#### The Distribution of Crisis Credit:

#### Effects on Firm Indebtedness and Aggregate Risk<sup>a</sup>

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#### **Motivation**

- During crises, governments seek to help firms to survive by providing "crisis credit"
  - Popular example from COVID-19: Public credit guarantees implemented through banks
- These programs often face a standard trade-off between micro credit access and macro risks
  - They seek to create incentives and conditions to support many viable firms in need
  - $\blacksquare$   $\Rightarrow$  Potential adverse selection  $\Rightarrow$  Potential high indebtedness, debt overhang, and macro risks
- What is the impact of the distribution of crisis credit on micro indebtedness and macro risks?
  - 1. How does credit (suddenly available) get allocated across the full range of firms?
  - 2. How do incentives and economic environment influence demand, supply, and equilibrium allocation?
  - 3. How does micro-level indebtedness get aggregated, affecting macro risks?
- Study credit guarantee program in Chile during COVID-19 (a.k.a. FOGAPE-COVID in Chile)
  - Policy coverage: 24% of eligible firms and 4.6% of GDP (formal firms: 3.6% of GDP)

- Policy and data Policy
  - Unique financial data on firms' applications and banks' approvals for credit guarantee program
  - Administrative financial and real microdata for universe of formal firms, banks, and transactions
  - Comparison with employment protection program
- Micro credit allocation
  - Applications and approvals to study the role of demand and supply
  - Impact of credit program on firm leverage and credit flows
  - Assess the causality of the credit program and pandemic (dynamic lockdowns, RDD)
- Macro risk assessment
  - Empirically: Via aggregation of micro data and impact on risk of banks and the government
  - Quantitatively: Via counterfactual model simulations
- Robustness analyses
- Conclusions

# Policy

#### Institutional Details of the Public Credit Guarantee Program

- Expand credit guarantee program: Fiscal injection of US\$3 billion (1.1% of GDP)
- Starts April 24, 2020
- Goal: Finance working capital up to 3 months of pre-pandemic sales
- Basic eligibility: Pre-pandemic sales < US\$35 million
- Attractive conditions for firms
  - Nominal interest rate cap: Monetary policy rate (0.5%) + inflation target (3%)
  - 6-month grace period + payment horizon of 24-48 months
  - Loan could not to be used to repay pre-existing debt, which needs to be restructured
- Some details on mitigating factors of policy design
  - Past due days < 30</p>
  - Guarantee rate: 85% for small, 80% for medium, 70% for medium-large, and 60% for large firms
  - Deductible: 5% for small, 3.5% for medium, 2.5% for medium-large, and 2.5% for large firms

# **Micro Credit Allocation**

#### Extensive Margin: Demand Stronger than Supply Default Model

		Employment Protection			
	Applications	Approvals	Use	Use	Use
	(1)	(2)	(3)	(4)	(5)
Risk	0.538***	-0.257***	0.337***	0.147***	-0.016
	(0.035)	(0.021)	(0.034)	(0.033)	(0.022)
Increase in Sales Dummy	0.186***	0.019***	0.195***	0.210***	0.053***
	(0.008)	(0.006)	(0.008)	(0.008)	(0.007)
Decrease in Sales Dummy	0.188***	0.019***	0.193***	0.211***	0.112***
	(0.007)	(0.006)	(0.008)	(0.008)	(0.006)
Use Employment Protection	0.117***	$-0.010^{***}$	0.095***	0.095***	
	(0.005)	(0.004)	(0.005)	(0.005)	
Use Public Credit Guarantee					0.056***
					(0.003)
Dependent Variable Mean	0.649	0.918	0.505	0.483	0.185
Dependent Variable Std. Dev.	0.477	0.275	0.500	0.500	0.389
Number of Firms	62,848	35,918	62,871	67,240	62,102
R <sup>2</sup>	0.061	0.033	0.045	0.043	0.081
Industry FE and Municipality FE	Yes	Yes	Yes	Yes	Yes
Sample	Eligible	Eligible	Eligible	Selection	Eligible
				Model	

Banked Firms :  $Pr(Program Use_i = 1) = \Phi(\alpha_s + \alpha_c + \beta_1 Risk_i + \beta_2 X_i + \epsilon_i)$ 

(1)

#### Intensive Margin: Demand Stronger Only in Guaranteed Credit

 $\textit{Credit Guarantee Users Sample}: \ \frac{\Delta \textit{Debt}_i}{\textit{Sales}_{i,2019}} = \alpha_s + \alpha_c + \beta_1 \textit{Risk}_i + \beta_2 X_i + \epsilon_i$ 

(2)

	$\Delta$ Guaranteed	l Debt /	∆ Non-guaran	teed Debt /	
	Sales 2	2019	Sales 2019		
-	(1)	(2)	(3)	(4)	
	Banked	Unbanked	Banked	Unbanked	
	0.095***	0.171***	-0.065***	-0.020	
	(0.007)	(0.019)	(0.011)	(0.014)	
Increase in Sales Dummy	-0.003	0.010**	0.007**	0.006**	
	(0.002)	(0.004)	(0.004)	(0.003)	
Decrease in Sales Dummy	-0.007***	0.004	0.004	0.004	
	(0.002)	(0.004)	(0.004)	(0.003)	
Dependent Variable Mean	0.138	0.116	-0.013	0.015	
Dependent Variable. Std. Dev.	0.076	0.079	0.128	0.062	
Number of Firms	31,782	9,119	31,782	9,119	
R <sup>2</sup>	0.033	0.091	0.029	0.066	
Industry FE and Municipality FE	Yes	Yes	Yes	Yes	

Macro Risk Assessment

#### Indebtedness Decomposition: From Micro to Macro Debt-to-Sales Ratio

• Consider a partition G of firms into groups indexed by g (e.g., risk levels • Other Groupings):



(3)

Group Change

	$\Delta Debt/Sales$		$\Delta Debt/Sales$
-	(1)	(2)	(3)
	Within Change (p.p.)	Weights (%)	Group Change (p.p.)
			$(=(1) \times (2))$
Risk Groups			
High Risk	4.34	1.8	0.08
Medium Risk	3.18	4.1	0.13
Medium-Low Risk	2.26	8.4	0.19
Low Risk	-0.15	59.3	-0.09
No Risk Data	0.48	26.4	0.13
Aggregate		100.0	0.44

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Risk Groups	Total Public Credit Guarantee Program (Million USD)	Total Public Credit Guarantee Program (%)	Default Probability (%)	Effective Guarantee (%)	Expected Loss/GDP (=(2)×(3)/GDP) (%)	Government's Expected Loss/GDP (=(4)×(5)) (%)	Bank's Expected Loss/GDP (=(5)-(6)) (%)
High Risk	606	8	18.17	35.8	0.04	0.01	0.03
Medium Risk	1,085	14	9.86	32.3	0.04	0.01	0.03
Medium-Low Risk	1,867	25	5.68	28.2	0.05	0.01	0.04
Low Risk	3,975	53	2.05	21.1	0.03	0.01	0.03
No Risk Data	1,489	17	18.17	35.8	0.11	0.04	0.07
Total	9,022	100	7.48	27.3	0.27	0.09	0.18
	(3.6% GDP)						

- Credit allocation across risk is proportional to size distribution of firms Figure
- Aggregate expected loss of 0.27% of GDP, an order of magnitude lower than size of the program
- Majority (2/3) of expected loss is taken by banks, but unexpected loss is taken by government

Despite micro adverse selection, macro risk stays relatively small due to several mitigating factors:

- 1. Riskiest firms in the economy were excluded, even when program targets SMEs Risk Samples
- 2. Partial guarantee + deductible  $\Rightarrow$  Banks screened firms (more for large firms)  $\bigcirc$  Rejections
- 3. Deductible cushions banks from tail risk: Higher default risk  $\Rightarrow$  Higher effective guarantee  $lacksymbol{0}$  simulation
- 4. Most credit flows toward large and safe borrowers
- 5. Low ex-ante and ex-post default risk (so far), partially due to weight of safer firms
- 6. Solvency of the banking industry increases by  $\uparrow$  capital,  $\downarrow \downarrow$  risk-weighted-assets (RWA)  $\bullet$  Solvency
- Combination of mitigating factors by policy design (1-3) and by equilibrium outcomes (4-6)
- Policy facilitator: Central bank backs lending by banks through liquidity support <- Liquidity Support

#### A number of robustness tests performed

- Different samples Unbanked Firms

#### Results are not COVID-19-specific

- Comparisons with the employment protection program
- Effect of firm performance since the onset of the pandemic (sales change)
- Effect of lockdown policies Maps RD Results RD Sales

Model simulations: Counterfactual roles of policy ingredients

# Conclusions

#### Conclusions

- Despite a large credit program that reaches many firms in a couple of months and features micro adverse selection (extensive and intensive margins), macro risks remain contained
  - Due to mitigating factors by policy design and by equilibrium outcome
  - Identification of micro elasticities and aggregate macro outcomes only possible due to rich financial+real admin data
- The crisis is not over yet
  - Default rates could end up being larger, though banks are cushioned by deductible and guarantees
  - Necessary to continue to monitor these risks as the recovery moves forward

Results feed into academic and policy debate on trade-off between financial access and macro risks

#### Thank you!

	(1)	(2)	(3)	(4)	(5)
	Number of	Share of Total	Share of	Credit Stock	Share of Value
	Firms	Number of	Employment	(%)	Added (%)
		Firms (%)	(%)		
Panel A: Universe of Firms					
Formal Firms	602,874	100	100	100	100
Active Firms	449,615	75	92	82	100
Public Credit Guarantee Eligible Firms	434,394				
Public Credit Guarantee Users	102,688				
Panel B: Firms with Observables for Firm-l	evel Estimation	5			
Default Model	96,424	16	61	51	67
Selection and Leverage Model	119,153	18	50	44	74
Banked Firms	67,240				
Unbanked Firms	51,913				
Public Credit Guarantee Eligible Firms	114,606	17	35	21	19
Banked Firms	62,927				
Unbanked Firms	51,679				
Public Credit Guarantee Users	40,901	6	14	9	7
Banked Firms	31,782				
Unbanked Firms	9,119				

#### Credit Default Probability Model • Return

Baseline Sample :  $Pr(Default_{i,t} = 1) = \Phi(\alpha_s + \alpha_c + \beta Characteristics_{i,t-1} + u_{i,t})$ 

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Net Worth)	-0.011***	-0.010***	-0.010***	-0.010***	-0.009***	-0.009***	-0.008***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Value Added / Number of Workers)	-0.021***	-0.020***	-0.018***	-0.018***	-0.019***	-0.019***	-0.017***	-0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm Age	-0.001***	-0.001***	-0.001***	-0.001***	-0.002***	-0.002***	-0.002***	-0.002***
Film Age	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(Wage Bill)	-0.009***	-0.009***	-0.008***	-0.008***	-0.008***	-0.008***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Annual Sales)	0.007***	0.006***	0.002**	0.002***	0.000	-0.000	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Credit Stock)					0.013***	0.013***	0.013***	0.013***
					(0.001)	(0.001)	(0.001)	(0.001)
Spread Ex-ante					0.003***	0.003***	0.003***	0.003***
oprede Ex ente					(0.000)	(0.000)	(0.000)	(0.000)
					(0.000)	(0.000)	(0.000)	(0.000)
Number of Firms	06 424	06 424	06.424	06 424	06.424	06 424	06 424	06 424
R <sup>2</sup>	0.051	0.061	0.064	0.073	0.005	0 103	0 104	0 112
Inductory EE	No	No.	0.004 Voc	0.073 Voc	0.095 No	0.103 No	0.104 Voc	0.112 Vec
Municipality EE	No	Voc	No	Vec	No	Vec	No	Vec
Municipality I E	140	105	140	105	140	105	140	165
Pred. Default Prob. Banked Firms	0.088	0.088	0.088	0.088	0.089	0.089	0.089	0.089
Pred. Default Prob. Unbanked Firms	0.113	0.113	0.107	0.107				

(4)

#### Policy Design Mitigates Adverse Selection: Including Non-Eligible Firms

Banked Firms + Different Samples :  $\Pr(Program Use_i = 1) = \Phi(\alpha_s + \alpha_c + \beta_1 Risk_i + \beta_3 X_i + u_i)$  (5)

	Used Public Credit Guarantee						
_	(1)	(2)	(3)	(4)			
	Only	Eligible Firms	Eligible Firms	All Firms			
	Eligible Firms	+ Firms with	+ Mega Firms				
		Overdue Payment					
Risk	0.337***	0.084***	0.412***	0.147***			
	(0.034)	(0.032)	(0.034)	(0.033)			
Increase in Sales Dummy	0.195***	0.206***	0.193***	0.210***			
	(0.008)	(0.008)	(0.008)	(800.0)			
Decrease in Sales Dummy	0.193***	0.208***	0.190***	0.211***			
	(0.008)	(0.008)	(0.008)	(0.008)			
Use Employment Protection	0.095***	0.088***	0.098***	0.095***			
	(0.005)	(0.005)	(0.005)	(0.005)			
Dependent Variable Mean	0.505	0.478	0.498	0.483			
Dependent Variable Std. Dev.	0.500	0.500	0.500	0.500			
Number of Firms	62,871	66,407	63,758	67,240			
R <sup>2</sup>	0.045	0.039	0.048	0.043			
Industry FE and Municipality FE	Yes	Yes	Yes	Yes			
Predicted Default Probability:							
Banked Firms	0.084	0.087	0.083	0.086			

#### Dynamics Lockdowns and Spatial RD Design: Maps • Return



## Dynamics Lockdowns and Spatial RD Design: Results Results

	Pt	ublic Credit Guarar	itee	Employment
-	(1)	(2)	(3)	(4)
	Use Public	Public Credit	Public Credit	Use Employment
	Credit	Guarantee	Guarantee	Protection
	Guarantee	Applications	Approvals	
Panel A: Region Fixed Effe	ects			
Post	0.025***	0.019***	0.098***	-0.009***
	(0.004)	(0.003)	(0.005)	(0.001)
Lockdown	-0.002	-0.000	-0.022*	0.022
	(0.002)	(0.004)	(0.010)	(0.014)
Lockdown $\times$ Post	0.005	0.012***	0.008	0.019***
	(0.003)	(0.002)	(0.004)	(0.000)
Number of Observations	103,932	103,932	32,238	110,439
Number of Firms	11,483	11,483	3,569	12,202
R <sup>2</sup>	0.009	0.007	0.065	0.010
Panel B: Municipality Bord	ler: Neighboring	Municipalities Fix	ed Effects	
Post	0.028***	0.014***	0.099***	0.002
	(0.003)	(0.003)	(0.007)	(0.004)
Lockdown	0.090***	0.033***	-0.132***	0.068***
	(0.005)	(0.004)	(0.009)	(0.003)
Lockdown $\times$ Post	0.007	0.024***	0.010	0.028***
	(0.008)	(0.007)	(0.015)	(0.005)
Number of Observations	14,796	13,419	3,978	17,172
Number of Firms	1,644	1,491	442	1,908
R <sup>2</sup>	0.013	0.013	0.075	0.012

#### RDD: Positive Effect of Credit Guarantee on Indebtedness



# Banked (Unbanked): Non-Guarantee Credit Complement (Substitute)

Eligible Sample : $\frac{\Delta Debt_i}{Sales_{i,20}}$	$\frac{1}{19} = \alpha_s$	$+ \alpha_c + \beta_1 Progr$	sam Use $_i + eta_2 Sa$	les Growth $_i + \iota$	I <sub>i</sub>
	$\Delta$ Guarantee	ed Debt /	∆ Non-guara	inteed Debt /	
	Sales	(2019)	Sale	es (2019)	
-	(1)	(2)	(3)	(4)	
	Banked	Unbanked	Banked	Unbanked	
Use Credit Guarantee	0.139***	0.118***	0.008***	0.011***	
	(0.000)	(0.001)	(0.001)	(0.001)	
Use Employment Protection	0.001***	0.000*	0.008***	0.001***	
	(0.000)	(0.000)	(0.002)	(0.001)	
Use Employment Protection	-0.003**	-0.009***	-0.010**	-0.006***	
imes Use Credit Guarantee	(0.001)	(0.002)	(0.003)	(0.001)	
Increase in Sales Dummy	-0.001	0.001**	0.023***	0.002***	
	(0.001)	(0.000)	(0.003)	(0.001)	
Decrease in Sales Dummy	-0.002**	0.000	0.021***	0.002***	
	(0.001)	(0.000)	(0.003)	(0.000)	
Dependent Variable Mean	0.070	0.020	-0.018	0.007	
Dependent Variable Std. Dev.	0.087	0.055	0.140	0.045	
Number of Firms	62,927	51,679	62,927	51,679	
R <sup>2</sup>	0.628	0.645	0.021	0.020	
Industry FE and Municipality FE	Yes	Yes	Yes	Yes	

### Decomposition of Macro Debt-to-Sales Ratio Creum

	$\Delta Debt/$		ΔDebt	/Sales
	Sales			
	(1)	(2)	(3)	(4)
	Within	Weights (%)	Group Change	Group Change
	Change (p.p.)		(p.p.)	(%)
			$(=(1) \times (2))$	
(i) Active Firms				
Panel A: Used Publi	c Credit Guarantee	e Program		
Users	9.71	13.9	1.35	100.0
Non-users	-1.06	86.1	-0.91	
Aggregate		100.0	0.44	100.0
Panel B: Banked Sta	atus			
Banked	0.49	85.2	0.41	52.6
Newly Banked	11.45	3.2	0.37	47.4
Newly Unbanked	-10.14	3.4	-0.35	
Unbanked Firms	0.00	8.2	0.00	
Aggregate		100.0	0.44	100.0
Panel C: Firm Size				
Small	5.25	8.0	0.42	44.7
Medium	4.14	7.6	0.31	33.0
Medium-Large	1.48	13.9	0.21	22.3
Large	-0.23	4.6	-0.01	
Mega	-0.75	65.9	-0.49	
Aggregate		100.0	0.44	100.0

#### Probability of Approval Diminishes with Firm Size • Return

	Publ	Public Credit Guarantee Approvals				
	(1)	(2)	(3)	(4)		
	All	Small	Medium	Large		
Panel A: Probit Estimation						
Risk	-0.257***	-0.246***	-0.439***	-0.755***		
	(0.021)	(0.025)	(0.082)	(0.238)		
Increase in Sales Dummy	0.019***	0.022***	0.008	-0.010		
	(0.006)	(0.008)	(0.019)	(0.035)		
Decrease in Sales Dummy	0.019***	0.022***	0.005	0.002		
	(0.006)	(0.007)	(0.019)	(0.034)		
Use Employment Protection	-0.010***	-0.008*	-0.015*	-0.026		
	(0.004)	(0.004)	(0.008)	(0.020)		
Dependant Variable Mean	0.918	0.913	0.918	0.902		
Dependant Variable Std. Dev.	0.275	0.282	0.275	0.298		
Number of Firms	35,918	26,623	5,916	1,392		
R <sup>2</sup>	0.033	0.036	0.082	0.171		
Industry FE and Municipality FE	Yes	Yes	Yes	Yes		
Panel B: Predicted Default Probability						
Banked Firms	0.09	0.102	0.061	0.036		

#### Effective Guarantee Simulation • Return



	2019	2020	Change
Capital/Total RWA	12.8%	14.7%	1.8%
Capital (MM USD) =	37,514	41,275	3,761
Common Equity Tier 1	28,645	30,163	1,519
+ Subordinated Bonds	8,050	9,423	1,373
+ Additional Provisions	820	1,689	869
Total RWA (MM USD) $=$	292,292	281,554	-10,738
RWA 1 (0%)	0	0	0
+ RWA 2 (10%)	1,969	4,562	2,592
+ RWA 3 (20%)	4,867	3,849	-1,018
+ RWA 4 (60%)	66,675	68,726	2,052
+ RWA 5 (100%)	218,781	204,417	-14,364
Total Assets (Million USD) $=$	373,931	383,825	9,894
Assets 1	0	0	0
+ Assets 2	19,690	45,620	25,920
+ Assets 3	24,335	19,245	-5,090
+ Assets 4	111,125	114,543	3,418
+ Assets 5	218,781	204,417	-14,364

#### Liquidity Support and Guaranteed Loans ( Return



#### Data Sources Return

- 1. Credit flows and stocks from financial regulator (Financial Markets Commission, CMF), 2012-2020
  - Transaction-level loans, interest rates, credit outstanding, default behavior
- 2. Applications and approvals of credit guarantee loans during  $2020 \Rightarrow$  Unique!
  - Transaction-level information, including loans requested, bank responses, approved amounts
- 3. Firm-level real and employment data from tax authority, 2005-2020
  - Sales, net worth, assets, liabilities, materials, number of workers, sector, municipality
- 4. Firm-level use of employment protection program (unemployment insurance administrator)
- Samples of firms Summary Statistics
  - 1. Formal firms  $\Rightarrow$  602,874 firms
  - 2. Active: Formal Firms + positive sales  $\Rightarrow$  449,615 firms (92% of employment, 82% of credit)
  - 3. Selection and Leverage Models: Active + observables  $\Rightarrow$  119,153 firms
  - 4. Eligible: Selection and Leverage Models + sales < US\$35 MM + past due days < 30  $\Rightarrow$  114,606 firms

#### Allocation of Crisis Credit and Firm Size • Return



## Default Probability Model: Different Regressors and Samples Reun

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Probit Estimation								
Log(Net Worth)	$-0.010^{***}$	$-0.009^{***}$	$-0.009^{***}$	-0.007***	$-0.010^{***}$	-0.006***	$-0.010^{***}$	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Value Added/Number of Workers)	$-0.018^{***}$	$-0.017^{***}$	$-0.015^{***}$	-0.014***	$-0.018^{***}$	-0.011***	$-0.017^{***}$	-0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm Age	$-0.001^{***}$	-0.002***	$-0.001^{***}$	-0.001***	$-0.001^{***}$	-0.002***	-0.002***	-0.003***
-	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(Wage Bill)	-0.008***	-0.007***	-0.006***	-0.006***	-0.008***	-0.004***	-0.009***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Annual Sales)	0.002***	-0.003***	0.005***	-0.003***	0.002**	0.000	0.007***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Credit Stock)		0.013***		0.012***		0.010***		0.012***
Log(creat story)		(0.001)		(0.001)		(0.001)		(0.001)
Spread Ex-Ante		0.003***		. ,		0.001***		0.003***
spread Extrance		(0.000)				(0.000)		(0.000)
Spread 2019		. ,		0.004***		. ,		. ,
Spread 2010				(0.000)				
Default Brobability				(,		0.226***		
Delaut Probability						(0.002)		
Color Meriation						()	0.040555	0.024888
Sales variation							-0.040	(0.002)
							(0.002)	(0.002)
Dependent Variable Mean	0.088	0.088	0.080	0.080	0.089	0.089	0.090	0.090
Dependent Variable Std. Dev.	0.284	0.284	0.271	0.271	0.284	0.284	0.286	0.286
Number of Firms	96,424	96,424	69,317	69,317	95.928	95.928	92,802	92,802
R <sup>2</sup>	0.073	0.112	0.068	0.117	0.073	0.284	0.092	0.124
Industry FE and Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel P. Readiated Default Probability								
Banked Firms	0.088	0.080	0.079	0.079	0.089	0.089	0.090	0.001
Unbanked Firms	0.107	0.009	0.091	0.019	0.108	0.005	0.097	0.031

#### Probaility of Firms Using Public Programs: Including Unbanked Firms

	Pub	lic Credit Guara	Employment Protection		
	(1)	(2)	(3)	(4)	
	Applications	Approvals	Use	Use Employment	
Unbanked Firms Risk	0.395*** (0.040)	- <mark>0.291</mark> *** (0.039)	<b>0.302</b> *** (0.040)	- <b>0.049</b> (0.030)	
Banked Firms Risk	0.543***	-0.265***	0.308***	-0.024	
	(0.033)	(0.022)	(0.028)	(0.020)	
Banked	0.313*** (0.005)	0.022*** (0.005)	0.299*** (0.005)	0.022*** (0.004)	
Increase in Sales Dummy	0.165*** (0.005)	0.020*** (0.006)	0.157*** (0.006)	0.058*** (0.005)	
Decrease in Sales Dummy	0.171*** (0.005)	0.022*** (0.006)	0.159*** (0.005)	0.111*** (0.005)	
Use Employment Protection	0.109*** (0.004)	-0.008** (0.003)	0.083*** (0.004)		
Use Public Credit Guarantee				0.054*** (0.002)	
Dependent Variable Mean Dependent Variable Std. Dev.	0.911 0.285	0.357 0.479	0.481 0.500	0.165 0.371	
Number of Firms	47,630	114,542	114,566	118,090	
R <sup>2</sup>	0.030	0.135	0.155	0.080	
Industry FE and Municipality FE	Yes	Yes	Yes	Yes	
Predicted Default Probability					
Unbanked Firms	0.094	0.104	0.094	0.093	
Banked Firms	0.084	0.090	0.084	0.086	

#### Probability of Firms Using Public Programs: Ex-Ante Spread • Return

	Public	Credit Guaran	Employment Protection		
	(1)	(2)	(3)	(4)	
	Applications	Approvals	Use	Use	
Spread Ex-Ante	0.003*** (0.001)	-0.001*** (0.000)	<b>0.002</b> *** (0.001)	- <b>0.001</b> (0.000)	
Increase in Sales Dummy	0.133*** (0.010)	0.015* (0.008)	0.143*** (0.011)	0.046*** (0.009)	
Decrease in Sales Dummy	0.136*** (0.009)	0.015* (0.008)	0.141*** (0.011)	0.105*** (0.009)	
Use Employment Protection	0.112*** (0.007)	-0.010** (0.005)	0.087*** (0.007)		
Use Public Credit Guarantee				0.054*** (0.004)	
Dependent Variable Mean Dependent Variable Std. Dev Number of Firms	0.656 0.475 36,156	0.926 0.262 20,656	0.517 0.500 36,212	0.190 0.393 37,739	
R <sup>2</sup>	0.095	0.037	0.071	0.084	
Industry FE and Municipality FE Predicted Default Probability Product Circuit	Yes	Yes	Yes	Yes	
Danked Firms	0.059	0.004	0.059	0.060	

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Public	Share of	Default	Effective	Expected	Government's	Banks'
	Credit Guarantee Program (Million USD)	Public Credit Guarantee Program (%)	Probability (%)	Guarantee (%)	Loss/GDP (=(2)×(3))/GDP (%)	Expected Loss/GDP (=(4)×(5)/GDP) (%)	Expected Loss/GDP (=(5)-(6)) (%)
Firm Size							
Small	2264	25	9.22	39.0	0.08	0.03	0.05
Medium	2372	27	5.97	33.0	0.06	0.02	0.04
Medium-Large	3322	37	3.45	19.0	0.05	0.01	0.04
Large	1008	11	2.49	0.0	0.01	0.00	0.01
No Sales Data	56	0	9.22	39.0	0.00	0.00	0.00
Total: Formal Firms	9022	100	5.47	25.6	0.20	0.06	0.14
	(3.6% GDP)						