



# FinTech and BigTech credit: a global overview

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\*The views expressed here are mine and not necessarily those of the Bank for International Settlements

# Overview

- FinTech and BigTech credit: some groundwork
- Lending volumes around the world
- What drives FinTech and BigTech credit?
- Performance in credit assessment
- Some open questions

# FinTech and BigTech credit: some groundwork

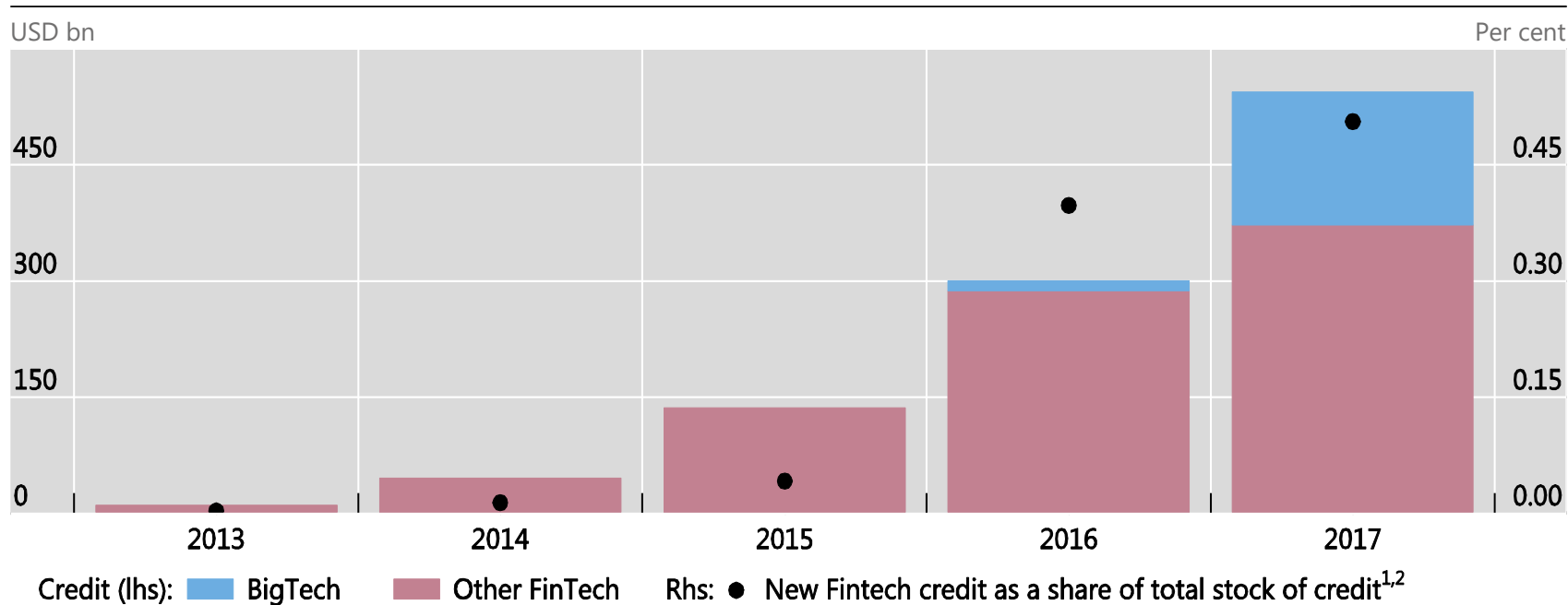
## FinTech credit

**Definition** Credit activity facilitated by electronic (online) platforms that are not operated by commercial banks (Claessens et al., 2018)

## BigTech credit (sub-set)

Credit activity facilitated by large companies whose primary activity is digital services, rather than financial services (Frost et al., 2019)

# Lending volumes have risen rapidly in the past few years

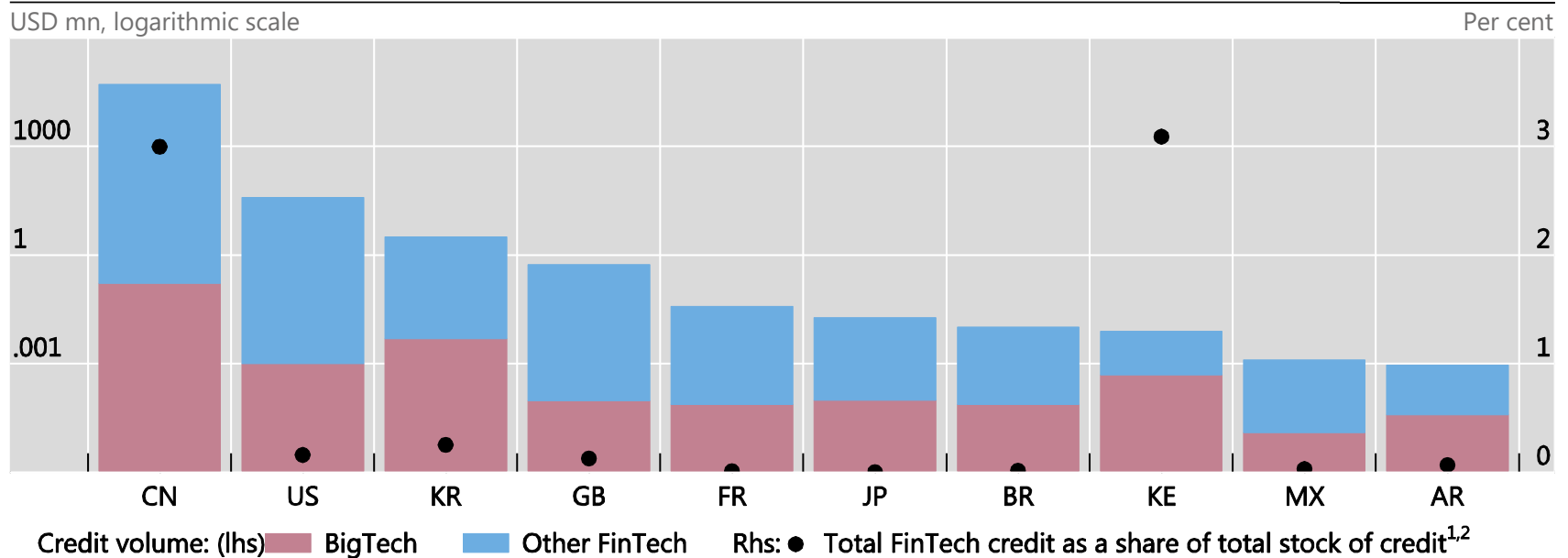


Figures includes estimates.

<sup>1</sup> Total FinTech, defined as the sum of FinTech and BigTech credit divided by the sum of total FinTech credit and total credit to the private non-financial sector. <sup>2</sup> Calculated on a selected set of countries.

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

# There is substantial heterogeneity across countries



Figures includes estimates. Bars are sorted by the sum of the logarithm of the FinTech and the logarithm of the BigTech credit.

<sup>1</sup> Total FinTech credit (including BigTech credit) divided by the sum of total credit to the private non-financial sector. The latter includes total FinTech credit. <sup>2</sup> Calculated on a selected set of countries.

Sources: Cambridge Centre for Alternative Finance; BigTech companies' financial statements; Frost et al. (2019).

# What drives FinTech credit?

Regression results for fintech credit volumes across countries, 2016

Table 1

	Total fintech credit (1)	Total fintech credit (2)	Business credit (3)	Consumer credit (4)
GDP per capita <sup>1</sup>	0.208***	0.201***	0.188***	0.081
GDP per capita squared <sup>1</sup>	−0.002*	−0.002*	−0.002*	−0.001
Lerner index <sup>2</sup>	3.295*	2.575*	2.225	2.450
Normalised regulation index <sup>3</sup>	−11.550**	−9.492**	−9.091*	−8.101*
CN dummy		4.038***		
US dummy		3.447***		
UK dummy		2.941***		
Constant	4.310	2.979	2.596	4.017
N	63	63	50	50
R squared	0.582	0.662	0.525	0.182

<sup>1</sup> Average from 2013–15; GDP per capita, in USD thousands. <sup>2</sup> Average from 2010–15. <sup>3</sup> In 2015.

\*/\*\*/\*\* indicates statistical significance at the 5/1/0.1% level.

Sources: IMF, *World Economic Outlook*; World Bank, *Bank Regulation and Supervision Survey* and Global Financial Development Database; Cambridge Centre for Alternative Finance and research partners; authors' calculations.

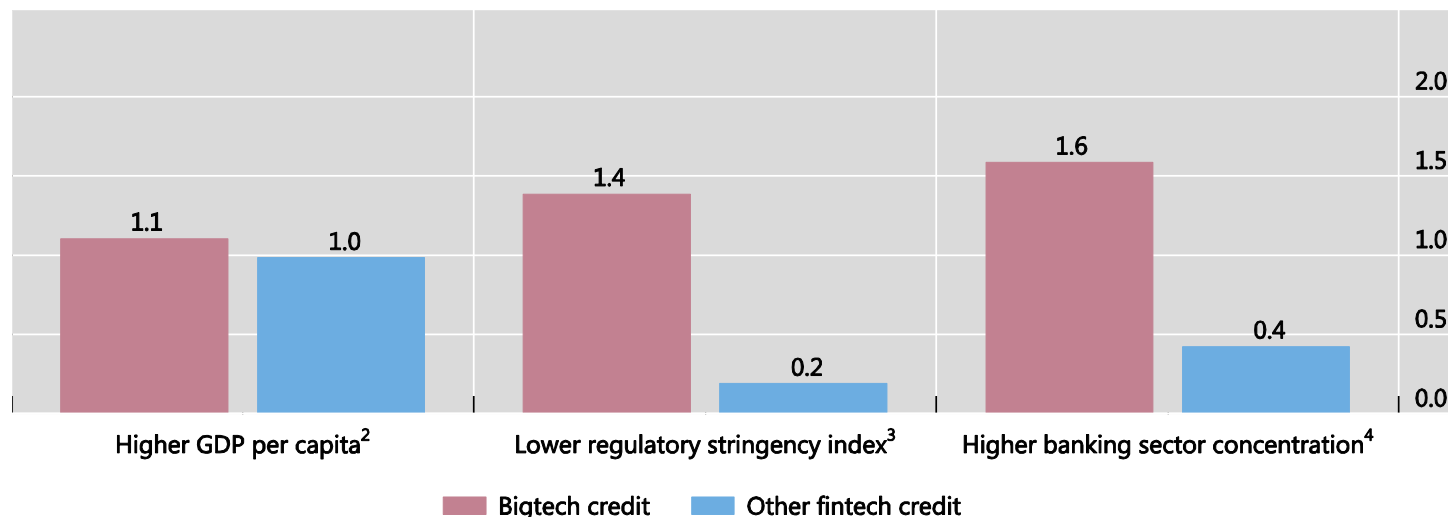
# Is BigTech credit special?

Explanatory variables	Dependent variable:				
	BigTech dummy (0/1)	Ln(BigTech credit per capita)	Ln(BigTech credit per unit of total credit <sup>6</sup> )	Ln(Total FinTech credit per capita) <sup>5</sup>	Ln(Total FinTech credit per capita) <sup>5</sup>
	(1)	(2)	(3)	(4)	(5)
GDP per capita <sup>1</sup>	0.0416*** (0.0132)	0.3890*** (0.1258)	0.0641 (0.0738)	0.1893*** (0.0637)	0.1443** (0.0608)
GDP per capita squared <sup>1</sup>	-0.0005*** (0.0002)	-0.0051*** (0.0018)	-0.0001 (0.0010)	-0.0026*** (0.0009)	-0.0020** (0.0008)
Lerner index <sup>2</sup>	0.9440** (0.4263)	9.9783*** (2.9311)	7.5166*** (2.1127)	3.9099* (2.1254)	1.2220 (1.4734)
Normalised regulation index <sup>3</sup>	-0.1197 (0.6025)	-5.9459 (5.5436)	-5.3582* (3.0774)	-8.0262** (3.0553)	-4.8756 (3.1879)
Bank branches per adult population <sup>3</sup>	-0.0045** (0.0020)	-0.0386** (0.0150)	-0.0325*** (0.0081)	0.0001 (0.0061)	0.0032 (0.0061)
BigTech dummy (BT)				1.3533* (0.7029)	9.8183** (4.1396)
Interactions with BigTech dummy					
BT*GDP per capita <sup>1</sup>					-0.1575 (0.1637)
BT*GDP per capita squared <sup>1</sup>					0.0039 (0.0026)
BT*Lerner index <sup>2</sup>					9.3670** (4.2551)
BT*Normalised regulation index <sup>3</sup>					-13.3597** (5.2568)
BT*Bank branches per adult population <sup>3</sup>					-0.0211 (0.0802)
Other controls <sup>4</sup>	Yes	Yes	Yes	Yes	Yes
No. of observations	64	64	64	64	64
Estimation method	OLS	Logit	Logit	OLS	OLS
R <sup>2</sup> / Pseudo R <sup>2</sup>	0.1848	0.0592	0.1911	0.7054	0.7769

Robust standard errors in parentheses; \*\*\*/\*\*/\* denotes results significant at the 1/5/10% level.

<sup>1</sup> Average from 2013–16; GDP per capita, in USD thousands. <sup>2</sup> Average from 2010–15. <sup>3</sup> In 2015. <sup>4</sup> Other controls include: a constant, GDP growth (in % average over the period 2010–2016); a crisis dummy that takes the value of 1 if the country was hit by the GFC and 0 elsewhere; (post 2006); total banking credit growth to the private non-financial sector (in % average over the period 2010–2016); Mobile phones per 100 persons (in 2016); a dummy that takes the value of 1 for advanced economies and 0 elsewhere. <sup>5</sup> The dependent variable is total FinTech credit per capita in 2017. Total FinTech is defined as the sum of FinTech and BigTech credit. <sup>6</sup> Sum of total FinTech credit and total credit to the private non-financial sector. More information on the database are provided in the annex.

# Estimated coefficients for BigTech and other FinTech credit



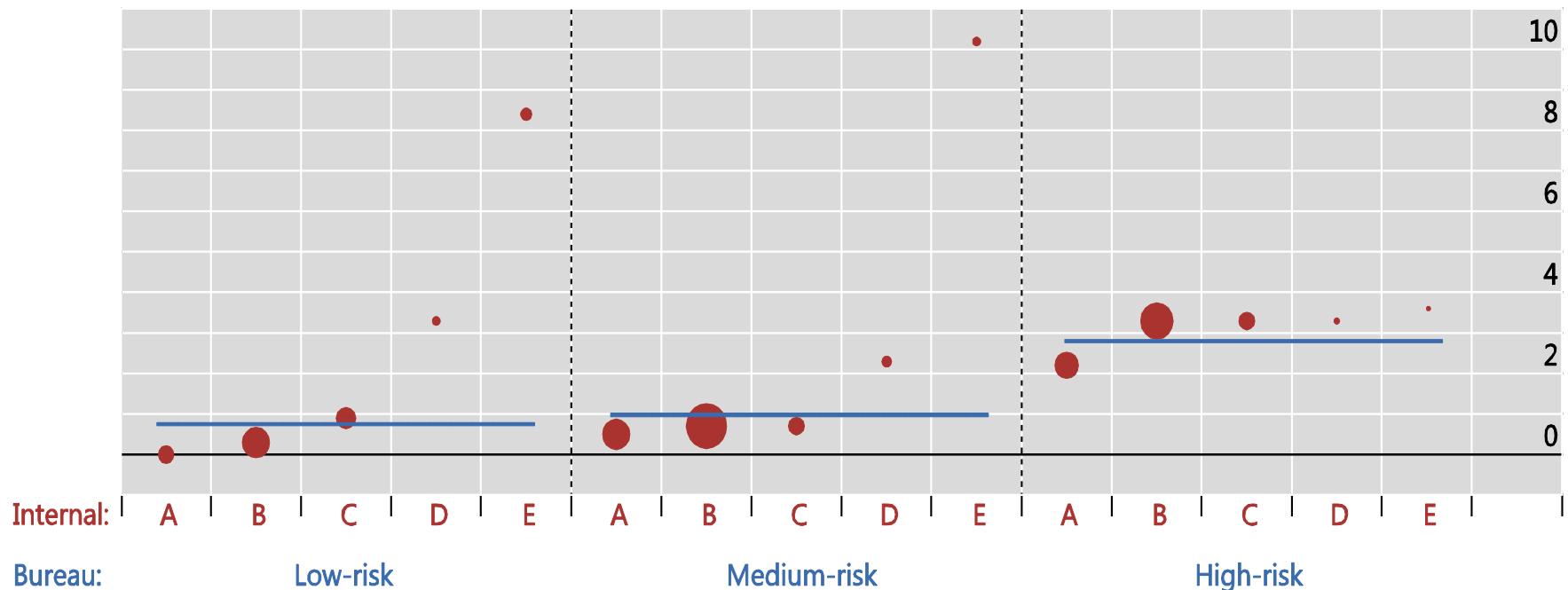
The bars visualise the estimated change in BigTech and other FinTech credit volumes from a change in the respective variables, based on the estimated coefficients displayed in the last column of Table 3.

<sup>1</sup> Change in BigTech credit and other FinTech credit per capita given a one-standard deviation change in the selected variables. <sup>2</sup> Nominal GDP in USD over total population. Given the non-linearity of the relationship, the change is calculated at the average GDP per capita level. <sup>3</sup> Regulatory stringency is constructed as an index based on the World Bank's Bank Regulation and Supervision Survey. The index takes a value between 0 (least stringent) and 1 (most stringent) based on 18 questions about bank capital requirements, the legal powers of supervisory agencies, etc. <sup>4</sup> One-standard deviation increase in the banking Sector Lerner index (an indicator of bank mark-ups and hence market power).

Source: authors' calculations.

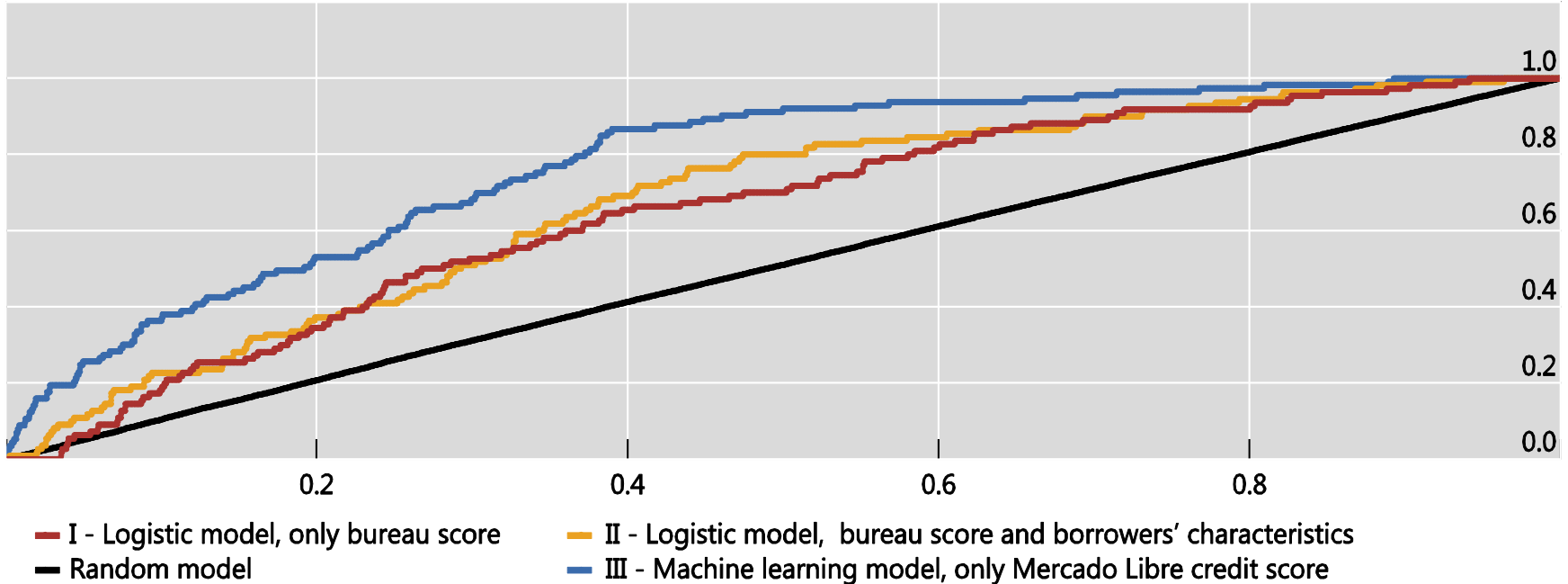


# Credit assessment performance: BigTech vs. credit bureau



The figure shows the loss rate, i.e. 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 (A through E) versus the three clusters identified by the bank bureau. For a given bureau rating (i.e. low), the expected loss rate is strictly monotonous with the internal rating (i.e. internal rating orders expected loss). Conversely, given an internal rating (i.e. C, D or E), the loss rate is not strictly monotonous with the bank bureau risk. The size of the dots is proportional to the share of the firms in rating distribution. Sources: authors' calculation on Mercado Libre data.

# Credit assessment performance: BigTech vs. credit bureau



The figure shows true positive rates versus false positive rates for borrowers at different thresholds for three different models: (I) a logistic regression with only the credit bureau score on firm  $i$  at time  $t$  as dependent variable; (II) a logistic regression with the credit bureau score and additional borrower characteristic; and (III) a machine learning model based only on the Mercado Libre internal rating. 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.

Sources: Mercado Libre; authors' calculations.

## Some open questions

- Performance of FinTech and BigTech credit during a downturn?
- Appropriate use of (big) data about borrowers?
- Challenge to incumbent lenders, and if so in what roles?
- Impact on credit access (especially in EMDEs)?
- Performance of borrowers following FinTech and BigTech credit

Thank you!

## References

Stijn Claessens, Jon Frost, Grant Turner and Feng Zhu (2018), "[Fintech credit markets around the world: size, drivers and policy issues](#)", BIS Quarterly Review, September.

Jon Frost, Leonardo Gambacorta, Yi Huang, Hyun Shin, and Pablo Zbinden (2019), "[BigTech and the changing structure of financial intermediation](#)", BIS Working Paper Series, no. 779.