

**ECONOMICS DEPARTMENT**

**MORTGAGE FINANCE ACROSS OECD COUNTRIES**

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## ABSTRACT / RESUME

### Mortgage Finance across OECD Countries

The landscapes of housing loan markets vary considerably across OECD countries, reflecting differences in preferences and policy settings. This paper first draws a topography of disparities in mortgage structure, documenting considerable variation across OECD countries in key features such as in use of fixed vs variable interest rates and typical maturities. The paper then discusses policies that can influence these outcomes. It highlights the scope for encouraging inclusive access to housing through tax-and-spending programmes that are neutral between renting and owning rather than through often very costly tax advantages for mortgage borrowing. The paper finally proposes a novel indicator to measure the balance between the rights of borrowers and lenders. Mortgage markets are deepest in countries where the index shows that creditor and borrower rights are balanced rather than severely tilted to one side.

Keywords: housing, mortgage markets, finance

JEL classification codes: G21; R21

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### Le financement hypothécaire dans les pays de l'OCDE

Le paysage des marchés du prêt au logement varie considérablement d'un pays de l'OCDE à l'autre en raison des différences relatives aux préférences et aux paramètres de l'action publique. Le présent document établit tout d'abord une topographie des différentes structures des marchés hypothécaires, mettant en évidence la variation considérable des paramètres clés, tels que les taux d'intérêt (fixes ou variables) et les échéances types, entre les pays de l'OCDE. Il examine ensuite les mesures qui sont susceptibles d'influer sur ces résultats. Il souligne qu'il est possible de favoriser l'accès inclusif au logement en adoptant des mesures fiscales et des programmes de dépenses qui soient neutres pour les propriétaires et les locataires, plutôt qu'en offrant de très coûteux avantages fiscaux pour les emprunts hypothécaires. Il propose enfin un nouvel indice pour mesurer à quel point les droits des emprunteurs et ceux des créanciers sont équilibrés. Les marchés hypothécaires les plus développés se trouvent dans les pays où les droits de l'emprunteur et du créancier sont, selon cet indice, équilibrés et ne favorisent pas fortement l'un ou l'autre.

Mots clés : logement, marchés hypothécaires, financement

*Classification JEL:* G21 ; R21

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# Mortgage Finance Across OECD Countries

By Frank van Hoenselaar, Boris Cournède, Federica De Pace and Volker Ziemann<sup>1</sup>

## 1. Introduction and main findings

1. Purchasing a home is, for most households, their biggest lifetime investment. In most cases, this purchase comes with their largest financial liability as well, since many households rely on mortgage loans to finance their home. The structure and functioning of mortgage markets can therefore have important consequences for people's access to housing and their financial situation. Across OECD countries, there are substantial differences in the depth of mortgage markets, the characteristics of mortgage products (i.e. maturity, currency, variable or fixed interest rate, with or with amortisation, etc.) and the regulation in place. Policies affecting mortgages vary regarding the tax treatment of mortgage debt, loan to value/income limits, public guarantees and foreclosure rules. The size and structure of mortgage markets ultimately have substantial implications for how downside risks to housing markets affect households, the real estate sector, mortgage suppliers and the broader economy.

2. This paper provides a descriptive overview of mortgage markets in the OECD from the perspective of households (i.e. the demand side of the market). It introduces a new Foreclosure index measuring the balance between borrower and creditor rights in mortgage regulation. A companion paper is covering the market's supply side, with a focus on the emergence of new providers of housing [see Box 1 and OECD (2021<sub>[1]</sub>)].

3. There are considerable differences in mortgage take-up across OECD countries. Within countries, the share of households with a mortgage is substantially lower for low-income households and young households. Several countries promote homeownership and mortgage access through tax subsidies (such as mortgage interest deduction) or other mortgage support schemes. However, as these subsidies become partly capitalised in house prices, they prove largely ineffective in improving housing accessibility and are often mostly benefit the upper-middle rather than the lower part of the income distribution.

4. Regulatory ceilings on loan-to-value (LTV), loan-to-income (LTI) or debt-service to income (DSTI) vary widely across the OECD. Similarly, the extent of effective borrowing, measured by mortgage debt to income ratios, exhibits considerable cross-country differences. Several mortgage characteristics such as

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<sup>1</sup> Frank van Hoenselaar, economist at the Dutch National Bank, worked at the OECD Economics Department at the time of writing. Federica de Pace, Boris Cournède and Volker Ziemann are members of the OECD Economics Department. The authors are indebted to Caroline Roulet (OECD Directorate for Financial and Enterprise Affairs) for her comments on outlines and successive drafts as well as her review of this paper. Their appreciation goes to Alain de Serres and Luiz de Mello (OECD Economics Department) for valuable guidance and comments and to Maria Chiara Cavalleri for her work on the Questionnaire on Affordable and Social Housing allowing the construction of the foreclosure indicator. They are grateful to members of the Working Party No. 1 on Macroeconomic and Structural Policies of the OECD Economic Policy Committee for their feedback on an earlier version. They would like to thank Ms. Celia Rutkoski for excellent document preparation. This paper contributes to the financial pillar of Phase II (2021-2022) of the OECD Horizontal Project on Housing by broadening the evidence base for policy advice to enhance financial markets' support for more inclusive, more efficient and more sustainable housing.

variable interest rates, foreign-currency payments and interest-only payments are common in some countries, widening the debt-related risk exposure of households (unless accompanied by special measures such as, for interest-only loans, incorporating an imputed nominal repayment in the DSTI calculation).

5. Across OECD countries, there are many discrepancies in how borrower and creditor rights are balanced and how quickly insolvency is resolved. A new Foreclosure Regulation index shows that, among the twenty covered countries, borrower rights are strongest in Italy and Colombia, while creditor rights are strongest in Sweden and Austria. Mortgage markets are deepest in countries where the index shows that creditor and borrower rights are balanced.

6. Against this background, the report identifies a number of policy options that can be considered to improve the functioning of mortgage markets, including measures to:

- Encourage inclusive access to good-quality housing by:
  - Gradually phasing out mortgage interest deduction, which would help to curb house price pressures and boost long-term affordability while providing potentially significant additional tax receipts;
  - Shifting the focus from promoting mortgage-funded home-ownership to improving affordable access to housing in an environment where tax and subsidy programmes gradually become neutral between rented and owner-occupied dwellings.
- Prevent the build-up of potentially destabilising levels of mortgage debt by:
  - Applying macroprudential brakes as DSTI and LTV-caps, which can limit household debt accumulation and limit house price appreciation;
  - Ensuring that lending standards properly account for the risks associated with variable rate and foreign-currency loans.
- Align mortgage markets with environmental goals: there is scope for the development of green mortgages to contribute to reductions in greenhouse gas emissions from the housing stock. Policies can create a favourable environment by
  - Establishing international standards for energy-efficient, or “green”, mortgages;
  - Creating mechanisms to ensure the quality of the energy certification of dwellings;
  - Setting supervisory standards for green mortgages to properly reflect their risk (which is typically reduced compared with standard mortgages).
- Facilitate orderly and efficient debt resolution: foreclosure procedures should strike a balance between the rights of borrowers and lenders so that both sides have an interest in managing housing loans risks.

### **Box 1. Main messages from the report on the Rise of Non-Bank Financial Intermediation in Real Estate Finance: Post COVID-19 Trends, Vulnerabilities and Policy Implications**

This box presents the main findings and policy considerations of a companion OECD report, which deals with the Rise of Non-Bank Financial Intermediation in Real Estate Finance: Post COVID-19 Trends, Vulnerabilities and Policy Implications (OECD, 2021<sup>[1]</sup>). While the present paper looks at mortgage finance from the point of view of borrowers, OECD (2021<sup>[1]</sup>) focusses on emerging issues on the supply side of housing finance.

Since the Global Financial crisis, the credit quality of structured real estate financial products has broadly improved, as regulators have strengthened regulation and oversight. An important change is that securities are no longer backed by subprime and Alt-A<sup>2</sup> collateral. However, highly accommodative monetary policy has contributed to fuelling household and corporate borrowing and inflating real estate prices, which have risen above the 2008 pre-crisis levels in many jurisdictions. Against a backdrop of exuberance in some real estate markets, the rising importance of leveraged non-bank financial intermediaries (NBFIs) that perform liquidity transformation may cause risks to system resilience and ultimately disrupt the availability of finance to the real economy.

The report offers an integrated assessment of the shift in the non-bank financial intermediation for real estate finance following the GFC, that incorporates activities and risks, considering the implications of the future path for monetary and fiscal policies. In this sense, the report discusses further policy considerations to help mitigate procyclicality and excessive risk taking in the non-bank financial sector.

#### ***Real estate mortgage-backed securities (MBS)***

Froth in some housing markets and vulnerable commercial real estate markets to conditions in the corporate sector make MBS markets prone to rating downgrades and rising defaults in the post COVID-19 environment. Household and corporate mortgage payment risks are likely to increase, which may erode the credit quality of underlying mortgage collateral of MBS. In addition to possible pandemic-induced structural changes, commercial MBS (CMBS) markets are also exposed to medium-term challenges related to climate transition risks that are likely to erode further the credit quality of some non-financial corporates. Also, hedging activities on MBS markets may trigger sell-offs of Treasury securities and heightened volatility in Treasury markets. Therefore, deteriorating conditions in several major MBS and Treasury markets may result in substantial losses for a wide range of financial intermediaries and investors with detrimental implications for financial resilience, the availability of finance to the real economy and ultimately economic growth.

#### ***Mortgage real estate investment trusts and mutual funds (mREITs and REMFs)***

While mREITs and REMFs can contribute to market liquidity under normal market conditions, they are vulnerable to margin calls and share redemptions. mREITs use leverage and perform liquidity transformation by funding the acquisition of real estate MBS and mortgages with revolving credit facilities from banks and borrowing from short-term secured funding markets. REMFs invest investors' funds in mREITs and provide liquid investments by offering redemptions at higher frequencies. mREITs may be subject to margin calls and may have to deleverage by unwinding their positions in MBS that would create feedback loops to MBS markets. Deteriorating financial soundness of mREITs may imply rising losses for REMFs that may be prone to sharp outflows from investor redemption, which forces the sale of assets into increasingly illiquid markets. Developments at the onset of the pandemic have shown that structural vulnerabilities remain in mREIT and REMF sectors, which have been deeply

<sup>2</sup> Mortgages are classified as Alt-A when their risk profile lies between prime and subprime.



affected by and contributed to the price volatility in MBS markets. mREITs and REMFs are prone to abrupt changes in investors' risk sentiment that are exacerbated by elevated real estate prices and rising debt levels and liquidity transformation of various stakeholders in the investment chain.

***The rising importance of non-bank mortgage originators and servicers in real estate finance***

Highly accommodative monetary policy and more stringent regulation implemented in the banking sector following the GFC have contributed to the development of leveraged non-bank mortgage originators and servicers that perform liquidity transformation. In addition, the low interest rate environment in the aftermath of the GFC has contributed to raising the interest of insurance companies and private pension funds for the issuance of real estate loans. Evidence show that insurance companies are often exposed to higher risk of losses from their commercial real estate investments while pension funds face moderate exposure to the real estate sector. While unprecedented monetary and fiscal support measures have mitigated the COVID-19 induced financial strain on non-bank lenders as well as their funding sources, any emergence of new COVID-19 variants combined with the uneven recovery across sectors could have detrimental implications for the asset quality of non-bank lenders in the absence of targeted income support for households and firms until economies can fully reopen.

***Policy considerations***

While the global financial system has entered the COVID-19 crisis more resilient as a result of regulatory reforms in the aftermath of the GFC, the market turmoil in March 2020 has exposed vulnerabilities across non-bank financial intermediation, from types of investment vehicles to non-bank institutions that lend to or invest in forms of real estate. In contrast to the many measures targeted at the banking sector, more work is needed to further develop and implement activities-based tools for mREITs and REMFs and a more comprehensive risk-based approach for the regulatory framework of non-bank mortgage lenders and servicers. The consideration of appropriate tools to address risks in the non-bank financial sector would help to mitigate excessive leverage, excessive liquidity transformation and the increase the transparency of financial products and intermediaries. Given that renewed tightening of monetary and fiscal policies could contribute to a sharp correction in real estate prices, the consideration of appropriate tools to address risks in the non-bank financial sector is prescient. As this sector grows in importance, it is crucial to mitigate its risks and strengthen resilience of the various types of intermediaries and institutions in the sector.

Source: OECD (2021<sup>[1]</sup>).

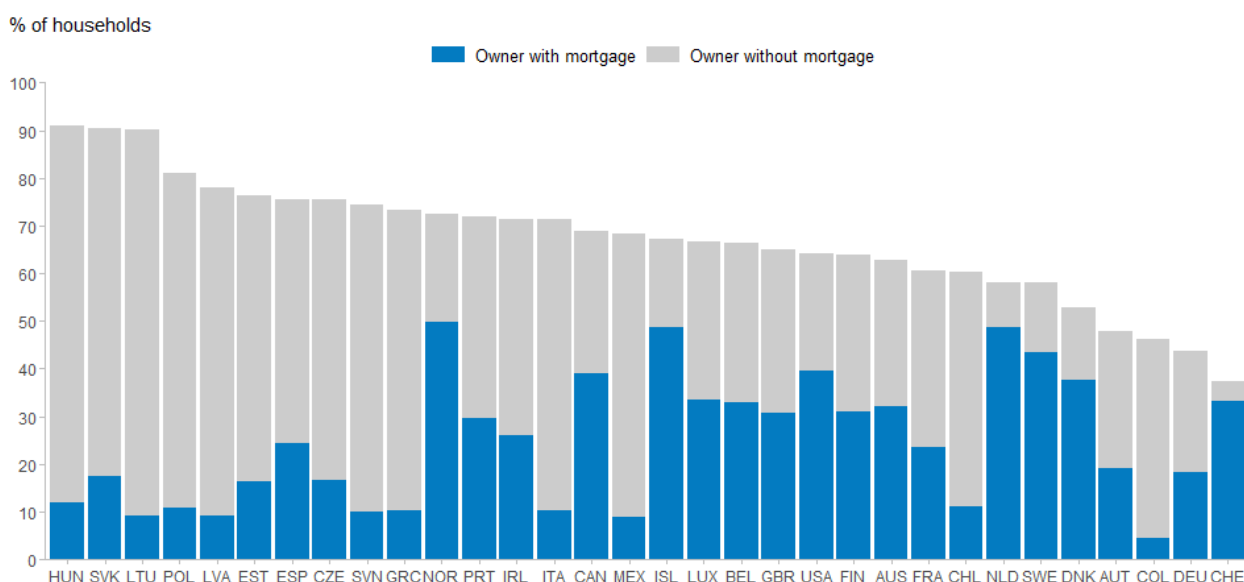
7. The remainder of the paper is structured as follows. Section 2 discusses the role that mortgage markets have in providing access to housing. It provides an overview of mortgage use across and within countries, discusses the role of the tax system in providing affordable housing and discusses the benefits of deeper (green) mortgage markets. Section 3 discusses the risk of household over-indebtedness, the typical loan-to-value and loan-to-income ratios across the OECD and other risky mortgage features such as variable rate loans, foreign exchange loans and interest-only mortgages. Section 3 discusses non-performing loans and the characteristics of the process of foreclosure. It introduces the new foreclosure regulation index based on the 2019 OECD Questionnaire on Affordable and Social Housing (QuASH).

## 2. A topography of mortgage markets

### 2.1. Mortgage take-up differs widely across income and age groups

8. Homeownership rates and the number of households with a mortgage show large differences across OECD countries (Figure 1). Several countries combine relatively high levels of homeownership and low take-up of mortgages. In Central and Eastern European countries, this situation is due to the transfer of state-owned dwellings in the early 1990s. Other countries such as Italy, Greece, Mexico, Chile, and Colombia owe the combination of high ownership and low mortgage debt to accumulated savings and a long history of inheritances as alternative ways to gain homeownership. In contrast, in Switzerland, Denmark, Sweden and the Netherlands, most households owning a home have mortgage debt, while homeownership rates are below the OECD average.

Figure 1. Homeownership rates across OECD countries



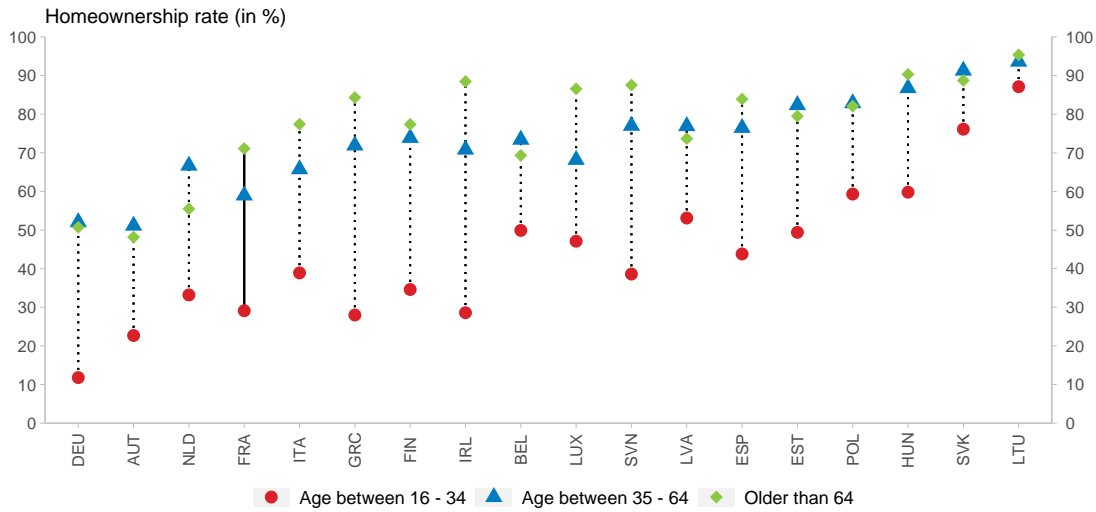
Note: 2019 or latest year available.

Source: OECD Affordable Housing Database.

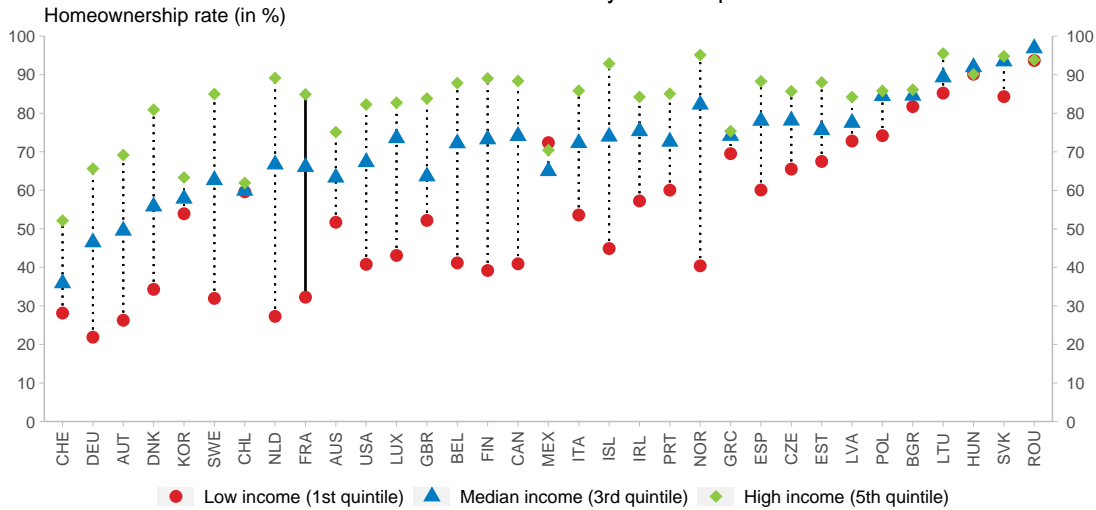
9. Homeownership and mortgage use is substantially lower for young or low-income households (Figure 2). The dispersion between the share of households that have a mortgage seems largest in countries where, on average, mortgage uptake is high. For instance, in Sweden and the Netherlands, 70% and 79% of households in the highest income quintile have a mortgage, whereas households with the lowest income only have a mortgage in 14% and 17% of the cases. In these countries, low-income households rely mostly on the social rental sector.

Figure 2. Homeownership and mortgage use

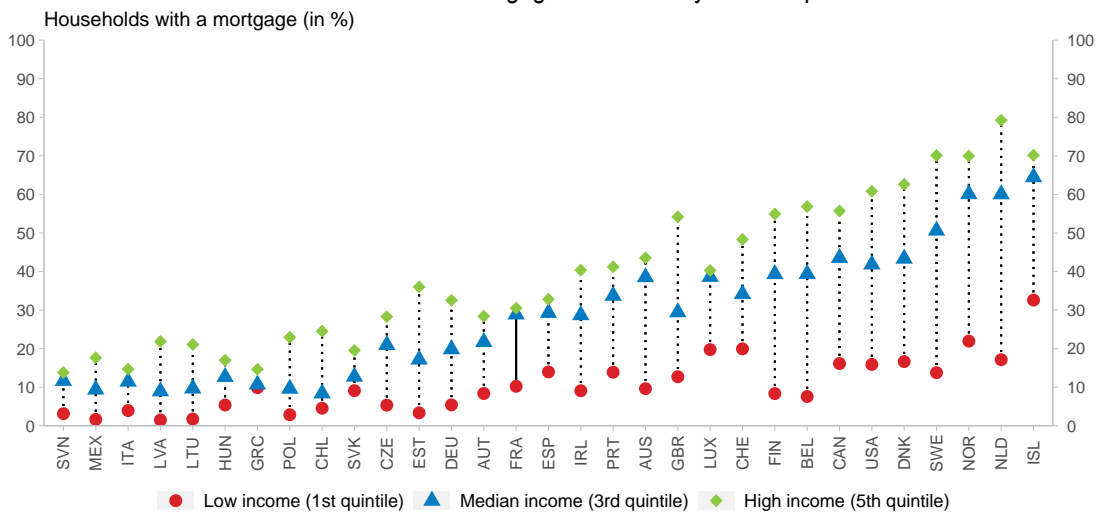
Panel A: Homeownership rate by age



Panel B: Homeowners by income quintile



Panel C: Share of mortgage borrowers by income quintile

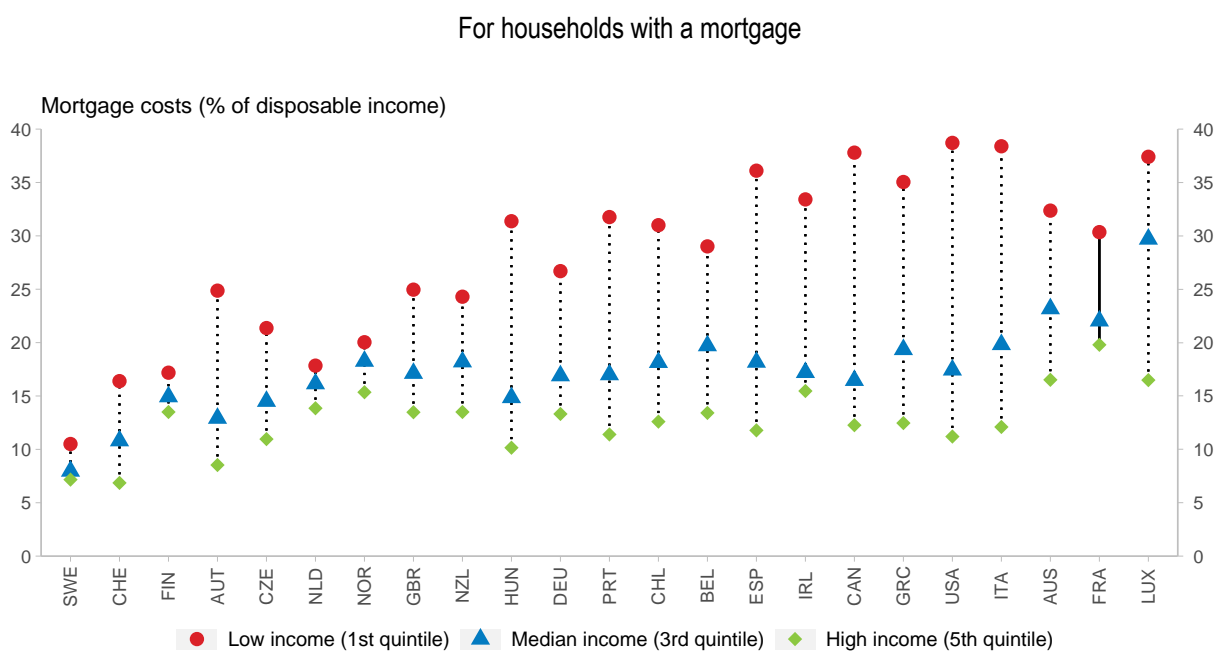


Note: Panel A refers to 2017 data, Panel B and C to 2019 or the latest year available.

Source: ECB (2017) Household Finance and Consumption Survey; OECD Affordable Housing Database.

10. Low-income households spend larger shares of their income on mortgage payments with considerable heterogeneity across the OECD (Figure 3). Earlier OECD work shows that the housing cost overburden rate – measured by the share of households spending more than 40% of income on housing – is substantially higher in the bottom quintiles of the income distribution (OECD, 2021<sup>[2]</sup>). For households that own a home, these numbers are relatively low compared to households with similar incomes that live in a rental dwelling.

**Figure 3. Mortgage costs as a percentage of disposable household income (2019)**

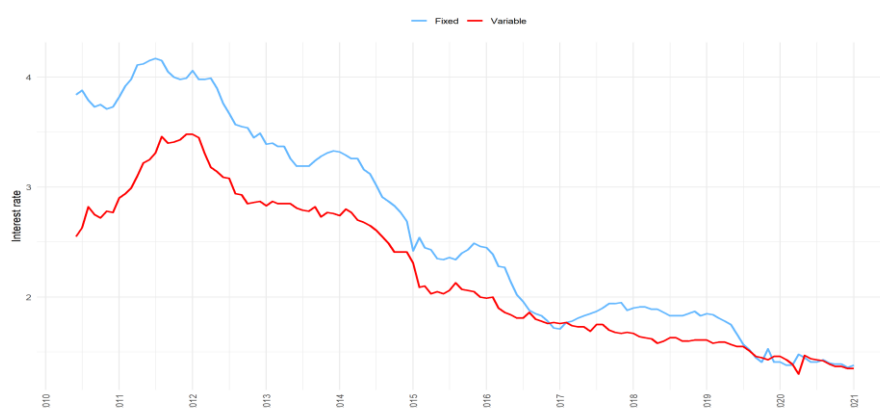


Note: 2019 or latest year available. For the United States & Chile, gross household income is used due to data limitations.  
Source: OECD Affordable Housing Database.

## 2.2. Mortgage loan characteristics

11. Loan characteristics, such as variable rate loans, foreign exchange loans or interest-only loans, can also confront households with additional risks. Contracts with these features often come at attractive terms because mortgage lenders transfer part of their risk to households. Hence, they lower costs at the start of the contract, but they run the risk of ultimately being more expensive over the contract's lifetime. However, the share of variable-rate loans has declined in most OECD countries partly due to the narrowing gap between fixed- and variable-rate loan rates (Figure 4).

**Figure 4. The spread between fixed and variable rates has declined**



Note: The variable rate refers to the average of bank mortgage interest rates with an initial fixed rate period that is less than one year. The fixed mortgage rate refers to an average of all mortgage rates with an initial fixed rate period of 10 years or longer.

Source: ECB Statistical Warehouse Bank interest rate statistics.

12. Nonetheless, variable-rate mortgages are still the most common housing loans in some jurisdictions – in Poland, it is even almost the only type of contract available (Figure 6, Panel A). Countries with fixed-rate contracts differ in the length over which the interest rates are constant. In some countries – such as the Czech Republic and the United Kingdom–most mortgages have a fixed-rate contract, but the fixed-rate period is mostly below ten years. In Belgium and Denmark, most mortgages have fixed-rate periods above ten years (Figure 6, Panel B). Although declining since the Global Financial Crisis, a substantial share of households in several countries engages in mortgage loans denominated in a foreign currency (Figure 6, Panel C). Foreign-currency denominated loans are high in central and eastern European countries like Croatia, Romania, Poland and Bulgaria. Foreign exchange mortgages can cause severe problems for households (e.g. Box 2). Currently, almost all countries in Europe with high shares of foreign exchange loans have loans denominated in Euro’s – except for Poland, Austria and Greece, which still have Swiss Franc loans.

13. Mortgages in the OECD are generally fully amortising, but interest-only mortgages have a substantial market share in some countries (Figure 6, Panel D). In the Netherlands, interest-only mortgages became the dominant mortgage type at the turn of the century, mainly because it allowed maximising the value of mortgage interest deductibility. As the Dutch government removed tax advantages for these types of loans for new homeowners, their take-up declined. Still, the share of interest-only mortgages remains substantial, because existing mortgages can still be refinanced without losing their tax advantages. In the United States, the share of bullet loans in new lending is currently very low. In the run-up to 2008, however, their share rose close to 20% of new lending. These interest-only loans were mostly taken out by US households that had relatively low income relative to house prices, as interest-only loans allowed financing higher-priced homes with a given income (Barlevy and Fisher, 2020<sup>[3]</sup>).

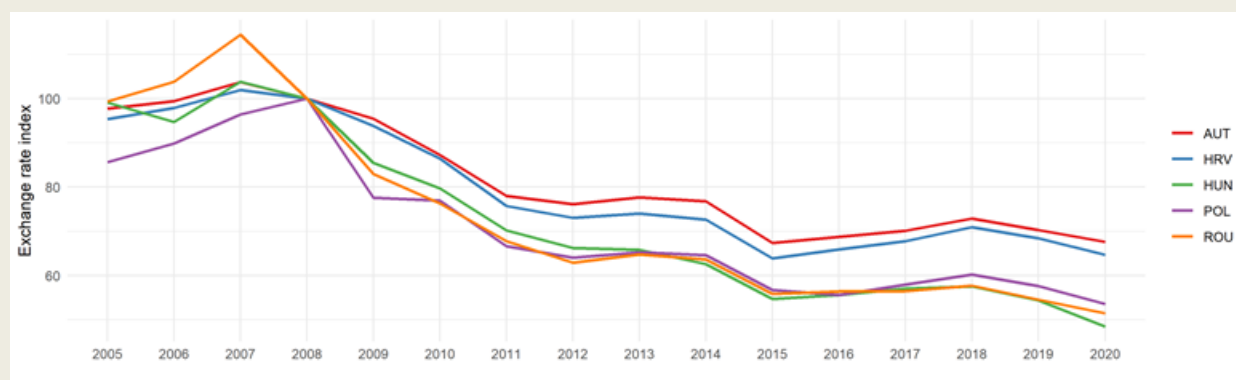
## Box 2. The foreign currency mortgage lending episode of 2015

In the leading up to the global financial crisis (GFC), credit to the private sector expanded rapidly in many Central and Eastern European (CEE) countries, for a large part denominated in foreign currency. Foreign currency mortgages were particularly attractive for households because they came with substantially lower interest rates than mortgages in their domestic currency. Moreover, there was a widespread belief that domestic currencies would further appreciate in the future, decreasing the loan value in real terms.

Households in Eastern Europe faced substantial increases in outstanding debt obligations due to the depreciation of domestic currencies against the Swiss Franc in the aftermath of the GFC (Figure 5). When the Swiss central bank decided in 2015 to abandon its cap of the Swiss Franc against the Euro, the appreciation continued even further. Although the Baltic countries also had large amounts of foreign currency loans, they did not suffer from currency risk as their currencies were practically pegged to the Euro, and they adopted the Euro soon after.

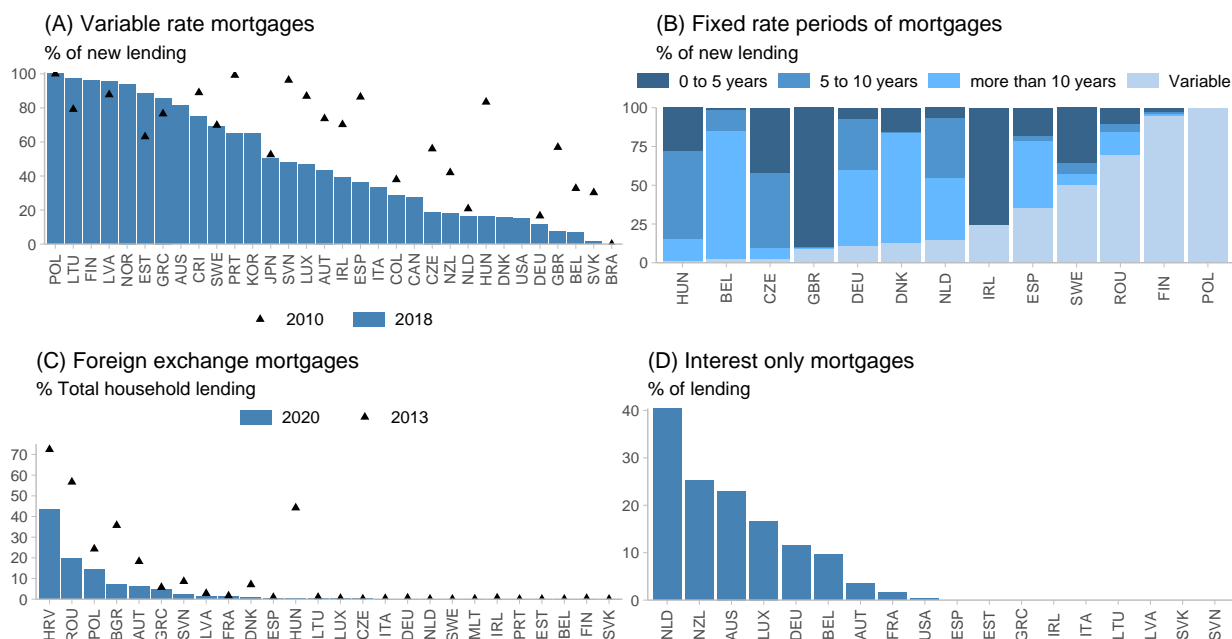
Governments responded to the pressing problems experienced by many borrowers and designed policies to prevent such events in the future. In Croatia, Hungary and Romania, governments effectively compelled mortgage lenders to convert foreign exchange mortgages into domestic currency at very favourable terms, sometimes at the exchange rate at the origination date. These measures have protected many households from severe payment problems and foreclosure at the cost of severe losses for mortgage lenders. The laws enforcing these conversion measures have therefore been contested in court for several years. Some countries have also implemented new instruments to better deal with the risks of foreign currency loans in the future. Hungary, for instance, introduced specific borrower based measures (LTV and DSTI) for foreign currency loans and increased mandatory capital and liquidity buffers. Poland also introduced specific LTV and DSTI caps for FX loans and increased the associated risk weights.

Figure 5. Exchange rate developments against the Swiss Franc



Source: OECD (2021) Exchange Rates Indicators, doi: 10.1787/037ed317-en.

Figure 6. Key mortgage characteristics

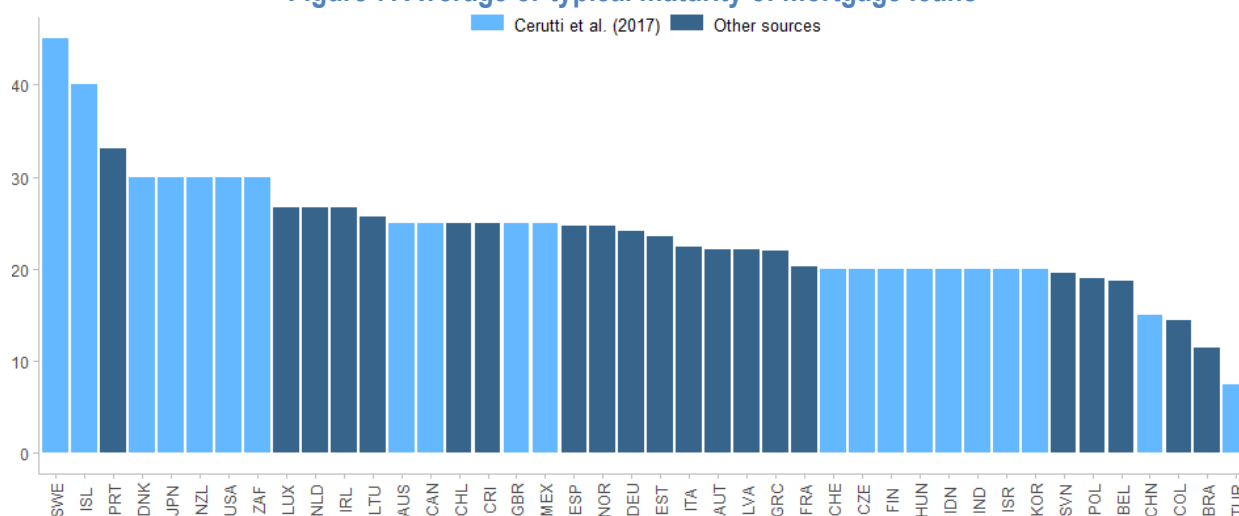


Note: On Panel (A), the data shown for Japan with the legend 2018 refers to 2016.

Source: (A) EMF except: Australia where the comes from the Australian Bureau of Statistics; Brazil, Colombia, Costa Rica and, New Zealand where the data has been collected by the OECD QUASH survey; the Unites States, where the data source is corelogit.com; (B) EMF; (C) ECB; (D) EMF except: Australia, where the data is taken from the Financial Stability Review, April 2017, Reserve Bank of Australia, New Zealand from the Reserve Bank of New Zealand website (rbnz.govt.nz), and the United States from the Federal Reserve Bank of Chicago website (chicagofed.org).

14. Average housing loan maturities vary considerably across OECD countries (Figure 7). Sufficiently long maturities can benefit households by allowing them to smooth their consumption over their lifetime. Most OECD and partner countries record average mortgage maturities (at issuance) above 20 years; some exceptions include Brazil, Colombia, and Turkey.

Figure 7. Average or typical maturity of mortgage loans



Note: The graph distinguishes between data from earlier work by Cerutti et al. (2017<sup>[4]</sup>) and more recent data that was available for some OECD countries from national sources. Where available, the national sources are preferred because they give actual averages rather than the typical maturities collected by Cerruti et al. (2017<sup>[4]</sup>)

Source: Cerruti et al. (2017<sup>[4]</sup>) and national sources.

### 3. Policies affecting mortgage take-up and risk-sharing

#### 3.1. Public support for mortgages often comes with adverse side-effects

15. Governments use various instruments to facilitate access to homeownership, including through access to cheaper mortgage debt (Table 1). In many cases, households are incentivised to fund their home with debt instead of their own funds. The most common instrument is the mortgage interest deduction (MID) in 17 OECD countries. MID contributes to the favourable tax treatment of housing relative to other assets, especially for owner-occupied housing (OECD, 2018<sup>[5]</sup>). Figure 8 (Panel A) reports MID's effect on the marginal effective tax rate (METR) of housing for OECD countries.<sup>3</sup> MID lowers the METR on average by 28%, but there is wide dispersion. In the Netherlands, where the latest governments have somewhat reduced MID, the mortgage interest deduction is still the most generous in the OECD, lowering the METR on housing by 87%. In Chile, the effect of MID is almost negligible.

16. The often large tax breaks for mortgage borrowing can substantially inflate house prices (Cournède, Ziemann and De Pace, 2020<sup>[6]</sup>; Cavalleri, Cournède and Özsöğüt, 2019<sup>[7]</sup>). Much or all of MID and housing subsidies, in general, get capitalised in house prices especially if housing supply is sticky (Damen, Vastmans and Buyst, 2016<sup>[8]</sup>; Hilber, 2017<sup>[9]</sup>). It is therefore not clear whether MID is actually an effective tool to promote homeownership, as the induced higher house price level makes it harder for first-time buyers to save up enough to meet their down payment constraint (Sommer and Sullivan, 2018<sup>[10]</sup>; Hilber and Turner, 2014<sup>[11]</sup>). Furthermore, as mortgage interest relief results in higher mortgage debt, it also contributes to greater macroeconomic volatility. Countries where the overall effective taxation of housing (of which mortgage interest relief is an important determinant) is higher have shown to be less exposed to severe economic downturns (Cournède, Sakha and Ziemann, 2019<sup>[12]</sup>).

<sup>3</sup> These numbers are preliminary estimates pending the publication of (Brys, B. et al., 2021<sup>[13]</sup>).

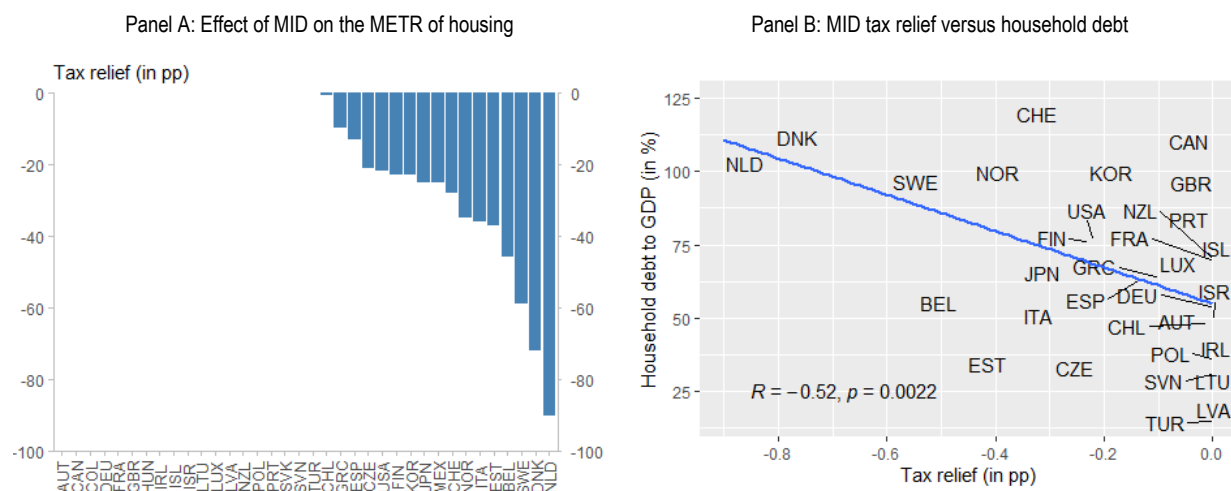


**Table 1. Country-level programmes to support mortgage borrowers**

	Mortgage interest relief	Mortgage guarantee schemes	Subsidised mortgages	Public mortgages
Belgium	X	X		
Canada		X	X	
Chile	X			
Costa Rica		X		
Czech Republic	X		X	X
Denmark	X			
Estonia	X	X		
Finland	X	X		X
France			X	
Greece	X			
Hungary			X	
Ireland				X
Israel			X	
Italy	X	X		
Japan	X		X	
Korea	X			
Latvia		X		
Lithuania			X	
Luxembourg		X	X	
Mexico	X		X	
Netherlands	X	X		
New Zealand		X		
Norway	X			X
Russia			X	
Spain	X			
Sweden	X	X		
Switzerland	X			
United Kingdom				X
United States	X	X		

Note: Only programs on the national level are selected. Various countries, however, also have programs on a local or regional level.  
 Source: OECD Affordable Housing Database.

**Figure 8. Mortgage interest deduction**



Note: Tax relief denotes the percentage point reduction of the marginal effective tax rate on residential property for debt-financed owner-occupied properties induced by mortgage interest relief.  
 Source: Brys, B. et al. (2021<sub>[13]</sub>) and OECD Household Accounts.

17. Many countries run additional public programs to support households' mortgage take-up (Table 1). In the United States, the Federal Housing Administration insures the lender against their borrowers' default in exchange for an origination premium and an annual fee. The loans covered by this program must meet certain requirements, such as a maximum DSTI and LTV. In 2020, about 20% of US homes were financed with an FHA mortgage. In New Zealand, the mortgage guarantee scheme helps down payment-constrained households by allowing higher LTVs than market lenders.

18. Alternatively, some countries directly extend housing loans to specified groups of households. The Rebuilding Ireland Home Loan programme, for instance, helps Irish households to get a mortgage with an LTV of up to 90%. The "Help to Buy" program in the United Kingdom allows households to cover their down payment by taking an equity stake in the house. This equity stake can be paid off gradually until the household fully owns its home. In Mexico, a public body called Infonavit extends mortgage loans with substantial interest rate subsidies to low- and middle-income households.

19. Another way that countries target loan supply to certain groups of households is via the secondary market. In the United States, government-sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac ensure a constant flow of funding types of mortgages, which suppresses their interest rates. In South Korea, the Korean Housing Finance Corporation fulfils a similar role. See the companion paper on the supply side for additional analysis (OECD, 2021<sup>[11]</sup>).

20. Government support comes with drawbacks. For example, guarantees or mortgage loans provided by governments transfer the default risk of households from the private to the public sector. In a deep housing crisis, this can have serious fiscal consequences. The public bailout of the US Federal Housing Agency in 2013 illustrates this point. Subsidised loans or loans that de facto loosen credit constraints lead to higher house prices (Carozzi, Hilber and Yu, 2020<sup>[14]</sup>), implying that the net effect on affordability and accessibility of owner-occupied housing is ambiguous. Moreover, these schemes may exacerbate the financial risks for the most vulnerable households.

21. Policymakers may want to reconsider the objective of promoting homeownership in favour of encouraging inclusive access to good-quality housing, including through a well-functioning rental market and social housing. Gradually phasing out mortgage interest deduction – and eventually moving to a neutral tax treatment of owner-occupied housing – would support market efficiency, curb house price pressures and boost long-term affordability. Fiscal neutrality also implies less inequality in the tax treatment between owners and tenants and a better housing allocation. Foregone government revenue from tax relief for homeownership is very high in some countries, reaching 1.3% in the Netherlands and the United Kingdom, 0.6% in Norway and 0.4% in Canada and Sweden.<sup>4</sup>

22. Reducing tax breaks in favour of mortgage borrowing would open opportunities to lower more distortionary taxes such as labour taxes, thereby contributing to the overall efficiency of the tax system. Furthermore, phasing out mortgage tax breaks, which mostly benefit middle and upper-income households, would improve after-tax income equality. Countries that have reduced tax advantages for owner-occupied housing have typically done through the accumulation of small changes over time: gradualism helps prevent large immediate shocks to house prices and individual households' net incomes, thereby helping to overcome political-economy obstacles to reform.

23. Tax-favoured savings plans, as an alternative support scheme of credit-constrained first-time buyers (e.g. German and Austrian 'Bausparen' scheme), have the advantage of encouraging the build-up of savings towards a down payment, resulting in more prudential debt levels. However, they may also benefit mainly upper-middle income households.

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<sup>4</sup> See Item PH2.2, "Tax Relief for Home Ownership," of the 2021 update of the OECD Affordable Housing Database: <https://www.oecd.org/els/family/PH2-2-Tax-relief-for-home-ownership.pdf>.

### 3.2. Macroprudential rules are helpful to regulate mortgage markets

24. High levels of mortgage debt, of which effective mortgage subsidisation can be one of the drivers, can adversely impact individual households while also fuelling aggregate volatility, compromising financial resilience and impairing economic performance (Box 3). Most countries have policies in place, *de jure* or *de facto*, to curtail over-indebtedness and alleviate associated micro and macro risks.

#### Box 3. Mortgage debt can create micro and macro risks

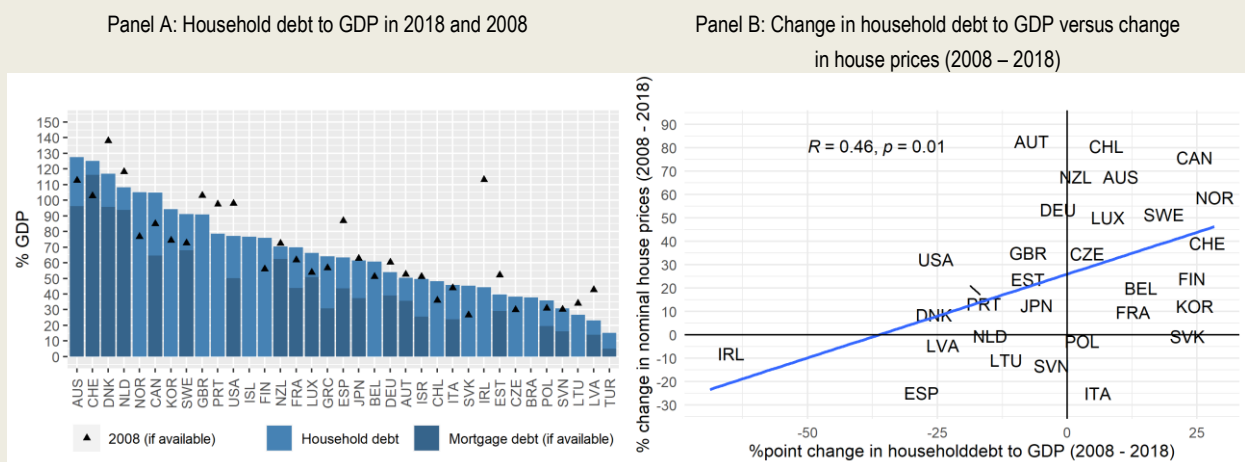
##### High levels of mortgage debt can put households under challenging situations

Although mortgages are a vital tool to improve housing access, they can also expose households to serious financial problems if they run into payment arrears or face negative home equity. Payment problems can arise when household income drops, monthly payments increase because of interest rate or currency movements or because households took on too much debt in the first place. In times of housing market exuberance, both households and mortgage lenders are willing to engage in riskier mortgage contracts with higher loan amounts as the perceived risks decline. In the event of falling house prices, households might end up “underwater” (i.e. the value of the outstanding loan exceeding the value of the home, which serves as collateral). Being underwater is especially risky for households that are also at risk of defaulting on their mortgage. Indeed, in many countries, households remain legally committed to repaying the remaining debt even after the property has been foreclosed upon (see section 4). Moreover, negative home equity makes it harder to move to another home, thereby reducing labour mobility (Morescalchi, 2019<sup>[15]</sup>).

##### Elevated aggregate borrowing generates financial risk and can harm economic performance

High levels of mortgage debt can therefore aggravate downturns and increase economic volatility. Indeed, downward pressure on house prices can adversely affect economic activity via wealth effects that lower consumption and via bank balance sheets and reduced new lending (Jordà, Schularick and Taylor, 2015<sup>[16]</sup>). Mian and Sufi (2013<sup>[17]</sup>) show that the significant run-up in household debt in the United States was followed by substantial deleveraging in the wake of the subsequent house price correction, leading to a strong contraction of economic activity. Earlier OECD work has also shown that rapid growth in household debt is an effective early warning indicator for economic downturns (Hermansen and Röhn, 2017<sup>[18]</sup>; Cournede and Denk, 2015<sup>[19]</sup>).

Figure 9. Total household (including mortgage) debt to GDP



25. To manage their risk exposures, mortgage lenders generally impose loan-to-value (LTV), loan-to-income (LTI) or debt-service-to-income (DSTI) standards themselves. Besides, many governments have put in place regulatory lending caps. The rationale for government regulation on top of market standards applied by mortgage lenders is that, even when mortgage suppliers and households are able keep their own risks manageable, there can still be negative externalities for the broader economy and financial system when mortgage debt is too high or develops too rapidly. In addition to borrower based measures such as DSTI and LTV caps, policymakers have also introduced risk weights that increase the amount of capital required to fund riskier mortgages (Cavalleri, Cournède and Ziemann, 2019<sup>[20]</sup>). There is mounting evidence that these instruments are effective to mitigate macro risks (Box 4).

#### Box 4. Selected empirical evidence about the effectiveness of macroprudential policy

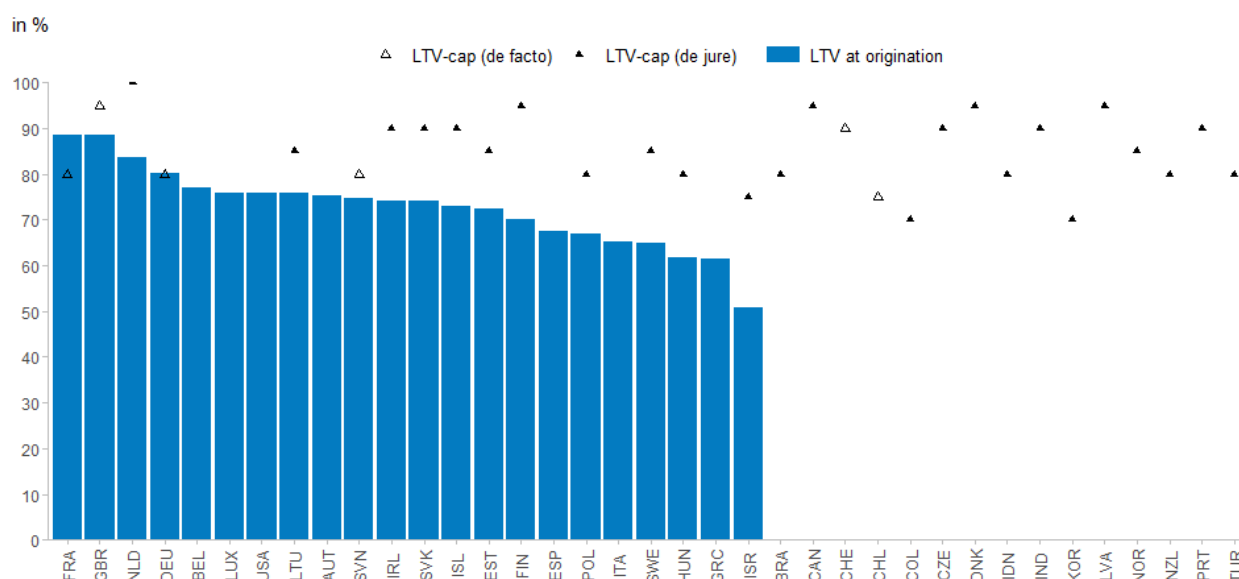
Loan-to-value (LTV) and debt-service-to-income (DSTI) caps are effective instruments to curb household debt (Cerutti, Claessens and Laeven, 2017<sup>[4]</sup>; Kuncle, 2016<sup>[21]</sup>; BIS, 2018<sup>[22]</sup>; IMF, 2011<sup>[23]</sup>) or housing cycles (Armstrong, Skilling and Yao, 2019<sup>[24]</sup>). LTV-caps are furthermore associated with a lower likelihood of severe economic downturns (Cournède, Sakha and Ziemann, 2019<sup>[12]</sup>) and significantly fewer mortgage arrears (Stanga, Vlahu and de Haan, 2020<sup>[25]</sup>). In contrast to LTV caps, DSTI and LTI caps become more restrictive as house price appreciation outpaces household income development.<sup>5</sup> The empirical evidence on the impact of DSTI is more limited but suggests that tightening of DSTI-caps could be a better instrument than tightening LTV-caps in curbing credit growth (Kuttner and Shim, 2016<sup>[26]</sup>). Other research looking at the combined effect of both LTV and DSTI-caps confirm that they are effective in limiting the build-up of household credit (Cerutti, Claessens and Laeven, 2017<sup>[4]</sup>; Claessens, Ghosh and Mihet, 2013<sup>[27]</sup>; Poghosyan, 2020<sup>[28]</sup>). OECD work on resilience debt-to-income ratios to be effective at reducing GDP tail risks while having no negative impact on average growth (Caldera Sánchez et al., 2017<sup>[29]</sup>).

26. Loan-to-value caps, as well as effectively observed ratios of loan amount to house price at origination, are strongly heterogeneous across the OECD. (Figure 10). The effective values shown are the average for existing homeowners and first time buyers, which explains the fact that in most cases they are well below the binding maximums.<sup>6</sup> First-time buyers will generally demand substantially higher LTV mortgages, since they typically have little savings and did not yet build home equity.

<sup>5</sup> Moreover, a DSTI-limit has the potential to work anti-cyclical as interest rates tend to move with the business cycle, although interest rates have more or less been steadily declining in the immediate post-GFC years and have remained low since then.

<sup>6</sup> Data that distinguishes these groups is only available for a handful of countries.

Figure 10. Loan-to-value at origination and loan-to-value caps



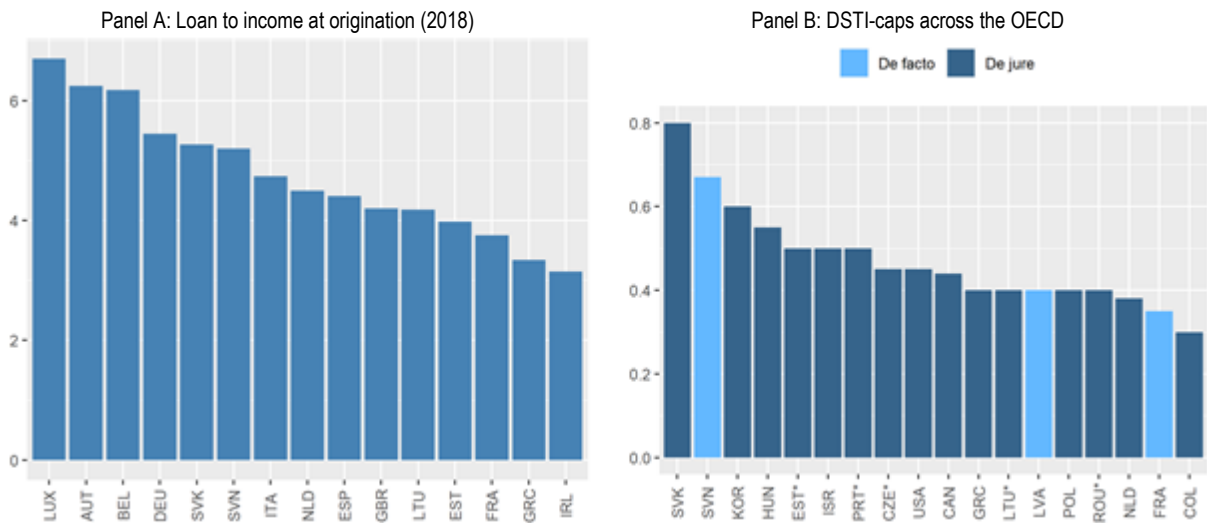
Note: De jure LTV-caps refer to official regulation of government institutions. The de facto caps are caps that follow from self-imposed constraints by financial institutions or recommendations from governments.

Source: ESRB (2021) Macprudential database; OECD QUASH 2019 survey; IMF Macprudential database; ECB (2020<sub>(30)</sub>); Bank of England.

27. There are significant cross-country differences in regulatory caps loan-to-income ratios of new loans (Figure 11A). The dispersion in the tightness of DSTI caps is remarkable: in Slovakia, borrowers can spend up to 80% of their income on mortgage payments, whereas in Colombia, this maximum stands at 30% (Figure 11B). However, some countries set their DSTI as a share of gross income, whereas others use net income. Furthermore, in three countries, the DSTI cap is not part of actual regulation but rather a recommendation of the responsible government institution (marked in the graph as 'de facto'). Moreover, some countries have a DSTI cap but allow a certain amount of new loans to be above the respective cap. In Lithuania, for instance, 5% of lending can exceed the 40% DSTI cap, and in Portugal, 20% of loans can have a DSTI greater than 50%.

28. Three OECD countries have an LTI-limit instead of a DSTI-cap in place. LTI caps present the advantage, over DSTI and LTV caps, of not being sensitive to fluctuations in interest rates or house price movements. Ireland, Norway and the UK have a maximum LTI of 3.5, 5 and 4.5, respectively. All these countries allow a certain share of new lending to exceed these caps.

Figure 11. Loan to income at origination and DSTI-caps



Note: (A) The LTI at origination is used because the DSTI at origination was not available for a wide set of countries. (B) The income used for the DSTI differs by country; some use gross income and some use net income. In Estonia, Portugal, the Czech Republic, Lithuania and Romania, a certain percentage of loans is extended above the DSTI-cap. For the U.S. the DSTI only applies for qualified mortgages that are eligible for purchase or guarantee by either the Federal National Mortgage Association (Fannie Mae) or the Federal Home Loan Mortgage Corporation (Freddie Mac).

Source: ECB (2020<sub>[30]</sub>); Bank of England; ESRB Macprudential database; IMF Macprudential database; OECD QUASH survey.

### 3.3. Green mortgages can deliver synergies

29. Green mortgages can benefit both financial institutions and households by lowering credit risk and offering lower interest rates. Green mortgages can lower credit risk because better energy performance increases property values and mitigates payment risks for households as it reduces their monthly energy expenses. A large body of literature finds a significant negative correlation between energy performance and mortgage default and a positive relation between energy performance and property values (Billio et al., 2020<sub>[31]</sub>). Recent empirical work for the Dutch mortgage market suggests that these effects remain significant even after controlling for borrower characteristics (Billio et al., 2021<sub>[32]</sub>). Green mortgages might also benefit from an increased appetite for green portfolios, further reducing financing costs.

30. Deepening the market for green mortgages across the OECD could contribute to aligning dwellings' energy efficiency with climate targets. Although the use of green mortgages is already on the rise in several countries, a further expansion of the market could yield significant benefits for households, financial institutions and the environment.<sup>7</sup> As heating and cooling of homes make up 65% of energy consumption by households in Europe, much can be accomplished by increasing the energy efficiency of homes. The IEA pathway to net zero emissions by 2050 foresees that greater energy efficiency would contribute nearly one-third of overall emission reductions from the building sector (IEA, 2021<sub>[33]</sub>).<sup>8</sup> Currently, about 80% of dwellings in Europe were built before 1990 (OECD, 2021<sub>[2]</sub>), which highlights the need for funding energy-saving investments in the existing stock of housing. Green mortgages reward home buyers for choosing energy-efficient properties or existing homeowners for making their dwellings more energy-efficient. These incentives can be favourable financing conditions or increased loan amounts. An energy performance certificate (EPC) measures the degree of energy efficiency.

<sup>7</sup> No systematic data on the size of green mortgage markets across the OECD was identified at the time of writing.

<sup>8</sup> Electrification, including widespread use of heat pumps, is the other key driving force.

31. Various countries have ongoing programmes to stimulate the market for green mortgages. In Europe, the European Mortgage Federation – European Covered Bond Council (EMF-ECBC) launched an Energy Efficient Mortgages Initiative in 2015. The initiative aims to promote energy efficiency, create standardised green mortgages and evaluate the availability of green mortgages across the EU. In early 2021, the EMF-ECBC introduced a green mortgage label (Energy Efficient Mortgage, EEM) to improve quality and transparency and facilitate further data collection on green mortgages. In Japan, the Housing Finance Agency has been promoting energy efficiency since 2005 through a program called Flat35S. In Mexico, the National Housing Fund for Workers is issuing green mortgages that allow households to get an additional loan amount to invest in energy improvements.

32. Looking ahead, policymakers can improve the functioning of green mortgage markets by setting international standards for green finance, further improving dwellings' energy certification, and making sure the supervisory standards for green mortgages are in line with their credit risk. Setting up an international green mortgages taxonomy would also ease the securitisation process, potentially contributing to cheaper funding sources. Policymakers could incentivise green mortgages and ensure prudent lending by adjusting DSTI-caps based on energy-performance ratings while, when green mortgages allow higher loan amounts, requiring that the realised energy savings are sufficiently high to cover the additional debt expenses.

#### 4. Balancing borrower and lender rights in mortgage foreclosure regulation

33. Mortgage defaults can have profound consequences for households and their lenders. The balance between the protection of borrowers and lenders' rights determines how the default burden is shared between households and the loan-issuing institution. This section reviews the key objectives of mortgage foreclosure regulation. It then introduces a new foreclosure regulation index measuring the balance between the housing-loan borrower and creditor rights. The section concludes with a discussion on the linkages between foreclosure regulation and outcomes.

##### **4.1. Objectives and implications of policy choices in mortgage foreclosure regulation**

34. Foreclosure regulation aims to efficiently handle non-performing loans by minimising hardship for borrowers and economic costs for lenders, two conflicting objectives. When mortgagors fail to keep up their mortgage payments, a foreclosure procedure can be activated. This is the formal process through which lenders attempt to force the sale of the collateral to (partly) recover their outstanding loan. Every foreclosure regime strikes a different balance between the rights of lenders and borrowers in case of default.

35. Foreclosure regimes that give strong rights to lenders create attractive conditions for lenders to supply loans but do not deal efficiently with debt overhang. Strong lender rights can lead to household over-indebtedness due to moral hazard, as lenders are willing to extend riskier loans to households if they know that their potential losses are small. Once debt overhang problems emerge, it is in the general interest that they are resolved quickly. However, lender-friendly regimes carry the risks that lenders will hold borrowers liable for their losses for long after they have defaulted with adverse consequences for households. Legal frameworks where liability for defaulted debt lasts long can also be detrimental to business start-ups by preventing entrepreneurs, who long ago defaulted on their mortgages, to fund their firm. On the other hand, strong lenders' rights discourage households from engaging in overly risky debt contracts.

36. Strong borrower rights, in contrast, could result in unfavourable credit conditions, credit rationing, and systemic risks for banks amid lenders' uncertainty over debt service payments. Strong borrower rights might also have the perverse effects of making access to finance less inclusive as lenders cherry-pick their

borrowers. Finally, in the event of a housing crisis, a foreclosure regime with strong borrower rights will lead to mortgage lenders taking on a relatively large amount of the losses.

#### 4.2. Building a foreclosure regulation index

37. A newly built Foreclosure Regulation Index highlights substantial variations in the design and functioning of foreclosure regimes. The Foreclosure Regulation Index measures how the rights of both lenders and borrowers are balanced in each country and is based on answers to the 2019 OECD Questionnaire on Affordable and Social Housing (QuASH, for more details, see Box 5 and Annex A).

#### Box 5. The Foreclosure Regulation Index

Following the literature on foreclosure proceedings across US states, the Foreclosure Regulation Index measures the degree to which foreclosure proceedings favour either the rights of the borrower or the lender. US states that, for instance, have a full recourse system or have out-of-court procedures are often described as being lender friendly (Pence, 2006<sup>[34]</sup>). Borrower-friendly characteristics are non-recourse systems, judicial rulings or high amounts of personal assets that are exempted from the bankruptcy case.

Eight questions of the 2019 wave of the OECD Questionnaire on Affordable and Social Housing (QuASH 2019) define the measure of the foreclosure regime's borrower-friendliness (Table 2). The index assigns a 1/3 weight to each subsection (1) before the procedure, (2) during the procedure and (3) after the procedure. Tables A.1 and A.2 in Annex A describe in further detail how the index has been constructed. Figure A.1-6, also in Annex A, show the individual components of the index.

Table 2. Questions underpinning the OECD Foreclosure Regulation Index

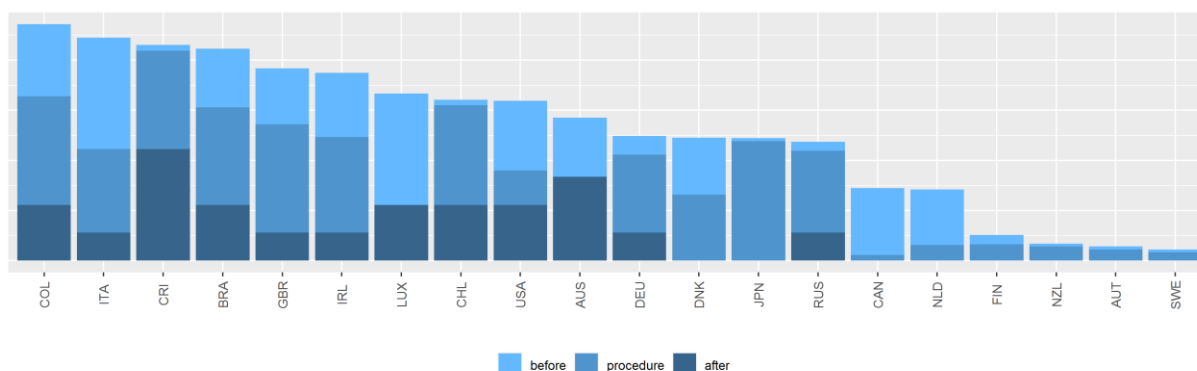
	Question	Answer
Before procedure	1. How much time after a first missed payment is required before a foreclosure procedure starts?	Shorter is more lender friendly
	2. Are lenders mandated to seek conciliation before starting foreclosure proceedings?	Yes is borrower-friendly
	3. Are there mechanisms whereby public authorities can force lenders to accept a rescheduling of mortgage payments?	Yes is borrower-friendly
During procedure	4. Do you have out-of-court procedures to handle foreclosure proceedings?	Yes is lender friendly
	5. How long do foreclosure proceedings typically take when out of court/in court	Shorter is more lender friendly
After procedure	6. After foreclosure proceedings have completed: Must the mortgageor leave the property?	Yes is lender friendly
	7. After foreclosure proceedings have completed: Does the mortgageor lose ownership of the property?	Yes is lender friendly
	8. After foreclosure proceedings have completed: Must the mortgageor continue paying?	Yes is lender friendly

Source: OECD Questionnaire on Affordable and Social Housing 2019.

38. The Foreclosure Regulation index suggests that Colombia and Italy have the most borrower-friendly regulations, whereas Sweden and Austria are the most lender-friendly jurisdictions (Figure 12). High scores for Colombia reflects borrower-friendliness across all three assessed dimensions: governments can force lenders to reschedule repayments (before), the proceedings are judicial and relatively lengthy (procedure), and the mortgage is a non-recourse loan (after). In contrast, in Sweden, procedures can be initiated swiftly as lenders do not have to seek reconciliation (before), the proceedings are out of court, short (procedure), and the lender will have to continue paying the remains of the loan in full.



Figure 12. The new OECD Foreclosure Regulation Index

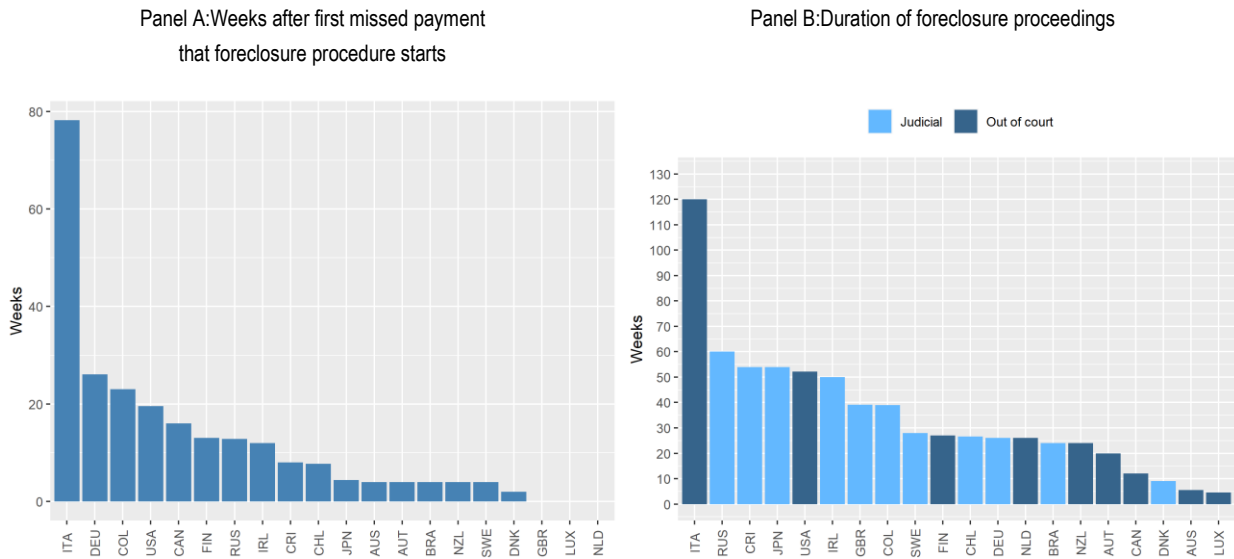


Note: Because countries can also have a score of zero for some questions, not all countries have a positive score on all three components of the index.

Source: Own index based on OECD Questionnaire on Affordable and Social Housing (2019) and several public sources (see Table A.2).

39. Whereas in some countries, foreclosure procedures can start already after the first missed payment, it takes more than a year in other countries for proceedings to be initiated (Figure 13, Panel A). In the Netherlands, Luxembourg and the United Kingdom, foreclosure procedures could already start after the first missed payment. However, this is not likely to happen in practice, as lenders mostly offer some grace periods. Other countries have legally binding minimum delays for the initiation of foreclosure proceedings. In Italy, foreclosure proceedings generally only start more than a year after the first missed payment. Lenders will generally prefer legal systems with a lot of freedom to initiate foreclosure proceedings, as it can be a tool to minimise their losses. However, from the borrower's perspective, overly quick initiation of foreclosure proceedings limits their possibilities to resolve their financial trouble. It will generally lead to a faster eviction from their homes.

40. Within the OECD, various countries offer out-of-court foreclosure proceedings (Annex A, Figure A.3). These procedures are often faster and hence less costly than in-court procedures. For lenders, these procedures allow for a smooth resolution of cases where borrowers are defaulting on their mortgage (lender friendly). Empirical research conducted in the United States shows that states with out-of-court foreclosures proceedings register lower losses for lenders in case of default compared to states with in-court foreclosure proceedings (Clauret and Herzog, 1990<sup>[35]</sup>). According to more recent research, lenders are twice as likely to foreclose on delinquent homeowners in states that offer out-of-court foreclosures (Mian, Sufi and Trebbi, 2015<sup>[36]</sup>). From the borrowers' perspective, out-of-court foreclosures limit the possibilities to undertake legal efforts to prevent the foreclosure of their home. In OECD countries, in-court and out-of-court foreclosure proceedings often coexist, although out-of-court procedures are generally the most used route if they are available.

**Figure 13. Foreclosure proceedings' characteristics across jurisdictions**

Note to Panel B: Typical duration of the foreclosure process for the most common procedure in the respective country (out of court or in court). Source: OECD QUASH survey and various public sources.

41. The duration of foreclosure proceedings ranges from over two years in Italy to about one month in Luxembourg (Figure 13, Panel B). These numbers indicate that the presence of out-of-court procedures seems to be associated with faster foreclosure proceedings. The high values for Italy also corroborate the finding that bankruptcy procedures in Italy are lengthy (Garrido, 2016<sup>[37]</sup>). Against this backdrop, Italy has recently initiated several bankruptcy reforms, which might result in shorter procedures in the future. From mortgage lenders' perspective, lengthy foreclosure proceedings involve additional risk as it takes longer for the loan in arrears to be repaid, and the quality of the underlying collateral might deteriorate. Empirical work for Italian provinces showed, for instance, that poor legal enforcement is associated with higher probabilities of households being denied a credit (Fabbri and Padula, 2004<sup>[38]</sup>).

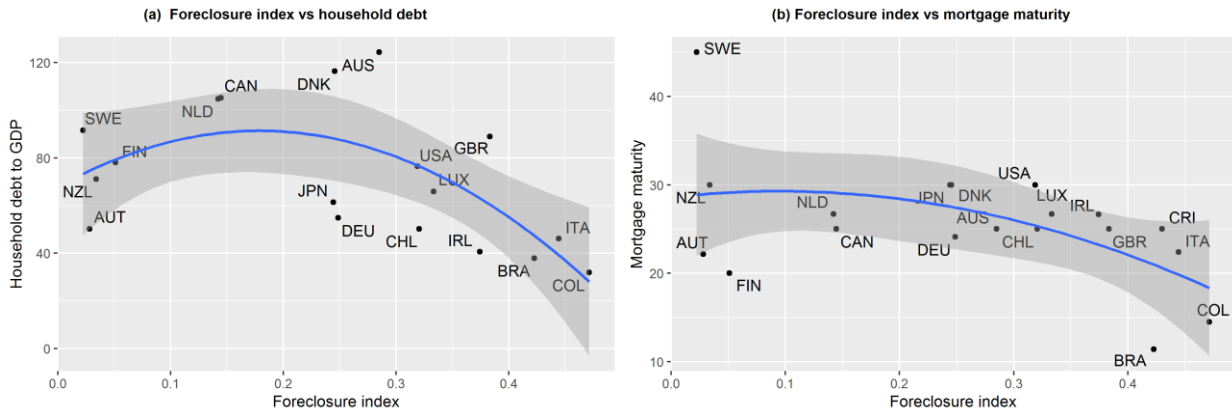
42. After foreclosure proceedings, households are still liable for the unpaid part of the loan in most OECD jurisdictions (Annex A, Figure A.7). This means that mortgage loans in many countries are full recourse, implying that the borrower is also liable for the loan with other assets and future income. Other jurisdictions can be categorised as non-recourse, meaning that the lender can only seize the collateral in case of default. This type of foreclosure is observed in Brazil, Colombia, Chile, Luxembourg and Costa Rica but also some Canadian provinces and US states. During the US subprime crisis, non-recourse arrangements allowed borrowers with negative home equity, especially those that had bought to let or resell rather than occupy, to strategically walk away from their mortgage debt. Empirical work shows that borrowers were 30% more likely to default on their mortgages in non-recourse than other US states (Ghent and Kudlyak, 2011<sup>[39]</sup>).

### 4.3. Foreclosure regulation and mortgage market characteristics

43. The Foreclosure Regulation Index suggests that extreme settings, i.e. strong protection of either borrowers or creditors, discourage mortgage lending. There is in fact a non-linear relationship between borrower rights and the level of mortgage debt (Figure 14a). Additionally, the Foreclosure Regulation Index results to be negatively correlated with the average length of maturity of mortgages (Figure 14b). The number of countries covered by the new Foreclosure Regulation Index is currently too small to allow empirical estimation of the importance of foreclosure regimes in determining mortgage and debt market outcomes. However, existing work on a broader set of countries (including developing economies) showed

that jurisdictions with stronger legal rights and deeper credit information systems generally have deeper mortgage markets (Warnock and Warnock, 2008<sub>[40]</sub>).

**Figure 14. Foreclosure regulation index and mortgage market**



Note: The blue line in panel a (b) shows the fitted values of a quadratic (linear) relationship between the variables; the grey bands depict 95 per cent confidence intervals. The estimated quadratic relationship in panel a) is:  $y=66.03 (5.56) + 280.89 (2.01) x - 766.05 (-2.614) x^2$  with an  $R^2$  equal to 0,40 (t-statistics are shown in parenthesis). The estimated linear relationship in panel b) is  $y=31.5 (10.67) -22.52 (-2.30) x$  with an  $R^2$  equal to 0,24 (t-statistics are shown in parenthesis).

Source: OECD Foreclosure Regulation Index (see Box 5) and calculations.

# References

- Armstrong, J., H. Skilling and F. Yao (2019), “Loan-to-value ratio restrictions and house prices: Micro evidence from New Zealand”, *Journal of Housing Economics*, Vol. 44, <http://dx.doi.org/10.1016/j.jhe.2019.02.002>. [24]
- Barlevy, G. and J. Fisher (2020), “Why were interest-only mortgages so popular during the U.S. housing boom?”, *Review of Economic Dynamics*, <http://dx.doi.org/10.1016/j.red.2020.09.001>. [3]
- Billio, M. et al. (2020), *Final report on correlation analysis between energy efficiency and risk*. [31]
- Billio, M. et al. (2021), “Buildings’ Energy Efficiency and the Probability of Mortgage Default: The Dutch Case”, *The Journal of Real Estate Finance and Economics*, pp. 1-32. [32]
- BIS (2018), “Moving forward with macroprudential frameworks”, *BIS Annual Economic*, <https://www.bis.org/publ/arpdf/ar2018e4.pdf>. [22]
- Brys, B. et al. (2021), “Effective Taxation of Residential Property” Forthcoming. [13]
- Caldera Sánchez, A. et al. (2017), “Strengthening economic resilience: Insights from the post-1970 record of severe recessions and financial crises”, *OECD Economic Policy Papers*, No. 20, OECD Publishing, Paris, <https://dx.doi.org/10.1787/6b748a4b-en>. [29]
- Carozzi, F., C. Hilber and X. Yu (2020), “On the Economic Impacts of Mortgage Credit Expansion: Evidence from Help to Buy”, *CEP Discussion paper*, Vol. 1681, <http://eprints.lse.ac.uk/108422/1/dp1681.pdf>. [14]
- Cavalleri, M., B. Cournède and E. Özsöğüt (2019), “How responsive are housing markets in the OECD? National level estimates”, *OECD Economics Department Working Papers*, No. 1589, OECD Publishing, Paris, <https://dx.doi.org/10.1787/4777e29a-en>. [7]
- Cavalleri, M., B. Cournède and V. Ziemann (2019), “Housing markets and macroeconomic risks”, *OECD Economics Department Working Papers*, No. 1555, OECD Publishing, Paris, <https://dx.doi.org/10.1787/737133d8-en>. [20]
- Cerutti, E., S. Claessens and L. Laeven (2017), “The use and effectiveness of macroprudential policies: New evidence”, *Journal of Financial Stability*, Vol. 28, <http://dx.doi.org/10.1016/j.jfs.2015.10.004>. [4]
- Claessens, S., S. Ghosh and R. Mihet (2013), “Macro-prudential policies to mitigate financial system vulnerabilities”, *Journal of International Money and Finance*, Vol. 39, <http://dx.doi.org/10.1016/j.jimonfin.2013.06.023>. [27]
- Clauret, T. and T. Herzog (1990), “The Effect of State Foreclosure Laws on Loan Losses: Evidence from the Mortgage Insurance Industry”, *Journal of Money, Credit and Banking*, Vol. 22/2, <http://dx.doi.org/10.2307/1992309>. [35]

- Cournède, B. and O. Denk (2015), "Finance and Economic Growth in OECD and G20 Countries", *SSRN Electronic Journal*, <http://dx.doi.org/10.2139/ssrn.2649935>. [19]
- Cournède, B., S. Sakha and V. Ziemann (2019), "Empirical links between housing markets and economic resilience", *OECD Economics Department Working Papers*. [12]
- Cournède, B., V. Ziemann and F. De Pace (2020), "The Future of Housing: Policy Scenarios", *OECD Economics Department Working Papers*, No. 1624, OECD Publishing, Paris, <https://dx.doi.org/10.1787/0adf02cb-en>. [6]
- Damen, S., F. Vastmans and E. Buyst (2016), "The effect of mortgage interest deduction and mortgage characteristics on house prices", *Journal of Housing Economics*, Vol. 34, <http://dx.doi.org/10.1016/j.jhe.2016.06.002>. [8]
- ECB (2020), *Trends and risks in credit underwriting standards of significant institutions in the SSM*, <https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr200610~c926a7b8c9.en.html>. [30]
- Fabbri, D. and M. Padula (2004), "Does poor legal enforcement make households credit-constrained?", *Journal of Banking and Finance*, Vol. 28/10, <http://dx.doi.org/10.1016/j.jbankfin.2003.09.009>. [38]
- Garrido, J. (2016), "Insolvency and Enforcement Reforms in Italy", *IMF Working Paper*. [37]
- Ghent, A. and M. Kudlyak (2011), "Recourse and residential mortgage default: Evidence from US states", *Review of Financial Studies*, Vol. 24/9, <http://dx.doi.org/10.1093/rfs/hhr055>. [39]
- Hermansen, M. and O. Röhn (2017), "Economic resilience: The usefulness of early warning indicators in OECD countries", *OECD Journal: Economic Studies*, [https://dx.doi.org/10.1787/eco\\_studies-2016-5jg2ppjrd6r3](https://dx.doi.org/10.1787/eco_studies-2016-5jg2ppjrd6r3). [18]
- Hilber, C. (2017), "The Economic Implications of House Price Capitalization: A Synthesis", *Real Estate Economics*, Vol. 45/2, <http://dx.doi.org/10.1111/1540-6229.12129>. [9]
- Hilber, C. and T. Turner (2014), "The mortgage interest deduction and its impact on homeownership decisions", *Review of Economics and Statistics*, Vol. 96/4, [http://dx.doi.org/10.1162/REST\\_a\\_00427](http://dx.doi.org/10.1162/REST_a_00427). [11]
- IEA (2021), *Net Zero by 2050*, International Energy Agency. [33]
- IMF (2011), "Macroprudential Policy: What Instruments and How to Use Them? Lessons from Country Experiences", *IMF Working Papers*, Vol. 11/238, <http://dx.doi.org/10.5089/9781463922603.001>. [23]
- Jordà, Ò., M. Schularick and A. Taylor (2015), "Leveraged bubbles", *Journal of Monetary Economics*, Vol. 76, <http://dx.doi.org/10.1016/j.jmoneco.2015.08.005>. [16]
- Kuncle, M. (2016), "Assessment of the Effects of Macroprudential Tightening in Canada", *Staff Analytical note. Bank of Canada*, Vol. 2016/12, <https://www.bankofcanada.ca/2016/08/staff-analytical-note-2016-12/>. [21]

- Kuttner, K. and I. Shim (2016), “Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies”, *Journal of Financial Stability*, Vol. 26, <http://dx.doi.org/10.1016/j.jfs.2016.07.014>. [26]
- Mian, A. and A. Sufi (2013), “Household Balance Sheets, Consumption, and the Economic Slump”, *Quarterly Journal of Economics*, Vol. 128/4, pp. 1687–1726. [17]
- Mian, A., A. Sufi and F. Trebbi (2015), “Foreclosures, House Prices, and the Real Economy”, *Journal of Finance*, Vol. 70/6, <http://dx.doi.org/10.1111/jofi.12310>. [36]
- Morescalchi, A. (2019), *Negative Home Equity and Job Mobility*, Springer, pp. 183 - 202. [15]
- OECD (2021), *Brick by brick building better housing policies*. [2]
- OECD (2021), *The Rise of Non-Bank Financial Intermediation in Real Estate Finance: Post COVID-19 Trends, Vulnerabilities and Policy Implications*, OECD, <https://www.oecd.org/finance/>. [1]
- OECD (2018), *Taxation of Household Savings*. [5]
- Pence, K. (2006), “Foreclosing on opportunity: State laws and mortgage credit”, *Review of Economics and Statistics*, Vol. 88/1, <http://dx.doi.org/10.1162/003465306775565774>. [34]
- Poghosyan, T. (2020), “How effective is macroprudential policy? Evidence from lending restriction measures in EU countries”, *Journal of Housing Economics*, Vol. 49, <http://dx.doi.org/10.1016/j.jhe.2020.101694>. [28]
- Sommer, K. and P. Sullivan (2018), “Implications of US Tax Policy for House Prices, Rents, and Homeownership”, *American Economic Review*, Vol. 108/2, <http://dx.doi.org/10.1257/aer.20141751>. [10]
- S, J. Stiglitz and A. Weiss (1981), “Credit Rationing in Markets with Imperfect Information”, *American Economic Review*, Vol. 71/3, pp. 393 - 410. [41]
- Stanga, I., R. Vlahu and J. de Haan (2020), “Mortgage arrears, regulation and institutions: Cross-country evidence”, *Journal of Banking and Finance*, Vol. 118, <http://dx.doi.org/10.1016/j.jbankfin.2020.105889>. [25]
- Warnock, V. and F. Warnock (2008), “Markets and housing finance”, *Journal of Housing Economics*, Vol. 17/3, <http://dx.doi.org/10.1016/j.jhe.2008.03.001>. [40]
- World Bank (2009), *Housing Finance Policy in Emerging Markets*. [42]

# Annex A. OECD Foreclosure Regulation Index

Table A.1. The OECD Foreclosure Regulation Index

## Intermediate steps and weighting

Sub components	questions	score	Weight within sub-component	Weight of sub-component in the final index
before starting procedure	<b>Q1.</b> How much time after a first missed payment is required before a foreclosure procedure starts?	Score between 0-1: (number of weeks – minimum in sample)/ (maximum – minimum)	0.33	0.33
	<b>Q2.</b> Are lenders mandated to seek conciliation before starting foreclosure proceedings?	0: if no 1: if yes	0.33	
	<b>Q3.</b> Are there mechanisms whereby public authorities can force lenders to accept a rescheduling of mortgage payments?	0: if no 1: if yes	0.33	
During procedure	<b>Q4.</b> Do you have out-of-court procedures to handle foreclosure proceedings?	0.2 If out of court exists and is the most common procedure*	0.50	0.33
	<b>Q5.</b> Do specialised courts handle foreclosure proceedings?	0.4 out of court exists, but judicial procedures by specialised courts are most common. 0.6 If out of court exists, but judicial procedures by normal courts are most common 0.8 If out of court does not exist and foreclosures are typically handled by specialised courts 1 if out of court does not exist and foreclosures are typically handled by normal courts.		
	<b>Q6.</b> How long do foreclosure proceedings typically take when out of court/in court?	Score between 0-1: (number of weeks – minimum in sample)/ (maximum – minimum)  We use the duration of the most common type of foreclosure procedure (in court or out of court).		
After the procedure	<b>Q7.</b> After foreclosure proceedings have completed: Must the mortgageor leave the property?	0: if yes 0.5 if uncertain 1: if no	0.33	0.33
	<b>Q8.</b> After foreclosure proceedings have completed: Does the mortgageor lose ownership of the property?	0: if yes 0.5 if uncertain 1: if no	0.33	
	<b>Q9.</b> After foreclosure proceedings have completed: Must the mortgageor continue paying?	0: if yes 0.5 if uncertain 1: if no	0.33	

Source: QuASH and authors.

Table A.2. Available answers via QuASH or public sources

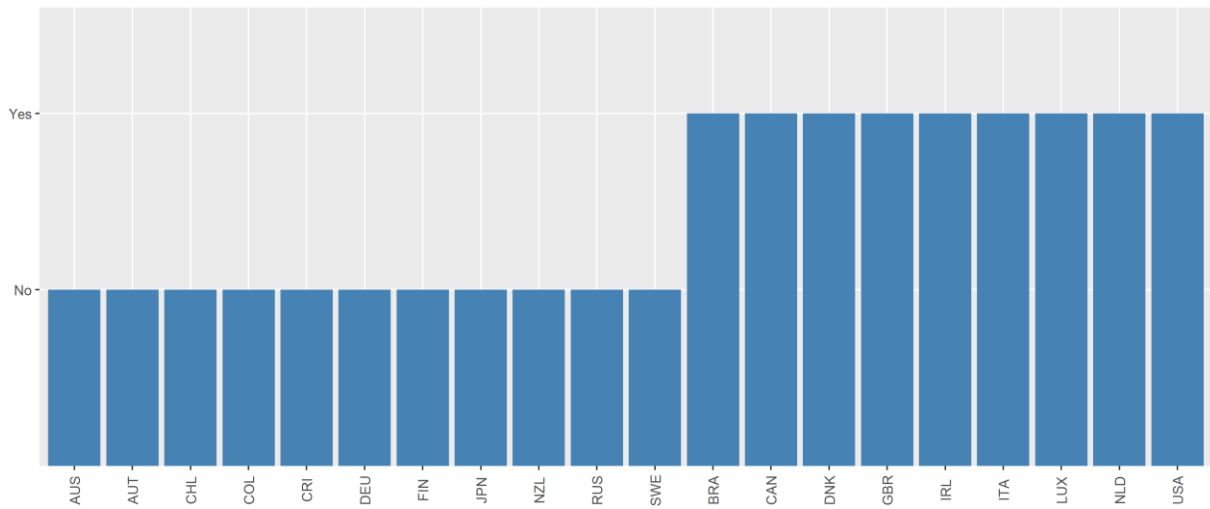
Status	Country	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
C	AUS	√	√	√	√	√	e	√	√	√
C	AUT	e	√	√	√	e	e	√	√	√
C	BRA	√	√	√	√	√	√	√	√	√
C	CAN	√	√	√	√	e	√	√	√	√
C	CHL	e	√	√	√	√	e	√	√	√
C	COL	√	√	√	√	√	√	√	√	√
C	CRI	e	√	√	√	√	√	√	√	√
C	DEU	e	√	√	√	√	e	√	√	√
C	DNK	e	√	√	√	√	√	√	√	√
C	FIN	e	√	√	√	√	√	√	√	√
C	GBR	e	√	√	√	√	e	√	√	√
C	IRL	√	√	√	√	√	√	√	√	√
C	ITA	e	√	√	√	√	e	e	e	e
C	JPN	e	√	√	√	√	e	√	√	√
C	LUX	e	√	√	√	√	e	√	√	√
C	NLD	e	√	√	√	√	√	√	√	√
C	NZL	√	√	√	e	√	e	√	√	√
C	RUS	√	√	√	√	√	e	√	√	√
C	SWE	√	√	√	√	√	√	e	e	e
C	USA	e	√	√	√	√	e	√	√	√
±	EST	√	√	√	√	√		√	√	√
±	ISL		√	√	√	e		√	√	√
±	ISR	√	√	√	√	√		√	√	√
±	LTU	√	√	√	√	√				
±	POL		√	√	√	√	e	√	√	√
±	PRT	e		e	e	e	e	e	e	e
X	BEL									
X	BGR									
X	CHE				e		e			
X	CZE				e				e	e
X	ESP				e		e	e	e	e
X	FRA				e		e		e	e
X	GRC									
X	HRV				e		e			
X	HUN									
X	KOR									
X	LVA									
X	MEX									
X	MLT									
X	NOR									
X	SVK									
X	TUR				e		e			
X	ROU									

Notes: Status C refers to the countries for which an index could be constructed, ± to countries where only a few answers are unavailable and X refers to countries with no answers or very few answers available. Questions with √ where answered via Quash and for questions with “e” external public sources were used (available upon request).

Source: QuASH and public sources where QuASH answers are missing.

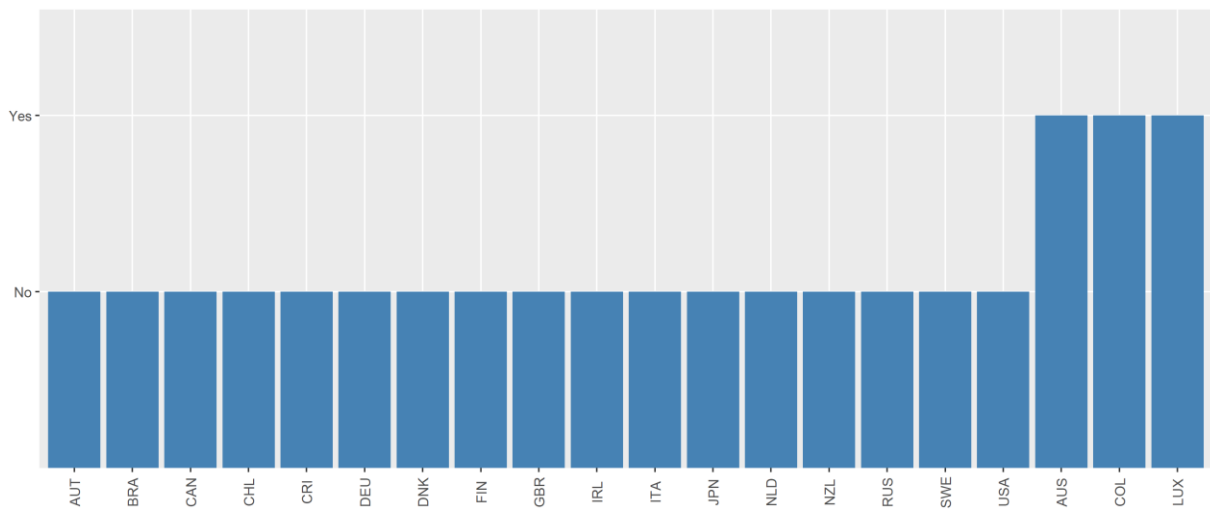


**Figure A.1. Are lenders mandated to seek conciliation before starting foreclosure proceedings?**



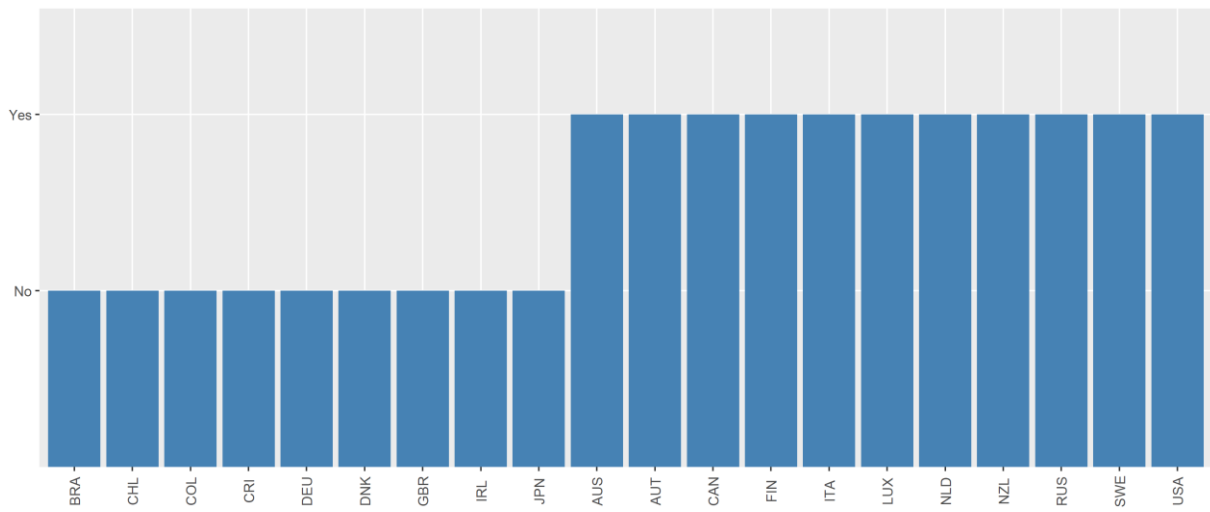
Source: QUASH and various public sources available upon request.

**Figure A.2. Are there mechanisms whereby public authorities can force lenders to accept a rescheduling of mortgage payments?**



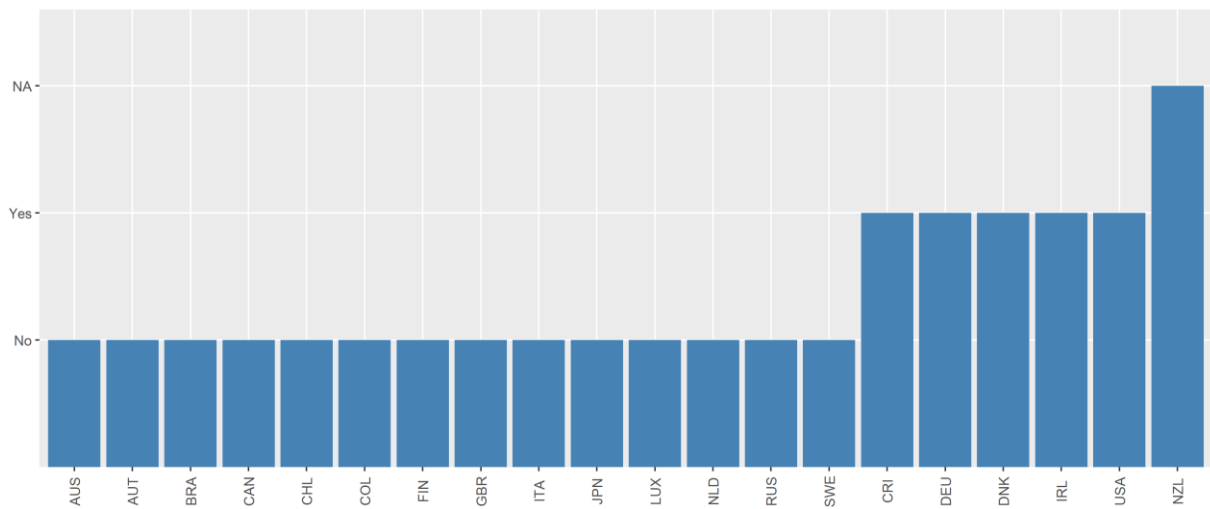
Source: QUASH and various public sources available upon request.

Figure A.3. Are there out of court foreclosure procedures available?



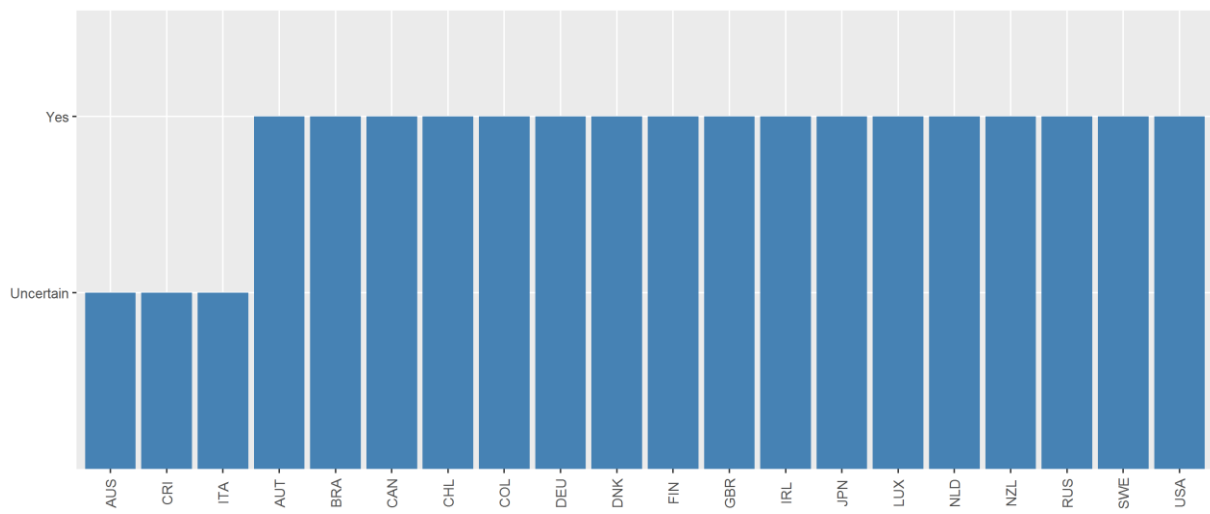
Source: QUASH and various public sources available upon request.

Figure A.4. Are there specialised bankruptcy courts that handle foreclosure proceedings?



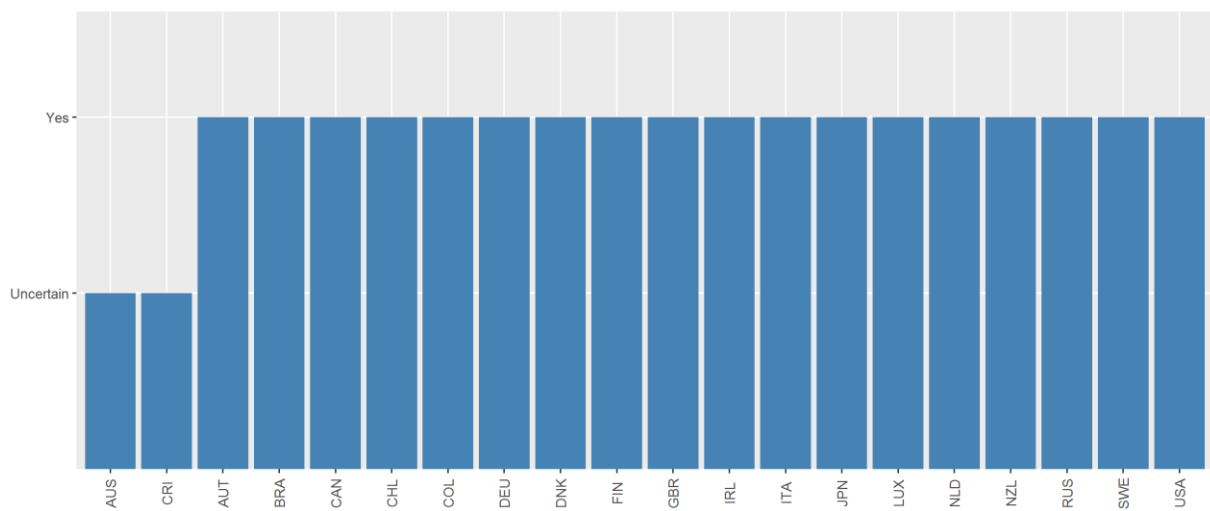
Source: QUASH and various public sources available upon request.

Figure A.5. Must the household leave the property after foreclosure procedure has ended?



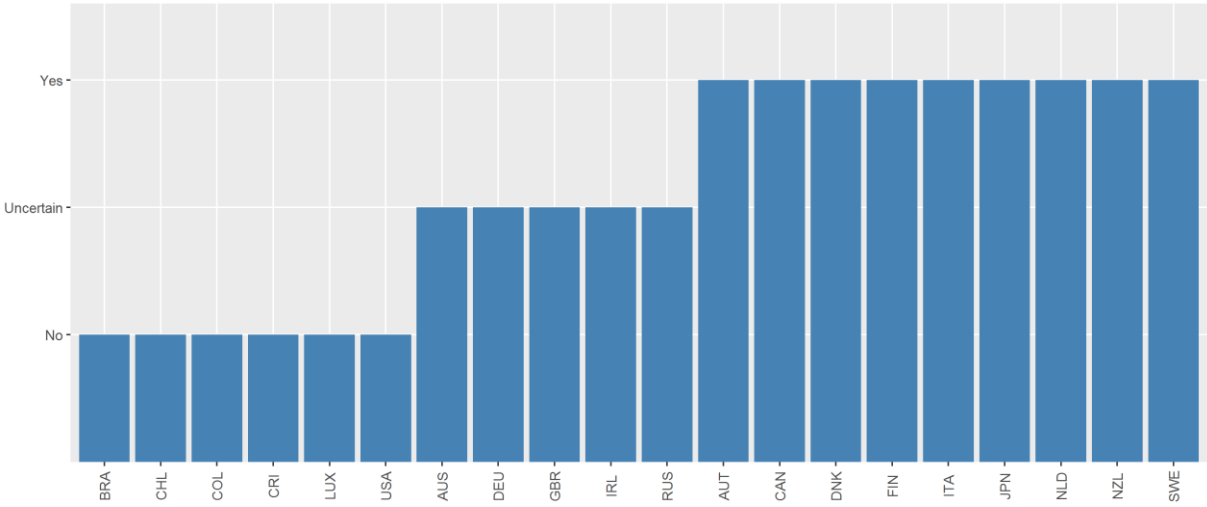
Source: QUASH and various public sources available upon request.

Figure A.6. Does the household lose the property after the foreclosure procedure has ended?



Source: QUASH and various public sources available upon request.

Figure A.7. Must the household continue paying after the foreclosure procedure has ended?



Source: QUASH and various public sources available upon request.