



Big techs, QR code payments and financial inclusion

Thorsten Beck,^{♣†} Leonardo Gambacorta,^{♦†} Yiping Huang,[♥] Zhenhua Li,^{*} and Han Qiu[♦]

[♣] European University Institute, [♦] Bank for International Settlements, [♥] Institute of Digital Finance, Peking University, ^{*} Ant Group, [†] CEPR.

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Outline of the presentation

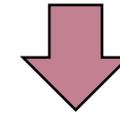
- ❑ Motivation and research questions
- ❑ Data and stylised facts
- ❑ Econometric analysis
- ❑ Conclusions



Motivation and research questions

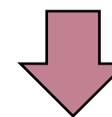
Use of QR code makes off-line firms into on-line firms

1. **QR scan code** system allows small vendors to improve the collection of payments and create data
2. Big techs **collect data** on payments and offer credit service based the information.
3. Almost all the QRcode merchants got their first loan from bigtech credit.



Relationship between bigtech credit and bank credit?

- ❑ Disclosure of firm's type is private information for the big tech?
- ❑ Are asymmetric information problems mitigated with other financial intermediaries, as well?
- ❑ If yes, what is the mechanism?
 - Credit line offer is not visible to banks
 - Credit use and information generated via the PBC credit bureau system are visible to banks
 - Use of QR code generates spillover effects on bank credit and could have "real" effects



Research questions

- Does the use of QR code in payments allow firms to have access to big tech credit?
- Does access/use of big tech credit allow firms to have access to more traditional bank credit?
- Does the use of QR code in payment and the subsequent provision of credit produce real effects on firms' activity?



Data and stylised facts

Dataset characteristics

- Unique dataset from MYBank (Ant Group) and Chinese banks
- Random sample of 500,000 Chinese firms in 2017:01-2020:07
- When firms start to use QR code applications, 16% of them have already access to big tech credit, but only 0.2% use it. Only 0.1% of these firms use bank credit
- Median big tech credit (USD 1,500) smaller than bank credit (USD 12,100)
- Firm level information at the monthly frequency:
 - transaction volumes and network score
 - personal characteristics such as age, gender, information on house property, and distance to bank branches
- BT borrowers are slightly younger than bank clients (34 vs 36 years)
- Female and male entrepreneurs have same access to BT credit

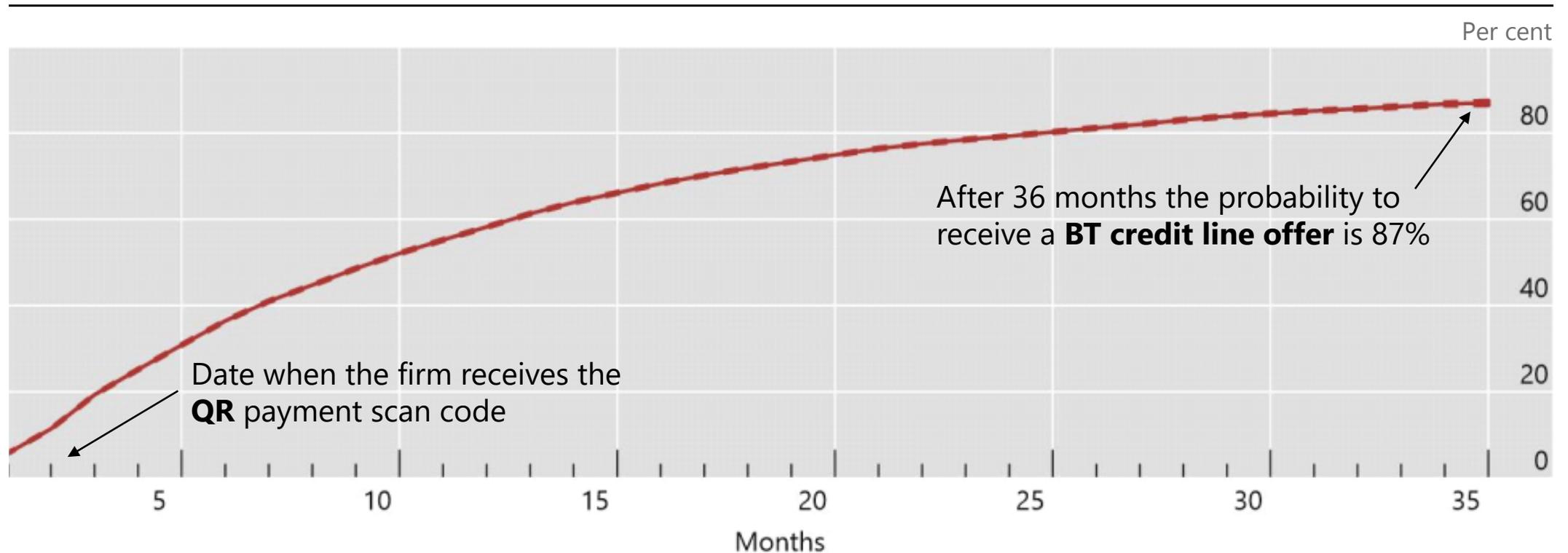


Econometric analysis

Question (1):

Does the use of QR code in payments allow firms to have access to big tech credit?

Probability for a firm with QR code to receive a big tech credit offer



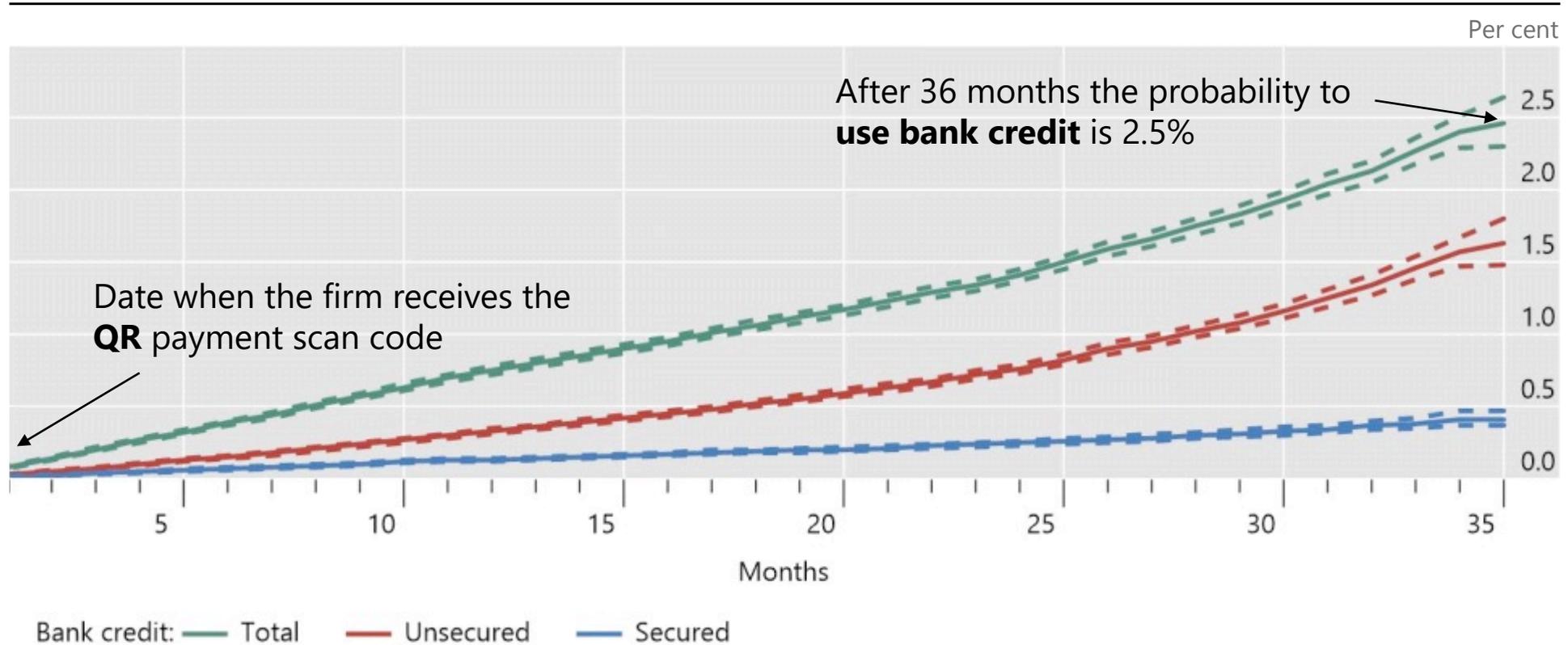
Dashed lines indicate 5th/95th percentiles. The x-axis reports the QR code duration, the number of months after the firm started to use the QR code payment system. The y-axis reports the probability for a firm of having access to big tech credit.

Source: Authors' calculations.



Question (2):
Does access/use of big tech credit allow firms to have
access to more traditional bank credit?

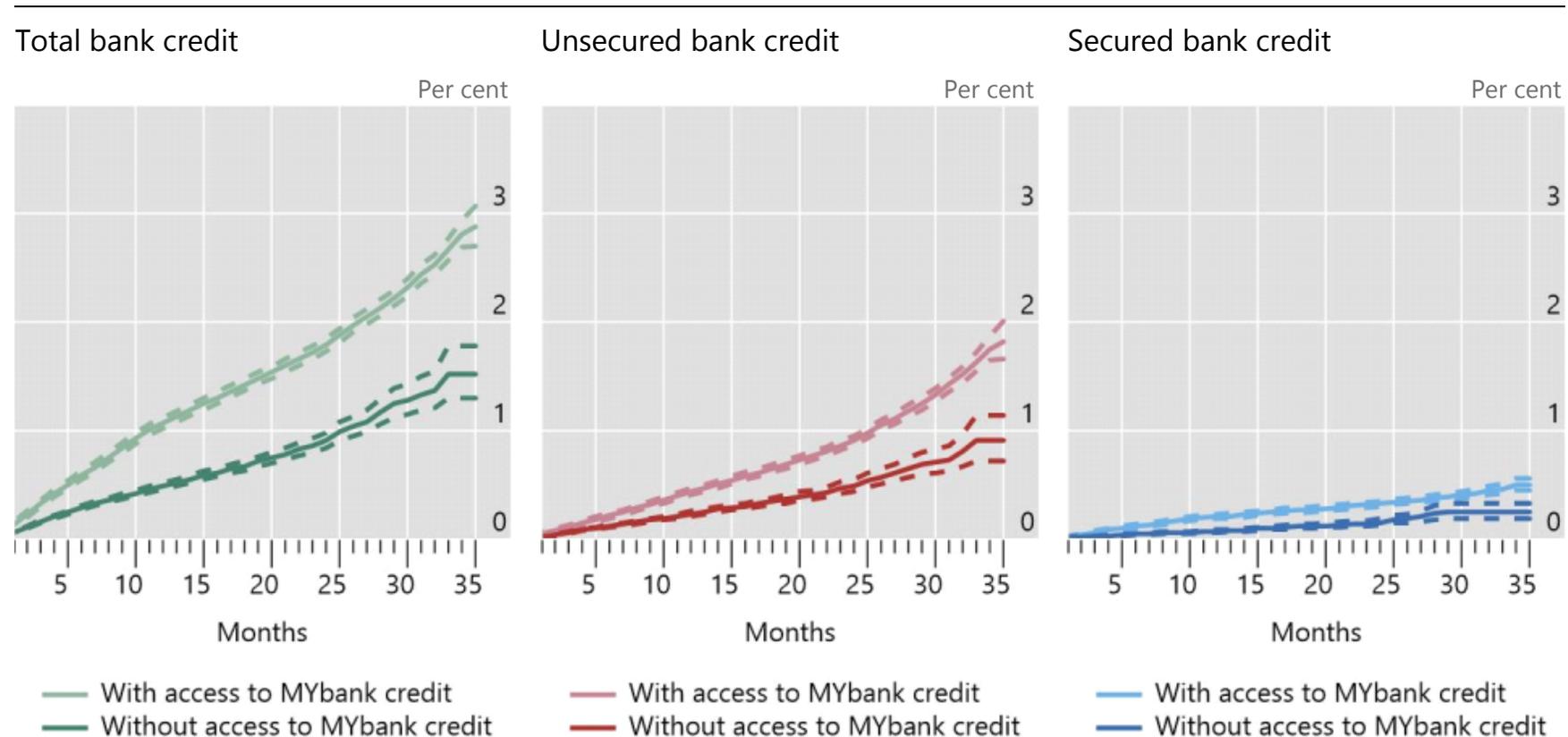
QR code payments slightly increases the probability of bank credit use



Dashed lines indicate 5th/95th percentiles. The x-axis reports the QR code duration, the number of months after the firm started to use the QR code payment system. The y-axis reports the probability for a firm of using bank credit.

Source: Authors' calculations.

Spillover effects from big tech credit access to bank credit use

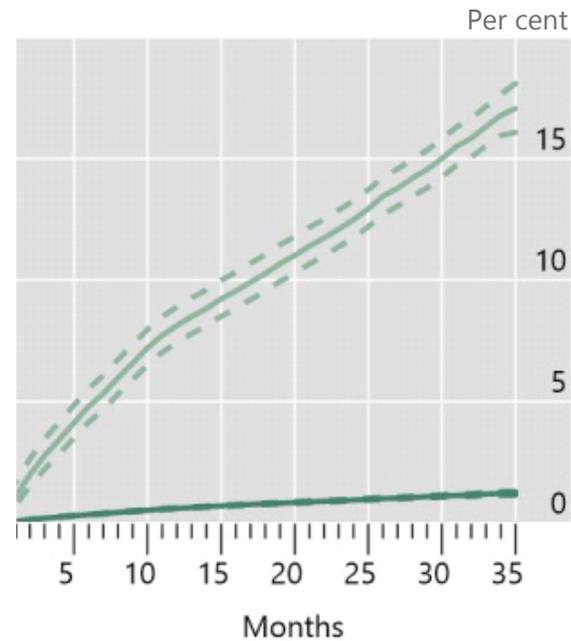


Dashed lines indicate 5th/95th percentiles. The x-axis reports the QR code duration, the number of months after the firm started to use the QR code payment system. The y-axis reports the probability for a firm of using bank credit.

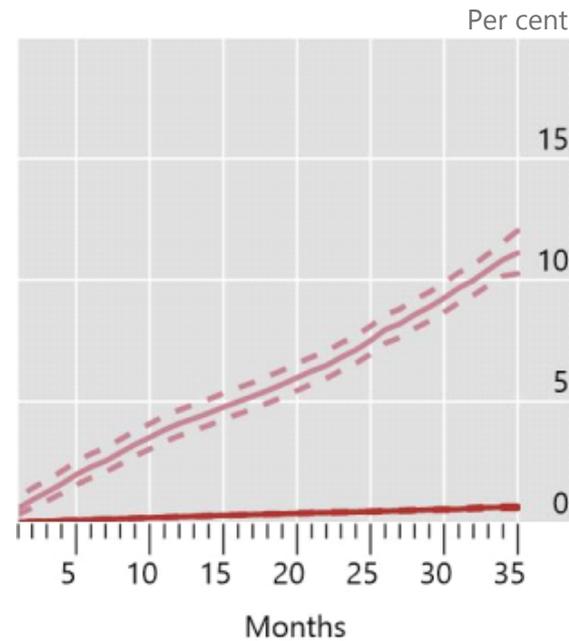
Source: Authors' calculations.

Spillover effects from big tech credit use to bank credit use

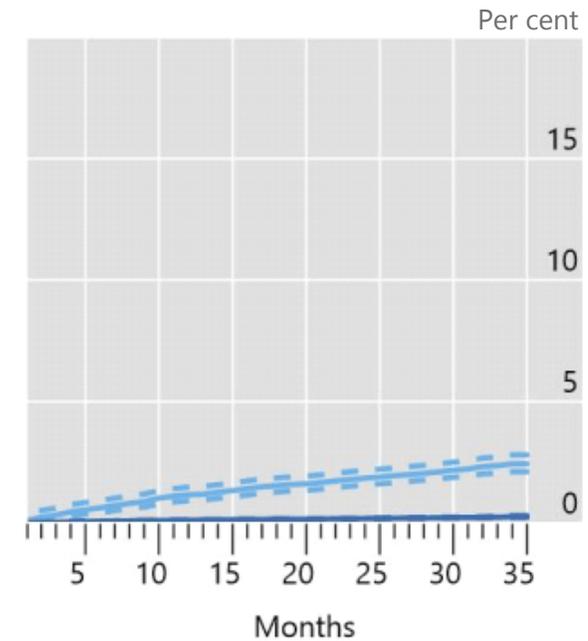
Total bank credit



Unsecured bank credit



Secured bank credit



— Firms that used MYbank credit
— Firms that did not use MYbank credit

— Firms that used MYbank credit
— Firms that did not use MYbank credit

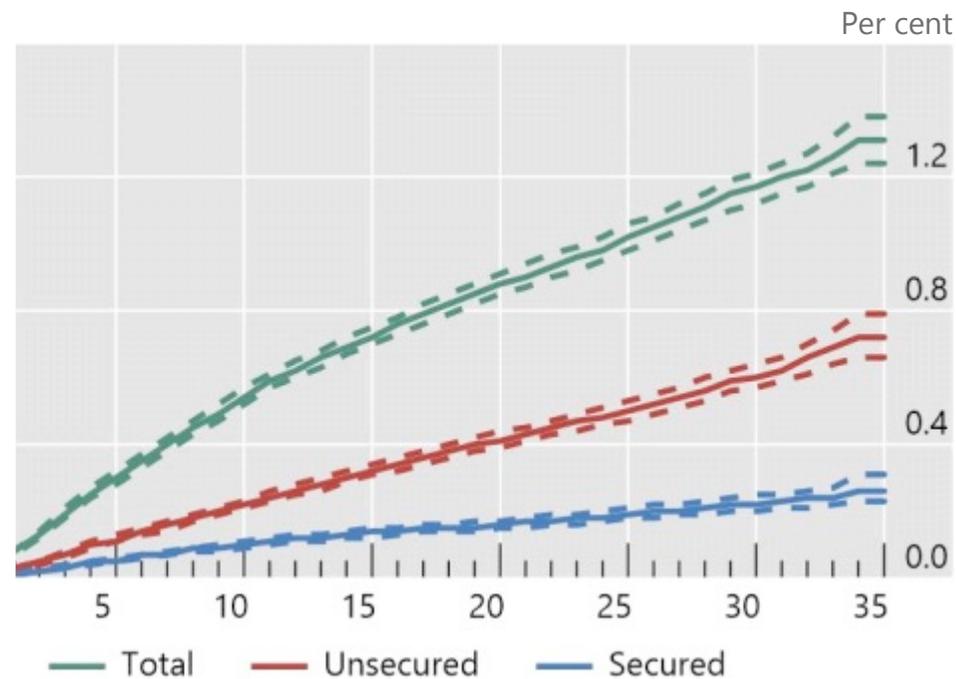
— Firms that used MYbank credit
— Firms that did not use MYbank credit

Dashed lines indicate 5th/95th percentiles. The x-axis reports the QR code duration, the number of months after the firm started to use the QR code payment system. The y-axis reports the probability for a firm of using bank credit.

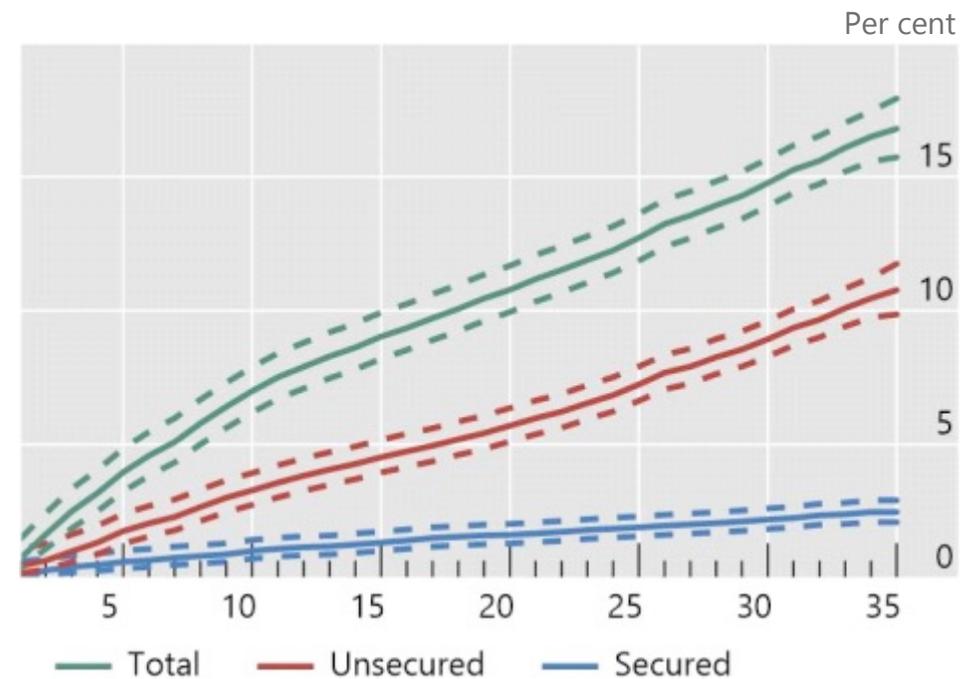
Source: Authors' calculations.

Controlling for demand effects: only firms which used big tech credit

Duration to bank credit use before using big tech credit...



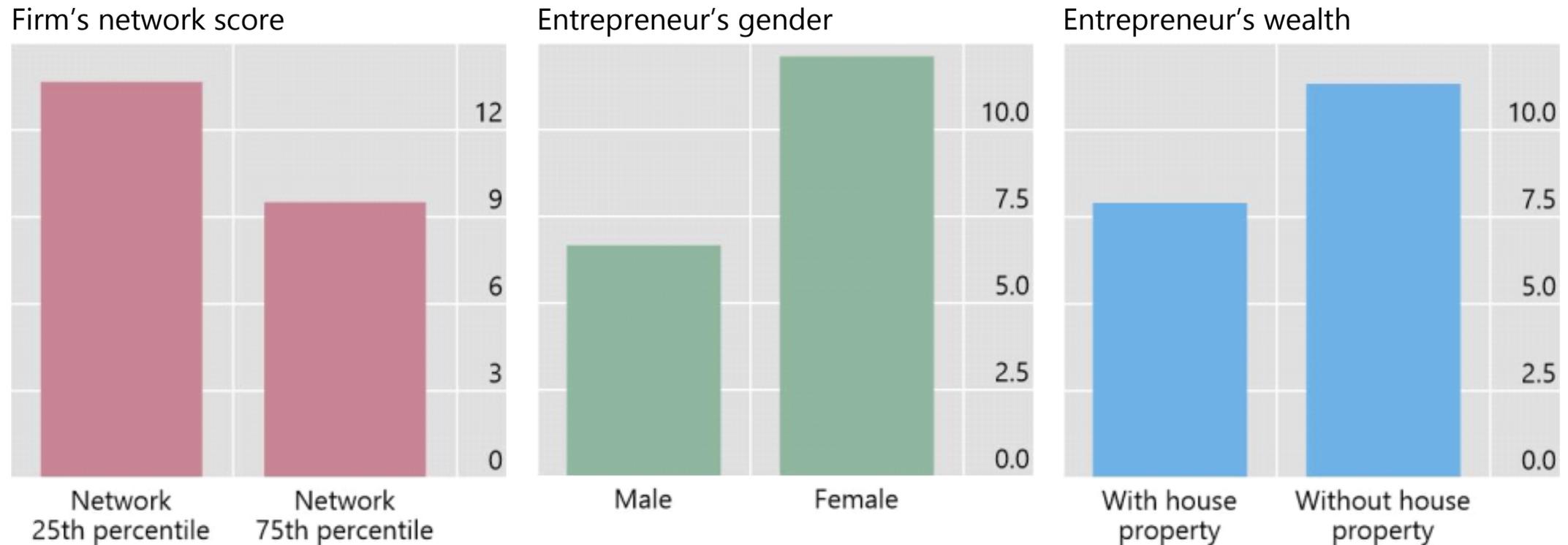
... and after using big tech credit



Dashed lines indicate 5th/95th percentiles. The x-axis reports the QR code duration, the number of months after the firm started to use the QR code payment system. The y-axis reports the probability for a firm of using bank credit.

Source: Authors' calculations.

QR code merchants characteristics: different probability for a spillover effect from big tech credit use to bank credit use



The bars show the different probability to get bank credit for firms who used big tech compared those that do not use it.

Source: Authors' calculations.



Question (3):

Does the use of QR code in payment and the subsequent provision of credit produce real effects on firms' activity?

Real effects of big tech credit

| | (I) | (II) | (III) |
|-------------------------|--|--|---|
| | Dependent variable: Log Transaction volume | | |
| Explanatory variables | Test 1: Exogenous shock of credit supply | Test 2: Effect in normal times | Test 3: Effect Covid-19 shock |
| Post*Treatment dummy | 0.093*** (0.000) | 0.035*** (0.000) | 0.200*** (0.008) |
| Time fixed effects | Y | N | N |
| Firm fixed effects | Y | N | Y |
| Firm*Time fixed effects | N | Y | N |
| Period fixed effects | N | Y | N |
| City*Time fixed effects | N | N | Y |
| Observations | 111,776 | 2,297,540 | 6,715,578 |



Conclusions

Main takeaways of the paper

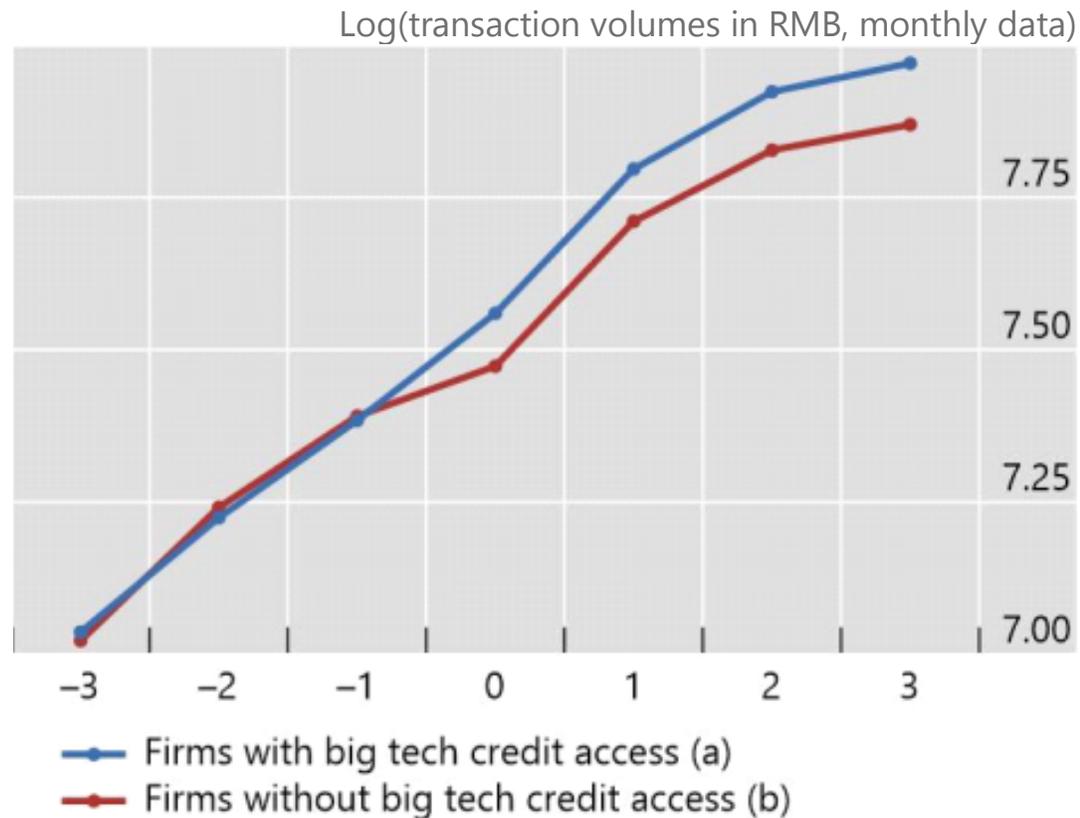
- The creation of a digital payment footprint allows firms to access other financial services and products offered by big techs.
- The use of big tech financial services and transaction data generated via QR code generates spillover effects on bank credit. The inclusion of big tech credit in the credit registry allows SMEs to be better screened/monitored by banks. These alleviate SMEs' asymmetric information problems with banks and allow SMEs to access also more traditional banking services.
- The real effects of QR code credit are economically relevant, especially in the case of the Covid-19 shock.



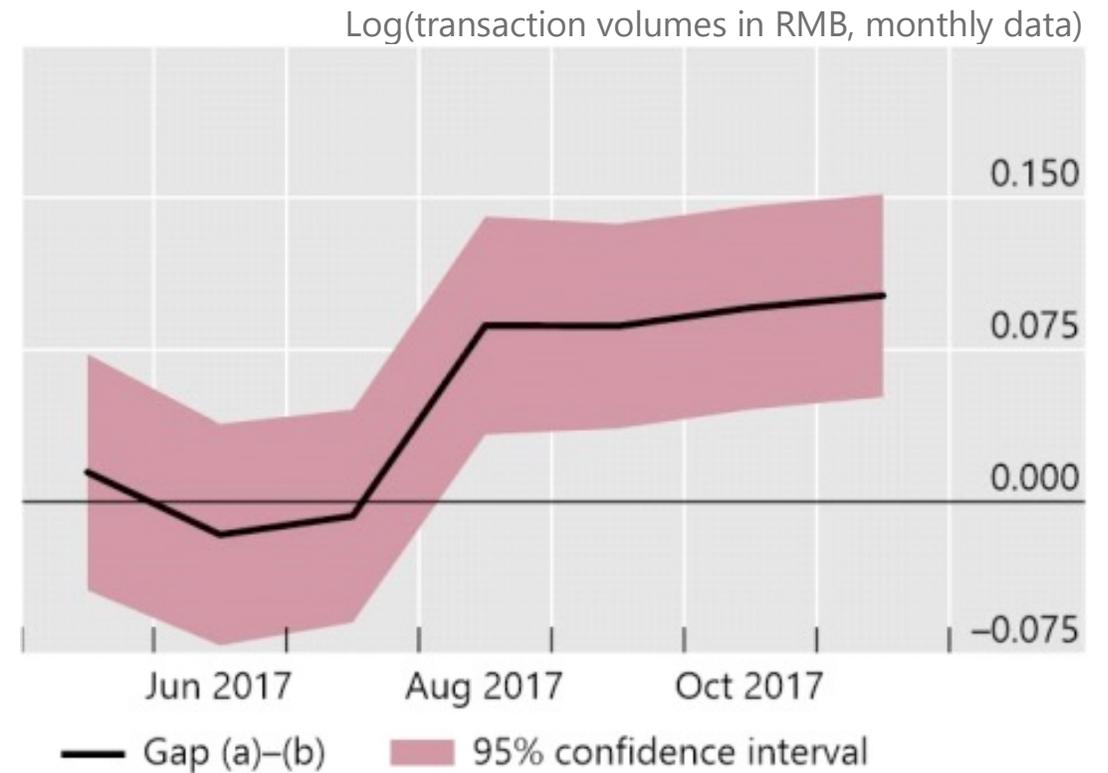
Annexes

Effect of the launch of big tech loan products on firms' transaction volumes

Evolution of Ln(transaction volume) around launch date



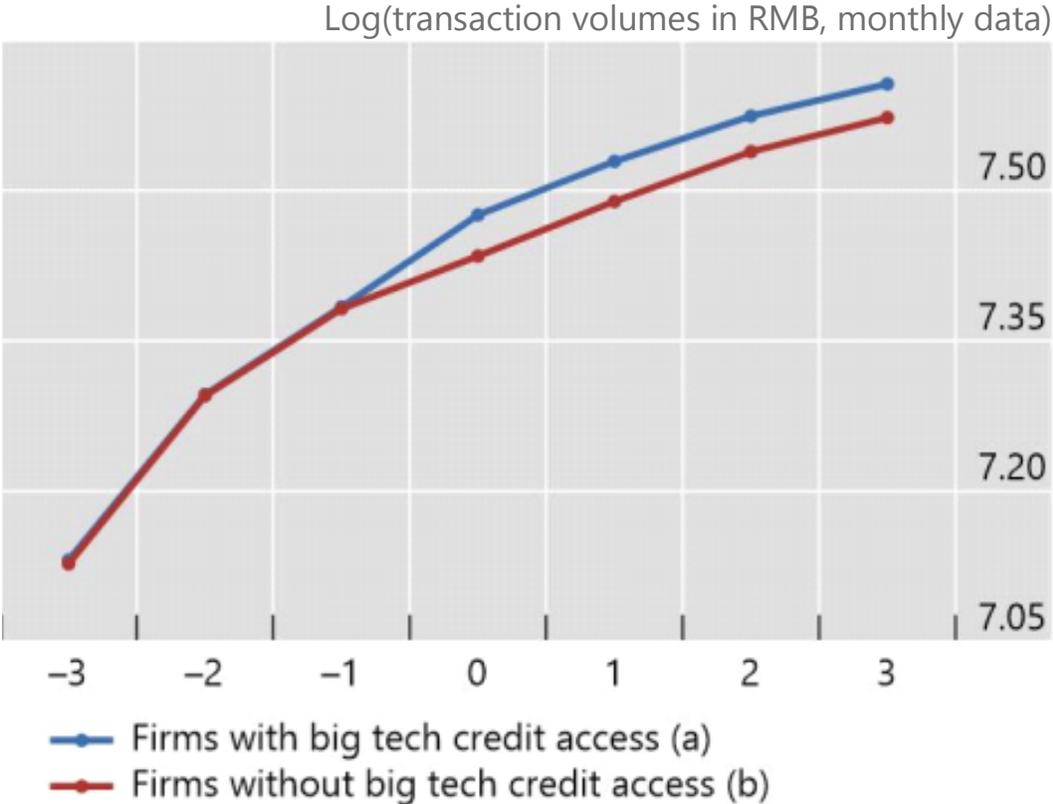
Difference between the two firms' type



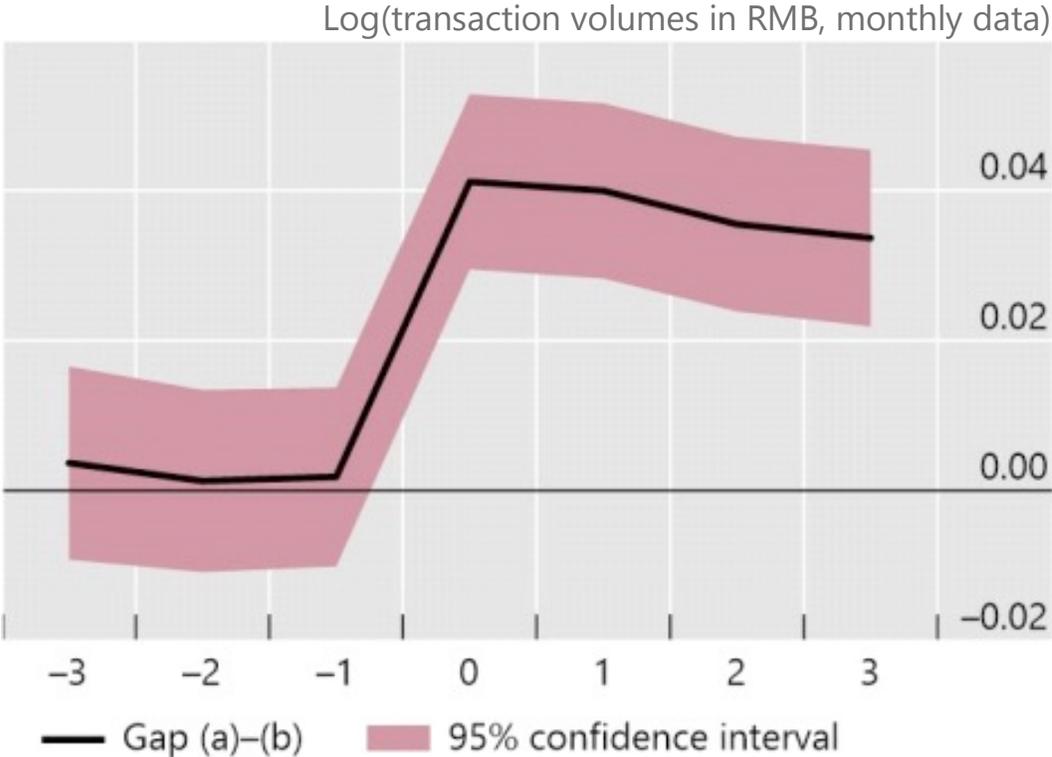
Source: Authors' calculations.

Effect of big tech credit access on firms' transaction volumes in normal times

Evolution of Ln(transaction volume) around access date

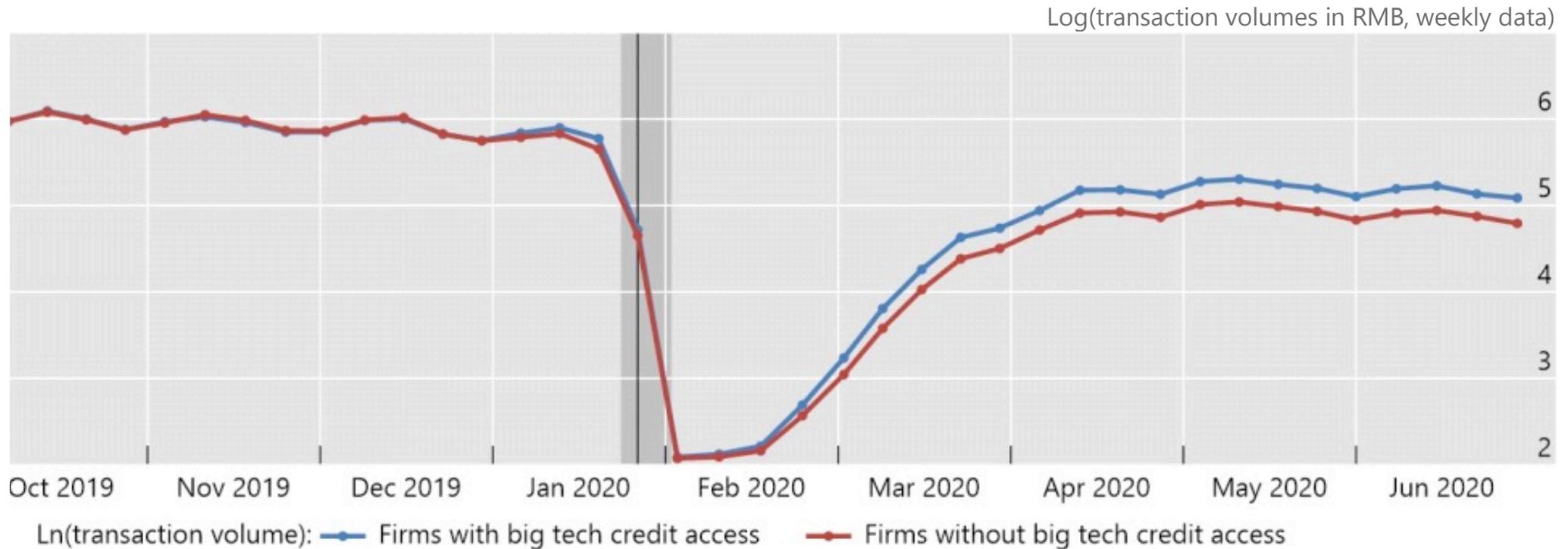


Difference between the two firms' type



Source: Authors' calculations.

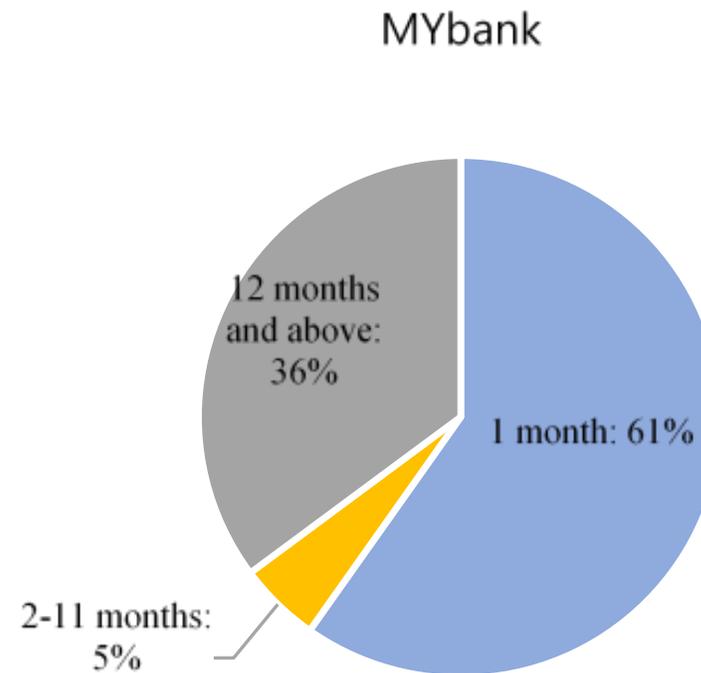
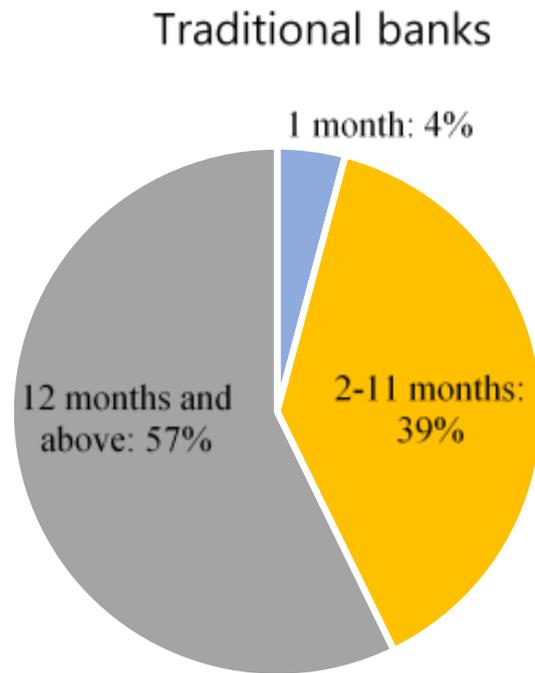
Chinese firms with QR code and access to big tech credit suffered less Covid-19 pandemic



The vertical line indicates 26 Jan 2020 (Covid-19 measures were effective from this date onwards). The shaded area indicates 24 Jan–2 Feb 2020 (Chinese Spring Festival). The sample includes 8,800 randomly selected QRcodes of merchants which are used to construct weekly-firm level panel data. 4,400 QRcode merchants have access to big tech credit and others don't.

Source: Authors' calculations.

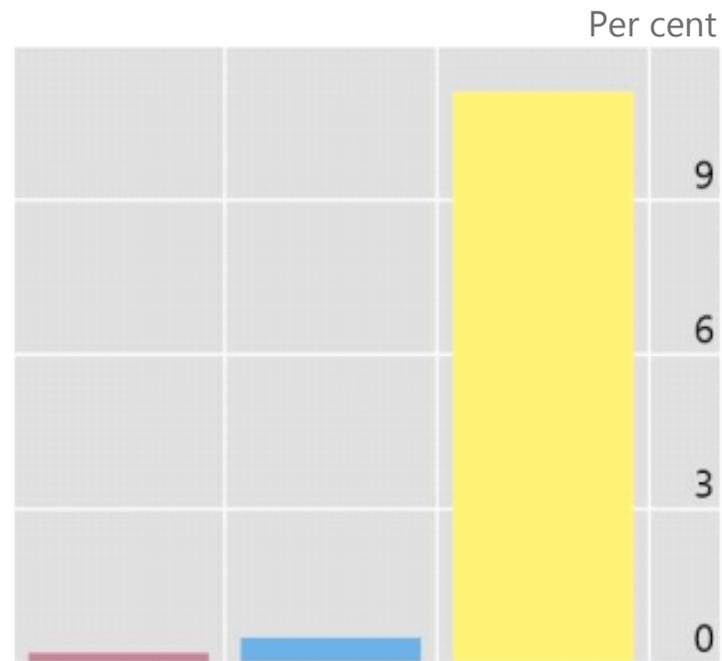
Distribution of loan by duration: Traditional banks vs MYbank



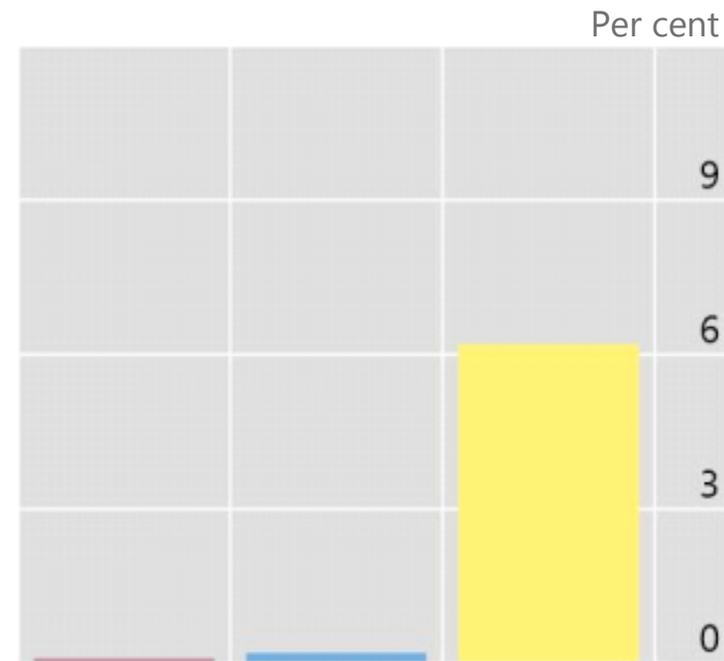
Source: MYbank.

Do “banked” firms have access or use big tech credit?

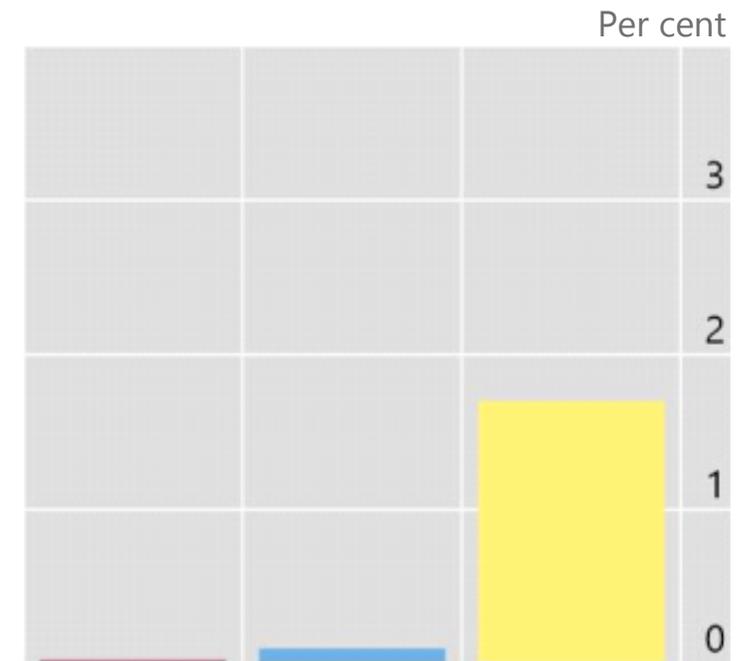
Bank credit total



Bank credit unsecured



Bank credit secured



Firms that do not have access to MYbank credit

Firms that have access to MYbank credit but that do not use it

Firms that use MYbank credit

Source: Ant Group.

Duration models

| | (I) | (II) | (III) | (IV) |
|-------------------------|--|-------------------------|----------------------------|--------------------------|
| | Hazard rate: probability that the firm ... | | | |
| | has access to big tech credit | uses bank credit | uses unsecured bank credit | uses secured bank credit |
| Log Transaction volume | 0.0494*** (0.00113) | 0.0393*** (0.00949) | 0.0257** (0.0127) | 0.0340*** (0.00932) |
| Network score | 0.0022*** (0.000143) | 0.0236*** (0.000616) | 0.0258*** (0.000822) | 0.0182*** (0.000671) |
| Male (0/1) | -0.153*** (0.00402) | 0.493*** (0.0292) | 0.452*** (0.0398) | 0.377*** (0.0297) |
| Age | -0.0031*** (0.00022) | -0.0160*** (0.00167) | -0.0281*** (0.00236) | -0.00279* (0.00169) |
| House property (0/1) | 0.565*** (0.00510) | 0.861*** (0.0426) | 0.974*** (0.0604) | 0.777*** (0.0457) |
| Distance to bank branch | 0.00883*** (0.00155) | -0.0256** (0.0108) | -0.0131 (0.0145) | -0.0262** (0.0108) |
| Time fixed effects | Y | Y | Y | Y |
| Province fixed effects | Y | Y | Y | Y |
| Macroeconomic controls | Y | Y | Y | Y |
| Observations | 3,547,119 | 8,435,471 | 8,480,023 | 8,435,471 |