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Financing Singapore's SMEs and the crowdfunding industry in Singapore

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Chapter 3 Financing Singapore's SMEs and the Crowdfunding Industry in Singapore (Prepared for the Book: The Singapore Economy: Designing Its Dynamism and Inclusion, Edited by Hoon Hian Teck)

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Abstract

As new digital technologies emerge that make the provision of financial services more efficient, they hold the potential to address barriers that SMEs face in accessing credit. This paper found empirical evidence that crowdfunding improved SMEs' timeliness to pay debt. Anecdotal evidence from SMEs suggests that getting crowdfunding loans also induced financing from banks. In just four years, Singapore's crowdfunding volumes have grown rapidly to make it the top crowdfunding hub in Southeast Asia. The rapid development of Singapore's crowdfunding industry can be attributed to its higher GDP per capita, higher level of financial sector development and greater availability of venture capital. Our results suggest that policies do matter to the development of the crowdfunding industry. The paper concludes with a discussion on the implications of crowdfunding on the future of banks and Singapore's approach to regulating crowdfunders.

Introduction

In many countries, SMEs represent an important share of firms and employment. SMEs play an important role in a healthy and dynamic economy. Recent research has shown SMEs faced greater financing barriers than large firms[2], and in turn, financial constraint affects the average firm size (Kumar, Rajan and Zingales (1999). In the Asia Pacific region, 39% of firms are fully and partially credit constraint[3], compared to the world average of 37% (Figure 1).

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[2] Beck, Demirgüç-Kunt & Maksimovic 2005; Beck & Demirgüç-Kunt 2006; and Beck, Demirgüç-Kunt, Laeven Maksimovic 2006

[3] Here are definitions of credit constrained firms according to the World Banks' Enterprise Survey:

Figure 1: Percentage of Credit Constraint Firms

Source: Enterprise Surveys Database
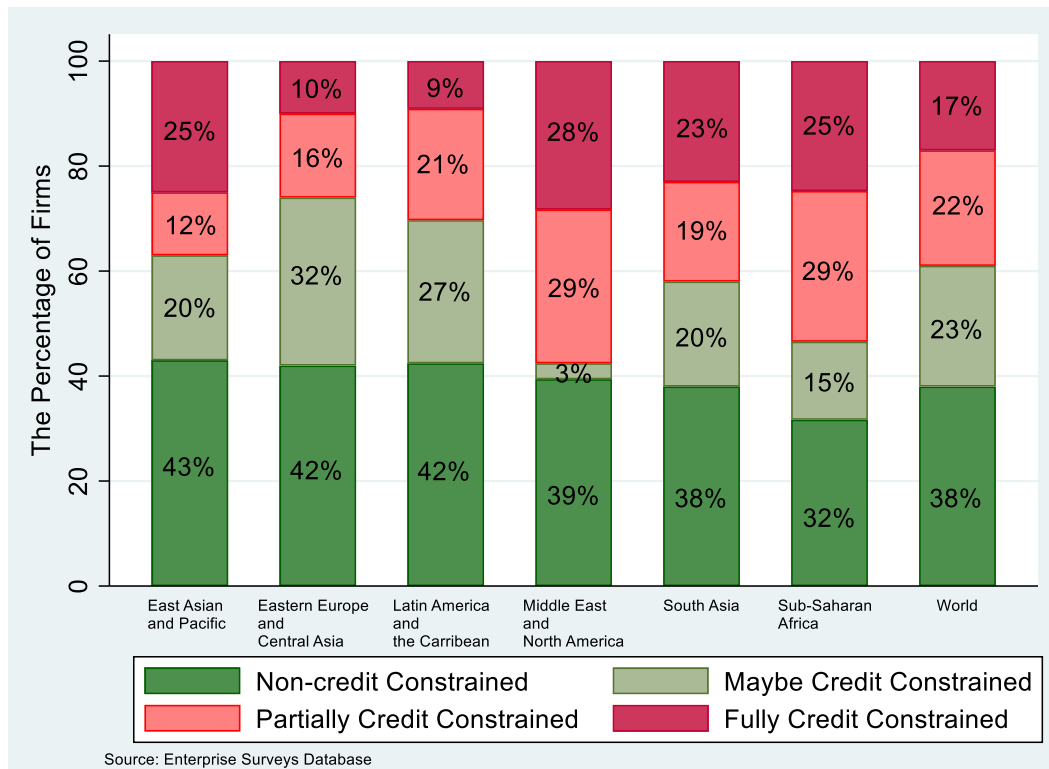
Many factors account for the credit constraint including information asymmetries, collateral shortage and lack of credit information. Lending to SMEs fell further during and after the global financial crisis as banks become more cautious in lending. The share of lending to SMEs declined both in advanced economies and in emerging markets (Figure 2). Lending to SMEs in Emerging Markets fell from a peak of 30% in 2007 to 21% in 2009. It has resumed in recent years, but the volume has remained below pre-crisis-levels in some jurisdictions (e.g. Singapore, HK, Korea, Italy). According to the Financial Stability Board[4], empirical evidence suggests that the more stringent risk-based capital requirement under Basel III has slowed the pace of lending to SMEs relative to other sectors. However, this effect was found to be temporary and differs across jurisdictions.

(i) Fully credit constrained (FCC) firms have no external loans because loan applications were rejected or the firm did not even bother to apply even though they needed additional capital.
(ii) Partially Credit Constraint firms (PCC) used external sources of finance for working capital and/or investments and/or have a loan outstanding but did not apply for a new loan
(iii) Marginally Credit Constrained firms (MCC) are those that used external sources of finance for working capital and/or investments during the previous fiscal year and/or have a loan outstanding at the time of the survey; and
(iv) Non-credit constrained firms (NCC) firms are those that did not apply for financing because they have enough capital.

[4] Financial Stability Board, "Evaluation of the effects of financial regulatory reforms on small and medium-sized enterprise (SME) financing", June 2019

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Figure 2: SME Loans (% of Total Bank Loans) in

Emerging and Advanced Economies

Source: Financial Stability Board
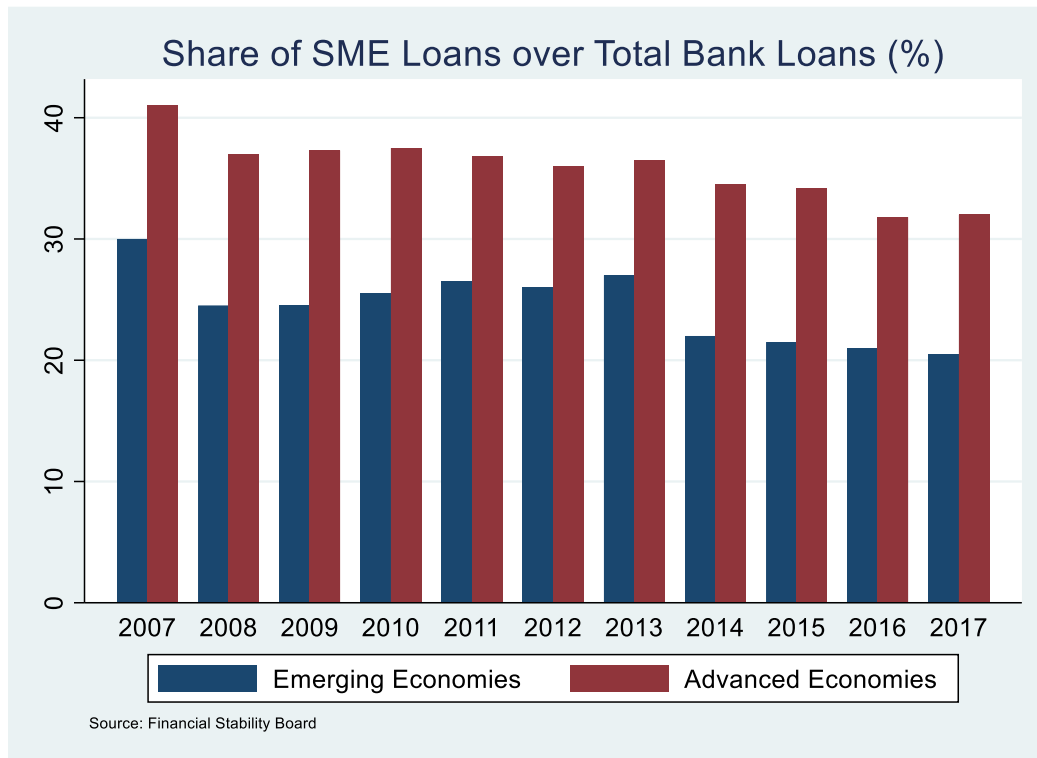
In Singapore, SMEs make up 99% of the companies in Singapore, employing about 65% of its workforce and contributing to nearly half of the country's nominal GDP in 2018. Yet, the share of total bank credit to SMEs is disproportionately low at 13.3% in 2017, while that to large corporates is about three times higher at 47.0%, with the remaining 39.6% to consumer loans[5] (Figure 3).

Figure 3: Share of Loans by Type - Singapore

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[5] In 2017, the outstanding SME loans was S$87.54 billion while total banking credit to both businesses and consumers was S$651.93 billion; making SME share to total banking credit at 13.4%. Source: Monetary Authority of Singapore MAS website.

Source: MAS Notice 610 Data and MAS SME Survey
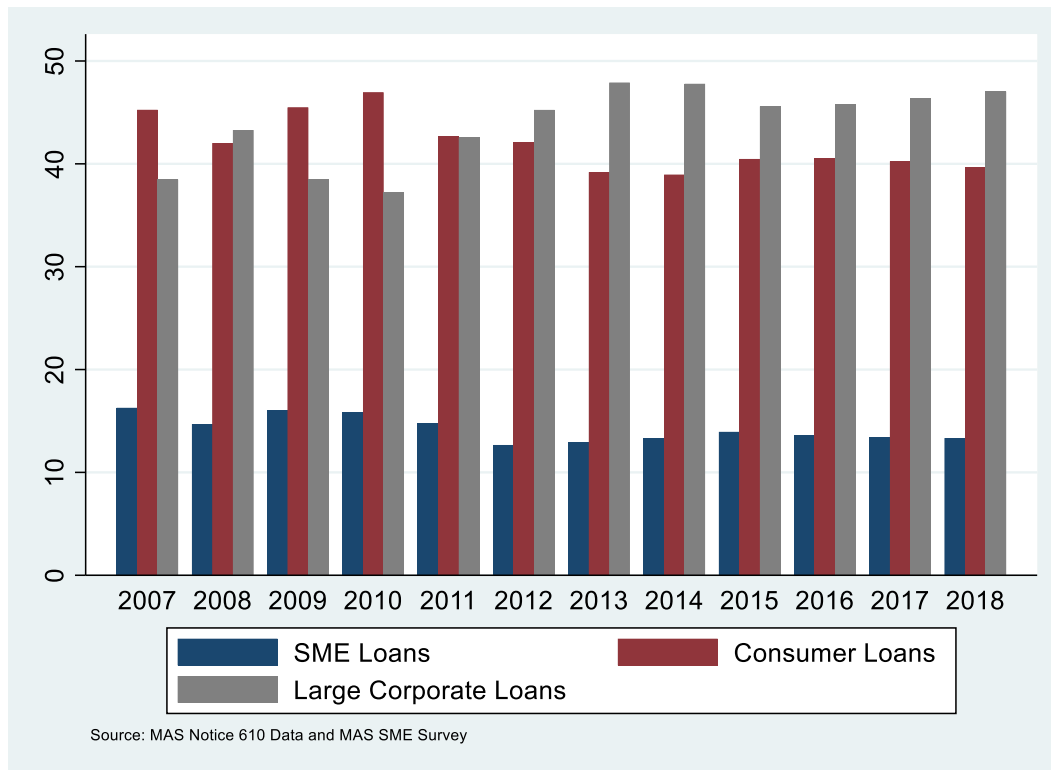
In Singapore, where access to finance is not a problem, the small and micro enterprises who lacks collateral and credit information would still find it difficult to get a bank loan. A *SME Development Survey in 2017* by DP Info found 35% of SMEs indicated financing concerns (surpassing the 22% figure in 2016 and 14% in 2015 respectively. According to MAS' internal survey[6], micro and small enterprises accounts for 57% of banks' outstanding SME loan portfolio. SMEs who have lower credit ratings faced greater difficulties getting a loan and higher spreads because of their higher risks and their loan is mostly unsecured.

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Figure 4: Singapore SMEs with Finance-Related Issues

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6   MAS Financial Stability Review, November 2018, Box F.
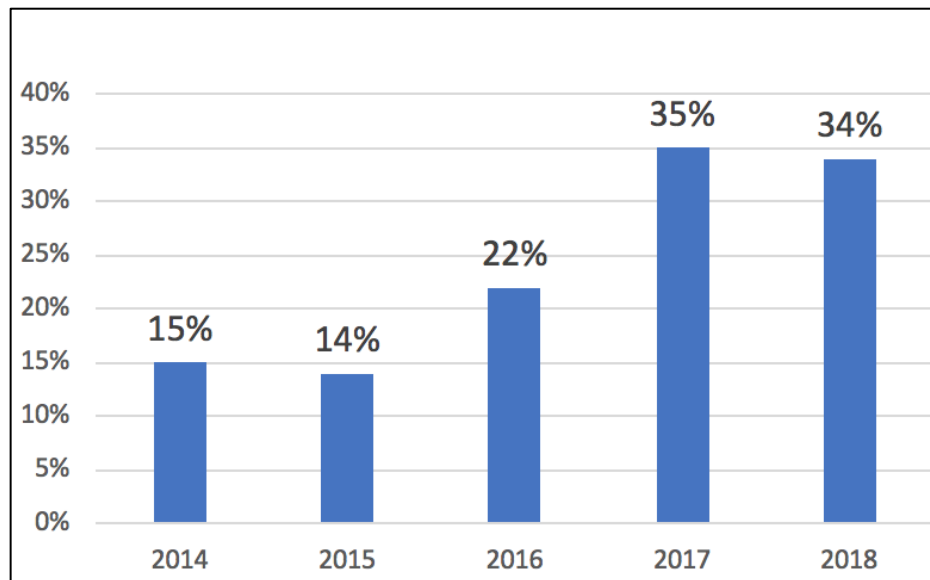
Source: Experian

Section 3.1 explains how crowdfunding works and describes crowdfunding development in Singapore using our survey and interviews of crowdfunders. Section 3.2 examines the key drivers of crowdfunding for nine major fintech players in the world, with a focus on Singapore's fintech sector using panel data modelling. Section 3.3 examines whether crowdfunding financing has improved cashflow for SMEs using time series regression. Sections 3.4 describes the risks of crowdfunding; Sections 3.5 and 3.6 analyse the implications of fintech on the future of banks and Singapore's regulatory approach to crowdfunders.

3.1 Crowdfunding Development in Singapore

Technology has transformed financial services in every area from payment, savings, borrowing and managing risks (Figure 5). One of the transformations comes from the use of the mobile phone for payments, lending and borrowing. This has allowed "unbanked" consumers in low income countries to access financial services for the first time, raising financial inclusion. In this paper, we focus only on one aspect of the fintech transformation, on P2P lending or crowdfunding[7] and as

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[7]   Different terminologies have been used to refer to crowdfunding and to avoid confusion, it is important to note that crowdfunding, P2P lending and marketplace lending are commonly used terms. They refer to all types of crowdfunding (including equity-based) and includes both consumer and business lending. The Bank of International Settlement (BIS) uses the term Fintech Credit to refer to all types of crowdfunding. The Cambridge Centre for Alternative Finance classifies crowdfunding models into 11 categories: P2P consumer lending, P2P

mentioned earlier, show how it can improve access to finance for the underbanked SMEs.

Figure 5: Technology Transformations to Financial Services
(to replot)
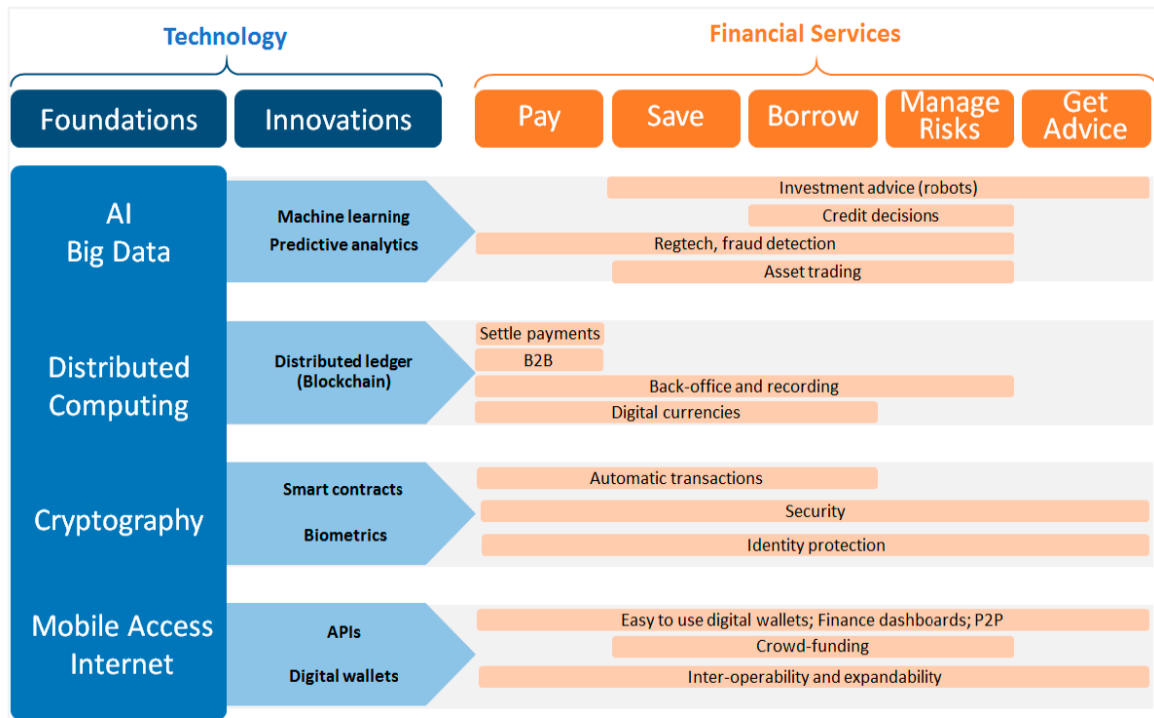
Source: IMF staff.

Crowdfunding is about raising small amounts of money (funding) from a large number of people (crowd, not necessarily family or friends), typically via the Internet or social media. The matching of lenders to borrowers is conducted directly on the crowdfunders' platforms. What makes crowdfunding attractive for the SMEs compared to bank loans is that the loans are usually not collateralised, of a smaller quantum and of a shorter loan duration, with faster approval time. Globally, the total crowdfunding market is mainly dominated by consumer lending (US and UK) but in Asia and Singapore, corporate lending tends to dominate. However recently, some crowdfunders (e.g. Minterest) have been issued a licence to lend to consumers (see Section 3.5). In Box 1, we describe the various types of crowdfunders in Singapore. In Appendix 1, we provide two case studies of Singapore-based crowdfunders.

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business lending, equity-based crowdfunding, reward-based crowdfunding, invoice trading, real estate crowdfunding, debt-based securities, mini-bonds, balance sheet business lending and profit sharing crowdfunding.

Studies have shown that crowdfunders can enhance the efficiency of intermediation through the use of digital technologies and granular customer data. Crowdfunders can provide faster and better credit risk assessments, shorten the time to approve a loan (e.g. through auto matching), as well as lower transaction costs, by using big data analytics and fraud detection. For example, Fuster et al. (2018) found that crowdfunders in the U.S. are able to process mortgages about 20 percent faster than traditional lenders, without the expense of higher defaults. Berg et al. (2019) found that credit assessment using digital footprint of customers' registration behaviour on websites predicted default rates better than that based on credit bureau data alone. Jagitani and Lemieux (2018) found that the U.S. crowdfunding platform Lending Club used non-traditional data for grading loan ratings, and the grades predicted the performance of the loans over the two years after origination. These studies suggest that crowdfunders are better able to price their loans according to the risk of their customers and less risky customers would be charged lower interest rates.

Our survey of crowdfunders in Singapore yielded a similar story. The average processing time for a loan ranges between two hours to five days, compared to banks of between 45 to 60 days. Many of them (e.g. Validus) were able to charge lower interest rates to consumers with higher credit ratings as suggested by their in-house credit assessment algorithm. Based on our data collected, there is a wide variation in their non-performing loans NPLs. See Appendix 3 for a list of crowdfunders in Singapore.

Box 1: Crowdfunding Models
Crowdfunding[8] the matching of lenders to borrowers via an online platform. The first crowdfunding started in1997 to raise funds for a British rock bank, Marillion to fund the band's reunion tour. Since then, crowdfunding has grown rapidly and different forms of crowdfunding have emerged. We briefly describe five different types of crowdfunding models below.
Donation-based Crowdfunding
Used for fundraising for charitable causes and do not provide any yield or returns.

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[8] The term "crowdfunding" was coined by Michael Sullivan, an entrepreneur who was trying to fund a video-blog project in 2006.

Examples: U.S: Kiva (2005) and GoFundMe (2010)
                Singapore: Giving Asia, Giving.sg and Simply Giving
Who bears the risk: Investors

Rewards-based Crowdfunding

Platform matchers investors with companies/people who are launching projects/new product (such as a 3D printer) in return for certain perks on pledged amounts.
Examples: U.S: Kickstarter (2009) and Indiegogo (2008)
                Singapore: Moolah Sense and Minterest
Who bears the risk: Investors

Lending-based Crowdfunding[9]

Platform matches investors with corporates in return for an interest on the loan *(pure lending-based)* or where the investor purchases a debenture or bond, to be paid specified interest rate during the term of the loan *(debt-based)* or where the investor purchases equity issued by the company, to be paid a dividend on the shares out of the company's profit *(equity-based).* Many of the platforms offer invoice-financing where it is structured as a security with the invoices as collateral.
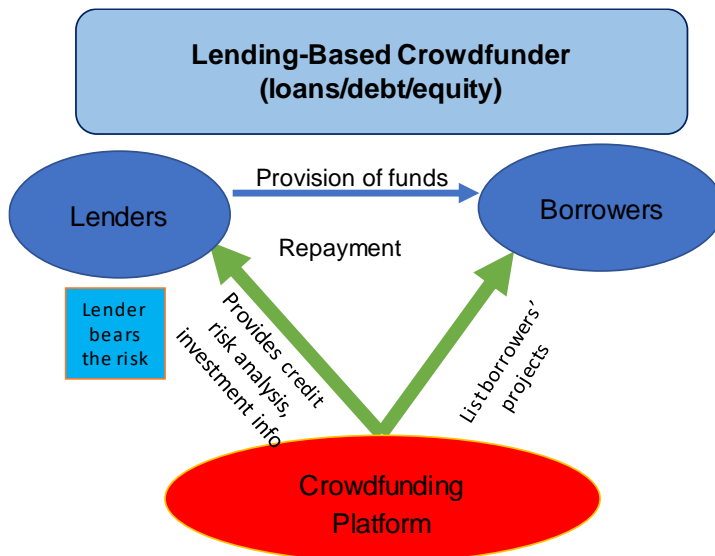
Who bears the risk: Under this model, the crowdfunder matches the lender and the borrower, but it does not bear the risks of the borrower as it is not involved in the loan contract between the borrower and the lender. Funds and the loan repayments are segregated from the platform's own account, and the crowdfunder earns its revenue from fees levied on the transacting parties e.g. for loan origination and servicing ongoing loan repayments.

Examples
    In US: Lending Club, Beehive
    In Singapore:
        Lending-based crowdfunding: Funding Society and Validus
        Debt-based crowdfunding: Fundnel and Funded Here

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[9] In Singapore, the predominant form of lending is to corporates rather than individuals. Lending to corporates are deemed to be an offer of debentures and falls under the Securities Futures Act and these crowdfunders are required to hold a capital market services license.

> *Equity-based crowdfunding: CapBridge which recently tied-up with the Singapore Stock Exchange (SGX) to launch Singapore's first private equity stock exchange*
> *InvestaCrowd (real estate crowdfunder)*

Excluding the outliers, the crowdfunders' NPL is lower than banks' (1.3%[10] vs 4.6%[11] in 2018). Notwithstanding these encouraging data, the fintech industry has not yet experienced a full credit cycle where default risks rise during downturn.

The Singapore market is small but growing rapidly. The Singapore market, which started a decade later than US and UK, is small compared to the global market when measured by total funds raised, number of platforms, or share of outstanding bank loans. **Nevertheless, it has grown rapidly to become the eighth largest in terms of volume of crowdfunding raised (at US$191 million, Figure 3); and eighth in terms of crowdfunding per capita (US$29 per capita) in 2016**. China has by far the largest crowdfunding market in the world, at US$358 billion. Globally there are more than 2,000 crowdfunding platforms (China has approximately 1,021 licensed operators as of 2018; followed at a distance by the U.S. which has 191 as of 2018; and the U.K. 63 as of 2018[12]).

In Singapore, there were 19 crowdfunding platforms as of 2018. Our survey of crowdfunders shows that 100% of them expect their business and the industry to grow rapidly in the next 24 months[13]. Loans amounting to US$191 million was raised via crowdfunding, amounting to 0.29% of banks' lending to SMEs. In other countries, crowdfunding shares to bank credit are also small. For example, in the U.K., crowdfunding was estimated to be 1.4% of the outstanding stock of bank lending to consumers and small businesses at end-2016[14]. In China, the figure was 3% at end-2015 (Creehand & Borst, 2017). Despite its small size, crowdfunding has

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[10] Data is based on the average NPLs of four crowdfunders in 2018 (Funding Socieities, Validus, Capital Match and Minterest). Crowdfunders such as Moolahsense and Fundtier have higher NPLs.

[11] Data is retrieved from MAS Financial Stability Review (2018)

[12] Data for China is from P2P Market Data, for U.S. from Fundly and for U.K. from Financial Conduct Authority Consultation Paper 18/20.

[13] We surveyed nine crowdfunders and received five fully completed responses.

[14] Committee on the Global Financial System and the Financial Stability Board (2017).

drawn the attention of bankers and regulators because of its capacity to enhance and disrupt financial services. (BCBS, 2017).

Figure 6 - Crowdfunding Volume (US$ million)

Fintech Credit Volumes in 2017 (USD Millions)

CHN	358,000
USA	42,810
GBR	7,967
AUS	1,149
KOR	1,130
JPN	349
IND	269
SGP	191
IDN	80
MYS	15

Source: The Cambridge Centre for Alternative Finance

Fintech Credit Volumes per Capita in 2017 (USD)

CHN	258
USA	131
GBR	121
AUS	47
SGP	34
KOR	22
JPN	3
MYS	.48
IDN	.30
IND	.20

Source: The Cambridge Centre for Alternative Finance
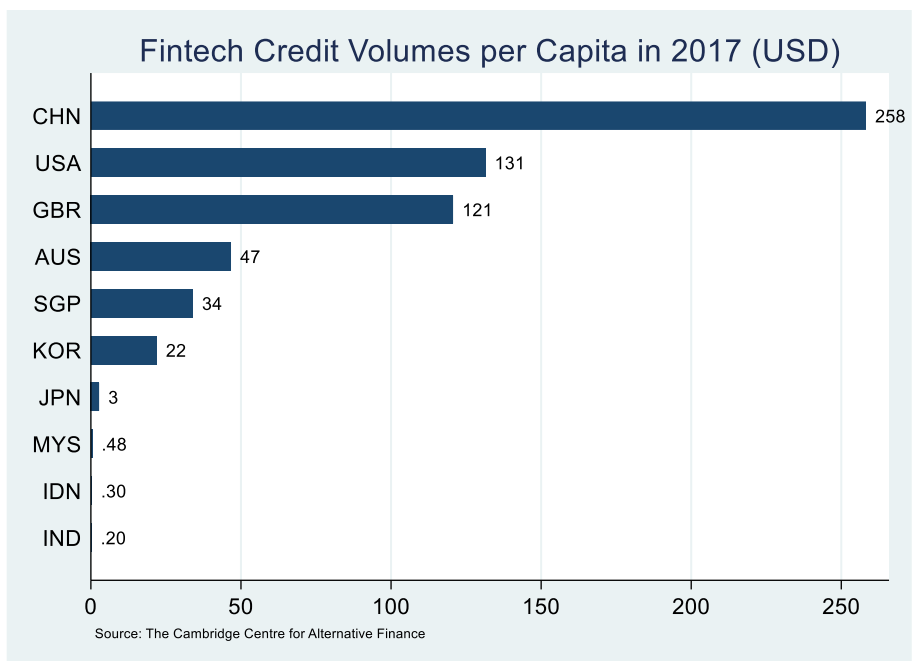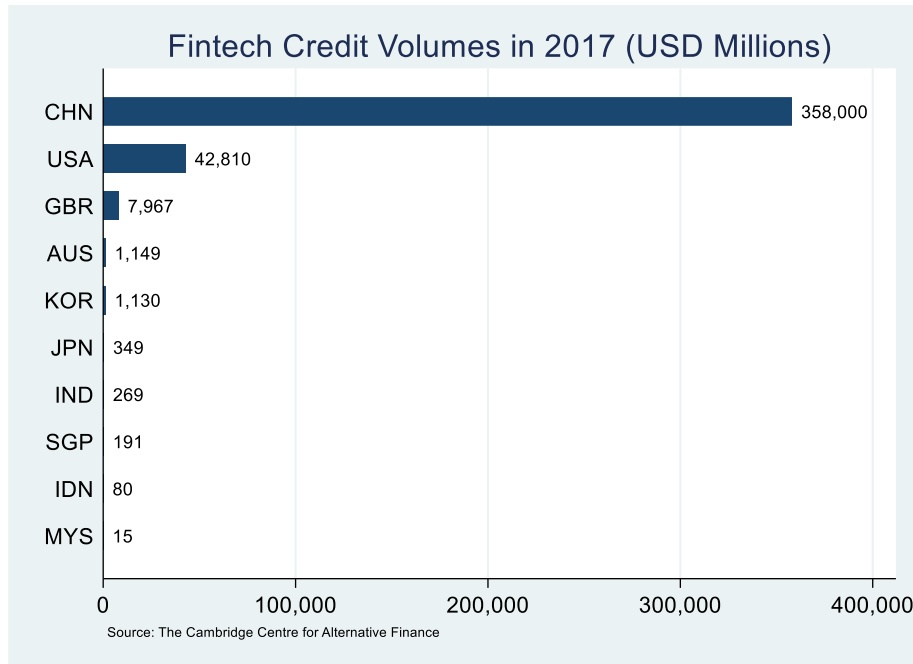
3.2 Key Drivers of Crowdfunding

What accounts for the variation in crowdfunding volumes around the world? Demirguc-Kunt and Levine (2018) found the level of economic and financial

development, economic growth, as well as the quality of legal and other institutions to be significant drivers of overall credit. Extending this to crowdfunding in per capita terms, Claessens et al. (2018) found a positive, non-linear relationship with GDP per capita and a negative relationship with the degree of competition of the banking system and banking regulation stringency. Rau (2017) found that barriers to entry and prevailing financial depth (i.e credit to GDP) both help promote the volume of crowdfunding, as do the rule of law, control of corruption, and quality of regulation in general.

In this paper, we modified Claessens et al. (2018)'s approach[15], using a strongly balanced panel data of nine countries – Australia, India, Indonesia, Japan, Korea, Malaysia, UK, US and Singapore *over* the period 2013 to 2016. Ideally, China should be included given its importance. However, we had to drop it from the sample because that China is the biggest market in both volume and per capita terms and it driven by a unique set of factors. As such its inclusion might affect the fit of the regression.

We estimated various models with different variables that could explain crowdfunding volume in different jurisdictions (such as the level of economic development in the country, its financial sector development, availability of venture capital, the ease of doing business, its country risk, and strength of legal rights). For purpose of discussion, consider this regression:

$$ln\_CF_{it} = \alpha + \beta_1 \, ln\_GDP_{it} + \beta_2 \, ln\_GDP_{it}^2 + \beta_3 \, ln\_VA_{it} + \beta_4 \, ln\_DB_{it} + \beta_5 \, ln\_ICRG_{it}$$
$$+ \beta_6 \, ln\_FA_{it} + \beta_7 \, ln\_FD_{it} + d_1 C_{1i} + d_2 C_{2i} + d_{n-1} C_{n-1,i} + \varepsilon_{it}$$

where the dependant variable **CF_{it}** is crowdfunding per capita for country *i*, at time *t*, in US$. The explanatory variables are: **GDP_{it},** -- GDP per capita as a proxy for economic development; **GDP_{it}^2** to capture possible nonlinearity in the relationship; **VA** -- venture capital availability to measure the ease of raising venture capital (its

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[15]   Claessens et al. (2018) conducted multivariate cross-country regression analysis for a sample of 63 economies for 2016 $c_i = a_i + b_1 y_i + b_2 y_i^2 + b_3 LI_i + b_4 RS_i$ *(i=1,... 63)* where y_i is the log of GDP per capita in economy *i*, as a measure of economic development, and the variable y_i^2 captures possible nonlinearity in the relationship; LI_i is the Lerner index of banking sector markups (an indicator of market power) in economy *i*; and RS is the regulatory stringency index (as constructed by Navaretti et all (2017)).

values lie between 1 to 7, from extremely difficult to extremely easy); **FA and FD financial institution access and depth** that capture the level of financial sector development across the two dimensions; **DB** -- World Bank's Ease of Doing Business Score (not the ranking) to capture how conducive it is to do business (the higher the number the better[16]); and **$ICRG_{it}$** – International Country Risk Guide with three subcategories and their respective weights, political (50%), financial (25%), and economic (25%) (the scores range from 0 to 100 such that higher values signifying less risk). We investigate if countries with better institutions (e.g. regulations that enhance business activities, as opposed to those that constrain them) grow faster and as a result enable SMEs to grow and drive demand for crowdfunding. Lastly, the country dummies C_i capture country-specific characteristics that are fixed or invariant over time (these could be geographical location, market size, entrepreneurship level, society's acceptance to risk-taking, or characteristics that do not vary over a long period of time). Singapore's country dummy was dropped to avoid multicollinearity and used as a country base-reference for comparison with other countries[17]. See Appendix 2 for a Glossary of the variables used.

By construction, higher values of DB index signify better ease in the doing business, and higher values of ICRG signify less risk and as expected, the coefficients for *DB* and *ICRG* have positive signs but they are not statistically significant in explaining crowdfunding volume (see Appendix 4). Hence, we dropped these two variables from the regression, Table 1 shows the final regression results.

Table 1: Regression results for Crowdfunding per capita using Fixed Effect Model

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[16] We use the Ease of Doing Business *score* (the higher the better), instead of the *Ranking indicator* (the lower the better).

[17] Data for crowdfunding volume are from Cambridge Centre for Alternative Finance CCAF. Data for population, GDP, regulatory quality, and venture capital availability are from the World Bank. Data for financial access and financial depth are from the IMF.

VARIABLES	(1) Main Model
GDP per Capita	31.03***
	(11.91)
Square of GDP per Capita	-1.722***
	(0.546)
Availability of Venture Capital	9.975***
	(1.194)
Financial Institutions Access	-6.236*
	(3.266)
Financial Institutions Depth	18.65***
	(5.022)
AUS	6.982**
	(2.793)
IND	12.55
	(7.756)
IDN	26.48***
	(7.853)
JPN	5.500
	(3.351)
KOR	4.934
	(3.425)
MYS	-10.19**
	(4.799)
GBR	3.834
	(3.087)
USA	8.411***
	(2.715)
Constant	-149.8**
	(72.59)
Observations	45
R-squared	0.933
Number of Countries	9
Robust	Yes
RMSE	0.978
Dependent Variable	Crowdfunding per Capita

We found positive and significant relationships between *crowdfunding per capita,* and *GDP per capita*, *venture capital availability and financial development depth.* The negative estimated coefficient on *squared GDP per capita* suggests that such effects become less important at higher levels of development. The negative estimated coefficient on *financial development access* suggests that the lower the level of financial access, the easier for crowdfunding activities to thrive because they can fill the funding gap from households and firms.

The results are intuitive for Singapore – its higher level of GDP per capita, more developed financial market, greater availability of venture capital[18], are key factors behind the growth of crowdfunding financing in Singapore. For Singapore, which already has a high level of financial development and access, further lowering the cost of financial services (through fintech) might not increase the demand for financial services and this is where the government can play a role to encourage technology adoption and fintech development. Indeed, the Singapore government's push towards digitalisation and growing the fintech market have played a significant role though this was difficult to capture in the regression. The dummy variables for Indonesia and US are significant and positive (at the 1% level) and similarly for Japan (at the 10% level), suggesting that there are country-specific factors that contributed to the higher crowdfunding per capita relative to Singapore, after controlling for the other explanatory variables. The country specific factors for Indonesia could be attributed to its relatively younger population, with high mobile phone penetration, high demand and adoption of fintech services. For the US, Silicon Valley is the global technology hub with a huge global talent pool and ready availability of venture capital which drives growth of fintech activities[19]. Our small sample size did not allow us to include these variables in the specification.

Figure 7 shows a decomposition of the goodness-of-fit (R^2) for Regression (2). GDP per capita variables accounted for 23% of total R^2, venture capital availability contributed 6%, financial institutions access and financial institution depth contributed 20%, while the remaining 39% is due to country dummies. **Governments can make a difference to the ensuring depth in financial institutions, and ease in venture capital availability.**

Figure 7: Decomposition of Goodness of Fit[20]

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[18]   According to a recent Accenture study using data from CB Insights, it found that Singapore is the third largest fintech market by funds raised, just behind China and India.

[19]   Global Fintech Hub Report (2018).

[20]   Owen decomposition of R^2, See, Frank Huettner and Marco Sunda, "Axiomatic Arguments for decomposing goodness of fit to Shapley and Owen values", Electronic Journal of Statistics, Vol 6 (2012).
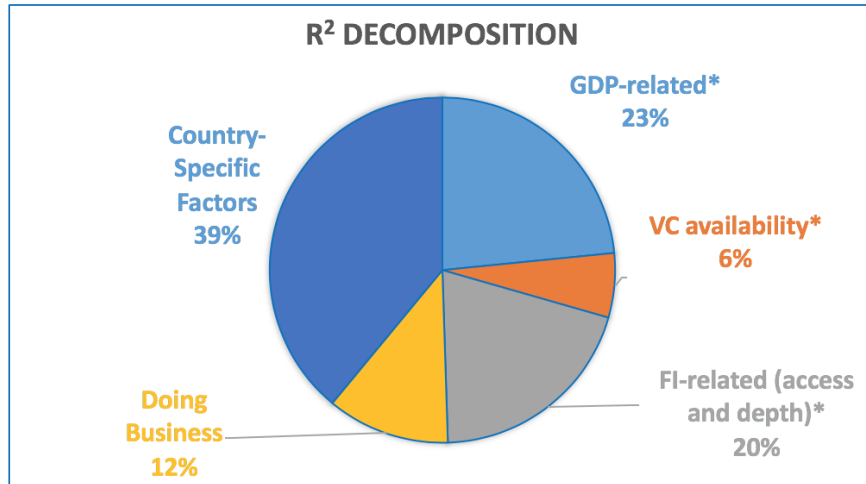
3.3 Impact of Crowdfunding on SMEs' Cashflow

As discussed earlier, SMEs, particularly smaller ones faced financing constraints as they lacked collateral and solid financials. In the last five years, the rapid rise in new digital technologies in the financial services sector (financial technology, or fintech for short) has helped SMEs overcome some barriers to financial access (OECD, 2018).

While banks in Singapore have been supportive of lending to SMEs, their share of loans to SMEs have remained steady at 13%. In addition, there are various government financing schemes to help SMEs such as such as the Micro Loan Program (MLP) and the SME Working Capital Loan but the take-up rate has been low.   With the advent of crowdfunding, SMEs have now an alternative source of finance to tap into.

From our survey and interviews with crowdfunders, their business models are well-suited to solving SMEs' liquidity problems by providing low quantum, short-term loans at competitive rates efficiently.   Even as SME loans growth moderated from 12% in 2014 to 4% in 2017, crowdfunding increased by 300% in one year (Figure 4). The surge in crowdfunding is due to the entry of more crowdfunding firms into the industry since 2016. This partly reflected MAS's move to ease the entry requirements for securities-based crowdfunding (SCF) in 2016, followed by efforts

to improve the conduct of crowdfunding business and disclosure in August 2018 (see Section 3.5 below). There is an inverse relationship between crowdfunding and the days turned cash variable – a measure of the timeliness of debt payment by SMEs.

Figure 8 – SME Bank Loans, Days Turned Cash and Crowdfunding (yoy)

Source: DP Information Group, MAS SME Survey and CCAF
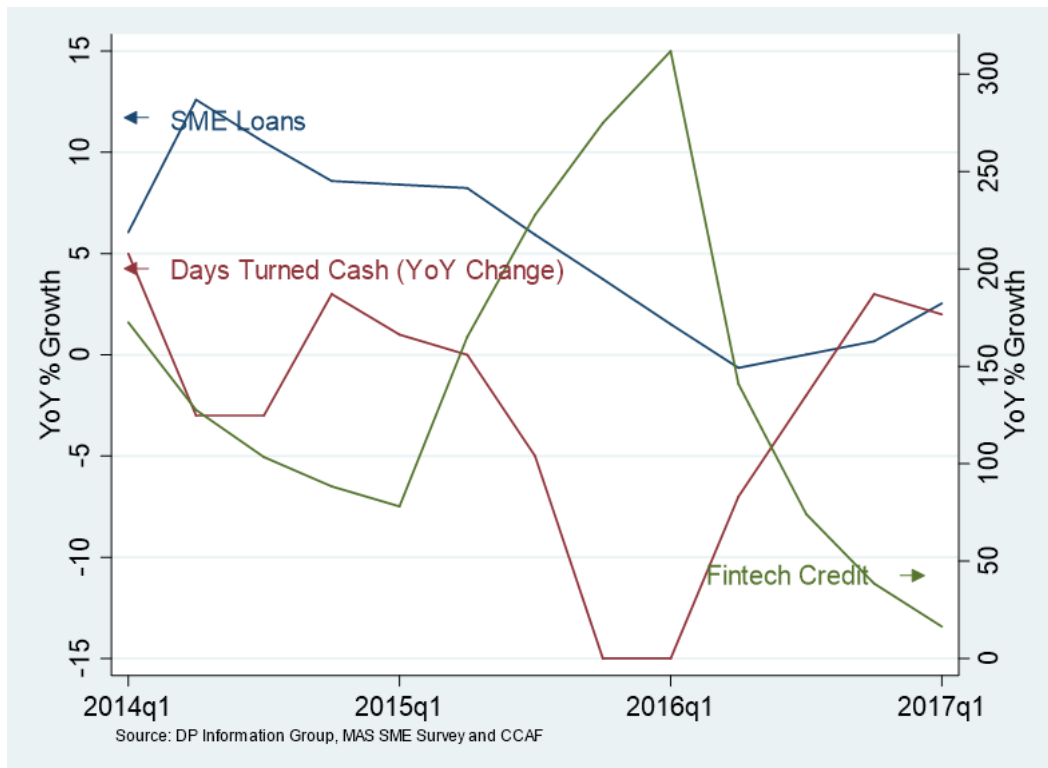
We analyse whether crowdfunding has affected SME cashflow. We expect an increase in the volume of crowdfunding to lead to quicker settlement of debt, hence easing SME cashflow. We use *Days Turned Cash (DTC)*[21] *, as* a measure of how quickly the SMEs pay off their debts -- the percentage of debts paid on or before due date. We used the average across all industries. A lower number means that SME settle their debts more quickly (or their debts turned cash) on average across all industries.

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[21] The DTC data (from Experian, previously DP information Group) is collected based on payment records of more than 120,000 companies in Singapore, across eight major sectors in the economy (retail, wholesale, construction, hospitality / food and beverage, information and communications, manufacturing, services, and transport / storage), in each quarter. It is also computed as national average.

DTC is sometimes referred to as Days Payable Outstanding. It is tricky to interpret the DTC number. A high DTC (compared to industry average) does not necessary mean that the company is a bad credit, because it could be using the excess cash for other purpose such as investing. On the other hand, a low DTC may indicate that the company is not fully utilising its cash position and may indicate a company operating inefficiently. There is no clear threshold of what is a good or bad. It varies significantly by industry, competitive positioning and bargaining power

The model is:

$$\Delta DTC_t = \alpha + \beta_1 * AFE_t \text{ (yoy)} + \beta_2 * CF_t \text{ (yoy)} + \beta_3 GDP \text{ (yoy)} + u_t$$

where the dependent variable *ΔDTC* is the year-one-year change in *days turned cash*. The explanatory variables are AFE *access to financing expectations*, as year-on-year growth rates; CF or crowdfunding as year-on-year growth rates, interpolated from annual data and GDP growth. The data is from 2013 to 2017[22].

Table 2 below summarises our regression results. The coefficient on CF is negative and significant i.e. crowdfunding improves the timeliness of debt payment by SMEs (reduction in DTC). Likewise, improved expectations of access to financing improves the timeliness of debt payment (reduction in DTC). GDP growth, which is the control variable that captures the overall macroeconomic environment for SMEs, is weakly positive (at the 10% level). This is because stronger economic growth could induce SMEs to more efficiently use their excess cash for investments (in expectation of higher returns) and stretch out their payment to suppliers. Thus, a higher DTC in this case is not an indication of cashflow problems.

Table 2: Regression Results for *Days Turned Cash* Model using OLS

VARIABLES	(1) OLS	(2) OLS
AFE Y-o-Y Growth	-0.324**	-0.320*

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[22]   Crowdfunding volume data is from Cambridge Centre for Alternative Finance, and financing expectations data is from CEIC.

	(0.140)	(0.154)
CF Y-o-Y Growth	-0.0674***	-0.0660***
	(0.00522)	(0.00525)
GDP Y-o-Y Growth		1.179*
		(0.603)
Constant	2.902**	-0.551
	(1.073)	(2.194)
Observations	15	15
R-squared	0.812	0.863
Robust	Yes	Yes
RMSE	3.206	2.855
Dependent Variable	Y-o-Y Change in Days Turned Cash	

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

The above suggests that crowdfunding has a positive effect on SMEs' timeliness to pay their debt. This is consistent with the finding from our survey of crowdfunders that SMEs (such as small restaurant owners) have benefited from crowdfunding as they not only improved their cashflow but also induced financing from banks**. This shows that crowdfunding plays a catalytic role to spur bank lending to SMEs.** While we do not have the figures for Singapore, survey data from the UK[23] showed that 79% of borrowers had attempted to get a bank loan before turning to crowdfunding. 33% of them thought it was unlikely or very unlikely that they would have been able to secure funding elsewhere had they not been successful in getting a crowdfunding loan.

3.4 Does crowdfunding pose any financial stability risks in Singapore?

Given the still small size of crowdfunding volumes relative to bank credit, it does not yet pose any systemic risks in Singapore. Nevertheless, the modalities and risks of the crowdfunding market can change rapidly and regulators should be vigilant of any changes in size and interconnectedness. At a macro-level, increased competition from new entrants could weaken lending standards, leading to higher default rates and financial instability. Collaborations between banks and crowdfunders and their interconnectedness could lead to contagion risk. A rising

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[23] Cambridge Centre for Alternative Finance, The UK Alternative Finance Industry Report, 2014.

share of crowdfunding credit could increase procyclicality; that is, a weakening of lending criteria during an economic upswing, and a tightening of credit during an economic downswing can amplify economic shocks. At the micro-level, the risks from crowdfunding are mainly in the investor protection area. This could arise from fraud, improper handling of investor funds, inadequate or misleading disclosure and cyber risk (high operational risk). Improving disclosures by crowdfunding platforms and ensuring quality data can bridge the information asymmetry for investors. Section 3.5 explains Singapore's regulatory response to crowdfunding.

3.5 Implications of Fintech on Banks - Possible Scenarios

The rapid growth of crowdfunding and other fintech services have raised concerns that banks would be disrupted. While it is too early to predict the eventual outcome, Hatami (2015) and the Basel Committee of Banking Supervision (2018) postulated various scenarios about how the future would look like. The following is adapted from Hatami's four scenarios ranging from minimum to complete disintermediation (Figure 9). We categorise the four scenarios into a "good" or "bad" outcome from the perspective of the incumbent bank.

Figure 9: Overview of Scenarios for Bank Business Models
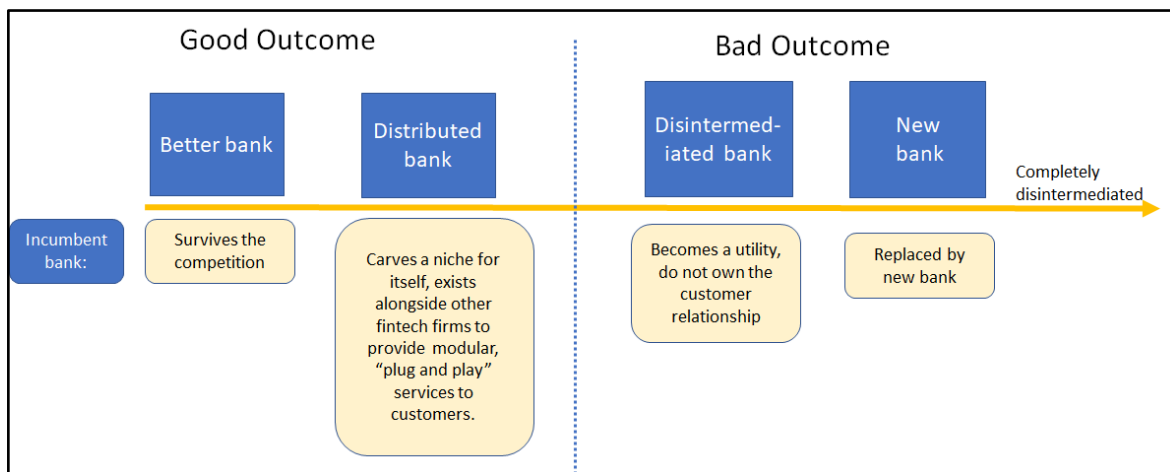
Good Outcome. Under the **"Better Bank"** scenario, the incumbent banks are swiftly digitizing and modernizing themselves (e.g. using biometry, video, chatbots, robo-advisor services) to retain its core banking services and customer

relationships. In the **"Distributed Bank"** scenario, financial services become increasingly fragmented and incumbent banks carve out enough of a niche to survive and exist alongside fintech firms. Each of them focused on providing specific products extremely well, offering services from payments, loans, savings products, forex, investments and mortgages. A new type of online business could also emerge to aggregate these providers to enable consumers to access multiple providers with one login and interface.

Bad Outcome. At the other extreme, under the **"New Bank"** scenario, the incumbent bank cannot survive the technology disruption and is replaced by a challenger bank. The "New Bank" provides a full suite of banking services on "built-for-digital" banking platforms, in a cost effective and innovative way. These new players obtain banking licences from regulators and own the customer relationship. For example, Atom and Monzo, are digital banks in the UK that aim at simplifying the banking experience using app technology and avoiding paperwork and physical branches. Users can open an account for free with both of them within minutes.

In the **"Disintermediated Bank"** scenario, fintech companies use front-end customer platforms to offer a variety of financial services from a diverse group of providers. The incumbent bank is relegated to simply providing commoditised services (such as deposit taking). Customers perform banking services with mobile phone companies or social network providers (e.g. Apple Pay, Samsung Pay, Google Wallet and Facebook for payment). For loans, customers bypass the banks and approach their preferred P2P lenders instead.

These scenarios are extremes and in practice, a combination of them could play out. The rapid pace at which technologies and innovation are happening meant that new products and channels could be created quickly. Regulatory changes (such as the issuance of digital bank licences in Singapore (see below) could also allow the entry of new players and create more disruption.

What are the possible scenarios for Singapore?
New regulations would play a key role in shaping the future outcome for the banking sector. The Monetary Authority of Singapore (MAS) announced in June

2019 that five digital banking licences will be issued for digital players. This would increase the competition for banks as players in the technology and e-commerce sector, including crowdfunders are likely to apply for these licences.

Under the existing internet banking framework, the incumbent banks could already set up digital banks as they operate within the same prudential framework as traditional banking. DBS is building digital banks in overseas market to reduce operating costs – it set up Digibank in India in 2017 -- the country's first mobile-only bank that is branchless and fully-digital. The model is replicated in Indonesia. DBS has also embarked on the journey to transform from within to become fully digital. Other banks in Singapore have also responded to the competition through seeking partnerships with fintech players and adopting new technologies e.g. UOB invested and partnered with Israel fintech AI firm Personetics to use data analytics to provide customers with real-time and personalised guidance on their financial decisions. UOB has also invested S$10 million in crowdfunding platform, OurCrowd in 2016. OCBC bank is providing investment advice through its robo-advisor.

It is too early to tell how the landscape will be like with the entry of the new digital banks but from the experience of Hong Kong who has issued eight digital bank licences, it is likely that many of the new digital banks would be consortiums instead of startups like those in Europe and US.   Thus, we foresee more fintech partnerships in the near future[24].   Respondents to our crowdfunding survey have likewise indicated a preference for partnerships with traditional banks, insurance and brokerage companies. For example, Visa in Singapore has partnered with Validus to offer a virtual credit card payment facility to the SMEs for faster payment. **All in, this raises the possibility of a "Better Bank" outcome existing alongside a "Distributed Bank" outcome.**

3.6   Singapore Regulator's Response to Crowdfunding

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[24]   A PWC (2017) survey showed 82% of financial services companies globally plan to increase FinTech partnerships in the next 3-5 years. CEOs at financial services firms around the world are allocating 15.4% of their annual turnover to develop FinTech projects (e.g. investing in FinTech companies, launching IT projects, or dedicating additional resources to existing FinTech projects).

There is currently no internationally agreed standard on regulatory approaches to crowdfunding. FSB and CGFS (2017) have reviewed the crowdfunding market globally and concluded that due to its small size, crowdfunding does not pose systemic risk to the global financial system. The risks posed by crowdfunding is mainly related to investors. Hence, most regulators have adopted a proportionate approach to regulating crowdfunding. This means regulating in a risk-focused manner, according to the activity of the crowdfunders (whether equity-based or lending-based crowdfunding), so as to strike a balance between the benefits and risks of crowdfunding. Given the rapid pace of innovation and change in the crowdfunding sector, regulators are monitoring this sector closely so as to keep pace with the changing nature and risks.

Likewise in Singapore, MAS seeks to balance improving access to capital for businesses and mitigating the financial stability risks arising from crowdfunding. It also adopts a proportionate approach to regulating crowdfunding, by applying risk-appropriate regulations to the specific activities that are conducted, be it lending to corporations or individuals.

First, lending to corporations via crowdfunders is subject to the prospectus requirements under the Securities and Futures Act because an invitation to lend money to a corporation in Singapore is considered as an offer of debentures under the law. Equity-based crowdfunding will similarly attract prospectus requirements. The prospectus requirements aim to ensure timely and accurate disclosure of information so that investors can make informed decisions about their investments. However, there are exemptions from prospectus requirements for small offerings, private placements, and offers to institutional and accredited investors [25].

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[25] Definition of small offers: under section 272A of the SFA, offerors may make personal offers of securities, up to $5 million within any 12-month period, without a prospectus subject to certain conditions. Further details on the criteria for a "personal" offer can be found in the Guidelines on Personal Offers made pursuant to the Exemption for Small Offers.
Definition of private placements. Under section 272B of the SFA, offers of securities to no more than 50 persons within a 12-month period may be exempted from the Prospectus Requirement subject to certain condition.
Definition of Accredited Investors: wealthy individuals with net personal assets exceeding SG$2 million in value (or the equivalent in a foreign currency) or with an income in the past 12 months of not less than SG$300,000 (or the equivalent in a foreign currency). Corporations with net assets exceeding SG$10 million in value (or the equivalent in a foreign currency) are also accredited investors.
Definition of Institutional Investor: under Section 4A of the SFA. The definition includes inter alia: a holder of a capital market license, an approved exchange, a designated clearing house, a pension fund, or collective investment scheme, a person (other than an individual) who carries on the business of dealing in bonds with accredited investors or expert investors.

Crowdfunders that facilitate or advise on offers of equity or debt securities will require a Capital Market Services License.

The MAS views that crowdfunding could provide an alternative source of financing for start-ups and SMEs and it has eased the entry requirements for securities-based crowdfunding (SCF). In June 2016, MAS (2016) reduced the base capital requirement from S$250,000 to S$50,000, and minimum operational risk requirement from S$100,000 to $50,000, as well as removed the requirement for a $100,000 security deposit. MAS also simplified the pre-qualification checks for small offers to investors, including retail investors. Crowdfunders need to determine that investors have either the financial competence or are suited to invest in SCF given their investment objectives and risk tolerance. Previously, the requirement was that they needed to satisfy both conditions. As a safeguard for investors, MAS requires crowdfunders to document and disclose the key risks of the investments and obtain investors' acknowledgement that they have read and understood these risks. In 2018, MAS issued new guidelines which require crowdfunders to enhance their practices and controls in relation to due diligence conducted on issuers, management of defaults, cessation of business and disclosures to investors. In particular, they are required to disclose interest rates and non-performing loan rates in a consistent manner.

Second, lending to individuals via crowdfunding platforms would be viewed as moneylending in Singapore. Any person engaged in the business of moneylending, be it as a principal or as an agent, is required to hold a moneylender's license from Singapore's Registrar of Moneylenders under the Ministry of Law. However, they are exempted from licensing if the lending goes exclusively to business entities or accredited investors. As such, only platforms that allow lending to non-accredited natural persons, i.e. a very narrow form of P2P-lending, need a license. The licensing requirements under the Moneylenders' Act are focused on protecting borrowers from predatory lending practices[26]. Moreover, the Moneylenders Act comes under the purview of the Ministry of Law, while the SFA is administered by

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[26] Such a license requires a deposit of SG$20,000 and a qualified and experienced person who is responsible for managing the moneylending business. A relevant exception applies, however, if the lending goes exclusively to business entities or accredited investors. This lending is then executed by "excluded moneylenders".

the MAS. These differences could give rise to opportunities for regulatory arbitrage[27]. So far, none of the 19 crowdfunders, except Minterest that are CMS licensees, have registered as moneylenders. It is important that the authorities monitor the industry closely for regulatory arbitrage. Improving transparency and availability of data for this sector is critical for market discipline to work. In Dec 2018, Min Law lifted its moratorium on issuance of new licences. It issued six new monelylending licences to businesses that are able to make better credit assessments using AI and non-traditional data sources to assess credit worthiness, thus lowering credit cost.

The rapid rise of fintech is expected to raise policy issues beyond the scope of prudential supervision such as safeguarding data privacy, cyber-security, consumer protection, fostering competition and compliance with anti-money laundering and combating the financing of terrorism AML/CFT. Regulation will have to adapt to the rapidly evolving financial landscape.

3.7 Conclusion

In Singapore, crowdfunding volumes have grown rapidly to make the country a top crowdfunding hub in Southeast Asia. Our empirical results showed that the key drivers of crowdfunding for Singapore are its **high GDP per capita, developed financial market and greater availability of venture capital.** We found evidence that crowdfunding has helped to improve SMEs' cashflow. This is consistent with the finding from our crowdfunder survey that SMEs have benefited from crowdfunding financing as they not only improved their cashflow but also induced financing from banks**.**

We suggested that a combination of the Better Bank and Distributed Bank scenarios is likely to happen in Singapore. Regulatory changes such as the issuance of new digital bank licences could shape the future fintech landscape. Regulators have to strike the right balance between developing the fintech industry while safeguarding financial stability. While the systemic risk from crowdfunding is low currently given its small size and limited interconnections, this could change quickly over time and

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[27] For example, a sole proprietor may borrow in his/her own name instead of in the name of his/her business.

it is important for regulators to monitor the industry closely and require greater disclosure from the crowdfunders.

As new digital technologies emerge that make the provision of financial services more efficient, they hold the potential to address barriers that SMEs face in accessing credit. We hope our findings in the paper will inspire more research on crowdfunders' effect on SMEs, and both their roles in building a dynamic and inclusive society in Singapore.

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Appendix 1: Case Studies of Crowdfunders

Note: Please do not distribute the case studies, because we have not cleared the content with both the companies yet. Thank you for your understanding

1) Case Study of Funding Societies

Funding Societies was founded in 2015 by two former Harvard Business School students, Mr. Reynold Wijaya and Mr. Kelvin Teo. It operates in Singapore, Indonesia and Malaysia, and it has received funding from SoftBank Ventures Asia amongst other investors.

According to Mr. Teo, *"We launched our Indonesia business in January 2016, six months after the launch in Singapore. The choice of Indonesia is primarily driven by our understanding and passion for the market (Reynold is Indonesian, while I have worked there for a year). Its large market size and our realistic chance of becoming No. 1 there are other driving factors. We are fortunate to have an excellent local country head to drive the business."*

He added, *"SME digital financing is a low margin, high volume business, and Singapore in itself is simply insufficient to build a sustainable business."*

Currently, Funding Societies has more than 200 employees and financed over 100,000 business loans, totalling over S$600 million in funds. The company serves mainly SMEs who need small, short-term and unsecured (uncollateralized) loans, and the average loan size is S$500,000. Its top lending segment is in the Information and Communication sector (32%), followed by the Commerce and Wholesales sector (21%), as well as the Hospitality and Food and Beverages sectors (16%). Interest rates vary from 9 per cent for secured loans, to as high as 16 per cent for unsecured loans. In 2018, its weighted average returns to investors was 9.32%.

Funding Societies' default rates in 2018 are 1.5%, down from 2% to 3% two years ago, due to improvements in its underwriting model. Its proprietary credit-scoring model uses risk-based pricing, with some degree of automation, to price the loans, which significantly reduces the average time to process a loan. It is the first

crowdfunder in Singapore to integrate its system with MyInfo[28] for a quicker and more accurate access to its borrowers' business information. In addition, the model incorporates alternative data to help in their credit assessment, such as CEO's credit card payment history and other qualitative information.

Funding projects are loaded on the platform, after the borrowers have accepted a set of terms and conditions relating to quantum, tenor and interest rate. Lenders such as retail, institutional and accredited investors can invest in Funding Societies' projects from as low as S$20 per project. Its financial services range from auto-invest, to quick loan, to invoice financing and unsecured business loan up to S$1,500,000. For instance, auto-invest is an automated algorithm-driven investment model that matches investors on the platform according to their desired investment criteria. With quick-loan, the SME can get a loan from US$500 to US$40,000 within two business hours to approve and disburse. For larger loan quantum, it would require a waiting period of two to seven days.

Funding Society shared a case of a client Mr. Prasad Raja who was the owner of Home Raj Pte Ltd, a Food and Beverage F&B Indian restaurant chain with a ten-year history in Singapore. Mr. Raja needed some funds to set up a new shop in Changi Business Park and renovate an existing restaurant. However, his loan applications to the banks were rejected, due to several factors. One was because of his age, and the other was because his company was facing declining profit margins at his existing restaurant due to 50% decline in footfall from on-going roadworks that would last three years. Mr. Prasad was introduced to the concept of alternative financing and eventually secured funds from Funding Societies. Since then, he has opened two more outlets in the vicinity of Changi Business Park and Buona Vista in Singapore.

According to Mr. Raja, *"In this business, cashflow is king. You need cash flow. Getting the finances on time was a big help"*.

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[28] Designed by the Government, MyInfo is a service that enables citizens and residents to manage the use of their personal data for simpler online transactions. Users control and consent to the sharing of their data and can view a record of past usage.

2) Case Study of Validus

Validus was founded in 2015 by three co-founders Mr. Ajit Raikar, Mr. Vikas Nahata and Mr. Nikhilesh Goel. It has grown from a firm of 4 to 50 people in 2019. Amongst its investors are Temasek Holdings' Vertex Ventures (Singapore sovereign wealth fund) and Dutch Investment Bank, FMO (a Netherland's entrepreneurial development bank).

Validus matches accredited individual and institutional investors (retail investors are excluded) to growing SMEs, with a total amount funded of S$270 million. It earns a fee of 0.75% to 3% on the amount crowdfunded.

Currently, 75% of Validus' loan portfolio is in invoice financing (with loan duration between one to three months) and the remaining 25% is in purchase order and working capital loans (with loan duration between 3 to 12 months). To diversity risk for its investors, Validus spreads the loans across several SMEs, which in turn allows Validus to price their loans at competitive rates, charging 4% to 6% on an annualized basis. The rates are similar to what banks offer to the SMEs. It is able to charge bank-like rates largely due to its institutional lenders which include family offices and sovereign wealth funds.

Validus' default rates are at 2.5%, which is lower than the NPL for SMEs of 5.1% in H1 2018[29]. Its default rates are 0% for loans for medium sized vendors of its corporate partners. Several factors may have contributed to the low default rates. One, its use of fraud detection algorithm based on Benford's Law have helped to detect irregularity in data if financial statements are doctored. Two, its business approach to collaborate with large stable corporates in Singapore has enabled it to reach out to vendors that have successfully secured contracts with the large corporates. For example, once a vendor has secured a contract, Validus offers short-term, low quantum loans at competitive interest rates. The vendor, a security services firm had won a $3 million project and required a 10% financing upfront (or S$300,000) to hire more security guards. Validus provided these financing over a short period, which helps ensure the project was completed.

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[29]   MAS Financial Stability Report 2018, page 72.

To further expand its business, Validus is collaborating with Visa to offer virtual credit card services for SMEs to make payments to their suppliers. Validus is also working with another non-bank financial institution to test out the loan application process for F&B firms using its proprietary platform. Validus has plans to partner with banks in Singapore to use its proprietary platform to lend directly to SMEs.

Appendix 2: Glossary of Variables and Data Sources

Crowdfunding Credit: the amount of crowdfunding raised in U.S. dollars, based on the data collected from the 'Global Alternative Finance Benchmarking Survey'. It comprises marketplace/P2P consumer lending, marketplace/P2P business lending, marketplace/P2P property lending, balance sheet business lending, revenue sharing/profit sharing crowdfunding, real estate crowdfunding, equity-based crowdfunding, invoice trading, reward-based crowdfunding, donation-based crowdfunding, debt-based securities and balance sheet consumer lending.

Source: Cambridge Centre for Alternative Finance

Population: country population data used to derive crowdfunding per capita.

Source**:** World Bank data from CEIC

WB Ease of Doing Business Index: The index ranks economies from 1 to 190, with first place being the best. On a scale of 0 to 100, a higher value (a low numerical rank) means that the regulatory environment is conducive to business operations. The index averages the country's percentile rankings on 10 topics covered in the World Bank's Doing Business Survey; they are 1. Starting a business; 2. Dealing with construction permits; 3. Paying taxes; 4. Trading across borders; 5. Registering property; 6. Getting electricity; 7. Enforcing contracts; 8. Protecting minority investors; 9. Getting Credit; 10. Resolving insolvency. The ranking on each topic is the simple average of the percentile rankings on its component indicators.

Source**:** World Bank, Doing Business project (http://www.doingbusiness.org/).

ICRG composite risk rating: This is a composite risk indicator that summarises risks across three subcategories and their respective weights: political (50%), financial (25%), and economic (25%). The political indicators are derived from surveys of risk perceptions related to each of the following 12 variables: government stability; internal conflict; external conflict; military in politics; law and order; ethnic tensions; bureaucracy quality; socioeconomic conditions; investment

profile; corruption; religious tensions; and democratic accountability. The financial risk rating are derived from the assessment of a country's ability to pay its official, commercial and trade debt obligations and based on the following 5 variables: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover and exchange rate stability. The economic risk components are derived from the assessment of a country's current economic strengths and weaknesses related to each of the 5 variables: GDP per Head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP. The composite scores range from 0 to 100with **higher values signifying less risk.**

Source: World Bank WDI database archive and the PRS Group.

Availability of Venture Capital: this is a sub-index from the World Competitiveness Index of the World Economic Forum (WEF). This is based on a survey response to the question: "In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? Its values lie between 1=extremely difficult, 7= extremely easy)

Source: World Economic Forum, Executive Opinion Survey.

Financial Institutions Depth and Financial Institutions Access: they are two of the six sub-indices from the IMF's Financial Development Index. The FD index is a relative ranking of countries on the depth, access and efficiency of their financial institutions and financial markets.

The **Financial Institutions Depth index** includes the following indicators:
 bank credit to the private sector as a percent of GDP; the assets of the mutual fund and pension fund industries and the size of life and non-life insurance premiums.

The Financial institutions Access is proxied by the number of bank branches and ATMs per 100,000 adults, number of bank accounts per 1,000 adults, percent

of firms with line of credit, and usage of mobile phones to send and receive money.

Source: http://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B&sId=1480712464593

(1)   Regression: Days Turned Cash

Days Turned Cash (DTC): it measures the timeliness of SMEs paying their debt -- the percentage of debts paid on or before due date. The lower the number, the timelier their payment. It is collected from payment records of more than 120,000 companies in Singapore, across eight major sectors in the economy (retail, wholesale, construction, hospitality / food and beverage, information and communications, manufacturing, services, and transport / storage), in each quarter.

Source: Experian previously DP Information Group

Access to Financing Expectations: this is a sub-index from the SME Index compiled by the Singapore Business Federation (SBF) and Experian. The SME Survey collects input from 3,600 SMEs on their expectations in seven key areas – Turnover, Profitability, Business Expansion, Capital Investment, Hiring, Capacity Utilisation, and Access to Financing.   A higher number means better access to financing expectations.

Source: Experian previously DP Information Group

Appendix 3: Crowdfunders in Singapore

Name/ Total Loan Book Size*	Type of Investors and Minimum Investment Amount	Duration and Loan Size	Borrower Fees	Weighted average returns to Investors***	Non-performing loan rate***
Funding Societies; S$628.88m**	Anyone. S$20 per project (initial deposit S$1,000).	Invoice financing; 3-12 months, up to 80% of invoice value. Secured business loan; 3-12 months, up to S$3,000,000. Unsecured business loan; 3-12 months, up to S$1,500,000. FS Bolt; quick loans of up to S$50,000, approval within 2 hours.	2%-5% on the amount crowdfunded.	Weighted average 9.32% p.a. (2018)	1.81% (2018)
SeedIn Technology; S$166 mn (excluding China)	Anyone. S$1,000 per project.	Unsecured or secured business loan against invoices/collateral; 1-12 months, S$1,000-S$5,000,000	3%-5% on the amount crowdfunded.	Weighted average 8.33% p.a. (2018)	0%
Validus; S$230.24 m	Only accredited and institutional investors. Minimum investment of 1000 per faculty (via Auto Invest) Minimum portfolio size of S$50,000).	Purchase order financing; 1-3 months, up to 60% of purchase order value. Invoice financing; 1-4 months, up to 80% of invoice amount. Unsecured business loan; 3-12 months, up to S$250,000.	0.75%-3% per month.	4.42-24% p.a. (2018)	2.5% (2018)
Capital Match; S$143.86 m	Anyone. S$1,000 per project.	Invoice financing; 1 week-4 months, S$5,000-S$2,000,000 or up to 85% of invoice value.	15%-20% on the amount crowdfunded.	15-20% p.a. (2018)	0.2% (2018)

		Business loan; 3-12 months, S$50,000-S$200,000.			
Moolahsense; S$74.38 m (Feb 2019)	Anyone. S$100 per project.	Invoice financing; 15-90 days, from S$15,000 up to 80% of invoice value. Unsecured business loan; 3-24 months, S$50,000-S$5,000,000 under Small Offers Exemption and above S$5,000,000 under Private Placement Exemption. Secured business loan; 6-24 months, S$50,000-S$5,000,000 under Small Offers Exemption and above S$5,000,000 under Private Placement Exemption.	Invoice financing; 1% per month and S$1,000 for annual application fees. Business loan; 3%-5% on the amount crowdfunded and S$500-S$750 for annual application fees.	9.9% p.a.(2018)	14.82%
Co-Assets; S$60 m	Anyone. S$1,000 per project.	Business loan; S$100,000-S$5,000,000	3%-5% on the amount crowdfunded.	9.9% p.a. (2018)	0%
Minterest; S$35 m	Anyone. S$500 per project (initial deposit S$1,000).	Invoice financing and business loan; up to 12 months, minimum S$50,000.	Invoice financing; minimum 0.5% per month. Business loan; minimum 2% on the amount crowdfunded.	12.95% p.a. (2018)	0.59%.
FundTier; S$9.7 m	Anyone. S$1,000 per project (initial deposit of S$50,000)	Business loan; average deal size S$31,000	na	Weighted average: 9.18% p.a. (2018)	6.55% (as at Dec 2018)

Aces Crowdfund	Only accredited and institutional investors.	Business loan; 12-24 months. Equity investment; typically longer duration.	na	na	na
Arcor Capital	Only accredited and institutional investors.	Targeting start-ups who needs early stage financing or mid-market SMEs, financing though mezzanine or private equity strucure	na	na	na
Crowd Genie	Only accredited and institutional investors. S$1,000 per project.	Unsecured business loan; S$50,000-S$500,000	2%-5% on the amount crowdfunded.	8.2% p.a. (2018)	na
Crowdo	Only accredited and institutional investors.	Invoice financing; Business loan; 3-9 months, backed by gold or jewellery collaters. Equity investment;	na	5% p.a. (2018)	0%
Fund Singapore	Anyone. S$1,000 per project.	Business loan and equity investment; real estate, average deal size S$1,500,000	na	na	na
SmartFunding	Anyone. S$100 per project (Initial deposit of S$1,000).	Invoice financing; Business loan;		na	na
Fundnel; S$800 mn	Only accredited and institutional investors.	Allows investors to invest in a set of start-ups, early to late stage, via equity convertible bonds, revenue sharing or bond/debt structure. S$1,000,000-S$100,000,000, average deal size S$3,200,000	5% on the amount crowdfunded.	na	na

Capbridge; S$900 m (2018)	Only accredited and institutional investors.	Business loan and equity investment in mid-to-late stage growth companies; S$5,000,000-S$50,000,000	na	na	na
FundedHere; >S$100 mn	Only accredited and institutional investors. S$50,000 per Listco bond project. S$5,000 per equity project.	Singapore-listed corporate bonds (Listco bonds) ; 24 months, S$1,000,000-S$5,000,000 Equity investment in early stage start-ups; S$100,000-S$1,000,000	Listco bonds; 1.5% on the amount crowdfunded. Equity; 6% (in cash) and 2% (in equity) of the amount crowdfunded.	12.14% p.a.(2018)	na
InvestaCrowd; S$ 1bn	Only accredited and institutional investors. S$100,000 per project (S$25,000 for first-time investor).	Real estate crowdfunder using blockchain technology Debt real estate investment (senior debt); 3-12 months Debt real estate investment (junior debt); 12-18 months Preferred equity real estate investment; 18-36 months Common equity real estate investment; >36 months Note: all projects are securities-backed with borrowers' pledged assets		Senior debt; 8%-12% p.a. Junior debt; 12%-18% p.a. Preferred equity; >20% p.a. Common equity; >40% p.a.	

Note: Most platforms engage escrow agencies such as Vistra and Watiga to hold investor funds.

Information is correct as at May 2019.*Total loan book size includes funds raised across all geographical regions that the crowdfunder operates (e.g. Funding Societies.

***Since Mar 2019, the MAS requires holders of CMS license to publish the following statistics amongst other disclosure requirements.

Weighted Average (Per Annum): Weighted Average Rate of Return is the percentage of the sum of all interests (per annum) less fees and charges for all loans (excluding interest payments for defaulted loans) divided by the total amount of loans disbursed during the year. This exclude the

amounts disbursed for defaulted loans during the applicable year.

Non-Performing Loan Rate is computed as the ratio of loans (principal + interest) that are at least 30 days past due over the total outstanding loans facilitated on the platform during the year (including outstanding amounts of defaulted loans) as at the applicable year end.

Appendix 4: Alternative Models with World Bank Ease of Doing Business Index and ICRG Composite Risk Rating.

VARIABLES	(1) DB Index	(2) ICRG
GDP per Capita	40.84**	27.11**
	(19.12)	(11.47)
Square of GDP per Capita	-2.246**	-1.579***
	(0.913)	(0.540)
Availability of Venture Capital	9.166***	9.661***
	(1.026)	(1.105)
Ease of Doing Business Index	6.754	
	(6.750)	
ICRG Composite Risk Rating		10.04
		(9.832)
Financial Institutions Access	-18.62***	-7.521**
	(7.173)	(3.608)
Financial Institutions Depth	22.23***	18.47***
	(5.377)	(4.607)
AUS	16.66***	8.903**
	(5.622)	(3.582)
IND	15.31	9.409
	(10.15)	(5.724)
IDN	36.93***	25.67***
	(11.07)	(6.858)
JPN	16.06**	6.730*
	(6.683)	(3.834)
KOR	11.46**	5.410
	(5.110)	(3.485)
MYS	-11.66**	-10.82**
	(5.365)	(4.243)
GBR	12.09**	5.529
	(5.420)	(3.839)
USA	19.60***	10.57***
	(6.189)	(3.757)
Constant	-234.8**	-169.6**
	(112.6)	(76.07)
Observations	41	45
R-squared	0.945	0.936
Number of Countries	9	9
Robust	Yes	Yes

| RMSE | 0.888 | 0.978 |
| Dependent Variable | Crowdfunding per Capita | |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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- **End of Paper** -