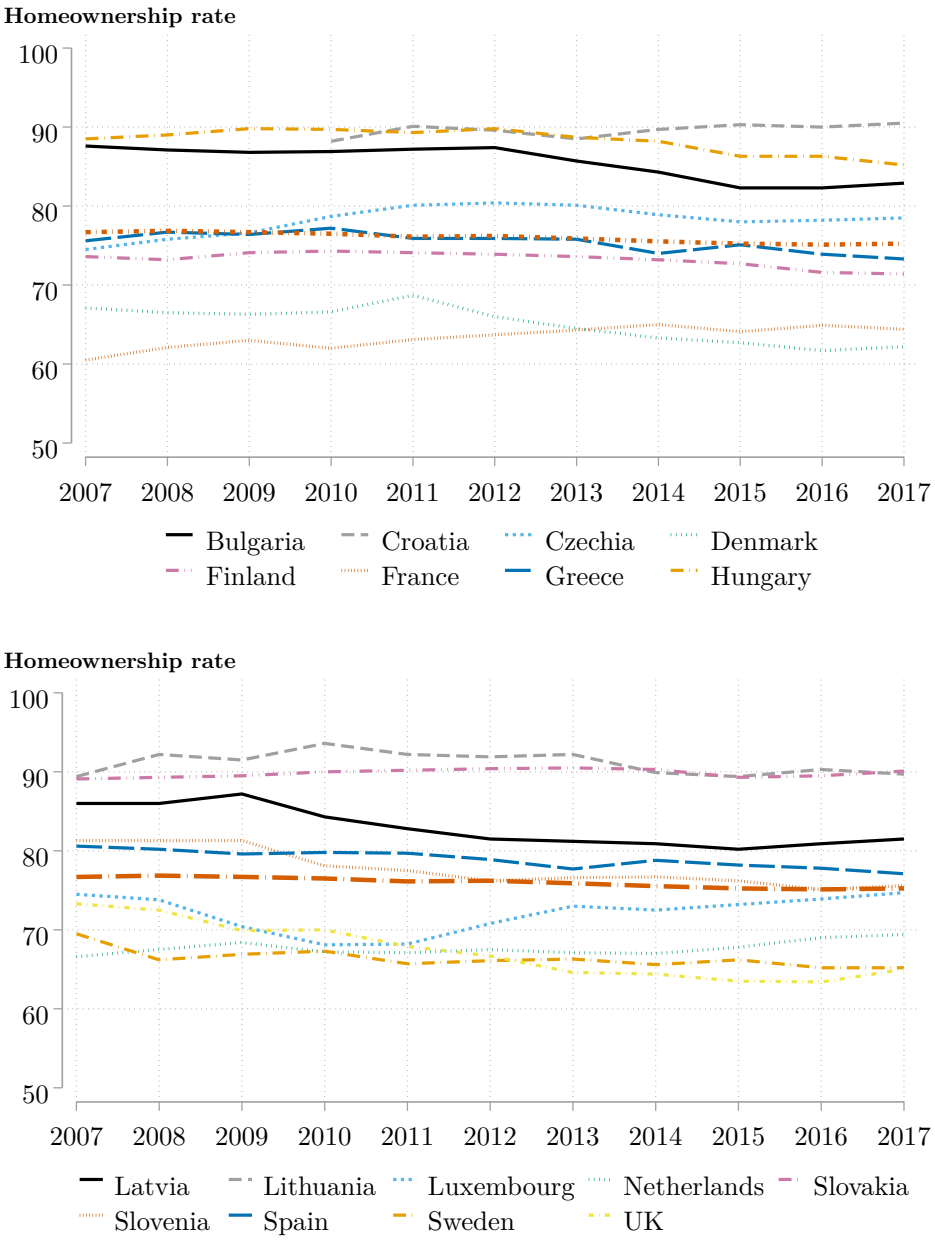


Figure A1: Homeownership rates across countries

Note: The figure shows the homeownership rate over time for all countries in the sample. The data source is EU-SILC. Panel a) plots results for Bulgaria, Croatia, Czechia, Denmark, Finland, France, Greece, and Hungary. Panel b) plots results for Latvia, Lithuania, Luxembourg, Netherlands, Slovakia, Slovenia, Spain, Sweden, and UK.

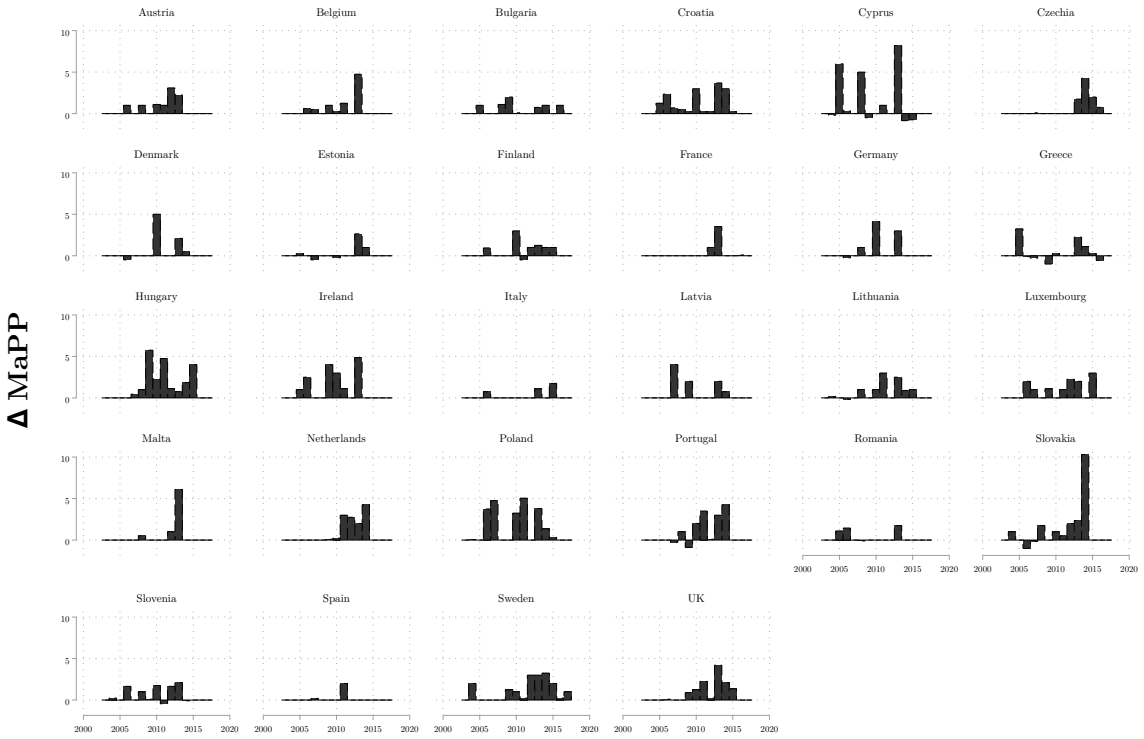


Figure A2: Macroprudential policy shocks by country

Note: The figure shows the macroprudential policy index over time for all countries in the sample. The data source is MaPPED database. Only policies included in the empirical analysis are included. This excludes policies with a countercyclical design.

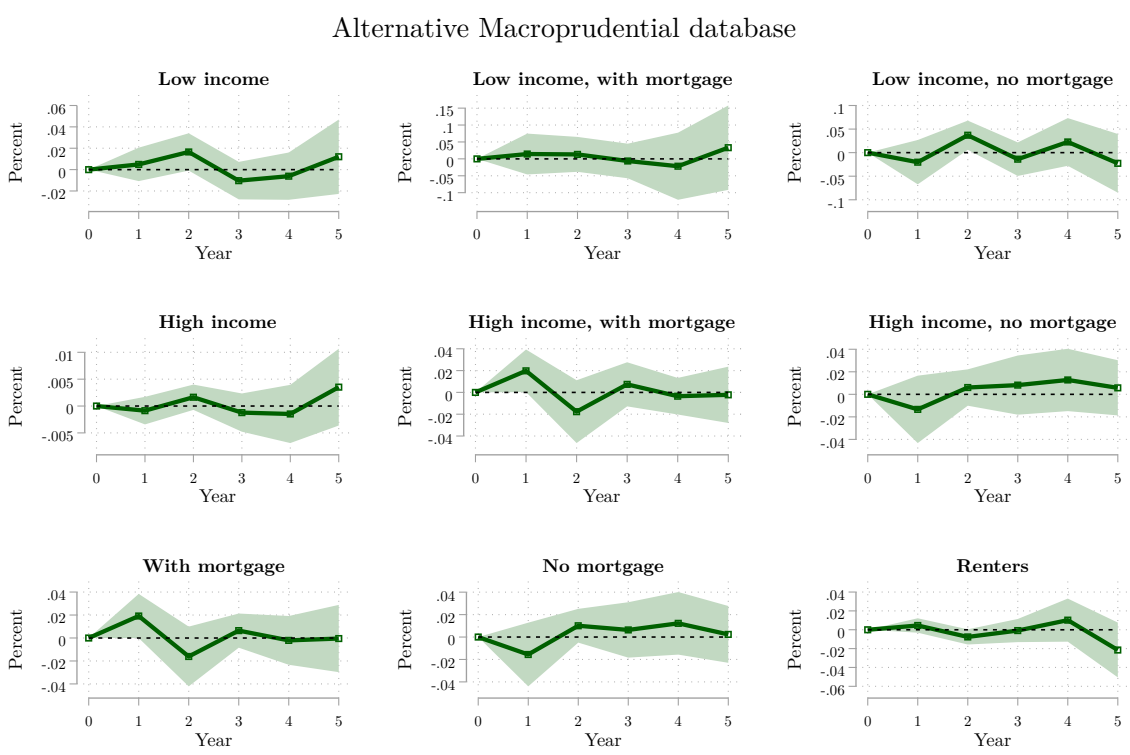


Figure A3: Linear projections with alternative macroprudential policy index

Note: The figure shows the impulse response functions for to an alternative macroprudential policy database over a five-year horizon, estimated using equation (1). The dependent variable is the homeownership rate, and the independent variable is the change in the cumulative sum of macroprudential policies from the iMaPP database. The red line represents the specification with control variables included, and the blue line represents the specification with control variables excluded. Control variables are all lagged one year, and include GDP growth rate per capita, inflation, the change in the house price index, the change in credit to the private non-financial sector relative to GDP, the change in the central bank interest rate, and the sum of macroprudential policies. 95 percent confidence intervals are marked in shaded areas.

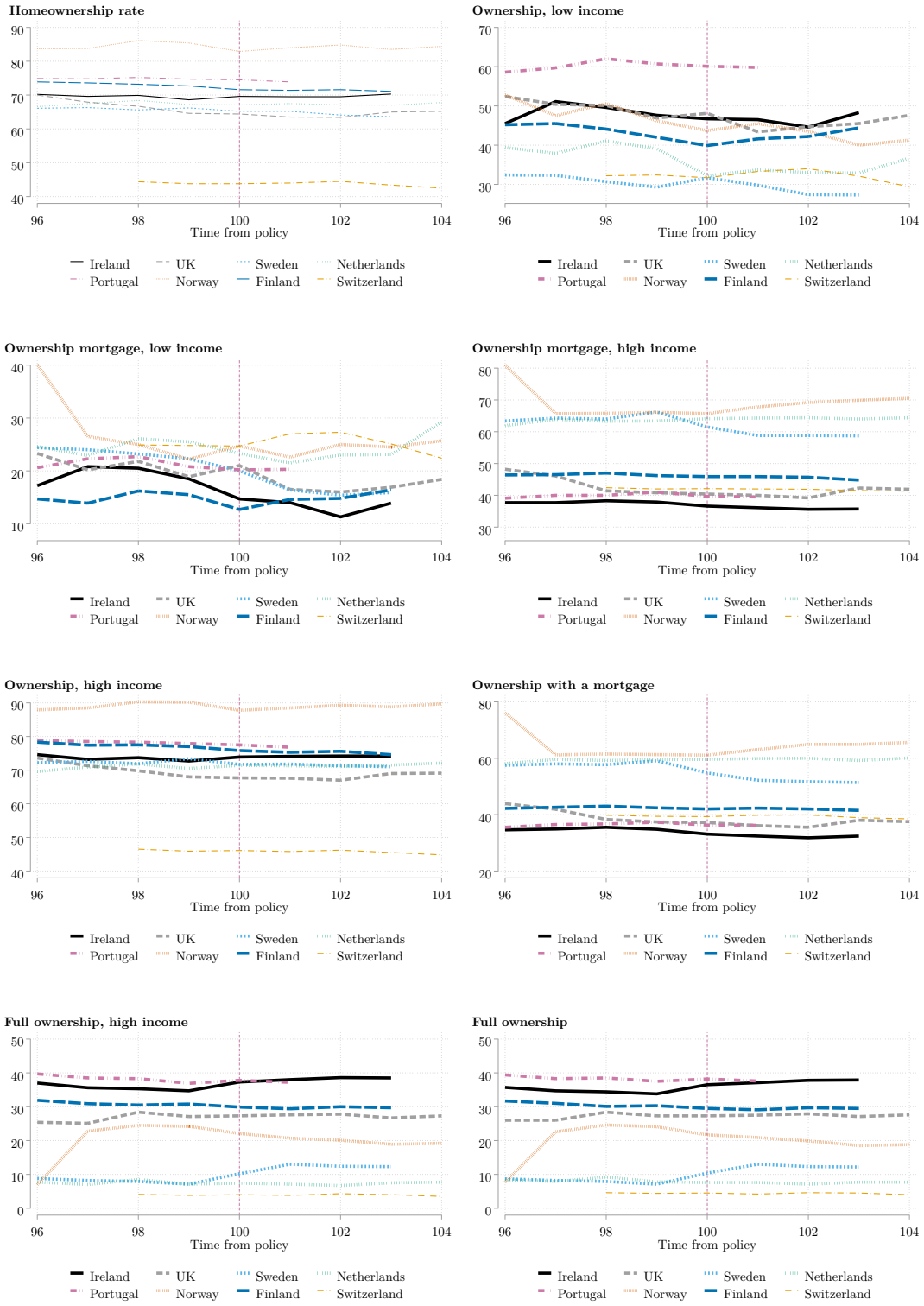


Figure A4: Homeownership rates around large macroprudential policy shocks

Note: The figure plots different homeownership rates around large macroprudential policy shocks. The countries (year of policy) are Ireland (2015), the UK (2014), Sweden (2016), the Netherlands (2011), Portugal (2018), Norway (2010), Finland (2016) and Switzerland (2012). The data source is EU-SILC. Each panel represents a different ownership group, stated above the y-axis.

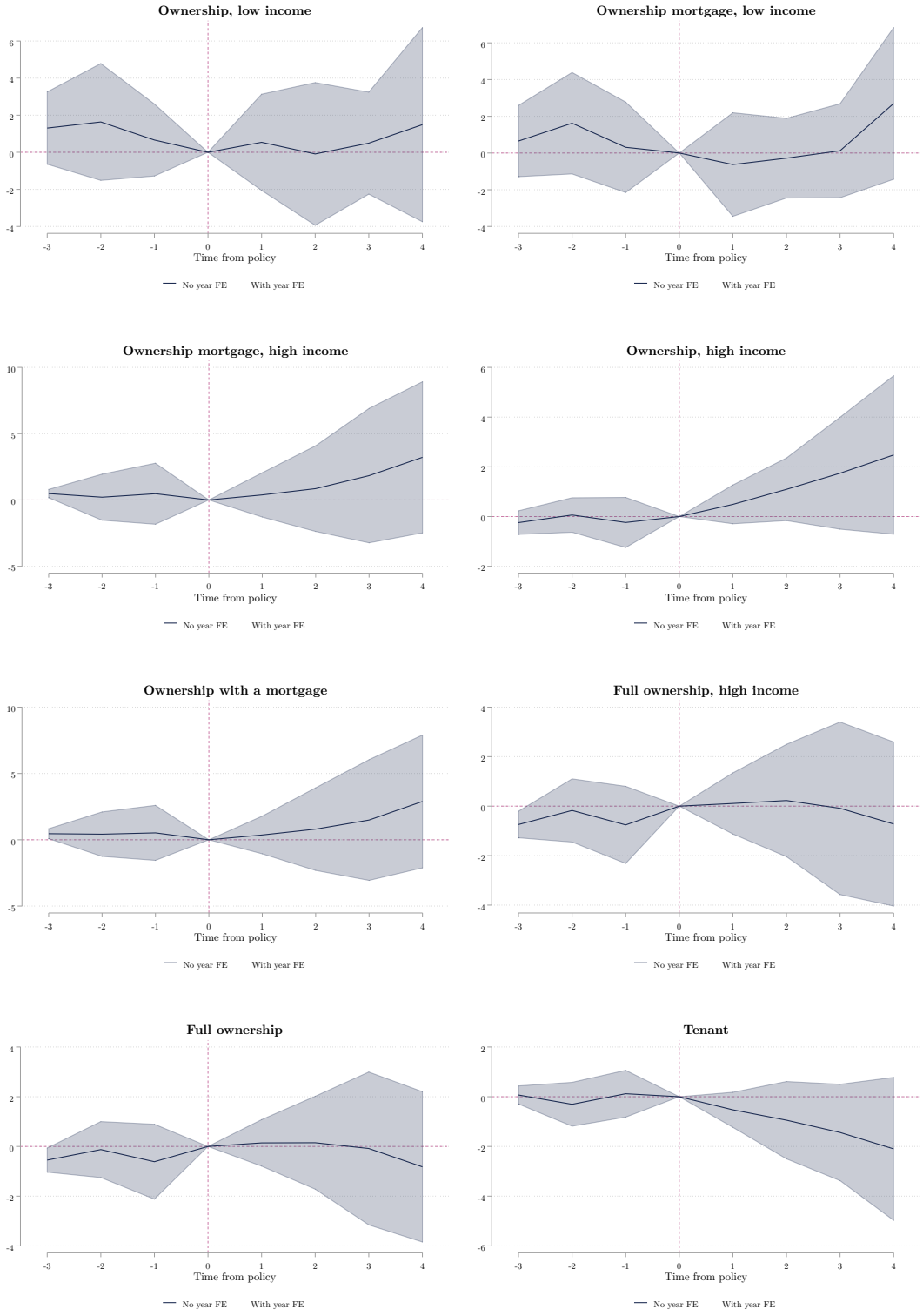


Figure A5: Coefficient estimates around large macroprudential policy shocks

Note: The figure plots the coefficients from estimating Equation (2) for different homeownership groups. The countries (year of policy) are Ireland (2015), the UK (2014), Sweden (2016), the Netherlands (2011), Portugal (2018), Norway (2010), Finland (2016) and Switzerland (2012). The time from event measures the time from the large macroprudential shock. Standard errors are clustered at the country level. 95 percent confidence intervals are marked in shaded areas.

B Online Appendix: Tables

Table B1: Summary statistics

	Mean	Std. Dev	Median	Min	Max
Ownership	71.84	8.00	72.80	51.70	89.80
Change in Homeownership variables					
Aggregate Ownership	0.00	0.02	-0.00	-0.09	0.17
With mortgage	0.02	0.08	0.01	-0.16	0.50
No mortgage	-0.01	0.14	-0.01	-1.55	0.83
High income, with mortgage	0.02	0.08	0.00	-0.17	0.45
Low income, with mortgage	0.02	0.19	0.00	-0.58	0.92
Macroprudential policy index					
Macroprudential policy index (MaPP)	5.71	5.81	3.95	-0.25	22.40
Change in MaPP	0.86	1.39	0.00	-1.00	5.75
Economic variables					
Δ GDP per capita	0.02	0.04	0.02	-0.10	0.32
Δ Final consumption per capita	0.02	0.03	0.02	-0.10	0.10
Δ Employment	0.00	0.02	0.01	-0.08	0.05
Δ Total population	0.00	0.01	0.00	-0.02	0.03
Δ Central bank interest rates	-0.43	0.71	-0.21	-3.71	1.25
Observations	191				

Notes: The table shows the summary statistics for the homeownership rate, the macroprudential policy index, and the control variables. The sample is all countries in the sample.

Table B2: Weighting Scheme for Different Macroprudential Policy Actions in Narrative Measure

Type of Policy Action	Weight	Strengthening / Loosening	Sign	Final Weight
Activation	1	Tightening	+	1
		Other/ambiguous impact		0
		Loosening	-	-1
Change in the Level	0.25	Tightening	+	0.25
		Other/ambiguous impact		0
		Loosening	-	-0.25
Change in the Scope	0.10	Tightening	+	0.10
		Other/ambiguous impact		0
		Loosening	-	-0.10
Maintaining the Existing Level and Scope	0.05	Tightening	+	0.05
		Other/ambiguous impact		0
		Loosening	-	-0.05

Notes: This table shows the weighting scheme used to construct the narrative measure of macroprudential policy actions. The final weight is calculated as the product of the base weight and the sign (+1 for tightening, -1 for loosening, 0 for ambiguous). Source: Meuleman & Vander Vennet (2020).

Table B3: Homeownership sample

			Homeownership rate			
Country	First year	Last year	First year	Last year	Average	Difference
Austria	2007	2019	59	55	56	-4
Belgium	2003	2019	73	71	72	-2
Bulgaria	2005	2019	85	84	85	-1
Croatia	2010	2019	88	90	90	2
Cyprus	2007	2019	74	68	72	-6
Czechia	2005	2019	74	79	78	5
Denmark	2003	2019	66	61	65	-5
Estonia	2006	2019	88	82	84	-6
Finland	2004	2019	71	71	73	0
France	2005	2018	62	65	63	3
Germany	2010	2019	53	51	52	-2
Greece	2007	2019	76	75	75	-1
Hungary	2005	2019	88	92	88	4
Ireland	2003	2018	80	70	74	-10
Italy	2004	2018	73	72	73	-1
Latvia	2007	2019	86	80	83	-6
Lithuania	2005	2019	88	90	91	2
Luxembourg	2007	2019	74	71	72	-3
Malta	2005	2019	80	80	80	0
Netherlands	2005	2019	64	69	67	5
Poland	2007	2019	62	84	79	22
Portugal	2004	2019	75	74	75	-1
Romania	2007	2019	96	96	96	0
Slovakia	2005	2018	82	91	89	9
Slovenia	2005	2019	83	75	78	-8
Spain	2007	2019	81	76	79	-5
Sweden	2004	2019	67	64	66	-3
UK	2005	2018	70	65	68	-5

Notes: The table provides information about available homeownership data for each country in our sample. The first column lists the first year where homeownership data is available and the second column lists the last year when homeownership data is available. The final three columns provides data on the homeownership rate in the first year, in the last year and on average for all years. Germany (2006, 2007, 2008 and 2009), Greece (2004, 2005 and 2006) and Turkey (2010) are missing data for select years.

Table B4: The effect of macroprudential policies on the homeownership rate

	(1) h=1	(2) h=2	(3) h=3	(4) h=4	(5) h=5
Panel A: No controls					
Δ MaPP	0.041	-0.006	-0.023	0.071	-0.061
	(0.079)	(0.061)	(0.041)	(0.098)	(0.057)
Observations	319	316	288	260	232
Economic significance	0.04	0.01	0.02	0.08	0.08
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	Yes
Panel B: With controls					
Δ MaPP	0.125	0.092	-0.021	0.068	0.192**
	(0.114)	(0.084)	(0.106)	(0.076)	(0.082)
L.Δ GDP per capita	7.098**	4.729**	5.767	-5.665	-4.522
	(2.481)	(2.025)	(4.278)	(4.195)	(4.564)
L.Inflation	14.403	2.779	2.351	-15.289	-12.341
	(9.739)	(7.105)	(10.760)	(10.622)	(16.489)
L.Δ House prices	-0.029	-2.892	-0.277	-0.736	4.076
	(1.007)	(2.217)	(2.508)	(3.422)	(4.372)
L.Δ Credit to GDP	-4.619	-0.487	-5.322	2.452	-1.575
	(2.660)	(5.402)	(3.668)	(3.537)	(4.784)
L.Δ Central bank interest rates	0.077	0.522***	0.219	0.189	-0.076
	(0.087)	(0.138)	(0.179)	(0.186)	(0.144)
L.Macroprudential policy index (MaPP)	0.054	0.064	0.022	0.131	0.200**
	(0.043)	(0.039)	(0.055)	(0.080)	(0.070)
Observations	175	159	143	126	109
Economic significance	0.13	0.09	0.02	0.07	0.26
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	Yes

Notes: The table shows the effect of macroprudential policies on the homeownership rate. The coefficients are the same as in Figure 2. The dependent variable is the homeownership rate, and the independent variable is the change in the number of macroprudential policies. The control variables are included in panel b. where "L" denotes lagged values of the control variables.

Table B5: The effect of macroprudential policies on the homeownership rate for different groups

	(1) h=1	(2) h=2	(3) h=3	(4) h=4	(5) h=5
Dep. var.: Ownership, low income					
Δ MaPP	-0.426	0.543**	-0.260	0.066	0.570**
	(0.271)	(0.255)	(0.207)	(0.241)	(0.270)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	-0.045	-0.063	-0.060	0.046	-0.065
Equivalence (CI fully inside margin):	No	No	No	Yes	No
Dep. var.: Ownership mortgage, low income					
Δ MaPP	-0.168	0.337*	-0.148	-0.200	0.252
	(0.272)	(0.194)	(0.231)	(0.317)	(0.199)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	-0.091	-0.063	-0.085	-0.079	-0.117
Equivalence (CI fully inside margin):	No	No	No	No	No
Dep. var.: Full ownership, low income					
Δ MaPP	-0.257	0.200	-0.115	0.271	0.326
	(0.305)	(0.191)	(0.272)	(0.186)	(0.247)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	0.036	-0.000	0.017	0.053	0.057
Equivalence (CI fully inside margin):	No	No	No	No	No
Dep. var.: Ownership, high income					
Δ MaPP	0.211*	0.014	0.028	0.095	0.116
	(0.111)	(0.083)	(0.114)	(0.074)	(0.120)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	0.035	-0.006	0.017	0.032	0.015
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	Yes
Dep. var.: Ownership mortgage, high income					
Δ MaPP	0.046	0.144**	-0.085	0.007	0.167
	(0.125)	(0.055)	(0.163)	(0.115)	(0.223)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	0.075	-0.005	-0.006	-0.088	-0.064
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	No
Dep. var.: Full ownership, high income					
Δ MaPP	0.162	-0.130*	0.118	0.083	-0.049
	(0.116)	(0.063)	(0.137)	(0.116)	(0.165)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	0.045	-0.000	0.036	-0.045	-0.091
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	Yes
Dep. var.: Ownership with a mortgage					
Δ MaPP	0.028	0.168**	-0.098	-0.019	0.172
	(0.126)	(0.063)	(0.131)	(0.117)	(0.192)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	0.068	0.021	-0.003	-0.068	-0.048
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	No
Dep. var.: Full ownership					
Δ MaPP	0.108	-0.086	0.087	0.096	0.017
	(0.119)	(0.058)	(0.141)	(0.109)	(0.150)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	0.058	0.019	0.017	-0.015	-0.057
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	Yes
Dep. var.: Renters					
Δ MaPP	-0.010**	-0.001	0.004	-0.004	-0.002
	(0.004)	(0.005)	(0.006)	(0.004)	(0.005)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	175	159	143	126	109
Adjusted R^2	-0.032	-0.081	-0.160	-0.152	-0.246
Equivalence (CI fully inside margin):	Yes	Yes	Yes	Yes	Yes

Notes: The table shows the effect of macroprudential policies on the homeownership rate. The coefficients are the same as in Figure 3. The dependent variable is the change in the homeownership rate, and the independent variable is the change in the cumulative index of macroprudential policies. The control variables are included in panel b. where "L" denotes lagged values of the control variables.

Table B6: The effect of macroprudential policies on the homeownership rate for lending standard restrictions

(1) h=1	(2) h=2	(3) h=3	(4) h=4	(5) h=5

Notes: The table shows the effect of lending standard restrictions on the homeownership rate. The coefficients are the same as in Figure 4. The dependent variable is the change in the homeownership rate, and the independent variable is the change in the cumulative index of macroprudential policies. The control variables are included in panel b. where "L" denotes lagged values of the control variables.

C Online Appendix: Data

C.1 Macroeconomic data

I collect data from the national accounts for each country at the quarterly and annual level. The data is collected from Eurostat, unless otherwise indicated. From national accounts, I collect real GDP, final consumption expenditure, gross capital formation, total employment, and population. All variables are available at current prices or at purchasing power standard per capita. I also collect data on gross capital formation (divided into total fixed assets and total construction) in gross terms and as a share of GDP, and finally I collect the harmonised Indices of Consumer Prices (HICP) as a measure of inflation.

C.2 Credit, interest rates and house price data

I collect credit data from the BIS total credit statistics. The dataset includes credit data for a number of different countries and series, including credit to the non-financial sector and the government sector. The data is divided into two series on the lending side: Total credit and Bank credit. Total credit comprises lending from domestic banks, other domestic financial corporations, non-financial corporations and non-residents, whereas bank lending only includes credit from domestic banks to the private non-financial sector. On the borrowing side, total credit is broken down into the government sector and private non-financial sector, where the latter is further broken down into non-financial corporations and households (including non-profit institutions serving households).

I collect data on house prices from the detailed series of the BIS Residential Property Price database.[5] This data is collected from national sources and is available for a large number of countries. Finally, I collect central bank interest data from the BIS policy rate statistics.

C.3 Other sources of macroprudential policies

I collect data on macroprudential policies from the IMF's integrated Macroprudential Policy (iMaPP) Database, originally constructed by Alam *et al.* (2019). The database provides a

[5]For more information, see http://www.bis.org/statistics/pp.htm.

dummy-type indicator for tightening and loosening of various macroprudential policy tools, along with a description of each policy action. The database combines information from five existing databases and the IMF's Macroprudential Policy Survey.[6] This dataset also contains data on the average LTV ratio. I collapse policies to the annual level in order to match the frequency of the homeownership data.

I construct several indicators for policy actions. The ideal situation would be to have an indicator that captures both the intensity and the timing of any macroprudential policy change. However, since macroprudential policy instruments remain highly country-specific and often expand in scope over time, it is difficult to capture the intensity of a given policy action. I therefore construct policy indicators that capture the timing of policies, following most studies within the field. For instance, Akinci & Olmstead-Rumsey (2018) and Kuttner & Shim (2016) use an indicator that tracks whether a policy action was tightened, loosened or if there was no change. For country i at time t, the indicator $s^j_{i,t}$ denotes whether policy j was tightened, loosened or remained unchanged:

$$s^j_{i,t} = \begin{cases} 1, & \text{if policy instrument } j \text{ is tightened} \\ -1, & \text{if policy instrument } j \text{ is loosened} \\ 0 & \text{otherwise} \end{cases}$$

I use this indicator to define a net index $S^j_{i,k}$ as:

$$S^j_{i,t} = \sum_{k=0}^{t} s^j_{i,k} \tag{3}$$

This index represents the net cumulative number of policy actions taken by country i from time k until time t, where k is the earliest year where the homeownership data is available.

[6] More information about the database is available at https://www.elibrary-areaer.imf.org/Macroprudential/Pages/Home.aspx.