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Fintech and macroprudential policy in Emerging Asia: Preparing for the digital era

The importance of financial technology (Fintech) is increasing in Emerging Asia, providing services such as lending, payments, financial advice, and insurance. While Fintech offers opportunities to foster financial stability through the decentralisation of the banking sector, and thanks to increased efficiency, new risks might also arise. In order to address these risks, regulators in Emerging Asia should consider implementing policies that would bring Fintech firms inside the regulatory perimeter. Moreover, to avoid risks associated with the cross-border nature of Fintech activities, regulators should increase co-operation through regulatory convergence.

Introduction

The rise of Fintech is expected to provide significant benefits to the consumers through increased efficiency, better financial inclusion, and more competition. However, it is also likely to bring new challenges in terms of financial stability. Indeed, new systemic risks to the financial sector may arise as the use of digital technologies becomes increasingly widespread for financial services such as lending, payment processing, asset management, and insurance. To be sure, these new risks may be intrinsic to the innovations that digital technologies have brought about. However, they may also constitute a recurrence of well-known risks that the financial system has traditionally faced, notably when new players, such as the Fintech firms of today, reveal gaps in regulatory coverage, or when insufficient data is available to regulators to adapt successfully to the new situation. Therefore, policymakers in Emerging Asia must consider new macroprudential policies, as well as an expansion in the scope of existing ones, in order to prevent a build-up of systemic risk in the financial sector being caused by the rise of the Fintech industry.

While many definitions of Fintech have been proposed, the most used definition is that of the Financial Stability Board, which defines Fintech as “advances in technology that have the potential to transform the provision of financial services, spurring the development of new business models, applications, processes, and products” (FSB, 2017^[1]). Other observers have defined Fintech as “as advanced technology to improve and automate the delivery and use of financial services to consumers and businesses” (Amstad et al., 2019^[2]).

In this report, Fintech services will be considered according to their impact on different areas of systemic risk, rather than the technologies they rely on, or their economic function. This approach makes it possible to form a holistic picture of how Fintech affects financial stability, and how different technologies interact in doing so. This approach is also warranted by the fact that many of the underlying technologies of Fintech are used across different areas of the financial sector, where they create similar risks. Finally, such an approach makes it possible to observe how Fintech fits in with the macroprudential policies described in Chapter 1. This is useful for examining whether existing policies can be expanded to the Fintech sector, or if new macroprudential policies are required.

The chapter starts by reviewing the main business areas of the Fintech industry in Emerging Asia. Thereafter, it discusses the main risks to financial stability introduced by Fintech. Given the still-nascent nature of the Fintech sector, the risks described in this section are conjectural, and their materialisation is conditional on Fintech reaching systemic relevance. Nevertheless, it remains important to gain awareness about potential systemic risks related to Fintech, notably its effects on operational developments, market structure, and aggregate risk-taking behaviours. Finally, the chapter concludes by discussing how macroprudential policies may keep in check the risks mentioned above, by considering policy responses to them.

Business areas of Fintech in Emerging Asia

Fintech is a broad field, covering a number of areas of financial business. These include credit provision, payments, personal wealth management, and insurance. This section reviews four major business areas in which Fintech firms are active in Emerging Asia, namely credit provision, payments and settlements, personal finance and wealth management, and other financial services.

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. In this system, borrowers provide information on their financing needs and

their credit rating; they are then matched with suitable investors. Once the loan is originated, the platform provides services such as repayment collection and cash-flow redistribution, and manages the recovery of unmet obligations. Peer-to-peer lenders make a profit through the collection of loan origination fees ranging from 1% to 6%, late-payment fees paid by borrowers, and a percentage on the borrower's repayments (usually 1%) (Thakor, 2020^[3]). The collection and processing of data on individual borrowers allows platform operators to provide precise credit ratings. The big data approaches that they use rely on data ranging from tax returns to proprietary data from online retailers or mobile payment services (Claessens et al., 2018^[4]). In certain cases, lenders may also receive an equity stake in exchange for their investment in a company, which is referred to as equity crowdfunding (Ehrentraud, Ocampo and Vega, 2020^[5]).

In most cases, Fintech platforms act merely as facilitators for the transaction, by drawing up a loan contract and providing some side services. Nevertheless, 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. Fintech balance-sheet lenders require funding to engage in lending. In order to fund their lending activities, they tend to rely on securitisation, equity-raising, and the issuance of debt (Thakor, 2020^[3]). Thus, this form of lending implies that the platform assumes the credit risk. This is in contrast to the peer-to-peer framework, in which all of the risk lays with the individual investor (Claessens et al., 2018^[4]). Finally, P2P lending may also be complementary to conventional banking as banks develop their own platforms or fund existing ones (OECD, 2020^[6]).

Banks and peer-to-peer lenders differ in many ways, given the fact that banks originate loans through the maturity transformation of deposits, while P2P lenders merely act as intermediaries between a lender and a borrower. This implies that banks both allow for risk-sharing between depositors, and create new liquidity, whereas P2P lenders do not perform these functions. Furthermore, banks' own exposure to credit risk implies an appropriate degree of monitoring. Moreover, while banks and P2P lenders both engage in screening, traditional banks do not rely on big data in the way that Fintech lenders do. Given the smaller range of services that P2P platforms provide, they face fewer incentive issues. However, their business model does imply that they face an incentive to engage in overlending. Finally, peer-to-peer platforms are much less regulated than banks. Table 3.1 provides an overview of the main differences.

Table 3.1. Comparison between Banks and P2P lending platforms

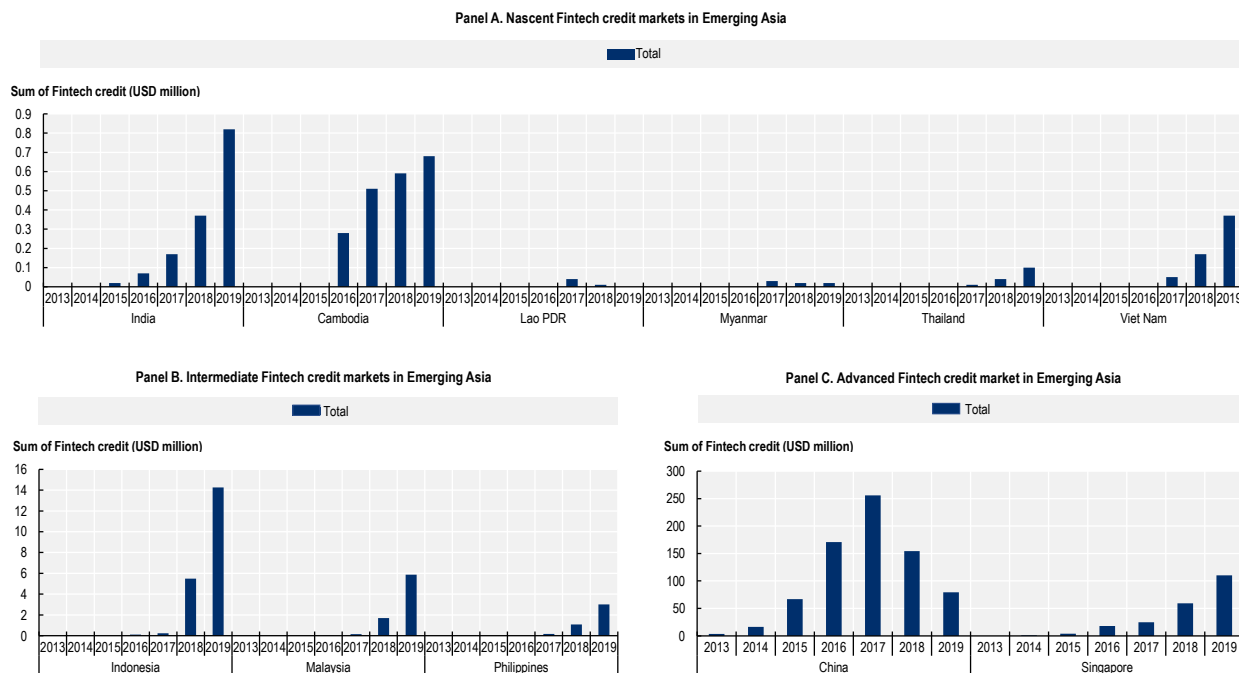
	Banks	P2P lending platforms
A. Services provided		
Improved risk-sharing and consumption insurance	Yes	No
Screening	Yes	Yes
Monitoring	Yes	No
Liquidity creation	Yes	No
B. Capital structure		
Capital structure	High leverage with little of the bank's own equity capital.	All equity-financed: no equity capital invested by lending platform, so investors are equity holders in loans.
C. Incentive problems		
Insufficient screening	Yes	Yes
Insufficient monitoring	Yes	No
Insufficient liquidity creation	Yes	No
Excessive risk-taking due to high leverage and safety nets	Yes	No
Over-lending risk	Over-lending and excessive growth due to incentives that are distorted by safety nets, and too little capital.	Over-lending and excessive growth due to profit-maximisation motives.
Insufficient capital due to safety nets	Yes	No

	Banks	P2P lending platforms
Incentives to renege on off-balance-sheet commitments	Yes	No
D. Regulation		
Deposit insurance and capital regulation	Yes	No
Regulatory burden	High regulatory costs and restrictions.	Lower regulatory burden.
E. Objective function		
Maximisation problem	Maximise the value of the bank's own equity.	Maximise value of P2P platform's owners' claim, which consists of fees for origination and other services, plus a fraction of the borrower's repayments.

Source: Adaptation from Thakor (2020^[3]), "Fintech and banking: What do we know?", *Journal of Financial Intermediation*, Vol. 41, Article 100833, <http://dx.doi.org/10.1016/j.jfi.2019.100833>.

In Emerging Asia, but also globally, China has been at the forefront of peer-to-peer lending. In 2016, the ratio of new P2P new loans to bank loans approached 40%. Since then, however, the introduction of more stringent regulations of Fintech credit platforms drove the ratio of new P2P loans to bank loans down to 10% in 2018 (Claessens et al., 2018^[4]). In the other Emerging Asian countries, Fintech's extension of credit increased between 2013 and 2019, although large disparities in usage remain (Figure 3.1). 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, following a robust trend of growth. In India, Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam, the peer-to-peer lending industry is still at a nascent stage, but growing quickly.

Figure 3.1. 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^[7]), "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>.

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Fintech offers an avenue for improving the efficiency of payments and settlements

Many Fintech firms use digital technologies to provide payment services. More specifically, they use digital solutions to channel funds from payers to payees, either by handling the funds themselves, or by initiating transactions on behalf of payers, from transaction accounts held at financial institutions (Ehrentraud et al., 2020^[8]). Fintech's provision of payment services also includes firms that specialise in the transfer of remittances, and the provision of debt-like instruments such as e-money.

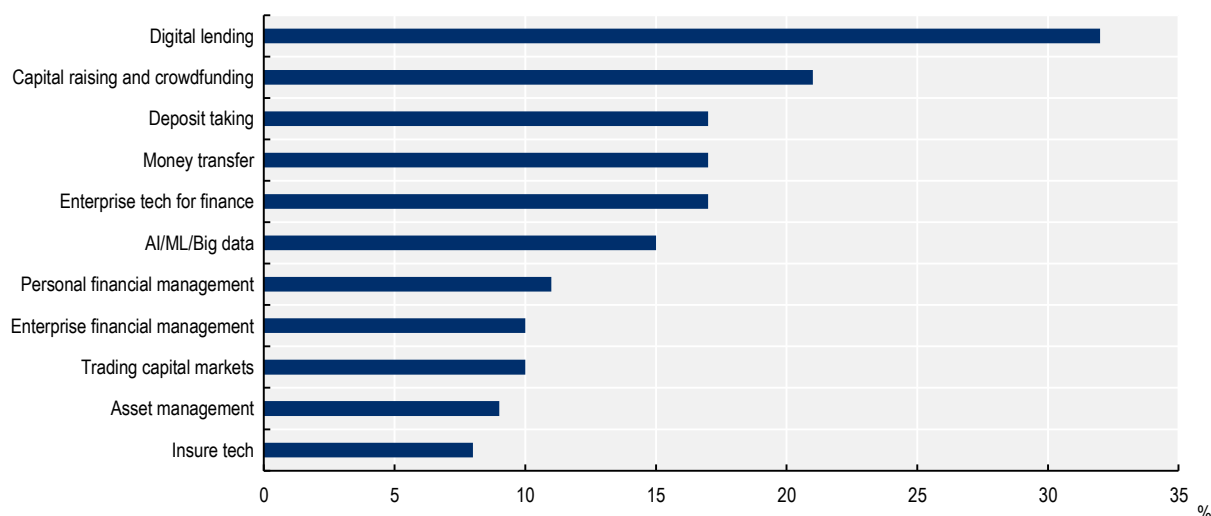
Payment services are an important component of the Fintech environment in Emerging Asia. In the Association of Southeast Asian Nations (ASEAN), they constitute a widespread business model, representing 17% of Fintech (Figure 3.2). Meanwhile, China is a global leader in Fintech payment solutions. Already in 2017, around 77% of Chinese adults were using Fintech mobile payment solutions. Moreover, the market for digital payment services in China is heavily concentrated, given that three firms provide for 80% of the users, and 50% of the users rely on a single firm (Huang, Wang and Wang, 2020^[9]; Amstad et al., 2019^[2]).

Personal finance and wealth management may become more accessible due to Fintech

Robo-advice refers to automated financial advice that is generated through algorithm-based tools. In general, robo- and traditional advisors receive the same regulatory treatment, and are held to the same standards (Ehrentraud et al., 2020^[8]). In Singapore, for instance, robo-advisors are required to hold a financial advisor's license to provide advisory services on financial investments. In addition, if a robo-advisor also provides a platform for dealing in capital market products, it needs to hold a capital markets services license (Ehrentraud et al., 2020^[8]). Such licenses define not just the type of financial products that robo-advisors may provide advice on, but also the type of advice they may provide, and the type of clients to which they may cater. In addition, robo-advisors are required to act in the best interest of their client, and only to provide suitable investment advice, and they must collect sufficient information on their client (Baker and Dellaert, 2018^[10]). Services relating to personal finance and wealth management are an important business area for Fintech firms in ASEAN, with 11% of respondents in a joint survey by the Cambridge Centre for Alternative Finance, the Asian Development Bank Institute, and Fintech Space indicating that they were involved in such activities (CCAF/ADB/IFintechSpace, 2019^[11]) (Figure 3.2).


Fintech also offers scope to improve the provision of other financial services

Fintech in Emerging Asia is also used in other business areas, such as the provision of technological solutions for financial institutions. Within that field, Southeast Asian firms are mostly involved in know your customer solutions, banking software, regulatory technology, and fraud prevention (CCAF/ADB/IFintechSpace, 2019^[11]). Furthermore, Fintech firms in Emerging Asia also provide so-called InsurTech services, which refer to the application of technology to the insurance business. Applications include comparison portals and brokers, as well as online insurance-underwriting services, peer-to-peer insurance-provision platforms, and on-demand insurance (Ehrentraud et al., 2020^[8]).

Figure 3.2. 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 CCAF, in partnership with ADBI and FintechSpace, and 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/ADBIFintechSpace (2019^[11]), *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>.

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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 foster financial stability through decentralisation and diversification

The rise of Fintech could indeed lead to more decentralisation and diversification. Several studies have shown that increased competition in the banking sector could lead to greater financial stability, and that concentration may foster fragility in the financial sector (Fu, Lin and Molyneux, 2014^[12]; Beck, 2008^[13]). Nevertheless, these studies also underline that positive outcomes associated with increased competition and decentralisation are conditional on an appropriate regulatory framework. In essence, increased competition may be beneficial for financial stability if the regulatory framework provides an incentive-compatible environment, which is to say an environment that does not reward excessive risk-taking (Beck, 2008^[13]). Furthermore, it has been shown in a study focusing on the Asia-Pacific region that higher competition for market entry through regulatory restrictions benefits the stability of the banking sector (Fu, Lin and Molyneux, 2014^[12]).

Fintech may both decrease concentration and increase competition in the financial sector. By leveraging new technologies in lending, Fintech platforms may be able to offer borrowing rates that are more competitive. In addition, by entering the market, these new players may be able to increase the contestability of the lending market, and thus increase the overall level of competition in credit markets (FSB, 2017^[11]). By fragmenting the market for banking services, Fintech firms could reduce the systemic risk associated with financial institutions of systemic size, and therefore increase the resilience of the financial system (BIS, 2018^[14]). In addition, in the financial advisory sector, robo-advisors could compete

with larger incumbents due to low entry costs and fixed costs (FSB, 2017^[11]). Indeed, robo-advisor fees range between 0.02% and 1.0% of the invested funds, while traditional fund managers usually charge a fee amounting to around 2.0% to 3.0% (Deloitte, 2016^[15]). Furthermore, it is estimated that robo-advisor firms require around half of the assets under management per staff member to cover their costs, compared to traditional asset managers (Deloitte, 2016^[15]). Thus, lower fees charged by robo-advisors, and lower minimum asset thresholds, could allow for greater market access, and thus higher overall liquidity.

Finally, Fintech might also be useful in guaranteeing access to credit in the event of a liquidity shock in the conventional financial system. Indeed, since usual business models for peer-to-peer lending have a lower maturity mismatch than traditional banks, and rely on individuals' savings, making them less reliant on liquidity conditions, Fintech platforms can offer another channel for credit if bank lending were impaired (FSB, 2017^[11]).

Efficiency gains from Fintech could make the financial system more robust

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, at a lower cost. These efficiency gains may have a favourable impact on financial stability (FSB, 2017^[11]). In the provision of credit, Fintech platforms can reduce the costs of searches and transactions, and can improve the allocation of capital. The positive effects on financial stability of using information technology in the provision of credit have already been shown in several instances. During the global financial crisis, banks that adopted information more extensively tended to experience lower non-performing loan ratios than banks that did not take this approach (Pierri and Timmer, 2020^[16]). Likewise, Jagtiani and Lemieux (2018^[17]) find that rating grades from the US platform Lending Club, which rely on non-traditional data, are effective at predicting loan performance. Nevertheless, the use of these data also raises concerns over privacy and discriminatory access to credit. Finally, Berg et al. (2019^[18]) have shown that a German P2P loan provider that bases its credit ratings on its users' digital footprint outperforms its assessments based on credit-bureau data alone. These pieces of evidence make a strong case for Fintech's ability to improve credit quality.

Efficiency gains in other areas of business are also likely to improve financial stability thanks to Fintech. For example, 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^[11]). This would reduce the overall level of credit risk in the financial system. Furthermore, machine learning could improve financial decision-making processes, thereby enhancing the provision of financial advice through robo-advisors, or could improve the risk-calculation models that financial institutions use (FSB, 2017^[11]).

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. These include the risks that could materialise due to changes to the structure of financial markets, such as changes in the risk-taking behaviour of incumbents, an amplification of reputational risk, decentralisation, or the involvement of the big technology companies, or BigTech, in finance. In addition, Fintech may also lead to different risk behaviours among both consumers and providers of financial products, due to misaligned incentives, room for regulatory arbitrage, and misinformation. Finally, cross-border operations by Fintech firms might pose a risk to financial stability (Table 3.2).

Table 3.2. Examples of systemic risks associated with Fintech

Risk type	Risk subtype	Description
Market structure risk	Change in the risk behaviour of traditional financial institutions.	Pressure on incumbent profits might incentivise them to increase risk-taking.
	Amplification of reputational risk.	Non-sticky 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.
Excessive incentives to take risks	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.
International co-operation	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 might.
Operational systemic risk	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.

Fintech is likely to alter the structure of financial markets, potentially increasing risk-taking by traditional banks. The entry of Fintech platforms into the market for providing financial services may affect the risk-taking behaviour of incumbent financial institutions. By driving up competition, Fintech platforms may disrupt the business models of incumbent firms (FSB, 2019_[19]). Indeed, incumbent financial institutions could lose large shares of the market for financial services if new entrants are better able to use innovations, and are better able to meet customers' expectations. Furthermore, Fintech might face lower compliance costs associated with Know your customer and Anti-Money Laundering rules (OECD, 2018_[20]). In turn, this may lead incumbent financial institutions to loosen lending standards inappropriately, and to increase overall risk-taking (FSB, 2019_[19]). In this connection, Cornaggia, Wolfe and Yoo (2018_[21]) provide evidence for such effects being at play in the United States. Using loan data, they show that increased peer-to-peer lending activity leads to decreased loan demand for small banks, especially in the high-risk consumer loan segment. Furthermore, they show that expansion in peer-to-peer lending affects incumbent banks' risk-taking behaviour, as personal loan quality declines among small banks subject to increased P2P pressure (Cornaggia, Wolfe and Yoo, 2018_[21]). Another risk is that lower profit margins could hamper incumbent financial institutions' capacity to weather financial shocks (BIS, 2018_[14]). One way in which the process mentioned above could occur is through the unbundling of banking services. Fintech firms usually have a comparative advantage in narrow business lines, and may outcompete traditional banks in precise product areas. This could lead to the breakdown of some of the bundling and cross-subsidisation practiced by banks (FSB, 2019_[19]).

Fintech may increase the volatility that can stem from reputational shocks. Indeed, Fintech aggregators may enable customers to move funds around the banking system quickly, according to changes in prices, relative performances, and other forms of information on specific institutions. Such behaviour may render deposits less “sticky”, thus making them an unreliable source of funding for institutions holding customer funds (World Bank, 2019_[22]). More generally, in an increasingly competitive environment, an increase in the speed and ease of switching between service providers may make the financial system more sensitive to new information (FSB, 2017_[11]). Another channel through which Fintech could exacerbate reputational risks to financial stability is through the provision of lending. Because retail investors’ appetite for risk might be more volatile than that of traditional lenders, bad news and reputational damage might have a larger impact on credit provision in a system catered to by retail lenders and investors that are operating through Fintech platforms (FSB, 2017_[11]).

Decentralisation and disintermediation due to Fintech could pose a challenge. Notwithstanding the potential benefits to financial stability of having a decentralised and disaggregated financial system, such a market structure also poses challenges to financial stability. Indeed, systemic risk is highest when individual actors are fragile, shocks are easily propagated, information asymmetries are widespread, and the overall market is large (Magnuson, 2018_[23]). Thus, Fintech firms which tend to be small, leanly staffed, and narrowly focused on one type of service, may be more vulnerable to shocks than larger financial institutions with large capital buffers, economies of scale, and diversification (Magnuson, 2018_[23]). It remains the case, however, that the failure of a large financial institution will have a much larger systemic impact than the failure of an individual Fintech firm. Furthermore, it is also likely that the Fintech sector will consolidate in the future. Indeed, for many of the activities covered by Fintech firms, significant network effects and economies of scale are there to be achieved, raising the prospect of increased concentration in the future. Finally, the degree to which bank disintermediation will occur depends on the extent to which consumers perceive Fintech as a substitute for traditional banking and to which extent they are loyal to their current financial service provider (OECD, 2018_[20]).

Fintech platforms might be harder to co-ordinate, due to their smaller size and large number. The current decentralised nature of the Fintech industry brings with it greater difficulty in monitoring and regulating an activity that is more dispersed, and also more likely to lie outside the perimeter of existing regulation. For instance, more lending falling outside the net of prudential regulation may limit the effectiveness of credit-related macroprudential policy measures (FSB, 2017_[11]). In addition, the dispersed nature of Fintech makes it more difficult for regulators to identify the relevant actors for the purposes of regulation, and makes it more costly to monitor the whole network of Fintech actors (Magnuson, 2018_[23]). Having a large number of small actors also makes co-ordination more difficult. Economic theory predicts that a group must either be small, or else must have a special mechanism that makes individuals act in the common interest in order to achieve co-ordination amongst its members (Olson, 1971_[24]). During the global financial crisis, the largest investment banks on Wall Street co-ordinated their actions in response to the failure of Lehmann Brothers. This was made possible by the fact that the actors were identifiable, and could meet in a single room (Magnuson, 2018_[23]). Arguably, the Fintech sector currently does not have the characteristics to meet these two conditions.

BigTech firms could relatively quickly reach a systemically important size. The biggest firms operating in the digital industries, the so-called BigTech companies, are playing an increasingly significant role in providing financial services. Services provided by BigTech firms include most of the areas of Fintech business described above, such as banking, credit provision, payments, crowdfunding, asset management, and insurance (FSB, 2019_[25]). BigTech firms are particularly competitive in consumer finance and making loans to small firms, due to their better access to information about parties seeking credit (Stulz, 2019_[26]). Furthermore, low levels of financial inclusion in some Emerging Asian countries imply that that the region is particularly suitable for the growth of financial service provision by BigTech firms relative to developed countries (FSB, 2020_[27]). While the provision of financial services by BigTech firms raises similar issues relating to financial stability as it does with regard to regular Fintech firms in

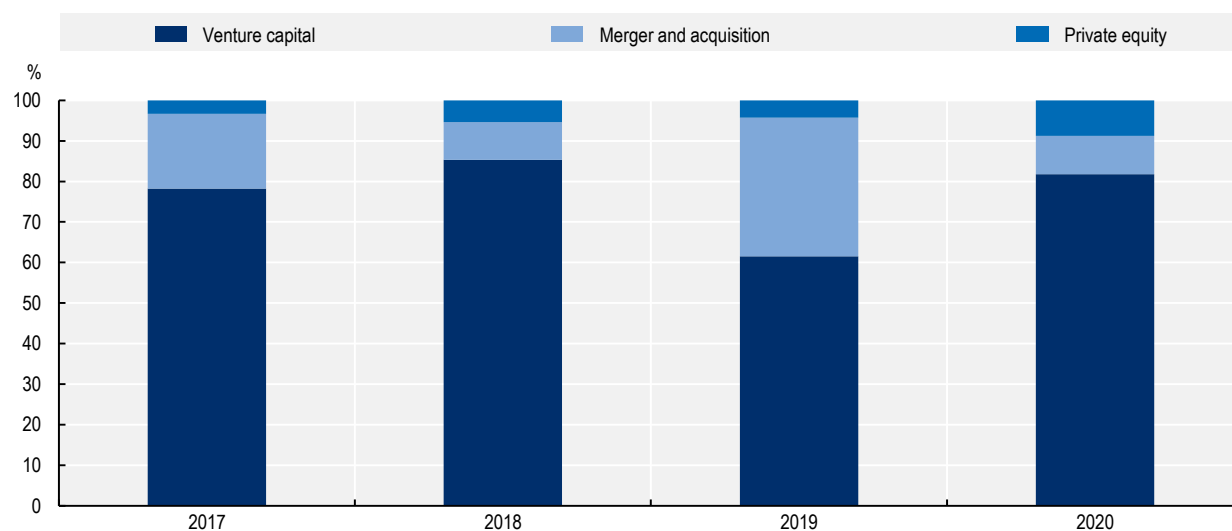
many respects, these bigger players also pose unique challenges. Primarily, BigTech's participation in the financial system raises the possibility that they will leverage their network and infrastructure to achieve scale in financial services very rapidly (FSB, 2019^[25]). This would imply that BigTech could become systemically important in the provision of financial services in a short amount of time. Moreover, it poses potential challenges to the financial system's resilience, given the current regulatory coverage of BigTech companies' financial activities. Indeed, while BigTech firms are generally subject to the same requirements as other market participants when providing financial services (such as holding the appropriate licenses to perform certain regulated activities), differences in the regulation of banks versus non-bank financial institutions may have implications for their regulatory coverage (Crisanto, Ehrentraud and Fabian, 2021^[28]).

The policy framework that is currently in place does not consider certain unique characteristics of BigTech firms. For instance, financial regulations are usually geared towards targeting the individual legal entities within the BigTech groups that provide specific financial services, without considering the potential spillovers that could occur across the different activities that BigTech conglomerates perform (Crisanto, Ehrentraud and Fabian, 2021^[28]). Indeed, BigTech firms may be active in a number of Fintech activities, such as lending, payments, and insurance. Yet they have tended to separate these out, through the creation of different individual legal entities (FSB, 2019^[25]). This has caused regulatory oversight to be limited to each legal sub-entity, thus overlooking inter-related risks. Furthermore, the overlaps created by BigTech conglomerates might render supervision more complicated, if different institutions are in charge of regulating different aspects of BigTech firms' business. For instance, if one regulator oversees a BigTech firm's credit operations, while another oversees its insurance branch, a lack of co-ordination might hamper their collective ability to limit macro-financial risks. Tackling these deficiencies is of growing importance, given that the failure of a BigTech firm could lead to widespread disruptions if it were one of the largest financial service providers in an economy.

Fintech may increase aggregate risks, via risk offloading and originate-to-distribute models.

Through risk offloading, which refers to the fact that Fintech lending platforms may not carry any credit risk from the loans that they originate, they may offload risk in two ways. In the peer-to-peer lending model, the platform itself does not assume any credit risk, merely acting as the facilitator between borrowers and lenders, and the transaction does not appear on its books at any time (FSB, 2017^[11]). Such offloading of risk from platforms to third parties implies that P2P lending platforms may encourage excessive risk-taking, as they benefit from loans being originated, but without bearing the risk. Although P2P lending companies have long-term reputational incentives to provide high-quality and reliable investment opportunities, short-term incentives for managers might still be misaligned with encouraging prudent behaviour among users of the platform (Magnuson, 2018^[23]). Another way in which Fintech platforms offload risk is using the originate-to-distribute model for lending. This involves the Fintech platform selling the loans that it originates to third parties, thereby removing the risk from its balance-sheet (Perkins, 2018^[29]). These practices may prove harmful for financial stability, as Fintech platforms have little incentive to limit excessive risk-taking, or to engage in the appropriate due diligence, given that the loans are removed from their balance sheet soon after they are originated (Purnanandam, 2010^[30]).

A winner-takes-all market structure, and venture capital funding, might exacerbate excessive risk-taking. Another element that may exacerbate risk-taking in the Fintech industry is the winner-takes-all structure of the market. In essence, companies that can gain an early lead in the deployment of technology to the market can attract a stable customer base, thus shoring up their future share of the market. Other, less successful, companies will usually drop out. Such a structure implies that Fintech firms are not playing an indefinite game, but one where an early lead is rewarded (Magnuson, 2018^[23]). In addition, many Fintech firms are funded by venture capital, a funding structure that has been shown to drive companies to expand as quickly as possible (Davila, Foster and Gupta, 2003^[31]). Indeed, on average between 2017 and 2021, 77% of investment into Fintech firms in the Asia-Pacific region originated from venture capital funds (Figure 3.3). The combination of these two factors implies that Fintech firms may have relatively larger incentives to take risks to grow quickly.

Figure 3.3. Investment in Fintech in the Asia-Pacific region, by source

Source: OECD Development Centre based on KPMG (2021^[32]), *Pulse of Fintech H2'20*, KPMG, Amstelveen, Netherlands, <https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/02/pulse-of-fintech-h2-2020.pdf>.

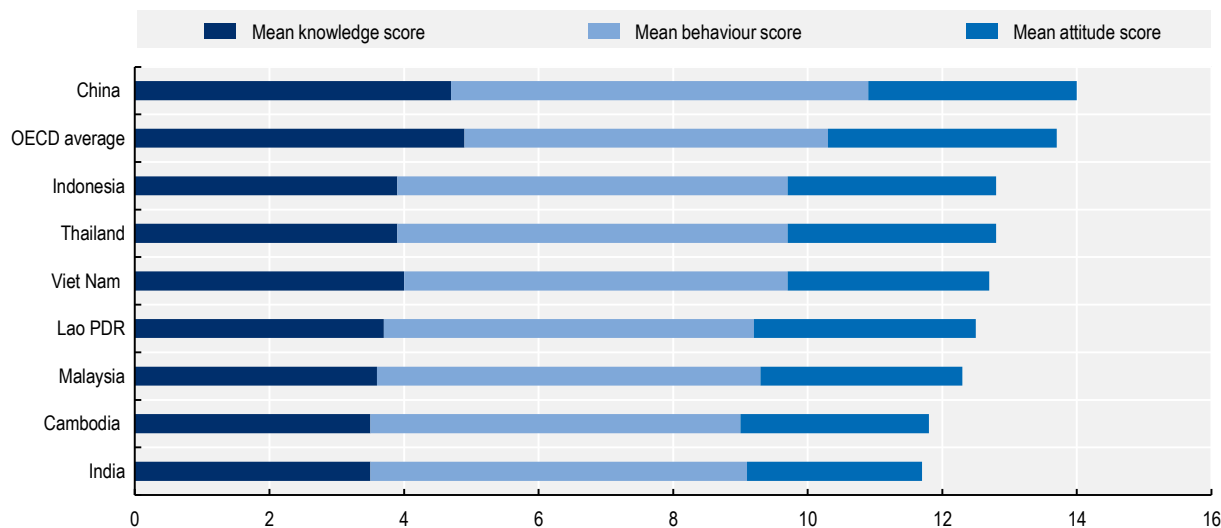
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Fintech lenders might increase aggregate risk by originating higher-risk loans. Arguments have been put forward claiming that Fintech's advantage over traditional banking stems from regulatory arbitrage, rather than from higher efficiency. These claims rely on the view that borrowers with low creditworthiness are attracted to Fintech providers because of the sector's lower regulatory oversight. This would imply that Fintech firms increase the aggregate level of credit risk in an economy by providing loans that would be deemed too risky by banks, given current regulatory standards. Evidence from China seems to point in this direction. For instance, Braggion, Manconi and Zhu (2018^[33]) have demonstrated that Chinese cities that tightened their loan-to-value caps on mortgages saw a rise in peer-to-peer lending, which is consistent with the view that P2P lending makes it possible to circumvent credit regulation. Research by Roue, Pelizzon and Tasca (2016^[34]), as well as by Cornaggia, Wolfe and Yoo (2018^[21]), also suggests that P2P lending might be particularly well suited for high-risk small loans. Evidence from the US on balance-sheet Fintech lenders from Buchak et al. (2018^[35]) is more nuanced. They do show that non-bank financial intermediaries catered overall to borrowers with lower creditworthiness than traditional brick-and-mortar banks. However, within that category of non-bank financial intermediaries, it turned out that it was Fintech firms that tended to cater to the highest-quality borrowers. Using market-wide, loan-level data on US mortgage applications and originations, Fuster et al. (2019^[36]) post a similar result, showing that Fintech balance-sheet lending does not lead to increases in default rates or the provision of credit to marginal borrowers.

Increased access to financial products might increase risk-taking if financial literacy is low. Fintech's use of digital technologies and alternative credit-scoring data has led some customers to be offered credit on a larger scale, and faster, than would have been the case with conventional financial institutions (FSB, 2020^[27]). Although expanding access to credit is a positive development, it may also lead to sub-optimal financial decisions. This could potentially cause issues of over-indebtedness and mismanagement of personal wealth, which in turn could have implications for financial stability. Moreover, Fintech platforms may facilitate access to complex financial products. If individuals lack the necessary knowledge to judge the risk profile of these products, easier access may provoke new financial stability risks (Elsinger et al., 2018^[37]). For instance, Panos and Wilson (2020^[38]) show that Fintech users display

riskier financial behaviour, as they are more likely to make impulsive financial decisions and to take out payday loans. As such, they argue that mobile loan products are often too accessible, allowing consumers to act upon fleeting preferences. Given that consumer protection laws and financial literacy tend to be lower in developing countries, the rise of Fintech may lead to challenges with regard to financial stability in Emerging Asia, due to excessively risky behaviour being enabled through Fintech platforms (FSB, 2020^[27]). Indeed, results from a survey on financial literacy by the OECD and the International Network on Financial Education show that, with the exception of China, financial literacy scores in Emerging Asia are below that of the OECD countries (OECD, 2016^[39]) (Figure 3.4).

Figure 3.4. Financial literacy score in selected Emerging Asian countries



Note: Scores obtained from survey data. The maximum score is 21. Financial Knowledge refers to basic knowledge of finance such as calculating interest rate risk, performing return evaluation, and understanding inflation and financial diversification. The indicator ranges between 0 and 7. Financial behaviour concerns taking, or not taking, financial actions such as household budgeting, saving, considering purchases, bill payments, taking care of financial affairs, long-term financial goals, and borrowing. The score ranges between 0 and 9. Attitudes refer to concepts such as an individual's time preference, and willingness to save. This score ranges between 1 and 5.

Source: OECD Development Centre based on OECD (2016^[39]), *OECD/INFE International Survey of Adult Financial Literacy Competencies*, OECD, Paris, <http://www.oecd.org/finance/OECD-INFE-International-Survey-of-Adult-Financial-Literacy-Competencies.pdf>; Morgan and Trinh (2019^[40]), "Fintech and Financial Literacy in the Lao PDR", *ADB Working Papers*, No. 933, Asian Development Bank Institute, Tokyo, <https://www.adb.org/sites/default/files/publication/491631/adb-wp933.pdf>.

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Supervisory co-ordination between jurisdictions on regulatory responsibility needs to be strengthened further. Fintech firms often operate on a global scale and this means that gaps between rules in different jurisdictions may give rise to opportunities for regulatory arbitrage, and that Fintech firms are likely to go shopping for the jurisdictions that are friendliest to their activities (World Bank, 2019^[22]). Therefore, loopholes in third-country regulatory frameworks are likely to have an impact on domestic financial stability, if an extra-territorial dimension is not added to the domestic regulatory framework for Fintech (Magnuson, 2018^[23]). Furthermore, it might well be that several regulators from different jurisdictions have valid reasons to seek to supervise certain platforms, causing regulations to overlap, and reducing their effectiveness due to poorly defined responsibilities (Magnuson, 2018^[23]). As such, without adequate supervisory co-ordination between jurisdictions on regulatory responsibility and information sharing, Fintech's international nature may pose a threat to financial stability.

New operational systemic risks could arise due to digital technologies. Due to their relatively large reliance on digital technologies and new and relatively untested technologies, Fintech service providers are more exposed to risks of piracy and IT failure (FSB, 2017^[1]). Disruptions to information and communication technology (ICT) systems due to technical failures or cyber attacks have the potential to undermine financial stability through three key transmission channels. The first of these is loss of confidence. A failure of a financial institution's ICT systems could result in a loss of confidence, which could potentially cause a bank run and start a broader crisis (IMF, 2019^[41]). Another potential channel is the lack of substitutability of certain key ICT systems that are essential for financial services, such as payments, clearing, settlement, exchanges, or even bank-account management. In the event of a major disruption to ICT systems, the ability of the financial sector to ensure the provision of essential services for the functioning of the economy might be impaired (IMF, 2019^[41]). Finally, ICT systems in the financial sector are highly interconnected in ways that are challenging to map fully. These interconnections linking organisations and technologies may prove to be important and unpredictable channels of transmission for systemic failure (IMF, 2019^[41]).

Increased outsourcing to third parties might hamper regulatory oversight and lead to excessive exposure. This is because of the difficulty of regulating these third parties, and the dilution of responsibility that occurs along the value chains. For instance, cloud computing allows financial institutions to share computer resources with remote data centres located anywhere in the world, which are, therefore, mostly out of reach for regulators (World Bank, 2019^[22]). In the Asia-Pacific region in 2019, 65% of financial institutions were using cloud computing services, 39% of which were hosted in a multi-tenant public cloud (IDC, 2020^[42]). Appropriate regulatory oversight over these service providers is, therefore, essential. In addition, the risk that stems from outsourcing would be of an even more systemic nature if some of the services provided by third parties were to be dominated by a few globally active players, as this would lead to a risk of concentration (BIS, 2018^[14]). Such a scenario does not seem very far-fetched, given that, for instance, the cloud industry is concentrated in the hands of only a few, mostly unregulated, providers (World Bank, 2019^[22]). Indeed, four providers account for 60% of the global market for cloud computing (FSB, 2019^[19]). The failure of just one of them would have strong repercussions on the financial system's ability to perform its role.

Algorithmic herd behaviour could lead to increased volatility in financial markets. Fintech activities may increase the pro-cyclicality of the financial sector, due to algorithmic herd behaviour. The latter refers to the fact that models with similar input data and underlying algorithms will react in similar ways to developments in the financial markets, thereby accentuating fluctuations. For instance, robo-advice could exhibit larger degrees of herd behaviour than traditional portfolio-allocation methods, if risk models are highly correlated due to reliance on similar algorithms (FSB, 2017^[1]). Given that asset-management algorithms have not been tested in times of market turmoil, and that they update their investment decisions based on market developments, feedback loops between algorithmic trading platforms may increase pro-cyclicality and volatility in the markets (Magnuson, 2018^[23]). For instance, high-frequency trading in financial markets is believed to have negative side effects for financial stability, as it may enable the occurrence of "flash crashes", when prices of assets collapse and then recover in a very short time interval (Kirilenko and Lo, 2013^[43]).

Box 3.1. Historical lessons about the macroprudential risks of central bank digital currencies

Central bank digital currencies (CBDCs) are a digital form of fiat money issued by a central bank (IMF, 2020^[44]). While many different forms of CBDC are possible, this box will focus on a retail version, meaning one that is accessible to the wider public, and that would amount to providing individuals with accounts at the central bank. CBDCs could offer a number of advantages to their users, as they would provide an alternative to cash, and would ensure that the public has access to a state-guaranteed means of payment. It would reduce the cost of handling cash in countries with vast territories, and it would facilitate cross-border payments, as it would reduce the role of intermediaries in making them work (IMF, 2020^[44]). While CBDCs have not been issued at a massive scale yet, many central banks have shown an interest in them. A survey by the Bank for International Settlements has shown that out of a group of 21 central banks from advanced economies and 44 from emerging-market economies, 86% are engaging in work related to CBDCs, and 60% have already progressed from analytical studies to experimentation (Boar and Wehrli, 2021^[45]).

While CBDCs offer a number of benefits, as outlined above, they may also create new macro-financial risks if not deployed safely. For instance, they could disintermediate banks if they prove to be very attractive, by crowding out bank deposits. Indeed, if CBDCs are considered safer, and if the interest rate on bank deposits is too low (an issue that would be amplified if CBDC accounts were to pay interest, for example, the central bank policy rate), consumers might find it preferable to store their liquidity in their CBDC account. (Allen et al., 2020^[46]). Such a development would prevent banks from engaging in maturity transformation and credit allocation, thus drying up the supply of loans to the economy.

The crowding out of deposits by CBDCs could have other detrimental effects on the level of macro-financial risk. For instance, it could increase banks' funding costs, thereby leading them to deleverage, and to decrease the supply of credit. Furthermore, and as described above, greater competition for deposits might lead banks to engage in excessive risk-taking in order to provide higher interest rates to retain customers. Finally, the crowding out of bank deposits by CBDCs could hamper banks' ability to build customer relationships, which are essential for the provision of credit. Indeed, a long-term relationship between a bank and its customer reduces information asymmetry, improves credit risk assessments, and increases credit provision (Moro, Fink and Maresch, 2015^[47]).

Given the lack of practical knowledge on the actual impact of CBDCs on financial stability, economists have resorted to historical proxies to evaluate potential scenarios. Baubeau et al. (2020^[48]) use the case of the French banking crises of 1930-31 to evaluate the impact on bank deposits of the existence of a safe alternative during times of financial stress. Indeed, they use the fact that while banks were unregulated, depositors had access to *Caisses d'épargne ordinaires*, which were government-guaranteed savings institutions, to show the potential effect of CBDCs on bank deposits in times of crisis.

Their research confirms that access to a safer outside option may lead to bank runs during times of financial trouble, as was the case in France during the 1930-31 crisis. Using data on financial flows, the authors document how depositors moved their money to the government-guaranteed savings institutions, as these were considered safer during several bank runs between 1930 and 1931. In turn, this led to a credit contraction, as the *Caisses d'épargne ordinaires* did not provide loans to the private sector, and could only fund the treasury and the central bank. Furthermore, they show that while they paid a higher interest rate than banks on deposits, in non-turbulent times, depositors preferred banks. This was because of the additional services that banks provided, such as credit relationships, means of payment, investment advice, and management of a securities portfolio. These findings indicate that it would be possible for a CBDC to pay interest rates on deposits, as long as there is a deposit ceiling to prevent runs during crises.

How macroprudential policies can address the risks associated with Fintech

This section considers a number of policies to address the risks created by Fintech. Potential policies to reduce macro-financial risk stemming from Fintech include:

- Adjusting current banking regulations to Fintech.
- Creating a regulatory framework for P2P lenders.
- Implementing risk-retention standards for lenders focusing on the originate-to-distribute model.
- Using an entity-based approach to regulate BigTech firms.
- Using regulatory sandboxes to test policies.
- Implementing reciprocity agreements between jurisdictions, and converging on regulatory standards for Fintech.

Current banking regulations should be adjusted to account for Fintech's business models

The existing regulatory framework may prove to be adaptable to the rise of Fintech, so long as a number of adjustments are made to ensure that regulatory coverage extends to them fully. In order to ensure that the development of Fintech does not result in gaps in the traditional supervisory and regulatory frameworks, policymakers should closely monitor changes in how financial services are delivered, and how these changes affect their ability to supervise (FSB, 2019^[19]). 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. Overall, Fintech platforms do require similar licenses to the ones that traditional financial institutions need in order to supply financial services. As a result, they are subject to similar regulatory standards (Crisanto, Ehrentraud and Fabian, 2021^[28]).

However, Fintech business models may offer financial products, or provide financial services, that fall outside what is considered to be traditional banking, such as P2P lending and digital currencies (BIS, 2018^[14]). As such, bank-licensing regimes should be reviewed and adjusted if they do not match the innovative business models of Fintech firms. This implies either creating a new regulatory framework dedicated to digital banks, or adjusting the current regulatory framework for banks to encompass and take full account of Fintech platforms.

In fact, Singapore has set up a new digital banking framework, which includes two types of licenses. The first of these is the digital full bank license, which allows holders to provide a wide range of financial services and take deposits from retail customers. The second kind of license is for a digital wholesale bank, which allows licensees to serve small and medium-sized enterprises and other businesses, but not to accept deposits in Singapore dollars from individuals (Ehrentraud, Ocampo and Vega, 2020^[5]). Furthermore, in order to obtain a digital banking license, applicants must display a track record in operating an existing business in the technology or e-commerce sectors, and prove that their proposition will serve unmet or under-served needs. Finally, digital banks must be incorporated in Singapore, comply with the same prudential rules as incumbent banks, and participate in the Singapore Deposit Insurance Corporation (Ehrentraud, Ocampo and Vega, 2020^[5]).

In the euro area, regulators have taken a different approach, requiring digital banks to hold the same license as traditional banks. However, the European Central Bank has released specific guidance on how licensing requirements should apply to Fintech platforms. This guidance highlights supervisory considerations with respect to the specific challenges that arise due to the business model of Fintech firms, such as increased cyber risks, IT competence of management, and the suitability of shareholders in terms of reputation and financial soundness (Ehrentraud et al., 2020^[8]).

In India, a new type of banking license was created for Fintech platforms providing banking services to low-income households and small businesses. In 2015, the Reserve Bank of India issued restricted payment bank licenses that allow these to hold a balance of 200 000 Indian rupees (INR) per customer, issue debit cards, and offer payment and remittance services (RBI, 2021^[49]; BIS, 2018^[14]). On the other hand, these banks are not allowed to engage in credit issuance, and therefore do not pose significant credit or market risk (RBI, 2014^[50]). These banks are subject to specific macroprudential rules, as they should have a minimum capital adequacy ratio of 15%, have a leverage ratio of no less than 3%, and a paid-up capital of at least INR 1 billion (RBI, 2014^[50]).

Box 3.2. Coverage of Fintech deposit-taking platforms in deposit insurance schemes

Incorporating Fintech providers of deposit-like products into deposit insurance schemes can help improve financial stability, as it may reduce hazards stemming from excessive reputational risk (Diamond and Dybvig, 1983^[51]). In most countries, government-backed deposit insurance schemes are reserved for licensed banks. In the event of a bank's failure, such a scheme guarantees depositors that they will recover at least part of their savings. This kind of insurance serves the macroprudential purpose of preventing bank runs from occurring due to the rapid deterioration of a bank's reputation, and becoming a self-fulfilling process as customers remove their savings, causing it to become illiquid.

Regulators across the globe have taken different approaches to deal with non-bank deposit takers. The direct approach is to make sure that the deposit-like products that Fintech platforms offer are themselves insured (World Bank, 2019^[22]). Singapore, Mexico and Colombia have created new types of banking licenses specific to digital banks, while other jurisdictions have opted for the pass-through approach. This approach extends insurance coverage to digital deposit-like products even when the provider is not a member of the scheme, often by requiring any deposit-taking Fintech platform to hold customer funds in a trust account, or an account with similar features to that with an insured depository institution. This approach is in use in a number of jurisdictions across the globe including the United States and the United Kingdom (World Bank, 2019^[22]).

P2P lending platforms should be regulated in order to avoid excessive credit growth and risk-taking

While Fintech balance-sheet lending tends to be subjected to similar licensing and regulatory regimes as do traditional credit institutions, peer-to-peer lending platforms often fall outside of this regulatory perimeter. It is important, therefore, either to expand the regulatory coverage to these platforms, or to develop new rules designed to limit the financial risk that arises from them. A number of jurisdictions have taken steps to reach this goal. In 2014, for instance, the United Kingdom's domestic financial regulator, the Financial Conduct Authority, moved to regulate P2P lenders (FCA, 2018^[52]). Thus, P2P lenders in the UK are subject to a modified version of capital adequacy and disclosure requirements, which are proportionate to their business (Chiu, 2017^[53]). Indeed, they are required to hold a minimum capital of 50 000 pounds (GBP), along with a level of variable capital that is based on total lending, following a regressive scale ranging from 0.3% to 0.1% (Chiu, 2017^[53]). Restrictions on peer-to-peer lending were tightened in 2019, when a cap on investment in P2P agreements for retail customers new to the sector was set at 10% of their investable assets (FCA, 2019^[54]).

China is another country with significant experience in regulating P2P platforms. After an initial boom in the sector amid a *laissez-faire* policy framework, the Chinese government tightened regulations for P2P lenders from 2015 onwards, notably with a set of interim measures on online lending in 2016 (Ding, Kavuri and Milne, 2020^[55]). Among other provisions, these regulations limit credit growth, by capping the balance of loans to the same natural person on one online platform to 200 000 Yuan renminbi (CNY), while the limit

is CNY 1 million for legal persons (Ding, Kavuri and Milne, 2020^[55]). Similarly, total lending from any online platform is also capped.

Finally, Indonesia acted in 2016, issuing a regulation on information-based lending services. Under these rules, P2P lending platforms are required to register with the country's banking regulator, are classified as "other" financial services institutions, and are supervised as non-bank financial institutions (OJK, 2017^[56]). In order to enhance financial stability, the maximum amount of loans that providers can grant to a single borrower is limited to IDR 2 billion (OJK, 2017^[56]).

Risk-retention standards could be used to improve incentives for originate-to-distribute platforms

While the originate-to-distribute model used by balance sheet-based Fintech lending platforms increases liquidity, therefore increases the provision of credit, it also creates a problem of misaligned incentives, as the loan originator transfers the credit risk to a third-party. The originate-to-distribute model was developed in tandem with the rise of securitisation, allowing assets to be pooled and resold. Indeed, it is seen as having been one of the drivers of the subprime crisis in the United States (Purnanandam, 2010^[30]). Following the subprime crisis, the US legislated to ensure that loan originators would keep sufficient "skin-in-the-game" to make sure that their incentives were compatible with maintaining high lending standards. This was achieved through the imposition of risk-retention rules under the Dodd-Frank Act, and was implemented from 2016 onwards. Under these rules, sponsors of asset-backed securities are required to retain an economic interest of at least 5% in credit risk for the secured asset. Furthermore, sponsors are not allowed to hedge or transfer their exposure to their regulatory retained interest in asset-backed securities (Hogan Lovells, 2020^[57]). Applying a difference in differences framework to the United States, Furfine (2019^[58]) shows that setting risk-retention rules increased credit quality, as measured by lower loan-to-value and higher debt-service ratios. Furthermore, loans that were originated under risk-retention rules were less likely to become troubled. Similar rules could be applied to Fintech balance-sheet lenders functioning under the originate-to-distribute model. This would promote responsible behaviour in the emission of new loans, thus also promoting financial stability.

Using an entity-based approach to regulate 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^[28]). 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. China has taken the first steps towards such an approach in regulating the BigTech firms that are involved in Fintech. In September 2020, the Chinese government approved a regulation that would introduce licensing procedures for financial holding companies (Government of China, 2020^[59]). In April 2021, meanwhile, China's central bank announced that it would increase the supervisory scrutiny of BigTech firms, mentioning issues such as the provision of certain services without an appropriate license, inadequate governance standards, and engaging in unfair competition through data transfer between different activities (PBOC, 2021^[60]). As such, the regulator ordered BigTech companies to register their financial units in such a way as to operate as single financial holding companies, thereby subjecting them to supervision. This includes meeting rules on capital adequacy and risk management. Furthermore, they must cut links between payment services and other financial products, break up their information monopolies, and register their credit-scoring services. They also have to prevent senior staff from having

responsibilities in different parts of the organisation, and they may not control more than one bank or insurance firm (PBOC, 2021^[60]).

Box 3.3. Limiting market concentration to avoid excessive exposure to a single actor

The entry of BigTech firms into the market for financial services raises the prospect of high degrees of concentration in the sector, enabled by network effects and economies of scale (FSB, 2020^[27]). Such a high degree of concentration would pose a threat to financial stability, as the failure of any single actor could prevent financial markets from functioning by drying up credit or hampering settlements. Furthermore, excessively large financial firms are harder to manage, and for the market to understand. In turn, they are also harder to discipline, and for regulators to supervise (FSOC, 2011^[61]).

As discussed above with regard to other concerns, ways to reduce the risks that stem from high levels of concentration may be drawn from what already exists in conventional financial markets. In the United States, under the Dodd-Frank Act, financial institutions are prevented from acquiring other financial institutions if the resulting tie-up would cause its liabilities to exceed 10% of the aggregate liabilities of all financial institutions (Federal Reserve, 2014^[62]). In this case, the definition of a financial institution includes any insured depository institution, but also non-bank financial companies. This includes any BigTech firm that is involved in the provision of financial services.

Such policies to avoid concentration may be applied to the context of Emerging Asian countries, in order to avoid single firms controlling large shares of the credit market and thereby creating excessive systemic risk. In formulating such policies, authorities should also bear in mind that BigTech firms tend to rely on network effects and information monopolies, rather than on mergers, to reach a high level of market control (FSB, 2019^[25]). Thus, in applying concentration limits on the accumulation of assets by BigTech, regulators should not focus solely on mergers, but also on the organic growth of these firms' consumer bases.

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 (OECD, 2018^[63]). Sandboxes also allow regulators to build an appropriate regulatory approach to new business models, maintaining control over potential risks without hampering innovation. They involve temporary and proportionate easing of certain regulatory or licensing requirements, in order to allow firms to test new products (IMF, 2019^[41]). Access to sandboxes usually depends upon a successful application by candidate firms. Regulators tend to grant access based on criteria, such as providing a genuine innovation with benefits for consumers, having a track record of good behaviour, being ready to enter the market, and not fitting into the existing regulatory framework (BIS, 2018^[14]). In general, sandboxes operate under restrictive parameters, such as setting a maximum number of customers or transactions, and run for a defined and limited amount of time.

In Emerging Asia, regulatory sandboxes for Fintech have become widespread. Singapore was a frontrunner in establishing a regulatory sandbox for Fintech, setting one up in 2016 (CCAF/ADB/IFintechSpace, 2019^[11]). In 2019, it developed an express sandbox, giving firms a faster option to test certain innovative financial products. As of April 2021, one entity was operating in Singapore's sandbox (MAS, 2020^[64]). Malaysia was another relatively early adopter of a regulatory sandbox for Fintech, with its central bank setting up such a framework in 2017 (CCAF/ADB/IFintechSpace, 2019^[11]). Also in 2017, Brunei Darussalam, Indonesia, and Thailand, all established regulatory sandboxes for Fintech

(CCAF/ADBI/FintechSpace, 2019^[11]). In 2018, the central bank of the Philippines established a special sub-sector for Fintech to “institutionalise the operational and cyber-resilience of the financial system”. This paved the way for establishment of the Philippines’ regulatory sandbox for Fintech (Diokno, 2019^[65]). In 2019, two other countries followed suit, with China and India creating their own regulatory sandboxes (RBI, 2019^[66]; China Banking News, 2019^[67]). Finally, Viet Nam also has plans to set up a regulatory sandbox (CCAF/ADBI/FintechSpace, 2019^[11]).

Co-ordinating the macroprudential regulation of Fintech to create a level playing field

Regulators across Emerging Asia should consider enhancing co-ordination among themselves, but also with international partners, to avoid creating opportunities for regulatory arbitrage. Indeed, regulators should ensure that the same measures apply to all of the financial institutions that are active within their jurisdiction, irrespective of the location of the parent institution. This would help to prevent platforms from seeking domiciliation in jurisdictions that best fit their needs, while building up financial risk abroad. To this end, regulators could use mandatory reciprocity agreements, which require all financial institutions operating within a jurisdiction to do so under the same macroprudential rules. This would include foreign Fintech platforms that engage in cross-border activities without setting up a local subsidiary. Such a principle is a cornerstone of the Basel III agreement on counter-cyclical capital buffers. This stipulates that when the buffer is activated in one country, reciprocity requires supervisory authorities in all countries to apply the same buffer on their banks’ exposure into the host country where the buffer is being applied, as long as the buffer does not exceed 2.5% of risk-weighted assets (IMF, 2014^[68]). Moreover, the European Union requires its financial institutions to reciprocate counter-cyclical capital buffers of the country in which it is active when engaging in cross-border operations between EU Member States (Cantone, Wildmann and Rancoita, 2019^[69]).

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. Several forums could be used to ensure policy co-ordination between regulators. For instance, regional initiatives already exist, with ASEAN being among the first to create a cross-jurisdictional sandbox. Named APIX, it was designed as a flexible Fintech marketplace and sandbox platform (CCAF/ADBI/FintechSpace, 2019^[11]). Regulators in Emerging Asia could also enhance inter-operability by joining the Global Financial Innovation Network (GFIN), which acts as a forum to share experiences on regulating financial innovations. It also provides an environment for testing cross-border technologies in the form of a global sandbox. The underlying principle is that if a Fintech firm is found to be satisfactory in a sandbox of a member, it is considered to meet the standards of all members of the network. In Emerging Asia, the central bank of the Philippines, the Monetary Authority of Singapore, and the Hong Kong Securities and Futures Commission are members of the network, with the latter two regulators also sitting on the co-ordination group that oversees its activities (GFIN, 2021^[70]). In addition, systemic risk can stem from the operational aspect, for instance coming from cyber infrastructure, though those types of risk are not necessary within the scope of macroprudential policies (Box 3.4).

Box 3.4. Assessing systemic operational risks by mapping cyber infrastructures

To tackle systemic operational risk arising from Fintech, supervisors must start by identifying where such risks are most likely to arise. They may get a better picture of the financial system's cyber network, and identify its weaknesses, by developing an analytical framework for mapping out cyber vulnerabilities (IMF, 2019^[41]). Such a framework would provide the opportunity to understand the financial and ICT connections of firms in the financial system better, and to identify interconnectedness, risk concentrations, and shared dependencies. As such, a mapping-out of the financial system's cyber network would focus on similar issues as those encountered when assessing risks relating to financial interdependencies. By integrating financial and cyber maps, this analysis can help to examine the effects of concentration and interconnections, and their role in spreading contagion in the event of IT failure or cyber-attacks (IMF, 2019^[41]). Having a clear picture of the weaknesses in the financial system's cyber network, and linking these to financial interdependencies, will help support the role of supervisors in promoting financial stability. Furthermore, when mapping out the financial system's cyber network as suggested above, care should be taken to include third-party service providers in the mapping (IMF, 2019^[41]). This will help to identify systematically important third-party service providers within the network.

Secondly, countries in Emerging Asia could enhance the supervisory access that their domestic authorities have to third-party service providers. In this connection, certain OECD countries have developed frameworks to guarantee their access to, and systematic monitoring of, third-party service providers. In the United States, for example, the Bank Service Company Act provides federal banking agencies with the authority to regulate and examine the performance of certain services provided by a third-party provider for a depository institution. It does so "to the same extent as if such services were being performed by the depository institution itself on its own premises" (BIS, 2018^[14]). Furthermore, US banking agencies have developed a formal supervisory programme for significant providers of service technology to the US banking sector. This focuses on technology and operational risk (BIS, 2018^[14]). Currently, in many jurisdictions including Singapore, regulatory access to third-party service providers depends on the contracts between the financial institution and the service provider. Enhancing access to third parties may be a useful step for reducing the systemic risk that arises from outsourcing (BIS, 2018^[14]).

Conclusion

Fintech is a sector of growing importance in Emerging Asia. The provision of credit through Fintech platforms is increasing in most Emerging Asian countries. A growing number of Fintech firms are offering payment services, as well as personal financial advice. The rise of these new platforms creates opportunities in terms of expanded access to financial services, increased efficiency, and higher levels of competition in the financial services sector. Nevertheless, Fintech platforms, because of their innovative business models, may also create new forms of systemic risk for the financial system, or enhance existent risks.

This chapter finds that risks to the financial sector may materialise due to changes in the structure of the financial services market stemming from the rise of Fintech. This could occur through increased risk appetite by incumbents, stronger volatility due to reputational shocks, weaker individual participants, lesser regulatory oversight, and high concentration due to BigTech's entry into the market. Fintech platforms also create, and face, different incentives to take on risk than do traditional financial institutions. Certain Fintech lending models might promote excessive risk-taking. Similarly, the funding structure of Fintech firms may drive them to focus on growth at the cost of sustainability. Fintech business models may lead to regulatory arbitrage due to imperfect regulatory coverage. In addition, Fintech platforms may enable excessive borrowing by vulnerable consumers. Finally, operational risks associated with the rise of Fintech may have a systemic impact on the financial sector, through heightened cyber risk, higher reliance on third parties, and algorithmic herd behaviour.

This chapter also lays out several macroprudential policies designed to reduce the risks that the rise of Fintech stands to create. First, macroprudential regulations that already exist may, in many cases, also be effective for reducing risks arising from Fintech platforms. Where gaps exist, however, this is conditional on expanding regulatory coverage to Fintech platforms. This implies that licensing regimes must either be adapted or expanded. In the case of balance sheet-based Fintech lenders, ensuring appropriate coverage by existing banking laws might be sufficient. Different policy frameworks may be tested using sandboxes, which allow for innovation in a controlled environment. Furthermore, increased international co-operation will be essential for guaranteeing financial stability in an increasingly interconnected and global market for financial services. Regulators should forge reciprocity agreements, and seek to converge in terms of macroprudential policy. Finally, systemic risks arising from weaknesses in cyber infrastructure could be managed by mapping the digital networks of financial institutions, and by identifying systemically important flaws. To reduce the risks that may arise from algorithmic herd behaviour, regulators could require circuit breakers be engineered into trading algorithms.

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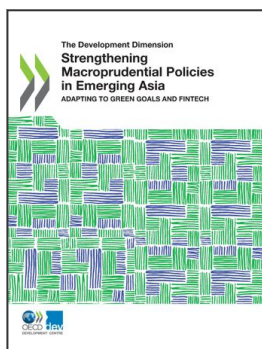
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