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Macroprudential policies to mitigate housing market risks

Report prepared by a CGFS Study Group chaired by Emmanuelle Assouan (Bank of France)

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Contents

Abbreviations

BTL   buy-to-let investor
CCyB   countercyclical capital buffer
DSTI   debt service-to-income ratio
DTI   debt-to-income ratio
FTB   first-time buyer
IRB   internal ratings-based
LTV   loan-to-value ratio
SSB   second-time and subsequent buyer

Country codes

AU   Australia   IL   Israel
BE   Belgium   LU   Luxembourg
CA   Canada   NL   Netherlands
FR   France   NZ   New Zealand
HK   Hong Kong SAR   SA   Saudi Arabia
IE   Ireland   SG   Singapore
IN   India   UK   United Kingdom

Executive summary

How can macroprudential policies most effectively mitigate the potential financial stability risks arising from housing market developments? This report draws lessons from the practical experience of authorities in 14 jurisdictions with a combined total of 168 years' experience. It focuses on risks related to households' and individual investors' investment in residential property. Although risks related to commercial property are also very relevant to financial stability, policies to mitigate them are not covered in this report as they require a separate macroprudential approach.

While the ultimate objective of macroprudential policies targeting housing market risks is financial stability, policymakers usually translate this into more specific intermediate objectives. Lender resilience is the most common of these objectives, but most authorities target others too. A number target borrower resilience, while a few seek to dampen the credit cycle or lean against house price exuberance.

Certain tools address specific intermediate objectives better than others. For example, loan-to-value ratios are less effective in targeting borrower resilience, though they do help to strengthen the resilience of lenders. Tools based on borrowers' income, like debt service-to-income ratios, are a more effective way to target borrower resilience.

Among the lessons about how macroprudential policies can help to mitigate housing market risks that can be drawn from the collective experience of authorities that contributed to this report, four stand out.

First, successful mitigation of the boom-bust cycles in housing markets that have destabilised financial systems in the past requires consistency across housing-related policies. Tax, planning and land supply policies all have a decisive influence on demand-supply imbalances in the housing market. Macroprudential policies complement these other policies by helping to strengthen financial resilience and dampen the build-up of financial vulnerabilities.

Second, governance arrangements have an important influence on policy effectiveness. They can affect the ability to use the best tools to meet specific objectives, the speed at which policies can be implemented to mitigate risks, and the scope of tools to limit potential leakages. For example, collective experience shows that policies have been better targeted at risks when macroprudential authorities have a clear mandate, operational independence and a legal basis to direct policy across the full range of macroprudential tools.

Third, inaction bias can be mitigated by prioritising tools that meet objectives without requiring adjustment. Guardrails, such as floors on loss-given-default parameters, minimum risk weights or appropriately designed income-based borrowing limits, help maintain resilience during housing market upswings and periods of sharp interest rate swings. Certain income-based tools may also help authorities meet objectives to dampen housing cycles without the need for policy adjustment due to their automatic stabiliser properties.

Finally, being open about cost-benefit trade-offs can foster long-term support for macroprudential policies. Candid communication about costs, benefits, uncertainties regarding their measurement and how they informed policy decisions helps to maintain support even as memories of housing crises fade.

1. Introduction

This report examines how macroprudential policies can most effectively mitigate the potential financial stability risks arising from housing market developments. It is based on the practical experience of authorities in 14 jurisdictions, with a combined 168 years' experience using macroprudential tools to mitigate these risks. Accompanying case studies document how these authorities have assessed housing market risks, set policies to mitigate them and evaluated policy effectiveness. This report draws common lessons from these case studies.

Housing market developments are closely monitored by central banks because of the pivotal role that boom-bust cycles have played in destabilising financial systems in the past. Although macroprudential policies can help dampen these cycles and build resilience, tax, planning and land supply policies have a decisive influence on demand-supply imbalances in the housing market. As the case study for Singapore highlights, successful mitigation of housing market risks requires consistency in the policies implemented by many authorities, from the central bank to the tax agency and land supply authority.

This report focuses on the contribution that macroprudential policies can make to mitigating housing market risks. Authorities in the jurisdictions that contributed to this report have used a variety of housing-specific tools (Table 1). They fall into two broad categories: borrower-based tools, such as loan-to-value (LTV), debt service-to-income (DSTI) and debt-to-income (DTI) limits, which target lending standards; and lender- or capital-based tools, such as risk-weight floors, add-ons and multipliers, which target lenders' buffers. Nearly all authorities use a combination of tools, but the combination differs across countries. Moreover, as they have gained experience, some authorities have changed which tools they use.

Borrower- and capital-based measures in place to mitigate housing market risks[1]														Table 1
	AU	BE	CA	FR	HK	IE	IL	IN	LU	NL	NZ	SA	SG	UK
Borrower-based measures														
LTV		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
DSTI		✓	✓	✓	✓		✓			✓		✓	✓	
DTI		✓				✓								✓
Amortisation requirements[2]	✓		✓	✓			✓			✓		✓	✓	
Capital-based measures														
Countercyclical capital buffer / sectoral systemic buffer	✓	✓[3]	✓	✓	✓	✓			✓	✓				✓
Risk-weight floors / add-ons / multipliers	✓	✓[3]			✓		✓		✓	✓	✓	✓		
Risk weight linked to LTV	✓						✓	✓		✓	✓	✓		
Risk weight linked to DSTI							✓							
Risk weight linked to loan size								✓						
Floor on credit loss allowance							✓							
Exposure limit on housing loans													✓	
Minimum equity buffer on housing loan portfolio							✓							
Specific capital requirements on loans to mortgage insurers			✓											

[1] Measures in place as of July 2023. [2] Includes maturity limits and/or measures targeting interest-only mortgages. [3] Risk-weight capital buffer until 2022, when it was replaced by sectoral system risk buffer.

This report applies a cross-country perspective to examine the effectiveness of macroprudential policies that target housing markets. It is structured around six questions: why housing markets are a source of risk; what to monitor; how to set macroprudential policy; which tools to use; how to calibrate tools; and what influences policy effectiveness. The report concludes with four policy messages that summarise the lessons learned. Annex A provides extensive details about the macroprudential policies in place in the jurisdictions that contributed to this report. The accompanying case studies published alongside this report provide additional country-specific details.

2.   Why are housing markets a source of risk?

Before setting policies to mitigate risks, an important first step is to identify the channels through which housing markets can impinge on financial stability. In economies with mature housing markets, many households have mortgages, and mortgage payments absorb a significant share of household income. Thus, difficulties in servicing mortgages can trigger defaults, especially when combined with negative housing equity. Banks often have large direct exposures to residential real estate, thus correlated defaults can result in large losses. The case studies show that these exposures can exceed 50% of bank assets. In economies with less mature but rapidly expanding housing markets, real estate construction activity can have a strong influence on aggregate demand.

First-round effects from housing market weakness can be amplified through several channels. Debt service demands can force households to cut consumption, leading to a slump in aggregate demand. Negative wealth effects from falling house prices can further weaken aggregate demand. Falling house prices can constrain access to credit as collateral values decline. Lenders may restrict credit to the real economy as losses on mortgage portfolios accumulate. These channels spread weakness to other sectors of the economy, further boosting defaults and declines in aggregate demand. Insufficient resilience of lenders and borrowers can magnify these effects.

Similar channels increase vulnerabilities during housing upswings, such as the housing boom many economies experienced starting in the mid-2010s, when house prices relative to incomes rose by 40% on average (Graph 1.A). More debt can make borrowers and lenders more vulnerable to shocks. Because borrowers and lenders fail to appreciate the impact of their own decisions on aggregate risk, these externalities can result in excessive leverage. During housing booms, borrowers and lenders can form extrapolative expectations, which lead them to underappreciate risks. Excessive price competition among lenders for market share can result in underpriced risks, especially as mortgages are relatively homogeneous products.

The case studies highlight how structural features of housing markets can amplify or mitigate risks. Large imbalances between housing demand and supply can lead to exuberance. These imbalances can be exacerbated when supply does not adequately keep up with demand (Graph 1.B). Favourable tax treatment of mortgage debt increases the incentive to leverage. Recourse debt, which allows lenders to seize other assets if the collateral is insufficient, influences default incentives.

Who bears interest rate risk matters when considering how to mitigate vulnerabilities. Borrowers are more exposed to interest rate risk in jurisdictions where floating rate mortgages or fixed rate mortgages with short maturities are common. Over the past decade, the importance of these mortgages has declined on average (Graph 2.A). However, large structural differences remain (Graph 2.B). For example, in Hong Kong SAR and Australia, the vast majority of mortgages are still at variable rates. By contrast, in France and Saudi Arabia nearly all mortgages are at fixed rates. In jurisdictions where long-term fixed rate mortgages are common, the financial sector bears more of the interest rate risk.
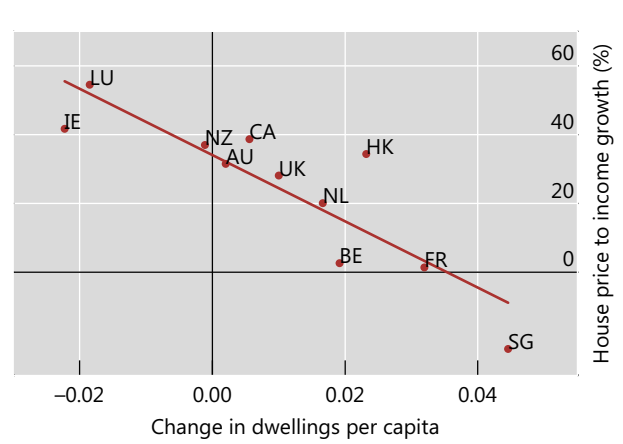
Strong rise in house prices to incomes over the past decade influenced by supply[1]

Graph 1

A. Strong rise in house prices to incomes over the past decade[1]
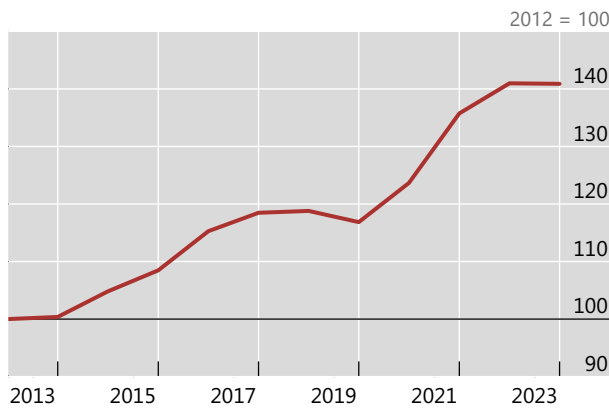
B. House prices to incomes have risen the most where supply has increased the least[2]

[1] Median of AU, BE, CA, FR, HK, IE, LU, NL, NZ, SG and UK.   [2] 2012 to latest. For SG, data refer to build-to-order public housing units in non-mature estates. SG housing market largely comprises public housing, with a significantly smaller share of private housing.

Source: CGFS study group.

There are also structural differences in who bears credit risks. In a few jurisdictions, guarantees on loans are common. For example, in France the majority of loans to purchase housing are not mortgages (ie collateralised against the housing asset) but instead include third-party guarantees. These guarantees transfer credit risk from the lender to other entities in the financial system or, in some countries, the government.

Household exposure to interest rate risk has fallen but is still high in some economies[1]

In per cent

Graph 2

A. Share of variable and short-term fixed rate mortgages[2]
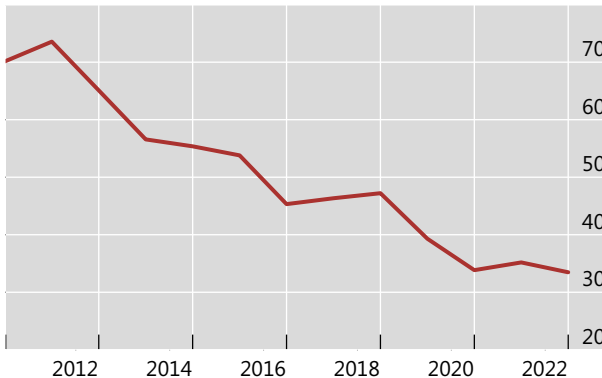
B. Large differences in borrower exposure to interest rate risk (2023 or latest available)

- Variable rate[3]
- Fixed rate up to 2 years[4]
- Fixed rate up from 3 to 5 years[5]
- Fixed rate up from 6 to 10 years
- Fixed rate for greater than 10 years[6]
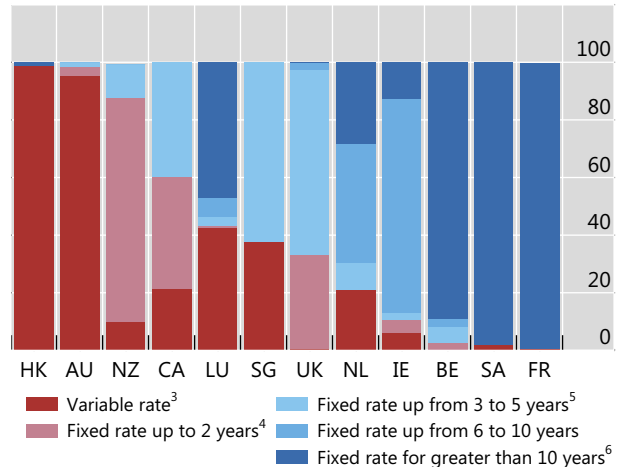
[1] AU, BE, CA, FR, HK, IE, LU, NL, SA and UK = new mortgages. NZ and SG = outstanding mortgages.   [2] Median across countries. Short-term fixed rates defined as those with fixed interest rates up to two years.   [3] LU = variable rate and fixed rate mortgages up to three months. NL = variable rate and fixed rate up to one year.   [4] LU = fixed rate from four months to two years.   [5] NL = fixed rate from one to five years.   [6] FR and HK = fixed rates for the duration of the loan. SG = fixed rate typically from two to five years.

Source: CGFS study group.

3.   What to monitor?

The channels provide a framework for assessing the potential risks that housing market developments pose to financial stability, but specific indicators are needed to turn this framework into a tool for monitoring the build-up of risks. The indicators discussed in the case studies fall into five groups:

- Aggregate credit indicators (eg household credit growth, mortgage arrears and defaults)

- House price indicators (eg house price growth, measures of overvaluation, investors' share of purchases and other measures of exuberance)

- Lending standards, lending interest rates/spreads and non-price lending conditions (eg maturity, size)

- Lender balance sheets and lender stress tests

- Borrower balance sheets (especially vulnerable borrowers in the tail of the distribution)

While there is broad consensus in the case studies on the types of variables to monitor, there remains significant uncertainty about their signal. When do these variables indicate that leverage, credit growth or house price developments are excessive? When it comes to easing macroprudential policies, these indicators are less useful because they do not capture the costs associated with excessively tightly calibrated measures. As discussed below, measurement of the costs is still in its infancy.

Given significant uncertainty about the signals from these variables, authorities rely heavily on expert judgment. This can lead to different interpretations across policy authorities about the size and types of risks, as well as contributing to inaction bias.

Interpreting the signal from aggregate flow variables provides a specific example of the challenge. Stock variables, such as the share of highly indebted households or the magnitude of house price overvaluation, better capture accumulated housing sector vulnerabilities. However, they are often more difficult to measure compared with aggregate flow variables, such as household credit growth or house price growth, which have often been used in studies linking housing market developments to financial instability. Authorities therefore need to assess whether apparent vulnerabilities indicated by such aggregate flow variables imply the same signal for the stock of vulnerabilities. This can be particularly challenging when there are structural shifts in the macroeconomy or changes in the composition of borrowers.

Over the past decade, monitoring efforts have increasingly made use of micro data on mortgages. Several authorities that contributed to this report invested in new reporting systems to obtain and manage bank- and loan-level data. Such micro data shed light on vulnerabilities that might be masked by aggregate data. For example, the tail of the distribution often provides a better signal of vulnerabilities than the middle. Micro data have also been important tools to monitor compliance with macroprudential measures (see Annex Table A.1). The case study for Belgium showcases how the central bank uses microdata to conduct a detailed peer benchmarking exercise, which facilitates the identification of declining or outlier lending standards.

Monitoring tends to focus on banks' activities, where data are readily available. Real estate investment funds and other non-bank financial institutions (NBFIs) are increasingly involved in housing markets, and their activities are more difficult to monitor. The case studies provide examples of macroprudential authorities' efforts to do so. For example, the Hong Kong Monetary Authority has used big data techniques to process transaction-level data from the land registry to gauge the extent of NBFIs' lending to households. Since 2016, the De Nederlandsche Bank has collected loan-level data from major non-bank lenders similar to that collected from banks. This helps to ensure a level playing field across lenders.

4.   How to set policy?

To address the build-up of vulnerabilities, policymakers need a framework to set policy. Governance arrangements define who has the power to direct policy. Intermediate objectives clarify how to achieve the ultimate objective of financial stability and guide the choice of macroprudential tools.

4.1   How to structure governance?

The case studies identified four types of governance arrangements (Table 2). Among the jurisdictions that contributed to this report, the most common arrangement is one where the central bank has the power to direct macroprudential policy actions. A second type places the powers of direction with the financial supervisor. This is the case in Australia, where the central bank does not have formal responsibility for setting prudential policy. A third type vests an inter-agency body with powers of direction. This body usually includes the finance ministry, central bank, banking supervisor and securities market regulator, as in France. The final type of governance arrangement divides the authority to direct macroprudential policy between different agencies. For example, in the Netherlands the central bank has powers over macroprudential tools directed at banks, while the ministry of finance is responsible for deciding on borrower-based measures.

Models of macroprudential governance	Table 2
Central bank has main powers of direction	IE, IL, IN, HK, NZ, SG,[1] SA, UK
Supervisor (separate from the central bank) has main powers of direction	AU
Inter-agency macroprudential authority with powers of direction (joint decision of represented agencies)	FR,[2] LU
Macroprudential powers of direction split between various authorities	BE, CA, NL

[1] The Monetary Authority of Singapore (MAS) is the only macroprudential authority; however, for the property market an interagency taskforce (MAS, the ministry of finance and the ministry of national development) coordinates measures under the overarching goal of promoting a sustainable property market.   [2] Central bank has exclusive powers to propose measures to be considered by the interagency authority.

Governance arrangements influence the use of macroprudential tools in several ways. First, they determine who is accountable for the outcome of decisions. Accountability is clearer where one authority is ultimately responsible for directing policy. When accountability is clear, the responsible authority has a stronger incentive to be transparent about the reasons for its decisions and to undertake regular public reviews of past policy decisions.

Second, governance determines the operational independence of the authority charged with directing macroprudential policy. Governance arrangements that require unanimous decisions, extensive consultations or long notice periods extend the time between risk identification and policy action. Such arrangements also encourage the front-running of policy actions. Including in the decision-making process agencies whose principal objectives are less well aligned with macroprudential ones (for example, the finance ministry) can introduce political considerations that delay actions or reduce the transparency of reasons for specific policy actions.

4.2   What intermediate objectives to set?

While the ultimate objective of actions to mitigate housing market risks is financial stability, this is hard to define in an implementable way. Therefore, policymakers usually translate the ultimate objective into more specific intermediate objectives. Well defined objectives are crucial for judging policy success. The case

studies identified four potential intermediate objectives, although in most countries macroprudential authorities target only one or two (Table 3).

Ranking of intermediate policy objectives to mitigate housing market risks

1 = more important objective, 2 = less important objective[1] Table 3

	AU	BE	CA	FR	HK	IE	IL	IN	LU	NL	NZ	SA	SG	UK
Maintain lender resilience	1	1	1	1	1	2	1	1	1	1	1	1	1	1
Maintain borrower resilience	1	2	2	1		1				1		1	1	1
Dampen housing credit cycles						1		1	1		2			
Promote the evolution of house prices in line with fundamentals											2		1	

[1] An empty cell indicates that it is not an intermediate objective.

In most countries, lender resilience is the most important intermediate objective. Overwhelmingly it refers to bank resilience. Several factors explain the focus on bank resilience. First, in many economies, banks dominate the provision of housing credit; non-bank financial institutions (NBFIs) do not play a significant direct role. Second, residential mortgages often constitute a large share of bank assets but a small share of NBFIs' portfolios. Third, in economies with bank-dominated financial systems, NBFIs are less systemically important than banks. Fourth, some types of NBFIs are outside the supervisors' remit.

Another common intermediate objective is borrower resilience. Some authorities target it because maintaining borrower resilience enhances bank resilience by directly reducing borrower defaults and hence bank losses (eg France, Ireland). Others also target borrower resilience because it dampens the negative effects of high housing debt on consumer demand (eg United Kingdom).

A few authorities complement resilience objectives with objectives to dampen the credit cycle or lean against house price exuberance. In Luxembourg, smoothing the residential real estate cycle is seen as an important way to increase lender resilience and safeguard financial stability. This is similar to the Central Bank of Ireland's objective of avoiding the emergence of an unsustainable relationship between credit and house prices. In India, dampening the credit cycle complements monetary policy to achieve macroeconomic stability because of the importance of housing for overall economic activity. The Monetary Authority of Singapore, in coordination with other government agencies, aims to promote a sustainable property market, where house prices move in line with fundamentals. Relatedly, the Reserve Bank of New Zealand's LTV policy is guided by reducing losses in the banking system from house price corrections, which are likely to be larger when prices deviate far from fundamentals.

Differences in intermediate objectives across countries are explained in part by views about the key channels through which housing markets potentially pose a systemic risk. The relative importance of each channel differs across countries depending, for example, on financial sector development, aggregate debt levels, imbalances in the supply and demand for housing or the structure of housing finance. The choice of intermediate objective is also influenced by governance arrangements, particularly the powers and scope delegated under the mandate for financial stability.

4.3 What costs to balance against the benefits?

Regardless of which intermediate objective is targeted, macroprudential policy actions have benefits in terms of enhanced financial stability. Furthermore, by mitigating the build-up of risks, they might dampen excesses that undermine the affordability of housing. However, macroprudential actions are not without costs. By purposefully reducing the flow of housing credit, they potentially impact output growth and have distributional consequences (Table 4). These potential costs influence the choice and calibration of macroprudential tools.

The case studies suggest that the output costs of policies to mitigate housing market risks tend to be small. As the output costs mainly affect aggregate demand they are likely to be temporary as any reduction in demand could be offset by monetary policy. Also, costs can be reduced by carefully timing the activation of measures, for example, outside crisis periods when the cost of capital is lower. Such timing could also help avoid policy contributing to the procyclicality of financial conditions.

The case studies identify two channels that might have longer-run output effects via their impact on potential supply of the economy. First, borrower-based measures might constrain small firms' access to credit by limiting housing equity withdrawals. Owners of small firms often borrow against their personal assets. Second, if macroprudential actions result in lower housing construction, this might constrain workers' ability to move to areas where they can be more productively employed. That said, overall the case studies indicate that other factors, such as planning regulations and construction costs, are more important constraints on housing supply.

The distributional consequences loom larger than the output costs. Borrower-based measures tend to result in less lending to lower-income borrowers or those with less savings. The effects are especially adverse for first-time home buyers, which tend to be younger households who have not yet reached their earning potential and have had less time to accumulate savings for a down payment. Such costs can be mitigated through targeted calibration, by allowing lenders some flexibility to use private information about borrowers' creditworthiness (see Section 6.2) or fiscal transfers.

Potential costs of macroprudential policies to mitigate housing markets risks					Table 4
Type of cost	Borrower-based measures		Capital-based measures		Impact on:
	LTV	DTI or DSTI	Non-binding	Binding	
Lower consumption by would-be homeowners forced to remain in rental sector while saving for the deposit	✓				Aggregate demand[1]
Higher funding cost for banks which may result in higher interest rates for borrowers			✓	✓	Aggregate demand[1]
Binding capital constraints for banks results in reduced housing loan supply				✓	Aggregate demand[1]
Lower consumption financed by housing equity withdrawal	✓	✓			Aggregate demand[1]
Lower consumption of "white goods" that typically accompanies home purchases	✓	✓			Aggregate demand[1]
Lower business investment financed by housing equity withdrawal	✓	✓			Aggregate demand[1] Potential supply
Lower construction sector activity	✓	✓			Aggregate demand[1] Potential supply
Lower access to the housing market for lower-income potential borrowers		✓			Inequality
Lower access to the housing market for potential borrowers with lower savings	✓				Inequality

[1] Any impact on aggregate demand is expected to be temporary.

5.   What tools to use?

Macroprudential authorities have used a broad menu of tools, as shown in Table 1. Which tools are the most effective? A clear message from the collective experience is that certain tools address specific intermediate policy objectives better than others. In other words, the effectiveness of individual tools depends on the objective. Combinations of tools can sometimes help meet objectives, but streamlining the number of tools simplifies communication.

5.1   Which tools are the most effective?

The case studies demonstrate how some tools are more successful at meeting certain intermediate objectives than others. Table 5 summarises the main findings. Box A outlines the different methods that authorities have applied to assess success.

Which tools for which objectives?		Table 5
Tools	Resilience objectives	Other objectives
Supervisory expectations	• Supervisory expectations on loss-absorbing buffers, for example through stress tests, boosts <u>lender resilience</u>. • Supervisory expectations on target. variables and peer benchmarking of lending standards boosts <u>borrower resilience</u> by raising lending standards but can still require follow up with more quantitative measures to achieve objectives.	• Supervisory expectations can be flexibly dialled up or down to smooth <u>credit cycles</u>.
LTV limits	• Boosts <u>lender resilience</u> to shocks by improving loss-given-default rates. • Less effective in raising <u>borrower resilience</u> as less effective in holding down debt service-to-income. But larger equity buffers provide more options in meeting serviceability challenges.	• Active adjustment dampens <u>credit cycles</u>. • Reduces <u>house price</u> growth and deviations from fundamentals, but the effect is relatively modest.
Borrower income-based limits (DTI, DSTI)	• Boosts <u>borrower resilience</u> to shocks, as debt service-to-income is closely associated with default probabilities and weaker consumer demand. • Can boost <u>lender resilience</u> by reducing LTVs in certain cases.	• Can help smooth <u>credit cycles</u> by dampening credit growth.
Capital-based risk-weight floors, add-ons and multipliers; sectoral systemic risk buffers	• Boosts <u>lender resilience</u> by adding a macroprudential capital buffer to cover systemic risks not reflected in microprudential capital requirements. • Limited effects on <u>borrower resilience</u>.	• Limited effects on <u>credit cycles</u> and <u>house prices</u>.
Risk weights linked to LTV or DSTI	• Boosts <u>lender resilience</u> to shocks.	• Active adjustment dampens <u>credit cycles</u> but more effective when tightening compared with loosening.
Investor targeted measures	• Raises <u>borrower resilience</u>.	• Mixed evidence about influence in dampening housing <u>credit cycles</u>.

Supervisory expectations

Supervisory scrutiny is often the first tool used to mitigate housing market risks. Stress tests have become an important tool to enhance lender resilience. Publication of the results can additionally exert public pressure on lenders to enhance their resilience. Public letters from authorities to lenders can encourage prudent practices by exerting moral suasion. As the first line of defence, supervisory expectations can

boost borrower resilience by influencing lending standards. In Australia, a benchmark for the growth in banks' lending to investors provided a trigger point for supervisors to consider more intensive supervisory action, which held back the growth of credit to investors. In Belgium, a periodic peer benchmarking exercise has been instrumental in enabling robust dialogues with lenders about lending standards, especially for outlier institutions. This contributed to higher loan amortisation rates and reduced the share of very high LTV mortgages. That said, eventually the National Bank of Belgium implemented borrower-based measures in 2020 as intensifying competition partially reversed earlier positive supervision-driven trends. The flexibility of supervisory expectations can facilitate the timely targeting of risks. In the case of France, guidance on DSTI limits helped to mitigate risks before legally binding measures could be introduced. For jurisdictions aiming to act countercyclically, supervisory expectations provide flexibility for measures to be quickly dialled up or down when needed (eg Australia). Finally, rigorous supervision is crucial to ensure the appropriate implementation of legally binding macroprudential tools.

LTV limits

Loan-to-value (LTV) limits are the most commonly used borrower-based tool. Four results emerge from the case studies. First, LTV limits primarily boost lender resilience by improving loss-given-default rates. Second, LTV limits are less effective in raising borrower resilience. Evidence from New Zealand and Luxembourg suggests that LTV limits have not been effective in holding down debt service-to-income, which is closely associated with borrower default probabilities. Nevertheless, larger equity buffers give borrowers more options when they face serviceability challenges. Third, LTV limits can help to smooth credit cycles by constraining mortgage flows. Fourth, evidence suggests that LTV limits can lower house price growth. However, the effects may be relatively modest compared with the overall house price cycle and thus have only weak effects on bringing house prices more in line with fundamentals.

Borrower-income based limits

Authorities usually only have one income-based measure, either a debt service-to-income (DSTI) limit (based on either actual or stressed interest rates) or a debt-to-income (DTI) limit. DSTI or DTI limits have boosted borrower resilience. Evidence from Ireland highlights their effectiveness as borrowers with higher loan-to-income ratios were much more likely to utilise Covid-19 payment breaks. Some case studies suggest that income-based measures could be more powerful than LTVs in strengthening lender resilience. In Ireland, income-based measures appear to be the more binding constraint on borrowers. In France, which does not have an LTV cap given specific features of the French housing finance model, LTV ratios nevertheless declined after the introduction of the DSTI limit. Analysis by the Bank of England indicates that DTI and stressed DSTI limits are close substitutes, leading to the withdrawal of the latter.

Capital-based measures

Capital-based tools are effective in building buffers against systemic risks not captured by microprudential capital frameworks. In Luxembourg and Belgium, which have not experienced a housing crisis, macroprudential recommendations on risk-weight floors and add-ons have brought average risk weights on mortgages under the internal ratings-based (IRB) approach in line with other European economies. Although not explicitly a housing market instrument, the counter cyclical capital buffer (CCyB) has also been effective in building lender resilience against housing market risks, though the case studies reveal a preference for more targeted measures. Overall, many authorities consider capital-based measures to not be particularly effective in boosting borrower resilience. In some jurisdictions, risk weights are linked to DSTIs or LTVs to influence borrower resilience. In Israel, 100% risk weights on high-DSTI mortgages had a significant impact on the origination of such loans. In India active adjustment of LTV-dependent risk weights helped to smooth the credit cycle by influencing resources flowing into the residential real estate sector. Evidence suggests that these effects were stronger when tightening compared with loosening.

Investor-targeted measures

Some authorities have targeted measures at buy-to-let investors to build resilience and dampen housing cycles. The evidence suggests that measures targeting investors can increase borrower resilience by increasing the interest rate spread on investor loans and reducing the share of interest-only mortgages to these borrowers. While these measures dampened the growth of investor loans, the results are mixed about their impact on dampening aggregate credit growth.

Box A

Methods to measure policy success

What methods have authorities used to measure success? A significant challenge facing macroprudential authorities is the limited number of housing cycles (if any) since the measures' introduction. This makes it difficult to fully assess their effectiveness in mitigating risks in downturns. Notwithstanding this challenge, the case studies show that authorities have turned to four broad methods.

Direct effect on target variables: The most common method is to measure the direct effect of a policy on target variables. This is effectively an exercise in measuring compliance with the macroprudential policies. Beyond measuring compliance, authorities assess how much the impact on the targeted variable might influence expected defaults, expected losses or lenders' capacity to absorb losses. Although compliance appears to be a straightforward binary outcome – they either do or do not comply – there is a non-trivial measurement challenge. Authorities need the necessary data to ensure lenders comply with borrower- or capital-based measures. Flexibility margins, which typically exempt a share of new lending from borrower-based measures, complicate measurement of compliance. Lenders need to ensure they have the necessary systems in place to ensure that flexibility margins are not exceeded. In fact, such measurement difficulties could partly explain why flexibility margins are not fully used (Annex Table A.5). Finally, there is a separate challenge of measuring compliance with supervisory guidance.

Indirect effects on other risk characteristics: Another method is to measure the indirect effects of policies on other risk characteristics beyond the specific variable targeted. For example, the effect of capital-based measures on lending standards, or the effect of borrower-based measures on macroeconomic variables such as house prices, credit growth or credit approvals. Several case studies note that there are often confounding effects, which make it hard to cleanly identify these indirect effects. This is especially challenging when trying to assess the success of individual policy interventions.

Counterfactuals: A third method is model-based counterfactual simulations. These take the form of regression-based counterfactual paths for certain key variables and scenario analysis to assess the projected influence of policies on the stock of mortgages; and stress tests. By modelling the interaction of different variables, counterfactual analysis can address the role of confounding factors to a certain extent.

Defaults and other related outcomes: The resilience objectives closely depend on the impact of policies on defaults or the size of losses relative to expected losses and loss-absorbing buffers. One method is to track defaults on mortgages by vintages. A number of case studies show post-policy improvements in the evolution of defaults. The ultimate test, however, is whether defaults and losses in downturns are unexpectedly large or large relative to loss-absorbing buffers. Among the contributing jurisdictions, Hong Kong SAR has had the longest experience with these measures. Its case study shows that delinquencies have not risen in recent years despite recent shocks. The Central Bank of Ireland utilised the take-up of Covid pandemic payment breaks to determine whether borrower-based measures had been successful. Such shocks provide useful ex post tests of policy success but by their nature cannot be used to regularly monitor effectiveness.

5.2   What combination of tools to use?

A striking fact about macroprudential policies targeting housing market risks is that nearly all authorities use more than one tool. What factors determine whether to use one or several tools to mitigate risks?

- *Multiple tools for multiple objectives*: Using multiple tools can be optimal because different tools are better at meeting different intermediate objectives. As described above, income-based tools are better at boosting borrower resilience, while LTV limits or capital-based tools can usefully target lender resilience. The latter can be particularly useful as they operate on the stock of vulnerabilities.

- *Path dependence*: History and path dependence can influence the combination of tools used. In many jurisdictions, LTV limits were often followed by income-based tools as authorities turned to other tools that would better target borrower resilience. The introduction of the new tool often did not result in the decommissioning of the old one in case other vulnerabilities emerged.

- *Experimentation followed by streamlining*: To better mitigate risks, authorities have experimented with new tools. This was particularly evident in pioneering macroprudential policy institutions. Even today, it is hard to claim that authorities know the best tools for the job. As authorities learn about the effectiveness of different tools, redundant or less effective tools can be decommissioned, resulting in a more streamlined use of tools. For example, the Bank of England consolidated its income-based tools following analysis showing strong overlaps between its DTI limit and the affordability test (a variant of a stressed DSTI limit), leading to the latter's withdrawal in 2022. Streamlining the number of tools also has the benefit of simplifying communication.

- *Mitigating leakages*: Multiple tools may be needed to mitigate policy leakages. Several authorities simultaneously introduced amortisation requirements alongside DSTI limits to prevent lenders using loan maturity extensions to bypass limits. More generally, use of a single tool could result in a higher likelihood of leakages. Thus, some authorities use multiple tools to avoid excessive dependence if leakages were to materialise.

- *Mitigating costs:* Authorities sometimes prefer to use combinations of tools because the costs of adequately mitigating housing risks with a single tool could be very high. By using multiple tools to mitigate risks, each one might not need to be set as restrictively, which potentially mitigates unintended consequences.

6.   How to calibrate tools?

After authorities have decided which macroprudential tools to use, they need to be calibrated to achieve their intermediate objectives. The calibration also needs to balance the costs. Calibration invariably involves multiple inputs as well as expert judgment given the challenges in quantifying the risks. Cross-country differences in the structure of housing markets also influence calibration. The case studies highlight several methods that have featured prominently in the calibration of newly introduced tools (Table 6).

6.1   Calibration methods

A commonly used calibration method is to use as a benchmark market practices when lending standards were considered prudent or capital buffers ample. As lending standards are often prudent early in the housing cycle, introducing and calibrating measures with reference to lenders' own standards at that time can lock in good practices. This method is especially useful for borrower-based measures, which operate

on the flow of new lending. If tools are introduced later in the cycle, then they can be calibrated with reference to historical norms or past periods when housing markets were less buoyant.

A related method is to calibrate tools so that they act as a "guardrail" that safeguards against a future deterioration of lending standards or capital buffers. They aim to bind if housing markets become exuberant, but not constrain activity under the central forecast scenario. Calibrations grounded on guardrails are usually designed to avoid a sudden tightening of lending standards or regulatory capital buffers upon introduction.

Authorities unsure of the appropriate calibration can adjust the tools in small steps. It helps policymakers learn about effectiveness and lenders comply with the tools. This also helps to minimise unintended consequences when new tools are implemented and mitigates the risk of overshooting objectives. The case studies point to a number of other factors that have influenced tool calibration over time, including the availability of new data sources and a desire to simplify tools or make them more targeted.

Model-based assessments can inform calibrations. Stress tests or simulations of a tool's broader economic impact enable authorities to better understand the ex ante effect of measures. For example, in 2021 the central bank of Luxembourg used empirical simulations and macroeconomic modelling as inputs into the calibration of its new LTV limit. In Israel, stress tests guide the calibration of tools by helping to illuminate the specific influence of different measures.

Calibration methods   Table 6

Method	Description	Advantages	Disadvantages	Examples
Early in the cycle	Calibrate measures using early in the cycle lending standards / capital buffers	Avoids a sudden tightening in lending standards / capital buffers. Based on lender' standards / capital buffers when they are prudent	Requires consensus to act early in the cycle before risks have become excessive	IE: 2015 LTV and LTI limits
Benchmark to historical period / norms	Calibration is determined by a historical period when lending standards were considered prudent / when lenders' buffers were conservative	Lenders already familiar with benchmark	Historical norms may not be appropriate after structural changes	FR: 2019 DSTI limit; NL: 2022 average risk-weight floor
Guardrails	Measures calibrated to only bind in scenarios of housing market exuberance	Avoids a sudden tightening in lending standards / capital buffers	Requires modelling scenarios and assumptions	UK: 2014 LTI flow limit
Gradual approach	Gradually adjust tools if uncertain about the calibration	Avoids a sudden tightening in lending standards / capital buffers and risk of overshooting objective	Requires multiple inputs and reliant on expert judgment	HK: 2009-17 LTV caps
International benchmarking	Calibrate measures based on calibrations used in other economies	Leverages practical experiences from other economies	Might not be appropriate due to differing structure of housing markets across countries	LU: 2016 average risk-weight floor
Stress tests and model simulations	Stress tests / model simulations to assess impact on banks, lenders and house prices	Potential to calibrate with respect to resilience objectives and economic impact. Can guide re-calibration with evolving macroeconomic and financial conditions	Data-intensive, requires modelling assumptions	FR: 2019 DSTI limit LU: 2021 LTV limit

Models also help policymakers assess whether tool calibrations remain appropriate as macroeconomic and financial conditions evolve. Some authorities intend tools to be structural such that their calibration does not vary over the cycle. Others adjust the calibration, such as LTV restrictions in the case of New Zealand, when models (and other metrics) indicate that risks have increased or declined.

Even though model-based calibration is useful, the case studies indicate that it is hard to do. Authorities still rely heavily on expert judgment. International benchmarking is often an important input into this judgement. It levers lessons learned in other jurisdictions. International benchmarking of capital-based measures is facilitated by the widespread adoption of the capital standards agreed by the Basel Committee on Banking Supervision. International benchmarking of borrower-based measures is complicated by differences in the specific definitions used across jurisdictions.

To facilitate international benchmarking of borrower-based measures, the study group re-calculated current levels of borrower-based limits on a consistent basis (Annex Table A.3). Standardising the limits indicates less dispersion than is apparent when comparing limits reported in official publications. For example, DSTI limits range from around 25 to 43% of income on a standardised basis, compared with 25 to around 60% before standardisation. Additional tables to facilitate international benchmarking and the design of borrower-based measures are presented in Annex A.

6.2   Calibration of borrower-based measures

As discussed in Section 4.3, the use of macroprudential tools can have distributional consequences. One way to offset these is through fiscal transfers. Another, more common, way is to differentiate among types of buyers when calibrating borrower-based measures. Limits for first-time buyers (FTBs) or on low-value properties are often less stringent than those for second-time and subsequent buyers (SSBs). FTBs tend to have lower credit risk, for example due to higher expected income growth early in their careers, which can justify less stringent limits.
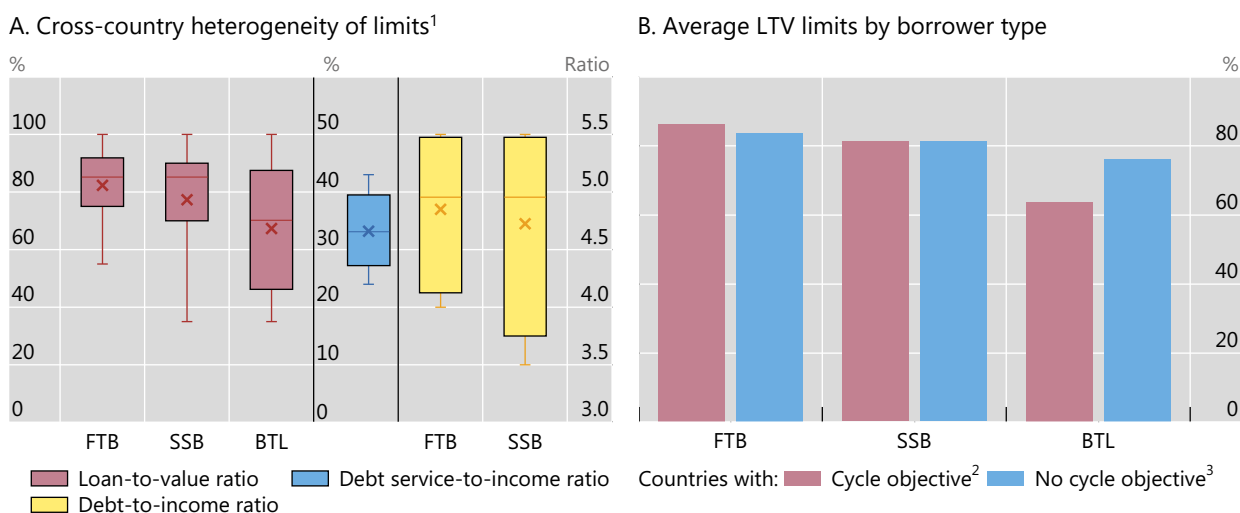
Across the countries that contributed to this report, FTBs have the loosest LTV limits, at around 83% on average (Graph 3.A). SSBs face tighter limits, at around 77%. Buy-to-let (BTL) investors face even tighter LTV limits at 67%. A similar pattern holds for income-based measures.

Internationally, there is more similarity in the calibration of measures applying to FTBs compared with other borrowers. FTB LTV limits range from 55 to 100%, while those for BTL investors show greater dispersion, with LTV limits ranging from 35 to 100%. DTI limits are also less dispersed for FTBs compared with SSBs. For BTLs, not all jurisdictions apply income-based limits due to difficulties in measuring rental income ex ante (Annex Table A.8). The international dispersion of LTV and DTI limits for FTBs measured by the coefficient of variation is surprisingly similar.

To some degree, the greater dispersion of investor limits reflects differences in the importance of intermediate objectives related to dampening credit cycles or house price exuberance (Graph 3.B).

Flexibility margins are another calibration tool that can help to mitigate the costs associated with borrower-based measures.[1] Flexibility margins typically exempt a share of new lending from borrower-based measures. They allow some space for lenders to use private information about borrowers' creditworthiness, which maintains bank screening incentives. In addition, they can mitigate potential economic costs with borrower-based measures that might arise from intra-country heterogeneity in house prices.

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[1]   Macroprudential authorities use different terms to cover the share of loans exempted from limits on borrower-based measures: flexibility margin (France, Luxembourg), speed limits (New Zealand, Belgium), allowances (Ireland) or flow limit (United Kingdom).

Greater dispersion of borrower-based limits for buy-to-let investors

Graph 3

A. Cross-country heterogeneity of limits[1]

B. Average LTV limits by borrower type

Loan-to-value ratio   Debt service-to-income ratio

Debt-to-income ratio

Countries with: Cycle objective[2]   No cycle objective[3]

BTL = buy-to-let; FTB = first-time buyers; SSB = second-time or subsequent buyers.

[1] AU, BE, CA, FR, HK, IE, IL, IN, KR, LU, NL, NZ, SA, SG and UK, depending on implementation. The crosses, lines, boxes and whiskers respectively show the means, medians, interquartile range and min–max range. LTV coefficient of variation for FTBs: 0.17; SSBs: 0.26; BTL: 0.33. DSTI coefficient of variation: 0.20. DTI coefficient of variation for FTB: 0.15; SSBs: 0.20.   [2] IE, IN, LU, NZ and SG.   [3] BE, CA, HK, IL, NL and SA.

Sources: CGFS study group.

Flexibility margins can also simplify tools. For example, they avoid the need for authorities to provide guidance about how to allocate complex loan arrangements for compliance purposes.

Finally, flexibility margins provide an additional method to recalibrate policy. In New Zealand, recalibration of the LTV has usually been done by adjusting the flexibility margin rather than the LTV limit itself.

Six jurisdictions that contributed to this report have implemented borrower-based measures together with flexibility margins (Annex Table A.4). Flexibility margins themselves are often targeted at specific borrower types. For example, they exempt 35% of new lending to FTBs in Belgium but only 10% of new lending to BTL investors. While flexibility margins are used by lenders, they appear to keep a buffer (Annex Table A.5).

7.   What influences policy effectiveness?

From the combined 168 years' experience using macroprudential tools across the jurisdictions contributing to this report, what have we learned about the factors that influence policy effectiveness? Four factors stand out. Effectiveness is enhanced by: (i) using the most appropriate tool to meet the specific intermediate objective; (ii) addressing policy leakages; (iii) minimising lags that delay risk mitigation; and (iv) using tools with automatic stabiliser properties. A common thread running through these factors is the influence of governance frameworks in promoting or hindering effectiveness.

7.1   Availability of the best tool to meet the objective

Policy is most effective when the best tools are used to meet the specific intermediate objective. However, governance issues can sometimes prevent this from happening. In some instances, there is no legal or political backing for specific tools, especially politically sensitive income-based measures. For example,

until recently an income-based tool was not included in the macroprudential memorandum of understanding between the Reserve Bank of New Zealand and the government.

In other instances, where powers of direction over specific macroprudential tools are scattered across agencies, some authorities with macroprudential responsibilities have had to resort to using second-best tools to the meet objectives. This tends to be the case when political economy pressures loom large in the agency with powers of direction over the most appropriate tool.

The best tool may not be available because the powers of direction do not cover certain lenders. For example, entity-based governance arrangements may not provide tools that can be used to directly target specific lenders that are responsible for housing risks. This can apply to certain non-bank lenders as well as lenders in another jurisdiction.

When the best tool is not available to meet the objective, macroprudential authorities have had to be creative by using other tools at their disposal or using financial sector supervision mandates to implement macroprudential policies on a "comply or explain" basis. Nevertheless, policy effectiveness, especially in terms of achieving it at the lowest cost, is likely to be impaired when authorities are unable to use the best tools to meet their objectives.

The case studies suggest that implementation has often been clearer and success greater – especially in using the appropriate tools to meet objectives – when one body has been assigned powers of direction over all relevant macroprudential tools.

7.2   Leakages

Leakages and regulatory arbitrage, if left unaddressed, could weaken policy effectiveness. What leakages have been problematic, and how have policy makers plugged them? The case studies document five types of leakage and describe the strategies that authorities have mobilised to mitigate specific leakages, summarised in Table 7.

- *Loan maturity extension:* A common leakage of DSTI limits results from lenders extending loan maturities. This spreads amortisation over a longer period, which reduces monthly debt servicing costs. While extending the loan maturity can bring stability by reducing rollover risk, maturity extensions also reduce the rate of loan amortisation. Borrowers, therefore, have more debt for longer, which reduces borrower resilience. To mitigate this leakage, authorities have jointly introduced DSTI limits with constraints on loan maturities (see Annex Table A.6 for details on the specific maturity limits). In a few cases, they have also required lower LTVs for long-maturity loans to maintain lender resilience.

- *Lenders out of scope:* A long-standing concern with macroprudential policy is leakages to out-of-scope lenders. The case studies indicate that cross-border leakages appear less relevant for housing risks, with the exception of tightly integrated jurisdictions. Rather, leakages to non-bank lenders are considered more important. In jurisdictions with activity-based regulation, the policy scope encompasses regulated non-bank lenders (Annex Table A.2). Where it does not, typically in jurisdictions with entity-based regulation, authorities have exploited the central place of banks in the financial system to mitigate leakages. For example, the Hong Kong Monetary Authority requested that banks terminate relationships with out-of-scope non-bank lenders issuing non-compliant loans.

- *Borrowers out of scope:* Borrower-based measures typically apply to households but not always to legal entities. Thus, borrowers could potentially sidestep these measures by setting up a separate legal entity and borrowing through this entity. To mitigate this leakage, some jurisdictions have extended the borrower scope to include special entities set up for small-scale purchases (Annex Table A.2). Others have cast the net wider to include all legal entities.

- *Income definition:* While the case studies suggest that income-based measures may be more effective than LTV limits, a key difficulty is the flexibility when defining income. Incomes can be inflated, treatment of unstable income may overstate expected incomes, or borrowers can put multiple names on mortgages to boost income. Strategies to mitigate income definition leakages include supervision to ensure bank income verification practices are sound and income verification based on taxable income. Weighting a single borrower's total mortgage exposures has been used to mitigate issues related to multiple names on mortgages.

- *Use of non-mortgage loans*: As borrower-based limits bite, borrowers may turn to other loans to finance a deposit. To mitigate this leakage, lenders can be requested to utilise credit registries or credit bureaus to assess borrowers' total debt exposure.

Leakages		Table 7
Leakage	Problem	Mitigation strategies
Extending loan maturities to loosen DSTI limits	• Spreads amortisation over a longer period, which slows rate of housing equity accumulation, undermining borrower resilience	• Limits on loan maturities • Lower LTV limits on long-maturity loans
Lenders out of scope	• Financial system vulnerabilities migrate to non-bank lenders • Cross-border leakages • Undermines lending standards	• Legal basis of regulation in law covering all lenders (not only supervised ones) with anti-avoidance clauses • Apply higher risk weights for supervised lenders' credit exposures to non-compliant lenders who fall outside the authority's supervisory remit • Request that supervised financial intermediaries terminate credit relationships with non-compliant lenders • Cross-border reciprocity agreements
Borrowers out of scope	• Households set up legal entities to avoid macroprudential policies targeting households	• Apply policies to all mortgage borrowers
Income definition	• Unstable incomes • Inflated incomes • Multiple names on mortgages	• Haircuts on less-stable income sources • Income verification based on taxable income • Supervisory oversight of banks' credit policies • Weighted limits based on full portfolio of borrowers' loans
Use of non-mortgage loans	• Lower lender resilience as actual debt higher than captured by LTV ratio • Lower borrower resilience than captured by loan-to-income or loan service-to-income ratios	• Use credit bureaus or credit registries to enable lenders to assess total debt • Use total debt/debt service to compute income-based limits • Anti-avoidance clauses

7.3   Lags

Lags can weaken policy effectiveness by delaying risk mitigation. The case studies identify three main sources, which are summarised in Table 8.

1. *Decision-making lags:* There are lags between the point at which risks are identified and the final policy decision. The heavy reliance on expert judgment in risk identification and uncertainty about the costs increases the tendency of political economy considerations to influence policy decisions, which leads to inaction bias. The case studies document instances where the need for policy consensus on specific macroprudential tools in inter-agency governance frameworks delayed policy action. Similarly, the case studies highlight how political economy considerations influenced the use of specific tools, especially when the powers of direction resided in authorities with less operational independence. For example, the Canadian case study identifies a case where

Macroprudential policies to mitigate housing market risks

political economy considerations led to delays in implementing policies. Supervisory expectations on target variables can be a useful tool to mitigate such lags. Their flexibility means that they can be used quickly to mitigate negative trends.

2. *Implementation lags:* There are lags between the initial decision to implement a policy and its actual implementation. The justification for such lags is that they give lenders time to adapt to the measures. They also avoid surprising borrowers who have initiated but not yet completed transactions. However, these implementation lags can have unwanted effects. For example, the case study for Canada identifies instances where the deliberate process of long lead times for policy implementation pulled activity forward, leading to temporary market distortions. The case studies provide examples about how the trade-off can be optimised. One example is to initially introduce policies as a non-binding recommendation soon after the initial decision, which is then subsequently followed up with legally binding measures. This strategy provides flexibility to avoid disruptions but mitigates the ability to front-run implementation.

3. *Lags in the materialisation of the desired result:* The third type of lag is that between policy implementation and the desired impact on aggregate vulnerabilities. As borrower-based measures operate on the flow of new mortgages, the case studies show that they can be less effective in raising aggregate resilience in the short run. Experience from New Zealand shows that it took around four years for the impact of tighter LTV limits to be fully reflected in the stock of mortgages. The past can cast a long shadow. Evidence from Ireland shows that, on average, loans granted before the Great Financial Crisis and still outstanding several years later were more risky than those granted after the introduction of borrower-based measures. These lags highlight one advantage of capital-based measures because they operate on the existing stock rather than only on the flow of new mortgages.

Policy lags   Table 8

Type of lag	Description	Problem	Mitigation strategies
Decision-making process lags	• Time between risk identification and final policy decision (eg due to need for consensus across relevant authorities)	• Delays achieving increased resilience • Weakens ability to implement timely cyclical policy	• Supervisory expectations can be used quickly to mitigate negative trends before other tools can be mobilised
Implementation lags	• Time between initial policy decision and policy implementation (eg need to provide lenders with time to adapt to new measures)	• Long lead time to implement measures after the announcement delays achieving increased resilience • Adverse effects through front-running measures, which creates temporary market distortions	• Initially implement policy through non-binding recommendations. This provides flexibility to avoid disruptions but mitigates front-running of legally binding measures
Lags in the materialisation of the desired result	• Time between initial policy implementation and impact on the stock of vulnerabilities	• Borrower-based measures: as only the flow of new lending must be compliant, there is a lag as the measure passes through to the entire stock of lending • Capital-based measures: after lead time for lenders to prepare there is no lag as measures operate on the stock of lending	• Introduce borrower-based measures early in the cycle or as structural (permanent) measures. • Use capital-based measures when resilience needs to be built quickly

7.4 Automatic stabiliser properties of tools

Automatic stabilisers are tools that become more binding in upswings and loosen during downswings without the need to recalibrate the policy stance. They enhance effectiveness by mitigating inaction bias arising from uncertainties regarding risk identification, governance challenges and lags. They do so because they avoid the need to actively change policy.

The findings on effectiveness in the case studies suggest that over the housing cycle some tools have good automatic stabiliser properties, while others need active policy adjustment to remain effective.

- *Tools with automatic stabiliser properties:* Among tools targeting borrower resilience, DTI limits tend to tighten credit conditions as housing upswings gather pace because individual households' incomes tend to be less cyclical than house prices. The automatic stabiliser properties of DSTI limits depend on the specific implementation. Stressed DSTI limits based on a fixed level of interest rates or on a fixed interest rate floor have very similar automatic stabiliser properties to DTI limits. By contrast, when limits are based on DSTIs that move with market interest rates, the automatic stabiliser properties will also depend on the correlation of these interest rates with the housing cycle. Conditional on monetary policy tightening, such DSTI limits will tighten if interest rates rise strongly alongside housing market upswings. Very accommodative monetary policy would loosen DSTI limits, all else equal. In markets with long-term fixed rate mortgages, the influence of monetary policy is somewhat dampened, as monetary policy largely influences the short end of the yield curve. Among lender resilience tools, risk weights dependent on borrower debt-to-income or debt service-to-income are also likely to have automatic stabiliser properties.

- *Tools needing active adjustment to remain effective:* Other tools can become less effective over the housing cycle without active policy adjustment. The resilience afforded to lenders by LTV limits declines as house prices rise, particularly if house prices move well above fundamentals.[2] In the light of this, the active adjustment of the Reserve Bank of New Zealand's LTV tool has been a crucial factor in its success. Internal ratings-based risk weights can loosen somewhat with the duration of the housing cycle upswing, especially if the historical incidence of housing market turmoil is limited in that country. Floors on risk weights (or floors on underlying risk-weight parameters) can partly mitigate this effect, and their impact during upswings will ultimately depend on the calibration. Risk weights linked to LTVs could well be procyclical without active policy adjustment. As valuations rise on properties that collateralise existing loans, risk weights would fall, freeing up capital for new lending, which in turn could feed further price rises.

8. Lessons for macroprudential policy

Drawing on the 168 years of practical experience summarised in the 14 case studies, what lessons can be drawn about using macroprudential policies to mitigate housing market risks? Four lessons stand out. First, boom-bust cycles in housing markets cannot be mitigated by macroprudential policies alone; it requires consistency across housing-related policies, including tax, planning and land supply policies. Second, governance arrangements have an important influence on the effectiveness of macroprudential policies. Third, prioritising the use of tools that meet objectives without requiring adjustment helps address

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[2] Valuations used in LTV ratios are typically based on the current market value or an appraiser valuation that is closely linked to the market value. Less procyclical measures of valuation, which aim to capture the fundamental value of the collateral, such as the mortgage lending value approach, could mitigate the need to actively adjust policy. However, they have become less common in recent years, partly due to the trend increase in house prices in many jurisdictions, which has cast doubt on the validity of such measures.

challenges faced by authorities in actively adjusting macroprudential tools. Fourth, openness about cost-benefit trade-offs helps to foster durable support for macroprudential measures.

Lesson 1. Macroprudential policies complement other housing-related policies

Successful mitigation of housing market risks and imbalances requires consistency across housing-related policies. Tax, planning and land supply policies have a decisive influence on demand-supply imbalances in the housing market. Through their focus on financial stability, macroprudential policies complement these by helping to dampen excesses and build resilience.

As the case study for Singapore highlights, consistency in policies requires mechanisms for sharing insights and perspectives with other authorities involved in housing markets, from the central bank to the tax agency and land supply authority. An overarching objective, mutually agreed by all authorities involved in housing markets, facilitates cooperation and helps ensure use of the most appropriate tool. Other authorities can indeed bring tools that might more effectively address the ultimate source of risk or cause of imbalances than macroprudential tools. For example, in a number of jurisdictions, fiscal authorities have progressively removed tax subsidies on mortgages, thereby reducing incentives for households to increase their leverage.

Lesson 2. Governance frameworks influence policy effectiveness

The collective experience described in the case studies suggests that governance frameworks have had an important influence on the effectiveness of macroprudential policies that target housing market risks. Certain aspects have helped macroprudential authorities achieve their objectives (Table 9). For example, jurisdictions with one body ultimately responsible for financial stability have often been more proactive in using macroprudential policy to mitigate housing risks. They have also tended to be more transparent, publishing regular reviews of policy. Clarity about the objectives is another governance aspect that has helped enhance accountability.

In the jurisdictions that contributed to this report, macroprudential policies have been better targeted at risks when authorities have had a clear legal basis to direct policy across the full range of macroprudential tools. Operational independence, where day-to-day policy is shielded from political considerations, has helped to guard against inaction bias. Greater operational independence, in turn, has facilitated more regular reviews of policy calibrations.

The capacity to monitor housing risks from a macroeconomic perspective has been helped by having access to analytical frameworks to analyse the macroeconomic consequences of housing vulnerabilities as well as reliable, up-to-date data to adequately assess risks. Cooperation between macro- and microprudential authorities has helped with the identification and targeting of housing market risks. Bottom-up insights from supervisors can alert macroprudential authorities about risk pockets. Supervisors also tend to have more levers to enforce compliance. Macroprudential authorities, however, are better placed to assess and warn against the accumulation of systemic risks, not least because housing loans are often regarded as low-risk exposures. The case studies point to how these synergies have been facilitated by macro- and microprudential authorities being in the same institution. Another way to facilitate synergies is by ensuring an appropriate coordination mechanism between institutions.

When governance frameworks have not met these ideals, some macroprudential authorities have found practical remedies that facilitate the policy-setting process (Table 10). Political considerations are an ever present challenge when setting macroprudential policy. This is especially so for policies related to housing markets. Given this inescapable problem, explicitly writing political considerations into objectives with a hierarchy has helped make trade-offs more explicit (eg similar to monetary stability mandates that focus on price stability but include a secondary objective of full employment). This, in turn, has

Aspects of governance frameworks that help mitigate housing risks   Table 9

Aspect	Reason	Practical considerations	Examples from case studies
One body ultimately accountable for financial stability	• Clear assignment of ultimate responsibilities	• Transparency around decision-making with regular evaluation of current stance and communication with public	• UK – Financial Policy Committee sole body responsible for financial stability
Clear mandate/ objective	• Facilitates accountability • Shields from political influence	• Ideally intermediate targets formulated as quantitative targets – though research still needed to achieve this	• New Zealand – memorandum of understanding
Clear legal basis to introduce tools that address all sources of housing risks	• Multifaceted sources of housing risks require tools that are best able to mitigate the sources of risk	• Limited scope of other agencies to block use of standard macroprudential tools • Scope to apply tools to broad set of lenders	• Ireland – central bank has broad regulation-making powers to ensure the proper and effective regulation of financial service providers, through which its mortgage measures were introduced
Operational independence	• Guards against inaction bias	• Lengthy consultation or implementation requirements can impair operational independence	• New Zealand – operational independence facilitated regular policy recalibration
Capacity to monitor housing risks	• Data: need data to adequately assess risks • Human capital: need skills to assess aggregate risk in housing markets	• Scope to request data • Budgets to hire and retain qualified staff • Close cooperation and information-sharing with microprudential regulator	• Singapore – synergies between macro- and microprudential mandates. Macro analysis informs gaps in micro assessments. Micro developments inform risk pocket analysis for macropru
Capacity to enforce compliance	• Need legal backing to monitor and enforce compliance	• Access to data to monitor compliance • Clear legal framework for enforcement	• Singapore – supervisors tend to have more levers to enforce compliance

helped boost transparency and accountability. Including external academics on inter-agency committees has brought outside perspectives, which have helped policymakers focus on fulfilling their specific financial stability mandates.

Tweaks to inter-agency macroprudential governance frameworks have helped mitigate inaction bias. Frictions associated with uncertainty about ultimate responsibility in inter-agency macroprudential governance structures have been smoothed by giving one institution the sole power to initiate macroprudential policy. When this role is delegated to an agency whose main objective is financial stability (eg the central bank), it has helped to reduce easing bias. Qualified majority voting, as exercised by some financial stability bodies, has also helped address inaction bias. When consensus has been needed, initial implementation based on guidance has helped to mitigate the build-up of risks in the short run until legally binding measures can be put into place.

Finally, where the desired tool is outside the remit of the macroprudential authority, or has not been granted legal backing, measures to mitigate housing risks have been implemented through financial sector supervision mandates or on a "comply or explain" basis. Such policies have proved useful in reducing coordination frictions between lenders where each alone faced incentives to loosen prudent lending standards due to fear of losing market share.

Governance: practical remedies that facilitate policy-setting

Table 10

Issue	Consequences	Remedies	Examples of remedies from case studies
Political considerations influencing policy	• Constrains operational independence • Inaction bias	• Write political considerations explicitly into objectives with a hierarchy (eg similar to price stability and secondary objective of full employment). • Include external academics on panel to bring an outside perspective	• New Zealand – political considerations explicitly written into the memorandum of understanding
Inter-agency macroprudential governance structures	• Challenge to assign responsibilities and hence ensure accountability • Inaction bias / easing bias	• Only the institution with the macroprudential objective has power to initiate relevant measures • Qualified majority voting	• France – only central bank has powers to initiate measures among High Council of Financial Stability (HCSF) members • France – HCSF includes outside academics as members
Measures delayed due to need for consensus	• Delays build-up of resilience • Weakens ability to implement cyclical policy • Reduces predictability of policy • Can distort incentives to loosen policy	• Initial and early implementation of measures though non-binding recommendations • Use of tools with automatic stabiliser properties	• France – implementation of DSTI requirement initially via guidance
Desired tool is outside the remit of the macroprudential authority or has not been granted legal backing	• Constrains ability of authorities to mitigate housing risks • Use of second- or third-best tools to mitigate risks	• Implement macroprudential measures though banking supervision mandates • Peer benchmarking to inform lenders of externalities • Robust supervisory expectations to counteract extrapolative expectations of lenders • Introduce macroprudential measures on a "comply or explain" basis	• Israel – implement macroprudential policies targeting housing risks through banking supervision mandates • Belgium – supervisory expectations with a formal "comply or explain" mechanism

Lesson 3. Tools that meet objectives without active adjustment are especially effective

Inaction bias due to uncertainty about underlying risks or governance deficiencies is an ever present challenge for macroprudential policymakers. Considering this challenge, tools that meet objectives without the need for active policy action would enhance their effectiveness. As risks evolve, some tools require periodic adjustment to meet their objectives: for example, LTV limits contribute less to lender resilience when house prices move well above fundamentals. Other tools automatically dampen risks without needing adjustment. These are typically tools that are either calibrated as guardrails to safeguard resilience or are intended to automatically stabilise the housing cycle.

Guardrails anchor prudent practices without the need for active policy action. They can be particularly effective in maintaining resilience during housing market upswings. Tweaks to capital frameworks can minimise the need for active policy adjustment to maintain lender resilience. Examples of such tweaks include floors on loss-given-default parameters, minimum risk weights, exposure limits on residential real estate and minimum equity holdings on housing portfolios.

Given the strong relationship between the DSTI ratio and defaults, income-based limits can meet resilience objectives without the need for active policy adjustment. In jurisdictions where mortgages are mainly at long-term fixed rates, permanent DSTI limits help maintain borrower resilience even as interest rates change. Where floating and short-term fixed rates dominate, appropriately calibrated DTI or stressed

DSTI limits can help ensure that borrowers are sufficiently resilient to withstand higher interest rates without policymakers needing to actively adjust policy as conditions evolve. However, the case studies show that such a tool has at times been refused due to political economy considerations.

Certain income-based tools may also help meet objectives to dampen housing cycles without the need for policy adjustment. In particular, the strong automatic stabiliser properties of DTI and DSTI limits based on a fixed stressed interest rate tend to tighten credit conditions as housing upswings gather pace and loosen in downturns because individual households' incomes tend to be less cyclical than house prices. Such tools could stabilise housing cycles in a similar way to income taxes and unemployment benefits, which automatically stabilise business cycles.

Capital-based measures with automatic stabiliser properties could usefully complement authorities' toolkits, not least because they directly affect the stock of vulnerabilities. Building in some conditionality ex ante with respect to the release of capital or tying risk weights to DSTI ratios could potentially help enhance automatic stabiliser properties of capital-based measures. Such measures are still under development and not yet widely used.

Lesson 4. Openness about cost-benefit trade-offs fosters support

Assessing the costs and benefits of macroprudential policies to mitigate housing market risks presents policymakers with enormous measurement and communication challenges. The direct and indirect benefits of successful policy actions, such as a reduction in the likelihood and severity of crises or the mitigation of housing market excesses that impair affordability, are largely invisible (because it is difficult to demonstrate the counterfactual of financial fragility) and dispersed across the population. By contrast, the apparent short-term costs are more immediately visible and borne by a specific and sometimes vocal minority.

The case studies show that macroprudential authorities have taken important steps to identify and mitigate potential costs. As described in Section 6, authorities have carefully calibrated policies to mitigate potential costs to first-time buyers. Significantly looser calibration of borrower-based measures can help boost affordability for this group.

The case studies suggest that transparency about the costs and benefits can help foster long-term support for macroprudential measures. Surveys measuring public support for macroprudential policies suggest that consistent and candid communication, which clearly articulates how policy is informed, helps to maintain support even as memories of housing crises fade. To the extent that the elaboration of costs and benefits has helped to justify the measures to politicians and the public, it has also helped enhance the operational independence of the macroprudential authority.

Periodic evaluations of the effectiveness of tools, including through external reviews, have helped ensure and demonstrate that current policymaking frameworks are consistent with best practice. Another way authorities have increased transparency is through cost-benefit calculations. A few macroprudential authorities now try to assess and communicate their macroprudential stance within cost-benefit frameworks. These efforts aim to make progress by first articulating the costs and then trying to quantify them against the benefits.

These cost-benefit frameworks, however, are still nascent, and there remain significant challenges in identifying and quantifying the relevant costs. Directing resources to enhance these frameworks, both within central banks as well as in the academic community, could pay substantial dividends. Being open about the challenges has been an important component. Public communication spotlighting the challenges sends a useful signal to the academic community about valuable avenues for future research.

9.   Conclusions

What has the combined 168 years of practical experience summarised in the 14 case studies taught us about how to use macroprudential policies to mitigate housing market risks? Despite significant initial reservations, in the countries that contributed to this report these policies have generally been accepted by the public and also by financial institutions as helpful complements to other housing-related policies. Macroprudential authorities have experimented with a variety of tools and now have a relatively good understanding of which tools work best for which objectives. They also have a better understanding of the costs and benefits of using these tools and ways to strengthen governance.

Even so, significant conceptual and practical challenges remain. These include how to use multiple tools optimally and quantify the costs and benefits precisely. Moreover, our understanding of tools' effectiveness is largely based on experience from upswings, so there is still a lot to learn about their optimal use in housing market downswings. Being transparent about the challenges of using macroprudential policies to mitigate housing market risks will in the long run enhance policymaking even if in the short term it might heighten scrutiny.

The interaction between macroprudential and monetary policy is one of the areas for further analysis. The rapid increase in interest rates since 2022 has raised questions about the optimal allocation of interest rate risk between borrowers and lenders. Many of the case studies noted that borrower resilience is tightly linked to DSTI ratios. Long-term fixed rate mortgages, such as those in France, or variable rate constant repayment mortgages with time-varying amortisation, like in Canada, have helped maintain borrower resilience by reducing the volatility of payments as interest rates have risen. In jurisdictions with a high share of floating rate mortgages or short-term fixed rate mortgages, authorities have used stressed DSTI or DTI limits to ensure borrowers have sufficient capacity to absorb payment volatility. The overall impact on financial stability depends on whether borrowers or lenders are better able to adequately manage the resulting interest rate risks. Also, in countries that aim to dampen the housing market cycle, there is still some uncertainty as to whether macroprudential or monetary policy would be more efficient in meeting this intermediate objective.

Annex A   Borrower-based measures: comparative tables

Reporting and monitoring compliance of borrower-based measures

	Data granularity	Frequency	Source of non-mortgage debt if included in debt definitions
AU	Bank-level	Quarterly	Borrower declaration + credit bureau
BE	Bank and insurance company level	Semiannual for banks Annual for insurance companies	Borrower declaration + credit register
CA	Loan-level	Monthly	Borrower declaration + credit bureau
FR	Bank-level	Monthly reporting with quarterly compliance monitoring	Borrower declaration + account statements
HK	Bank-level. Will be replaced with loan-level data	Monthly	Credit reference agency
IE	Loan-level	Semiannual	
IL	Loan- and bank-level	Monthly + quarterly	
IN	Bank-level	Quarterly	
LU	Bank-level	Semiannual	
NL	Loan-level	Quarterly	
NZ	Bank-level	Monthly	
SA	Loan-level	Quarterly bank-level, monthly new loans	Borrower declaration + credit bureau + account statements in some cases
SG	Loan-level	Quarterly	Borrower declaration + credit bureau
UK	Loan-level	Quarterly	

Regulatory scope of borrower-based measures

	Lenders	Borrowers	Loans (in addition to standard housing loans)
AU	Regulated banks. Non-bank lenders can also be required to comply, if considered risk to financial system stability		
BE	Bank and insurance companies (the main credit providers in the mortgage market; other bank/non-bank institutions in scope if their mortgage portfolio exceeds €1 billion)	Natural persons	All loans used to acquire or build/renovate a house and bridge loans except certain renegotiated loans under strict conditions
CA	All institutions using government-insured loans	Natural persons[1]	
FR	Domestic credit institutions (banks) and financing institutions supervised by the microprudential authority (ACPR)	Natural persons + specific real estate legal entities ("sociétés civiles immobilières")	
HK	Authorised institutions (banks, restricted licence banks and deposit-taking companies under the Banking Ordinance)	Natural persons + all legal entities	Mortgage loans for non-residential properties are also subject to DSR and LTV limits. LTV limits apply on construction loans
IE	The regulations apply to all regulated financial services providers	Natural persons + legal entities with annual turnover of €3 million or less and not a member of a group of persons having a combined annual turnover of more than €3 million	
IL	Domestic banking system	Natural persons	All loans collateralised on real estate
IN	All regulated entities involved in providing home loans		Construction, bridge and renegotiated loans
KR	Domestic banks and non-banks	Natural persons	DSTI applies to housing loans only. LTV also applies to construction and bridge loans
LU	Credit institutions, insurance corporations, and professionals engaged in lending activities	Natural persons + specific real estate legal entities ("sociétés civiles immobilières")	Renegotiations, construction loans and bridge loans
NL	All financial institutions	Natural persons + all legal entities	
NZ	Banks	Natural persons + all legal entities	All new retail loans collateralised against residential real estate, including renegotiated loans where the lending amount increases
SA	Banks and finance companies	Natural persons	All loans for natural persons for non-commercial purposes
SG	Banks, merchant banks, finance companies and insurers	Natural persons + all legal entities set up for purchase of property	Refinancing of housing loans for servicing limits, unless the property is for owner occupation
UK	All lenders which have both extended residential mortgage lending in excess of £100 million and who have issued more than 300 mortgages over trailing 4 quarters	Natural persons	

[1] Separate programme for mature commercial properties used by corporations.

Use of borrower-based tools and current limits

Definition of limits standardised across jurisdictions[1]   Table A.3

	LTV[2]	DSTI[3]	DTI[4]
AU			
BE	FTB = 90% SSB = 90% BTL = 80%	30%	5.4
CA	95%, 92.5% and 80% depending on house price	39%[5]	
FR		25.5%	
HK	FTB = 70%, 60%, 50% depending on house price and subject to a loan cap SSB = 60%, 50%, 40% depending on house price and subject to a loan cap BTL = 50%, 40% depending on multiple mortgages[6]	35.5%[7]	
IE	FTBs and SSB = 90%; BTL = 70%		FTB = 4 SSB = 3.5
IL	FTB = 75% SSB = 70% BTL = 50%	33%	
IN	FTB = 90%, 80%, 75% depending on loan size and house price SSB = 80%, 70%, 65% depending on loan size and house price SSB and BTL = same as FTB for second dwelling unit. However, loans for third and additional dwelling units are treated as CRE exposures with RWA 75% and no LTV prescription		
KR	FTB = 50%, 70% depending on speculation in area SSB = 0%, 70% depending on speculation in area	24%	
LU	FTB = 100% SSB = 90% BTL = 80%		
NL	100%	13.5–34% (17.5–41.5% for retirees)[8]	
NZ	FTB = 80% SSB = 80% BTL = 65%		
SA	FTB = 90% SSB = 85% (finance companies) 70% (banks)	43%[8]	
SG	FTB = 75% SSB = 75%, 35% (third property), 20% points below limit if the maturity > 30 years or age > 65	40%	
UK			4.5

BTL = buy-to-let investor; FTB = first-time buyer; SSB = Second-time and subsequent buyer.

[1] As at end-July 2023. The limits have been standardised to aid comparison across jurisdictions and thus may differ from those in official publications. Note that the standardised limits are approximate. [2] Standardised definition = mortgage loan to value of property. [3] Standardised definition = mortgage debt service costs to gross income. [4] Standardised definition = mortgage debt to gross income. [5] For government insured mortgages. [6] BTL refers to non-self-use properties. [7] FTB only. Different limits for SSB and BTL. [8] DSTI limits increase with income.

Lending flexibility around borrower-based limits[1]

<div align="right">Table A.4</div>

	LTV	DSTI	DTI
AU	na	na	na
BE	The speed limits: 35% for FTB (with 5% for LTV > 100%); 20% for SSB (but 0% for LTV > 100%); 10% for BTL (but 0% for LTV > 90%)	Speed limits: 5% for the combination LTV > 90% and DSTI > 30%	Speed limits: 5% for the combination LTV > 90% and DTI > 5.4
CA	No	No	na
FR	na	Flexibility margin of up to 20% of the amount of new quarterly issued housing loans. At least 70% of the maximal flexibility is reserved for loans on primary residences and at least 30% is specifically reserved for FTBs of primary residences. The remaining 30% of the maximal flexibility can be used freely.	na
HK	No	No	na
IE	15% of new lending to FTBs is allowed to exceed the LTV and/or the LTI limit; 15% of new lending to SSBs is allowed to exceed the LTV and/or the LTI limit	na	15% of new lending to FTBs is allowed to exceed the LTV and/or the LTI limit;15% of new lending to SSBs is allowed to exceed the LTV and/or the LTI limit
IL	No	No	na
IN	No	na	na
KR	No	No	na
LU	The 90% LTV limit for SSB has a 15% flexibility margin but the LTV ratio must remain below 100%	na	na
NL	No	No	na
NZ	15% for owner-occupiers, 5% for investors	na	na
SA	No	No	na
SG	No	Loans above limit only granted in exceptional cases requiring enhanced credit evaluation, including: (i) approval for the policies and procedures from the board of directors; and (ii) approval of individual cases by the credit committee of the financial institution	na
UK	na	na	Lenders must limit the share of high loan-to-income lending (defined as a LTI of ≥4.5) at 15% of their new lending to owner-occupiers. Hence, a maximum of 15% of new lending can be above the limit

BTL = buy-to-let investor; FTB = first-time buyer; SSB = second-time and subsequent buyer.

[1] As at end July 2023.

Use of flexibility margins

Share of regulatory flexibility margin used by lenders in per cent   Table A.5

	LTV limit	Income based limits
BE	BTL 87%, other owner-occupied 50% and FTB 68%	40% for high LTV + high DSTI risk pocket; 55% for high LTV + high DTI risk pocket
FR		69%
IE	Less than 1% of FTB flexibility margin; 23% of SSB flexibility margin	60% of FTB flexibility margin; 15% of SSB flexibility margin
LU	85% of SSB flexibility margin	
NZ	Banks keep the share of new lending around 5 percentage points below the limit	
UK		65%[1]

BTL = buy-to-let investor; FTB = first-time buyer; SSB = second-time and subsequent buyer.
[1] Average October 2014 to March 2023.

Mitigating DSTI limit leakages[1]   Table A.6

	Loan maturity for DSTI computation	Loan amortisation
AU	Contractual maturity. Most mortgages 25–30 year term.	Yes
BE	Contractual maturity. Weighted maturity of mortgages 18.7 years.	Yes
CA	Contractual maturity. Maturity capped at 25 years.	Yes
FR	Contractual maturity. Average maturity 22 years. Maximum maturity capped at 25 years, with flexibility to extend for two additional years in specific cases.	Yes
HK	Contractual maturity. Average maturity 27 years. Maximum maturity capped at 30 years.	Yes
IL	Contractual maturity.	Yes (excluding bullet/balloon loans)
KR	Contractual maturity. Maximum maturity capped at 10 years.	Yes
NL	Typically 30 years	Yes
SA	Contractual maturity. Loan maturities are typically 20 years, in line with limits applicable for subsidised loans.	Yes
SG	Contractual maturity. Maximum maturity 35 years. Loans with maturity above 30 years subject to higher LTV limits.	Yes

[1] As at end-July 2023.

First use of borrower-based tools

	AU	BE	CA	FR	HK	IE	IL	IN	KR	LU	NL	NZ	SA	SG	UK
LTV limits		2020	1950[2]		1991	2015	2012	2010	2000	2021	2013	2013	2013	1996	
Income-based limits[1]		2020	1950[2]	2019	1997[3]	2015	2013		2017		2013	2023[4]	2018	2013	2014

[1] Income-based tools include debt service-to-income and debt-to-income limits. [2] On government-insured loans. [3] Standardised at current levels in 2010. [4] Not yet activated.

Buy-to-let investors[1]

	BTL limits compared with SSBs	Future rents considered as part of income for DSTI or DTI limits if BTL subject to such limits?
AU		Yes with haircuts (although not prescribed, guidance recommends at least 20% is prudent)
BE	Lower LTV	Yes, but only actually perceived rents (not hypothetical future ones)
CA	Same DSTI + lower LTV	Varies by lender, generally reduced the mortgage payment, but has been used in income (this is an ongoing issue)
FR	Same DSTI	Yes, in case of BTL loans, future rents are accounted for as income to assess the DSTI ratio. However, a discount (not defined by the measure) must be applied by banks to reflect the risks associated with this source of income
HK	Lower DSR + Lower LTV	
IE	No DTI + lower LTV	
IL	Same DSTI + lower LTV	Banks are allowed to recognise future income from rents in the event of an investment apartment or in the event that the borrower intends to rent the purchased apartment, while at the same time a leased apartment
IN	Third dwelling unit treated as commercial real estate with 75% risk weights. No LTV limits	
LU	Lower LTV limit	
NL	Same DSTI	No
NZ	Lower LTV + smaller speed limit	
SA	Same LTV as SSB[2]	
SG	Same DSTI + lower LTV	Yes, with 30% haircut
UK	No DTI. A type of the DSTI limit is applied	

BTL = buy-to-let investor; FTB = first-time buyer; SSB = second and subsequent buyer.

[1] As at end-July 2023. [2] Differentiation in measures the first property purchase and subsequent purchases. For example, the first property purchased qualifies for the FTB LTV limit, even if it is purchased as a BTL property.

Annex B   Members of the study group

Chair	Emmanuelle Assouan (Bank of France)
Reserve Bank of Australia	Marcus Robinson
National Bank of Belgium	Thomas Schepens
Bank of Canada	Brian Peterson
European Central Bank	Barbara Jarmulska
Bank of France	Marine Dujardin Edouard Vidon
Hong Kong Monetary Authority	Philip NG
Reserve Bank of India	Avdhesh Kumar Shukla
Central Bank of Ireland	Niamh Hallissey Fergal McCann
Bank of Israel	Ziv Naor
Bank of Korea	Jaehyun Park
Central Bank of Luxembourg	Sara Ferreira Filipe
Bank of Mexico	Calixto López Castañón
De Nederlandsche Bank	Lu Zhang
Reserve Bank of New Zealand	Chris McDonald
Saudi Central Bank	Ghaida Alshalan
Monetary Authority of Singapore	Aloysius Lim
Bank of England	Alexandra Varadi
Bank for International Settlements	Ryan Banerjee (Secretary) Philip Wooldridge

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The study group was chaired by Nathalie Aufauvre, formerly of Bank of France, from its establishment until December 2022.

Annex C   Country case studies

The accompanying country case studies are available on the BIS website:

Australia:	https://www.bis.org/publ/cgfs69_au.pdf
Belgium:	https://www.bis.org/publ/cgfs69_be.pdf
Canada:	https://www.bis.org/publ/cgfs69_ca.pdf
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