

# Overview: Strengthening macroprudential policies to adapt to green goals and Fintech in Emerging Asia

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Macroprudential policy has an important role to play in supporting the transition to a low-carbon and digital economy. This Overview summarises the main points in the publication *Strengthening Macroprudential Policies in Emerging Asia: Adapting to Green Goals and Fintech*. Chapter 1 provides a comprehensive overview of the region's experience with macroprudential policy and identifies the main challenges. Chapter 2 explores the systemic risks associated with climate change and stresses how countries in the region need to expand their macroprudential policy toolkits in order to tackle these risks and support low-carbon investments. Chapter 3 discusses new challenges related to the rise of Fintech and the importance of strengthening macroprudential policies to bring Fintech firms inside the regulatory perimeter.

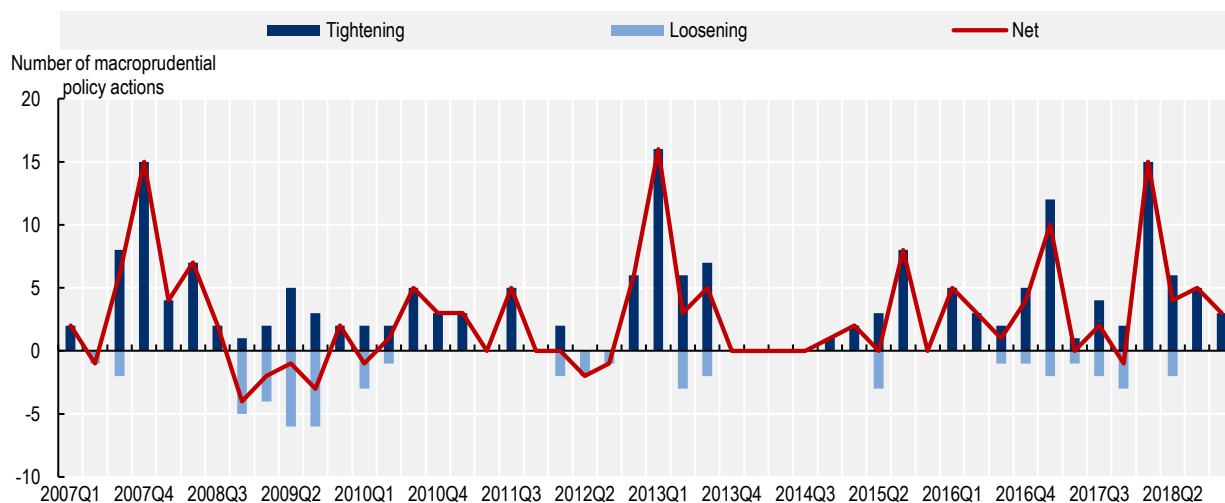
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## Chapter 1: Macroprudential policy in Emerging Asia at a glance: Recent developments and challenges

The global financial crisis of 2007-08 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. In light of the adverse developments preceding the Asian and 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.

More recently, several macroprudential policy instruments are 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).

**Figure 1. Number of tightening and loosening macroprudential policy actions, and overall policy stance in selected Emerging Asian economies, Q1 2000 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<sup>[1]</sup>), "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.

Several changes in the systems of macroprudential regulation have occurred, in particular, in the aftermath of the global financial crises. Indeed, policy makers in Asian countries have come under considerable pressure to raise prudential standards and a wide range of macroprudential measures is now in place in Emerging Asian countries (Table 1). 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 that stem from foreign-exchange exposures, while in Viet Nam they have focused mostly on credit growth.

**Table 1. 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 |
|---|-------------------|----------|-------|-------|-----------|---------|----------|-------------|-----------|----------|----------|
| <b>Capital buffers and other capital requirements</b>                                     |                   |          |       |       |           |         |          |             |           |          |          |
| Basel III countercyclical capital buffer  |                   |          | •     | •     | •         |         | •        | •           | •         | •        |          |
| Basel III capital conservation buffer   |                   |          | •     | •     | •         |         | •        |             | •         | •        |          |
| Other capital requirements <sup>1</sup>   |                   |          | •     | •     |           |         | •        | •           |           | •        |          |
| <b>Measures targeting the leverage of banks</b>   |                   |          |       |       |           |         |          |             |           |          |          |
| Basel III leverage ratio  |                   |          | •     | •     | •         |         | •        | •           | •         |          |          |
| <b>Requirements on loan-loss provisioning</b>   |                   |          |       |       |           |         |          |             |           |          |          |
| Dynamic provisioning  |                   |          | •     | •     |           |         |          | •           |           |          |          |
| <b>Measures targeting liquidity, foreign exchange exposures, and currency mismatches</b>  |                   |          |       |       |           |         |          |             |           |          |          |
| Liquidity ratios <sup>2</sup>   |                   | •        | •     | •     | •         |         | •        | •           | •         |          |          |
| Limits to the loan-to-deposit ratio   |                   |          |       |       | •         |         |          |             |           |          |          |
| Limits on foreign exchange positions <sup>3</sup>   |                   | •        |       | •     | •         | •       |          |             |           |          |          |
| <b>Limits on credit growth and volume, and other restrictions on loan characteristics</b> |                   |          |       |       |           |         |          |             |           |          |          |
| Limits on the growth and volume of credit <sup>4</sup>                                    | •                 |          | •     | •     |           |         |          |             |           |          | •        |
| Other restrictions on loan characteristics <sup>5</sup>                                   | •                 | •        | •     |       | •         |         | •        | •           | •         |          |          |
| <b>Borrower-based measures</b>  |                   |          |       |       |           |         |          |             |           |          |          |
| Limits to loan-to-value ratios <sup>6</sup>   | •                 |          | •     | •     | •         |         | •        | •           | •         | •        |          |
| Limits to debt-service-to-income ratio or loan-to-income ratio <sup>7</sup>               | •                 |          | •     | •     |           |         | •        |             | •         | •        |          |
| <b>Other measures with macroprudential character</b>                                      |                   |          |       |       |           |         |          |             |           |          |          |
| Taxes applied to transactions, assets or liabilities                                      |                   |          | •     |       |           |         | •        |             | •         |          |          |
| Reserve requirements for macroprudential purposes   | •                 | •        | •     | •     | •         |         | •        | •           |           |          |          |
| Other measures <sup>8</sup>   | •                 |          |       |       |           |         |          |             | •         |          |          |

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<sup>[1]</sup>); information from the Basel Committee on Banking Supervision's website (<https://www.bis.org/bcbs/ccyb/>); and national sources.

### ***Macprudential policy: Country experiences***

In response to these developments and the experience of the two financial crises (the Asian financial crisis and global financial crisis), substantial efforts have been deployed in Emerging Asian countries to enhance the policy toolkit for dealing with systemic risks. This is illustrated by a tightened policy stance between 1990 and 2018 across all categories of macroprudential policies that target the capital of banks. More recently, several countries in Emerging Asia have implemented capital conservation buffers, and have tightened capital requirements targeting exposures to the household sector. Several countries also implemented the Basel III countercyclical capital buffer, and adjusted capital requirements applicable to exposures to the corporate sector.

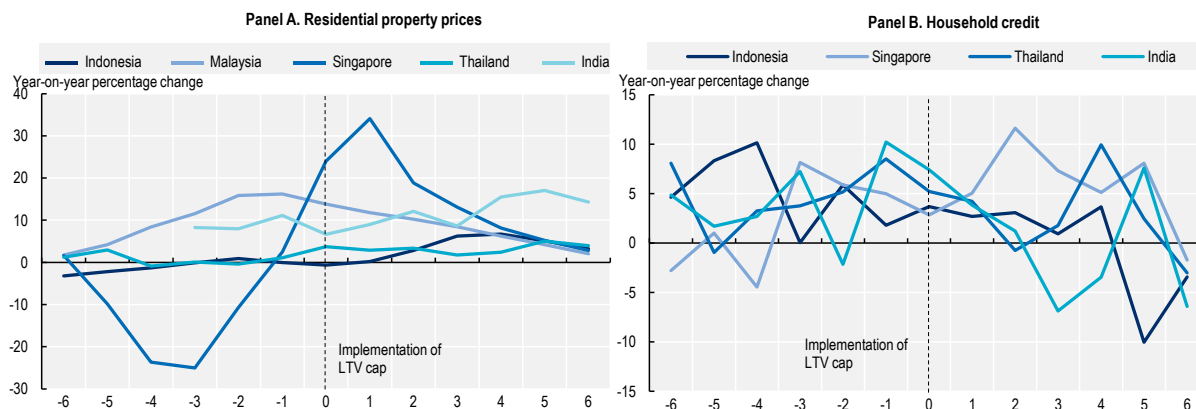
In addition, some Emerging Asian countries have implemented the Basel III leverage ratio, which is aimed at preventing a build-up of excessive on- and off-balance sheet leverage in the banking sector. Indonesia, Malaysia, the Philippines, Singapore, China, and India have all implemented the Basel III leverage requirements. Another category of macroprudential tools implemented by Emerging Asian policy makers comprises various policies targeting the liquidity of banks, foreign exchange exposures, and currency mismatches. Some of these measures have been implemented as part of the Basel III package. For instance, the liquidity coverage ratio has become a minimum requirement from January 2015 onwards and it was increased by 10 percentage points each year until January 2019. The liquidity coverage ratio has been implemented in Cambodia, Indonesia, Malaysia, the Philippines, Singapore, China and India. Similarly, the net stable funding ratio (NSFR) became a minimum requirement under Basel III as of January 2018. Banks in Indonesia, Malaysia and Singapore also need to comply with the NSFR requirement, in addition to the liquidity coverage ratio. Other policies currently active include limits on net open positions in foreign currency (Cambodia, Indonesia, Lao PDR, the Philippines, China, and India), and limits to the loan-to-deposit ratio (Indonesia).

Policy makers in Emerging Asia have acquired extensive experience with macroprudential measures aimed at tackling housing market imbalances. Since the late-1990s, some Emerging Asian countries have experienced significant increases in house prices. A cap on loan-to-value ratio is one of the most common macroprudential measures applied by Emerging Asian countries, for instance, in Brunei Darussalam, China, India, Indonesia, Malaysia, the Philippines, Singapore and Thailand. In addition to loan-to-value caps, authorities in Emerging Asia implemented several other types of borrower-based macroprudential measures. These include limits to the debt-service-to-income ratio (Brunei Darussalam, Singapore, Thailand, China and India), and other restrictions that are conditioned on loan characteristics (Brunei Darussalam, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Viet Nam, and China).

Figure 2 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 loan-to-value cap was implemented. 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 in the first three quarters after the loan-to-value cap was enacted.

**Figure 2. 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<sup>[5]</sup>), “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>; the Bank for International Settlements, and national sources.

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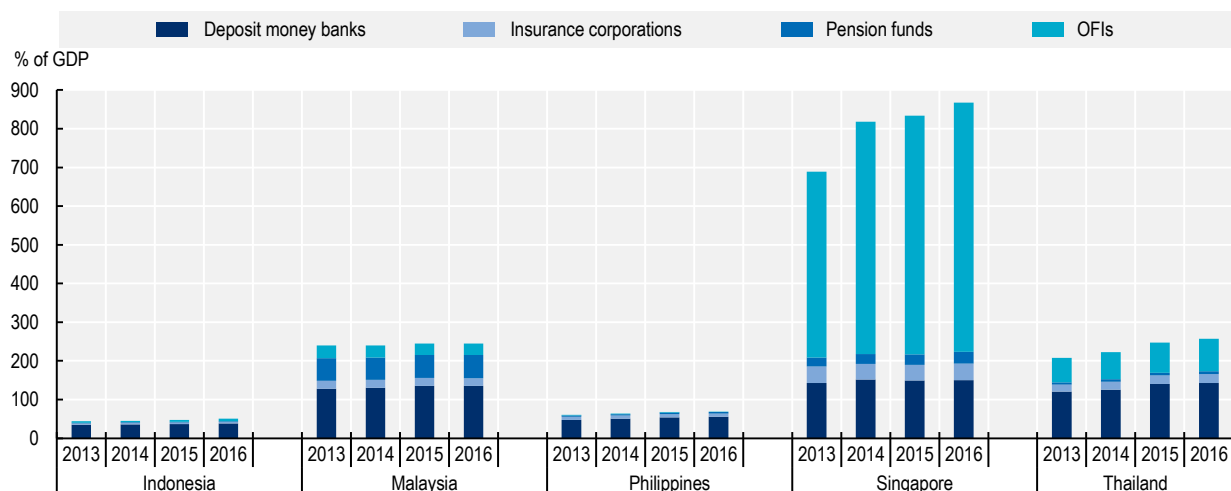
Finally, policy makers in Emerging Asia have implemented a plethora of macroprudential measures that cannot be classified under any of the previous categories. Such measures include limits on credit growth (Brunei Darussalam, Viet Nam, China and India), and loan-loss provisioning rules (Brunei Darussalam, the Philippines, China and India). They also include taxes applied for macroprudential purposes to transactions, assets or liabilities (Malaysia, Singapore and China).

### ***Institutional framework of macroprudential policy and financial structures***

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 (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 3). Other countries with a financial sector that is bigger than their 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 has increased between 2013 and 2016 in all ASEAN countries for which data are available (Figure 3). 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 other financial institutions, while GDP expanded slightly over that period.


**Figure 3. Size and structure of the financial sector in selected ASEAN economies, 2013-16**

Ratio of total assets to GDP, %



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 3). Banks remain the dominant financial intermediaries in ASEAN, partly because the development of capital markets has been slower in these countries. The category of other financial institutions accounts 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 exception is Malaysia, where pension fund assets amounted to nearly 60% of 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, to a certain extent, by the Employee Provident Fund (EPF), which covers all private sector employees in Malaysia.

Second, the institutional setup also differs among countries in Emerging Asia. In Emerging Asia, the dominant model in relation to the macroprudential institutional set-up is the central bank-based one. However, in Indonesia, the Philippines and Thailand, the responsibility for conducting macroprudential policy is shared between the central bank and other designated authorities (Table 2).

**Table 2. 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).<br>Philippines (central bank, insurance regulator, financial services regulator, finance department and deposit insurance agency).<br>Thailand (central bank, financial services regulator and insurance regulator). |
| Cambodia          |   |
| China             |   |
| India             |   |
| Lao PDR           |   |
| Malaysia          |   |
| Myanmar           |   |
| Singapore         |   |
| Viet Nam          |   |

Source: OECD Development Centre based on Lee, Gaspar and Villaruel (2017<sup>[2]</sup>); and various sources.

## ***Macroprudential policy challenges and implications: from interactions with other policies to the implications of COVID-19***

**Measuring a country's macroprudential stance is difficult.** 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. 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. A conceptualisation of an overall macroprudential stance can be used to establish the link between macroprudential policies, on the one hand, and the financial stability objective on the other. 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.

**Macroprudential and monetary policies interact.** Macroprudential policy and monetary policy are inter-related. Assessing the effectiveness of macroprudential policy is relatively complex because of this inter-relation. Indeed, a macroprudential stance is 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.

**Macroprudential policy must account better for increasing interconnections between banks and non-bank financial intermediaries.** 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 spread due to a shortage of inter-bank refinancing, or as asset portfolios are liquidated at fire sale prices. In order to mitigate risks arising from interconnections within the financial system, macroprudential regulators must properly identify the institutions with a systemic footprint. For this purpose, access to timely data is essential, including data on financial institutions' cross-border activities.

**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. When implementing new macroprudential policies, they should also take account of the macroprudential policies in other countries. When warranted, policy makers in Emerging Asia could consider reciprocating other countries' macroprudential measures.

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

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

**Macroprudential policy serves key functions during large external shocks such as the COVID-19 pandemic.** Notwithstanding the important role that macroprudential policy has played in enhancing financial stability, it may be desirable and feasible, once a credible macroprudential policy framework is in place and functioning properly, to loosen macroprudential requirements in times of economic turmoil, such as the COVID-19 pandemic. Indeed, buffers that have been accumulated during upturns could be released in order to mitigate the adverse mechanisms that come into play during a downturn. Moreover, while macroprudential policy plays an important role in strengthening the financial system's resilience to adverse shocks, monetary policy actions, and in particular the unconventional measures, also remain very effective crisis-management tools.

At the current juncture, relatively 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 for Emerging Asian economies, the deterioration of their financial situation, and their difficulties in accessing external financing, are of particular concern for these countries' broad economic prospects post-pandemic. When lenders' aversion to risk is high, macroprudential policy may be deployed to address the risk of rationing in certain borrowing segments.

## **Chapter 2: Green goals and macroprudential policy in Emerging Asia: Promoting climate resilience and financial stability**

The risks associated with climate change raise the spectre of a severe destabilisation of the financial system, and thus of the entire economy. This threat is leading a growing number of stakeholders in global finance to integrate climate change into their concerns. The increased involvement of central banks and other macroprudential authorities, essentially by playing a co-ordinating role in the transition to a low-carbon economy, could accelerate this process. Already, central banks are increasingly integrating climate-related risks into their overall policy agenda, and some are starting to quantify those risks. Indeed, some have also said they will explore how macroprudential policy can help to mitigate risks related to climate change.

### ***Risks related to climate change could destabilise the financial sector***

**Central banks' mandates do not explicitly embed objectives related to climate change.** Addressing risks related to climate change did not have the same sense of urgency about it when central bank mandates were initially defined in the countries of Emerging Asia. Nevertheless, some rules and principles that define central banks' remit, and state the limits of their responsibility to address future challenges such as climate change, are embedded in the mandates of several central banks in ASEAN. The examples of the central banks of Indonesia, Malaysia, Myanmar, the Philippines and Singapore are very relevant, as their mandates embed support for the government's economic policy, which includes sustainable growth. Cambodia's central bank is also tasked, albeit in a less explicit manner, with conducting its monetary policy in a way that facilitates sustainable economic development, in line with the country's overall economic and financial policy. These underlying rules determine rather general obligations and limits on how each central



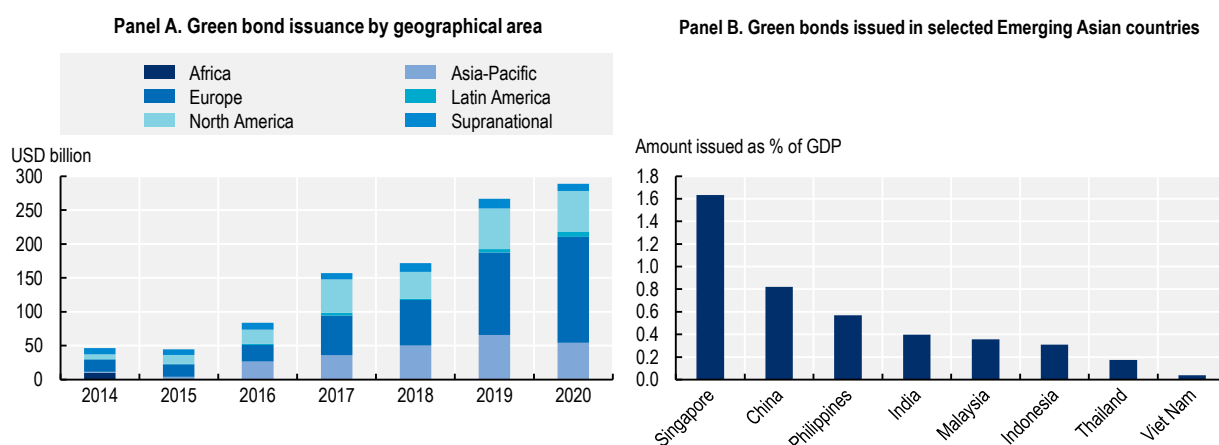
bank in Emerging Asia must contribute to the urgent need of tackling climate change. Central banks in the region should take decisive action wherever their financial stability mandate overlaps with climate change.

**The measurement of risks related to climate change poses various methodological challenges.** The measurement of climate risk remains a developing field in the area of quantitative research. Even though climate risk intersects with the different categories of risk to which banks are exposed, such as credit, market, operational, and sovereign risks, current models fail to capture climate risk in its entirety. For instance, climate-related risk can lead to credit risk as they can cause deteriorations in both borrowers' ability to repay their debt, and in banks' recovery rates. There is also a prospect of market risk, in that a sharp correction in the valuations of assets such as equities and commodities may occur if the transition to a low-carbon economy is abrupt.

Capturing physical risk in banking risk models is a methodological challenge. A natural disaster can cause a borrower to fail. However, credit risk models are ill-equipped to anticipate such strongly-correlated events. In the event of a localised natural disaster, such as a flood or an earthquake, the correlation between default events is primarily a geographical one. The correlation is more difficult to capture in the case of a non-localised natural disaster, or a localised disaster with broad effects, such as a pandemic or heat wave. For a comprehensive approach, one would need to identify the idiosyncratic vulnerabilities of each counterpart to climate risk. However, the effects of physical risk are complex to anticipate, since each type of event gives rise to a specific scenario.

**Some current macroprudential requirements may discourage investment in low-carbon instruments.** The transition to a low-carbon economy requires a major investment effort, in particular, to allow the reduction of greenhouse gas emissions, and to ensure the resilience of energy systems to climate change. The squeeze that the COVID-19 pandemic put on fiscal headroom in Emerging Asian countries, with the pandemic occurring in a context of already rising levels of government debt, makes it even more imperative to mobilise private capital for the transition to a low-carbon economy. However, the private sector alone may not have the capacity to contribute to this goal without support from policy makers. Although green bond issuance has grown in the Asia-Pacific region since 2016, it still trails volumes issued in Europe and North America (Figure 4).

**Figure 4. Green bond issuance by geographical area in 2014-20, and amounts issued in selected Emerging Asian countries in 2020**



Source: OECD Development Centre based on national sources and data from the Climate Bonds Initiative, <https://www.climatebonds.net/market/data/>.

It has been argued that some of the macroprudential policies implemented in the aftermath of the global financial crisis, most notably the Basel III package, tend to promote short-term brown projects, to the detriment of longer-term, climate-friendly investments. For example, liquidity requirements might have a negative impact on banks' willingness to finance climate-friendly investments. Two distinct aspects of the Basel III framework that could reduce banks' appetite to fund renewable energy via project finance are particularly noteworthy in this connection. First, long-term financing is likely to become more expensive because of liquidity metrics such as the liquidity coverage ratio and the net stable funding ratio. Second, the new capital requirements in Basel III imply that banks will have less scope to invest in illiquid assets.

### ***Macroprudential frameworks could be enhanced to support the green transition***

The existence of climate externalities and failures in financial markets could justify the use of financial regulation to combat climate change. In this connection, different regulatory instruments can be used to address the challenges of climate change (Table 3). For macroprudential policy, preserving financial stability may require the use of new macro-surveillance instruments, such as climate-related macro-stress tests. It could also involve the use of specific macroprudential regulatory tools, such as a capital conservation buffer, a counter-cyclical capital buffer, sectoral exposure rules, or loan-to-value caps.

**Table 3. Examples of green macroprudential policy tools**

| <b>Main category</b>                | <b>Type of tool</b>  | <b>Objective(s)</b>  |
|-------------------------------------|--|--|
| Tools to monitor systemic risk      | Climate-related stress tests.  | Quantify the links between climate change, climate impacts, and socio-economic conditions.   |
| Capital requirements                | Climate-adjustment factor that alters the risk weights applicable to green versus brown assets and activities.                               | Limit credit growth associated with brown assets and activities, and encourage credit growth associated with green assets and activities.                            |
|                                     | Countercyclical capital buffer.  | Promote financial stability in the transition to a low-carbon economy.   |
| Leverage requirements               | Sectoral leverage ratio requirement applicable to brown assets and activities.   | Limit bank indebtedness with respect to brown assets and activities.   |
| Liquidity requirements              | Differentiated liquidity coverage ratio and net stable funding ratio, in order to give preference to green over brown assets and activities. | Facilitate the financing of green assets and activities, and slow the financing of brown assets and activities.  |
| Exposure limits and credit ceilings | Limits on exposure to brown assets and activities that are highly exposed to transition risk.  | Promote the diversification of banks' portfolios in order to withstand the bankruptcy of a large company or group of companies carrying out brown activities better. |
|                                     | Credit ceiling to limit the expansion of bank lending to brown activities.   | Reduce financial flows to sectors or companies that exceed certain carbon-emission targets.  |
| Borrower-based measures             | Differentiation of the loan-to-value cap, by applying a lower cap on loans used to finance brown assets and activities.                      | Reduce the amount of lending associated with brown assets and activities.  |
|                                     | Differentiation of the debt service-to-income cap, by applying a lower cap on loans used to finance brown assets and activities.             |  |

Note: Green assets and activities are defined as having a low-carbon intensity, while brown assets and activities are defined as those with a high carbon intensity.

Source: OECD Development Centre.

### ***Integration of risks related to climate change into macroprudential stress tests***

An effective framework for monitoring systemic risks is an essential element of the macroprudential toolkit, and macroprudential stress tests have a key role to play. Such stress tests also take into account the interactions between a deteriorating situation in the financial sector and the real economy. To account better for systemic climate risk, it is necessary to integrate the impact of climate change into these macro-

stress tests. In Emerging Asia, such exercises have been carried out by the Monetary Authority of Singapore, while the People's Bank of China recently announced its intention to perform climate-related stress tests.

### ***Existing macroprudential policy instruments could be amended to support green finance***

Capital requirements could be used to address climate-related risks. Depending on how assets affect the transition to a low-carbon economy, for example, a climate-adjustment factor could be used to modify their risk weights. This could be achieved either by applying lower risk weights to green assets, or by increasing the risk weights applicable to so-called brown assets, whose carbon intensities are relatively high.

Another type of requirement that could be used is the leverage ratio. Introduced as part of the Basel III framework, this tool aims to limit each bank's overall leverage. The leverage ratio could be supplemented with a sectoral leverage ratio requirement that imposes stricter rules for assets with a high carbon intensity. Further research would be needed to evaluate the effectiveness and difficulty of implementation of such a policy tool as compared to minimum capital requirements.

Liquidity requirements represent another type of requirement that could be amended to promote the transition to a low-carbon economy. Under Basel III, banks are subject to a short-term liquidity ratio, which requires banks to hold a certain level of short-term assets. They are likewise subject to a long-term structural liquidity ratio, which requires that long-term assets be financed by instruments with a maturity above one year. As has already been discussed with regard to capital requirements, liquidity requirements as they currently stand could hamper the financing of green activities, by making long-term financing more expensive. Regulators could consider differentiating these liquidity requirements to account for climate change, in order to give preferential treatment to green assets over brown assets.

Exposure limits and credit ceilings constitute the last group of tools that could help to promote and manage the transition to greater sustainability. Rules on large exposures typically set limits, usually a certain percentage of capital, which individual loans cannot exceed. Concentration limits, meanwhile, usually set a given percentage of capital that the total amount of large loans cannot exceed. The aim of such limits is to force banks to diversify their loan portfolios in order to withstand the bankruptcy of a large individual company, or a group of large companies better. Concentration limits could be applied to overall levels of investment in carbon-intensive assets, which would be highly sensitive to a sharp transition to a low-carbon economy. As regards credit ceilings, limiting the expansion of bank lending to certain industries, and investments in certain specific asset classes, could also reduce financial flows to sectors or companies that exceed a given target for carbon emissions.

### ***The development of a green taxonomy is a prerequisite for effective green macroprudential policy***

Implementing green macroprudential regulation implies being able to distinguish with certainty among green, brown and climate-neutral projects. The development of a stable, clear and standardised taxonomy in as many countries as possible is, therefore, of critical importance. Such a taxonomy will make it possible to apply common transparency rules on all financial products, resulting in an obligation for all companies to report the proportion of green activities that make up their financial portfolios. In addition, a common taxonomy at the regional level in Emerging Asia could facilitate the monitoring of cross-border operations.

## **Chapter 3: Fintech and macroprudential policy in Emerging Asia: Preparing for the digital age**

The rise of Fintech is expected to provide significant benefits to the consumers through increased efficiency, better financial inclusion, and more competition. However, Fintech is also likely to bring new challenges in terms of financial stability. Policy makers in Emerging Asia must therefore consider new

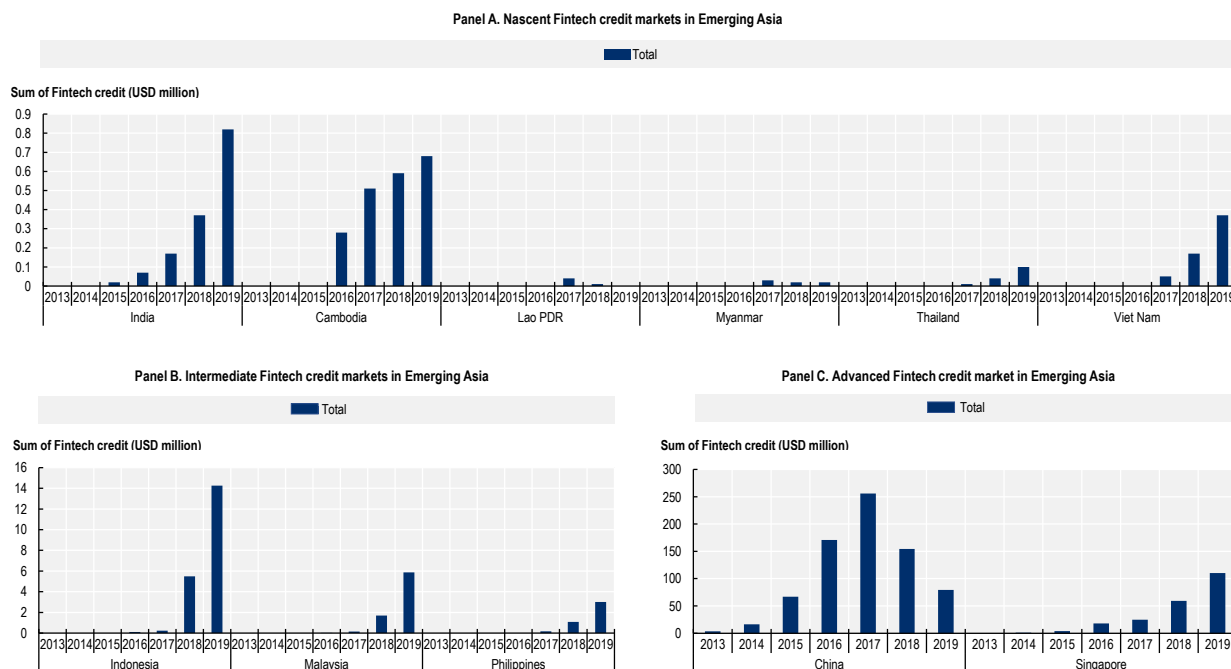
macroprudential measures, as well as an expansion in the scope of existing ones, to prevent a build-up of systemic risk in the financial sector being caused by the rise of the Fintech industry; a broad field covering several areas of financial business including payments services, personal wealth management, insurance, and credit provision.

### ***Credit provision through Fintech is growing in Emerging Asia***

Fintech credit refers to lending activities that are enabled by digital platforms. Fintech platforms following the peer-to-peer (P2P) business model act as matchmakers between borrowers and lenders, which may be either people or companies (Claessens et al., 2018<sup>[3]</sup>). Certain platforms use their balance sheets to lend in what is referred to as Fintech balance-sheet lending. In this business model, Fintech platforms use technology to provide unsecured short-term loans or credit lines.

In Emerging Asian countries, Fintech credit extension increased between 2013 and 2019, although large disparities in usage of Fintech credit remain (Figure 5). Only in China and Singapore did new Fintech credit extension per capita exceed 100 US dollars (USD). In Indonesia, however, new Fintech credit per capita increased by a factor of three between 2018 and 2019. Moreover, new Fintech credit extension is already substantial in Malaysia and the Philippines, and following a robust trend of growth. In India, Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam, the peer-to-peer lending industry is still in its infancy, but growing quickly.

**Figure 5. Fintech credit extended in Emerging Asia, 2013-19, USD per capita**

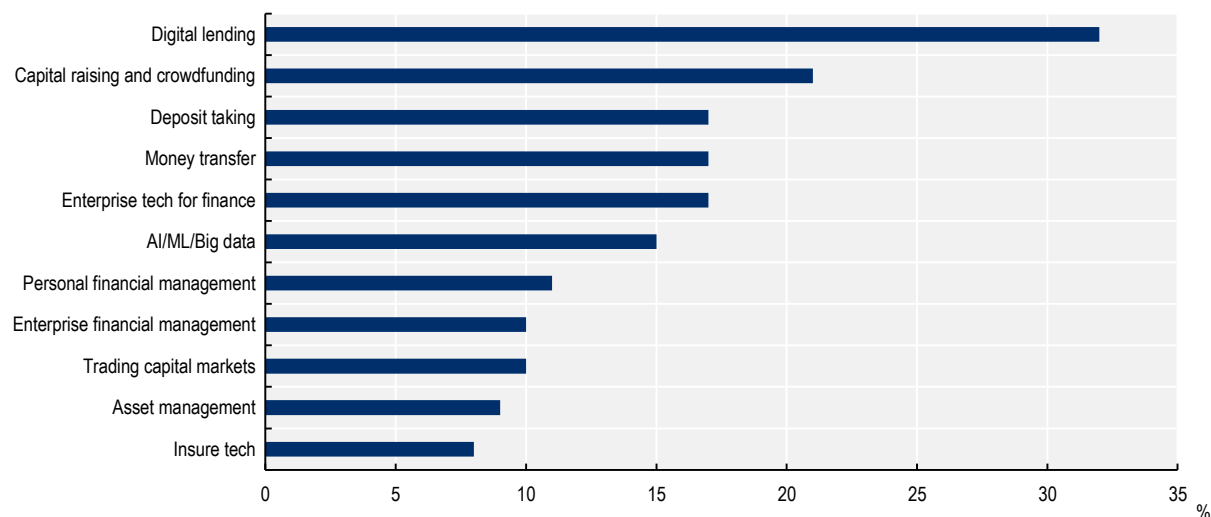


Note: “Nascent” refers to markets with Fintech lending per capita, per year, of less than USD 1 in any year. “Intermediate” refers to less than USD 100 in any year. “Advanced” refers to more than USD 100 per capita in any year.

Source: OECD Development Centre, based on Cornelli et al. (2020<sup>[4]</sup>), “Fintech and big tech credit: a new database”, *BIS Working Papers*, No. 887, Bank for International Settlements, Basel, Switzerland, <https://www.bis.org/publ/work887.pdf>.


Emerging Asian Fintech businesses are also involved in other activities, such as deposit taking, money transfers, personal financial management, and the provision of technology services for financial firms (Figure 6). Money transfers refer to the provision of transfer services for settlements and remittances that rely on digital solutions to channel funds. Financial management services are provided through robo-advice tools that generate automated financial advice through algorithm-based technologies.

**Figure 6. Percentage of Fintech firms involved in each business area of Fintech in ASEAN**



Note: Sample of Fintech firms obtained from a survey conducted in 2019 by the Cambridge Centre for Alternative Finance (CCAF), in partnership with the Asian Development Bank Institute (ADBI) and Fintech Space, covering 208 firms. The combined percentages may not add up to 100%, since Fintech firms might be involved in several business areas.

Source: OECD Development Centre based on CCAF/ADBI/Fintech Space (2019<sup>[5]</sup>), *The ASEAN Fintech Ecosystem Benchmarking Study*, Judge Business School, Cambridge, UK, <https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-ccaf-asean-fintech-ecosystem-benchmarking-study.pdf>.

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

### **Opportunities for financial stability associated with Fintech**

Fintech offers several opportunities to reduce systemic risk within the financial sector, namely through increased decentralisation and diversification, and through enhanced efficiency.

Fintech may decrease concentration and increase competition in the financial sector. In lending, Fintech platforms may be able to offer borrowing rates that are more competitive, by leveraging new technologies. Fintech might also be useful in guaranteeing access to credit in the event of a liquidity shock in the conventional financial system, since the usual business models for P2P lending have a lower maturity mismatch than traditional banks, and rely on individuals' savings. In the financial advisory sector, robo-advisors could compete with larger incumbents, due to lower entry costs and fixed costs (FSB, 2017<sup>[6]</sup>). Lower fees charged by robo-advisors, and lower minimum asset thresholds, could allow for greater market access, and thus higher overall liquidity.

Fintech has the potential to improve efficiency within the financial sector, as the adoption of productivity-enhancing technologies can enable the provision of higher-quality financial services, and at a lower cost. For instance, improved technologies for settling transactions could lead to reduced transaction times, thereby reducing the time during which one counterparty is exposed to another (FSB, 2017<sup>[6]</sup>). As a result, this would mitigate the overall level of credit risk in the financial system.

## Key systemic risks associated with Fintech

While Fintech has the potential to enhance financial stability, there are also macro-financial risks associated with its rise. The main risks to financial stability associated with Fintech are outlined in Table 4.

**Table 4. Overview of systemic risks associated with Fintech**

| Risk type                                 | Risk subtype  | Description   |
|---|---|---|
| <b>Market structure risk</b>              | Change in the risk behaviour of traditional financial institutions. | Pressure on incumbent profits might incentivise them to increase risk-taking.   |
|   | Amplification of reputational risk.                                 | Unsticky deposits mean that reputational shocks could hamper the funding stability of banks.  |
|   | Risks stemming from decentralisation and disintermediation.         | Small actors with narrow business focuses might be less resilient than large actors with greater buffers and activities that are more diverse.  |
|   | Difficulty in regulating and co-ordinating small actors.            | Regulatory oversight of many small actors requires more resources and co-ordination, and is harder to achieve.  |
|   | BigTech's ability to achieve systemic scale.                        | BigTech's capacity to use its network to achieve a systemic scale rapidly amid low regulatory coverage might pose a threat to financial stability.  |
| <b>Excessive incentives to take risks</b> | Offloading of risk by P2P lending firms.                            | Fintech lending platforms might not bear the risk of the loan they facilitate or originate due to their business model. This could create excessive credit growth.  |
|   | Winner-takes-all market structure.                                  | A Fintech platform's funding structure might be geared towards quick growth, rather than sustainability.  |
|   | Regulatory arbitrage within jurisdictions.                          | Regulatory loopholes might give an unfair advantage to Fintech platforms by enabling avoidance of macroprudential measures.   |
|   | Financial illiteracy, and increased access to financial products.   | Increased access to financial products might lead to excessive risk-taking if consumers are not aware of the associated risks.  |
| <b>International co-operation</b>         | Regulatory arbitrage between jurisdictions.                         | The cross-border scope of Fintech firms might lead to irregularities in supervisory and regulatory coverage. Some jurisdictions might have less strict macroprudential standards than others.                     |
| <b>Operational systemic risk</b>          | Cyber and information technology (IT) failure.                      | Increased reliance on digital technologies might increase vulnerability to IT failures of systemic scale.   |
|   | Outsourcing.  | Increased reliance on third-party service providers may pose a threat to financial stability, due to market concentration in the provision of certain digital services, and a lack of regulatory access.          |
|   | Algorithmic herd behaviour.   | Algorithmic trading platforms, or automated asset managers, might enhance volatility due to feedback loops between similarly built algorithms that optimise investment decisions based on live market conditions. |

Source: OECD Development Centre.

## How macroprudential policies can address risks associated with Fintech

There are several policies to address the risks created by Fintech. These include adjusting banking regulations to Fintech developments, regulation of risk-taking by P2P lending platforms, implementation of risk-retention standards for originate-to-distribute lending platforms, using entity-based approaches to regulate the provision of financial services by BigTech, the development of regulatory sandboxes, and developing regional and international regulatory frameworks to prevent regulatory arbitrage.

**Current banking regulations should be adjusted to Fintech's business models.** To ensure that the development of Fintech does not result in gaps in the traditional supervisory and regulatory frameworks, policy makers should closely monitor changes in how financial services are delivered, and how those changes affect their ability to supervise (FSB, 2019<sup>[7]</sup>). Indeed, if Fintech firms are offering financial services that were previously performed by regulated banks, and face similar risks as these banks, then they should be held to the same regulatory standards.

However, Fintech business models may offer financial products, or provide financial services, that fall outside what is considered traditional to be banking, such as P2P lending and digital currencies (BIS, 2018<sup>[8]</sup>). As such, bank licensing regimes should be reviewed and adjusted if they do not match the innovative business models of Fintech firms.

**P2P lending platforms should be regulated to avoid excessive credit growth and risk-taking.** Peer-to-peer lending platforms often fall outside of the regulatory perimeter; it is therefore of importance either to expand regulatory coverage to these platforms, or to develop new rules designed to limit the financial risk that they pose. Best practices from the United Kingdom, China and Indonesia include setting restrictions on investment and lending by individuals on P2P platforms.

**Risk-retention standards for originate-to-distribute lending platforms could reduce incentive misalignments.** The originate-to-distribute model used by balance sheet-based Fintech lending platforms creates an issue of misaligned incentives, as the loan originator transfers the credit risk to a third party. It is necessary, therefore, to ensure that loan originators keep sufficient “skin-in the-game”. This could be achieved by requiring Fintech balance-sheet lenders at least to retain an economic interest in the credit risk for the secured asset that they emit.

**Using an entity-based approach to regulating BigTech.** Given the tendency of BigTech firms to segregate their sub-entities, allowing them to provide different financial services while being part of the same holding group, regulators should consider recalibrating the mix of entity-based and activity-based rules (Crisanto, Ehrentraud and Fabian, 2021<sup>[9]</sup>). Enhancing entity-based regulation is a way for authorities to gain better control over the inter-related risks that arise from BigTech firms’ different financial activities, such as e-commerce, payments, and lending. Such an approach would reduce anti-competitive behaviour, thereby preventing very high levels of concentration. It would also allow for the inclusion of the risks that arise from the interactions of different entities within a single holding group.

**Regulatory sandboxes are used across Emerging Asia to allow for safe financial innovation.** A regulatory sandbox refers to a mechanism that allows the live testing of new products in a controlled environment. Regulators set up sandboxes in order to encourage experimentation and innovation in Fintech, while also maintaining a good overview and control over the associated risks for the financial system. In Emerging Asia, regulatory sandboxes for Fintech have become widespread, as most countries have set one up or are in the process of doing so.

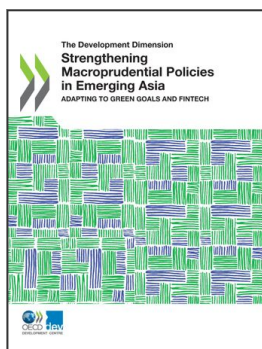
**Bolstering international co-operation to avoid regulatory arbitrage.** Regulators across Emerging Asia should consider enhancing co-ordination among themselves, but also with international partners, to avoid creating room for regulatory arbitrage. To this end, they could use mandatory reciprocity agreements, which require all financial institutions operating within the jurisdiction to do so under the same macroprudential rules. Another option is to standardise the regulation of Fintech globally, or regionally, in order to ensure the mutual recognition of macroprudential policies and licensing frameworks.



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