

1 Macroprudential policy in Emerging Asia: Recent developments and challenges

Countries in Emerging Asia experienced a build-up of risks with stability of financial systems, particularly in the period leading up to the global financial crisis. This chapter aims to provide a comprehensive overview of countries' experiences with various types of macroprudential measures. It also discusses some of the present challenges in this area of policy.

Introduction

Several countries in Emerging Asia accumulated significant financial imbalances in the periods leading up to the Asian financial crisis of 1997-98 and the global financial crisis of 2007-08. In response to the experience of these crises, substantial efforts have been deployed in Emerging Asian countries to enhance the policy toolkit for dealing with systemic risks.

In addition to strengthening their macroprudential policy frameworks, some countries in the region have established dedicated institutions. Indeed, financial stability committees have been set up in several countries. These include the Financial System Stability Committee in Indonesia, the Financial Stability Executive Committee in Malaysia, the Financial Stability Coordination Council in the Philippines, the Management Financial Stability Committee in Singapore, and the Financial Stability and Development Council in India.

More recently, a number of macroprudential policy tools have been embedded in national legislation in Emerging Asian countries, transposing the Basel III regulatory standards into local law. The macroprudential tools covered by legislation in Emerging Asia include a wide range of instruments, such as minimum capital requirements and capital buffers, leverage ratios, liquidity requirements, borrower-based measures, and other means of tightening up lending standards. They also include limits on credit growth, provisioning requirements, and taxes for macroprudential purposes.

Notwithstanding the progress made in Emerging Asia in the development of institutions and the implementation of various macroprudential measures, relatively little is known about the practicalities and effectiveness of these tools. Against this background, this chapter aims to provide a comprehensive overview of countries' experiences with the various types of macroprudential measures that they have sought to implement.

In this chapter, after briefly reviewing the basic concept of systemic risk and its sources, the first section illustrates Emerging Asian countries' macroprudential policy activism in the aftermath of the Asian and global financial crises, reviewing some of the benefits and costs of macroprudential policy. The second section zooms in on the various macroprudential tools that have been implemented over time in the region, providing a detailed overview of policy actions and their character (i.e. tightening versus loosening). This overview also features a chronological dimension, as it captures the entire history of any given measure, starting with its implementation. This chapter also discusses some of the challenges inherent to this policy area. One key challenge is the need to take account of the various interactions between macroprudential and monetary policies. It is also crucial to evaluate whether, and to what extent, the implementation of macroprudential policy may have unintended consequences (e.g. cross-border spillovers, or giving rise to moral hazard). Finally, the role of macroprudential policy during times of large external shocks also merits particular attention.

Macroprudential policy: Tools and frameworks

Macroprudential policy as a complement to microprudential policy

The global financial crisis and its aftermath led to a new emphasis on macroprudential policy as a means of addressing systemic risk. After the crisis, it became clear that microprudential policy alone could not cope with system-wide financial distress. Indeed, micro- and macroprudential policies are different in many respects (Table 1.1). In general, the main objective of macroprudential policy is to tackle systemic financial distress, while the scope of microprudential policy is focused on individual financial institutions. While the design of macroprudential policy takes into account correlations and common exposures among financial institutions, microprudential policy focuses on risks at the level of individual financial institutions. For

instance, fire sales provide an illustrative example of divergence between micro- and macroprudential objectives.

Table 1.1. Comparison between micro- and macroprudential regulation

	Microprudential	Macroprudential
Objectives	Ensure the soundness of individual financial institutions.	Preserve financial stability.
Actions/behaviour to be tackled by prudential regulation	Excessive risk-taking.	Excessive systemic risk.
	Hide risk in tail.	Herding or irrational fashions.
	Gambling for resurrection (i.e. excessive risk-taking by banks).	Create tails.
	Diversification.	Diversity.
Policy tool	<ul style="list-style-type: none"> • Risk-based quantitative instruments that establish capital and liquidity requirements for individual institutions. • Effective supervisory powers over institutions (e.g. licensing, governance, risk management, sanctions and powers to take corrective actions). • Capture risk in isolation (Value at Risk, or VaR). 	<ul style="list-style-type: none"> • Prudential instruments built to have an impact on the procyclicality of the financial system (e.g. countercyclical capital buffers), or on the contribution of a financial institution to systemic risk (e.g. surcharges for systemically important financial institutions). • Prudential instruments to address a build-up of systemic risk in specific segments of the market (such as loan-to-value ratios) and instruments aimed at constraining general or specific leverage in non-financial sectors (such as debt-to-income ratios). • Tools to address systemic liquidity concerns. • Capture risk of system (Conditional Value at Risk, or CoVaR).
Fallacy of composition	Fire sale of assets is micro-prudent.	Fire sale is not prudent in aggregate.
	Deleveraging to meet capital or liquidity requirements is micro-prudent.	Need to raise equity, not to sell assets or renew loans.
	Individual bank run.	Credit crunch and drying up of aggregate liquidity.

Source: OECD Development Centre's compilation based on Freixas, Laeven and Peydro (2015^[1]), *Systemic Risk, Crises, and Macroprudential Regulation*, <https://mitpress.mit.edu/books/systemic-risk-crises-and-macroprudential-regulation>; Osinski, Seal and Hoogduin (2013^[2]), "Macroprudential and Microprudential Policies: Toward Cohabitation", *IMF Staff Discussion Notes*, No. 13/5, <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/Macroprudential-and-Microprudential-Policies-Toward-Cohabitation-40694>.

One can observe synergies between micro- and macroprudential policy, but sometimes conflicts may arise between the respective objectives of these two policy functions. In theory, microprudential supervision and macroprudential policy work hand in hand. However, tensions can appear, especially at times of crisis. In such a situation, microprudential governance would encourage banks to increase their capital and restrict the granting of loans, while macroprudential policy would recommend that institutions reduce the capital buffers built up during the period of expansion, in order to avoid credit rationing and thus to prevent a slowdown in activity. A summary of how micro- and macroprudential policy actions differ throughout the financial cycle is provided in Table 1.2.

Table 1.2. Typical micro- and macroprudential policy reactions at different stages of the financial cycle

Phase in the financial cycle	Characteristics of phase in the financial cycle	Microprudential objective and actions	Macroprudential objective and actions
Boom	Strong credit and asset price growth, higher risks, high returns, over-optimism, weakening of underwriting standards, expansive leveraging.	No need to intervene, as banks are highly profitable and can replenish capital and liquidity if needed. Intervention in underwriting standards to probe the desirability of more marginal and “frothy” deals.	Address causes of systemic risk, correct excessive imbalances and/or strengthen financial system resilience. Build up strong counter-cyclical capital and liquidity buffers.
Bust (type-I), resulting in no crisis	Slowdown in credit growth, stable or falling asset prices, lower returns, no confidence lost.	Preserve stability of financial institutions. Stabilise (or increase selectively) capital and liquidity ratios; some restrictions on dividends, more scrutiny.	Avoid serious deleveraging. Release countercyclical capital and liquidity buffers built during good times.
Bust (type-II), resulting in crisis	Deleveraging, substantial fall in asset prices due to fire sales, substantial financial losses, loss of confidence.	Regain confidence in institutions. Increase capital and liquidity ratios because previous minimum was wrong compared to risk. Extensive scrutiny and possible forbearance.	Regain confidence in financial system and avoid deleveraging. Decrease capital and liquidity buffers (if lower levels are deemed sufficient), or increase them if they are the source of lack of confidence.
Recovery	Cautious re-leveraging; moderate credit and asset price growth.	Maintain capital and liquidity ratios rebuilt during crisis, or increase them if needed.	No need to intervene.

Source: Osinski, Seal and Hoogduin (2013^[2]), “Macroprudential and Microprudential Policies: Toward Cohabitation”, *IMF Staff Discussion Notes*, No. 13/5, <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/Macroprudential-and-Microprudential-Policies-Toward-Cohabitation-40694>.

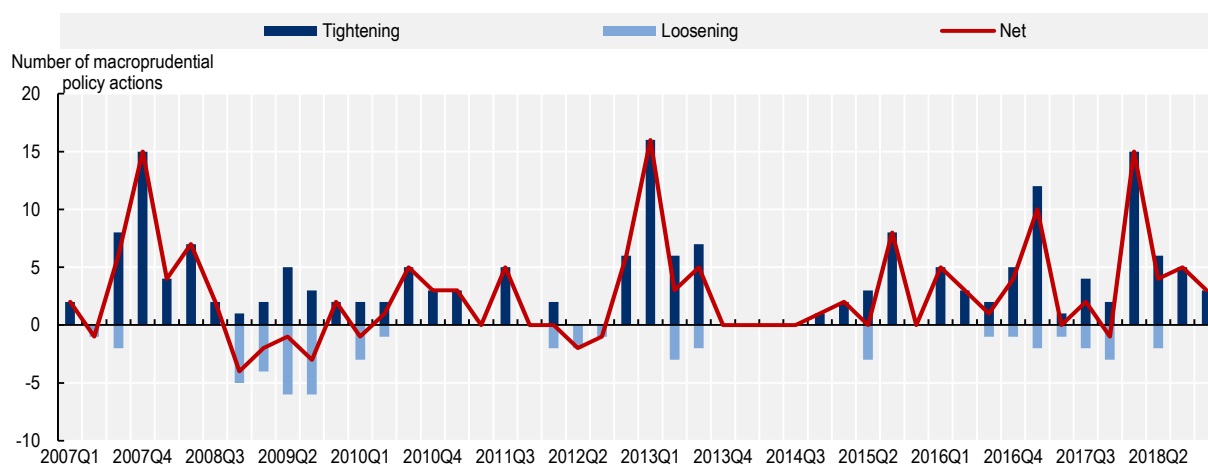
Returning to the overarching objective of macroprudential policy, which is to address systemic risk, various definitions of what constitutes systemic risk have been proposed. According to one of these, it is the risk that financial instability significantly impairs the provision of necessary financial products and services by the financial system to a point where economic growth and welfare may be materially affected (ECB, 2009^[3]). Notwithstanding the complexity of the phenomenon, three main forms of systemic risk can be highlighted. First, contagion risk captures the possibility that an idiosyncratic problem becomes more widespread (i.e. the failure of a bank causes the failure of another bank). The second form of systemic risk refers to a widespread exogenous shock that negatively affects a range of intermediaries and/or markets in a simultaneous fashion (i.e. banks tend to be vulnerable to economic downturns). The third type of systemic risk refers to the endogenous build-up of widespread imbalances in financial systems over time, as in the case of a lending boom (ECB, 2009^[3]).

Developments in macroprudential policy implementation in Emerging Asia

In light of the adverse developments preceding the global financial crises, policy authorities in Emerging Asia have enacted various macroprudential measures to ensure the stability of the financial system as a whole, to increase banks’ resilience to shocks, and to reduce the build-up of systemic risk. Several macroprudential policy instruments are currently embedded in various pieces of national legislation across the region, transposing the Basel III reform package. These are mainly capital-based instruments aimed at increasing banks’ resilience to macro-financial shocks, but they also include measures targeting banks’ levels of leverage and liquidity. Alongside these recent developments, the use of macroprudential policy tools in Emerging Asia has been growing more robust. A number of countries in the region have implemented various types of macroprudential measures to increase the resilience of the financial system,

and to prevent or mitigate the further build-up of risks related to housing markets and household indebtedness. On an aggregate level, the macroprudential stance in Emerging Asia has undergone a tightening in recent years for the most part (Figure 1.1). These findings are in line with the empirical evidence provided in Kim (2019^[4]), who concludes that tightening actions have been more frequent than loosening actions in a sample of 11 Emerging Asian economies since 2000. This tightening mostly occurred in response to rapid credit expansion in the sample countries. According to the same study, tightening actions were implemented more frequently after the global financial crisis than prior to it. Meanwhile, macroprudential policy was counter-cyclical in most economies, meaning that it tightened as credit expanded (Kim, 2019^[4]).

Figure 1.1. Number of tightening and loosening macroprudential policy actions and overall policy stance in selected Emerging Asian economies, Q1 2007 to Q4 2018



Note: Data capture the number of macroprudential policy actions implemented during the respective quarter in all member countries of the Association of Southeast Asian Nations (ASEAN), with the exception of Myanmar, and the addition of China and India. Data capture both tightening and loosening actions. Policy tightening is defined as the activation of a new measure or an amendment to an existing measure, in the sense of rendering it stricter. Policy loosening is defined as the deactivation of an existing measure or an amendment to an existing measure, in the sense of rendering it less strict. 'Net' is computed as the difference between the number of tightening actions and the number of loosening actions. The figure should be interpreted with caution, as the number of macroprudential policy actions implemented does not necessarily give an indication of drastic reform.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-arear.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

StatLink  <https://stat.link/z91flu>

Several changes in the systems of prudential regulation have occurred in the aftermath of the global financial crises. Indeed, policy makers in Asian countries have come under considerable pressure to raise prudential standards. After successive interventions, in particular, after global financial crises, a wide range of macroprudential measures is now in place in Emerging Asian countries (Table 1.3). The macroprudential policy toolkit is comprised of a wide variety of instruments, most notably in China, India, Malaysia, the Philippines and Singapore. By contrast, policy makers in Lao PDR have focused mostly on tackling risks stemming from foreign exchange exposures, while in Viet Nam they have focused mostly on credit growth.

Table 1.3. Overview of macroprudential measures currently in place in selected Emerging Asian economies

	Brunei Darussalam	Cambodia	China	India	Indonesia	Lao PDR	Malaysia	Philippines	Singapore	Thailand	Viet Nam
Capital buffers and other capital requirements											
Basel III countercyclical capital buffer			•	•	•		•	•	•	•	
Basel III capital conservation buffer			•	•	•		•		•	•	
Other capital requirements ¹			•	•			•	•		•	
Measures targeting the leverage of banks											
Basel III leverage ratio			•	•	•		•	•	•		
Requirements on loan-loss provisioning											
Dynamic provisioning			•	•				•			
Measures targeting liquidity, foreign exchange exposures, and currency mismatches											
Liquidity ratios ²		•	•	•	•		•	•	•		
Limits to the loan-to-deposit ratio					•						
Limits on foreign exchange positions ³		•		•	•	•					
Limits on credit growth and volume, and other restrictions on loan characteristics											
Limits on the growth and volume of credit ⁴	•		•	•							•
Other restrictions on loan characteristics ⁵	•	•	•		•		•	•	•		
Borrower-based measures											
Limits to loan-to-value ratios ⁶	•		•	•	•		•	•	•	•	
Limits to debt-service-to-income ratio or loan-to-income ratio ⁷	•		•	•			•		•	•	
Other measures with macroprudential character											
Taxes applied to transactions, assets or liabilities			•				•		•		
Reserve requirements for macroprudential purposes	•	•	•	•	•		•	•			
Other measures ⁸	•								•		

Notes: Data are as of 30 April 2021. Data for Myanmar are not available.

1. Including risk weights, systemic risk buffers and minimum capital requirements.
2. Including liquidity coverage ratios, liquid assets ratios, net stable funding ratios, core funding ratios and external debt ratios that do not distinguish between currencies.
3. Including limits on net or gross open foreign exchange positions, limits on foreign exchange exposures and foreign exchange funding, and restrictions on currency mismatches.
4. Including limits on the growth and volume of aggregate credit, credit to the household sector, credit to the corporate sector, and penalties for high credit growth.
5. Including limits on loan maturity, size and type of interest rate, or restrictions depending on bank characteristics (e.g. mortgage banks).
6. Including loan-to-value ratios targeted at housing loans, consumer loans and commercial real estate loans.
7. Including debt service-to-income and loan-to-income limits targeted at housing loans, consumer loans, and commercial real estate loans.
8. Including limits on single client exposures or other restrictions on housing loans.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; information from the Basel Committee on Banking Supervision's website (<https://www.bis.org/bcbs/ccyb/>); and national sources.

Evidence of the economic impact of macroprudential policies

Before implementing new macroprudential policy measures, it is always crucial for policy makers in Emerging Asia to conduct a thorough impact assessment. A useful starting point in this regard would be

the ideas that emerge from the theoretical and empirical literature on how changes in macroprudential regulation impact the banking sector and the real economy (Table 1.4). Many studies document the benefits of macroprudential policy in fostering financial stability. This can be defined as limiting the build-up of vulnerabilities in the financial system in order to mitigate systemic risk (Belkhir et al., 2020^[6]; Klingelhöfer and Sun, 2019^[7]; Martinez-Miera and Repullo, 2019^[8]; Wong et al., 2011^[9]; Ahuja and Nabar, 2011^[10]). On the other hand, another strand of literature documents the trade-offs between the financial stability objective of macroprudential policy, and various other outcomes. For instance, liquidity requirements are shown to decrease systemic risk, but at the cost of lower efficiency (Aldasoro, Delli Gatti and Faia, 2017^[11]).

Table 1.4. Summary of selected evidence of the benefits and costs of macroprudential policy

Type of macroprudential tool	Study	Impact on selected outcome variables of a tightening measure
Minimum capital requirements	Thakor (1996 ^[12])	Credit growth ↓
	Concetta Chiuri, Ferri and Majnoni (2001 ^[13])	Credit growth ↓
	Concetta Chiuri, Ferri and Majnoni (2001 ^[14])	Credit growth ↓
	Bridges et al. (2014 ^[15])	Lending for commercial real estate, other corporates and household secured lending ↓ Small and insignificant impact on household unsecured lending
	Huang and Xiong (2015 ^[16])	Credit growth ↓
	Akinci and Olmstead-Rumsey (2018 ^[17])	Credit growth ↓
	Roulet (2018 ^[18])	Credit growth ↓
	Fang et al. (2020 ^[19])	Credit growth ↓
	Garcia Revelo, Lucotte and Pradines-Jobet (2020 ^[20])	Credit growth ↓
Capital buffers	Drehmann and Gambacorta (2012 ^[21])	Credit growth ↓ during boom times
Liquidity requirements	Aldasoro, Delli Gatti and Faia (2017 ^[11])	Systemic risk ↓ Bank efficiency ↓
Borrower-based measures (i.e. LTV, DSTI caps) and other lending restrictions	Ahuja and Nabar (2011 ^[10])	Systemic risk ↓ Property price growth ↓ Housing credit growth ↓
	Lim et al. (2011 ^[22])	Housing credit growth ↓
	Wong et al. (2011 ^[9])	Systemic risk ↓ Household leverage growth ↓
	Claessens, Ghosh and Mihet (2013 ^[23])	Banks' leverage growth ↓ Banks' asset growth ↓ Banks' non-core to core liabilities ↓
	Lambertini, Mendicino and Teresa Punzi (2013 ^[24])	Social welfare ↑
	Tillmann (2015 ^[25])	Housing credit growth ↓
	Cerutti, Claessens and Laeven (2017 ^[26])	Housing credit growth ↓
	Akinci and Olmstead-Rumsey (2018 ^[17])	Housing credit growth ↓
	Richter, Schularick and Shim (2019 ^[27])	Economic growth ↓
Provisioning requirements	Jiménez et al. (2017 ^[28])	Lending to firms ↑ Employment ↑ Firm survival ↑
Various types of macroprudential tools used in conjunction	Klingelhofer and Sun (2019 ^[7])	Systemic risk ↓
	Martinez-Miera and Repullo (2019 ^[8])	Systemic risk ↓ Social welfare ↑
	Belkhir et al. (2020 ^[6])	Systemic risk ↓ Economic growth ↓

Source: OECD Development Centre.

A large number of studies focus on the impact of individual macroprudential policy tools on various outcomes. A general finding is that when faced with higher capital requirements, banks are likely to alter their lending decisions and credit conditions. Garcia Revelo, Lucotte and Pradines-Jobet (2020^[20]), Fang et al. (2020^[19]), Roulet (2018^[18]), Akinci and Olmstead-Rumsey (2018^[17]), Huang and Xiong (2015^[16]), Bridges et al. (2014^[15]), Concetta Chiuri, Ferri and Majnoni (2001^[13]), Concetta Chiuri, Ferri and Majnoni (2001^[14]) and Thakor (1996^[12]), all find that banks tend to reduce their credit supply when they are confronted with higher capital requirements. By running panel regressions on a dataset comprised of bank-level data for the United Kingdom (hereafter “UK”) between 1990 and 2011, Bridges et al. (2014^[15]) document a heterogeneous response of lending to an increase in capital requirements. More specifically, banks tend to cut loan growth for commercial real estate, other corporates, and household secured lending, in the year following the increase in capital requirements. On the other hand, the response of unsecured household lending is smaller and indeed insignificant over the first year as a whole. Loan growth mostly recovers within three years (Bridges et al., 2014^[15]). Drehmann and Gambacorta (2012^[21]) focus on the counter-cyclical capital buffer, and suggest that this policy tool could reduce credit growth during booms, and attenuate the credit contraction once it is released.

On the other hand, evidence relating to the real economic impact of changes to leverage and liquidity requirements, and to borrower-based measures or provisioning requirements, is more limited. For example, Akinci and Olmstead-Rumsey (2018^[17]), Cerutti, Claessens and Laeven (2017^[26]), Tillmann (2015^[25]) and Lim et al. (2011^[22]) report a negative or countercyclical impact of loan-to-value (LTV) and debt-to-income (DTI) caps on housing credit. Additionally, Claessens, Ghosh and Mihet (2013^[23]) assess the impact of borrower-based measures on banks’ risk-taking behaviour, by deploying panel regressions on a sample of 2 800 banks in 48 countries over the period 2000-10. The study finds that LTV caps reduce leverage growth by approximately 0.75%, asset growth by 0.49%, and growth in non-core to core liabilities by 1.1%. Limits on DTI tend to have a much greater impact on bank risks. When implemented, DTI limits reduce leverage growth by 1.1%, asset growth by 2%, and growth in non-core to core liabilities by 2.3%. Furthermore, limits on credit growth are also found to reduce asset growth by 0.6%, while the impact of these tools is statistically insignificant when measuring leverage and non-core to core liabilities risk (Claessens, Ghosh and Mihet, 2013^[23]). Furthermore, assessing Spain’s experience with dynamic provisioning requirements, Jiménez et al. (2017^[28]) report that countercyclical capital buffer requirements (as reflected in the dynamic provisioning) tend to smooth the credit cycle, and can have positive real economic effects. More specifically, a 1% increase in capital buffers extends credit to firms by 9%, increasing firm employment by 6%, and chances of survival by 1% (Jiménez et al., 2017^[28]).

Research on the links between macroprudential policy, on the one hand, and growth and welfare on the other, is scarcer. A general conclusion that does emerge from this literature, however, is that the impact of macroprudential policy on economic growth is rather mixed. For instance, Belkhir et al. (2020^[6]) argue that, although macroprudential policies reduce the incidence of systemic banking crises, they also have an indirect destabilising effect by depressing economic growth. In a similar vein; Richter, Schularick and Shim (2019^[27]) find that, over a four-year horizon, a 10% decrease in the maximum LTV ratio leads to a 1.1% reduction in output. Still, despite the predominance of research pointing to the potentially harmful effect of macroprudential policy on economic growth, some studies suggest the opposite. Lambertini, Mendicino and Teresa Punzi (2013^[24]), for example, find that using a lean-against-the-wind monetary policy, or indeed a counter-cyclical macroprudential policy, can have different welfare implications for different economic agents. More precisely, they suggest that using a counter-cyclical LTV policy along with an interest rate response to credit growth is optimal in terms of social welfare, due to the large gains that accrue on the side of borrowers.

Evidence of the impact of macroprudential policies in Emerging Asian economies

A large strand of literature attempts to answer the question of whether capital requirements affect credit supply and risk-taking behaviour at banks in Emerging Asia. With respect to the impact on credit growth, Lee, Asuncion and Kim (2015^[29]) provide compelling empirical evidence to support the view that capital-related policies targeting credit expansion in India had the desired effect of moderating a credit boom there. In a study of Viet Nam's experience with the Basel II capital requirements, Phi et al. (2019^[30]) find that, at the bank level, a tightening of regulatory capital requirements does not induce a higher lending rate in the long term. In a cross-country study of 11 Asian economies over the period 2000-14, Kim, Kim and Mehrotra (2019^[31]) show that contractionary macroprudential policy shocks have negative effects on credit.

As regards Asian banks' risk-taking behaviour, Chalermchatvichien, Jumreornvong and Jiraporn (2014^[32]) study the association between the Basel III capital standards and risk-taking, drawing on a sample of East Asian banks over the period of 2005-09. The results show that an improvement in capital stability by one standard deviation diminishes the extent of banks' risk-taking by 5.37%. Lee and Hsieh (2013^[33]) apply the Generalised Method of Moments technique for dynamic panels, using bank-level data for 42 Asian countries over the period 1994-2008, in order to assess the impact of bank capital requirements on profitability and risk. The impacts on profitability and risk are heterogeneous among different types of banks. Investment banks display the lowest and most positive capital effect on profitability, while commercial banks reveal the largest reverse capital effect on risk. Furthermore, the distinction between banks in low-income countries and those in lower middle-income countries shows that the former show a higher capital effect on profitability, while the latter exhibit the highest reverse capital effect on risk.

Although they are less numerous, some studies have focused in particular on exploring the impact on the behaviour of Emerging Asian banks of macroprudential tools other than capital requirements. Zhang and Zoli (2016^[34]) formulate various macroprudential policy indices for 13 Asian economies (including China, India, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam), and 33 economies in other regions over the period of 2000-13. The effects of macroprudential policy are evaluated through several methods, namely an event study, cross-country macro panel regressions, and bank-level micro panel regressions. The results indicate that housing-related macroprudential measures, and in particular LTV caps and housing-tax measures, have helped to curb housing price growth, credit growth, and bank leverage in Asia (Zhang and Zoli, 2016^[34]). Similar results are obtained as regards the effectiveness of LTV and DTI caps in Korea (Jung, Kim and Yang, 2017^[35]; Igan and Kang, 2011^[36]).

Rather than focusing on individual macroprudential policy tools, Cantu, Gambacorta and Shim (2019^[37]) use quarterly bank-level data combined with a macroprudential policy index to assess the effectiveness of various macroprudential policies in five countries in the Asia-Pacific region (i.e. Australia, Indonesia, New Zealand, the Philippines and Thailand). They distinguish between tightening and loosening policies, and differentiate between macroprudential measures depending on whether they are implemented to respond to cyclical conditions or to enhance resilience. Several important results emerge from the study. First, macroprudential policies are shown to be effective in reducing the growth of household credit. Second, bank characteristics play an important role in the transmission of macroprudential policies, with larger banks and those with higher liquidity buffers less sensitive to a macroprudential policy change. Third, the authors report asymmetric effects in the implementation of macroprudential policies, in the sense that a tightening action has a stronger effect on credit growth than a loosening one. Another important result is that macroprudential policies are effective in reducing bank risk, where the share of non-performing loans in total loans serves as a proxy for bank risk (Cantu, Gambacorta and Shim, 2019^[37]).

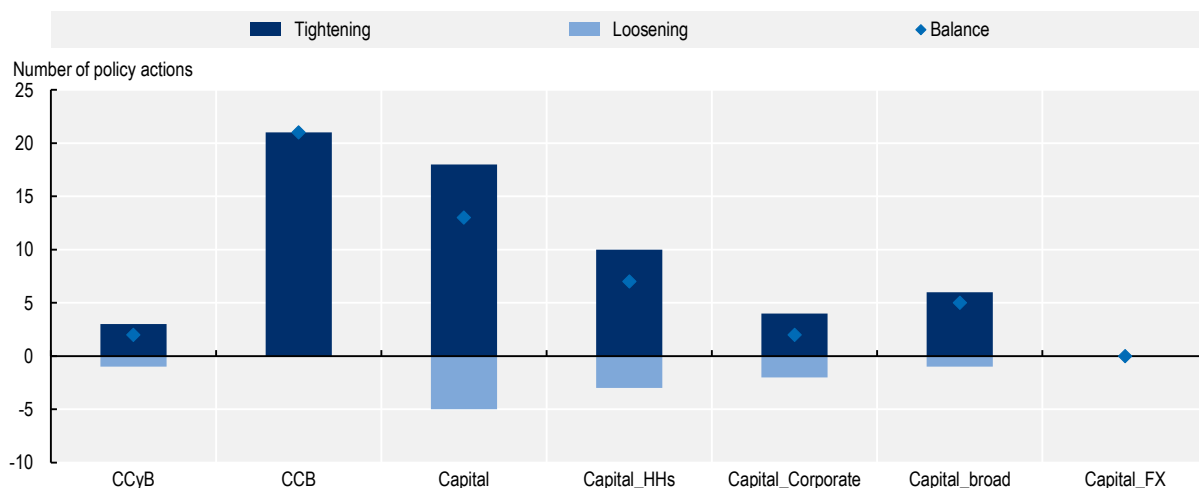
Macprudential policy: Country experiences

Country experiences with minimum capital requirements and capital buffers

The Asian financial crisis of 1997-98 confirmed the overall relevance of capital adequacy standards for banks, while stressing the need to correct certain aspects. Just before the crisis, the capital of Asian banks met the minimum standards determined by the Basel Committee on Banking Supervision, sometimes even far exceeding it. The weaknesses of Asian banks lay elsewhere, in areas that could not be accounted for by the synthetic measure offered by the Cooke ratio (Asian Policy Forum/ADB, 2001^[38]), which was established by the Basel Committee in its 1988 accord. In emerging markets, in particular, a capital ratio may not be an adequate indicator of the true net worth of a bank, which rather depends on the quality of its portfolio of assets. Indeed, questions arose shortly after the Asian financial crisis that asked if certain characteristics of the capital adequacy standard may have introduced harmful biases in the behaviour of creditor banks (Asian Policy Forum/ADB, 2001^[38]).

Figure 1.2 points to an overall tightened policy stance between 1990 and 2018 across all the categories of macroprudential policies that target the capital of banks. In particular, most countries in Emerging Asia implemented capital conservation buffers, and tightened capital requirements that target lenders' exposure to the household sector. Several countries also implemented the Basel III countercyclical capital buffer, and adjusted capital requirements that target exposure to the corporate sector. A detailed description of the timeline of capital requirement implementation in each Emerging Asian country is provided hereafter.

Figure 1.2. Number of tightening and loosening policy actions for each macroprudential tool targeting bank capital in selected Emerging Asian economies, Q1 1990 to Q4 2018



Note: Data capture the number of policy actions in all ASEAN member countries, with the exception of Myanmar, and with the addition of China and India. "CCyB" means countercyclical capital buffer; "CCB" means capital conservation buffer. "Capital_HHs" designates capital requirements other than "CCyB" and "CCB" (i.e. risk weights, minimum capital requirements, etc.) that target banks' exposure to households, that "Capital_broad" designates broad-based capital requirements, other than "CCyB" and "CCB". "Capital_FX" means capital requirements other than "CCyB" and "CCB" that target foreign currency loans. Implementations of the countercyclical capital buffer at 0% are not considered to be tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Indonesia's central bank implemented the Basel II standards between 2007 and 2012. Indonesia enacted the final Basel III capital rule in December 2013, with the capital buffers phased in from January 2016. The Basel framework is applied to all commercial banks operating in Indonesia, although Sharia-compliant banks and rural banks are not subject to the Basel requirements. In addition, the market risk framework and the capital conservation buffer are only applied to larger Indonesian banks. The minimum capital requirements of 4.5% for Common Equity Tier 1 (CET1), 6% for Tier 1, and 8% for total capital, were implemented in line with the Basel framework. In Indonesia, all banks are required to maintain a countercyclical capital buffer, while all banks with core capital above 5 trillion Indonesian rupiah (IDR) must apply the capital conservation buffer (BCBS, 2016^[39]).

In Malaysia, the detailed plan for the implementation of the Basel III reform package was set out in a communication to the banking industry in December 2011. The country's central bank finalised the definition of capital rules in November 2012, and they have been effective since 1 January 2013 (FSI, 2013^[40]). The rules stipulate that a banking institution shall hold and maintain, at all times, minimum capital requirements of 4.5% for CET1, 6% for Tier 1 and 8% for total capital. In addition, a banking institution is required to hold and maintain capital buffers. These include a capital conservation buffer of 2.5%, a countercyclical capital buffer (determined as the weighted average of the prevailing countercyclical capital buffer rates applied in the jurisdictions in which the institution has credit exposures), and a higher loss absorbency requirement for an institution that is designated as a systemically-important domestic bank (BNM, 2020^[41]).

The central bank of the Philippines released the final rules for implementing the minimum capital requirements from Basel III in January 2013. This included the adoption of the capital conservation buffer and the loss absorbency requirements. However, the Philippine central bank did not envision the implementation of a countercyclical capital buffer. The Basel III framework is applicable to all universal or commercial banks, as well as to their subsidiary banks or quasi-banks (FSI, 2013^[40]). As regards minimum capital requirements, the central bank retained the total capital ratio requirements at 10%, introducing the CET1 ratio at 6% and a Tier 1 capital requirement set at 7.5%. Aside from raising the quality of capital, the central bank also mandated a capital conservation buffer of 2.5%, which is composed of CET1 capital on top of the minimum CET1 requirement. The new rules came into effect on 1 January 2014 (BSP, 2013^[42]).

In Thailand, all of the Basel III capital rules, including risk-coverage frameworks, have been in force since 1 January 2013. The rules regarding the capital conservation buffer and the countercyclical capital buffer were published in November 2012 (FSI, 2013^[40]). Locally-incorporated banks and foreign bank branches are required to maintain a CET1 ratio of at least 4.5%, a Tier 1 ratio of 6%, and a total capital ratio of 8.5%. In addition, the Bank of Thailand requires commercial banks to hold two types of capital buffers, in addition to minimum capital requirements. Locally-incorporated banks must hold CET1 of more than 2.5% of total risk-weighted assets as a capital buffer. Moreover, the central bank may require a locally-incorporated bank to hold CET1 of up to 2.5% of total risk-weighted assets, in addition to the capital conservation buffer ratio that aims to address systemic risk during a downturn (BOT, 2017^[43]).

Singapore implemented the Basel II requirements in January 2008. With the implementation of new capital rules under the Basel III framework, the Monetary Authority of Singapore sought to enhance the quality and amount of regulatory capital of Singaporean banks by adopting more stringent capital requirements than Basel III's minimum levels. For instance, there is an explicit CET1 capital adequacy requirement of 6.5%, as compared to the Basel III minimum of 4.5%. The Tier 1 capital adequacy requirement was also increased from the Basel III minimum of 6% to 8%. Meanwhile, the total capital adequacy requirement, at 10%, also exceeds the Basel III minimum of 8%. In addition to these minimum requirements, Singapore also implemented a capital conservation buffer set at 2.5%. This has to be met with CET1 capital, and is consistent with the Basel III minimum. In addition, Singapore's monetary authority mandated that capital rules be maintained from 1 January 2013, two years ahead of the Basel Committee's 2015 timeline. The requirements apply at both the group and solo levels (BCBS, 2013^[44]).

In the case of China, the China Banking Regulatory Commission issued rules adopting the Basel III capital framework in June 2012, publishing supplementary documents in October and November of that year. The new capital standards became effective on 1 January 2013. The requirements apply to all commercial banks registered in China, including small and medium-sized commercial banks that are not active internationally. In a number of areas, the Chinese regulations go beyond the minimum Basel III standards. For instance, they apply a CET1 ratio requirement of 7.5% (including the capital conservation buffer), instead of the Basel III minimum of 7%. In addition, there is no phase-in arrangement for the minimum capital ratio. As of 1 January 2013, commercial banks were required to meet a minimum ratio of 5% for CET1, 6% for Tier 1, and 8% for total capital. At the same time, the capital conservation buffer was also introduced as of 1 January 2013, three years earlier than the Basel framework required (BCBS, 2013^[45]).

India's central bank issued guidelines based on the Basel III reforms on capital regulation in May 2012, phasing in the Basel III capital requirements from 1 April 2013. The new capital requirements were fully implemented as of 31 March 2019. The requirements are applicable to all commercial banks in India, except for local-area banks and regional rural banks (RBI, 2014^[46]). India's central bank applies minimum capital requirements of 5.5% for CET1, 7% for Tier 1, and 9% for total capital, exceeding the minimum requirements from Basel III. In addition, the central bank's guidelines on the Basel III regime regarding countercyclical capital buffers came into effect in February 2015, before being revised in April of that year (BCBS, 2015^[47]). The capital conservation buffer requirements were also implemented in line with the Basel framework, at 2.5% of risk-weighted assets in the form of CET1 capital (RBI, 2014^[46]).

Country experiences with macroprudential policies targeting the leverage of banks

The Basel Committee implemented a leverage ratio as part of the Basel III reforms. An underlying cause of the 2007-08 global financial crisis was the build-up of excessive on- and off-balance sheet leverage in the banking sector, while the ensuing deleveraging process at the height of the financial crisis triggered a vicious circle of losses, reducing the availability of credit to the real economy. The leverage ratio was introduced in the Basel III framework with the aim of reducing the risk of such periods of deleveraging post-crisis, and limiting the damage that they inflict on the broader financial system and economy. The leverage ratio is defined as the capital measure (i.e. Tier 1 capital as defined for the purposes of the Basel III risk-based capital framework) divided by the exposure measure, expressed as a percentage. The exposure measure includes both on-balance sheet exposures and off-balance sheet items. The minimum requirement was set at 3%, and the related public disclosure requirements have been in effect since 1 January 2015 (BCBS, 2014^[48]). In 2019, the Basel Committee released several revisions to the treatment of client-cleared derivatives for calculating the leverage ratio. At the same time, the BCBS issued a revision to the disclosure requirements for leverage ratios, with the aim of reducing excessive volatility in banks' exposures around key dates, i.e. "window dressing" (BCBS, 2019^[49]).

Table 1.5. Implementation of the leverage ratio in selected Emerging Asian countries, 2000-20

Date	Type of policy action	Description of policy action
Indonesia		
January 2020	Policy tightening	Banks required to calculate and disclose the leverage ratio; minimum leverage ratio set at 3%, in line with the Basel III framework.
Malaysia		
January 2018	Policy tightening	Banking institutions required to comply with a minimum leverage ratio of 3.
Philippines		
July 2018	Policy tightening	Minimum Basel III leverage ratio set at 5%, above the 3% Basel requirement.
Singapore		
January 2018	Policy tightening	Minimum leverage ratio requirement set at 3%, in line with the Basel III framework.
China		
April 2015	Policy tightening	Limit on leverage ratio of 4% extended to systemically-important banks in consolidated and unconsolidated terms.
India		
April 2015	Policy tightening	Revised guidelines on leverage ratio framework issued, incorporating amendments based on the Basel Committee's leverage ratio framework (January 2014); banks operating in India monitored against an indicative leverage ratio of 4.5%.
October 2019	Policy loosening	Minimum leverage ratio lowered to 4% for domestic systemically-important banks, and 3.5% for other banks.

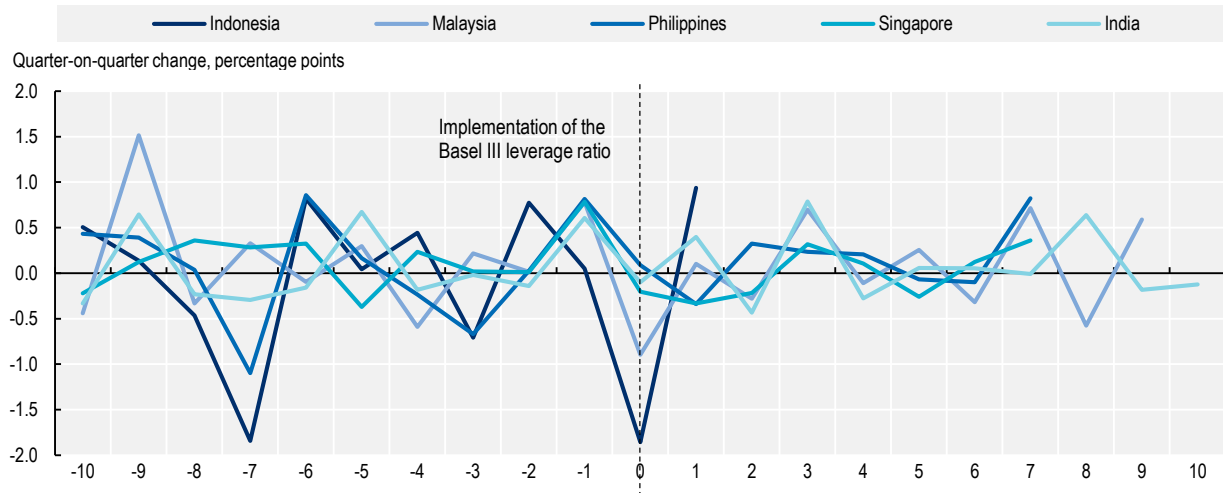
Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Indonesia, Malaysia, the Philippines, Singapore, China and India have implemented the Basel III leverage requirements (Table 1.5). Indonesia's financial services regulator issued rules in December 2019 stipulating that all banks operating in Indonesia must observe a minimum leverage ratio of 3%. The requirement became applicable to all conventional commercial banks as of January 2020 (OJK, 2019^[50]). In Malaysia, banking institutions were required to maintain a minimum leverage ratio of 3% at all times, starting from January 2018. The leverage ratio requirement is applicable to banking institutions at both the solo level and the consolidated level (BNM, 2017^[51]). In the Philippines, the minimum leverage ratio requirement of 5%, goes beyond Basel III's minimum requirement of 3% (BSP, 2015^[52]). In Singapore, meanwhile, reporting banks are also required, at all times, to maintain a minimum leverage ratio of 3%, at both the solo and group levels. The minimum requirements for leverage ratios in Singapore took effect in January 2018 (MAS, 2012^[53]). Furthermore, China's implementing rules on the leverage ratio are stricter than those outlined in the Basel III package, with banks required to comply at all times with a leverage ratio of 4% (IMF, 2017^[54]). Finally, banks operating in India were required to disclose their leverage ratio as from January 2015, with banks operating there monitored against an indicative leverage ratio of 4.5% (RBI, 2014^[46]). In June 2019, the Reserve Bank of India decided to lower the minimum leverage ratio to 4% for domestic systemically-important banks, and to 3.5% for other banks (RBI, 2019^[55]).

Banking sectors in Emerging Asian countries had average leverage ratios between roughly 10%, which was the case for India, and 21%, in Indonesia, before the Basel III minimum leverage ratio requirements entered into force in each respective country. In the quarter in which the Basel III requirement was implemented, these ratios fell in each of the countries in the region that transposed the requirement into their national legislation (Figure 1.3). The decline was most pronounced in Indonesia, where it fell from 21.7% in the quarter prior to implementation, to 19.9% in the quarter of implementation. Since the onset of the COVID-19 crisis, Emerging Asian banks have not deleveraged significantly, and have maintained lending. In the third quarter of 2020, banks in the region were operating with leverage ratios between 14.3% in India and 21.7% in Indonesia (IMF, n.d.^[56]).

Figure 1.3. Banks' leverage ratio before and after the implementation of the Basel III leverage ratio requirement in selected Emerging Asian countries



Note: The horizontal axis displays the deviation in quarters, from the quarter in which the Basel III leverage ratio requirement was implemented in each respective country. The leverage ratio is defined as the ratio of regulatory Tier 1 capital to risk-weighted assets.

Source: OECD Development Centre based on data from Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; national sources; IMF (n.d.^[56]), Financial Soundness Indicators.

StatLink  <https://stat.link/b3ft9p>

National experiences with macroprudential policy targeting the liquidity of banks, foreign exchange exposure, and currency mismatches

This section provides an overview of Emerging Asian countries' experiences with macroprudential policies targeting the liquidity of banks, exposure to foreign exchange, and currency mismatches. Countries implemented some of these measures as part of the Basel III package. For instance, the liquidity coverage ratio became a minimum requirement from January 2015 onwards, and it was increased by 10% each year until January 2019. The liquidity coverage ratio aims to enhance banks' short-term resilience to potential disruptions to liquidity. It ensures that the stock of unencumbered high-quality assets¹ that can be converted into cash is sufficient to cover the bank's liquidity needs for 30 calendar days under a pre-defined short-term stress scenario (BCBS, 2013^[57]). Similarly, the net stable funding ratio became a minimum requirement under Basel III as of January 2018. The purpose of this ratio is to ensure that each bank holds enough stable funding in relation to the liquidity risk profile of its assets over a one-year horizon (BCBS, 2014^[58]). In addition to the internationally agreed-upon metrics mentioned previously, Emerging Asian policy makers also enacted various other measures such as loan-to-deposit ratios and limits to foreign-currency positions.

Prior to the implementation of the liquidity coverage ratio rules in Basel III, Cambodia lowered the liquidity ratio requirement applicable to banks from 100% to 50% (Table 1.6). In December 2015, and following the Basel III framework, Cambodia's central bank issued a proclamation on the liquidity coverage ratio. It required banks and monetary financial institutions, by 1 September 2016, to maintain it at 60% of their projected 30-day net cash outflows. This level was set on a course to increase by 10% each year, and to reach a liquidity coverage ratio of 100% by January 2020. In addition to liquidity ratios, a limit on the net open positions in foreign currency of banks and financial institutions was imposed in August 2007, to limit these institutions' foreign exchange risks (Table 1.6). At all times, banks and financial institutions are required to maintain their net open position in foreign currencies, in either any foreign currency or overall net open position in all foreign currencies, whether long or short, below 20% of their regulatory capital (NBC, 2007^[59]).

Table 1.6. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in Cambodia, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
December 2006	Policy loosening	Liquidity ratio reduced from 100% to 50%.
September 2016	Policy tightening	Liquidity coverage ratio of 60% implemented.
September 2017	Policy tightening	Liquidity coverage ratio increased to 70% from 60%.
September 2018	Policy tightening	Liquidity coverage ratio increased to 80% from 70%.
June 2019	Policy tightening	Liquidity coverage ratio increased to 90% from 80%.
January 2020	Policy tightening	Liquidity coverage ratio increased to 100% from 90%.
Limits on foreign exchange positions		
August 2007	Policy tightening	Single-currency net open position limit raised from 8% to 20% of regulatory capital; overall limit was set at 20% of regulatory capital.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In Indonesia, the framework for managing bank liquidity is composed of various liquidity ratios, including the liquidity coverage ratio and the net stable funding ratio, as well as limits on the loan-to-deposit ratio and foreign exchange positions (Table 1.7). The country has implemented a liquidity coverage ratio and a net stable funding ratio in accordance with the Basel III framework. The liquidity coverage ratio was set at a minimum of 70% at the end of 2015, increasing by 10% a year to reach 100% in December 2018 (OJK, 2015^[60]). The net stable funding ratio framework was implemented in January 2018 for all conventional commercial banks and foreign banks operating in Indonesia (BCBS, 2020^[61]). Since March 2011, Indonesia's central bank has imposed higher reserve requirements on banks that have a loan-to-deposit ratio below 78% or above 100% (IMF, 2011^[62]). The reserve requirements linked to the loan-to-deposit ratio were further tightened in December 2013, and then loosened in August 2015 (Table 1.7). Since July 2013, banks are also required to maintain sufficient capital to cover at least 20% of all types of net foreign currency positions at the end of each day (Table 1.7). Some of the rules governing banks' foreign exchange positions were loosened in October 2008. For instance, the reserve requirement ratio on foreign currency deposits was lowered from 3% to 1%, while the limits on borrowing by banks in foreign currencies were abolished.

Table 1.7. Macprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in Indonesia, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
December 2015	Policy tightening	Liquidity coverage ratio requirement set at a minimum of 70%.
December 2016	Policy tightening	Liquidity coverage ratio requirement increased from 70% to 80%.
January 2018	Policy tightening	Banks must maintain stable and adequate funding that is measured by net stable funding ratio at a minimum of 100%.
December 2017	Policy tightening	Liquidity coverage ratio requirement increased from 80% to 90%.
October 2018	Policy tightening	Macprudential liquidity buffer also applied to Islamic banks.
December 2018	Policy tightening	Liquidity coverage ratio requirement increased from 90% to 100%.
Limits to the loan-to-deposit ratio		
March 2011	Policy tightening	Implementation of a reserve requirement linked to the loan-to-deposit ratio: additional reserve requirement of 0.1% for each percentage point by which the loan-to-deposit ratio falls short of 78%, plus an additional reserve requirement of 0.2% for each percentage point that the loan-to-deposit ratio exceeds 100% if the capital adequacy ratio falls short of 14% at the same time.
December 2013	Policy tightening	Additional reserve requirement of 0.2% for each percentage point by which the loan-to-deposit ratio exceeds 92% (100% previously), if the capital adequacy ratio is inferior to 14% at the same time.
August 2015	Policy loosening	Relaxed the reserve requirement linked to the loan-to-deposit ratio: additional reserve requirement of 0.2% for each percentage point by which the loan-to-deposit ratio exceeds 94% (92% previously), concurrently with a capital adequacy ratio below 14% for banks that meet certain criteria.
Limits on foreign exchange positions		
July 2003	Policy tightening	Banks are required to maintain a minimum of 20% of capital for all types of net foreign currency positions at the end of each day.
October 2008	Policy loosening	Several rules were relaxed: (1) the maturity of foreign exchange swaps was extended from seven days to one month; (2) the reserve requirement ratio on foreign currency deposits was lowered from 3% to 1%; and (3) the limits on foreign currency borrowing (by banks) were abolished.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Two types of liquidity-management requirements are currently in place in Lao PDR. These include a cash-reserve ratio, and limits on net foreign currency positions. As of September 2013, commercial banks and branches of foreign commercial banks operating in Lao PDR were required to maintain a cash-reserve ratio at the end of each business day of at least 2% of total deposits (Table 1.8). Regarding open positions in foreign currency, the central bank in Lao PDR requires commercial banks to maintain a net open position, long and short, for a single foreign currency, at no more than 20% of Tier 1 capital. At the same time, banks must maintain a net foreign currency position, both long and short positions, for all foreign currencies, at no more than 25% of Tier 1 capital (Table 1.8).

Table 1.8. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in Lao PDR, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
September 2013	Policy tightening	Commercial banks and branches of foreign commercial banks must maintain a cash-reserve ratio at the end of each business day of at least 2% of total deposits (excluding deposits by commercial banks and other financial institutions).
Limits on foreign exchange positions		
January 2010	Policy tightening	The net position of each foreign currency should not exceed $\pm 20\%$ of Tier 1 capital; the net position of all foreign currencies should not exceed $\pm 25\%$ of Tier 1 capital.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Malaysia phased in the liquidity coverage ratio requirements gradually, starting in June 2015 (Table 1.9). The minimum liquidity coverage ratio requirement was initially set at 60%, and was raised by 10% a year to reach 100% in January 2019. In addition, banking institutions in Malaysia are required to cap the amount of inflows in excess of outflows at 75% of their total expected cash outflows. According to the rules established by Malaysia's central bank, banks should also account adequately for sudden, adverse exchange rate movements that could sharply widen existing mismatched positions in their liquidity plans (BNM, 2016^[63]). In July 2020, the central bank announced that banks would be allowed to operate below the minimum liquidity coverage ratio of 100%, in order to support the economy in overcoming the fallout from the COVID-19 pandemic, provided banks are able to restore their buffers within a reasonable period after the end of 2020. The implementation of the net stable funding ratio requirement at 80% was also announced in July 2020, with banking institutions required to comply with a higher requirement of 100% as of the end of September 2021 (BNM, 2020^[64]).

Table 1.9. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in Malaysia, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
June 2015	Policy tightening	Minimum liquidity coverage ratio requirement set at 60%.
January 2016	Policy tightening	Minimum liquidity coverage ratio requirement increased to 70%, from 60%.
January 2017	Policy tightening	Minimum liquidity coverage ratio requirement increased to 80%, from 70%.
January 2018	Policy tightening	Minimum liquidity coverage ratio requirement increased to 90%, from 80%.
January 2019	Policy tightening	Minimum liquidity coverage ratio requirement increased to 100%, from 90%.
July 2020	Policy tightening	Implementation of the net stable funding ratio requirement at 80%.
July 2020	Policy loosening	Banks allowed to operate below the minimum liquidity coverage ratio of 100% in response to the COVID-19 crisis.

Note: The activation of a new macroprudential policy instrument is coded as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Banks operating in the Philippines are subject to various liquidity requirements, including the liquidity coverage ratio, and a limit on net open foreign exchange positions. Moreover, higher risk weights are applicable to non-deliverable forward transactions to curb speculative attacks on the Philippine peso (Table 1.10). The minimum liquidity coverage ratio requirement of 90% came into force in January 2018. As of January 2019, the minimum value of this ratio was raised to 100%. While the liquidity coverage ratio must be met in a single currency, banks are expected to be able to meet their liquidity needs in each currency that they use, and to maintain high-quality liquid assets that are consistent with the distribution of their liquidity needs across different currencies (BSP, 2018^[65]). Since March 2007, moreover, banks' allowable net open foreign exchange positions (either overbought or oversold) have to be the lower of either 20% of their unimpaired capital, or USD 50 million. Banks are also requested to submit a report on their daily-consolidated foreign exchange position (IMF, 2020^[66]).

Table 1.10. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in the Philippines, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
January 2018	Policy tightening	Universal and commercial banks required to maintain a liquidity coverage ratio on solo and consolidated basis of at least 90%.
January 2019	Policy tightening	Universal and commercial banks required to maintain a liquidity coverage ratio on solo and consolidated basis of at least 100%.
Limits on foreign exchange positions		
March 2007	Policy tightening	A bank's allowable net open foreign exchange position (either overbought or oversold) must be the lower of 20% of their unimpaired capital, or USD 50 million; any excess beyond the allowable limit must be settled on a daily basis.
November 2011	Policy tightening	Higher risk weights of 15% capital charge, up from 10%, imposed on non-deliverable forward transactions to curb speculative attacks on the Philippine peso.

Note: The activation of a new macroprudential policy instrument is coded as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[65]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In Singapore, the liquidity coverage ratio requirement came into force in January 2015, before gradually being ramped up (Table 1.11). As of 1 January 2015, domestic systemically-important banks incorporated in Singapore, or with a head office or parent bank incorporated in Singapore, had to permanently maintain a liquidity coverage ratio in Singapore dollars of at least 100%, and an all-currency liquidity coverage ratio of at least 60%. A reporting bank is only allowed to use liquid assets denominated in Singapore dollars to fulfil the requirements of the liquidity coverage ratio in that currency. The all-currency liquidity coverage ratio requirement was raised by 10% each year to reach 100% in January 2019. Banks whose head office or parent bank is incorporated outside Singapore must maintain, at all times, an liquidity coverage ratio in Singapore dollars of at least 100%, and an all-currency liquid coverage ratio of at least 50% (MAS, 2014^[67]).

Table 1.11. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in Singapore, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
January 2015	Policy tightening	Banks incorporated and headquartered in Singapore must maintain an all-currency liquidity coverage ratio of at least 60% at all times; liquidity coverage ratio for Singapore dollar exposures implemented at 100%.
January 2016	Policy tightening	All-currency liquidity coverage ratio increased to 70%, from 60%, for banks incorporated and headquartered in Singapore.
January 2017	Policy tightening	All-currency liquidity coverage ratio increased to 80%, from 70%, for banks incorporated and headquartered in Singapore.
January 2018	Policy tightening	All-currency liquidity coverage ratio increased to 90%, from 80%, for banks incorporated and headquartered in Singapore. The net stable funding ratio was imposed on domestic systemically important banks on an all-currency basis. The ratio for banks of this kind that are locally-incorporated and headquartered in Singapore should be no less than 100%, while the minimum ratio requirement for all other domestic systemically important banks should be no less than 50%.
January 2019	Policy tightening	All-currency liquidity coverage ratio increased to 100% from 90% for banks incorporated and headquartered in Singapore.

Note: The activation of a new macroprudential policy instrument is coded as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In China, banks must comply with several liquidity-management requirements (Table 1.12). Chinese legislation, required commercial banks to observe a minimum liquidity coverage ratio of 100% before the end of 2018. During the transition period, the liquidity coverage ratio of commercial banks ramped up in stages, standing at 60% until the end of 2014, 70% until the end of 2015, 80% until the end of 2016, and 90% until the end of 2017. The China Banking Regulatory Commission has also incorporated the Basel Committee's principles for sound liquidity risk management and supervision in its rules on the management of liquidity risk for commercial banks (BCBS, 2017^[68]). Among other requirements, the rules introduced a high-quality liquid assets coverage ratio, applicable to commercial banks with assets below 200 billion Yuan renminbi (CNY). In addition, banks' net foreign exchange position to capital ratio is capped at 20% (Table 1.12).

Table 1.12. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in China, 2000-20

Date	Type of policy action	Description of policy action
Liquidity ratios		
December 2014	Policy tightening	Minimum liquidity coverage ratio requirement set at 60%.
December 2015	Policy tightening	Minimum liquidity coverage ratio requirement raised to 70%, from 60%.
December 2016	Policy tightening	Minimum liquidity coverage ratio requirement raised to 80%, from 70%.
December 2017	Policy tightening	Minimum liquidity coverage ratio requirement raised to 90%, from 80%.
July 2018	Policy tightening	Measures for the management of liquidity risk at commercial banks were implemented, introducing the high-quality liquid asset adequacy ratio. The high-quality liquid asset adequacy ratio applies to commercial banks with assets under RMB 200 billion, with the minimum regulatory requirement reaching 100% once fully implemented. A phase-in arrangement was adopted to meet the requirements for the high-quality liquid asset adequacy ratio, with a requirement to meet 80% and 100% of the requirement by the end of 2018 and the end of June 2019, respectively.
December 2018	Policy tightening	Minimum LCR requirement raised to 100% from 90%.
Limits on foreign exchange positions		
2005	Policy tightening	Net foreign exchange position to capital ratio capped at 20%.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

The liquidity-management toolkit in India is comprised of various elements (Table 1.13). First, banking institutions must observe a statutory liquidity ratio. Starting from January 2019, the requirement for this ratio was reduced by 25 basis points every quarter to reach 18% of net deposit and time liabilities by April 2020 (RBI, 2018^[69]). In addition, the liquidity coverage ratio requirement became binding in January 2015. To provide a transition period for banks, the minimum requirement for this ratio was established at 60% for the calendar year 2015, and was then raised in equal steps to reach the required level of 100% in January 2019. The rules specify that, during a period of financial stress, banks may use their stock of high-quality liquid assets, and thereby operate with a liquidity coverage ratio below 100% (RBI, n.d.^[70]). In order to accommodate the burden on banks' cash flows in the context of the COVID-19 pandemic, banks were permitted to operate with a liquidity coverage ratio of 80% between April and September 2020. Starting from October 2020, the requirement was gradually increased to 90%, with a view to being fully restored at 100% by April 2021 (RBI, 2020^[71]). Furthermore, as of March 2013, all banks must apply a capital charge of 9% on the open foreign exchange position limit or the actual position, whichever is higher. In April 2014, India decided to implement incremental provisioning and capital requirements for banks' exposures to entities with unhedged foreign currency exposures. On the other hand, the limit on resident entities' hedging of foreign exchange exposures in the over-the-counter market was raised from USD 250 000 to USD 1 million (Table 1.13).

Table 1.13. Macroprudential measures targeting the liquidity of banks, foreign exchange exposures, and currency mismatches in India, 2000-21

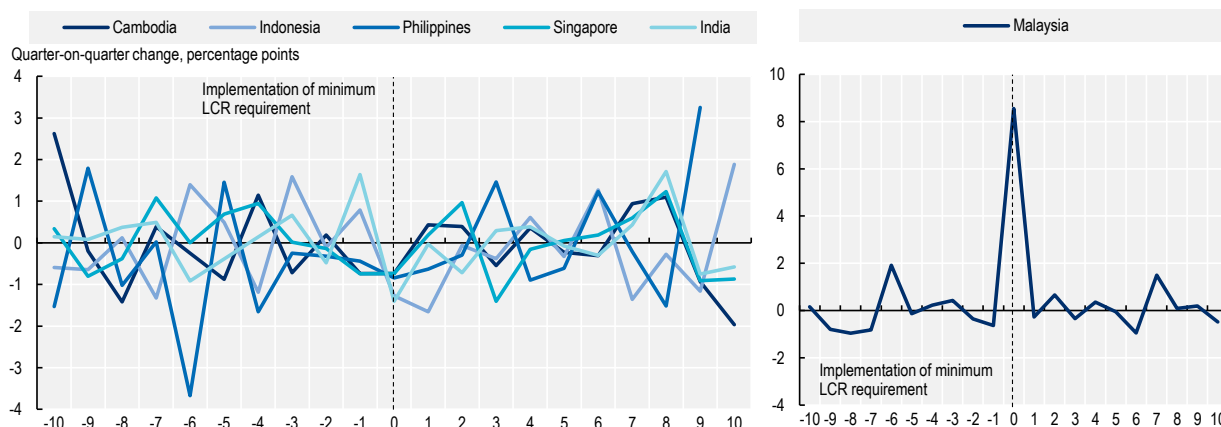
Date	Type of policy action	Description of policy action
Liquidity ratios		
September 2008	Policy loosening	Statutory liquidity ratio relaxed on a temporary basis by 1%, from 25% to 24% of the net deposit and time liabilities of scheduled commercial banks.
November 2009	Policy tightening	Statutory liquidity ratio restored to 25% of the net deposit and time liabilities.
December 2010	Policy loosening	Statutory liquidity ratio lowered from 25% to 24%.
January 2015	Policy tightening	Minimum liquidity coverage ratio requirement set at 60%.
January 2016	Policy tightening	Minimum liquidity coverage ratio requirement raised to 70%, from 60%.
January 2017	Policy tightening	Minimum liquidity coverage ratio requirement raised to 80%, from 70%.
January 2018	Policy tightening	Minimum liquidity coverage ratio requirement raised to 90%, from 80%.
January 2019	Policy tightening	Minimum liquidity coverage ratio requirement raised to 100%, from 90%.
January 2019	Policy loosening	Statutory liquidity ratio lowered to 19.25%.
April 2019	Policy loosening	Statutory liquidity ratio lowered to 19%.
July 2019	Policy loosening	Statutory liquidity ratio lowered to 18.75%.
October 2019	Policy loosening	Statutory liquidity ratio lowered to 18.50%.
January 2020	Policy loosening	Statutory liquidity ratio lowered to 18.25%.
April 2020	Policy loosening	Statutory liquidity ratio lowered to 18%.
April 2020	Policy loosening	Minimum liquidity coverage ratio requirement lowered to 80%, in response to COVID-19.
October 2020	Policy tightening	Minimum liquidity coverage ratio requirement raised to 90%.
April 2021	Policy tightening	Minimum liquidity coverage ratio requirement restored to 100%.
Limits on foreign exchange positions		
March 2013	Policy tightening	All banks must apply a capital charge of 9% on the open foreign exchange position limit or the actual position, whichever is higher.
April 2014	Policy tightening	Incremental provisioning and capital requirements implemented for bank exposures to entities with unhedged foreign currency exposures.
September 2015	Policy loosening	Limit for resident entities for hedging their foreign exchange exposure in the over-the-counter market raised from USD 250 000 to USD 1 million.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.


As Figure 1.4 shows, the implementation of the Basel III minimum liquidity coverage ratio requirements did not have a major immediate impact on Emerging Asian banks' liquid asset ratios. The exception is the Malaysian banking sector, for which the average liquid assets ratio edged more than 8% higher during the quarter in which the Basel III minimum liquidity coverage ratio requirement first came into force. From a longer-term perspective, banks in Indonesia, Malaysia, and the Philippines increased their holdings of liquid assets by 2.7%, 1.5%, and 1.8% respectively between the quarter in which the liquidity coverage ratio was implemented (which varied by country), and the second quarter of 2020 (IMF, n.d.^[56]). The impact of the economic fallout from the COVID-19 pandemic on Emerging Asian banks' liquidity positions has been contained so far, owing to an accommodative stance in terms of monetary policy.

Figure 1.4. Banks' liquid asset ratio before and after the implementation of minimum liquidity coverage ratio requirements in selected Emerging Asian countries



Note: The horizontal axis displays the deviation in quarters, from the quarter in which the minimum liquidity coverage ratio requirement was implemented in each respective country.

Source: OECD Development Centre based on data from Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-arear.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; national sources; IMF (n.d.^[56]), Financial Soundness Indicators.

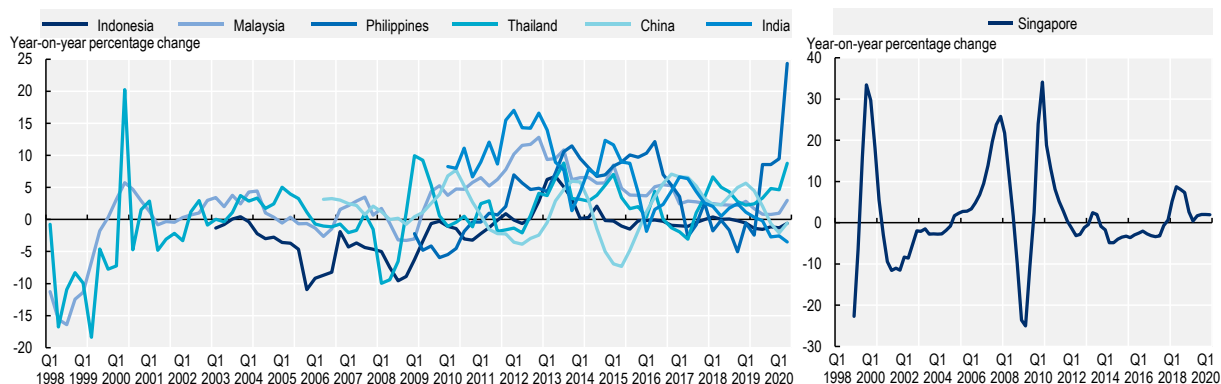
StatLink  <https://stat.link/w9uijm>

National experiences with borrower-based measures and other lending restrictions

Since the end of the 1990s, some Emerging Asian countries have experienced significant increases in house prices. Whereas in some countries, such as Indonesia, Singapore, and Thailand, the trend of increasing house prices reversed with the onset of the global financial crisis, other countries (such as India, Malaysia, and the Philippines) experienced a continued increase in house prices (Figure 1.5). The divergence in trends between the different countries suggests that housing markets are driven not just by global economic developments, but also by national considerations. For example, despite the COVID-19 pandemic, demand for housing in the Philippines has remained just as significant; residential property prices increased by nearly 25% year-on-year in the second quarter of 2020 (Figure 1.5).

Figure 1.5. Residential property prices in selected Emerging Asian economies, Q1 1998 to Q2 2020

Year-on-year percentage change



Note: Data refer to real residential property prices.

Source: Bank for International Settlements.

StatLink  <https://stat.link/pvd3bl>

A cap on loan-to-value ratios is one of the most common macroprudential measures to have been applied by Emerging Asian countries. Indeed, measures of this kind are in place in Brunei Darussalam, China, India, Indonesia, Malaysia, the Philippines, Singapore, and Thailand (Table 1.3). In addition to caps on loan-to-value ratios, authorities in Emerging Asia implemented several other types of borrower-based macroprudential measures. These include limits to the debt-service-to-income ratio, and other restrictions that are conditioned on loan characteristics (e.g. loan size, maturity, loan-to-value ratio, etc.). A tightened policy stance can be observed across all categories of borrower-based measures, most notably as regards loan-to-value caps and restrictions on loans to the household sector (Figure 1.6). A detailed description at country level is provided below.

Figure 1.6. Number of tightening and loosening borrower-based policy actions in selected Emerging Asian economies, Q1 1990 to Q4 2018



Note: Data capture the number of policy actions in all ASEAN member countries, with the exception of Lao PDR and Myanmar, and with the addition of China and India. "LTV" captures limits to the loan-to-value ratios, including those mostly targeted at housing loans, but also including those targeted at automobile loans and commercial real estate loans. "DSTI" refers to limits to the debt-service-to-income ratio and the loan-to-income ratio, which restrict the size of debt services, or debt relative to income. These include those targeted at housing loans, consumer loans, and commercial real estate loans. "Loan_restr_HHs" is defined as loan limits and prohibitions that are conditioned on loan characteristics, and are targeted to the household sector. "Loan_restr_Corporate" is defined as loan limits and prohibitions that are conditioned on loan characteristics, and are targeted to the corporate sector.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

StatLink  <https://stat.link/8vzmnr>

Various borrower-based measures are currently in place in Brunei Darussalam, including debt-service-to-income limits and other loan restrictions (Table 1.14). A cap on the loan-to-value ratio, at 75%, was implemented in December 2012, and was subsequently abolished four years later. Moreover, the entitlement amount for personal loans for individual borrowers was limited, as of May 2015, to 12 times the gross salary in question. The personal entitlement requirement was loosened in June 2015, when the loan entitlement limit was raised to 18 times the net salary of borrowers (Table 1.14). Additionally, in June 2015, the total debt-service ratio was set at 60% for borrowers with a minimum net monthly income of 1 750 Brunei dollars (BND). The aim was to limit individuals' total monthly debt obligations, and to ensure that individuals have sufficient disposable income. In August 2017, the central bank decided to allow banks to increase the total debt servicing ratio limit from 60%, to a maximum of 70%, but only for credit facilities

used to finance the purchase or construction of properties such as houses (AMBD, 2017^[72]). Furthermore, the Personal Loans Directive required all banks to reduce their personal loans portfolio to 30% of their total loans. This requirement came into force in May 2010, and was loosened in February 2014, when the cap was raised from 30% to 40%, and in November 2017, when it was decided that banks' personal credit portfolio must not exceed 60% of total credit facilities at any given time (AMBD, 2017^[73]). In addition, several unsecured personal credit facilities were restricted to 18 times the borrower's net monthly income. Finally, the maximum loan tenure for the financing of motor vehicles was capped at seven years (Table 1.14).

Table 1.14. Borrower-based measures and other loan restrictions in Brunei Darussalam, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
December 2012	Policy tightening	Loan-to-value ratio of 75% introduced.
December 2016	Policy loosening	Loan-to-value ratio of 75% abolished.
Debt service-to-income limits		
May 2005	Policy tightening	Entitlement amount for personal loans for individual borrowers limited to 12 times the gross salary in question.
June 2015	Policy tightening	Total debt service ratio was set at 60% for borrowers with a minimum net monthly income of BND 1 750.
June 2015	Policy loosening	Loan entitlement limit raised to 18 times the net salary of borrowers, from 12 times.
August 2017	Policy loosening	Total debt service ratio limit raised to 70%, from 60%, for credit facilities to finance the purchase or construction of properties such as houses.
November 2017	Policy loosening	A bank may exceed the 60% total debt-servicing limit for certain credit facilities.
Loan restrictions		
March 2006	Policy tightening	Credit and financing activities approved or granted to any one person, or to that person and their associates, restricted to 20% of a bank's capital funds.
September 2008	Policy tightening	For Islamic banks, credit and financing activities approved or granted to any one person, or to that person and their associates, restricted to 20% of a bank's capital funds.
May 2010	Policy tightening	The Personal Loans Directive requires all banks to reduce their portfolio of personal loans to 30% of their total loans.
February 2014	Policy loosening	The cap on personal loans in a portfolio is increased from 30% to 40% of total loans.
June 2015	Policy tightening	Several unsecured personal credit facilities were restricted to 18 times the borrower's net monthly income.
December 2015	Policy tightening	The maximum loan tenure for motor vehicle financing capped at seven years.
November 2017	Policy loosening	Banks' personal credit/financing portfolio was increased to 60%, from 40%, of total credit facilities.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Cambodia implemented several macroprudential policies to address risks stemming from credit growth in the real estate sector. A cap on bank lending to the real estate sector was implemented in June 2008, at 15% of a banks' total loan portfolio (Table 1.15). In addition, the country's central bank issued new rules in December 2016, promoting the provision of credit in the national currency as a mechanism to support the implementation of monetary policy. According to the new rules, all banks and financial institutions under the central bank's supervision were required to have at least 10% of their total loan portfolio denominated in Cambodian riel (KHR). The final deadline for full compliance by the concerned banks and financial institutions was set for 31 December 2019 (IMF, 2019^[74]).

Table 1.15. Borrower-based measures and other loan restrictions in Cambodia, 2000-20

Date	Type of policy action	Description of policy action
Loan restrictions		
June 2008	Policy tightening	Cap on bank lending to the real estate sector introduced at 15% of bank loan portfolio.
December 2016	Policy tightening	All banks and financial institutions required to have at least 10% of their total loan portfolio denominated in Cambodian riel.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In Indonesia, the cap on the loan-to-value ratio was first implemented in June 2012 for conventional banks, and in November 2012 for Sharia-compliant banks. The requirement ranged from 50% to 70%, depending on the surface in question, and on purpose of the mortgage facilities (Table 1.16). Confronted with rapid credit growth, Indonesia's central bank further tightened the loan-to-value requirements in September 2013, lowering the ratio to 60% for second loans backed by houses and certain types of apartments, and to 50% for third or further loans backed by those properties. Against the backdrop of the slow growth in Indonesia's economy in 2015, the loan-to-value rule was eased (Wijayanti, Adhi and Harun, 2020^[75]). As such, the cap was raised by 10% for property loans, while the down payment for automotive loans was reduced by 5% (Table 1.16). Furthermore, as of January 2015, non-bank borrowers were required to hedge at least 20% of the amount by which foreign currency liabilities coming due in the following two quarters exceeded their foreign currency assets. Also starting from January 2015, non-bank borrowers were required to maintain a liquidity ratio of 50%. This was defined as the ratio of foreign currency assets to foreign currency liabilities that are set to mature in the ensuing three months. Both requirements were tightened in January 2016, with the minimum hedging ratio increased to 25%, while the minimum liquidity ratio was increased to 70% (Table 1.16).

Table 1.16. Borrower-based measures and other loan restrictions in Indonesia, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
June 2012	Policy tightening	Maximum loan-to-value ratio of 70% for bank loans backed by houses. Likewise, a level of 70% for a second loan for an office or a shop-house. A ratio of 60% for third or further loans for an office or a shop-house. Ratios of 80% for first loans backed by an apartment of 22-70 square metres, 70% for second loans backed by an apartment in that size range, and 60% for third or further loans backed by such an apartment. A maximum of 70% for first loans backed by an apartment measuring 70 square metres or more; 60% for second loans backed by such an apartment, and 50% for third or further loans backed by apartment of this size. The requirements were extended to Sharia-compliant banks in November 2012.
September 2013	Policy tightening	Loan-to-value ratio lowered to 60% for second loans backed by houses and apartments of 70 square metres or more, and lowered to 50% for third or further loans backed by those properties.
June 2015	Policy loosening	Loan-to-value ratio raised by 10% for property loans, with the down payment for automotive loans reduced by 5%.
June 2018	Policy loosening	Regulatory limits on first mortgages were lifted while keeping limits on the second mortgages unchanged. The limits on third or further mortgages were eased, by making them equal with the limits on second mortgages.
Loan restrictions		
January 2015	Policy tightening	Hedging ratio set at 20% and minimum liquidity at 50% for non-bank borrowers.
January 2016	Policy tightening	Hedging ratio increased to 25% from 20%, and liquidity ratio increased to 70% from 50%.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In Malaysia, the macroprudential policy toolkit targeted at the characteristics of individual borrowers is composed of rules on loan-to-value ratios, along with various other loan restrictions (Table 1.17). A maximum loan-to-value ratio of 60% on loans to purchase houses costing over 150 000 Malaysian ringgit (MYR), and shop-houses above MYR 300 000, was introduced as early as October 1995, in order to curb speculative activities. The loan-to-value requirements were loosened in October 1998, and then were tightened twice, in November 2010 and December 2011 (Table 1.17). In April 1997, the limits on credit facilities extended to the property sector were set at 20% of banking institutions' total outstanding loans as of the end of the previous quarter. These rules were partially relaxed in September 1998, when the threshold on residential loans, over which banks are subject to the 20% exposure limit, was raised from MYR 150 000 to MYR 250 000. In December 1998, the requirements were further loosened, when the threshold of MYR 250 000 on residential loans with a loan-to-value ratio below 50% was withdrawn from the calculation of the 20% exposure limit. Subsequently, the rules on credit card holdings were tightened in March 2011. According to the requirements, new credit card holders must be aged 21 or older, and have an annual income of at least MYR 24 000. Cardholders earning MYR 36 000 or less per annum may only hold credit cards with a maximum of two issuers, with the maximum credit per issuer capped at twice the customer's monthly income. Maximum tenures were also established for different loan types. In November 2011, the maximum tenure for the purchase of motor vehicles was capped at nine years. Then, in July 2013, the maximum tenure for the purchase of properties was capped at 35 years, while the maximum tenure for personal financing was capped at 10 years. Additionally, the minimum price for house purchases by foreigners was raised from MYR 250 000 to MYR 500 000 in January 2012. Finally, in November 2013, the central bank issued a circular communication to prohibit banks from providing financing to any project that offers any form of interest capitalisation scheme² (Table 1.17).

Table 1.17. Borrower-based measures and other loan restrictions in Malaysia, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
November 2010	Policy tightening	Maximum loan-to-value ratio of 70% introduced for third and subsequent mortgages.
December 2011	Policy tightening	Maximum loan-to-value ratio for all housing loans taken by non-individuals introduced at 60%.
Loan restrictions		
March 2011	Policy tightening	New credit card holders must be aged 21 or older, with an income of at least MYR 24 000 per annum. Cardholders earning MYR 36 000 or less per annum can hold credit cards with a maximum of two issuers, with the maximum credit per issuer capped at twice the person's monthly income.
November 2011	Policy tightening	Maximum tenure for loans for the purchase of motor vehicles capped at nine years.
January 2012	Policy tightening	Minimum price for house purchases by foreigners was raised from MYR 250 000 to MYR 500 000.
July 2013	Policy tightening	Maximum loan tenure for purchase of properties capped at 35 years, and maximum tenure for personal financing capped at 10 years.
November 2013	Policy tightening	Financial institutions are prohibited from granting any end-financing facility to any individuals for the purpose of financing the purchase of a property that is offered under an interest capitalisation scheme, or any other permutation thereof, including the developer interest-bearing scheme.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In the Philippines, loan-to-value caps, and limits on real estate loans, were implemented as early as 1997 (Table 1.18). The maximum loan-to-value ratio was lowered to 60% in May 1997, and was subsequently loosened twice. First, it was decided, in June 1997, to raise the maximum loan-to-value ratio to 70% for certain loan types. This included loans of up to 3.5 million Philippine pesos (PHP) to finance the acquisition or improvement of residential units. A further loosening was announced in August 2002, when the maximum loan-to-value ratio was raised to 80% on loans for home-building and subdivision development for low and middle-income households. In October 2014, mortgage collateral value for real estate was fixed at 60% of appraised value (Table 1.18). In addition to loan-to-value caps, an aggregate limit on real estate loans was imposed in June 1997. The first element of this was to fix an aggregate limit on real estate loans at no more than 20% of the respective total loan portfolio. The second element was to fix an aggregate limit on real estate loans at no more than 30% of the total loan portfolio in question. The requirements on the aggregate limits were loosened in December 2000 and February 2008, when certain types of loans were excluded from the 20% exposure limit. Finally, it was decided in November 2015 that real estate loans would be restricted to 20% of the total loan portfolio, net of interbank loans (Table 1.18).

Table 1.18. Borrower-based measures and other loan restrictions in the Philippines, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
August 2002	Policy loosening	Maximum loan-to-value ratio raised from 60% to 80% for loans for home-building and subdivision development for low and middle-income families. This was applicable to loans taken out against real estate security. Housing loans were defined as loans granted for the purpose of constructing, improving or acquiring a residential property that is rented or occupied, or intended to be occupied, by the borrower, and provided the title of the real estate security was in the name of the borrower or mortgagor.
October 2014	Policy tightening	Real estate mortgage collateral value fixed at 60% of appraised value.
Loan restrictions		
December 2000	Policy loosening	Client-directed Investment Management Accounts (IMA) real estate loans of the bank's trust department excluded from the 20% aggregate limit and 30% ceiling on real estate loans.
February 2008	Policy loosening	Exclusion of the following loans from the 20% exposure limit: (1) loans made to individual households for purposes of financing the acquisition, construction, and/or improvement of housing units, and the acquisition of any associated land that is, or will be, occupied by the borrower, regardless of amount; (2) loans extended to land developers and construction companies for the purpose of development and/or construction of socialised and low-cost residential properties; (3) loans to the extent that they are guaranteed by the Home Guaranty Corporation (HGC); and (4) loans to the extent that they are collateralised by non-risk assets under existing regulations.
November 2015	Policy tightening	Real estate loans restricted to 20% of the total loan portfolio, net of interbank loans.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre, based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Singapore is one of the countries in Emerging Asia where macroprudential measures have mostly focused on the property market. This is because residential property is the largest component of Singaporean households' balance sheets, while property-related loans also account for a considerable share of total bank lending in Singapore. As such, adverse developments in the residential property market could have serious implications for the soundness of household finances, the banking system, and the broader economy. Acknowledging these facts, Singaporean policy makers have enacted various measures targeted at household balance sheets. For instance, limits on loan-to-value ratios for housing loans have been lowered in multiple stages, in combination with other restrictions to lending standards, taxes, and direct caps on banks' property exposures. Loan-to-value caps are also differentiated depending on whether the borrower has other mortgages, and depending on other characteristics of the loan (Table 1.19).

Table 1.19. Borrower-based measures and other loan restrictions in Singapore, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
July 2005	Policy loosening	Maximum loan-to-value ratio raised from 80% to 90%.
February 2010	Policy tightening	Maximum loan-to-value ratio lowered from 90% to 80% on all housing loans.
August 2010	Policy tightening	Maximum loan-to-value ratio lowered from 80% to 70% for second and subsequent mortgages, and for loans taken by non-natural individuals.
January 2011	Policy tightening	Maximum loan-to-value ratio lowered from 70% to 60% for individuals with one or more outstanding housing loans at the time of the new purchase, and from 70% to 50% for purchasers who are not natural individuals.
October 2012	Policy tightening	Loan-to-value limits on housing loans were tightened. For a borrower who is an individual with no outstanding housing loan, and who is applying for a housing loan: (a) 80%, if the loan tenure does not exceed 30 years, and the loan period does not extend beyond the borrower's 65th birthday; (b) 60% if the loan tenure exceeds 30 years, or the loan period extends beyond the borrower's 65th birthday. For a borrower who is an individual with one or more outstanding housing loans, and who is applying for another housing loan: (a) 60% if the loan tenure does not exceed 30 years, and the loan period does not extend beyond the borrower's 65th birthday; (b) 40% if the loan tenure exceeds 30 years or the loan period extends beyond the 65th birthday. For a borrower who is not an individual: 40% regardless of whether the borrower has any outstanding housing loan.
January 2013	Policy tightening	Loan-to-value limits on housing loans were further tightened. For a borrower who is an individual with one outstanding housing loan, and who is applying for another housing loan: (a) 50% if the loan tenure does not exceed 30 years, and the loan period does not extend beyond the borrower's 65th birthday; (b) 30% if the loan tenure exceeds 30 years or the loan period extends beyond the borrower's 65th birthday. For a borrower who is an individual with two or more outstanding housing loans, and is applying for another housing loan: (a) 40% if the loan tenure does not exceed 30 years and the loan period does not extend beyond the borrower's 65th birthday; (b) 20% if the loan tenure exceeds 30 years or the loan period extends beyond the 65th birthday. For a borrower who is not an individual: 20%, regardless of whether the borrower has any outstanding housing loan.
February 2013	Policy tightening	Introduction of loan-to-value limits on motor vehicle loans: (1) 60% where the open market value of the motor vehicle does not exceed 20 000 Singapore dollars (SGD); and (2) 50% where the open market value of the motor vehicle exceeds SGD 20 000.
May 2016	Policy loosening	Loan-to-value limits on motor vehicle loans were recalibrated as follows: (1) 70% (increased from 60%) where the open market value of the motor vehicle does not exceed SGD 20 000; and (2) 60% (increased from 50%) where the open market value of the motor vehicle exceeds SGD 20 000.
July 2018	Policy tightening	Loan-to-value limits on housing loans were lowered. For a borrower who is an individual with no outstanding housing loan, and who is applying for a housing loan: 75% if the loan tenure does not exceed 30 years (or 25 years for housing loans to purchase public housing) and the loan period does not extend beyond the borrower's 65th birthday; 55% if the loan tenure exceeds 30 years (or 25 years for housing loans to purchase public housing), or if the loan period extends beyond the borrower's 65th birthday. For a borrower who is an individual with one outstanding housing loan, and who is applying for another housing loan: 45% if the loan tenure does not exceed 30 years (or 25 years for housing loans to purchase public housing), and if the loan period does not extend beyond the borrower's 65th birthday; 25% if the loan tenure exceeds 30 years (or 25 years for housing loans to purchase public housing), or if the loan period extends beyond the borrower's 65th birthday. For a borrower who is an individual with two or more outstanding housing loans, and who is applying for another housing loan: 35% if the loan tenure does not exceed 30 years (or 25 years for housing loans to purchase public housing), and if the loan period does not extend beyond the borrower's 65th birthday; 15% if the loan tenure exceeds 30 years (or 25 years for housing loans to purchase public housing), or if the loan period extends beyond the borrower's 65th birthday. For a borrower who is not an individual: 15%, regardless of whether the borrower has any outstanding housing loan.
Debt service-to-income limits		
January 2013	Policy tightening	Mortgage servicing ratio capped at 30% of gross monthly income.
June 2013	Policy tightening	Total debt-servicing ratio for property loans capped at 60% of gross monthly income.
March 2017	Policy loosening	The total debt-servicing ratio framework would not apply to borrowers seeking new loans, or refinancing loans that are otherwise secured by property and with a loan-to-value ratio of 50% or less.

Loan restrictions		
July 2001	Policy tightening	Caps on banks' loan exposures to the property sector (excluding residential mortgages for owner occupation) introduced at 35% of total non-bank exposure.
October 2001	Policy loosening	Foreigners allowed to use SGD-denominated loans.
January 2003	Policy loosening	Loan tenure cap of seven years on motor vehicle loans removed.
September 2009	Policy tightening	Loan schemes that could have encouraged speculation (interest absorption scheme and interest-only housing loans) abolished.
October 2012	Policy tightening	Tenure cap of 30 years introduced on new housing loans for the purchase of residential property.
January 2013	Policy tightening	Tenure cap of five years on motor vehicle loans reintroduced.
August 2013	Policy tightening	Introduction of a tenure cap of 25 years on new housing loans for the purchase of public housing.
May 2016	Policy loosening	Tenure cap on motor vehicle loans increased to seven years, from five years.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on BIS (2017^[76]), "Macroprudential frameworks, implementation and relationship with other policies", *BIS Papers*, No. 94, <https://www.bis.org/publ/bppdf/bispap94.pdf>; Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-arear.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Thailand implemented caps on both loan-to-value and debt service-to-income ratios in the early 2000s (Table 1.20). A maximum loan-to-value ratio of 70% was first introduced in December 2003 for high-end real estate, defined as condominiums, land, and residences with a value of 10 million Thai baht (THB) and above. This requirement was loosened in March 2009, when the maximum loan-to-value ratio for high-end real estate was raised from 70% to 80%. A new requirement relating to the came into force in January 2011, when it was decided that mortgages on high-rise buildings would be subject to a maximum loan-to-value ratio of 90%. Similarly, a maximum ratio of 95% was introduced in January 2012 for mortgages on low-rise buildings. In addition to these limits, several caps on borrowers' debt service-to-income were implemented in Thailand, beginning in 2004 (Table 1.20). In April 2004, the minimum monthly payments were raised from no less than 5% of outstanding debt for new cardholders, to 10%. In January 2005, a borrower's line of credit for personal loans was limited to no more than five times their average monthly income, or their cash flows that pass through borrowers' deposit accounts. The maximum credit line limit for credit card loans was further tightened in September 2017. According to the new rules, the maximum credit line limit for credit card loans ranges from three to five times the borrower's average monthly income, depending on the size of their income. In a similar vein, the maximum credit line limit for personal loans ranges from one-and-a-half to five times the borrower's average monthly income.

Table 1.20. Borrower-based measures and other loan restrictions in Thailand, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
December 2003	Policy tightening	Maximum loan-to-value ratio of 70% introduced for high-end real estate, i.e. condominiums, land and residences valued at or higher than THB 10 million.
March 2009	Policy loosening	Maximum loan-to-value ratio for high-value mortgages (above THB 10 million) raised from 70% to 80%.
January 2011	Policy tightening	Maximum loan-to-value ratio of 90% introduced for mortgages on high-rise buildings.
January 2012	Policy tightening	Maximum loan-to-value ratio of 95% introduced for mortgages on low-rise buildings.
Debt service-to-income limits		
April 2004	Policy tightening	Minimum monthly payments raised from no less than 5% to 10% of outstanding debt for new cardholders.
January 2005	Policy tightening	Line of credit of personal loans limited at no more than five times the average monthly income or cash flows that pass through borrowers' deposit accounts.
September 2017	Policy tightening	Maximum credit line limit for credit card loans ranging from three to five times the borrower's average monthly income, depending on income level; maximum credit line limit for personal loans ranging from 1.5 to five times the average monthly income, depending on income level.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In Viet Nam, there are currently no restrictions that impose caps on loan-to-value and debt service-to-income. The only macroprudential measure that could be mentioned in the category of borrower-based measures and other loan restrictions is a limit on lending for investment in stocks, which came into force in February 2015 (Table 1.21). This new requirement stipulates that the total credit extension of a credit institution or a branch of a foreign bank to all of its customers for investment in stocks may not exceed 5% of the charter capital and granted capital of that credit institution or foreign bank branch.

Table 1.21. Borrower-based measures and other loan restrictions in Viet Nam, 2000-20

Date	Type of policy action	Description of policy action
Loan restrictions		
February 2015	Policy tightening	Total credit extension of a credit institution or foreign bank branch to all of its customers for investment in stocks may not exceed 5% of charter capital and granted capital of that credit institution or foreign bank branch.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

China has extensive experience with loan-to-value and debt service-to-income caps, as well as with the implementation of various loan restrictions (Table 1.22). The maximum loan-to-value ratio for mortgages was set at 80% in April 2001. It was then decided, in March 2005, to tighten the maximum loan-to-value ratio from 80% to 70% for properties situated in cities and areas where real estate prices were rising quickly. Since then, loan-to-value caps have been adjusted several times (Table 1.22). The latest of these measures was implemented in March 2017, when the maximum loan-to-value ratio for Beijing residential households with no housing under their own names, and for whom there are no local records of commercial housing loans or provident fund housing loans, under the first home policy currently in force, was lowered to 75%. At the same time, the maximum loan-to-value ratio for Beijing residential households purchasing housing other than their ordinary residence was lowered to 60%. In September 2004, in addition to the loan-to-value caps, a maximum debt-service-to-income ratio of 50% was imposed on borrowers for house

purchases (Table 1.22). Furthermore, various restrictions on loan characteristics were implemented between June 2003 and January 2011. More specifically, rules were issued in June 2003 that tightened up on property loans to developers and buyers of high-end housing and luxury villa projects. In September 2007, the minimum lending rate was raised from 0.9 times to 1.1 times its equivalent-maturity benchmark lending rate, while the mortgage rate was further raised to 1.5 times the base rate in September 2010. Loans for land purchases and for idle projects were forbidden in August 2008, and housing purchase restrictions were applied in all municipal cities and cities with overheated real-estate markets throughout 2011 (Table 1.22).

Table 1.22. Borrower-based measures and other loan restrictions in China, 2000-20

Date	Type of policy action	Description of policy action
Loan-to-value caps		
April 2001	Policy tightening	Maximum loan-to-value ratio for mortgages lowered to 80%.
March 2005	Policy tightening	Maximum loan-to-value ratio lowered from 80% to 70% for properties in cities and areas where the price of real estate is believed to be rising too fast.
June 2006	Policy tightening	Maximum loan-to-value ratio applied to housing loans made by commercial banks lowered from 80% to 70%.
September 2007	Policy tightening	Maximum loan-to-value ratio of 60% enacted for borrowers applying for second mortgage loans.
October 2008	Policy loosening	Maximum loan-to-value ratio raised to 80%.
December 2009	Policy tightening	Maximum loan-to-value ratio for land purchases set at 50% with the full amount of down payment made within one year from the date of purchase.
April 2010	Policy tightening	Maximum loan-to-value ratio on first homes (apartments over 90 m ²) lowered from 80% to 70%; maximum loan-to-value ratio on second homes lowered from 60% to 50%.
September 2010	Policy tightening	Maximum loan-to-value ratio lowered to 70% for all first home buyers.
January 2011	Policy tightening	Maximum loan-to-value ratio on second homes lowered from 50% to 40%.
April 2015	Policy loosening	Maximum loan-to-value ratio for second mortgages increased from 40% to 60%.
September 2015	Policy loosening	Maximum loan-to-value limit for buyers in cities without restrictions raised from 70% to 75%.
February 2016	Policy loosening	Maximum loan-to-value limit raised from 75% to 80% for a first mortgage, and from 60% to 70% for a second mortgage in cities without restrictions.
March 2017	Policy tightening	Maximum loan-to-value ratio for Beijing residential households who have no housing under their own names, and for whom there are no local records of commercial housing loans or provident fund housing loans, under the first home policy currently in force, lowered to 75%; maximum loan-to-value ratio for Beijing residential households when they purchase housing that is not for their ordinary residence lowered to 60%.
Debt service-to-income limits		
September 2004	Policy tightening	Maximum debt service-to-income ratio of 50% imposed on borrowers for house purchases.
Loan restrictions		
June 2003	Policy tightening	Rules were issued that tightened up on property loans to developers and buyers of high-end housing and luxury villa projects.
September 2007	Policy tightening	Minimum lending rate raised from 0.9 times to 1.1 times its equivalent-maturity benchmark lending rate.
August 2008	Policy tightening	Loans for land purchases and for idle projects forbidden.
April 2010	Policy tightening	Minimum mortgage rate set at 110% of the base lending rate for second home buyers, instead of the previous 80%.
September 2010	Policy tightening	Mortgage rate raised to 1.5 times the base rate.
January 2011	Policy tightening	Housing purchase restrictions applied in all municipal cities and cities with overheated real-estate markets. The restrictions were further tightened in March and August 2011.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

India applies both loan-to-value and debt service-to-income caps (Table 1.23). The loan-to-value cap was first implemented in December 2010, in the form of a tiered system. In this system, residential real estate loans with a value of over 2 million Indian rupees (INR) became subject to a maximum loan-to-value ratio of 80%, while the maximum loan-to-value ratio was established at 90% for housing loans up to INR 2 million. The loan-to-value requirements were further tightened in June 2013, and were subsequently relaxed in October 2015. According to the latest requirements that came into force in October 2015, the loan-to-value requirement has been implemented on the basis of a three-tiered approach. As such, the maximum loan-to-value ratio for all new individual housing loans up to INR 3 million is set at 90%. In parallel, the maximum loan-to-value ratio for all new individual housing loans above INR 3 million, and up to INR 7.5 million, is set at 80%, while the maximum loan-to-value ratio for all new individual housing loans above INR 7.5 million remains at 75% (Table 1.23). In addition, Indian borrowers are subject to a debt service-to-income cap. In April 2015, it was decided that the total indebtedness of a borrower, excluding certain expenses, should not exceed INR 1 million. This represented an increase from the previous limit of INR 50 000 (Table 1.23).

Table 1.23. Borrower-based measures and other loan restrictions in India, 1990-2020

Date	Type of policy action	Description of policy action
Loan-to-value caps		
December 2010	Policy tightening	Maximum loan-to-value ratio set at 80% for residential real estate loans greater than INR 2 million; for housing loans up to INR 2 million, maximum loan-to-value ratio set at 90%.
June 2013	Policy tightening	Maximum loan-to-value ratio for all new individual housing loans up to INR 2 million set at 90%; maximum loan-to-value ratio for all new individual housing loans above INR 2 million, and up to INR 7.5 million, set at 80%; maximum loan-to-value ratio for all new individual housing loans above INR 7.5 million set at 75%.
October 2015	Policy loosening	Maximum loan-to-value ratio for all new individual housing loans up to INR 3 million set at 90%; maximum loan-to-value ratio for all new individual housing loans above INR 3 million and up to INR 7.5 million set at 80%; maximum loan-to-value ratio for all new individual housing loans above INR 7.5 million remains at 75%.
Debt service-to-income limits		
April 2015	Policy loosening	Total indebtedness of a borrower, excluding certain expenses, should not exceed INR 1 million, representing an increase from the previous limit of INR 50 000.

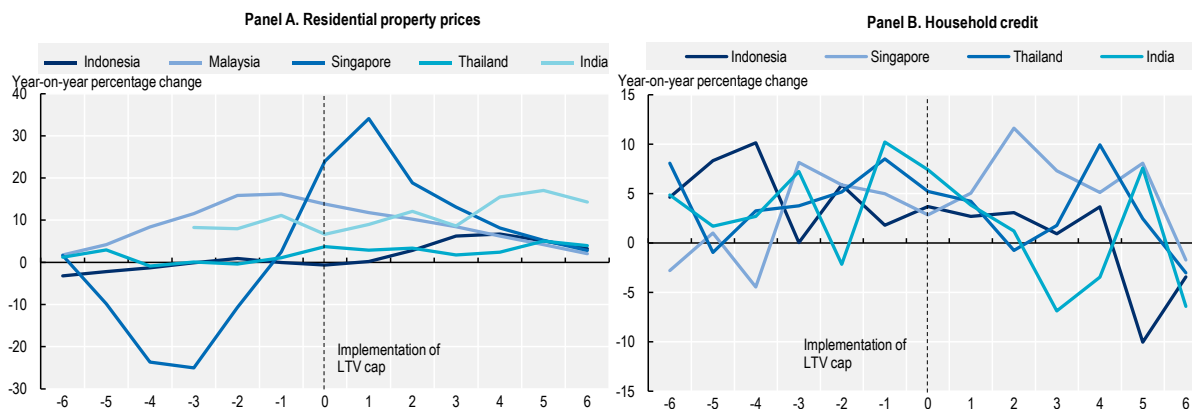
Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Figure 1.7 summarises the impact of the loan-to-value cap on residential property prices and household credit growth. In Indonesia, for instance, residential property prices and the rate of credit growth did not change materially following the implementation of the loan-to-value cap, although a marked decline in household credit occurred in the fifth quarter since the cap came into force. In Malaysia, the loan-to-value cap contributed to a dampening of residential property prices. In Singapore, the loan-to-value cap seems to have moderated house prices, but not the rate of credit growth, which continued to edge higher after the implementation of the loan-to-value cap. In Thailand, the effect on residential property prices was negligible, whereas household credit growth decelerated following the implementation of the cap. In India, house prices continued to increase, although credit growth slowed down in the first three quarters after the loan-to-value cap was enacted.

Figure 1.7. Residential property prices and household credit growth before and after the introduction of loan-to-value caps in selected Emerging Asian economies

Year-on-year percentage change



Note: The horizontal axis displays the deviation in quarters, from the quarter in which the loan-to-value cap was implemented in the respective country. Data on household credit for Malaysia prior to the implementation of the cap are not available. Data on residential property prices and household credit prior to implementation are not available for China and the Philippines.

Source: OECD Development Centre based on data from Alam et al. (2019^[5]), “Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database”, *IMF Working Papers*, No. 19/66, <https://www.elibrary-arear.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; the Bank for International Settlements, and national sources.

StatLink  <https://stat.link/h7dwec>

Country experiences with miscellaneous macroprudential policies

Without being exhaustive, this section reviews Emerging Asian countries’ experience with other types of macroprudential measures that cannot be categorised under any of the previous categories. More precisely, it describes countries’ experiences with limits on credit growth, loan-loss provisioning rules, and taxes applied to transactions, assets or liabilities for macroprudential purposes. Macroprudential measures of this kind have been implemented in Brunei Darussalam, Malaysia, the Philippines, Singapore, Viet Nam, China and India.

Brunei Darussalam imposed limits on credit growth and rules on the minimum level of provisioning for impaired assets (Table 1.24). In May 2010, banks were required to cap their portfolio of personal loans to 30% of their total loans, in order to limit borrowers’ high level of indebtedness. The 30% limit was relaxed in February 2014, when the cap on banks’ portfolios of personal loans was raised to 40% (Table 1.24). As regards provisioning, several rules on the minimum level of provisioning for impaired assets were implemented in March 2017. First, in the case of substandard impaired assets (i.e. more than 90 days past their due date), banks are requested to make a specific impairment provision of not less than 20% of the carrying amount of the financial asset. Second, for doubtful impaired assets (i.e. more than 180 days past due), banks shall make a specific impairment provision of no less than 50% of the carrying amount of the financial asset. Finally, banks are required to make a specific impairment provision equivalent to 100% of the carrying amount for loss impaired assets (i.e. more than 360 days past their due date).

Table 1.24. Miscellaneous macroprudential policy measures in Brunei Darussalam, 1990-2020

Date	Type of policy action	Description of policy action
Limits on credit growth		
May 2010	Policy tightening	Banks required to cap their personal loans portfolio to 30% of their total loans according to a Personal Loans Directive that aimed to address the high indebtedness of borrowers.
February 2014	Policy loosening	Cap on banks' personal loans portfolio increased from 30% to 40% of total loans.
Loan-loss provisioning		
March 2017	Policy tightening	Several rules on the minimum level of provisioning for impaired assets were implemented: (1) In the case of sub-standard impaired assets (i.e. more than 90 days past due), banks shall make a specific impairment provision of not less than 20% of the carrying amount of the financial asset. (2) In the case of doubtful impaired assets (i.e. more than 180 days past due), banks shall make a specific impairment provision of not less than 50% of the carrying amount of the financial asset; (3) In the case of loss impaired assets (i.e. more than 360 days past due), banks shall make a specific impairment provision equivalent to 100% of the carrying amount.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

In Malaysia, several transaction taxes were implemented for macroprudential purposes between January 2012 and January 2014 (Table 1.25). In January 2012, the real property gains tax was set at 10% for disposals within the second year, 5% for disposals within the third, fourth and fifth years, and 0% thereafter. In January 2013, it was raised to 15% for disposals within two years, 10% for disposals in the third, fourth and fifth years, and 0% thereafter. Then, in January 2014, this tax was tightened again. According to the new provisions, the real property gains tax for the disposal of property by resident individuals stood at 30% within three years after the date of property acquisition, 20% in the fourth year, 15% in the fifth year, and 0% thereafter. In parallel, the real property gains tax for the disposal of property by non-resident individuals was set at 30% within five years after the date of property acquisition, and 5% thereafter. Finally, the real property gains tax for disposal of property by companies was implemented at 30% within three years after the date of property acquisition, 20% in the fourth year, 15% in the fifth year, and 5% thereafter. In response to the COVID-19 pandemic, Malaysian authorities announced in June 2020 that an exemption to the real property gains tax would be applicable for the disposal of residential homes between 1 June 2020 and 31 December 2021. This exemption was limited to the disposal of three units of residential homes per individual (MoFM, 2020^[77]).

Table 1.25. Miscellaneous macroprudential-policy measures in Malaysia, 1990-2020

Date	Type of policy action	Description of policy action
Taxes applied to transactions, assets or liabilities for macroprudential purposes		
January 2012	Policy tightening	Real property gains tax raised to 10% (from 5%) within two years, 5% in the third, fourth and fifth years, and 0% thereafter for resident individuals, non-resident individuals and companies.
January 2013	Policy tightening	Real property gains tax raised to 15% (from 10%) within two years, 10% (from 5%) in the third, fourth and fifth years, and 0% thereafter for resident individuals, non-resident individuals, and companies.
January 2014	Policy tightening	Real property gains tax for disposal of property by resident individuals implemented at 30% within three years after the date of property acquisition, 20% in the fourth year, 15% in the fifth year, and 0% thereafter. Real property gains tax for disposal of property by non-resident individuals implemented at 30% within five years after the date of property acquisition, and 5% thereafter. For disposal of property by companies, the tax was implemented at 30% within three years after the date of property acquisition, 20% in the fourth year, 15% in the fifth year, and 5% thereafter.
June 2020	Policy loosening	Exemption of Malaysians from paying the 5% (or higher) real property gains tax for the disposal of residential property between 1 June 2020 and 31 December 2021.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Loan-loss provisioning rules were amended multiple times in the Philippines (Table 1.26). In October 1998, banks were required to put up general provisions over and above existing specific provisions, equivalent to 1% of the gross loan portfolio, minus loans considered non-risk under existing regulations. The rules were subsequently tightened in April 1999, when the general loan-loss provisioning requirement was raised to 1.5%, and again in October 1999, when the general loan-loss provisioning requirement was raised to 2%. Thrift banks were required to comply fully with the general loan-loss provisioning requirements by 31 May 2000. The policy was loosened in December 2001, as it was decided that the general provisioning requirements would be lowered from 2% to 1% (Table 1.26).

Table 1.26. Miscellaneous macroprudential-policy measures in the Philippines, 1990-2020

Date	Type of policy action	Description of policy action
Loan-loss provisioning		
May 2000	Policy tightening	Thrift banks required to comply fully with the general loan-loss provisioning requirements by 31 May 2000.
December 2001	Policy loosening	General loan-loss provisioning requirements amended such that the outstanding balance of unclassified restructured loans minus the outstanding balance of restructured loans considered non-risk under existing regulations is subject to 5% general provisioning; the outstanding balance of unclassified non-restructured loans minus the non-risk loans is subject to 1% general provisioning (loosening of general provisioning requirements from 2% to 1%).

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Singapore also enacted various taxes on transactions for macroprudential purposes (Table 1.27). First, a seller's stamp duty was implemented in February 2010 on all private properties sold within one year of purchase. The duty operated according to a tiered system: 1% for the first SGD 180 000, 2% for the next SGD 180 000, and 3% for the remaining balance. The seller's stamp duty was further tightened in

August 2010 and January 2011, and was subsequently loosened in March 2017 (Table 1.27). In their latest form, the seller's stamp duty rates stand at 12% (previously 16%) for properties sold within the first year of purchase, 8% (previously 12%) if sold within the second year, and 4% (previously 8%) if sold within the third year. There is no duty to pay if the sale takes place after three years (previously 4% if sold within four years). To complement the seller's stamp duty, Singapore brought in an additional buyer's stamp duty in December 2011. These rates were tightened in January 2013 and July 2018. Following the latest tightening, which occurred in July 2018, the additional buyer's stamp duty rates include a 12% level for Singapore citizens buying a second residential property. There is also an additional buyer's stamp duty rate of 15% for citizens buying third or subsequent properties, or for permanent residents buying a second or subsequent property. Finally, an additional buyer's stamp duty rate of 20% is applicable to foreigners buying any residential property, while an additional buyer's stamp duty rate of 25% is applicable to non-individuals (corporate entities) purchasing any residential property (Table 1.27). In February 2013, it was also decided that non-owner-occupied residential properties (i.e. residential properties that are let out) would be taxed at progressive rates between 10% and 20%, as opposed to the flat rate of 10% (Table 1.27).

Table 1.27. Miscellaneous macroprudential-policy measures in Singapore, 2000-20

Date	Type of policy action	Description of policy action
Taxes applied to transactions, assets or liabilities for macroprudential purposes		
February 2010	Policy tightening	Seller's stamp duty introduced on all private properties sold within one year of purchase at the rate of 1% for the first SGD 180 000, 2% for the next SGD 180 000, and 3% for the remaining balance.
August 2010	Policy tightening	Seller's stamp duty extended to sales within three years of purchase, with rates of 3%, 2% and 1%, depending on the length of the holding period.
January 2011	Policy tightening	Seller's stamp duty extended to sales within four years. Rates raised to 16% for sales within a year, decreasing gradually thereafter to a minimum of 4% in the fourth year. Rates of the duty (on the actual price or market value, whichever is higher) implemented as follows: 16% for properties sold within first year of purchase, 12% if sold within second year, 8% if sold within third year, and 4% if sold within four years.
December 2011	Policy tightening	Additional buyer's stamp duty introduced. Rate of 3% for citizens buying third or subsequent property, or for permanent residents buying second or subsequent property. Rate of 10% for foreigners buying any residential property. Rate of 10% for non-individuals (corporate entities) buying any residential property.
January 2013	Policy tightening	Additional buyer's stamp duty rates tightened. Rates of 7% for Singapore citizens buying second residential property, 10% for citizens buying third or subsequent property, and 5% for permanent residents buying first residential property. Rate of 10% for permanent residents buying second or subsequent properties and 15% for foreigners or non-individuals (corporate entities) buying any residential property.
February 2013	Policy tightening	Non-owner-occupied residential properties (let out residential properties) taxed at progressive rates between 10% and 20%, as opposed to the flat rate of 10%.
March 2017	Policy loosening	Seller's stamp duty rates (on the actual price or market value, whichever is higher) lowered as follows: 12% (previously 16%) for properties sold within first year of purchase, 8% (previously 12%) if sold within second year, and 4% (previously 8%) if sold within third year. No duty if sold beyond three years (previously 4% if sold within four years).
July 2018	Policy tightening	Additional buyer's stamp duty rates increased as follows: 12% (previously 7%) for Singapore citizens buying second residential property, 15% (previously 10%) for citizens buying third or subsequent property, 15% (previously 10%) for permanent residents buying second or subsequent property, 20% (previously 15%) for foreigners buying any residential property, 25% (previously 15%) for non-individuals (corporate entities) buying any residential property.

Note: The activation of a new macroprudential policy instrument is coded as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Authorities in Viet Nam have attempted to limit the growth of credit by applying credit growth targets (Table 1.28). In February 2011, the central bank instructed commercial banks to hold credit growth below 20% (down from 23% previously). Later that year, the credit ceiling was again lowered, to between 15% and 17%. A loosening was decided in July 2012, when the credit growth target was raised to between 25% and 30% (Table 1.28).

Table 1.28. Miscellaneous macroprudential-policy measures in Viet Nam, 2000-20

Date	Type of policy action	Description of policy action
Limits on credit growth		
February 2011	Policy tightening	Credit growth target cut to below 20%, from 23%.
September 2011	Policy tightening	Credit ceiling set to 15%-17%.
July 2012	Policy loosening	Credit ceiling increased to 25%-30%.

Note: The activation of a new macroprudential policy instrument is coded as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Several macroprudential measures have been implemented in China in the form of limits on credit growth, loan-loss provisioning requirements, and taxes on transactions for macroprudential purposes (Table 1.29). A loan quota mechanism was imposed on commercial lenders in January 2010. According to this mechanism, the total amount of new loans extended each month was capped at no more than 12% of a bank's annual loan target. Additionally, the total amount of new loans extended each quarter was capped at no more than 30% of a bank's annual loan target (Table 1.29). As for provisioning requirements, these were strengthened in January 2002, having previously only been applicable to systemically-important institutions. As of January 2002, all banks became subject to the loan-loss provision ratio of 2.5%, and to the provision coverage ratio of 150% (Table 1.29). Various taxes were imposed for macroprudential purposes on certain transactions. These included, in January 2007, a value-added tax on land transactions. In April 2008, a tax on capital gains was imposed on advanced payments of housing purchases. Moreover, a personal income tax was imposed on corporate entities purchasing properties for individuals in June 2008. Finally, a capital gains tax of 20% on profits became applicable in March 2013 to homeowners who sell their properties (Table 1.29). On the other hand, the deed tax rate for individuals purchasing ordinary residential houses was loosened several times between August 1999 and February 2016.

Table 1.29. Miscellaneous macroprudential-policy measures in China, 2000-20

Date	Type of policy action	Description of policy action
Limits on credit growth		
January 2010	Policy tightening	Loan quota mechanism imposed on commercial lenders. Total amount of new loans extended each month capped at no more than 12% of a bank's annual loan target, with the total amount of new loans extended each quarter capped at no more than 30% of the bank's annual loan target.
Loan-loss provisioning		
January 2002	Policy tightening	Central bank started to implement a strengthened provisioning rule, the Guidance on Provisioning for Loan Losses.
December 2016	Policy tightening	All banks became subject to the loan-loss provision ratio of 2.5% and to a provision coverage ratio of 150%. Previously, the requirement was only applicable to systemically-important institutions.
Taxes applied to transactions, assets or liabilities for macroprudential purposes		
August 1999	Policy loosening	Deed tax temporarily reduced by half for individuals purchasing ordinary residential houses for their own use.
January 2007	Policy tightening	Value-added tax imposed on land transactions.
April 2008	Policy tightening	Tax on capital gains imposed on advanced payments of housing purchases.
June 2008	Policy tightening	Personal income tax imposed on corporate entities purchasing properties for individuals.
November 2008	Policy loosening	Deed tax rate uniformly lowered to 1% for individuals who made their first-time purchase of ordinary residential housing of 90 square metres or less.
October 2010	Policy loosening	Deed tax reduced by half for individuals purchasing ordinary residential houses where the residential house is the family's only residence.
March 2013	Policy tightening	Capital gains tax of 20% on profits applicable to homeowners who sell their properties.
February 2016	Policy loosening	Deed tax reduced to a rate of 1% for individuals purchasing the family's only residential house with an area of 90 square metres or less. For larger houses, deed tax reduced to 1.5%. With the exception of Beijing, Shanghai, Guangzhou and Shenzhen, deed tax reduced to 1% for individuals purchasing the family's improved second residential house, for houses with areas of 90 square metres or less. For houses with areas in excess of 90 square metres, deed tax rate reduced to 2%.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

India has extensive experience with general provisioning requirements, and has also implemented a limit on credit growth (Table 1.30). In November 2010, loans for housing real estate and commercial real estate were limited at 10% of a bank's total assets. In terms of provisioning requirements, the general provisioning ratio was raised to 0.4%, from 0.25%, on standard advances for all types of loans (excluding agricultural loans, and loans to small and medium-sized enterprises [SMEs]) provided by banks and non-bank financial companies. The rules were further tightened in June 2006, when requirements were raised to 0.55%, and in September 2006, when they were raised to 0.70%. In November 2008, the general provisioning requirements were lowered to 0.4%. Furthermore, it was decided in December 2010 to increase the standard asset-provisioning ratio for outstanding housing loans with teaser rates from 2% to 0.4%. In February 2014, banks were allowed to use up to 33% of counter-cyclical buffer or floating provisions, held as of 31 March 2013, to make specific provisions for non-performing assets. Similarly, in March 2015, banks were allowed to use up to 50% of countercyclical buffer or floating provisions, held as of the end of 31 December 2014, to make specific provisions for non-performing assets (Table 1.30).

Table 1.30. Miscellaneous macroprudential-policy measures in India, 2000-20

Date	Type of policy action	Description of policy action
Limits on credit growth		
November 2010	Policy tightening	Replacement of an existing limit of 15% of deposits for housing and commercial real estate loans by urban co-operative banks with a limit of 10% of total assets.
Loan-loss provisioning		
November 2005	Policy tightening	General provisioning ratio on standard advances for all types of loans (excluding agricultural and SME loans) provided by banks and non-bank financial companies raised to 0.4%, from 0.25%.
June 2006	Policy tightening	General provisioning ratio raised to 0.55%, from 0.4%, on personal loans, capital market exposures, commercial real estate loans, as well as residential lending above INR 2 million, by scheduled commercial banks.
September 2006	Policy tightening	General provisioning ratio raised to 0.70% from 0.55% on personal loans, capital market exposures, commercial real estate loans, as well as residential lending above INR 2 million, by scheduled commercial banks.
January 2007	Policy tightening	General provisioning requirements increased further; general provisioning on exposures to systemically-important financial institutions also increased.
November 2008	Policy loosening	General provisioning requirements lowered to 0.4% for personal loans, capital market exposures, commercial real estate loans (as well as residential lending) by scheduled commercial banks.
December 2010	Policy tightening	Standard asset provisioning ratio for outstanding housing loans with teaser rates raised from 2% to 0.4%.
February 2014	Policy loosening	Banks allowed to use up to 33% of countercyclical buffer/floating provisions held as of 31 March 2013, for making specific provisions for non-performing assets.
April 2014	Policy tightening	Capital and provisioning on unhedged foreign currency exposures increased.
March 2015	Policy loosening	Banks allowed to use up to 50% of countercyclical buffer/floating provisions held as of the end of 31 December 2014, for making specific provisions for non-performing assets.

Note: The activation of a new macroprudential policy instrument is classified as policy tightening.

Source: OECD Development Centre based on Alam et al. (2019^[5]), "Digging Deeper – Evidence on the Effects of Macroprudential Policies from a New Database", *IMF Working Papers*, No. 19/66, <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/iMaPPDatabase.aspx>; and national sources.

Macroprudential policy challenges and implications

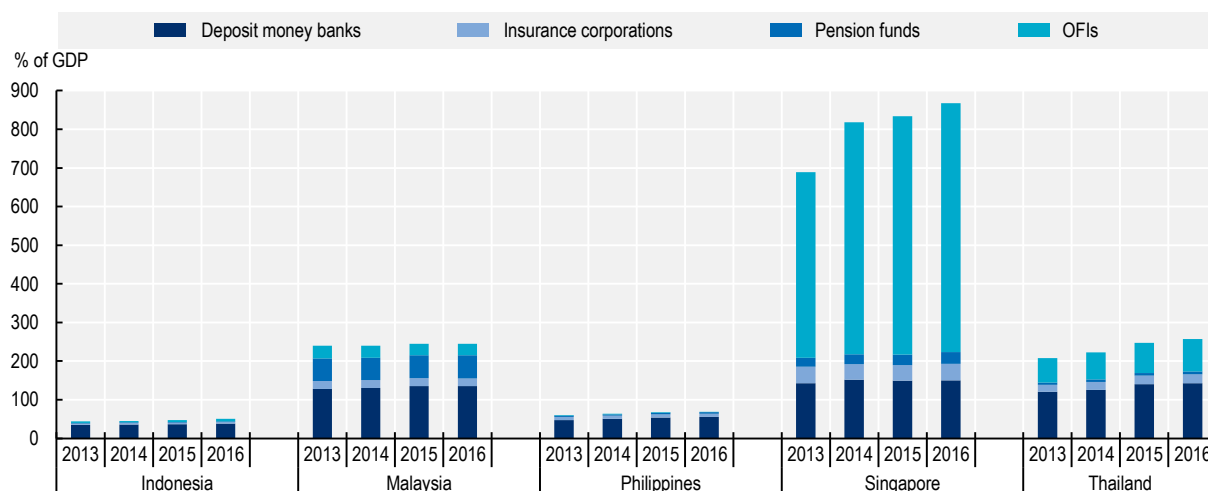
This section will discuss some of the most pressing challenges facing macroprudential policy makers in Emerging Asia. These include, but are not limited to, effectively measuring the macroprudential stance, understanding how macroprudential policy interacts with monetary policy, and assessing whether, and to what extent, macroprudential policy may have unintended consequences. The conduct of macroprudential policy, and the extent to which these challenges are more significant in one country than in another, is likely to be influenced by the structure of each country's financial system, and by the institutional set-up as regards macroprudential policy. These elements will be briefly reviewed as a preamble to the broader discussion about macroprudential policy challenges and implications.

First, there are very significant differences among Emerging Asian countries in terms of the size and structure of the financial sector. In 2016, the size of the overall financial sector, which is defined in this case as the ratio of total financial assets to gross domestic product (GDP), ranged from almost 900% of GDP in Singapore, to slightly above 51% of GDP in Indonesia (Figure 1.8). Other countries with a financial sector greater than domestic GDP are Malaysia (2.4 times) and Thailand (2.6 times). At the other end of the spectrum, the size of the financial sector in the Philippines stood at 69% at the end of 2016. The relative size of the financial sector increased between 2013 and 2016 in all ASEAN countries for which data are available (Figure 1.8). In Singapore, the size of the financial sector increased from 6.9 times GDP in 2013 to 8.7 times in 2016. The increase in Singapore is mainly a result of the increase in assets held by financial

institutions other than deposit money banks, insurance corporations and pension funds, while GDP expanded slightly over that period.


Figure 1.8. Size and structure of the financial sector in selected ASEAN economies, 2013-16

Ratio of total assets to GDP, percentage



Note: "OFIs" stands for other financial institutions, and includes financial institutions other than deposit money banks, insurance corporations and pension funds. Complete data are not available for Brunei Darussalam, Cambodia, Lao PDR, Myanmar and Viet Nam.

Source: OECD Development Centre based on data from the World Bank, *Global Financial Development Database*, <https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database>.

StatLink  <https://stat.link/orkc08>

Deposit money banks represent the largest share of the financial sector in most ASEAN countries for which such data are available, with the exception of Singapore (Figure 1.8). Banks remain the dominant financial intermediaries in ASEAN, partly because the development of capital markets has been slower in these countries. Other financial institutions account for the largest share of the overall financial sector in Singapore, and the second-largest share in Thailand. The insurance sector ranges from about 4.4% to 42.8% of GDP. It is particularly developed in Singapore, and to a lesser extent in Thailand and Malaysia. Finally, the pension fund sector is the smallest of the four sectors in nearly all ASEAN countries. The only exception is Malaysia, where pension fund assets amounted to nearly 60% of domestic GDP in 2016, making it the second-largest financial sector after deposit money banks. The large size of the pension fund segment in Malaysia could be explained by the existence of the Employee Provident Fund, which covers all private sector employees in Malaysia, to a certain extent.

Second, the institutional setup also differs among countries in Emerging Asia. To be sure, the dominant kind of macroprudential institutional setup is the central bank-based model (Table 1.31). However, in Indonesia, the Philippines and Thailand, the responsibility for conducting macroprudential policy is shared between the central bank and other designated authorities. In Indonesia, a Financial System Stability Committee was set up in 2013. It comprises the central bank, the finance ministry, the financial services regulator, and a deposit insurance institution. The roles are clearly divided among the various authorities. For instance, the central bank is responsible for implementing monetary and macroprudential policies to mitigate external and currency-related risks, macro-financial imbalances, and systemic risks. On the other hand, the financial services regulator is responsible for microprudential supervision to mitigate individual banking and financial market failures. The Financial System Stability Committee co-ordinates policy with

the aim of preventing and resolving any financial crisis that could be caused by multi-dimensional risks, according to the mandate of each participating institution (BIS, 2017^[76]).

Table 1.31. Macroprudential policy authorities in Emerging Asian economies

Central bank	Multiple designated authorities (joint committee)
Brunei Darussalam	Indonesia (central bank, financial services regulator, finance ministry and deposit insurance agency).
Cambodia	Philippines (central bank, insurance regulator, financial services regulator, finance department and deposit insurance agency).
China	
India	Thailand (central bank, financial services regulator and insurance regulator).
Lao PDR	
Malaysia	
Myanmar	
Singapore	
Viet Nam	

Source: OECD Development Centre based on Lee, Gaspar and Villaruel (2017^[78]), "Macroprudential Policy Frameworks in Developing Asian Economies", *ADB Economics Working Paper Series*, No. 510, March 2017, <https://www.adb.org/sites/default/files/publication/230801/ewp-510.pdf>; and various sources.

In the Philippines, there are other entities in charge of macroprudential policy, in addition to the central bank. In 2011, a Financial Stability Coordination Council was established at the initiative of the central bank. In addition to the central bank, the membership of this council is comprised of the Insurance Commission, the Securities and Exchange Commission, the Philippine Deposit Insurance Corporation, and the Department of Finance. It meets on a quarterly basis, and has five working groups that focus on specific concerns. A working group on corporate leverage looks at the domestic and cross-border debt exposures of non-financial corporations. Meanwhile, a working group on shadow banking and real estate focuses on real estate activities that are beyond the purview of the financial system regulators. A further working group on capital market development assesses issues on pricing and valuation in capital markets and contingent markets, in addition to concerns on financial market infrastructure. Moreover, a working group on financial crisis management and resolution is responsible for recovery and resolution strategies. Finally, a working group for communication manages financial stability-related issues (BIS, 2017^[76]).

In Thailand, meanwhile, the central bank (Bank of Thailand), the Securities and Exchange Commission, and the Office of Insurance Commission are the principal regulatory authorities that share the responsibility for maintaining financial stability. The central bank takes the lead role in safeguarding the country's overall financial stability. It is legally tasked with the supervision of commercial banks, specialised financial institutions, finance and real-estate credit companies, asset management firms, and credit card and personal loan companies. For its part, Thailand's Securities and Exchange Commission approves securities issuance for sale to the public. It also oversees compliance with disclosure and reporting requirements after issuance. In addition, it is also responsible for the supervision of securities companies, asset management companies, and derivatives business operators. Finally, the Office of Insurance Commission regulates insurance companies, brokers and agents by governing the issuance of operating licenses, and ensuring compliance with regulations that apply to the insurance sector (BIS, 2017^[76]).

The difficulty of measuring a country's macroprudential stance

Although the purpose of macroprudential policy is to foster financial stability and mitigate systemic risk, there is no consensus on methods for measuring the extent to which regulators meet these objectives. Measuring the likelihood and quantifying the cost of financial distress with sufficient foresight and confidence to take preventive action poses even greater challenges (BIS, 2017^[76]). A conceptualisation of an overall macroprudential stance can be used to establish the link between macroprudential policies and the financial stability objective. It is, therefore, crucial to establish a well-defined framework for measuring

a country's macroprudential stance. Such a framework would ultimately help Emerging Asian policy makers to assess the effectiveness of the macroprudential policy actions that they have implemented, and to judge whether additional policy measures may be warranted.

A macroprudential stance is more difficult to measure than a monetary stance. While the instruments of monetary policy are less numerous, the macroprudential policy toolkit is much broader. Indeed, it is very difficult to aggregate a range of different instruments, whose impact on financial risk can differ greatly (BIS, 2017^[76]). Moreover, the intermediate objectives of macroprudential policy are manifold, as opposed to monetary policy's primary goal of maintaining price stability. Macroprudential policy instruments can be classified in several different ways. The classification framework developed by Galati and Moessner (2017^[79]) is presented in Table 1.32. The overarching goal of macroprudential policy is to use prudential means to enhance system-wide financial stability, with a view to limiting the macroeconomic effects of financial distress. Multiple intermediate objectives can be set in order to achieve the ultimate goal of system-wide financial stability, and multiple instruments can be deployed. Broadly speaking, the two most prominent intermediate objectives of macroprudential policy are to counter financial booms, and to strengthen the resilience of the financial system by addressing various externalities (Table 1.32).

Table 1.32. Overview of macroprudential policy tools and intermediate objectives

Intermediate objectives				
Counter financial booms by addressing externalities generated by collateralised borrowing.		Strengthen the resilience of the financial system by addressing externalities arising from market structure, and in the financial infrastructure.		
Fire sales.	Strategic complementarities.	Interconnectedness.	Size and position in the market.	Financial infrastructure.
Examples of instruments that could be used to achieve the intermediate objectives				
Capital requirements (time-varying surcharges).	Capital requirements (e.g. surcharge linked to aggregate credit growth).	Capital requirements (e.g. surcharges for systemically-important financial institutions).		Central counterparty clearing (e.g. funding requirements for systemically important counterparties).
Liquidity requirements (net stable funding and liquidity coverage ratios).	Restrictions on activities, assets or liabilities (e.g. debt-to-income and loan-to-value ratios).	Restrictions on activities, assets or liabilities (e.g. Volcker Rule).		
Time-varying margining requirements.		Taxation (e.g. Pigouvian tax on systemically-important financial institutions dependent on interconnectedness).		
Taxation (e.g. Pigouvian tax on short-term funding).				

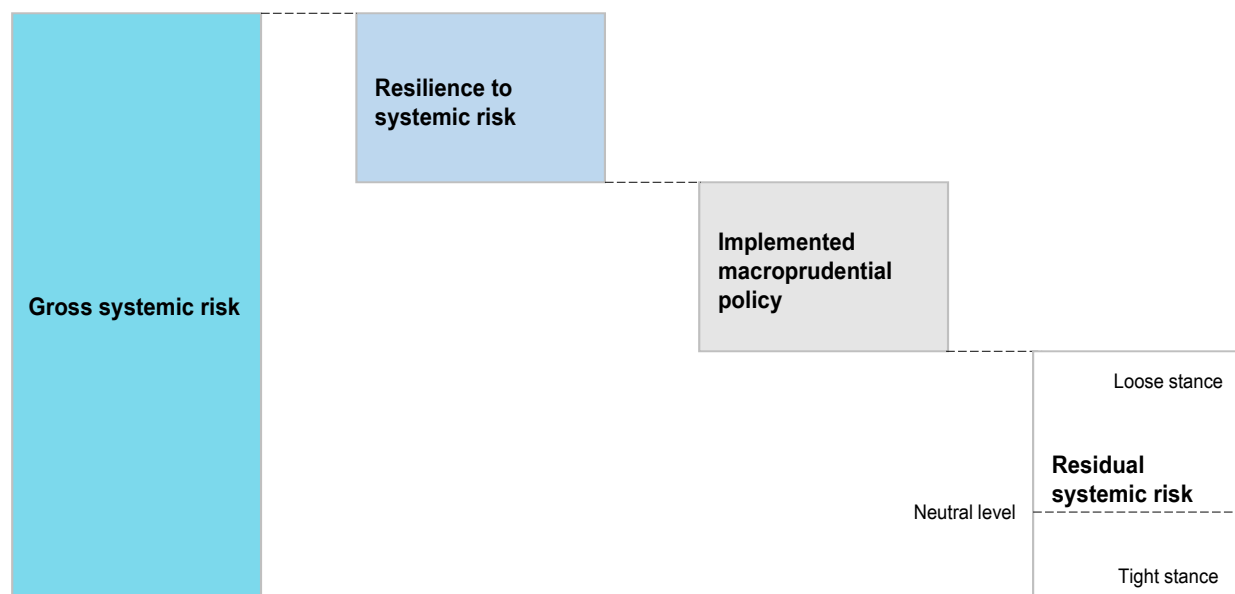
Note: The Volcker Rule generally prohibits banking entities from engaging in certain activities (e.g. proprietary trading), and from acquiring and retaining ownership interests in, sponsoring, or having certain relationships with a hedge fund or private equity fund.

Source: Galati and Moessner (2017^[79]), "What Do We Know About the Effects of Macroprudential Policy?", *Economica*, Vol. 85/340, pp. 735-770, <http://dx.doi.org/10.1111/ecca.12229>.

Notwithstanding these challenges, various frameworks have been proposed for measuring a country's macroprudential stance. For example, a risk-resilience framework for the assessment of the macroprudential stance is described in ESRB (2019^[80]). In this framework, the macroprudential stance is assessed as the difference between the observed level of systemic risk and a benchmark level of risk, which could be seen as the neutral level (Figure 1.9). The implementation of macroprudential policies would reduce the gap between risk and resilience, and bring the macroprudential stance back towards the neutral level. If the observed level of systemic risk is higher than the neutral level, the macroprudential stance could be considered as loose. By contrast, an observed level of systemic risk that is lower than the neutral level corresponds to a tight macroprudential stance. A tight macroprudential stance implies a trade-off between

the financial system's ability to provide products and services to the real economy, and its capacity to withstand adverse developments. For example, in the event of a tight macroprudential stance, lending to the real economy may be curtailed. In turn, once shocks materialise, the systemic risk component declines, and the macroprudential resilience mechanisms will absorb the fallout (ESRB, 2019_[80]).

Figure 1.9. Risk-resilience framework for the assessment of the macroprudential stance



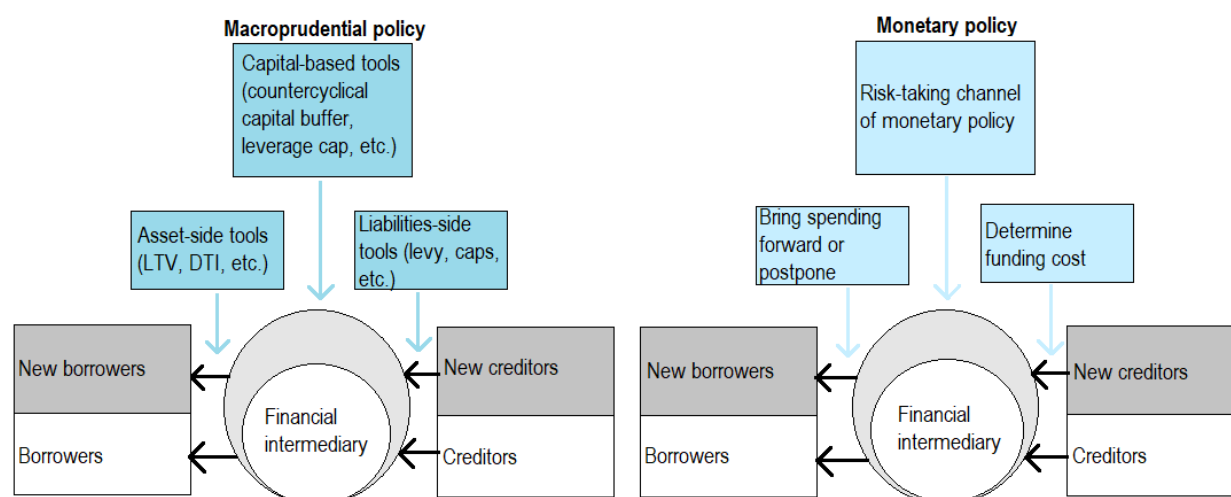
Source: ESRB (2019_[80]), *Features of a Macroprudential Stance: Initial Considerations*, https://www.esrb.europa.eu/pub/pdf/reports/esrb.report190408_features_macroprudential_stance_initial_considerations-f9cc4c05f4_en.pdf?ce1d199fbe8fee00effc5ac21cd9f549.

While many macroprudential policy authorities have stated that they do not measure the macroprudential stance at all, authorities in other jurisdictions have developed their own methodology. For instance, Hungary, Korea, and South Africa calibrate their macroprudential stance by tracking financial risks as a proxy (BIS, 2017_[76]).

Interaction between macroprudential and monetary policies

Macroprudential policy and monetary policy are inter-related (Figure 1.10). Because of its interaction with monetary policy, assessing the effectiveness of macroprudential policy is relatively complex. The macroprudential stance is therefore impacted by the level of interest rates and by liquidity conditions. Since both monetary policy and macroprudential policy have the capacity to influence price and financial stability conditions, it is important to take into account the implications for systemic risk of the overall conditions prevailing in the financial system. In addition, monetary policy and macroprudential policy can be seen as strategic complements. In addressing risks stemming from financial imbalances, an active macroprudential policy has the potential to reinforce monetary policy as it seeks to lean against the wind of financial imbalances. It can also support it in pursuing a mandate of price stability (ESRB, 2019_[80]).

Figure 1.10. Inter-relation between macroprudential policy and monetary policy



Source: Gadanez and Jayaram (2015^[81]), *Macroprudential Policy Frameworks, Instruments and Indicators: A Review*, https://www.bis.org/ifc/publ/ifcb41c_rh.pdf.

A first step in exploring the interaction between the macroprudential and monetary function is to assess the transmission channels of selected macroprudential policy tools (Table 1.33). For instance, the aim of minimum capital requirements and capital buffers is to increase the resilience of the banking system by making sure that adequate buffers are in place for banks to cope with potentially sizeable losses. Leverage requirements, on the other hand, are aimed at restricting the build-up of leverage in the banking sector, acting as a supplement to capital requirements. As for liquidity requirements, their purpose is to mitigate not only liquidity risks, but also solvency risks in the banking sector. Finally, caps on loan-to-value and debt-service-to-income ratios, as well as other restrictions on lending standards, pertain to the asset side of banks' balance sheets. These measures have a direct impact on borrowers' borrowing constraints. As a result, they render the banking system less vulnerable to borrower defaults.

Table 1.33. Illustration of the transmission mechanism of selected macroprudential policy tools and their interaction with monetary policy

Type of macroprudential policy tool	Transmission mechanism
Minimum capital requirements and capital buffers	Banks react by charging higher margins on new loans and curtailing the provision of credit to the real economy. The resulting contraction in both investment and consumption expenditure dampens capital and house prices, which exacerbates the propagation effects through financial accelerator mechanisms. The impact on economic activity and inflation is mitigated by significant monetary policy accommodation. Conversely, a simultaneous increase in capital requirements and the monetary policy rate can be anticipated in order to effectively curb bank lending, and to slow down economic activity.
Leverage requirements	During the global financial crisis of 2007-08, banks were forced to reduce their leverage in a manner that amplified downward pressure on asset prices. This deleveraging process exacerbated the feedback loop between losses, falling bank capital, and shrinking credit availability. The Basel III reforms introduced a minimum leverage ratio requirement to act as a supplementary measure to risk-based capital requirements, and to restrict the build-up of leverage in the banking sector in order to avoid destabilising deleveraging processes similar to those that occurred at the height of the crisis. Banks with a higher leverage ratio could react to a monetary policy tightening by taking on more risk, while banks with a lower leverage ratio could react in the opposite direction.
Liquidity requirements	The Basel III minimum liquidity requirements have been developed to achieve two objectives: (1) promote the short-term resilience of a bank's liquidity risk profile by ensuring that it has sufficient high-quality liquid assets to withstand an acute stress scenario lasting for one month; and (2) promote resilience over a longer-term horizon by creating additional incentives for a bank to fund its activities with more stable funding sources. The Basel III liquidity rules could, therefore, support monetary policy implementation to the extent that they reduce the share of banks that are overly dependent on central bank credit.

Type of macroprudential policy tool	Transmission mechanism
Borrower-based measures and other restrictions to lending standards	A lower loan-to-value or debt-service-to-income cap, or other such restrictions on loans to households, constrain the maximum loan that a bank is willing to grant against collateral. This triggers relative price adjustments together with substitution effects in bank lending, whereby housing loans decline. Overall, the effects on economic activity and inflation are influenced by the intensity of these price adjustments and substitution effects. The adverse impact on housing investment, and then on output and inflation, can partly be mitigated by a prompt loosening of the monetary stance.

Source: OECD Development Centre based on various sources.

Some of the recent literature in this field has concluded that monetary and macroprudential policies should be co-ordinated well in order to pursue jointly the objectives of price stability, output stability and financial stability. For instance, Gambacorta and Murcia (2017^[82]) conclude that macroprudential policies tend to be more effective in tackling credit cycles when they are accompanied by a counter-cyclical monetary policy. Similarly, Garcia Revelo, Lucotte and Pradines-Jobet (2020^[20]) consider a sample of 37 emerging and advanced economies in order to assess whether the effectiveness of macroprudential policies is affected by monetary policy conditions. The findings from this study are twofold, supporting the view that co-ordination between the two policy areas is desirable. First, the authors show that a restrictive monetary policy enhances the impact of macroprudential tightening on credit growth. Second, the results suggest that monetary policy helps to reduce delays in the transmission of macroprudential policy actions (Garcia Revelo, Lucotte and Pradines-Jobet, 2020^[20]). Malovaná and Frait (2017^[83]) reach a similar conclusion with respect to the Czech Republic.

Therefore, in principle, monetary policy could complement macroprudential policy in limiting the build-up of financial imbalances, discouraging risk-taking behaviour, and addressing excessive credit growth and leverage. In practical terms, however, the precise interaction between the two policy functions is likely to be influenced by the degree of concordance between real and financial cycles, which is ultimately related to the underlying shocks that drive the economy, and the specificities of the transmission mechanism. For instance, Angelini, Neri and Panetta (2010^[84]) use a dynamic general equilibrium model featuring a banking sector to assess the interaction between a counter-cyclical macroprudential policy, and monetary policy. The findings from this study suggest that, in the presence of a financial shock, the benefits of using macroprudential policy become sizeable compared to a scenario of monetary policy operating alone. By considering the implementation of a loan-to-value cap, Angelini, Neri and Panetta (2010^[84]) also argue that the role of macroprudential policy becomes potentially important in the presence of sectoral shocks affecting, for instance, the financial sector or the real estate market. As posited by the authors, enhancing the toolbox with a specific instrument that is more targeted towards the sector in which the economic disturbance arises can bring about substantial macroeconomic advantages (Angelini, Neri and Panetta, 2010^[84]).

Another important issue relates to the role of macroprudential policy in dealing with credit cycles. For instance, a loose monetary policy in an economy with booming credit and asset markets may encourage excessive risk-taking behaviour, and thus further exacerbate existing imbalances (Altunbas, Gambacorta and Marques-Ibanez, 2010^[85]). Against this background, macroprudential policy may be a valuable tool for aligning incentives in a counter-cyclical direction, as well as for addressing developments for which monetary policy alone is less relevant or insufficient. For instance, N'Diaye (2009^[86]) uses a new framework that blends a standard model for monetary policy analysis with a contingent claims model of financial sector vulnerabilities to explore how prudential regulations can support monetary policy in reducing output fluctuations, while maintaining financial stability. The results suggest that counter-cyclical tools, such as capital adequacy requirements, can allow monetary authorities to pursue the same output and inflation objectives with smaller adjustments to interest rates. Moreover, counter-cyclical rules can help stem swings in asset prices, and to lean against a financial accelerator process, thus enhancing financial stability (N'Diaye, 2009^[86]).

Furthermore, the precise interaction between macroprudential and monetary policy will depend on country-specific circumstances. For example, in the event of a positive supply shock that reduces inflation in the market for goods and increases asset prices and credit, macroprudential policy could tackle the latter, while the monetary stance could remain relatively accommodative. In addition, macroprudential policy could also increase the room for manoeuvre for monetary policy in open economies that are prone to capital-flow volatility. For instance, when capital inflows lead to increases both in leverage and exposure to exchange rates, macroprudential tools may be deployed to address these developments, thus allowing monetary policy to be tighter in response to inflationary shocks (IMF, 2013^[87]).

The literature on the interaction between macroprudential policy and monetary policy in Emerging Asian countries is relatively scarce. Using a panel regression set-up for 12 Asia-Pacific economies (including China, India, Indonesia, Malaysia, the Philippines, Singapore, and Thailand) between 2004 and 2013, Bruno, Shim and Shin (2017^[88]) suggest that macroprudential policies have been employed in such a way as to pull in the same direction as monetary policy. This implies that macroprudential policies tend to be implemented during periods of monetary tightening. In related scholarship, Kim, Kim and Mehrotra (2019^[31]) estimate a reduced-form vector auto-regression inflation model for a sample of 11 Asian economies, including China, India, Indonesia, Malaysia, the Philippines, Singapore, and Thailand, for the period 2000-14. They find that the effects of macroprudential policy on credit and output are qualitatively similar to the effects of monetary policy, suggesting that an economy could face a policy conflict when credit expansion is strong but the real economy is weak. These findings are consistent with earlier work by Kim and Mehrotra (2018^[89]), who document similar effects of monetary and macroprudential policies in four inflation targeting economies in the Asia-Pacific region (Australia, Indonesia, Korea, and Thailand).

Macroprudential policy must better account for increasing interconnections between banks and non-bank financial intermediaries

Overview of shock transmission mechanisms within the financial sector

Macroprudential policy aims to monitor system-wide risks. Financial institutions are connected through multiple types of contracts, such as bilateral loans, overlapping asset portfolios, and derivative contracts. In normal times, these interconnections facilitate risk-sharing among financial institutions. During periods of stress, however, shocks propagate more easily because of these links. This can result in a domino effect, a kind of chain reaction of defaults among financial institutions. Shocks may also propagate due to a shortage of interbank refinancing, or as asset portfolios are liquidated. Macroprudential policy aims to mitigate these effects through different instruments, such as additional capital requirements for systemically important institutions.

The first channel of transmission is through direct exposures, or the domino effect. Two different scenarios can be identified. In the first scenario, banks exposed to insolvent banks through bilateral loans suffer a loss equal to the amount of their exposure, adjusted by the potential amount recovered. In the second scenario, declines in the market price of bank securities (i.e. shares and bonds issued by banking institutions) can affect other institutions via their direct exposures (i.e. if bank A directly holds shares or bonds issued by bank B). In this case, banks may suffer losses even in the absence of default by a counterparty due to the depreciation of these securities, which are valued on balance sheets at their reduced market value.

The second channel, in which there is a shortage of interbank refinancing, is linked to the behaviour of banks at times of stress. When banks lose confidence in the market, they may stop lending to each other, either because they have their own liquidity needs, or as a preventive measure. Their counterpart banks that are particularly dependent on this type of refinancing subsequently encounter difficulties in refinancing themselves, and may become illiquid. For example, such a scenario was at play during the Lehman Brothers collapse in 2008. This second channel of shock transmission operates through the interbank

commitments on banks' balance sheets. External liabilities such as deposits are deemed more stable, because they are less likely to suffer from this loss of confidence. Indeed, depositors are typically covered by a bank deposit guarantee fund, which is not the case for interbank creditors.

The third transmission channel operates via the liquidation of overlapping asset portfolios. Distressed institutions seek to deleverage and sell assets. As these divestments take place under already deteriorating market conditions, the market prices of these assets fall even further. The other institutions holding the same assets then suffer losses, since these assets are valued at market prices on their respective balance sheets. These institutions may also start liquidating their assets to readjust their securities portfolios, which could trigger a downward spiral. This last channel concerns tradable items on a bank's balance sheet, such as shares or bonds issued by a given firm.

The specialised literature looks at these interconnections from multiple angles. Existing models, mostly centred on the banking sector, underline the non-monotonic nature of interconnections, or the diversification of counterparties and its impact on the resilience of the system. Increasing the number of connections first increases, and then diminishes, the level of liquidity. However, in the event of a major crisis, interconnections amplify contagion mechanisms. Gai, Haldane and Kapadia (2011^[90]) develop a network model of interbank lending, and show how systemic liquidity crises can arise within such a network. The model illustrates how greater complexity and concentration in the financial network may amplify this fragility. The analysis also suggests that a range of policies, including tougher regulation of liquidity, and surcharges for systemically important institutions, could render the financial system more resilient (Gai, Haldane and Kapadia, 2011^[90]).

The empirical literature on financial networks is rich in analyses that aim to provide better understanding of and quantify the nature and extent of inter-connections. Nevertheless, no consensus on the best way to quantify these interconnections has emerged. A first strand of analysis is that of core/periphery structures and their impact on financial stability. In an analysis of the German interbank lending market between 1997 and 2007, Craig and von Peter (2014^[91]) differentiate between “money centre banks” and the rest, with the former acting more as factors of contagion; Bech and Atalay (2010^[92]) document similar dynamics in the US Fed funds market. A second strand of empirical analysis aims to understand the complexity of interbank relations better, by developing models with multiple layers of interconnections (i.e. multiplexes). For instance, Aldasoro and Alves (2017^[93]) analyse the network of large European banks at the end of 2011. They conclude that the core/periphery analysis is not sufficient to understand the importance of a node in the network—for this reason, Aldasoro and Alves (2017^[93]) developed new measures of systemic risk that take into account the contribution of each entity at each layer of the multiplex. They thus identify about ten banks that go beyond the “core” concept described above, and highlight in a granular manner the elements of their balance sheet that may potentially be risk factors.

Most empirical studies characterising financial networks, however, focus on the banking sector, and only a few recent papers study the nature of the links between non-bank financial intermediaries and the rest of the financial system. For instance, Xisong and Nadal de Simone (2016^[94]) use data from the portfolios of investment funds and banks in Luxembourg to assess the impact of various shock scenarios on systemic risk. They document a change over time in the interdependence between investment funds and banks, as well as an asymmetry in interconnections, with investment funds posing a greater threat of contagion to banks than the other way around. Using data on Spanish mutual funds, Gil-Bazo, Hoffmann and Mayordomo (2019^[95]) show that bank-affiliated funds provide funding support to their parent company via purchases of bonds in the primary market, and that this support is more consequential during times of crisis, and for riskier banks. The authors also conclude that these trades generate abnormal returns, therefore benefitting banks at the expense of fund investors (Gil-Bazo, Hoffmann and Mayordomo, 2019^[95]).

Few interconnection studies based on data from Emerging Asia exist at this stage. Mensah and Premaratne (2017^[96]) undertake an empirical investigation of systemic risk stemming from bank interconnections in Asia. Their analysis reveals that the degree of interconnectedness has generally increased among banks in Asia, although the causal network among banks has become less dense since the global financial crisis. The authors also find a positive relationship between bank size and contribution to systemic risk (Mensah and Premaratne, 2017^[96]). Using data from 111 Chinese banks over the period 2013-16, Chen et al. (2020^[97]) simulate the effects of credit and liquidity shocks on China's banking network. Simulation results show that, under the extreme pressure scenario, the contagion arising from a liquidity shock is significantly stronger than the effect of a credit shock, highlighting the importance of liquidity in the banking system. The authors also find that an increase in the level of capital can enhance the ability of banks to withstand both credit and liquidity shocks (Chen et al., 2020^[97]).

Macroprudential policies need to effectively address contagion risks within the financial system

In order to mitigate risks arising from interconnections within the financial system as previously described, the Basel III framework equips macroprudential regulators with specific tools to tackle these risks. Several capital surcharges were introduced following the global financial crisis to shield the financial system from the most destabilising institutions, namely banks with a systemic footprint. A distinction can be made between the instruments that are specifically designed to mitigate the amplification channels of shocks. On one hand, the capital surcharges for systemically important institutions (designated by the Basel Committee) focus on the individual characteristics of financial institutions. On the other hand, the systemic risk buffer targets the structural vulnerabilities of the banking system as a whole.

In addition, since the 2007-08 global financial crisis, supervisors have been provided with more granular data on bilateral exposures, in particular in the segments of interbank lending, securities and derivatives holdings, and short-term funding. These data have made it possible to effectively monitor and quantify risks stemming from interconnections in the financial system, and have improved the design and conduct of top-down stress tests. While significant progress has been made in assessing and containing financial contagion in the banking system, several challenges remain. First, the focus of macroprudential regulation is still largely national, whereas most major banking groups have cross-border activities. Second, risk stemming from interconnections between banks and other financial institutions are yet to be fully understood and properly measured. Finally, while data on interconnections in the non-bank sector are gradually becoming available, their usability may be hindered by still insufficient quality (Banque de France, 2018^[98]). The three challenges previously listed will be discussed in more detail in the paragraphs below.

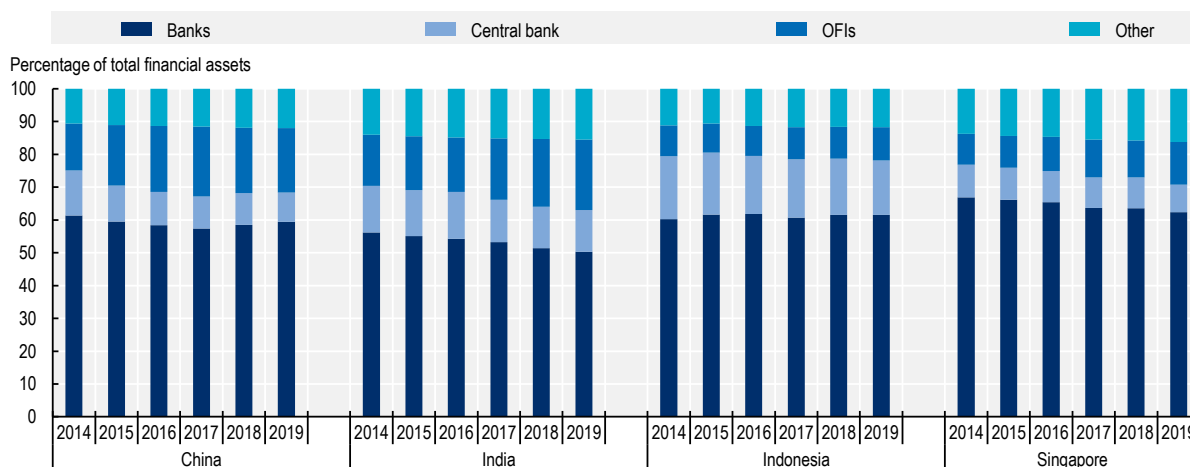
First, the national focus of macroprudential policy does not take proper account of major banking groups' cross-border activities. It is indeed through their size, their cross-border activities, their complexity, and their interconnections, that these institutions contribute to systemic risk. Lim, Khong and Tan (2015^[99]), for example, empirically show that the increasing integration of banks in the Asia-Pacific region is often associated with the banking sector's vulnerability to adverse shocks and financial instability. The authors argue that a sustainable framework for effective cross-border bank supervision and regulation should be established at a regional level in Asia-Pacific. Similar conclusions are obtained by Le and Dickinson (2015^[100]), whose empirical results suggest that the risk of a sudden stop in East Asian countries is associated not only with global liquidity and host country productivity shocks, but also with common contagion effects among lenders. Another finding is that lending flows to the banking sector are more sensitive to shocks than are flows to the non-bank private sector (Le and Dickinson, 2015^[100]).

Second, risks stemming from interconnections between banks and non-bank financial intermediaries are not fully understood. From a theoretical standpoint, the interconnections within financial networks could have stabilising effects, resulting from the diversification of financial risks, but also amplifying effects, resulting from the creation of additional channels that could propagate shocks. The Financial Stability

Board noted in its 2014 report on shadow banking in Asia that the definition of what represents a non-bank financial intermediary was interpreted differently across jurisdictions (FSB, 2014^[101]). This may jeopardise the process of quantifying interlinkages within the financial system, and the systemic risk posed by the respective non-bank financial intermediaries. This issue is particularly relevant for countries with a large non-bank financial sector, such as Singapore, and to some extent also Thailand (Figure 1.11).

Third, data on the activity of non-bank financial intermediaries, although increasingly available, is not of sufficient quality. Furthermore, the monitoring of non-bank financial intermediation using an entity-based approach should be complemented by an activities-based approach that focuses on intermediation activities conducted primarily through financial markets (i.e. securitisation transactions, securities financing transactions, collateral management services, and other economically similar transactions). In its 2020 *Global Monitoring Report* on non-bank financial intermediation, the Financial Stability Board reports that the growth of this sector in 2019 outpaced that of banks. As noted in the report, at the global level, non-bank financial intermediation grew by 8.9% in 2019, to USD 200.2 trillion, covering 49.5% of total global financial assets. These developments were mainly driven by increases in investment funds, pension funds, and insurance corporations (FSB, 2020^[102]). In Emerging Asia, the structural importance of other financial intermediaries increased between 2014 and 2019. As of 2019, their collective share of total financial assets in the respective jurisdictions of the region ranges from 10.1% in Indonesia to 21.5% in India (Figure 1.11). The expansion is most notable in India, where the share of assets held by other financial intermediaries expanded by nearly 6% between 2014 and 2019.

Figure 1.11. Breakdown of financial assets by economic function in selected Emerging Asian economies, 2014-19



Note: "OFIs" stands for other financial intermediaries. The category 'Other' refers to the sum of pension funds and public financial institutions. Source: OECD Development Centre, based on data from FSB (2020^[102]), *Global Monitoring Report on Non-Bank Financial Intermediation 2020*, <https://www.fsb.org/wp-content/uploads/P161220.pdf>.

StatLink  <https://stat.link/fshzcb>

Although the scope of data on interconnectedness improved for the 2020 monitoring exercise, the Financial Stability Board notes that significant data gaps remain. In certain instances, authorities only reported a subset of exposures. Furthermore, the 2020 monitoring exercise did not call for the collection of data by type of exposure, or for granular data on cross-border linkages (FSB, 2020^[102]). This implies that macroprudential authorities do not have a complete picture either of the nature of exposures, or the extent of cross-border links between these entities. Moreover, aggregate data is not detailed enough to allow a

full understanding of key sources of systemic risk, such as the presence of leverage, maturity and liquidity transformation, or the possible channels for contagion.

The cross-border spillover effects of macroprudential policy

Owing to the international dimension of the financial sector in Emerging Asia and beyond, macroprudential policies implemented domestically may have material cross-border spillover effects. These have the potential to be both positive and negative. Therefore, policy makers need to give due consideration to the cross-border effects of macroprudential policies that are implemented domestically, in order to ensure their effectiveness. They should also take into account the macroprudential settings prevalent in other countries when implementing new macroprudential policies. When warranted, policy makers in Emerging Asia could consider reciprocating other countries' macroprudential measures.

Few academic papers embed parameters of macroprudential policy and can support an assessment of the potential cross-border spillover effects of such policy in terms of contagion. One of these studies is the agent-based network formation model developed by Hałaj and Kok (2015^[103]) for the euro area. In order to explore the implications that changes to regulatory parameters can have on the risk of contagion that is embedded in the system (including cross-border spillovers), the authors develop a model of the euro area banking system, in which banks are subject to capital and liquidity constraints, as well as to large exposure limits. By running various policy experiments, they conclude that macroprudential policies can make a significant difference through their impact on the formation of networks, and ultimately on the risk of interbank contagion from adverse shocks. In another recent study, Cont and Schaanning (2017^[104]) build a framework for quantifying the impact of fire sales in a network of financial institutions with common asset holdings, subject to leverage or capital constraints. The results indicate that moderately large macroshocks may trigger fire sales that could subsequently lead to substantial losses across bank portfolios. These findings highlight the importance of the risk to endogenous financial stability posed by fire sales that defy national borders. The authors also point to the potential of various types of macroprudential policies in mitigating such risks. In this regard, Cont and Schaanning (2017^[104]) argue that any meaningful systemic stress test should account for the magnitude of cross-country indirect exposures. Moreover, they argue that such a test cannot be conducted at the level of a single country, and that transnational co-ordination of macroprudential policies is necessary.

Other studies focus on how regulatory leakages, including macroprudential measures, affect cross-border capital flows, which in turn act as a conduit for financial spillovers. The findings from some of the studies on this topic are summarised in Table 1.34 below. However, measuring cross-border financial spillovers poses several challenges. First, there is a need to assess domestic effects and international spillovers using more detailed bank-level data, and to rely on measures of prudential regulation with greater precision. Second, an appropriate empirical methodology is required in order to account better for potential interactions of cross-border spillover effects, and to assess their implications for cross-border spillovers and spillbacks. Third, a better distinction is needed between common shocks and spillovers from country-specific shocks. Furthermore, it is necessary to evaluate multiple countries simultaneously, in order to allow for the possibility of second-round spillovers. Given the growing role of emerging markets in the world economy, they should be jointly analysed with advanced economies, taking the rest of the world as an aggregate (Agenor and Pereira da Silva, 2018^[105]).

Table 1.34. Examples of empirical findings on the impact of macroprudential regulatory leakages on cross-border capital flows

Authors	Geographical coverage and time span	Results
Houston, Lin and Ma (2012) ^[106]	26 OECD member countries; quarterly data starting from December 1983.	Less stringent bank regulations in the recipient country induce more bank inflows. The recipient country in the sample with the lowest level of restrictions on activity is likely to attract 2.61% higher bank inflows on an annual basis, relative to the recipient country with the highest level restrictiveness on activity.
Aiyar, Calomiris and Wieladek (2014) ^[107]	United Kingdom Bank-level data between 1998 and 2007.	Unregulated banks (resident foreign branches) increase lending in response to tighter capital requirements on a relevant reference group of regulated banks. This “leakage” is substantial, amounting to about one-third of the initial impulse from the regulatory change.
Bremus and Fratzscher (2015) ^[108]	46 advanced and emerging economies. Data on bilateral bank claims between 2005 and 2012.	Source countries that experienced larger increases in capital stringency, banking supervisory power, or overall independence of the supervisor, saw larger increases in cross-border bank claims, i.e. larger outflows of bank credit.
Karolyi and Taboada (2015) ^[109]	78 advanced and emerging countries. Data on cross-border bank acquisitions announced between 1995 and 2012.	Around the announcement date for an acquisition, the capital adequacy ratios and aggregate capital adequacy ratios of target banks are positively correlated with differences in the quality of bank regulation between the countries of the acquirer and the target. The (aggregate) capital adequacy ratios of target banks are higher when acquirers are from countries with more restrictions on bank activities, stricter capital requirements, stronger private monitoring, and better overall regulatory quality.
Avdjiev et al. (2017) ^[110]	16 home countries and 53 destination countries. Quarterly bank lending data between Q1 2000 and Q4 2014.	Tighter loan-to-value limits in the destination country have increased the amount of international loans extended to that country. Banks’ international lending also responds to changes to loan-to-value rules in their home country, with balance sheet characteristics affecting the strength of international transmission.
Cerutti, Claessens and Laeven (2017) ^[26]	119 advanced and developing countries. Data on the use of macroprudential policies between 2000 and 2013.	The use of macroprudential policies is associated with greater cross-border borrowing. This suggests that countries face issues of avoidance, which they may be able to limit by adapting their financial sector regulations, and by adopting capital-flow management tools.
Kang et al. (2017) ^[111]	64 advanced and emerging economies. Quarterly data on cross-border bank lending and borrowing between Q1 2000 and Q1 2015.	Existence of cross-border bank credit spillovers from sectoral and liquidity-based macroprudential policy measures, but not from capital measures. This empirical evidence is stronger for tightening than for loosening measures, is distributed across credit leakage and reallocation effects, and is generally concentrated regionally.
Takats and Temesvary (2019) ^[112]	16 home countries and 53 destination countries. Quarterly bank lending data and data on macroprudential policies between Q1 2000 and Q1 2013.	Macroprudential measures implemented in borrowers’ host countries prior to the so-called “taper tantrum” of 2013 (when markets jolted when the US Federal Reserve signalled that it was considering a move away from quantitative easing) significantly reduced the negative effect of this event on cross-border lending growth. The shock-mitigating effects of host country macroprudential rules are present both in lending to banks, and in lending to non-banks. They are stronger for lending flows to borrowers in advanced economies and to the non-bank sector in general.

Source: OECD Development Centre.

The scope for cross-border policy co-ordination also depends on the nature of the different policy tools. In light of these considerations, the principle of jurisdictional reciprocity becomes highly relevant. The Basel Committee on Banking Supervision established the principle of jurisdictional reciprocity in the context of the use of the countercyclical capital buffer. Under this principle, foreign supervisors must apply at least the same additional capital buffers as a bank’s home regulator imposes on it, if it makes an international loan into their jurisdiction. The ultimate goal is to ensure that all banks operate in a level-playing field when lending to entities in the host country (Agenor and Pereira da Silva, 2018^[105]). On the other hand, there

may be less need for cross-border policy co-ordination for those policy measures that can be implemented effectively by national authorities at a local level, such as loan-to-value caps, and exposure limits.

Moral hazard

The substantial losses that banks incurred during the global financial crisis of 2007-08 raised serious concerns about their risk-taking behaviour and called for more effective regulatory actions and macroprudential policies. Some of the important factors that could lead to moral hazard are imperfect information in complex organisations such as banks, deposit insurance schemes, and government bailout programmes for institutions deemed “too-big-to-fail”.

The presence of imperfect information in complex organisations like banks could lead to moral hazard. This arises from distorted incentives between the principal and the agent (Alexander, 2006^[113]). For example, Dewatripont and Tirole (1994^[114]) develop a framework for modelling the classic moral hazard problem regarding the unobservable effort of managers. They conclude that banks with low leverage have an incentive to increase risk-taking. In a similar vein, Admati et al. (2017^[115]) demonstrate that if a firm has superior information about the quality of its assets, shareholders would prefer to de-leverage by selling safer assets and retaining the riskier ones, without issuing equity. Gropp et al. (2018^[116]) provide similar empirical evidence supporting the asset reduction hypothesis and document no impact on equity. More specifically, they use the 2011 capital exercise conducted by the European Banking Authority as a quasi-natural experiment and find that banks that were subject to the exercise increased their capital ratios by reducing their risk-weighted assets rather than by raising their levels of equity. As such, banks reduce lending to corporate and retail customers (Gropp et al., 2018^[116]).

Other studies have attempted to provide quantitative evidence on banks’ risk-taking behaviour arising from deposit insurance schemes. Grossman (1992^[117]) finds a positive and significant relationship between the adoption of deposit insurance schemes and risk-taking by US thrift banks, using the ratio of judgements and real estate owned to total assets as proxies for risk-taking behaviour. In a similar vein, Demirgüç-Kunt and Detragiache (2002^[118]), using a sample of 61 countries, conclude that deposit insurance significantly increased the probability of a banking crisis in the country between 1980 and 1997. To get a sense of the magnitude, the authors computed estimated probabilities of a banking crisis for four crisis episodes, under the hypothesis that the coverage of the deposit insurance system in the four countries is reduced to the level of the benchmark country, Switzerland. One of these four crisis episodes was the 1981 crisis in the Philippines. In the case of that episode, the probability of a banking crisis would have declined from 21% to 3.8% if deposit insurance coverage had been reduced to the level prevalent in Switzerland.

Selected banks may receive capital when they experience financial stress, in the form of bailouts. The general notion of moral hazard refers to the expectation that governments would not let an ailing, yet systemically important, financial institution fail, owing to the serious economic damage that its default would trigger. In turn, this government support may turn into a funding advantage for banks deemed “too-big-to-fail” or “too-interconnected-to-fail” when compared with non-systemic banks. Debt holders will naturally tend to require a lower rate of return in the case of systemically important financial institutions. This is inherently conducive to risk-taking, to the extent that such institutions tend to engage in riskier strategies, expanding their balance sheets and increasing leverage, in the absence of a disciplining effect from the market. This moral hazard thus creates a bias towards risk-taking. For example, Farhi and Tirole (2012^[119]) find that bailouts limit the capacity of creditors to resolve a bank’s moral hazard problem, while worsening its ex-ante efficiency.

Policies to address the issue of moral hazard

The special risks posed by systemically important financial institutions have prompted a wide range of proposals on how to tackle these risks at the national and international level. There are two apparent objectives in this sense. First, macroprudential regulation should aim simultaneously to increase their loss-

absorption capacity and diminish their contribution to systemic risk. Second, it is key for macroprudential regulation to address the moral hazard problem inherent in government bailout guarantees, with a clear focus on reducing the burden on taxpayers. The frontier between these two objectives is nevertheless blurred, given the fact that the systemic importance of these financial institutions, and the moral hazard issue associated with “too-big-to-fail”, tend to complement and reinforce each other. The issue is made more complex because, in the heat of a crisis, public authorities tend to consider most institutions as being systemically important. For instance, the US authorities did not consider the broker-dealer Bear Stearns to be systemically important before the subprime crisis of 2007-08.

Capital requirements are typically considered an effective regulatory option to increase banks' capacity to absorb losses during an economic downturn and maintain the financial system's resilience. A common view put forward is that the specific risks posed by systemically important financial institutions could be addressed by making additional prudential requirements applicable to these institutions. Capital surcharges or contingent capital instruments may be one way to do this (Jiménez et al., 2017^[28]; Delis and Staikouras, 2011^[120]; VanHoose, 2007^[121]). A strand of the economic literature supports this view. For instance, it is hypothesised that higher capital levels may discourage risk-taking behaviour, since bank managers and shareholders would have more skin in the game and would, therefore, have an incentive to adopt prudent behaviour (Acharya, Mehran and Thakor, 2015^[122]). Furthermore, bank managers may have incentives to avoid excessive risk-taking because more risk increases the variance of returns, which can amplify the probability of significant losses to banks' equity (Repullo and Suarez, 2004^[123]; Hellmann, Murdock and Stiglitz, 2000^[124]). In practical terms, implementing a capital surcharge would imply that a higher capital buffer would be calibrated for institutions designated as systemically important, according to their contribution to systemic risk. Defined as debt instruments that could be converted into equity in specific circumstances (i.e. when the capital ratio falls below a certain threshold), contingent capital would also work towards a higher capital buffer.

It is commonly agreed that improving supervisory regimes is paramount for reducing the probability of default for banks overall and systemically important institutions in particular. Furthermore, Emerging Asian countries are noticeably absent from the Basel Committee, which could lead to lax and unenforceable bank regulation for underdeveloped banking systems. Stress tests could provide key insights for the implementation of *ex ante* measures, aimed at reducing the probability and impact of a default. Some studies focus on the capacity of stress tests to render banks safer, and thus to enhance financial stability. For instance, Cortés et al. (2020^[125]) suggest that stress tests work as intended. Banks that are more affected by stress tests reduce their willingness to supply loans to small businesses, and this reduction is concentrated among relatively riskier small business borrowers. Lending falls more so in markets where stress-tested banks do not own branches near the physical location of borrowers, and prices rise predominantly where they do. This emphasises the importance of market structure and branch location in mediating the impact of capital requirements on credit supply (Cortés et al., 2020^[125]). However, aggregate credit does not seem to have been adversely impacted by stress tests. Instead, small, local lenders seem to act as substitutes when large stress-tested banks exit those markets. In the event of a default by a systemically important financial institution, *ex post* measures are necessary to ensure that the failure of the financial institutions that it affects can be resolved in an orderly manner, thus limiting the impact of the resolution on the financial system. Related to increasing supervisory regimes is enhancing information disclosure for improved market discipline. Banks which disclose more information on their risk profile are subject to stronger market discipline, leading to self-imposed high capital buffers (Nier and Baumann, 2006^[126]).

Finally, according to other views, when macroprudential policy is not targeted optimally or too tight, distortions may arise. Tighter regulations also can create stronger incentives for circumvention, with the risk of vulnerabilities accumulating outside of the regulatory perimeter. In an assessment of macroprudential policies' impact on bank vulnerabilities, Claessens, Ghosh and Mihet (Claessens, Ghosh and Mihet, 2013^[23]) conclude that certain types of macroprudential tools aimed at mitigating the build-up

of financial vulnerabilities, including caps on loan-to-value and debt service-to-income, could work perversely during financial downturns when not sufficiently loosened, as they make adjustments more difficult. In addition, the authors argue that poorly designed or wrongly implemented macroprudential tools can be circumvented, thus implying further distortions. As also pointed out in the study, several country-specific characteristics need to be considered when calibrating macroprudential policies (Claessens, Ghosh and Mihet, 2013_[23]).

Macroprudential policy during major external shocks: Implications for the COVID-19 pandemic

The COVID-19 crisis tested the solidity of the financial system. Moreover, it questioned the relevance of all of the reforms, that followed the global financial crisis of 2007-08 including macroprudential measures. Unlike during that crisis, the banking sector, in particular, has proven of late to be more resilient. This is because it is better capitalised due to the combined action of both micro- and macroprudential authorities. In turn, this has lent support to crisis-management tools. Indeed, the soundness of the banking system has contributed to the effectiveness of public authorities, governments, and central banks, as they have acted in the face of the pandemic and its economic consequences. Authorities in many Emerging Asian countries quickly mobilised a wide range of instruments to support the financing of the real economy, in particular via the banking sector. These measures complemented the fiscal stimulus extended at the national level to support businesses and households that were hit hard by the pandemic-induced recession.

Macroprudential loosening may be warranted during times of economic turmoil

Notwithstanding the important role that macroprudential policy has played in enhancing financial stability, it may, once a credible macroprudential policy framework is in place and functioning properly, be desirable and feasible to loosen macroprudential requirements in times of economic turmoil such as the current pandemic. Indeed, the buffers accumulated during upturns could be released to mitigate the adverse mechanisms at play during a downturn. Moreover, while macroprudential policy plays an important role in strengthening the resilience of the financial system to adverse shocks, monetary policy actions, particularly the unconventional measures, also remain very effective crisis-management tools. The research study by Kawata et al. (2013_[127]) lends support to this view. By applying a financial macro-econometric model in the case of Japan, they show that, while macroprudential policy is effective in preventing the build-up of financial imbalances, it would need to be complemented by other policies in order to support the economy during a phase of contraction.

At the current juncture, riskier borrowing segments in Emerging Asian countries, notably micro, small and medium-sized enterprises, are most vulnerable to bank credit supply constraints and excessive risk-aversion on the part of lenders. Given the importance of these enterprises to Emerging Asian economies, the deterioration of their financial situation and their difficulties in accessing external financing are of particular concern in terms of these countries' broad economic prospects post-pandemic. Several studies have attempted to illustrate how macroprudential tools could increase the risk of rationing in certain borrowing segments when lenders' aversion to risk is high. Combining balance sheet data on 900 000 firms from 48 countries, with information on macroprudential policy implementation between 2003 and 2011, Ayyagari, Beck and Martinez Peria (2018_[128]) find that these policies are associated with lower credit growth. The effects are particularly significant for micro, small and medium-sized enterprises and indeed for young firms, which tend to be more financially constrained and dependent on bank financing. By the same token, Allen et al. (2012_[129]) assert that the availability of bank credit to smaller firms could deteriorate as the new Basel III liquidity requirements force banks to reduce non-liquid assets and restrict credit.

As they have sought to attenuate the economic fallout induced by COVID-19, Emerging Asian policy makers have had recourse to certain macroprudential measures. For example, several countries in

the region eased their approach to the treatment of non-performing loans. Authorities in Malaysia have asked banks to take into account government assistance when evaluating a borrower's capacity to repay a loan. In some countries, authorities have loosened the minimum liquidity requirements applicable to banks. Authorities in India and Malaysia have permitted banks to operate temporarily with a lower liquidity coverage ratio than the one prescribed by the Basel III framework. Finally, policy makers in certain countries used other tools to help borrowers. In Malaysia, for instance, authorities announced in June 2020 that an exemption to residential property gains tax would be applicable for the disposal of residential homes between 1 June 2020 and 31 December 2021.

The COVID-19 crisis has highlighted the vulnerabilities of non-bank financial intermediaries

Furthermore, the COVID-19 crisis has shed light on the vulnerabilities of non-bank financial intermediaries, in particular those of investment funds. It has also shed light on some of inadequacies in existing regulatory frameworks. The rise of non-bank financial intermediation and, in particular, the development of the investment fund sector, has moved a portion of financial intermediation to a segment dominated by more numerous and more heterogeneous actors than in the traditional banking sector. However, these non-bank actors often respond to identical dynamics, the effects of which may be pro-cyclical. The degree of interconnectedness of these non-bank financial intermediaries with the traditional banking sector calls for the development of a macroprudential framework for them, which takes into account their systemic footprint. Indeed, non-bank intermediaries are highly connected to each other and to banks. This is the case through direct exposures, but also through indirect exposures, in particular via financial conglomerate structures and overlapping asset portfolios. In addition, the low interest rate environment may encourage non-bank financial intermediaries to increase their leverage by holding riskier and less liquid assets.

The turmoil unleashed by the COVID-19 pandemic was particularly acute for money market funds. In March 2020, money market funds investing primarily in high-quality, short-term private debt securities, were beset by large-scale redemptions (Avalos and Xia, 2020^[130]). The action of central banks was decisive, in particular to foster liquidity in short-term funding markets, where money market funds are most active in normal times. For instance, the Monetary Authority of Singapore has provided ample local-currency liquidity to the financial system through its daily money market operations. It has also established a new USD 60 billion facility to support stable liquidity conditions in US dollars (MAS, n.d.^[131]). In the absence of central bank support, the withdrawal of money market funds at the height of the COVID-19 crisis may have had a pro-cyclical effect of drying up the liquidity available to non-financial corporations.

The current macroprudential framework applicable to money market funds may be insufficient, as it fails to integrate the negative externalities that their activities trigger for the entire financial system. This poses liquidity risks to the real economy, which increasingly relies on money market funds as a source of funding. Liquidity buffers may need to be strengthened, but the macroprudential framework should remain flexible enough to allow regulators sufficient flexibility to relax these constraints during times of large external shocks. A regional or even international approach is desirable, given the high degree of interconnection and interdependence among non-financial intermediaries that goes beyond the national perimeter.

Macroprudential policy should be able to tackle potentially destabilising capital flows

Unlike during the global financial crisis, international bank flows have not collapsed during the COVID-19 crisis. As the pandemic evolves, macroprudential authorities will need to take into account the heterogeneity of banks, as well as country-specific factors, in order to manage risks to financial stability effectively. Overall, the amendments to national macroprudential policies in the next phases of the pandemic could have various spillover effects. The likely direction of these effects will depend on the type of macroprudential instrument used, the characteristics of the banking sector in the respective country, as well as the impact of the policy instrument on banks' lending capacity. More precisely, developments on

the macroprudential policy front may influence bank lending activity and its international spillover effects. Such effects could jeopardise the effectiveness of national measures when, for example, credit inflows increase as authorities attempt to curb already rapid credit growth at the national level.

During the COVID-19 crisis, banks in Emerging Asian countries were encouraged to lend, and to tap into their capital buffers if necessary. Guarantee schemes have been deployed on a large scale to support the real economy, deferring or mitigating loan losses on bank balance sheets. Throughout the recovery phase, policy makers will need to decide when, and to what extent, these capital buffers need to be re-established. In the event of substantial credit losses, banks could prioritise rebuilding their own funds and cleaning up their balance sheets, at the risk of temporarily weakening the capacity of domestic banks to support growth and economic recovery. International capital inflows from foreign banks may partly offset the lower capacity of domestic banks to support the recovery. This could take the form of bilateral loans granted either directly to domestic borrowers, or through internal financing mechanisms to subsidiaries that carry out a lending activity. However, if a tightening of capital requirements were to reduce the availability of funding from foreign banks, the trade-off at the national level between the macroeconomic objective and that of financial stability would entail more complications.

Macroprudential measures could have both positive and negative spillover effects on bilateral capital flows. To assess these effects properly, particular attention should be devoted to the nature of the macroprudential instruments used, and to the characteristics of credit institutions. Such an exercise requires granular data on the instruments used, and indeed on the credit institutions involved. Lessons from the past can shed light on the potential effects of amendments to macroprudential policy. According to Buch and Goldberg (2017^[132]), the fallout from credit growth is significant in a third of the regressions carried out in the study, and therefore cannot be ignored. In addition, these effects vary according to the macroprudential instruments used, and to the characteristics of banks. As a result of macroprudential tightening, better-capitalised banks are able to gain market share, and to lend more than less-capitalised banks. Other studies reach similar conclusions. Noring (2019^[133]), for instance, assesses the impact of macroprudential measures in 157 countries within the framework of a gravity model. The author's findings confirm the existence of cross-border effects induced by macroprudential policy. Moreover, this study reports that the overall effect of more macroprudential regulation is highly dependent on the income group of the countries in which banks operate. The effects are opposite for advanced and for emerging economies, with banks having more opportunities for regulatory arbitrage in emerging market economies than in advanced economies.

Regional and international co-operation will be important post-COVID-19

Policy makers in Emerging Asia and around the world intervened in a relatively synchronised way to mitigate the shock that the COVID-19 pandemic induced, by exploiting the flexibility of existing regulatory frameworks. By contrast, when determining the extent and the timing of policy normalisation, different countries' future macroprudential actions might be out of step with each other. Future decisions must take into account disparities among banking sectors, the severity of the recession, and the nature of policy support programmes implemented via the banking sector. Macroprudential policy decisions will be even more complex in economies where the recovery is slower. Fiscal support may be needed for longer in such cases, banks' loss-absorption capacity runs the risk of diminishing, and the macroprudential policy options to support the economic recovery may prove to be limited.

Regional or international co-ordination of macroprudential policy may be necessary given the cross-border spillover effects of domestic macroprudential measures, which are potentially amplified by frictions in the banking sector. It is necessary, therefore, to assess whether cross-border bank flows and global shocks may have externalities, either positive or negative. Positive externalities may arise when national macroprudential policy supports financial stability and lending in other countries. On the other hand, negative externalities can arise if risky activities migrate to other countries in response to a tightening of

national macroprudential regulations (Korinek, 2011^[134]). Likewise, negative externalities arise when the tightening of the domestic regulatory stance leads to a reduction in the supply of credit to foreign countries that rely on this funding source.

When negative externalities prevail, national policies alone may be insufficient, and international co-ordination may be required (Vinals and Nier, 2014^[135]). To the extent that financial intermediation and stress transcend national boundaries, the effectiveness of national macroprudential policies may be hampered by the existence of common issues that need to be addressed on a broader level. Appropriate co-ordination and communication of actions is needed in order to define common standards for resilience. In addition, decisions must be made regarding the co-ordination and reciprocity of measures at the bilateral, regional or multilateral level.

Conclusions

Macroprudential policy emerged from the 2007-08 global financial crisis as a policy function of renewed importance in Emerging Asian countries. This has been reflected in the fact that several countries in the region have transposed the Basel III regulatory framework into their respective national legislation.

These developments notwithstanding, much work still needs to be carried out for policy makers to improve their understanding of the transmission channels of macroprudential policy, and of how this area of policy interacts with other policy domains, in particular monetary policy. There is also work to be done in identifying the potential unintended consequences of macroprudential policy. Furthermore, the implementation of macroprudential policy must take into account emerging challenges and policy priorities, such as the growing interlinkages between banks and non-bank financial intermediaries, and how macroprudential policy could support the economy in the aftermath of the COVID-19 crisis.

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Further reading

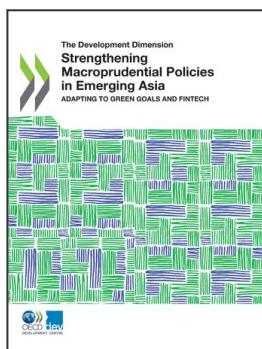
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Notes

¹ The main high-quality liquid assets for the purpose of the net stable funding ratio include the following items: cash, central bank reserves and high-quality marketable securities, which are assigned a 0% risk-weight under the Basel II standardised approach for credit risk (BCBS, 2013_[57]).

² An interest capitalisation scheme is defined as a type of scheme where the interest costs are capitalised instead of being paid by the borrower as they are incurred.



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