

Macroprudential Policy Frameworks and Tools

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Over the past decade, policymakers have increasingly used macroprudential tools to address a range of financial stability concerns. International institutions have identified and offered guidance on the components of an effective macroprudential framework, while noting the need for such a framework to be sufficiently broad to reflect differences in national circumstances. This article outlines key issues faced by policymakers in identifying and mitigating systemic risk and notes the flexible approach taken by Australia's regulatory agencies. In this context, macroprudential policy is seen as just one component of an effective financial stability framework.

Background

The global financial crisis has increased the focus of policymakers on financial stability risks. This focus has taken three broad forms: to collect the necessary data and develop early warning approaches in order to identify and monitor systemic risk in banking and other parts of the financial system; to put in place appropriate prudential and other financial sector regulations to enhance institutions' resilience to shocks; and to adopt macroprudential and other policies to contain system-wide risks. While macroprudential policies were used in some economies well before the crisis, they are a relatively new policy approach for many, especially advanced economies.

What is Macroprudential Policy?

While there is no universally accepted definition, most refer to macroprudential policy as the use of prudential actions to contain risks that, if realised, could have widespread implications for the financial system as a whole as well as the real economy; these risks are often referred to as systemic risks.¹

The actions generally involve employing a range of tools, such as caps on loan-to-value ratios (LVRs), to target particular sources of systemic risk. Systemic risk can build over time (the time dimension) or be related to the distribution of risk in the financial system (the cross-sectional dimension). In addition to addressing the sources of risk, macroprudential policy also aims to ensure that financial system resilience is proportionate to the level of risk.

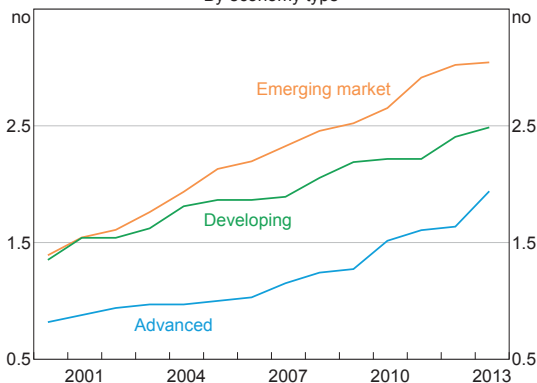
Macroprudential policy is often discussed separately from *microprudential* policy, with macroprudential policy seen as taking a system-wide and often time-varying approach to risk while microprudential policy is said to take an institution-specific approach, focusing on ensuring that individual financial institutions are resilient to shocks and apply appropriate risk management frameworks. However, these two policies generally complement and reinforce each other, since sound individual financial institutions support a stable financial system while a stable financial system supports the soundness of individual institutions (IMF 2013). Furthermore, there is a significant overlap between the tools used to achieve the objectives of microprudential policy and macroprudential policy; since they work through similar transmission mechanisms, it can be difficult to separate these two policies.

* This work was completed within Financial Stability Department.

¹ This definition reflects that used by many international bodies, including the International Monetary Fund. Note that non-prudential tools can also have implications for systemic risk, such as tax policies, capital controls and monetary policy.

The use of macroprudential tools has increased significantly since the early 2000s; the increased use in advanced economies in recent years is particularly noteworthy (Graph 1). In part this trend reflects the increased realisation that adverse developments in the financial system can in turn affect the real economy. Most recently, the increase in debt levels and in residential and other asset prices in many economies, largely associated with the low global interest rate environment since the onset of the financial crisis, has prompted an increased use of macroprudential policy to contain the potential risks to financial stability (Graph 2).

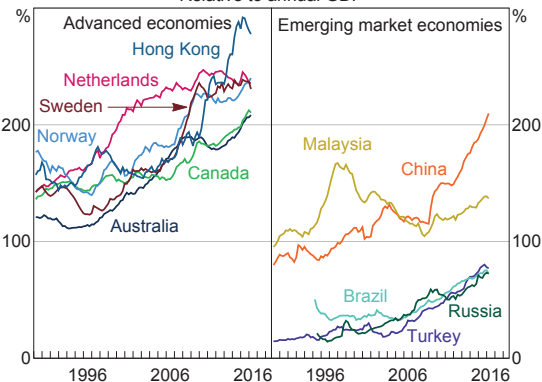
Graph 1
Use of Macroprudential Tools*
By economy type



* Use is measured by the average number of tools used per economy type; economy types are defined using the October 2016 IMF *World Economic Outlook* and World Bank publications

Sources: Cerutti, Claessens and Laeven (2015); RBA

Graph 2
Private Non-financial Sector Debt*
Relative to annual GDP



* Economy types are defined using the October 2016 IMF *World Economic Outlook* and World Bank publications

Source: BIS

Macroprudential Policy Frameworks

Macroprudential policy frameworks vary significantly across jurisdictions. Building on earlier work and the growing evidence from national experiences with these policies, in August 2016 the International Monetary Fund, Financial Stability Board and Bank for International Settlements released a report for the G20 that aimed to identify the elements of an effective macroprudential framework (see IMF, FSB and BIS (2016); hereafter referred to as the *Report*).² This work covers three components of jurisdictions' macroprudential frameworks: institutional arrangements; the approach to identifying and monitoring systemic risk; and the macroprudential toolkit.

Institutional arrangements

International work emphasises the importance of adequate institutional arrangements so that macroprudential policies can effectively mitigate systemic risk. Three key aspects are covered in the *Report*:

- Mandate.** A clear mandate for macroprudential policy is essential for reducing the risks of policy inertia. Across jurisdictions, there are three common models for assigning a macroprudential mandate: (1) to the board or governor of the central bank if the central bank is also the prudential supervisor; (2) to a committee within the central bank that also allows the participation of external authorities if the central bank holds both the monetary and macroprudential policy functions; and (3) to an inter-agency committee, usually chaired by the central bank or the ministry of finance, if the powers and financial stability mandates are spread across multiple authorities. Hence, in all three cases the central bank typically plays an important role in the macroprudential decision-making process, which the *Report* suggests is likely to reflect the expertise, incentive to take action and independence of central banks.

2 The earlier international work includes IMF, FSB and BIS (2011a, 2011b), CGFS (2012) and IMF (2013, 2014).

- *Powers.* Macroprudential authorities need sufficient powers to achieve their financial stability mandate. This means that these authorities need the powers to request information, develop and adjust regulatory instruments, designate certain institutions as systemically important and if necessary seek to expand their powers to cover financial institutions that lie outside the regulatory perimeter. The types of powers used vary from hard powers (e.g. implementing a macroprudential tool) to soft powers (e.g. providing a risk warning). Both types of powers are useful, though the *Report* notes that soft powers alone are unlikely to be sufficient.
- *Domestic cooperation.* Coordination problems can arise if the macroprudential policy mandate and/or powers are split across many authorities. Problems can also arise when the objectives of macroprudential policies are in conflict with the objectives of other policies that can affect financial stability (e.g. monetary policy). The international work suggests that inter-agency cooperation can be useful since it allows the relevant authorities to discuss different perspectives on systemic risks, possible tools and the potential for arbitrage opportunities across the various regulations being imposed on financial institutions. The *Report* notes that explicit mechanisms for cooperation and information-sharing can improve the effectiveness of macroprudential frameworks, including legal requirements, memoranda of understanding and inter-agency committee arrangements.
- aggregate credit and asset prices, such as the private sector credit-to-GDP gap, which some research has found to be a useful early warning indicator of financial crises and has been incorporated into the Basel III countercyclical capital buffer (CCyB) framework (BCBS 2010; Drehmann, Borio and Tsatsaronis 2011)³
- sectoral credit, such as housing credit growth
- maturity and foreign currency mismatches, such as the Liquidity Coverage Ratio (LCR) and the proportion of business debt denominated in foreign currency⁴
- concentration of risk measures, such as the size and interconnectedness of financial institutions
- resilience measures, such as leverage ratios, debt-service burdens and stress tests.

The international work provides two broad suggestions for monitoring systemic risk. The first is that authorities have a comprehensive and flexible framework to regularly monitor risks in the financial system as a whole. This should include monitoring risks that emanate from the non-bank financial sector as well as those arising from innovation in the financial system. The second is that authorities take into account the broader economic context when assessing the signal provided by their systemic risk indicators.

The macroprudential toolkit

As with the identification and monitoring of systemic risk, there is no single framework for choosing and calibrating specific macroprudential policy tools (MPTs). Past experiences suggest that a wide range of tools have been used to address systemic risk. In terms of choosing the appropriate tool, international work suggests that flexibility is needed since the effectiveness of different MPTs

Identifying and monitoring systemic risk

The international work emphasises that timely and appropriate policy decisions require macroprudential authorities to identify and assess systemic risks at an early stage. There is no single framework used across jurisdictions to do so. Rather, the *Report* presents the main types of indicators and approaches typically used by macroprudential authorities for this purpose, including:

³ The CCyB is a Basel III reform that aims to ensure that banking sector capital requirements take into account the macrofinancial environment in which banks operate.

⁴ The LCR is a Basel III reform that requires a bank to have an adequate stock of high-quality liquid assets that can be converted into cash easily and immediately to meet its liquidity needs for a 30-day liquidity stress scenario.

is not well understood at present, and probably depends on domestic circumstances. Nonetheless, the *Report* notes that establishing a comprehensive macroprudential toolkit *ex ante* can be useful since it can take some time to finalise the legal and operational features necessary to make use of some MPTs when they are most needed.

There are many options available and choices to make when it comes to calibrating policy responses to systemic risks, including which tools to use, how many tools to use, how targeted the tools should be and whether a gradual or more activist approach should be taken. Another important option is whether the policy response should be based on pre-defined rules or left more to the discretion of policymakers. While a rules-based calibration can in principle address policy inertia and potential political influences, it may not be sufficiently flexible to the shifting sources of risk and improvements in the understanding of the system over time, and could be prone to regulatory arbitrage. Instead, it is common across jurisdictions to use judgement when calibrating macroprudential policy responses; this is often referred to as ‘guided discretion’. Nonetheless, some jurisdictions are attempting to provide a more formal quantifiable approach to these decisions (e.g. Hong Kong’s indicative CCyB).⁵

Policymakers have many MPTs to choose from. The *Report* separates the MPTs commonly used across jurisdictions into four types:

- Broad-based capital tools: These are tools aimed at addressing vulnerabilities associated with a broad-based credit boom, such as dynamic provisioning requirements, the CCyB and time-varying leverage ratio caps.

- Sectoral capital and borrower-based tools: These are tools aimed at addressing vulnerabilities associated with specific sectors and asset markets. These tools include restrictions on borrowers such as caps on LVRs, debt-to-income ratios and debt-service-to-income ratios, as well as restrictions on lenders such as risk-weight floors and sectoral capital requirements.
- Liquidity-related tools: These are tools primarily aimed at addressing the build-up of liquidity and foreign-exchange risks associated with lending booms. They include reserve requirements, the LCR requirement, the Net Stable Funding Ratio (NSFR) requirement and caps on loan-to-deposit ratios.⁶
- Structural tools: These are tools aimed at addressing vulnerabilities from interconnectedness and limiting contagion. They include interbank exposure limits and additional loss-absorbing capacity for systemically important financial institutions.

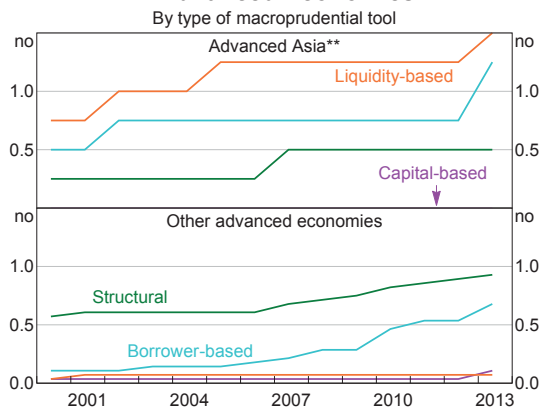
In general, the use of all four types of MPTs has increased across all types of economies over the past decade (Graph 3; Graph 4), though there are some notable differences in the use of MPTs across economies. Advanced Asian economies have made considerably more use of liquidity-based and borrower-based MPTs compared with other advanced economies, which have instead tended to rely more on structural tools (particularly limits on interbank exposures and on the concentration of lending). The use of borrower-based tools such as LVR limits has also increased sharply of late in the advanced economies. Emerging market and developing economies make extensive use of structural tools, though unlike many advanced economies outside Asia, they rely on liquidity tools and capital-based tools as well.

The greater use of liquidity-based and capital-based MPTs in emerging market and developing

5 Hong Kong’s CCyB decisions are guided by its Initial Reference Calculator (IRC). The ‘composite CCyB guide’ is calculated as 1.1 times the simple geometric mean of the credit-to-GDP gap and the residential property price-to-rent gap. The ‘indicative CCyB ceiling’ sets thresholds of stress based on the interbank market spread and average loan quality that are mapped to a maximum CCyB rate. The IRC rate is then taken as the lower of the composite CCyB guide and the indicative CCyB ceiling, though the authorities can choose to diverge from the IRC buffer guide.

6 The NSFR is a Basel III reform that aims to match the duration of banks’ liabilities and assets more closely by comparing liabilities considered stable (such as deposits and long-term debt) with longer-term assets (such as loans).

Graph 3
Use of Macroprudential Tools
in Advanced Economies*

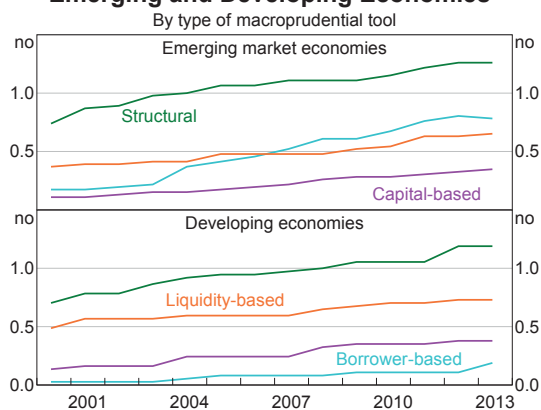


* Use is measured by the average number of tools used per economy type; advanced economies are defined using the October 2016 IMF *World Economic Outlook*

** Advanced Asia includes Hong Kong, Japan, Singapore and South Korea

Sources: Cerutti, Claessens and Laeven (2015); RBA

Graph 4
Use of Macroprudential Tools in
Emerging and Developing Economies*



* Use is measured by the average number of tools used per economy type; economy types are defined using the October 2016 IMF *World Economic Outlook* and World Bank publications

Sources: Cerutti, Claessens and Laeven (2015); RBA

economies compared with many advanced economies could be attributed to their greater exposures to external shocks, such as volatile capital flows, and their less liberalised financial systems (Claessens 2014). That said, the use of some of these tools can sometimes be motivated by reasons other than financial stability concerns. The main example of this is reserve requirements, which can

be used to supplement or substitute monetary policy to reduce capital inflows and manage the exchange rate (Montaro and Moreno 2011; Blundell-Wignall and Roulet 2014). The greater use of borrower-based tools in advanced economies could reflect their more developed mortgage markets, which have been an increasing source of concern for financial stability in the ongoing low global interest rate environment (Cerutti, Claessens and Laeven 2015).

Potential Challenges of Macroprudential Policy

The international work, including the *Report*, alongside that of academic and other commentators, has discussed a number of challenges that macroprudential authorities face when designing policy frameworks and employing MPTs. These challenges include: measuring the effectiveness of MPTs; the potential for leakage and spillovers; the interaction between MPTs and other policies; and the limited experience with relaxing or deactivating time-varying MPTs.

Measuring effectiveness of macroprudential tools

To date, the evidence on the effectiveness of MPTs is mixed.⁷ The *Report* highlights several themes that appear in the literature. Aggregate and sectoral capital-based tools appear to support financial system resilience and promote credit growth in economic downturns, though there is only limited evidence that these tools dampen the pace of credit growth once a credit boom has started. On the other hand, borrower-based tools appear to dampen credit growth and increase borrower resilience, though there is limited evidence that these tools affect the pace of housing price growth. The effects of most liquidity-related tools (e.g. LCR, NSFR) are as yet unknown since they are relatively

⁷ For recent work on the effectiveness of macroprudential tools, see Claessens (2014), Akinci and Ohmstead-Rumsey (2015) and Cerutti *et al* (2015).

new. Notwithstanding these themes, the *Report* acknowledges that there is no consensus in the literature on which tools are the most effective and under what circumstances. This makes it challenging for the relevant macroprudential authority to know which, if any, of the tools it should implement.

The mixed evidence on the effectiveness of MPTs to date could arise from a number of factors:

- There is only a *relatively short sample period* in which MPTs have been widely used, particularly in advanced economies and for certain types of tools. This makes it challenging to find statistically significant evidence for or against their effectiveness. Moreover, if some tools are only effective under certain circumstances, it will be difficult to show their effectiveness since a wide range of country experiences with MPTs would first be needed to establish statistical significance.
- *The overall aim of macroprudential policy – financial system stability – cannot be mapped into a clear single target.* A multiplicity of intermediate targets has been proposed, including: sufficient levels of bank capital; sound liquidity and risk management; prudent lending standards; and robust crisis resolution frameworks. However, it is not clear how these intermediate targets translate to the ultimate goal of financial stability. As a result, financial stability cannot be quantified in a precise manner, making the effectiveness of MPTs in terms of their contribution to the degree of financial stability difficult to measure.
- *MPTs are many and varied and their transmission mechanisms to achieve the various intermediate targets are largely unknown.* Not only is the mapping from intermediate target to the ultimate goal unclear, but so is the relationship between particular MPTs and achievement of these intermediate targets. Combining this with the use of multiple MPTs and the potential for the transmission channels of these tools to interact causing unintended consequences

highlights the complexity involved in measuring the effectiveness of individual tools.

- *It is difficult to isolate the effects of MPTs.* Many of the intermediate objectives that the tools aim to achieve will also be influenced by other policies, domestic circumstances, and economic and financial developments, making it challenging to disentangle the effects of different MPTs from these other influences.

Overall, this section highlights that there is still considerably more work to be done in this space. As more experiences with macroprudential policy are collected across different jurisdictions, transmission mechanisms of the tools are better understood and the effects of these tools assessed over a longer period, the body of research on their effectiveness will expand. As a result, policymakers should find it easier over time to know which tools are likely to be most appropriate for their circumstances.

Leakage and spillovers

There is evidence that MPTs can result in leakage, both within and across jurisdictions, which further complicates the measurement of their effectiveness. In terms of cross-border leakage, Aiyar, Calomiris and Wieladek (2014) find that one-third of the fall in lending resulting from higher bank capital requirements in the United Kingdom was offset by lending by foreign branches that were exempt from the requirements. An example of both cross-border and domestic leakage is the implementation of a cap on bank credit growth in Croatia in 2003, which slowed bank credit growth but was accompanied by a strong rise in the growth of foreign borrowing as well as loans and financial leases provided by domestic leasing companies (Galac 2010). On the other hand, there has been little evidence of leakage from New Zealand’s 2013 LVR limits on mortgage lending (OECD 2015). While all types of MPTs can experience leakage, the *Report* notes that leakage from borrower-based tools is more easily contained than for capital-based tools. In addition to leakage, MPTs could also have undesirable

spillovers if financial institutions respond by shifting their risky activities into other jurisdictions or other domestic industries.

Given the potential for leakage and spillovers, international work has emphasised the importance of jurisdictions monitoring all areas of the financial system, taking actions to contain domestic risks and considering the potential for negative cross-border and domestic effects when designing and calibrating their tools. In addition, the international work has noted the potential for collaboration on macroprudential policy to help address leakage and undesirable spillovers, including reciprocity arrangements such as those agreed for the Basel III CCyB. Some integrated regions, such as the Nordic countries and the euro area in general, have sought to address the impact of cross-border leakage and spillovers by establishing reciprocity arrangements for MPTs as well as mechanisms to monitor regional risks.

Interaction with other policies

It is uncertain how macroprudential policies should best be used in the context of other policies.

As discussed in IMF (2013), fiscal and monetary policies, among others, can also affect financial stability and either complement or conflict with macroprudential policy. For example, expansionary monetary policy promotes additional risk-taking, which could increase systemic risks even when they are already high. As a result, the macroprudential authority needs to consider how its policy objectives are affected by the stance of other policy tools (and vice versa for other policymakers). The *Report* suggests that some form of coordination between policymakers may be needed to resolve any significant tensions between macroprudential policies and other policies (e.g. inter-agency committee arrangements). More research on the interactions of macroprudential policy and other policies as well as more experiences of coordination should help alleviate this challenge to some extent.

Relaxing tools

There are relatively few experiences to date of relaxing time-varying MPTs once the risk is assessed to have diminished (Cerutti *et al* 2016). This skew towards tightening could reflect the ongoing low interest rate environment and may change once the data collected span a full financial cycle. However, it could also reflect the challenges that macroprudential authorities and other policymakers face when determining the appropriate conditions and strategies for the relaxation of MPTs, especially given the challenges in quantifying a decline in the degree of systemic risk and related biases towards maintaining measures intended to enhance resilience in the absence of clear evidence that the risks have receded. Notably, there could be significant costs to relaxing tools too early or too late (CGFS 2012; IMF 2014); relaxing a tool too early could lead to a further build-up in financial imbalances, while relaxing a tool too late could exacerbate a slowdown in credit and economic activity.

An Australian Perspective

The relevant agencies consider the Australian regulatory framework to be consistent in broad terms with the guidance provided by the international work, though in some respects Australia has a less formal framework than many other economies. The Australian framework includes: a shared responsibility for financial stability across regulatory agencies with effective coordination arrangements; clear mechanisms for identifying and monitoring systemic risk; and a number of policy tools available to contain systemic risk, including supervisory tools. In particular, the Australian authorities have taken a holistic approach, seeing macroprudential policy as being subsumed within a broad and comprehensive financial stability policy framework that is backed by inter-agency cooperation and coordination. Furthermore, the Australian Prudential Regulation Authority (APRA) modifies the intensity of its prudential and supervisory tools in line with variations in the level

of institution-specific risks as well as overall systemic risks. This framework is viewed as having been effective to date in helping to mitigate systemic risk; the policy actions taken in late 2014 to shore up prudent residential housing lending standards is a recent example as outlined below.

Macprudential policy within the Australian financial stability framework

Four main agencies play a role in managing financial stability. APRA is the primary regulator of financial institutions and has an explicit statutory financial stability mandate. It supervises a range of institutions including banks and other deposit-taking institutions, sets prudential standards and holds a wide range of directive and resolution powers. It is also the only agency with the power to directly change the behaviour of financial entities, and hence the majority of the tools for macroprudential policy in Australia can only be exercised by APRA. The Reserve Bank of Australia provides liquidity to the financial system, has regulatory powers over clearing and settlement facilities and the payments system, and incorporates financial stability assessments in its monetary policy decision process and publications. The Australian Securities and Investments Commission (ASIC) is the corporate regulator, promotes market integrity and helps to ensure sound consumer protection laws, including within the financial sector. The Australian Treasury provides advice to the government on public legislation and enacting the Treasurer's powers. The actions of these four agencies in promoting the stability of the Australian financial system are coordinated by the Council of Financial Regulators (CFR), which is chaired by the Reserve Bank Governor. The CFR serves as a discussion and information-sharing forum for its four members and as a means of coordinating macroprudential and other regulatory actions, though it has no regulatory functions or powers apart from those of its individual members.

APRA and the Reserve Bank undertake a variety of analyses to assess systemic risk. Both agencies use a broad range of information to detect emerging vulnerabilities and risks to the financial system, including individual institution credit, balance sheet and other data, macroeconomic and asset price indicators and behavioural indicators (e.g. measures of risk appetite). Lending standards and the capacity of borrowers to service their debts receive particular attention. In carrying out its duties, APRA takes an industry-wide or systemic perspective, consistent with its financial stability mandate. For example, APRA's risk-based approach subjects institutions that pose greater systemic risks to more intensive supervision and APRA can apply higher capital or other prudential requirements on a financial institution of concern.⁸ APRA also undertakes 'bottom-up' system-wide stress testing and the Reserve Bank is currently developing a 'top-down' system-wide stress testing framework. This approach to detecting financial stability risks helps to ensure that a broad range of indicators and developments is taken into account in order to determine where the most significant risks lie.

In terms of policy actions to mitigate the identified risks, both agencies see macroprudential policy as inseparable from microprudential policy. In essence, effective policy measures to mitigate financial stability risks are seen as ensuring ongoing good *microprudential* supervision as much as *macroprudential* policy. The framework is therefore not just about regulation, but also ongoing supervision at an institutional level that takes into account a macro perspective (including the supervision of lending standards and practices).⁹ Against this background, APRA can use a variety of tools to address systemic risk, including its supervision and its prudential tools. APRA's toolkit includes the CCyB, which has an explicit macroprudential focus in line with the Basel

⁸ For further details, see RBA and APRA (2012).

⁹ For further rationale and details of this approach, see Edey (2012), Ellis (2012, 2014) and RBA and APRA (2012).

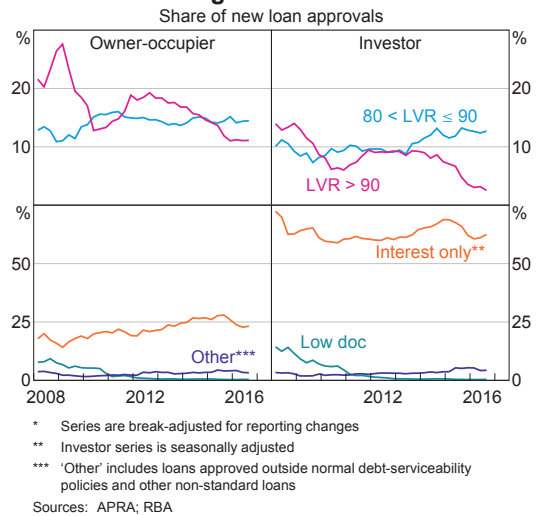
framework, and other measures such as the LCR and the capital buffers for domestic systemically important banks. APRA also has the ability to alter the behaviour of regulated entities through its advisory capacity, communication with individual entities and industry, public commentary and its directive powers. The complementary instruments available to the Reserve Bank in pursuing its financial stability objective include the use of its role as liquidity provider to the financial system. The Bank also recognises that the setting of macroeconomic policies needs to be informed by financial stability developments, and financial stability assessments are therefore regularly incorporated into its decision-making processes. Public discussion of these assessments in the semiannual *Financial Stability Review* also aims to help shape the risk assessments and decisions of households and firms.

An example in the context of Australia

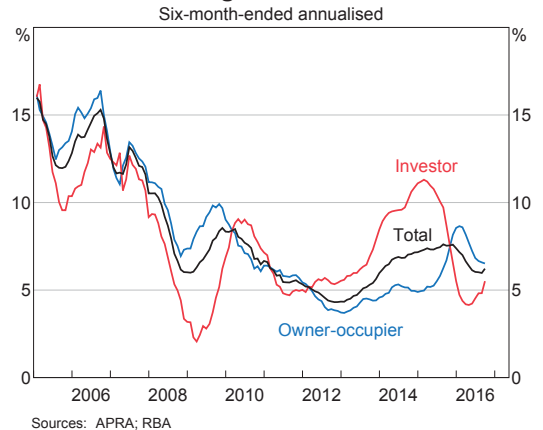
A recent example of the interaction between supervisory and macroprudential policy is the approach taken by the Australian regulators in late 2014 to reinforce residential housing lending practices. At that time, a number of trends were raising concerns about the level of risk-taking by banks and other financial institutions as well as households in the housing market. In particular, aided by lower funding costs, price competition in the mortgage market had intensified, with lenders extending larger discounts on their advertised variable rates and broadening the range of borrowers that received these discounts. In this climate, the characteristics of new loan approvals suggested that some non-price lending terms had started to be relaxed. For instance, the share of new loans extended by authorised deposit-taking institutions (ADIs) on interest-only terms to owner-occupiers and investors had been drifting up (Graph 5). These loans tend to amortise more slowly than principal and interest loans, which increases the risk of borrowers moving into a negative equity position (and being more likely to default)

in the event of a decline in nominal housing prices. In addition, investor lending had increased sharply, with investor loan approvals in New South Wales more than doubling since 2012. Nationally, investor housing credit growth had picked up to over 10 per cent in six-month annualised terms (Graph 6) and housing price growth in Sydney and Melbourne had been strong. This was cause for some concern since investors are likely to induce a more pronounced cycle in housing prices than would otherwise occur, in part because they face fewer barriers to exit when the housing market

**Graph 5
ADIs' Housing Loan Characteristics***



**Graph 6
Housing Credit Growth**



turns down (Haughwout *et al* 2011; RBA 2015). Any subsequent downswing could have posed risks to the housing market and household balance sheets overall, not just those of the recent investors. While these risks were largely macroeconomic in nature, risks to the financial sector were also increasing.

Against this background, APRA and ASIC announced a number of prudential and supporting supervisory measures to address the growing risks being undertaken by the banking sector and households. These actions were taken following discussions within the CFR, and built on increased supervision and communication on housing market risks that had already been undertaken by the CFR member agencies at the time. In particular:

- In December 2014, APRA advised that:
 - (i) supervisors would be alert to annual growth in a bank's investor housing lending above a benchmark of 10 per cent; (ii) serviceability assessments for new mortgage lending should include interest rate buffers of at least 2 percentage points above the effective variable rate applied for the term of the loan, and a minimum floor assessment rate of at least 7 per cent to allow borrowers to accommodate future increases in interest rates; and (iii) supervisors would be alert to high levels of higher-risk mortgage lending, such as lending with a high LVR and/or loan-to-income ratio and lending to owner-occupiers with lengthy interest-only periods. In contrast to the approach used in other countries, these benchmarks were not intended to be 'hard' limits. However, where a bank was not maintaining a prudent approach to housing lending practices and/or where a bank's growth in investor lending materially exceeded APRA's stated 10 per cent benchmark, these could serve as a trigger for more intense supervisory action, potentially including additional capital requirements.
- At the same time, ASIC announced that it would undertake a loan review to determine whether lenders' interest-only housing lending practices complied with responsible lending obligations.

This included the condition that new borrowers do not overstretch themselves to purchase property or rely on expectations of future increases in housing prices to enable them to do so. The results of this review indicated several instances where this and other conditions had not been met. ASIC followed up with a review of large mortgage broker lending practices in September 2016.

- In early 2015, APRA undertook the first of several 'hypothetical borrower' exercises, which required lenders to provide serviceability assessments for two hypothetical owner-occupier borrowers and two investor borrowers. The results revealed large variability in lending limits and serviceability practices across the industry. Partly in response to these concerns, APRA stepped up the intensity of its supervisory activities by:
 - (i) increasing its analysis of lenders' underwriting standards, including strengthening household income definitions in pre-loan serviceability calculations (e.g. applying a discount to some income such as bonuses and overtime) and presenting its concerns to the chief risk officers and senior management of banks; (ii) tightening requirements around interest-only lending; and (iii) conducting onsite reviews of past and new loan documents to spotlight additional areas where stronger actions are needed to enhance resilience.
- In late 2016, APRA put out for public consultation a revised *Prudential Practice Guide* that formalised the recent tightening of standards on serviceability buffers and interest-only lending for residential mortgages (APRA 2016).

Lenders have since announced many changes to a range of price and non-price lending terms and conditions to strengthen their lending practices in response to supervisory expectations. In particular, interest rates for both new and existing investor loans were increased,¹⁰ high-LVR lending

¹⁰ There is now a differential between the indicator rate for owner-occupier and investor housing loans for the first time since 1996.

(above 90 per cent) was further reduced (for new loans) and serviceability criteria for housing loans were tightened across a range of metrics.¹¹ By April 2016, the pace of investor housing credit had declined from its recent peak of about 11 per cent to just below 5 per cent on a six-month annualised basis (Graph 6).¹² Nonetheless, loan approvals for investor housing have increased over recent months, accompanied by an increase in housing price growth, driven by Sydney and Melbourne in particular. Even so, the earlier tightening in lending standards has helped to increase the resilience of household sector balance sheets, and hence also those of lenders, as new borrowers should be better placed to withstand any adverse shocks to income or decline in housing prices than would otherwise have been the case.

Conclusion

With the use of macroprudential policy increasing, international institutions have been monitoring and examining international experiences with macroprudential frameworks and tools as well as the potential lessons from these experiences. To date, this work has indicated that a range of frameworks and practices have been used to manage the systemic risks faced by each jurisdiction. In addition, policymakers face a number of challenges when designing macroprudential frameworks and employing macroprudential tools; as more experience with these frameworks and tools is gained, some of these challenges may diminish. In Australia, the relevant agencies have found that the use of a macroprudential focus within their broad regulatory and supervisory

approach has helped to underpin an effective framework and thereby enhance the overall level of financial stability. ✎

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¹¹ For details, see RBA (2015).

¹² The risk of leakage through non-ADI originators is expected to be limited, given that these lenders are a small part of the market and they have limited scale and capacity to write large volumes of loans. They also rely on warehouse funding from banks, which regulators are monitoring. Reports from liaison also suggest that there is unlikely to be sufficient appetite from institutional investors to absorb any material increase in the issuance of residential mortgage-backed securities, which are the originators' main source of funding, though this is an area that will receive ongoing attention.

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