

Public guarantees and credit additionality during the Covid-19 pandemic

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*How effective were policy measures in supporting bank lending
during the Covid-19 crisis?*

The views expressed are those of the authors and do not necessarily reflect those of the Bank of Italy.

Motivation

Public guarantees and credit additionality

- ▶ Public guarantee programs were a cornerstone of governments' strategy to mitigate the effects of the Covid-19 pandemic on the economy.
- ▶ Main policy objective was to relax the credit constraints of firms facing a severe liquidity shock.
- ▶ But banks and firms may opportunistically use public guarantees to substitute pre-existing non-guaranteed credit for new publicly guaranteed loans.
- ▶ Loan substitution at the bank level (i.e. within-bank) lowers expected losses on pre-existing credit and in turn it frees up bank capital.

This paper

We evaluate the loan guarantee programs launched by the Italian Government in response to the Covid-19 shock.

- ▶ **Bank and firm characteristics** associated with the granting of a guaranteed loan
- ▶ Degree of **credit additionality** of the programs by estimating a **guarantee multiplier** (i.e. €s of new credit for €1 of guarantees) and show how this changes across:
 - Guarantee programs
 - Firm and bank characteristics
- ▶ A key novelty of our paper is that we document relevant **heterogeneities** depending on:
 - **Coverage** of the guarantee program (100, 90, 80)
 - **Time period**: high uncertainty (Q2-2020) vs the rest (Q3-2020 – Q1-2021)

Literature review

- ▶ Covid-19 Support measures:
 - Effects on employment and firm shutdowns: Autor et al. (2020), Granja et al. (2020), Hubbard & Stain (2020).
 - Lending during Covid (and loan guarantees): Chodorow-Reich et al. (2020), Kapan & Minou (2020), Core & De Marco (2020), Balyuk et al. (2021), Li & Strahan (2021), Altavilla et al. (2021), Jimenez et al. (2022).
- ▶ Previous literature on loan guarantees:
 - Fondo Centrale di Garanzia: D'Ignazio & Menon (2013), Boschi et al. (2014), De Blasio et al. (2018), Cerulli & Ventura (2020).
 - Other countries: Smith (1983), Gale (1990, 1991), Ono et al. (2013), Mullins & Toro (2018), Bachas et al. (2020).

Outline

1. Theoretical framework
2. Data
3. Propensity to grant/receive a guaranteed loan
4. Credit additionality
5. Robustness checks
6. Conclusions

Theoretical Framework

Loan substitution, bank perspective:

- ▶ Reduce risk weights, lower capital absorption
- ▶ Reduce expected losses as government guarantees for a substantial share of the loan (coverage ratio)
- ▶ But interest income loss, as guaranteed loans carry a lower rate (some programs have interest rate caps)

Loan substitution, firm perspective:

- ▶ Save on interest expenses
- ▶ But if substitute more, may be less able to cover liquidity needs (immediate and prospective).

Theoretical Framework

We derive a simple game-theoretic model of the interaction between a firm and its lenders that captures the main trade-offs and delivers the following key testable implications:

- ① A higher coverage ratio implies, *ceteris paribus*, a higher credit multiplier (i.e. more additionality)
- ② Banks with lower costs of funding (debt and/or equity) have higher credit multipliers, especially for programs with lower guarantee coverage.
- ③ Higher firm leverage (liquidity needs) leads to lower (higher) credit multipliers.

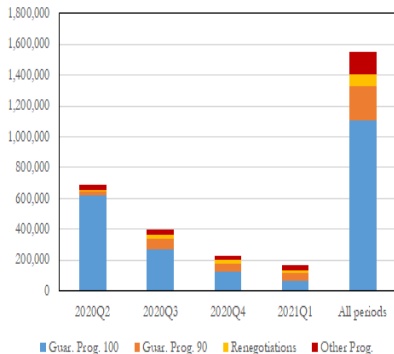
Sample

- ▶ Firms eligible for FCG guaranteed loans: SMEs without non-performing loans.
- ▶ Monthly data on credit to Italian non-financial firms (NFCs): Italian Credit Register – December 2019 - March 2021
- ▶ AnaCredit for interest rate data at loan level
- ▶ Data on guaranteed loans:
Fondo Centrale di Garanzia (FCG) – from 2020Q2
- ▶ Accounting information on borrowers: Cerved
- ▶ Data on banks' consolidated balance sheets:
Harmonized supervisory reports (FINREP)

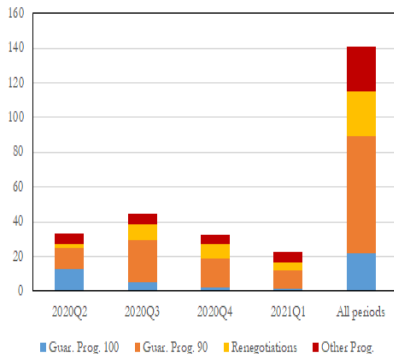
FCG guaranteed loans

Distribution across FCG loan guarantee programs

a) Number of guar. loans



b) Amount of guar. loans (€bn)



- ▶ Guarantee program 100 ("Letter M"; less of €30,000, 100% coverage)
- ▶ Guarantee program 90 ("Letter N and C"; less of €5 million, 90% coverage)
- ▶ Renegotiations (program for debt renegotiations, 80% coverage)
- ▶ Other pre-existing programs as a benchmark (up to 80% coverage)

Likelihood to *receive* a guaranteed loan

Methodology

Multivariate analysis

$$D(\text{Guar.LoanProgram}Y_i) = \beta_1 \text{FirmCharacteristics}_i + \text{industry}_i + \text{province}_i + \epsilon_i \quad (1)$$

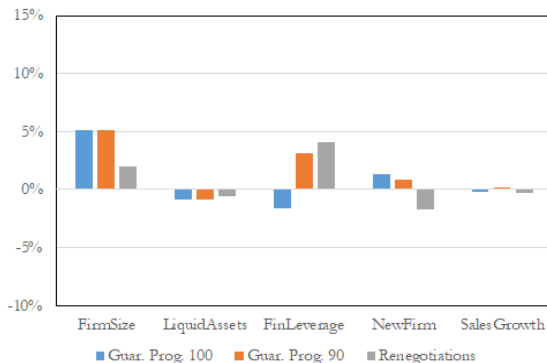
- ▶ $D(\text{Guar.LoanProgram}Y_i)$: equal to one if firms i obtained a guaranteed loan of a specific program (100%, 90%, 80%, renegotiation)
- ▶ $\text{FirmCharacteristics}_i$: *Size* (log Sales), *Liquid Assets* (ratio of liquid assets to tot short term liabilities), *FinLeverage* (ratio fin debt to tot liabilities), *NewFirm* (dummy if firm established less than 3 years ago), *Sales Growth* (avg. sales growth last 3 years)
- ▶ Industry and province FE

Likelihood to *receive* a guaranteed loan by program

Guaranteed loans are more likely for firms with larger size, less liquidity, higher leverage and lower age; but small effects average all progr.

Likelihood differences across firms

All periods (2020Q2-2021Q1)



For each variable of the vector *FirmCharacteristics*, the likelihood difference is computed using the corresponding coefficient in Table and multiplying it by the inter-quartile range (IQR) of that variable. For program 100 loans only firms with sales below €500k are considered.

Likelihood to *provide* a guaranteed loan

Methodology

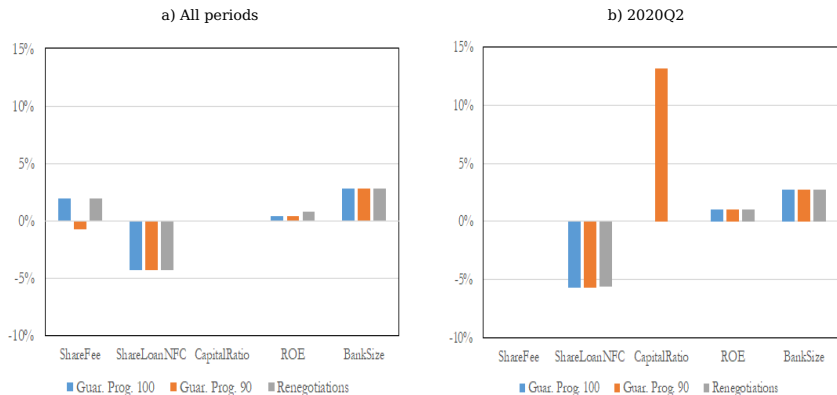
$$D(\text{GuaranteedLoan}_{i,j}) = \beta_1 \text{BankCharacteristics}_j \bullet \text{ProgramY}_{i,j} + \beta_2 \text{Relationship}_{i,j} + \text{Firm}_i + \epsilon_{i,j} \quad (2)$$

- ▶ $D(\text{GuaranteedLoan}_{i,j})$: equal to one for guaranteed loans granted by bank j to firm i
- ▶ $\text{BankCharacteristics}_j$: *ShareFee* (fee income over oper income), *ShareLoan-NFC* (diff. share NFC vs. HH loans over tot loans), *CapitalRatio* (tot equity over tot assets), *ROE* (pre-tax income over tot equity), *Size* (log tot assets)
- ▶ $\text{ProgramY}_{i,j}$: set of dummies to identify guarantee programs between firm i and bank j .
- ▶ $\text{Relationship}_{i,j}$: *MainLender* (the bank holding the largest share of credit) and $\Delta\text{Credit2020Q1}$ (change in outstanding credit in 2020Q1)
- ▶ Firm FE

Likelihood to *provide* a guaranteed loan

Bank capital matters in 2020Q2 for program 90

Likelihood differences across banks



For each variable of the vector *BankCharacteristics*, the likelihood difference is computed using the corresponding coefficient in [Table](#) and multiplying it by the inter-quartile range (IQR) of that variable.

Guarantee multiplier - non-parametric analysis

- ▶ How many euros of additional credit are generated by €1 of guarantees for firm i

$$\Delta \frac{\text{credit granted by bank } j}{\text{total granted credit}} = \beta \frac{\text{guaranteed amount by bank } j}{\text{total granted credit}}$$

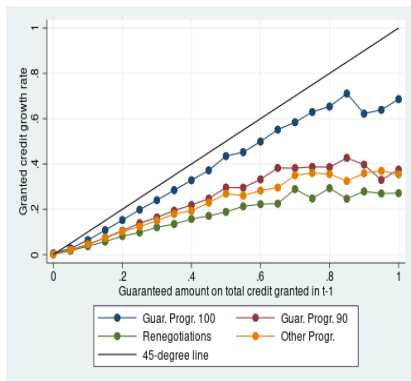
- Full **additionality** if β is equal to 1
 - Full **substitution** if β is equal to 0
- ▶ We check that credit substitution occurs within the same bank providing the guaranteed loan. Indeed, very small substitution ($\approx \text{€}0.02$ for €1 guarantee) for other lenders.

Credit additionality across programs

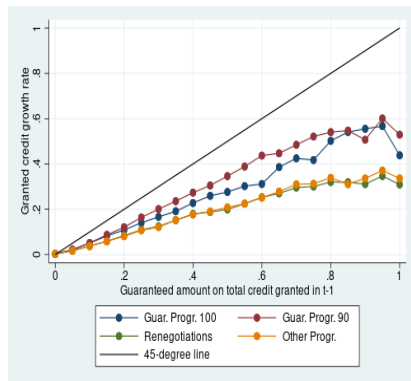
Loan Growth: greater additionality for program 100 in 2020Q2

- ▶ Estimated guarantee multiplier: slope of the curve

a) Multiplier 20Q2



b) Multiplier 20Q3

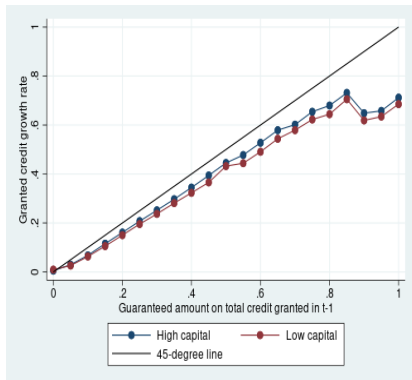


In each period we assign each bank-firm relationship to 20 buckets based on the ratio between the guaranteed amount taken in each quarter and the amount of granted credit at the beginning of the period (from 0 to 1 with a 0.05 interval). For each bucket we compute the average of the growth of granted credit.

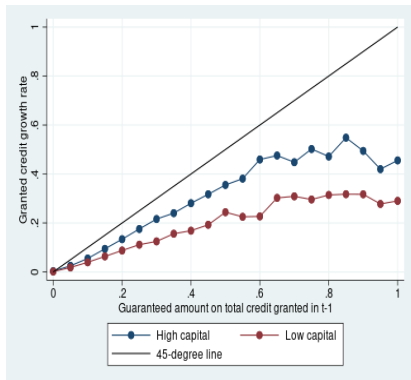
Credit additionality: bank capital

The role of bank capital is negligible for fully guaranteed loans while it matters when banks have more "skin in the game"

a) Multiplier [guarantee program 100](#): 20Q2



b) Multiplier [guarantee program 90](#): 20Q2



In each period we assign each bank-firm relationship to 20 buckets based on the ratio between the guaranteed amount taken in each quarter and the amount of granted credit at the beginning of the period (from 0 to 1 with a 0.05 interval). For each bucket we compute the average of the growth of granted credit. The figure reports different lines for banks with capital ratios above (high capital) or below (low capital) the median level.

Credit additionality across programs

Methodology

$$\begin{aligned}\Delta\text{Credit}_{i,j} = & \alpha \text{GuarLoan}_{i,j} * \text{ProgramY}_{i,j} \\ & + \beta \text{GuarLoan}_{i,j} \text{ProgramY}_{i,j} * \text{GuarAmount}_{i,j} + \\ & + FE + \epsilon_{i,j}\end{aligned}\tag{3}$$

- ▶ $\Delta\text{Credit}_{i,j}$: the change in credit granted by bank j to firm i over the total amount of granted credit to firm i
- ▶ $\text{GuarLoan}_{i,j}$: equal to one for guaranteed loans granted by bank j to firm i
- ▶ $\text{GuarAmount}_{i,j}$: the ratio of the amount of the guaranteed loan provided by bank j to the total amount of granted credit to firm i
- ▶ $\text{ProgramY}_{i,j}$: set of dummies to identify guarantee programs
- ▶ FE: different sets of FE (bank, firm or sector and province)

In further steps we interact $\text{GuarLoan} * \text{GuarAmount}$ with firm and bank characteristics for each program

Credit additionality across guarantee programs

Higher multiplier for fully guaranteed loans in 2020Q2

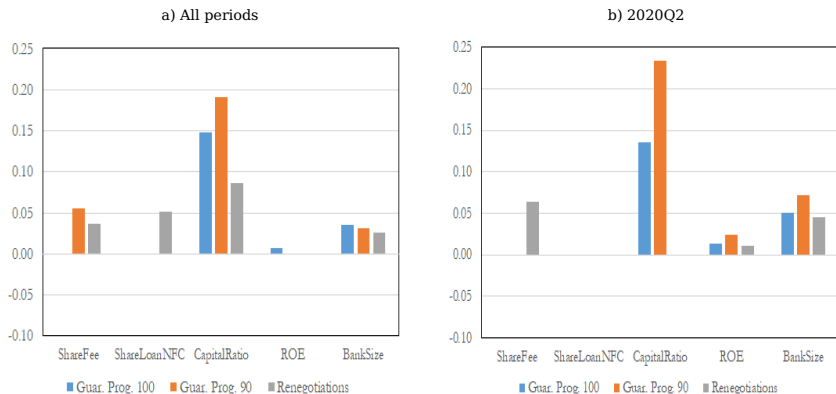
	(1)	(2)	(3)	(4)	(5)
	All periods	2020Q2	2020Q3	2020Q4	2021Q1
GuarLoan x GuarAmount	0.7263*** (0.0000)	0.8370*** (0.0000)	0.6025*** (0.0000)	0.4845*** (0.0000)	0.5674*** (0.0000)
GuarLoan x GuarFirm90 x GuarAmount	-0.0996*** (0.0000)	-0.2550*** (0.0000)	0.0714*** (0.0000)	0.0733*** (0.0000)	0.0086 (0.5626)
GuarLoan x GuarFirmRen x GuarAmount	-0.1072*** (0.0000)	-0.1908*** (0.0000)	-0.0535*** (0.0023)	-0.0731*** (0.0000)	-0.0701*** (0.0002)
GuarLoan x GuarFirm80 x GuarAmount	-0.2334*** (0.0000)	-0.2708*** (0.0000)	-0.1538*** (0.0000)	-0.0739*** (0.0000)	-0.1226*** (0.0000)
Constant	0.0015*** (0.0000)	0.0013*** (0.0000)	0.0036*** (0.0000)	0.0011*** (0.0000)	-0.0001 (0.3044)
Guar. program dummies	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.2958	0.5117	0.2752	0.1629	0.1393
Observations	3507628	851018	877850	888597	890163

The table shows the results of Eq. (3). The dependent variable is $\Delta Credit_{i,j}$. In column (1) sector, province, and bank fixed effects are interacted with quarter dummies. Specific dummies for each guarantee program are not reported. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Differences in guarantee multipliers across banks

Bank capital levels matter mainly when banks have more "skin in the game"

The impact of an IQR change of each bank characteristic on guarantee multipliers across programs

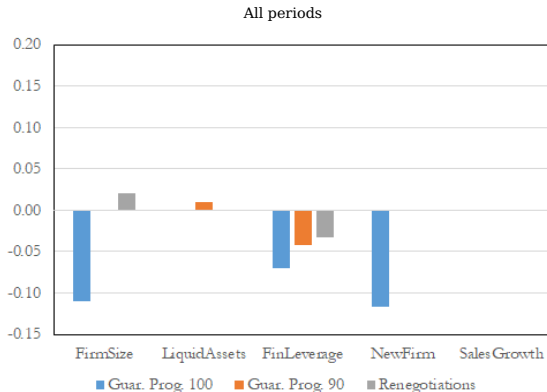


Note. For each variable of the vector *BankCharacteristics* the difference in guarantee multipliers across banks is computed using the coefficient of $GuarLoan \times GuarAmount \times BankCharacteristics$ in [Tables](#) for guarantee program 100, guarantee program 90, and renegotiations, respectively, and multiplying it by the inter-quartile range (IQR) of the variable for the sample of banks.

Differences in guarantee multipliers across firms

Low heterogeneity across firms

The impact of an IQR change of each firm characteristic on guarantee multipliers across programs



Note. For each variable of the vector *FirmCharacteristics* the difference in guarantee multipliers across firms is computed using the coefficient of $GuarLoan \times GuarAmount \times FirmCharacteristics$ in [Table](#) for guarantee program 100, guarantee program 90, and renegotiations, respectively, and multiplying it by the inter-quartile range (IQR) of that variable.

Robustness checks

- ▶ Selection of borrowers within and across guarantee programs:
 - ① Pre-trend differences in credit growth between guaranteed and not-guaranteed borrowers in 2020Q1
 - ② Firm characteristics similar across the €30,000 threshold
 - ③ Specification with firm fixed effects
 - ④ Guarantee multipliers for the 100 and 90 programs for strictly comparable borrowers (firm sales btw 500k and 1m).
- ▶ Alternative tests for effect of bank characteristics
 - ① Propensity to provide a guaranteed loan by the most capitalized bank among the lenders of the firm
 - ② Propensity to provide a guaranteed loan and bank characteristics by adding also a bank FE estimated on Q1-2020
 - ③ Bank-specific credit multipliers for the 90 program to estimate the average difference w.r.t. the 100 program
 - ④ Guarantee multipliers and bank characteristics for firms with multiple program 90 loans from different banks
- ▶ Test cross-interaction btw bank and firm charact.: very limited effects

Drivers of additionality: banks vs. firms

- ▶ Interest rate differential (ΔIR) between existing non-guaranteed loans and guaranteed loans generates opposite incentives to substitute loans for banks and firms.
 - Firms want to substitute more, the larger the differential, to save on interest expenses.
 - The opposite occurs for banks – holding other things equal such as the amount of loan substitution and firms credit risk – to gain more interest income.
- ▶ ΔIR is arguably not affected by firms' conditions after Covid: rates on guaranteed loans show weak link to measures of firm riskiness (and those of the 100% program are capped).
- ▶ We interact ΔIR with credit multiplier and firm leverage (to control for different credit risk).

Drivers of additionality: banks vs. firms

Marginal effect for avg. (per program) values of ΔIR is 8-13 cents less per euro of guarantees

	(1)	(2)	(3)	(4)	(5)
	All periods	2020Q2	2020Q3	2020Q4	2021Q1
GL x GA x ΔIR	(0.0000) -2.4729*** (0.0000)	(0.0000) -0.8174* (0.0506)	(0.0000) -4.5766*** (0.0000)	(0.0118) -4.6068*** (0.0000)	(0.3789) -2.8477*** (0.0001)
GL x GuarFirm90 x GA x ΔIR	-5.3741*** (0.0000)	-8.8586*** (0.0000)	-4.6407*** (0.0000)	-2.7143*** (0.0000)	-2.8256*** (0.0000)
GL x GuarFirmRen x GA x ΔIR	0.2606 (0.4556)	-0.2382 (0.7941)	-1.1033 (0.1629)	-1.1020* (0.0643)	1.3481* (0.0782)
GL x GuarFirm80 x GA x ΔIR	-1.8675*** (0.0000)	-4.3353*** (0.0000)	1.0025 (0.2723)	1.3941** (0.0412)	-1.8443** (0.0435)
Interaction with FinLeverage	Yes	Yes	Yes	Yes	Yes
Guar. program dummies	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.3941	0.4596	0.4479	0.3409	0.3113
Observations	1917046	476820	483343	483185	473698

Conclusions

- ▶ Our evidence suggests that **high coverage ratios** effectively provide banks with incentives to originate new credit **during a phase of severe economic distress**
- ▶ **High bank capital levels** are key not only to have sufficient loss absorbing buffers but also to favour the effectiveness of public guarantees at preserving credit access for SMEs
- ▶ **Small effect of firm risk on credit multipliers**: in general, limited heterogeneity of firm characteristics.
- ▶ **Credit additionality depends on both banks' and firms' incentives.**

ADDITIONAL MATERIAL

FCG guaranteed loans

Credit dynamics for borrowers with and w/o guaranteed loans

Table: FCG guaranteed loans for borrowers

Borrower type	Quarter	Num. of firms	Credit at the start	Credit at the end	Gr.rate of credit (%)	Median gr.rate (%)	Guar. loans
Guar. Borrowers	2020Q2	276,307	188	207	9.95	17.39	32.2
	2020Q3	151,260	182	203	11.63	11.85	35.2
	2020Q4	113,341	160	174	8.58	8.59	30.1
	2021Q1	78,106	101	110	8.09	9.02	18.4
	All periods	451,430	375	442	17.83	22.71	115.9
Other borrowers	2020Q2	709,464	483	485	0.44	-0.42	
	2020Q3	606,887	383	380	-0.60	-0.42	
	2020Q4	549,672	318	317	-0.31	-0.85	
	2021Q1	521,863	297	292	-1.77	-0.96	
	All periods	486,161	287	281	-1.9	-3.16	

For each quarter, the table reports the number of firms, the amounts of credit granted (i.e. the sum of outstanding and loan commitments), the growth rate, and the median growth rate for borrowers with records in the Italian Credit Registry with no non-performing exposure. Borrowers are divided into two groups: those that received at least one loan covered by the FCG guarantee in that quarter (*Guar. Borrowers*) and other borrowers (excluding firms with revenues above €50 million). The last column reports the amount of guaranteed loans to the former group. Credit amounts are indicated in billion EUR.

Summary statistics

	mean	median	p25	p75	sd	N
D(GuaranteedLoan)	0.097	0.000	0.000	0.000	0.296	3,721,682
ΔCredit	0.016	0.000	-0.004	0.000	0.114	3,526,516

	mean	median	p25	p75	sd	N
GuarAmount	0.018	0.000	0.000	0.000	0.087	3,702,995
GuarFirm100	0.091	0.000	0.000	0.000	0.287	3,721,682
GuarFirm90	0.117	0.000	0.000	0.000	0.321	3,721,682
GuarFirm80	0.108	0.000	0.000	0.000	0.311	3,721,682
GuarFirmRen	0.074	0.000	0.000	0.000	0.261	3,721,682
D(GuarLoan in prev. quarters)	0.181	0.000	0.000	0.000	0.385	3,721,682

	mean	median	p25	p75	sd	N
ShareFee	0.333	0.372	0.259	0.379	0.079	3,057,009
ShareLoanNFC	0.090	0.095	0.032	0.202	0.137	3,057,009
CapitalRatio	0.073	0.071	0.066	0.079	0.019	3,057,009
ROE	0.046	0.075	0.039	0.087	0.120	3,057,009
BankSize	24.505	25.093	22.001	27.198	2.442	3,057,009
HighCapBank	0.182	0.000	0.000	0.000	0.386	664,673

	mean	median	p25	p75	sd	N
FirmSize	7.255	7.283	6.155	8.430	1.673	3,659,587
LiquidAssets	0.331	0.096	0.021	0.324	0.678	3,719,385
FinLeverage	0.198	0.131	0.000	0.350	0.219	3,715,862
NewFirm	0.034	0.000	0.000	0.000	0.181	3,721,682
SalesGrowth	0.079	0.038	-0.044	0.162	0.346	3,687,254

Propensity to receive a guaranteed loan

Guaranteed loans are more likely for firms with larger size, less liquidity, higher leverage, lower age, lower sales growth, and higher usage of credit lines [back](#)

	(1)
	All periods
FirmSize	0.0176*** (0.0000)
LiquidAssets	-0.0552*** (0.0000)
FinLeverage	0.0674*** (0.0000)
NewFirm	0.0224*** (0.0000)
SalesGrowth	-0.0041*** (0.0000)
Δ Credit2020Q1	0.2726*** (0.0000)
Constant	0.1138*** (0.0000)
Sector FE	Yes
Province FE	Yes
Adj. R-squared	0.1043
Observations	1286100

Robust p-values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Propensity to receive a guaranteed loan by program

back

	(1)	(2)	(3)	(4)
	Guar.Prog.100	Guar.Prog.90	Ren.	Other Prog.
FirmSize	0.0395*** (0.0000)	0.0398*** (0.0000)	0.0157*** (0.0000)	0.0205*** (0.0000)
LiquidAssets	-0.0286*** (0.0000)	-0.0279*** (0.0000)	-0.0205*** (0.0000)	-0.0298*** (0.0000)
FinLeverage	-0.0528*** (0.0000)	0.0888*** (0.0000)	0.1168*** (0.0000)	0.1389*** (0.0000)
NewFirm	0.0132*** (0.0000)	0.0081*** (0.0006)	-0.0170*** (0.0000)	-0.0179*** (0.0000)
SalesGrowth	-0.0101*** (0.0000)	0.0100*** (0.0000)	-0.0163*** (0.0000)	-0.0100*** (0.0000)
ΔCredit2020Q1	0.2864*** (0.0000)	0.0921*** (0.0000)	-0.0020*** (0.0067)	0.0059*** (0.0000)
D(GuarLoan in prev. quarters)	0.0968*** (0.0000)	-0.0330*** (0.0000)	-0.0583*** (0.0000)	-0.0520*** (0.0000)
D(GuarLoan in prev. quarters) x FirmSize	-0.0325*** (0.0000)	0.0051*** (0.0000)	0.0093*** (0.0000)	0.0092*** (0.0000)
D(GuarLoan in prev. quarters) x LiquidAssets	0.0256*** (0.0000)	0.0077*** (0.0000)	-0.0015* (0.0868)	0.0009 (0.4196)
D(GuarLoan in prev. quarters) x FinLeverage	0.0550*** (0.0000)	-0.0404*** (0.0000)	-0.0102*** (0.0075)	-0.0205*** (0.0000)
D(GuarLoan in prev. quarters) x NewFirm	-0.0057** (0.0223)	0.0108** (0.0110)	0.0054** (0.0420)	0.0140*** (0.0001)
D(GuarLoan in prev. quarters) x SalesGrowth	0.0128*** (0.0000)	0.0184*** (0.0000)	-0.0019 (0.3221)	0.0022 (0.3386)
D(GuarLoan in prev. quarters) x ΔCredit2020Q1	-0.2857*** (0.0000)	-0.0982*** (0.0000)	-0.0262*** (0.0000)	-0.0480*** (0.0000)
Constant	-0.0444*** (0.0000)	-0.2146*** (0.0000)	-0.0752*** (0.0000)	-0.0836*** (0.0000)
Sector FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Adj. R-squared	0.2478	0.0441	0.0359	0.0340
Observations	704300	944975	944975	944975

The table shows the results of Eq. (1). The dependent variable is $D(\text{GuaranteedLoanProgram}Y_{i,j})$. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Propensity to provide a guaranteed loan by program

back

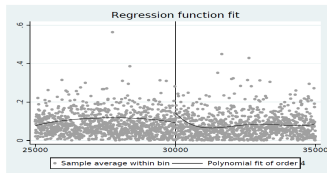
	(1)	(2)	(3)	(4)	(5)
	All periods	2020Q2	2020Q3	2020Q4	2021Q1
ShareFee	0.1982* (0.0876)	0.2012 (0.1752)	0.2721** (0.0150)	0.1291 (0.4117)	0.2011** (0.0472)
ShareLoanNFC	-0.1546* (0.0168)	-0.2050** (0.0147)	-0.1320** (0.0422)	-0.0260 (0.7469)	-0.0821 (0.1105)
CapitalRatio	-0.2341 (0.5820)	-0.8428 (0.1144)	0.8828* (0.0960)	-0.0378 (0.8464)	-0.0837 (0.8425)
ROE	0.0852* (0.0065)	0.1860*** (0.0000)	-0.0754 (0.5422)	0.0504 (0.4427)	0.1147*** (0.0000)
BankSize	0.0163*** (0.0000)	0.0160*** (0.0001)	0.0140*** (0.0003)	0.0131*** (0.0033)	0.0215*** (0.0000)
MainLender	0.0886** (0.0000)	0.0840*** (0.0000)	0.0603** (0.0005)	0.0825*** (0.0000)	0.0675*** (0.0000)
ΔCredit2020Q1	0.1364*** (0.0006)	0.1086* (0.0761)	0.1516** (0.0126)	0.2176*** (0.0000)	0.0504 (0.4245)
GuarFirm90 x ShareFee	-0.2674** (0.0473)	-0.2126 (0.2764)	-0.2366* (0.0570)	-0.3056** (0.0389)	-0.4470*** (0.0005)
GuarFirm90 x ShareLoanNFC	-0.0280 (0.7749)	-0.1230 (0.4857)	-0.0082 (0.9150)	-0.0908 (0.2631)	-0.0188 (0.8119)
GuarFirm90 x CapitalRatio	1.2367 (0.1651)	3.2853** (0.0456)	0.3283 (0.6374)	0.4419 (0.5357)	-0.2854 (0.0537)
GuarFirm90 x ROE	-0.0092 (0.8123)	-0.1414 (0.1416)	0.1529*** (0.0088)	0.0165 (0.6037)	-0.0543* (0.0537)
GuarFirm90 x BankSize	0.0073 (0.4370)	0.0198 (0.2439)	0.0033 (0.6587)	0.0061 (0.3257)	0.0038 (0.4376)
GuarFirm90 x MainLender	0.0060 (0.8717)	0.0461*** (0.0048)	0.0002 (0.9745)	-0.0196* (0.0595)	-0.0112 (0.3311)
GuarFirm90 x ΔCredit2020Q1	-0.2396*** (0.0000)	0.0596 (0.5913)	-0.3047*** (0.0000)	-0.4027*** (0.0000)	-0.1131* (0.0663)
GuarFirm90 x ShareFee	0.3688 (0.1219)	0.2154 (0.2601)	0.3669 (0.2841)	0.6089** (0.0419)	0.6337 (0.1202)
GuarFirm90 x ShareLoanNFC	0.2237 (0.1083)	0.3822** (0.0112)	0.3199* (0.0932)	0.0496 (0.7387)	0.0592 (0.7479)
GuarFirm90 x CapitalRatio	-0.3956 (0.5114)	-0.8842 (0.2456)	-0.3331 (0.6493)	-0.5099 (0.5956)	0.1498 (0.6686)
GuarFirm90 x ROE	-0.3528*** (0.0002)	-0.1972 (0.2186)	-0.2714 (0.1074)	-0.3761*** (0.0007)	-0.3447*** (0.0000)
GuarFirm90 x BankSize	0.0023 (0.7166)	-0.0082 (0.1981)	0.0017 (0.8474)	-0.0009 (0.9166)	0.0049 (0.6734)
GuarFirm90 x MainLender	0.0551*** (0.0000)	0.0796*** (0.0000)	0.0718*** (0.0000)	0.0533*** (0.0000)	0.0076 (0.6581)
GuarFirm90 x ΔCredit2020Q1	-0.1787 (0.1231)	0.2822 (0.1469)	0.1401 (0.2523)	-0.2426*** (0.0002)	-0.2566 (0.1101)
GuarFirm80 x ShareFee	-0.3566 (0.1268)	-0.1026 (0.4771)	-0.3980 (0.2899)	-0.6372** (0.0237)	-0.4146 (0.1328)
GuarFirm80 x ShareLoanNFC	-0.0098 (0.9180)	0.0017 (0.9851)	-0.0295 (0.8299)	-0.0756 (0.5050)	0.0262 (0.8576)
GuarFirm80 x CapitalRatio	-0.5499 (0.3772)	-0.3151 (0.4667)	-1.1895 (0.1870)	-0.9221 (0.2129)	-0.4133 (0.6015)
GuarFirm80 x ROE	0.0786* (0.0926)	0.0679 (0.1718)	0.0662 (0.4670)	0.0638 (0.2213)	0.0426 (0.5343)
GuarFirm80 x BankSize	0.0017 (0.7657)	-0.0091 (0.1057)	0.0012 (0.9151)	0.0175** (0.0301)	0.0052 (0.6341)
GuarFirm80 x MainLender	0.0321*** (0.0000)	0.0144 (0.1518)	0.0477*** (0.0035)	0.0279*** (0.0421)	0.0461*** (0.0000)
GuarFirm80 x ΔCredit2020Q1	-0.1439*** (0.0027)	-0.0265 (0.7730)	-0.1935** (0.0212)	-0.2790*** (0.0001)	-0.0516 (0.4772)
Constant	-0.2612* (0.0543)	-0.2135 (0.3662)	-0.2211 (0.1256)	-0.2835*** (0.0003)	-0.3804*** (0.0001)
Firm FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.1918	0.1834	0.1956	0.2024	0.2004
Observations	600259	197774	166212	142381	93892

The table shows the results of Eq. (2). The dependent variable is $D(\text{GuaranteedLoanProgram}Y_{i,j})$. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

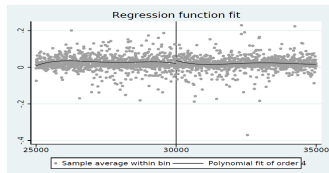
Firm characteristics

back

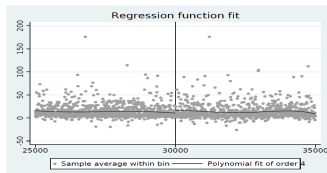
a) Liquidity



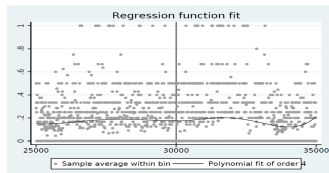
b) ROA



c) Interest Coverage Ratio



d) Dummy Bad Z-Score=1



Differences in guarantee multipliers across banks

Program 100 [back](#)

	(1)	(2)	(3)	(4)	(5)
	All periods	2020Q2	2020Q3	2020Q4	2021Q1
GuarLoan x GuarAmount	-0.2022 (0.1499)	-0.3837** (0.0323)	-0.0161 (0.9463)	-0.1051 (0.6463)	0.4181* (0.0941)
GuarLoan x GuarAmount x ShareFee	0.3514 (0.2052)	0.3424 (0.2844)	0.1626 (0.6538)	0.2170 (0.4641)	0.2238 (0.6174)
GuarLoan x GuarAmount x ShareLoanNFC	-0.1225 (0.3068)	-0.1885 (0.2200)	0.1883 (0.3111)	-0.2878* (0.0902)	-0.0314 (0.9098)
GuarLoan x GuarAmount x CapitalRatio	2.7462*** (0.0002)	2.4986** (0.0139)	3.5197*** (0.0015)	4.0247** (0.0115)	-2.0942 (0.2938)
GuarLoan x GuarAmount x ROE	0.1305** (0.0463)	0.2658*** (0.0067)	0.0645 (0.4954)	-0.2731** (0.0378)	0.0923 (0.5678)
GuarLoan x GuarAmount x BankSize	0.0207*** (0.0008)	0.0294*** (0.0004)	0.0137 (0.1192)	0.0132 (0.1462)	0.0105 (0.4620)
Rel. Controls	Yes	Yes	Yes	Yes	Yes
Guar. program dummies	Yes	Yes	Yes	Yes	Yes
GuarLoan x BankVar	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.5120	0.5656	0.4586	0.4109	0.4511
Observations	144274	93988	27903	15918	6465

The table shows the results of Eq. (3) by including an interaction with bank characteristics. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Differences in guarantee multipliers across banks

Program 90 [back](#)

	(1)	(2)	(3)	(4)	(5)
	All periods	2020Q2	2020Q3	2020Q4	2021Q1
GuarLoan x GuarAmount	-0.2638 (0.1831)	-0.9801*** (0.0047)	0.1310 (0.3884)	-0.1405 (0.4844)	-0.1575 (0.3704)
GuarLoan x GuarAmount x ShareFee	0.5534** (0.0446)	0.4107 (0.4025)	0.3826 (0.1203)	0.4121 (0.1144)	1.2514*** (0.0000)
GuarLoan x GuarAmount x ShareLoanNFC	-0.0815 (0.3953)	-0.1652 (0.4011)	0.0542 (0.6066)	-0.1029 (0.2825)	-0.0945 (0.4254)
GuarLoan x GuarAmount x CapitalRatio	3.5376*** (0.0000)	4.3214*** (0.0014)	2.6161*** (0.0026)	4.0476*** (0.0000)	3.4090*** (0.0003)
GuarLoan x GuarAmount x ROE	0.0659 (0.3928)	0.4808** (0.0178)	0.1859*** (0.0044)	-0.0398 (0.7368)	-0.2873** (0.0158)
GuarLoan x GuarAmount x BankSize	0.0182*** (0.0008)	0.0414*** (0.0000)	0.0100** (0.0243)	0.0134** (0.0174)	0.0046 (0.5045)
Rel. Controls	Yes	Yes	Yes	Yes	Yes
Guar. program dummies	Yes	Yes	Yes	Yes	Yes
GuarLoan x BankVar	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.6014	0.5911	0.6582	0.5617	0.5528
Observations	284878	74451	95849	69111	45467

The table shows the results of Eq. (3) by including an interaction with bank characteristics. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Differences in guarantee multipliers across banks

Renegotiations [back](#)

	(1)	(2)	(3)	(4)	(5)
	All periods	2020Q2	2020Q3	2020Q4	2021Q1
GuarLoan x GuarAmount	-0.1343 (0.3045)	-0.6045** (0.0286)	-0.0559 (0.7265)	0.0132 (0.9254)	0.2541* (0.0560)
GuarLoan x GuarAmount x ShareFee	0.3653* (0.0791)	0.6486* (0.0845)	0.3847 (0.1001)	0.1264 (0.5209)	0.3508* (0.0670)
GuarLoan x GuarAmount x ShareLoanNFC	0.1853* (0.0505)	-0.0908 (0.4939)	0.2915*** (0.0050)	0.2214* (0.0640)	0.3122** (0.0104)
GuarLoan x GuarAmount x CapitalRatio	1.5960*** (0.0070)	1.9319 (0.1213)	1.4179 (0.1164)	1.9610*** (0.0021)	1.0176 (0.1790)
GuarLoan x GuarAmount x ROE	-0.0478 (0.2930)	0.2179* (0.0718)	0.0767 (0.1816)	-0.2416*** (0.0000)	-0.1122 (0.1080)
GuarLoan x GuarAmount x BankSize	0.0148*** (0.0023)	0.0262** (0.0189)	0.0140*** (0.0074)	0.0106** (0.0460)	0.0004 (0.9436)
Rel. Controls	Yes	Yes	Yes	Yes	Yes
Guar. program dummies	Yes	Yes	Yes	Yes	Yes
GuarLoan x BankVar	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.4927	0.4996	0.5428	0.4557	0.4691
Observations	195778	32398	60841	64490	38049

The table shows the results of Eq. (3) by including an interaction with bank characteristics. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Differences in guarantee multipliers across firms

back

	(1)	(2)	(3)	(4)
	Guar.Prog.100	Guar.Prog.90	Ren.	Other Prog.
GuarLoan x GuarAmount	1.2108*** (0.0000)	0.6438*** (0.0000)	0.4383*** (0.0000)	0.3799*** (0.0000)
GuarLoan x GuarAmount x FirmSize	-0.0851*** (0.0000)	-0.0021 (0.6394)	0.0119*** (0.0013)	0.0159*** (0.0000)
GuarLoan x GuarAmount x LiquidAssets	0.0318 (0.1631)	0.0339** (0.0109)	0.0212 (0.1488)	-0.0015 (0.9240)
GuarLoan x GuarAmount x FinLeverage	-0.2000*** (0.0000)	-0.1214*** (0.0000)	-0.1136*** (0.0000)	-0.0945*** (0.0000)
GuarLoan x GuarAmount x NewFirm	-0.1165** (0.0262)	-0.0725 (0.1417)	0.0018 (0.9624)	-0.0148 (0.7493)
GuarLoan x GuarAmount x SalesGrowth	0.0138 (0.6336)	-0.0163 (0.3934)	0.0359** (0.0201)	0.0183 (0.2732)
GuarLoan	0.0373*** (0.0000)	0.0236*** (0.0000)	-0.0145*** (0.0010)	0.0056 (0.2474)
GuarLoan x FirmSize	-0.0032*** (0.0000)	-0.0023*** (0.0003)	0.0009* (0.0642)	-0.0013** (0.0177)
GuarLoan x LiquidAssets	0.0016 (0.5472)	0.0088*** (0.0023)	0.0090*** (0.0040)	0.0058* (0.0871)
GuarLoan x FinLeverage	-0.0060* (0.0543)	-0.0087** (0.0174)	0.0043 (0.1397)	0.0046 (0.1649)
GuarLoan x NewFirm	0.0182** (0.0116)	0.0323*** (0.0026)	0.0072 (0.4564)	0.0117 (0.3280)
GuarLoan x SalesGrowth	0.0037 (0.2188)	0.0079** (0.0131)	0.0023 (0.3865)	0.0028 (0.3293)
Constant	0.0035*** (0.0000)	0.0025*** (0.0000)	0.0020*** (0.0000)	0.0015*** (0.0000)
Firm FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Rel. Controls	Yes	Yes	Yes	Yes
Adj. R-squared	0.5403	0.5922	0.4894	0.4925
Observations	186229	350916	337058	236362

The table shows the results of Eq. (3) by including an interaction with firm characteristics. Robust p -values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Credit growth in 2020Q1

No significant differences across borrowers before the introduction of guarantee schemes [back](#)

	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Guar. firms	Non-guar. firms	All firms	Guar. firms	Non-guar. firms
ShareFee	0.0138** (0.0265)	0.0159** (0.0257)	0.0091** (0.0446)			
ShareLoanNFC	-0.0009 (0.7613)	-0.0009 (0.8054)	-0.0014 (0.6012)			
CapitalRatio	0.0277* (0.0944)	0.0364* (0.0711)	0.0109 (0.3880)			
ROE	-0.0026 (0.1907)	-0.0028 (0.1561)	-0.0023 (0.2712)			
BankSize	-0.0003* (0.0518)	-0.0004** (0.0375)	-0.0002* (0.0728)			
MainLender	0.0032*** (0.0001)	0.0037*** (0.0002)	0.0023*** (0.0004)	0.0013*** (0.0000)	0.0029*** (0.0000)	-0.0013*** (0.0021)
ShareLoanCommitment	0.0163*** (0.0000)	0.0174*** (0.0000)	0.0146*** (0.0000)	0.0116*** (0.0000)	0.0155*** (0.0000)	0.0073*** (0.0000)
FirmSize				0.0027*** (0.0000)	0.0028*** (0.0000)	0.0025*** (0.0000)
LiquidAssets				-0.0028*** (0.0000)	-0.0031*** (0.0000)	-0.0011*** (0.0000)
FinLeverage				-0.0057*** (0.0000)	-0.0066*** (0.0000)	-0.0056*** (0.0000)
NewFirm				0.0128*** (0.0000)	0.0138*** (0.0000)	0.0093*** (0.0000)
SalesGrowth				0.0070*** (0.0000)	0.0085*** (0.0000)	0.0048*** (0.0000)
Constant	-0.0061* (0.0706)	-0.0052 (0.1657)	-0.0077*** (0.0055)	-0.0250*** (0.0000)	-0.0255*** (0.0000)	-0.0239*** (0.0000)
Firm FE	Yes	Yes	Yes	No	No	No
Sector FE	No	No	No	Yes	Yes	Yes
Province FE	No	No	No	Yes	Yes	Yes
Bank FE	No	No	No	Yes	Yes	Yes
Adj. R-squared	0.1394	0.1533	0.1015	0.0080	0.0099	0.0066
Observations	742192	512003	230189	746973	515210	231732

The table shows the results of a regression model estimated by considering all firms (columns 1 and 4), only borrowers that will request a guaranteed loan in the following quarters (columns 2 and 5), and only firms that will not request a guaranteed loan until 2021Q1 (columns 3 and 6), respectively. The dependent variable is $\Delta Credit_{i,j}$ in 2020Q1. Robust p-values in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.