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**Working Paper**

## SME finance in Asia: Recent innovations in fintech credit, trade finance, and beyond

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## **ADB Working Paper Series**

### **SME FINANCE IN ASIA: RECENT INNOVATIONS IN FINTECH CREDIT, TRADE FINANCE, AND BEYOND**

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**Abstract**

This study gives an overview of recent innovations in the financing of small and medium-sized enterprises (SMEs) in Asia. While SMEs are an important contributor to employment and gross domestic product in Asia, they often face significant credit constraints. Recently, in the context of Asia's rapidly digitalizing economy, both incumbents and new entrants are developing innovative means of providing SME finance. This includes the growth of fintech credit, big tech providers, and new initiatives in trade finance.

**Keywords:** small and medium-sized enterprises, fintech, trade finance

**JEL Classification:** G21, G23, G32, F65, F37, O16

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# 1. THE IMPORTANCE OF SME FINANCE IN ASIA<sup>1</sup>

Small and medium-sized enterprises (SMEs) play an important role in the Asian economy (Table 1). Although estimates vary, several sources suggest that SMEs account for over 95% of all firms, contribute to 50%–70% of employment, and constitute 30%–60% of various countries' gross domestic product (GDP).<sup>2</sup>

Despite their importance to the economy, SMEs in Asia often have a difficult time obtaining external finance. A joint study by the Organisation for Economic Co-operation and Development and the Asian Development Bank found that SMEs in Asia trail global peers in access to financial services, specifically with respect to credit (OECD-ADB 2014). In addition, they are roughly half as likely to apply for loans as global peers, and are also more likely to have relied on retained earnings over external financing for investment.

One reason for SMEs' reluctance to borrow may be due to stricter requirements from banks; in Asia, SMEs are roughly 50% more likely to be required to provide collateral for loans. By contrast, in Europe, loans to SMEs are mainly in the form of credit lines that are typically uncollateralized. Moreover, most countries in Europe have mutual guarantee institutions, which are non-profit organizations that allow small firms to improve their borrowing capacity (see Columba et al. 2010 for the Italian case). Banks may also be less willing to lend to SMEs in Asia as the risks and transaction costs are high relative to returns.

**Table 1: SMEs in Asia are Highly Significant Contributors to the Economy**

<b>Jurisdiction</b>	<b>SME Share of Employment (%)</b>	<b>SME Contribution to GDP (%)</b>	<b>Data Year</b>
People's Republic of China	64.7	60.0	2011, 2013
Hong Kong, China	47.0		2012
India	40.0	37.5	2015, 2013
Indonesia	97.0	60.3	2009, 2013
Japan	69.7	43.7	2012
Republic of Korea	87.7	47.6	2012
Malaysia	65.0	35.9	2014
Philippines	63.7	35.7	2013, 2009
Singapore	68.0	45.0	2012
Taipei, China	78.0	30.0	2011
Thailand	80.3	39.6	2014
Viet Nam	46.8	40.0	2012, 2011

GDP = gross domestic product, SME = small and medium-sized enterprise.

Source: Asian Development Bank (2019).

<sup>1</sup> This paper draws on examples from specific firms. These are for illustrative purposes only. They are not exhaustive and do not imply any statement with regard to any firm, product, or service.

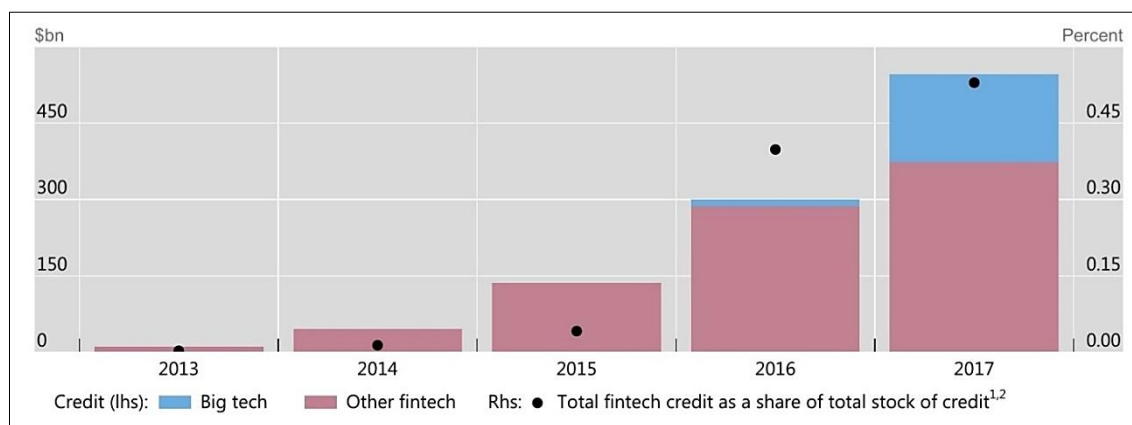
<sup>2</sup> According to the SME Finance Forum, SMEs comprise 98% of enterprises and employ 50% of the workforce in Asia and the Pacific (Ata 2014). The Asian Development Bank estimates that SMEs account for more than 96% of all Asian businesses and provide two-thirds of private sector jobs (ADB 2019). Notably, the definition of SMEs differs across countries. Most define them based on thresholds for employment, capital, and revenue.

## 2. FINTECH CREDIT AND SME FINANCING

Against the backdrop of SMEs struggling to obtain conventional sources of financing, emerging financial technological innovations in Asia have changed traditional models such that they may help to bridge the funding gap. In recent years, fintech<sup>3</sup> and big tech<sup>4</sup> firms have increasingly stepped in to provide funding to SMEs.

In particular, fintech credit has expanded rapidly. According to data from the Cambridge Centre for Alternative Finance (CCAF),<sup>5</sup> global debt-based alternative finance (fintech credit) volumes grew by 26% in 2017, from \$287 billion in 2016 to \$373 billion in 2017. If big tech credit is added to that, then the growth was even more rapid (Figure 1), and the provision of total fintech credit stood at \$543 billion globally in 2017. Most of these volumes (\$492 billion) are in the People's Republic of China (PRC) and elsewhere in Asia.

**Figure 1: Global Volume of New Fintech and Big Tech Credit Has Grown through 2017**



LHS = left-hand scale, RHS = right-hand scale.

<sup>1</sup> Total fintech, defined as the sum of fintech and big tech credit divided by the sum of total fintech credit and total credit to the private non-financial sector.

<sup>2</sup> Average calculated for a selected set of countries.

Note: Figures include estimates.

Sources: Cambridge Centre for Alternative Finance and research partners; big tech companies' financial statements; Frost et al. (2019).

<sup>3</sup> Fintech credit refers to credit through online (non-bank) platforms. This includes all credit activity facilitated by online platforms that are not operated by commercial banks (CGFS-FSB 2017; Claessens et al. 2018). Depending on the jurisdiction, these platforms can be referred to as peer-to-peer (P2P) lenders, loan-based crowdfunders, or marketplace lenders.

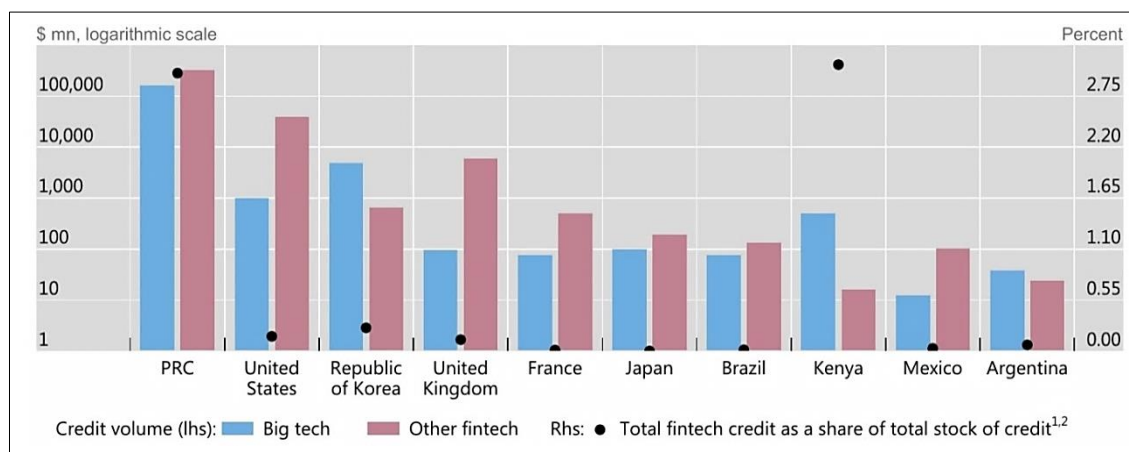
<sup>4</sup> A rapidly growing subset of fintech credit, which is generally not captured in standard data sources, is big tech credit, i.e., credit provided by large technology companies whose primary business is digital services, rather than financial services (Frost et al. 2019).

<sup>5</sup> As mentioned previously, data on big tech credit are scarce, and are not included in those from the Cambridge Centre for Alternative Finance (CCAF). As such, volumes have been estimated based on publicly available data. Aggregate data on returns and net losses are generally not publicly available. Microdata on losses are available to big tech firms themselves, and can be used for empirical analysis (Frost et al. 2019).

Although still a small proportion of the total, fintech credit is becoming an economically relevant source of finance to SMEs in certain countries around the world, including the PRC and other parts of the Asia and the broader Pacific region (FSB 2019b). While data on aggregate SME financing volumes are not available for the PRC, WDZJ.com estimates that fintech credit made up 13% of new lending to the private sector in the first 5 months of 2018. In Australia, fintech credit volumes stood at over \$1.0 billion in 2017, mostly in the form of business balance sheet lending, P2P funding, and invoice trading (CCAF 2018). In the Republic of Korea, India, and Japan, fintech credit stood at \$652 million, \$220 million, and \$190 million, respectively, most of which was to small businesses (CCAF 2018).

For both big tech and other fintech credit, the PRC remained by far the largest market in 2017, with a volume of \$163 billion and \$321 billion, respectively (90% of the global volume). In the Republic of Korea, big tech credit comprised \$4.9 billion (mostly from Kakao Bank and KBank), with other fintech credit being \$653 million. While total fintech credit was only 0.5% of outstanding credit at a global level in 2017, this was much higher in the PRC, at 3.0% (Figure 2).

**Figure 2: Total Fintech Credit Varied by Jurisdiction in 2017**



PRC = People's Republic of China.

<sup>1</sup> Total fintech credit (including big tech credit) divided by the sum of total credit to the private non-financial sector. The latter includes total fintech credit.

<sup>2</sup> Selected countries.

Notes: Figures include estimates. Bars are sorted by total fintech credit volume. Logarithmic scale.

Sources: Cambridge Centre for Alternative Finance; research partners; big tech companies' financial statements; Frost et al. (2019).

As of 2018, there was evidence that fintech credit platforms are becoming economically relevant in Indonesia, with Rp9.213 trillion (\$650 million) in loans disbursed to 1.43 million borrowers as of July 2018 (KPMG 2018). Big tech players like Grab and Go-Jek also have extensive lending in Indonesia and other countries in Southeast Asia, including to car buyers. Recently, these firms have begun offering consumer credit for purchases in stores (Tani 2019).

## 2.1 Innovative Uses of Data in Credit Analysis

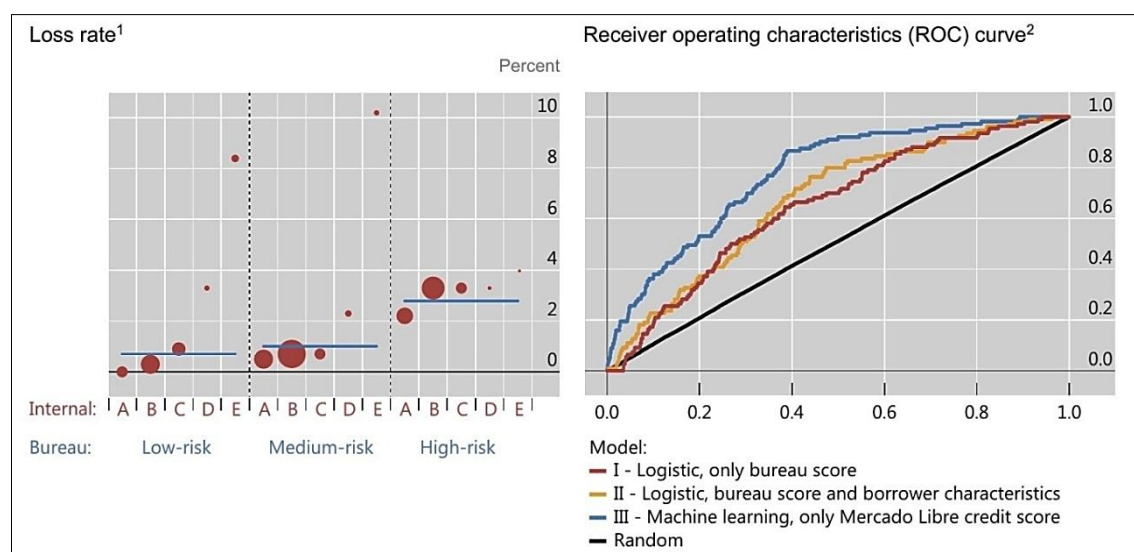
Fintech and big tech firms have a number of specific advantages compared to incumbent financial activities, including their access to data and networks (FSB 2019a; BIS 2019; Stulz 2019); in some cases, this can allow them to adapt to the unique challenges and



needs of SMEs. Compared to banks, fintech and big tech firms have been better able to use alternative sources of data and technology to supplement traditional credit information. This has helped SMEs previously disadvantaged by limited credit history and has the potential to address a key problem in many Asian countries that lack comprehensive credit bureau coverage.

The credit scoring approach of big tech firms may provide an advantage over incumbent banks, where it is common to rely heavily on traditional information sources like audited financial statements, collateral, and loan officer judgment to approve or reject a potential borrower. The use of machine learning could aid the direct and rapid assessment of credit risk. In particular, it can improve underwriting, draw on information from relationships between customers, and, in some cases, prevent human bias from entering the decision. The greater data resources could open the possibility that big tech lenders lend to borrowers who were previously shut out of the formal bank credit market.

**Figure 3: Credit Assessment for SMEs and Big Data Analytics**



SME= small and medium-sized enterprise.

<sup>1</sup> The loss rate is the volume of loans more than 30 days past due relative to the origination volume. In its use to date, the internal rating of Mercado Libre is better able to predict such losses. It segments the originations into five different risk groups versus the three clusters identified by the bank bureau. The size of the dots is proportional to the share of the firms in the rating distribution.

<sup>2</sup> True positive rates versus false positive rates for borrowers at different thresholds for a logistic model with (I) only the credit bureau score, (II) a logistic model with the bureau score and borrowers' characteristics, and (III) a machine learning model with the Mercado Libre credit score. A random model is included for comparison purposes. The ROC curve shows that the machine learning model has superior predictive power to both the credit bureau score only and the credit bureau score with borrower characteristics.

Source: Frost et al. (2019).

As an example from outside Asia, using data from Mercado Libre in Argentina, Frost et al. (2019) suggest that big tech firms' machine learning-based credit scoring applied to small vendors from a wide variety of platform data outperforms models based on credit bureau ratings and traditional borrower characteristics. As shown in Figure 3, Mercado Libre's internal ratings (A to E) can be compared with those of the credit bureau (low-risk to high-risk), which banks rely on, but augment with other borrower characteristics and soft information (Figure 3, left-hand panel). For a given bureau rating (e.g., low-risk), the expected loss rate is strictly in line with the internal rating, i.e., the patterns of the dots

show that the internal rating increases with expected loss. Conversely, for a given internal rating (e.g., C, D or E), the loss rate is not strictly in line with credit bureau risk. For example, the dot associated with internal rating D in the low-risk bureau category indicates a higher risk than the internal rating D in the medium-risk bureau category. Moreover, the internal rating has a broader range, covering losses from 0.0% to 10.2%; the bureau rating ranges from 0.7% to 2.8%.

Most importantly, by using the internal scoring model, Mercado Libre can provide credit to the profiles assessed as high-risk by the bureau. The size of the dots in the left-hand panel of Figure 3 is proportional to the share of the firms in the rating distribution; a substantial number of clients are in the credit bureau high-risk category. Because banks use a mix of credit bureau information, hard information from financial statements, and soft information from loan officers, this segment may have much less access to traditional banking services. With its more granular scoring model, Mercado Libre offers 30% of its credit to this category. Further, the internal rating system based on machine learning techniques and data obtained from the e-commerce platforms can outperform simple models based on bureau score and borrower characteristics in predicting defaults (Figure 3, right-hand panel).

Similar credit assessment models are used by fintech and big tech lenders in the Asia and the Pacific region, and there is evidence that these may enhance credit access; for instance, Hau et al. (2018) find evidence that PRC fintech credit mitigates supply friction and allows firms with a lower credit score to access credit.<sup>6</sup> Fintech credit may also serve firms that do not have access to collateral, such as new firms whose primary assets are intangible intellectual property. While fintech credit may thus enhance financial inclusion, it may also go to marginal borrowers, who may have lower creditworthiness.

While available evidence thus suggests that innovative uses of data can aid credit assessments and potentially enhance inclusion, there are questions as to whether this performance is superior to bank models that also use soft information, and whether it can be sustained over full business and financial cycles. In particular, many new credit assessment models rely on a relatively short time series of information, and have not yet been tested in a downturn (Claessens et al. 2018). Globally, policy makers recognize the paradox of limited access to finance due to insufficient data on SMEs in an age when it is significantly more available, and note that technology is increasingly reconciling this paradox (Carney 2019).

## 2.2 Trade Finance

Another area where technology can play a notable role in transforming business practices is in trade finance. The growing importance of Asia in world trade emphasizes small businesses' need for expanded access to finance. SMEs contribute over 40% of exports in major economies like the PRC and India (Table 2). Asia is now responsible for roughly one-third of global trade, trailing only Europe, while Asian firms account for roughly half of the world's supply chain exports, which involve trade in parts and components (WTO 2016).

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<sup>6</sup> Similarly, for consumer lending, Tang (2019) finds that fintech credit complements bank lending for small-scale loans in the US, and Jagtiani and Lemieux (2018) find that Lending Club has penetrated areas that are underserved by traditional banks. De Roure, Pelizzon, and Tasca (2016) find that fintech credit serves a slice of the consumer credit market neglected by banks in Germany.

**Table 2: Trade Finance to SMEs Has Particular Importance in Asia**

<b>Jurisdiction</b>	<b>SME Share of Exports (%)</b>	<b>Data Year</b>
People's Republic of China	41.5	2011
India	42.4	2013
Indonesia	15.7	2013
Republic of Korea	18.8	2012

SME = small and medium-sized enterprises.

Source: Asian Development Bank (2019).

Despite SMEs' existing participation in Asia's trade, their presence is restricted by access to finance. In an Asian Development Bank Survey, SMEs report limited funding as a common reason for refraining from trade in the global supply chain, with 60% saying that they did not proceed with a trade because of lack of finance. Importantly, ADB estimates that a 10% increase in trade finance is associated with a 1% increase in employment (ADB 2019).

In trade finance, technology-driven changes to business models can expand access to financial services with growth potential for Asia's SMEs by modernizing inefficient processes and reducing the role of costly intermediaries. Similarly, technological innovations have the potential to transform invoice financing by leveraging the digitalization of commerce to make accounts receivables more easily priced and traded.

The complexity and paperwork-intensive nature of trade finance transactions has made distributed ledger technologies (DLT) an attractive option in the Asia and the Pacific region. DLT could help digitize and automate the trade supply chain and make checks much quicker, more efficient, and less costly. DLT could also improve processes via smart contracts, which operate like traditional contracts, but can be executed automatically without the need for intermediaries or paper-based processes. Using DLT to create single digital records for customs clearance could in principle help lower fees and reduce barriers to trade.

According to estimates by the World Economic Forum and Bain & Company, DLT could increase new trade by \$1 trillion globally (WEF and Bain 2018). In particular, the study shows that such use of DLT would reap material benefits in the Asia and the Pacific region, which accounts for a large share of the global trade finance gap.<sup>7</sup>

There have been several public and private sector initiatives that attempt to promote DLT technology in a way that would benefit SMEs. The Hong Kong Monetary Authority, the Monetary Authority of Singapore, and the People's Bank of China have actively promoted the private sector using DLT to address trade finance issues (MAS 2017; King 2018). These proposals aim to reduce the risk of fraud and duplicate financing; improve operational efficiency by allowing for verification of information by users rather than by a single trusted party; and increase the speed of transactions and reduce the need for paper reconciliation (FSB 2019c). Moreover, incumbent banks have piloted DLT solutions to trade windows, for instance, for trade between New Zealand and the Republic of Korea (ASB 2018). In Thailand, 22 banks have teamed up to form the Blockchain Community Initiative, whose goal is to reduce the time it takes to issue letters of guarantee (Lorenzo 2019). This consortium was established under the auspices of the Bank of Thailand's regulatory sandbox. Eleven banks in India have also established a

<sup>7</sup> The World Economic Forum estimates that the global trade finance gap was around \$1.5 trillion in 2017, of which close to 40% of this gap is attributed to the Asia and the Pacific region (WEF and Bain 2018).

similar consortium that promotes blockchain for SME financing solutions (Manikandan 2019).

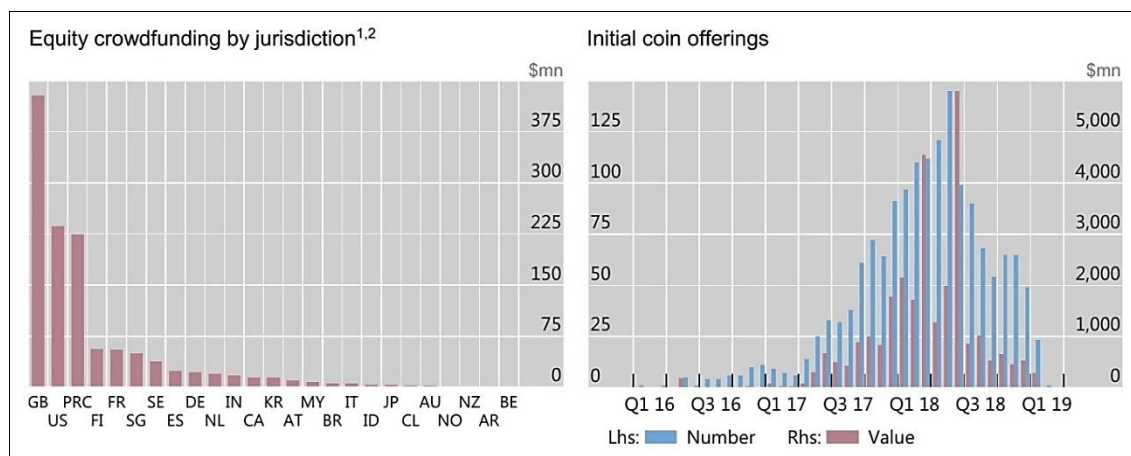
While using DLT in areas such as trade finance and letters of guarantee has the potential to significantly reduce processing times and overhead costs compared to conventional processes, the extent to which these advantages play out in practice has yet to be tested.

## 2.3 Other Forms of Fintech Financing

Equity crowdfunding and initial coin offerings (ICOs) are further potential sources of finance to businesses, including to SMEs. Equity crowdfunding allows investors to take an equity stake in firms. This form of finance is especially widespread in the UK and, to a lesser extent, the US and the PRC (Figure 4, left panel). ICOs, meanwhile, involve the sale of a crypto-asset (“coin”) or a digital representation of value. There have been significant governance problems in this sector, including widespread dissemination of fraudulent information to investors in so-called “whitepapers”. If these issues can be addressed, some authors posit the potential for ICOs to aid SME financing in the future (OECD 2019). ICOs raised \$3.9 billion in the first 2 months of 2018, but only \$285 million in the corresponding period in 2019 (Figure 4, right panel).

More generally, the use of mobile money from big tech has had a significant impact on financial services in emerging markets, including for micro SMEs. Mobile money transactions now account for 7% of GDP in Asia, compared to close to 20% of GDP in sub-Saharan Africa and less than 2% of GDP in other regions (IMF 2019). While most use cases are related to remittances, broader uses are increasingly common, including for the payments for goods and services. In some cases, these operators also provide savings, loan, and insurance products.

**Figure 4: Equity Crowdfunding and Initial Coin Offering Volumes**



AR = Argentina, AT = Austria, AU = Australia, BE = Belgium, BR = Brazil, CA = Canada, CL = Chile, DE = Germany, ES = Spain, FI = Finland, FR = France, GB = United Kingdom, ID = Indonesia, IN = India, IT = Italy, JP = Japan, KR = Republic of Korea, LHS = left-hand scale, MY = Malaysia, NL = Netherlands, NO = Norway, NZ = New Zealand, PRC = People's Republic of China, RHS = right-hand scale, SE = Sweden, SG = Singapore, US = United States.

<sup>1</sup> Top 25 countries.

<sup>2</sup> 2017 data.

Sources: Cambridge Centre for Alternative Finance; Coinschedule.

### 3. CONCLUSION

SMEs play an important role in the Asian economy but generally have a difficult time obtaining external finance due to a number of factors on both the supply and demand side, including the lack of financial statements or insufficient documentation, higher demand for collateral from Asian banks, and the limited presence of mutual guarantee institutions to mitigate asymmetric information problems. Fintech innovations in Asia have changed traditional funding models, which may help bridge the funding gap. As shown in this paper, fintech finance has rapidly expanded in several Asian countries through online lending platforms, lending by big tech firms, and more recently, new forms of trade finance, equity crowdfunding, and ICOs.

In addition to new sources of funding, technology can also help improve access to credit for small firms in Asia, with innovative use of machine learning technologies and data in credit analysis by fintech and big tech firms providing an advantage over traditional banks. Central banks and governments in several countries are more actively intervening, often with the private sector, to promote new technologies to increase funding opportunities for SMEs. These actions include grappling with the private and public benefits and the rights related to information.

While several legal and regulatory challenges remain and the resilience of these new funding models have not yet been tested in a downturn, new technologies have already started to transform SME financing.

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