Business as Usual?

Bank Lending under Credit Relief Programs

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Acknowledgment

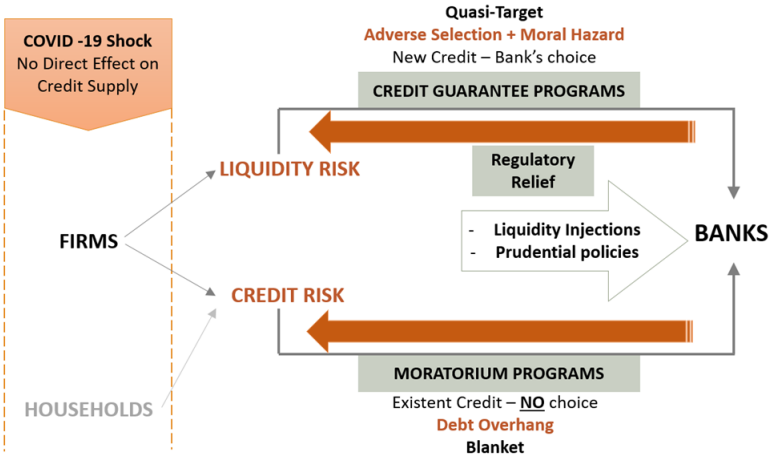
The views and opinions expressed in this work are those of the authors and do not necessarily reflect the views or positions of Banco of Portugal or the Eurosystem.

Motivation

Motivation

- The COVID-19 pandemic caused a liquidity crunch but initial policy reactions were laid out rather rapidly
- The favorable outcome of the support policies reflects general equilibrium effects on credit. Little is known about how banks cope with the support policies in extending new credit.
- **Do banks sustain lending to the economy and support viable distressed borrowers as intended, netting on the effect of the credit support programs?**
  - The design of these programs needs to strike a tricky balance.
  - Scarce empirical evidence on the efficacy of credit support programs when banks are not under stress
  - Scarce empirical evidence on the externalities of credit support programs

Target Measure Versus Blanket Measure



This Paper

- compares lending (non-public-guaranteed) of banks with different exposure to credit relief programs around the peak of policy uptakes using difference-in-differences
- addresses the endogeneity concern using the Bartik Instrument (Goldsmith-Pinkham, et al., 2020)
- We find strong evidence of policy externalities. Banks participating more in the credit guarantee programs,
  - increase lending in general as intended but decrease loan supply within the program to preserve lending to less-risky more productive firms outside the program with better conditions
  - contraction effect of moratorium programs and higher bank risk-taking behaviors

Link to the Literature

- **Public Guarantee Programs:** Bachas et al. (2021), Custodio et al. (2022), de Blasio et al. (2018), Lagazio et al. (2021), and Zecchini and Ventura (2009)
- **Credit Demand and Supply during COVID-19:** Acharya and Steffen (2020), Li et al. (2020)), Chodorow-Reich et al. (2021), Kapan and Minoiu (2021), Greenwald et al. (2020), Berger et al. (2021), and Couaillier et al. (2022)
- **Government Intervention during COVID-19:** Altavilla et al. (2021), Minoiu et al. (2022), Cascarino et al. (2022), Core and De Marco (2020), Altavilla et al. (2020), Arping et al. (2010), Gourinchas et al. (2021), Kozeniauskas et al. (2022)
- **Sovereign-Bank-Corporate Nexus:** Acharya et al. (2014), Acharya and Steffen (2015), Acharya et al. (2018), Bottero et al. (2020), Leonello (2021), and Bonfim et al. (2022)

Institutional Background and Data

- Significant impact of PGSs on lending in Portugal
  - By June, 2020 Newly originated loans subject to PGSs amounts to 2.1% of total loans, ranked the 2nd in the Euro zone after Spain

Public Guarantee Schemes *Banco Português de Fomento Statistics*

- Extended use of moratoria
  - More than 20% of their reported loans to NFCs and HHs were under moratoria up to June 2020

Moratorium *EBA Report: First Insights into the COVID-19 Impacts* Timeline

- The Portuguese banking system was in a resilient position at the onset of the COVID-19 crisis but there was a deterioration in risk perceptions

Loan Loss Provision

Data

- **CRC:** monthly loan-level data (threshold of 50 euros, PG Versus NPG)
- **MFI Statistics:** monthly bank-level data
- **CB:** annual firm-level data
- **SPAI** geodemographic infos on banks, MGSs, firms
- **SIAC:** in-house credit assessment system
- **CITIUS:** judicial restructuring (PER) process
- **July 2019 - March 2020, June 2020 - December 2020**, 251,131 firms; 55 banks; 2,079,823 bank-firm-quarter obs

Firms under Different Credit Relief Programs

	PGS	Moratorium	None	Total
Firm Chars				
Firm Assets (thousand)	1,366.22	2,698.86	1,721.65	1,848.95
Risk	0.04	0.09	0.12	0.11
Leverage	0.21	0.58	3.77	3.06
Profitability	0.04	-0.11	-9.47	-7.45
Industry affectedness	0.17	0.18	0.11	0.12
Region affectedness	0.07	0.08	0.08	0.08
Bank Chars				
PG Exp.	0.47	0.31	0.28	0.33
Morat. Exp.	8.31	7.42	6.91	7.41
Bank Assets (Billion)	13.90	10.10	8.79	10.40
Foreign Bank	0.32	0.35	0.34	0.34
Bank Liquidity	0.03	0.02	0.02	0.02
NPLs	0.03	0.03	0.04	0.03
Capital Ratio	0.14	0.16	0.17	0.16
Obs	14,498	36,421	200,212	251,131

Identification Strategy

Difference-in-Differences

- We compare lending between the pre- and post-COVID periods of banks with different exposure to the two credit relief programs

$$
\begin{aligned}
Credit_{fbt} = & \sum_{t=1}^{n} \boldsymbol{\beta}_{1,t} Period_t \times \widehat{PG\ Exp}_b + \\
& \sum_{t=1}^{n} \boldsymbol{\beta}_{2,t} Period_t \times Morat\ Exp_b + \\
& \sum_{t=1}^{n} \boldsymbol{\alpha}_t Period_t \times \mathbf{BankChars}_b + \\
& \gamma_{ilst} + \omega_{fb} + \epsilon_{fbt}
\end{aligned}
\tag{1}
$$

- Credit: Total + NPG
- BankChars: COVID Exp., Bank Size, Liquidity, NPLs, Capital Ratio, Foreign Dummy
- Fixed Effects: ILST (Degryse et al. (2019)), Bank-Firm

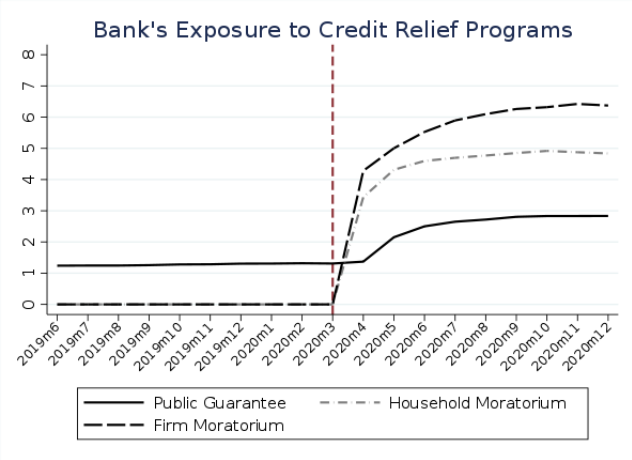
Bank's Exposure to Credit Relief Programs

1. Bank's Exposures to Public Guarantee Programs

$$PG\ Exp_b = \frac{\sum_{f=1}^{n} PG_{fb,March-May\ 2020}}{Assets_{b,2019}} \tag{2}$$

2. Bank's Exposures to Moratorium Programs

$$Morat\ Exp_b = \frac{\sum_{f=1}^{n} Morat_{fb,March-May\ 2020}}{Assets_{b,2019}} \tag{3}$$


Bank's Exposure to Credit Relief Programs
0
1
2
3
4
5
6
7
8
2019m6
2019m7
2019m8
2019m9
2019m10
2019m11
2019m12
2020m1
2020m2
2020m3
2020m4
2020m5
2020m6
2020m7
2020m8
2020m9
2020m10
2020m11
2020m12
Public Guarantee
Household Moratorium
Firm Moratorium

IV for Bank Participation

▸ Distribution ▸ Balance Checks

- Bartik instrument (Goldsmith-Pinkham et al.,2020): shift-share predictor of policy uptake from March 2020 to May 2020 by municipality and industry

$$Bartik_b = \frac{\sum_{m=1}^{n}\sum_{s=1}^{m} Credit\ Share_{msb,2019} \times Shifter_{ms-b,March-May\ 2020}}{Assets_{b,2019}} \tag{4}$$

IV for Bank Participation

1. Relevance
   - Banks with a larger pre-pandemic credit portfolio that is affected by COVID-19 are more likely to participate and increase uptake
   - Statistically important effects on PGS Participation
2. Exclusion ▸ Disbursement of PG Loans
   - Affected sectors and the expansion regions were not anticipated, thus orthogonal to bank's lending decisions

Results

Credit Supply

1. General ▸ OLS

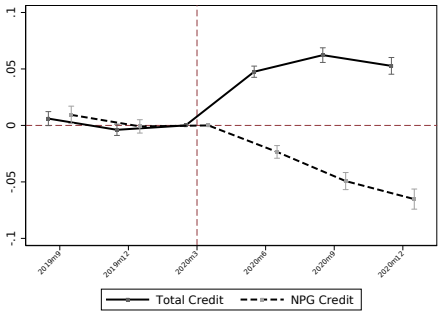


Figure: Bank's Exposure to Public Guarantee Programs ($\beta_{1,t}$)

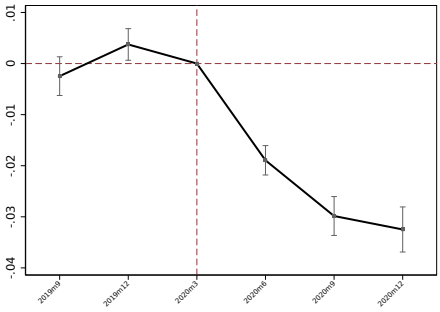


Figure: Bank's Exposure to Moratorium Programs($\beta_{2,t}$)

Credit Supply

❷ Within and Outside Schemes

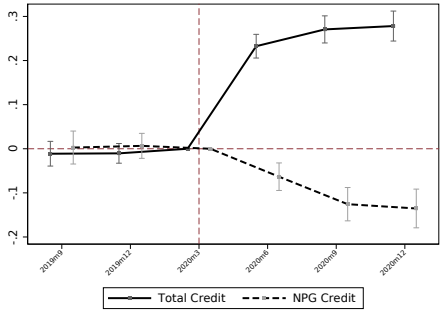


Figure: Firms with PG Loans

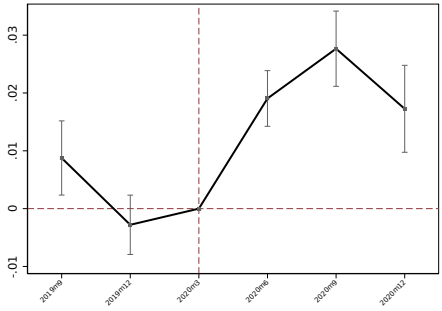


Figure: Other Firms

Credit Supply

❸ Static Specification

	Total Credit All Firms	NPG Credit All Firms	Total Credit With PG	NPG Credit With PG	Total Credit Without PG
Post × PG Exp.	0.054***	-0.048***	0.268***	-0.110***	0.020***
	(0.003)	(0.003)	(0.015)	(0.017)	(0.003)
Post × Morat. Exp.	-0.028***	-0.022***	-0.045***	-0.015	-0.023***
	(0.002)	(0.002)	(0.008)	(0.010)	(0.002)
		First Stage			
Post × Bartik	6.063***	6.063***	6.192***	6.192***	6.055***
	(0.007)	(0.007)	(0.033)	(0.033)	(0.007)
Bank Chars	Yes	Yes	Yes	Yes	Yes
ILST FE	Yes	Yes	Yes	Yes	Yes
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	2,079,823	2,079,823	155,639	155,639	1,908,207
F	819.405	192.384	342.443	9.448	526.333

Lending Conditions

	Pricing				Collateral			
	All Firms	With PG	With Moratorium	None	All Firms	With PG	With Moratorium	None
Post × PG Exp.	-0.952***	-1.646**	-1.017***	-0.570***	-0.051**	0.106	-0.069**	-0.082***
	(0.148)	(0.763)	(0.273)	(0.150)	(0.020)	(0.146)	(0.031)	(0.025)
Post × Morat. Exp.	0.627***	1.058**	0.655***	0.371***	0.047***	-0.052	0.054***	0.063***
	(0.100)	(0.502)	(0.185)	(0.097)	(0.013)	(0.096)	(0.020)	(0.016)
				First Stage				
Post × Bartik	0.602***	0.308***	0.732***	0.685***	0.602***	0.308***	0.732***	0.685***
	(0.038)	(0.061)	(0.069)	(0.040)	(0.038)	(0.061)	(0.069)	(0.040)
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	70,460	8,656	15,761	16,073	70,460	8,656	15,761	16,073
Adjusted R^2	0.014	0.008	0.021	0.009	0.007	0.004	0.012	0.008
F	20.410	2.062	10.992	6.237	8.040	1.843	3.773	3.015

Heterogeneity

Probability of obtaining a NPG loan

1. Risk

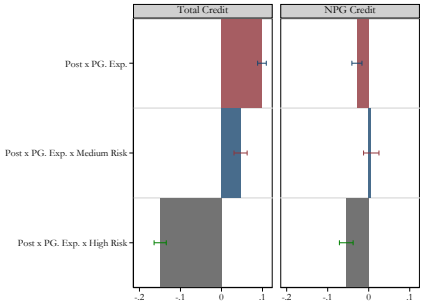


Figure: Bank's Exposure to Public Guarantee Programs ($\beta_{1,t}$)

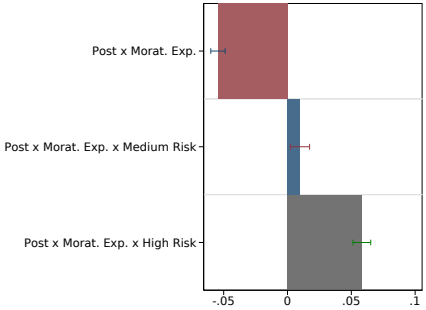
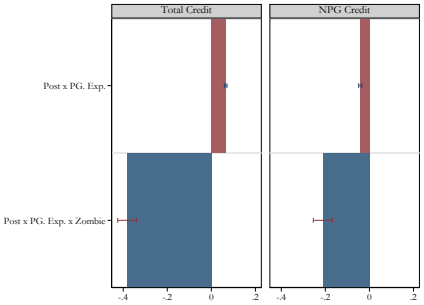


Figure: Bank's Exposure to Moratorium Programs($\beta_{2,t}$)

Heterogeneity

❷ Zombie Firms



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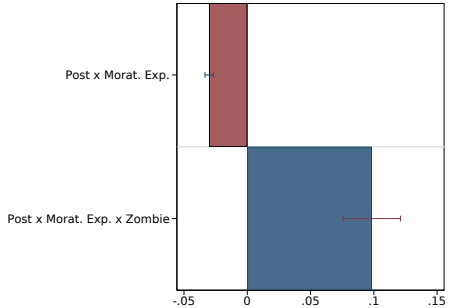


Figure: Bank's Exposure to Moratorium Programs($\beta_{2,t}$)

Heterogeneity

❸ Productivity

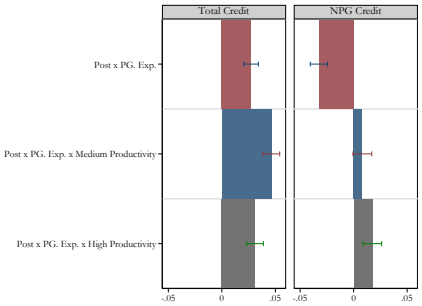


Figure: Bank's Exposure to Public Guarantee Programs ($\beta_{1,t}$)

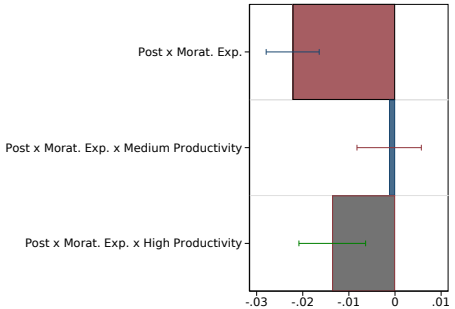


Figure: Bank's Exposure to Moratorium Programs($\beta_{2,t}$)

Conclusion

Conclusion

- Our results reveal strong credit externalities: a reallocation effect of public guarantee programs and a contraction effect of moratorium programs
- Our results are robust to
  - isolating credit demand from credit supply
  - alternative IV: Google Playstore review rating on bank's mobile app (Core and De Marco (2020))
  - controlling for COVID-related liquidity injection
  - The reallocation effect of the PGS is more prominent in firms with refinancing needs, consistent with Altavilla et al. (2021)
  - The effect is persistent at the firm level

Appendix

Credit Relief Programs

Guarantee Programs	- New credit with double screening - Quasi-Target measure - Q4, 2020 EUR 8,105 million - Guaranteed (mainly) at 80 to 90% - Maximum maturity (mainly) 3 to 6 years - Cost of the guarantee (mainly) 25-175 bps
Moratorium	- Existent credit at firm's request - Blanket measure - Applications: Mar20 to Mar21; End: Sep21 to Dec21
Other	Non-refundable liquidity incentives, tax relief programs, and lay-off programs

Credit Relief Programs - Eligibility Criteria

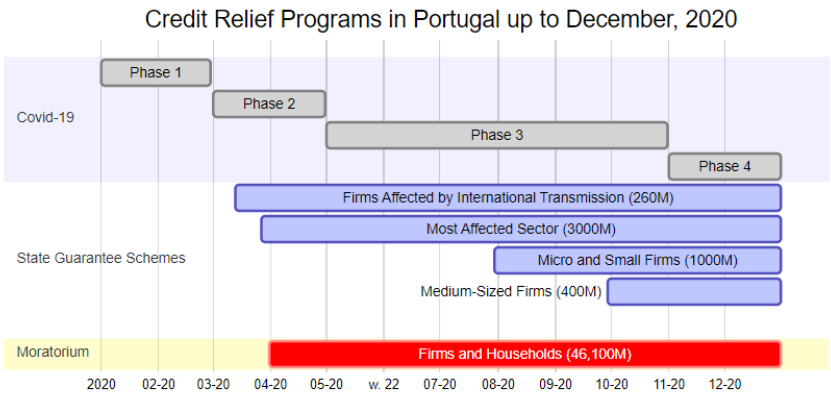
Back **Guarantee Programs:**

- Positive equity in 2019
- No active default incidents
- No active debts to the Social Security and Tax Authority
- Not classified as "undertaking in difficulty" firms as defined in the Commission Regulation (EU) No 651/2014 article 2 number 18
- Decrease in sales of at least 40% between March and May 2020, when compared with the same period in 2019

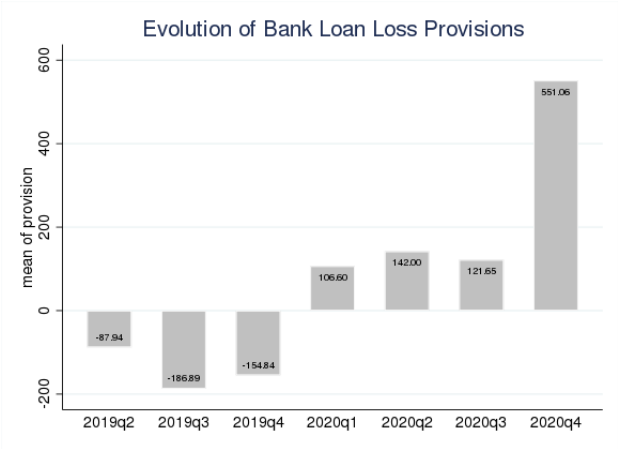
Moratorium:

- Firms could not be in a credit default situation (more than 90 days)
- No active debts to the Social Security and Tax Authority

Back

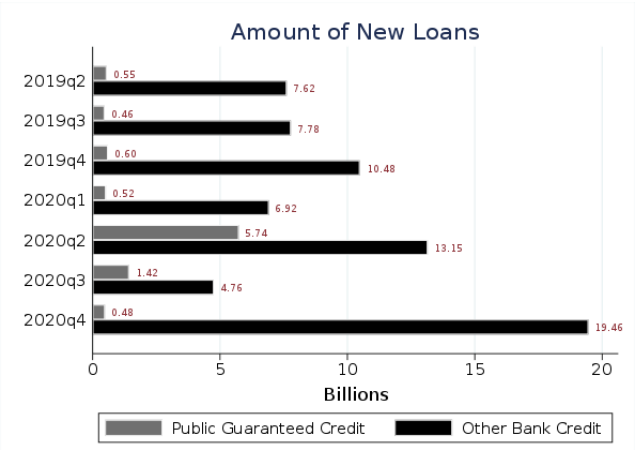

Credit Relief Programs in Portugal up to December, 2020
Covid-19
Phase 1
Phase 2
Phase 3
Phase 4
State Guarantee Schemes
Firms Affected by International Transmission (260M)
Most Affected Sector (3000M)
Micro and Small Firms (1000M)
Medium-Sized Firms (400M)
Moratorium
Firms and Households (46,100M)
2020
02-20
03-20
04-20
05-20
w. 22
07-20
08-20
09-20
10-20
11-20
12-20

Back



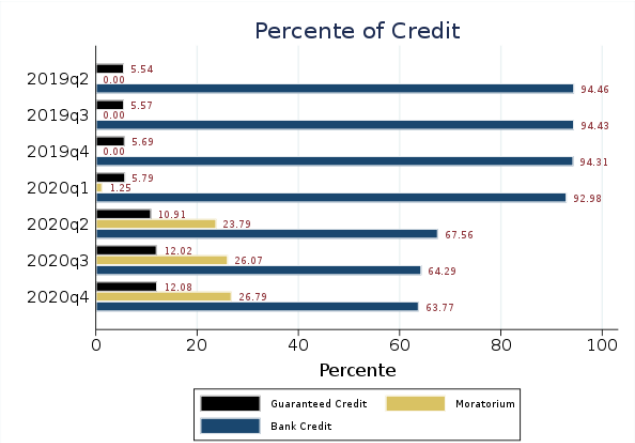
Back

- Significant impact of PGSs on lending in Portugal



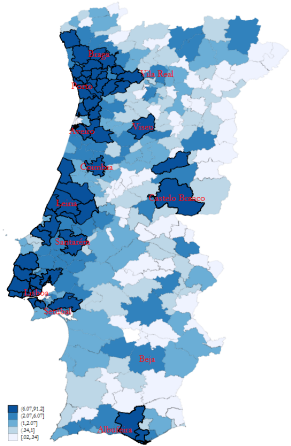
Back

- Extended use of moratoria

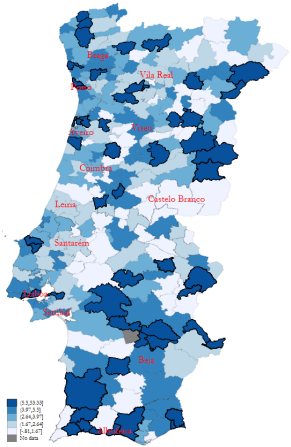


Disbursement of PG Loans

Back



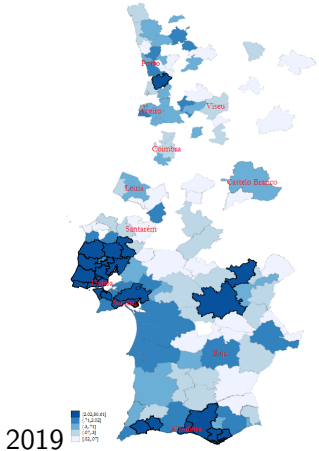
Pre-COVID

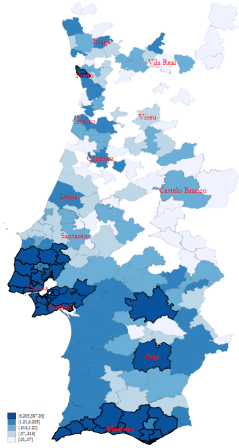


COVID Markup

LISGARANTE

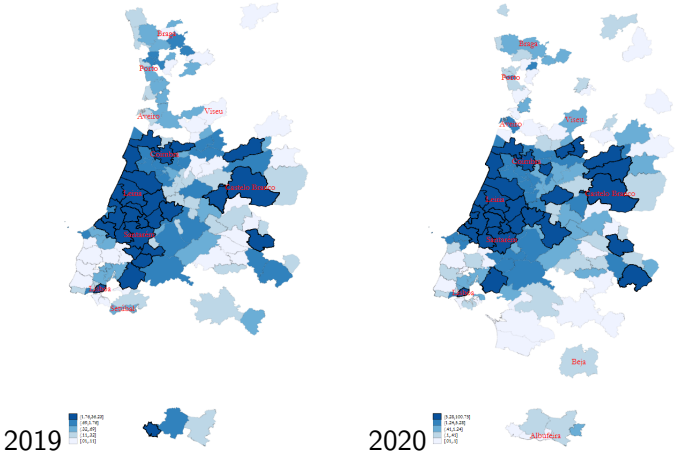
Back





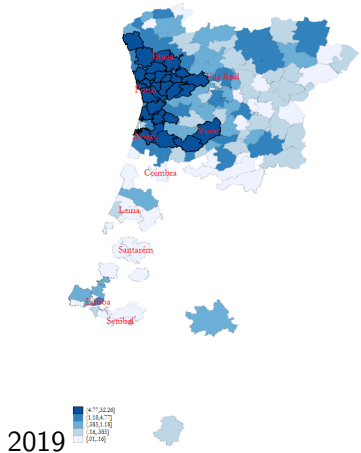
GARVAL

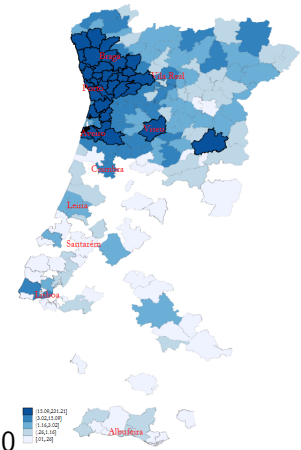
Back


Braga
Porto
Aveiro
Viseu
Coimbra
Leiria
Castelo Branco
Santarém
Lisboa
Setúbal
2019
Braga
Porto
Aveiro
Viseu
Coimbra
Leiria
Castelo Branco
Santarém
Lisboa
Setúbal
Beja
Algarve
2020

NORGARANTE

Back





AGROGARANTE

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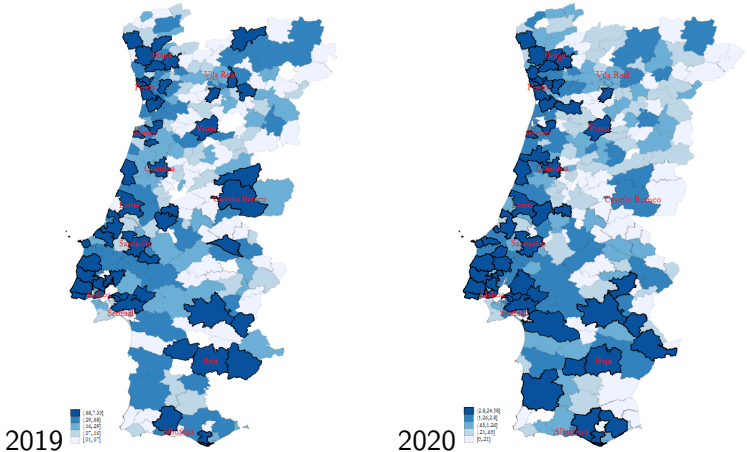
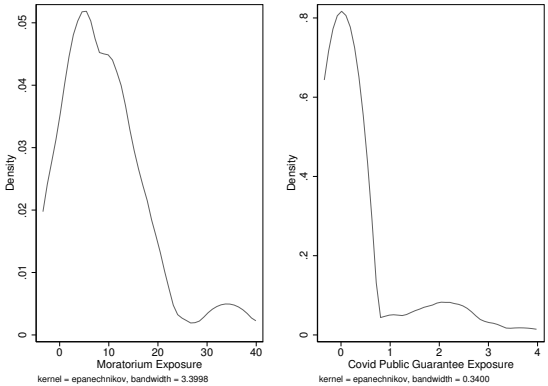


Distribution of Bank Exposure to Credit Relief Programs

Back



Balance Checks on Moratorium Exposure

Back

	High Morat. Exp.	Low Morat. Exp.	Diff.	S.E.
Observations	27	28		
PG Exp.	0.429	0.047	0.382**	(0.146)
Morat. Exp.	10.943	2.357	8.586***	(1.142)
Previous PG Exp.	0.366	0.047	0.319	(0.196)
Bank Size	7.376	6.200	1.176**	(0.566)
Foreign Bank	0.370	0.357	0.013	(0.132)
Bank Liquidity	0.030	0.015	0.015	(0.010)
NPLs	0.023	0.042	-0.019	(0.015)
Capital Ratio	0.146	0.189	-0.044	(0.054)
Credit Ratio	0.716	0.662	0.054	(0.062)
Covid Exp.	39.443	29.170	10.273	(6.908)

Balance Checks on Public Guarantee Exposure

Back

	Exposed Banks	Non-Exposed Banks	Diff.	S.E.
Observations	13	42		
PG Exp.	0.991	0.000	0.991***	(0.216)
Morat. Exp.	10.102	5.480	4.622***	(1.473)
Previous PG Exp.	0.857	0.002	0.855**	(0.369)
Bank Size	9.338	5.984	3.354***	(0.570)
Foreign Bank	0.154	0.429	-0.275**	(0.130)
Bank Liquidity	0.046	0.015	0.032***	(0.010)
NPLs	0.042	0.029	0.013	(0.015)
Capital Ratio	0.113	0.185	-0.072*	(0.038)
Credit Ratio	0.685	0.690	-0.005	(0.059)
Covid Exp.	37.088	33.324	3.764	(5.074)

Credit Supply: Bank-Firm Level OLS Results

Back

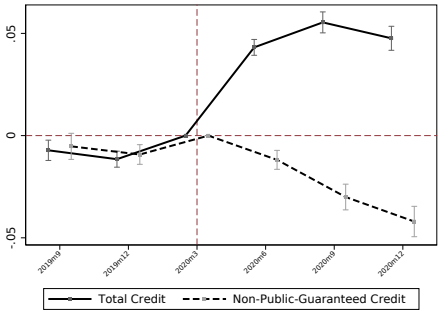


Figure: Bank's Exposure to Public Guarantee Programs ($\beta_{1,t}$)

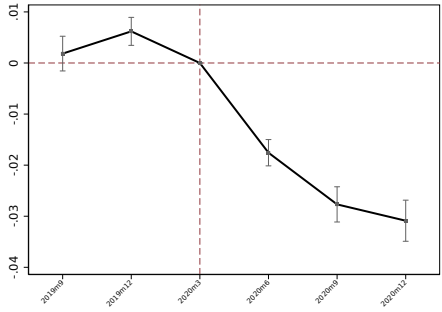


Figure: Bank's Exposure to Moratorium Programs($\beta_{2,t}$)

Credit Supply: Firm Level IV Results

	Total Credit All Firms	NPG Credit All Firms	Total Credit With PG	NPG Credit With PG	Total Credit Without PG	Total Credit With Moratorium	Total Credit None
Post × PG Exp.	0.023***	-0.035***	0.056	-0.123**	-0.005	0.002	-0.005
	(0.004)	(0.005)	(0.034)	(0.051)	(0.004)	(0.009)	(0.005)
Post × Morat. Exp.	-0.013***	-0.013***	0.002	0.027	-0.010***	-0.021***	-0.010***
	(0.003)	(0.003)	(0.024)	(0.032)	(0.003)	(0.006)	(0.003)
Post × Covid Exp.	-0.003	-0.020***	0.054**	-0.036	-0.012***	0.003	-0.014***
	(0.003)	(0.003)	(0.027)	(0.034)	(0.003)	(0.005)	(0.003)
			First Stage				
Post × Bartik	6.781***	6.781***	6.977***	6.977***	6.778***	6.875***	6.775***
	(0.012)	(0.012)	(0.081)	(0.081)	(0.013)	(0.041)	(0.014)
Bank Chars	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Chars	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ILST FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,055,095	1,055,095	40,203	40,203	984,512	136,374	789,992

Back

Who Were Granted PG and NPG Loans?

Back

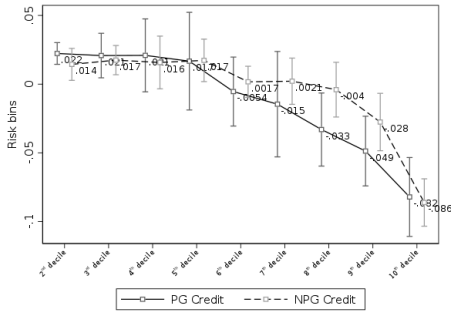


Figure: Firm Risk Deciles

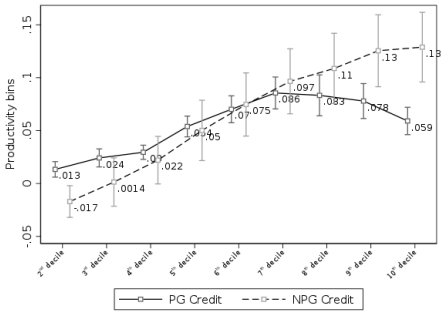


Figure: Firm Productivity Deciles

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