Relationship Networks in Banking Around a Sovereign Default and Currency Crisis[1]

Pablo D'Erasmo — FRB of Philadelphia
Hernán Moscoso Boedo — University of Cincinnati
María Pía Olivero — Drexel University
Maximo Sangiacomo — Banco Central Republica Argentina

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[1] The views expressed here do not necessarily reflect those of the FRB Philadelphia, The Federal Reserve System or the Central Bank of Argentina.

What We Do

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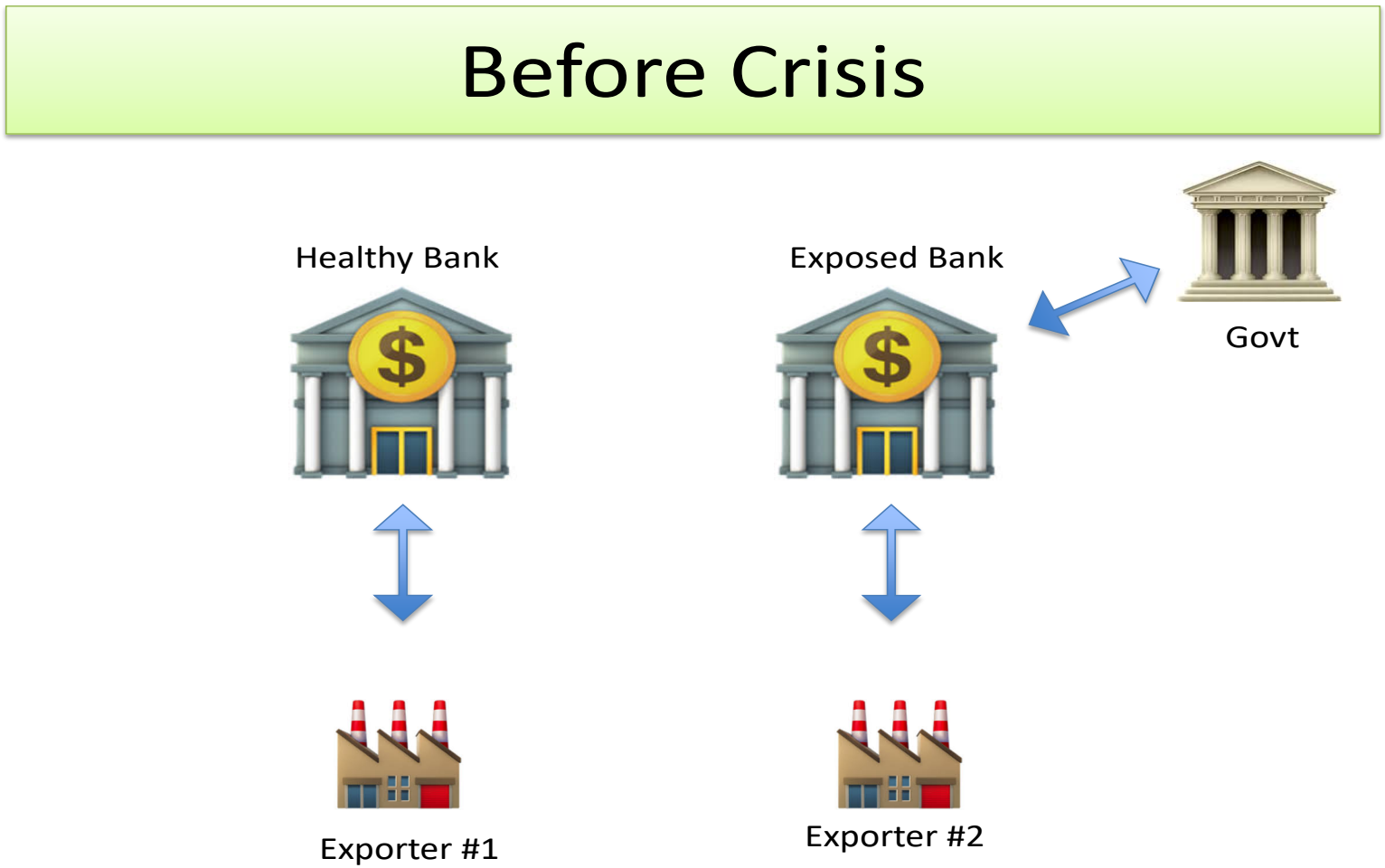
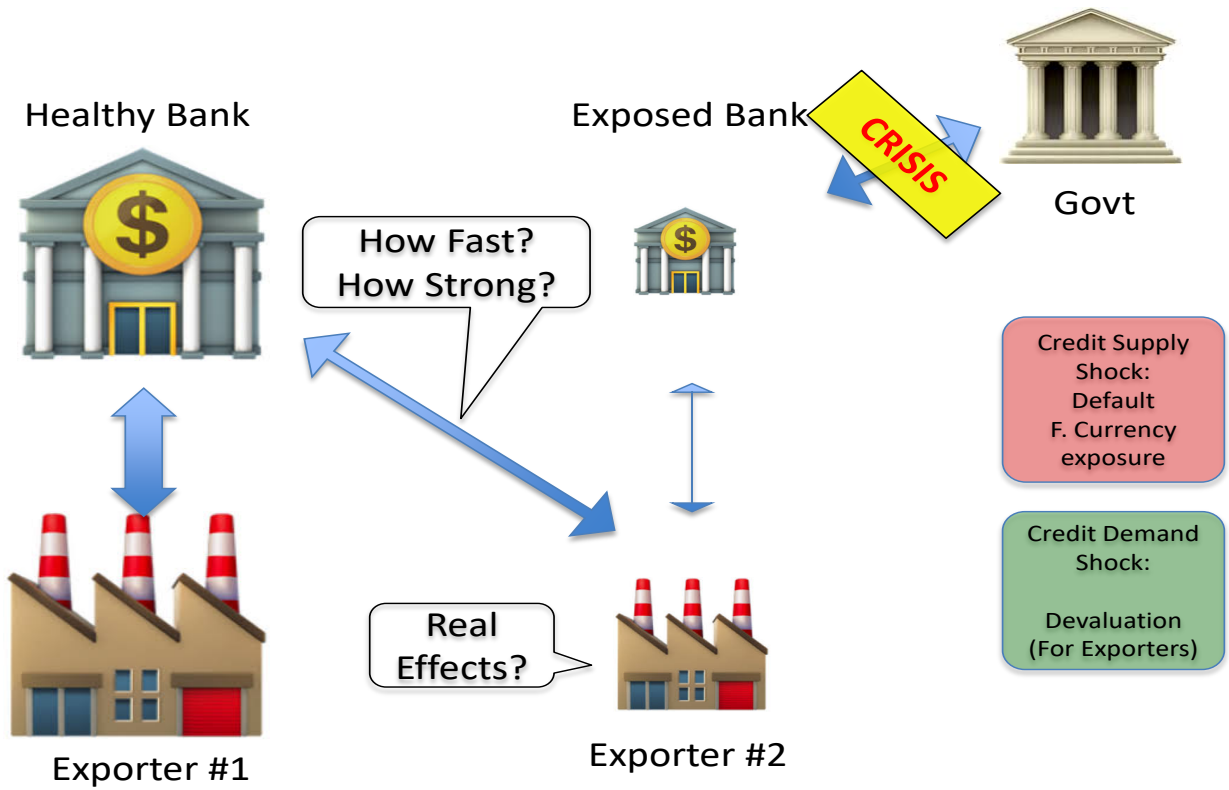
- We study the impact of a sovereign default and currency devaluation on corporate bank credit and real activity
- We propose a matching model where firms set up long-term credit relationships and find it costly to switch lenders
- We evaluate the predictions of the model
  - Data from Argentina around the 2001/2002 default and devaluation
  - Novel linked firm-bank level data to identify credit demand vs. supply effects and characterize network (universe of firms and banks)
  - Detailed information on measures of domestic sovereign debt and foreign currency exposure
- Provide evidence largely consistent with the model

Intuition


Before Crisis
Healthy Bank
Exposed Bank
Govt
Exporter #1
Exporter #2

Intuition

After Default and Devaluation

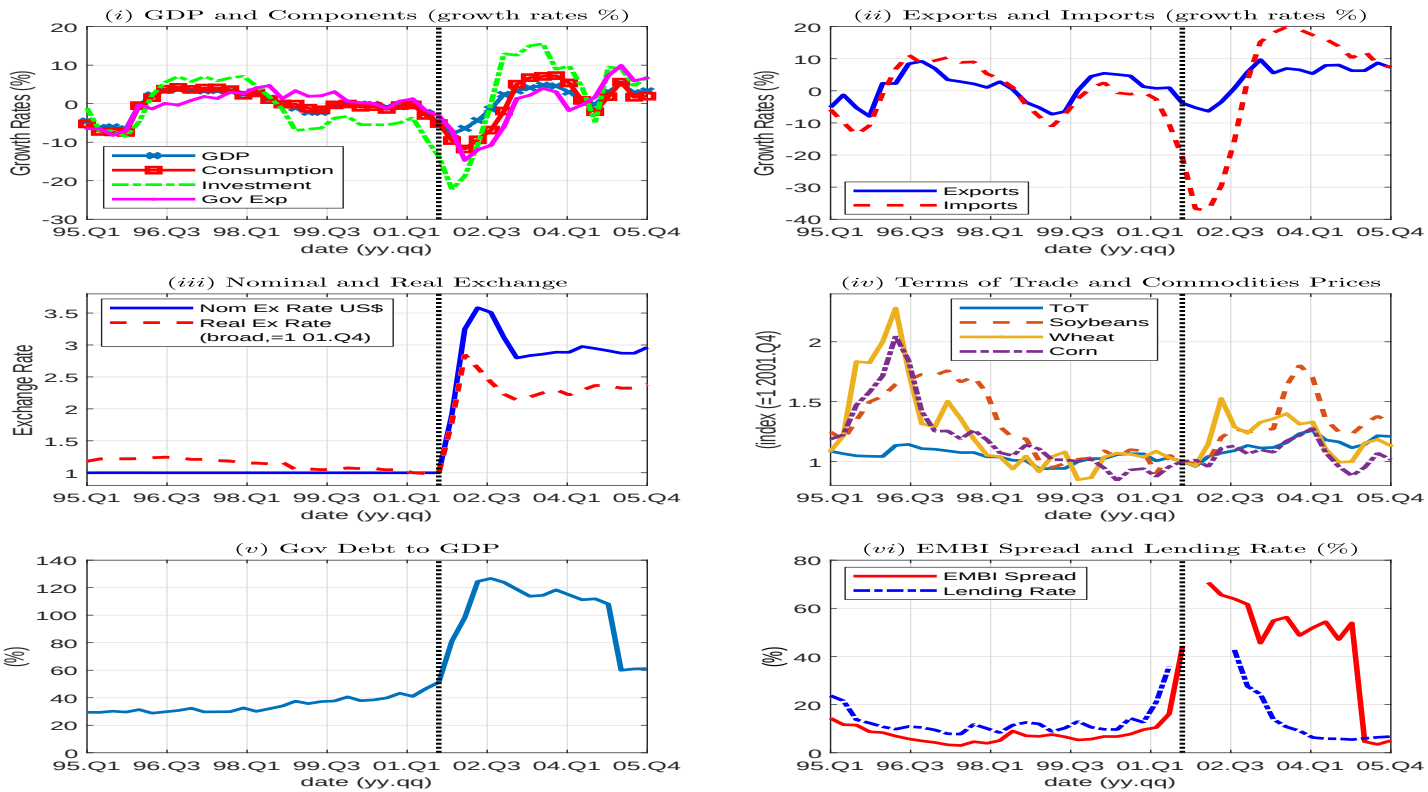


Previous Literature

- Bank-level data: Paravisini (JF, 2008), Popov and Van Horen (RF, 2015), Gennaioli, Martín and Rossi (JME, 2018)
- Identification strategy (loan-Level data): Gan (RFS, 2007), Khwaja and Mian (AER, 2008), Jiménez et al, (2014), Bottero et al (2016), Schwert (2015), Kalemli-Ozcan et al (REStat 2016), Alfaro et. al (2019).
- Cost of Sovereign Default/Fin Crisis (banks/firms): Gennaioli, Martín and Rossi (JF, 2014), Bocola (JPE, 2016), Pérez (2015), Arellano, Bai and Bocola (2017), Rojas (2018)
- Cost of Sovereign Default/Fin Crisis (banks/trade): Manova (REStud, 2012), Mendoza and Yue (QJE, 2012), Gopinath and Neiman (AER 2014)

Argentina's Default of 2001

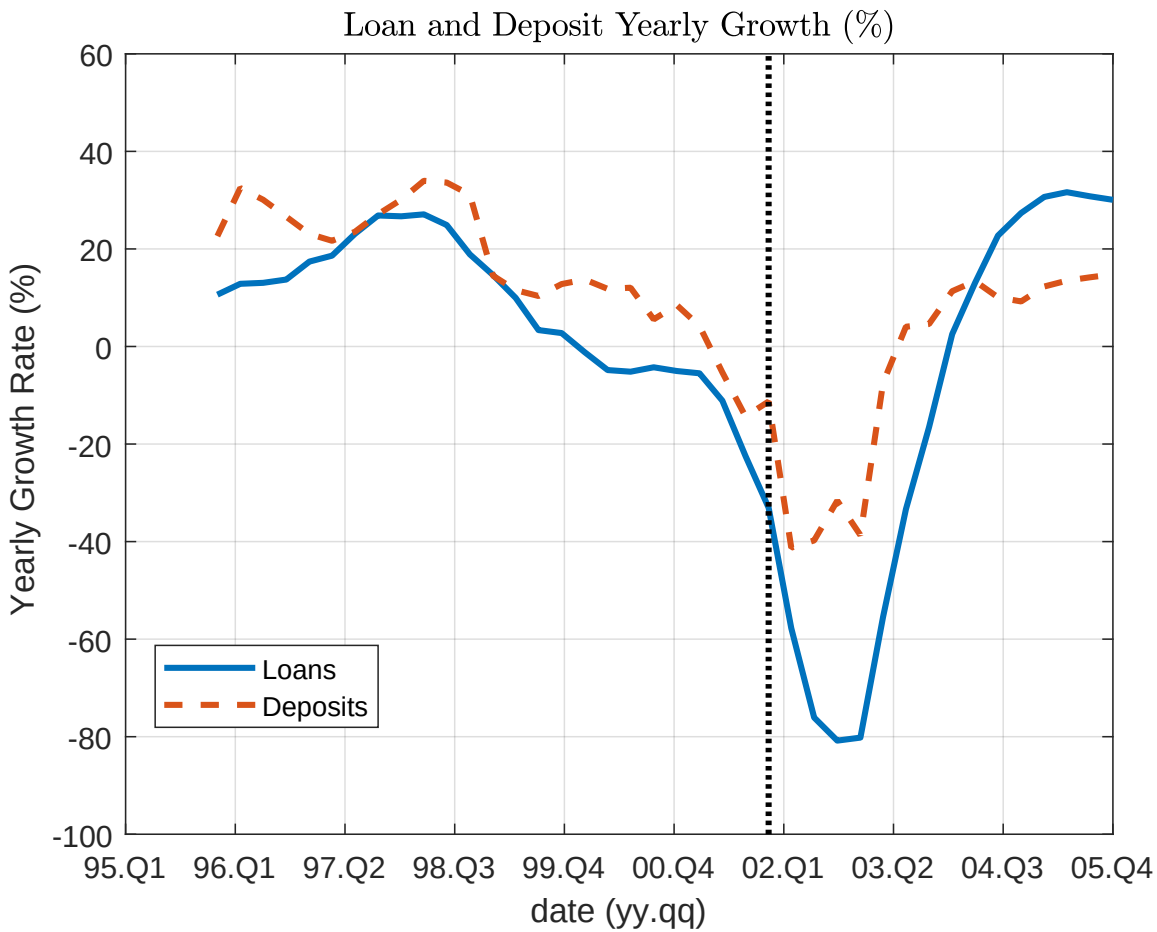
Figure: Evolution of Macro Aggregates



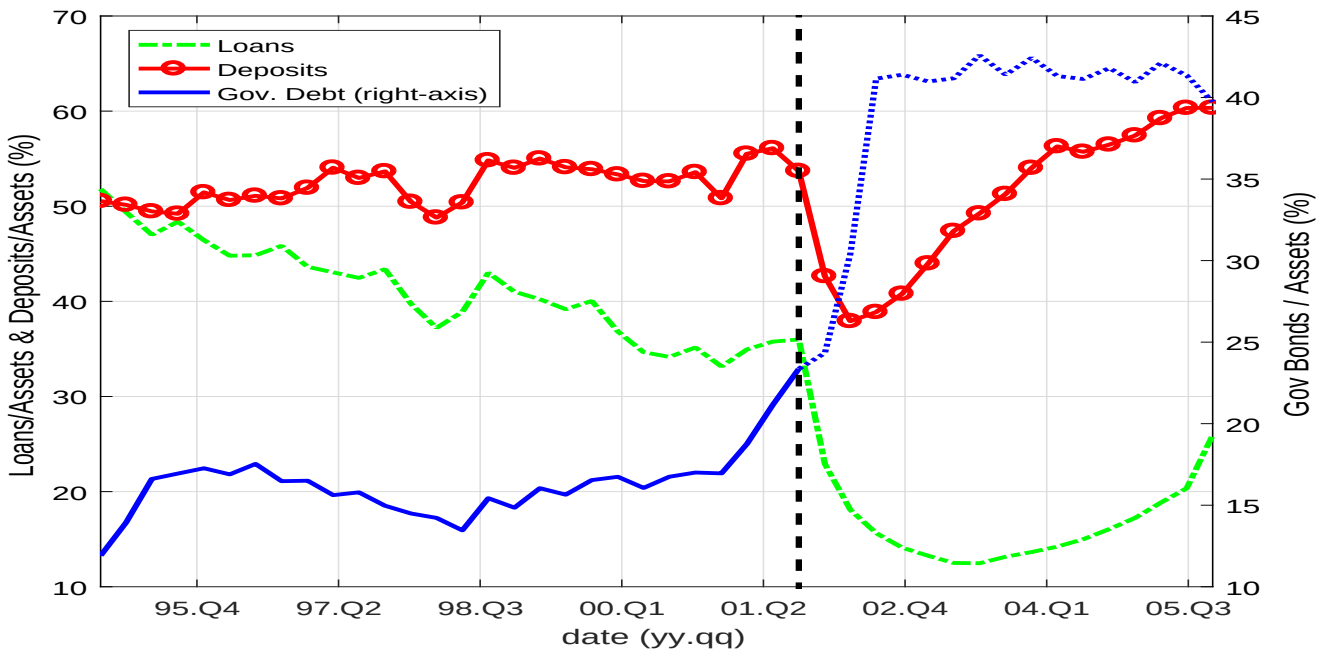
The Bank-Level Data

- We use balance sheet and income statement data for ALL (95) banks in Argentina
- Dynamics around default can be identified: monthly data
- Currency composition of portfolios
- Portfolios by sectors of depositors and borrowers
- Data on banks exposure to domestic sovereign and private debt

Loans and Deposits Dynamics

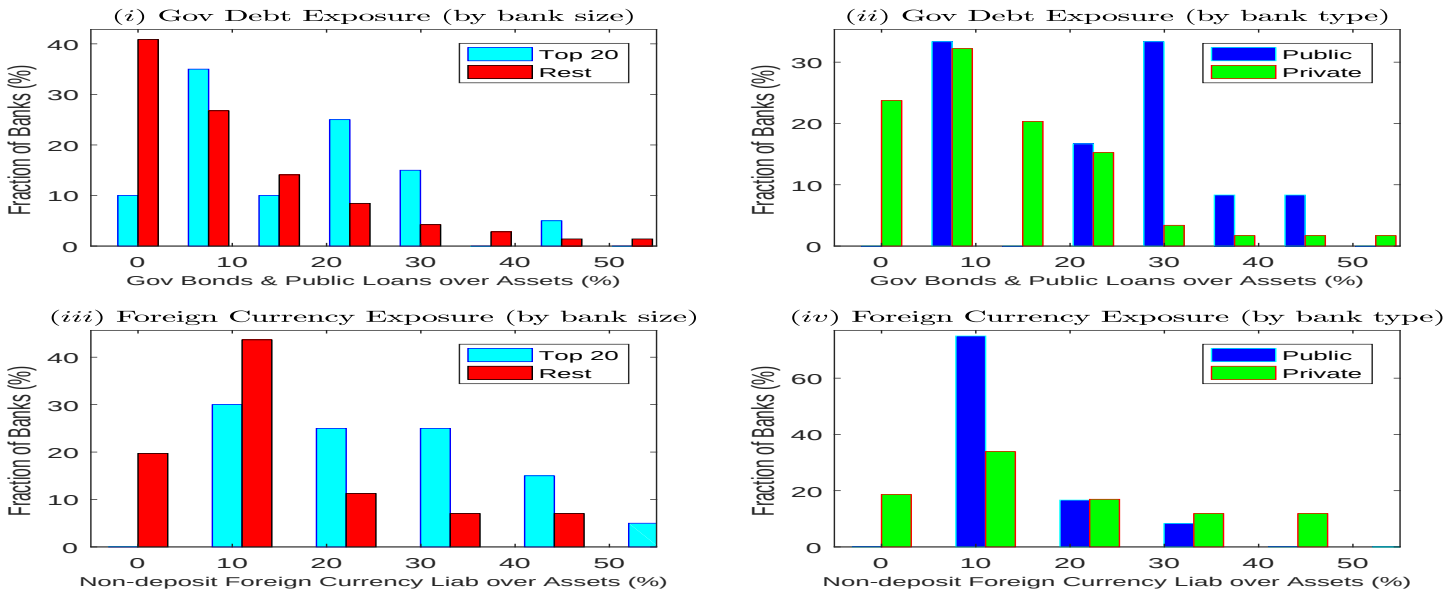


Evolution of Balance Sheet Ratios

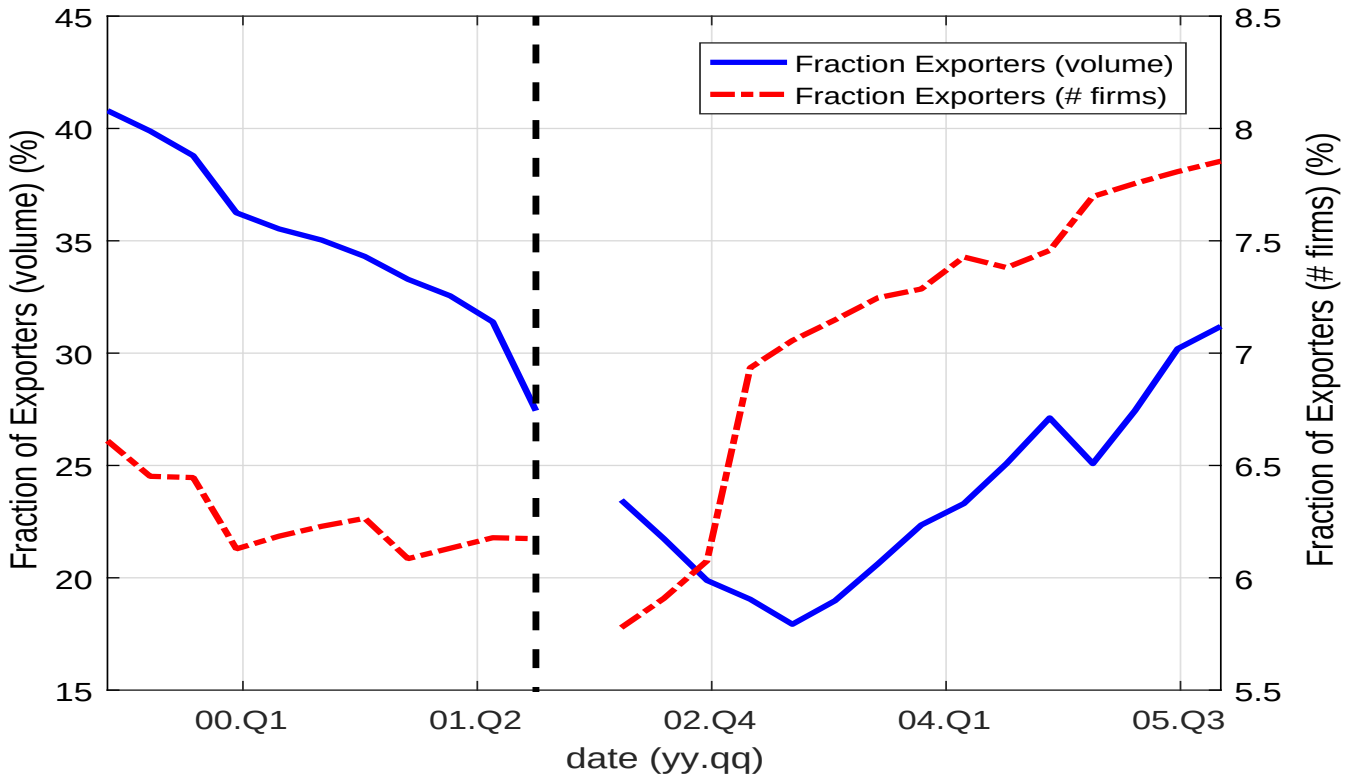


Banks' Government Exposure in 2001

- Distribution of holdings of domestic government debt and foreign currency exposure (by bank size and type)



Fraction of Exporters (%)



Bank Level Analysis: Credit Effects of Default/Dev

We follow (Genniaoli et.al (2018)),

$$\Delta \ell_{it} = \alpha_t + \beta_1 E_{i2001} + \beta_2 FC_{i2001} + \beta_3 X_{it-1} + u_{it}$$

where:

- ℓ_{it}: loans (real terms) by bank i in period t
- $\Delta \ell_{it} = \frac{\ell_{it} - \ell_{it-3}}{0.5(\ell_{it} + \ell_{it-3})}$ for 2003-2005
- E_{i2001}: sovereign debt exposure in 2001 (dom sov Bonds to assets)
- FC_{i2001}: exposure to devaluation in 2001 (non-deposit foreign currency liabilities to total assets)
- α_i bank FE, X_{it-1}: bank-level controls

Bank-Level Effects of Sovereign Debt and Foreign Currency Exposure

Dep. Variable	$\Delta \ell_{it}$					
Government Exposure						
Sov. Debt Exposure (E_{i2001})	-0.845**	-0.923**	-0.985**	-0.721*	-0.747*	-0.847**
	(0.047)	(0.030)	(0.018)	(0.095)	(0.084)	(0.045)
FC Exposure (FC_{i2001})				-0.298	-0.495**	-0.386*
				(0.118)	(0.014)	(0.051)
Bank Characteristics						
Liquity$_{t-3}$	1.353***	1.553***	1.393***	1.239***	1.440***	1.306***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage$_{t-3}$	-0.622***	-0.755***	-0.431***	-0.633***	-0.824***	-0.487***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
(log) Real assets$_{t-3}$		0.0501**	0.0219		0.0692***	0.0370
		(0.024)	(0.314)		(0.003)	(0.109)
Net Income$_{t-3}$			2.387***			2.371***
			(0.000)			(0.000)
Bank Type × Time FE	yes	yes	yes	yes	yes	yes
Period	2003-2005	2003-2005	2003-2005	2003-2005	2003-2005	2003-2005
No Observations	3,220	3,220	3,220	3,220	3,220	3,220
R-squared	0.029	0.030	0.077	0.029	0.032	0.078

Note: "Sov. Debt Exposure 01" refers to ratio of Domestic Government Bonds over assets in 2001. "FC Exposure" refers to the ratio of non-deposit foreign currency liabilities over assets in 2001.

Setup Simple Matching Model

- Firms and banks distributed in $I + 1$ islands
- I peripheral islands $i \in [1, I] + 1$ central island
- B banks per island
- F firms per peripheral island. No firms on the central island
- Firms remain in the market for only one period

- Relationships between firms and banks on peripheral islands - already existing - no setup cost
- The central island: a market where new firm-bank relationships are established after incurring in a switching cost z

Setup (ctd.)

- In each period a fraction α_i of firms receive an investment opportunity
- Investment opportunities require external financing with cost r_i
- Each bank receives v_i units of available credit
- A financed project produces y units of output
- Once banks and firms meet, they split the surplus via Nash Bargaining (ϕ bank's bargaining power):
  - $(y - r_i)$ for the firm and r_i for the bank

Matching in Credit Markets - Networks

- Banks and firms find each other using a constant-returns-to scale matching function

$$M = m\left(F\alpha_i\right)^{\gamma}\left(B\nu_i\right)^{1-\gamma}$$

- Banks and firms find each other randomly with market tightness:

$$\theta_i = \frac{Bv_i}{F\alpha_i}$$

- Probability of a project being financed:

$$\begin{aligned} q(\theta_i) &= \frac{M}{F\alpha_i} = m\left(\frac{Bv_i}{F\alpha_i}\right)^{1-\gamma} \\ &= m\theta_i^{1-\gamma} \end{aligned}$$

Timing

1. The vectors α and v containing the information on α_i and v_i for all islands are observed;
2. Peripheral island markets open for all islands 1 through I;
3. Random matching happens and $q(\theta_i)$ projects receive financing;
   - A fraction $(1 - q(\theta_i))$ of projects do not find a bank;
4. The central market opens;
5. Firms decide whether to take their unmatched projects to the central island by paying the cost z

Equilibrium

- On the central island, matched firms and banks bargain over the match surplus without any outside option $\max_{r_0}(y - r_0)^{1-\phi} r_0^{\phi}$

$$\max_{r_0}(y - r_0)^{1-\phi} r_0^{\phi}$$

- This determines the interest rate in the central island: $r_0 = \phi y$

When do Firms Switch to the Central Island

- A firm will transition to the central island market as long as

$$\underbrace{z}_{\text{switching cost}} < \underbrace{q(\theta_0)(y(1-\phi))}_{\text{value switching}}$$

  Recall $q(\theta) = \frac{M}{F\alpha} = m\theta^{1-\gamma}$

- Threshold

$$\hat{\theta_0} = \frac{z}{[my(1-\phi)]}^{\frac{1}{1-\gamma}}$$

  Firms will transition as long as $\theta_0 \geq \hat{\theta_0}$

- Let $\underline{\theta}_0 = \frac{Bv_0}{F\sum_{i=1}^{I}\alpha_i(1-q(\theta_i))}$ (for given v_0, $\{\alpha_i, v_i\}_{i=1}^{I}$)

Switching Lenders (ctd.)

- If $\underline{\theta}_0 \geq \hat{\theta}_0$, all the unmatched projects transition to the central island and market tightness is
$$\theta_0 = \underline{\theta}_0$$
- If $\underline{\theta}_0 < \hat{\theta}_0$, firms transition consistent with $\theta_0 = \hat{\theta}_0$. They use a mixed strategy and transition with probability $0 < \tau < 1$ (endogenous)
- Overall, firms will switch to the central island with probability $\hat{\tau} = \min(\tau, 1)$.

Supply shocks: Exposure to sov debt/devaluation

In steady state: Fraction projects being financed

$$q(\theta_i) + (1 - q(\theta_i))\hat{\tau}q(\theta_0) = q(Bv/F\alpha) + (1 - q(Bv/F\alpha))\hat{\tau}q(\theta_0)$$

After a negative shock to v_i, testable implications:

- Good initial network, more credit: $\frac{\partial q(\theta_i)}{\partial v_i} \geq 0$
- Bad initial network, new relationships: $\frac{\partial \hat{\tau} q(\theta_0)}{\partial v_i} \leq 0$

The Firm-Bank Level Data

- Credit registry of Argentina
- Construct unique monthly data of credit at firm-bank level: 202K firms, 345K lending relationships ($\approx 2M$ monthly obs)
- Information on total debt, sector, credit quality, total number of banking relationships
- Export status (information from Custom data)
- Match with bank level data: capture supply shock
  - Challenge is to identify time-varying bank supply shocks from firm-borrowing shocks
  - Follow a similar approach to Khwaja and Mian (2008) among others
- Aggregated to firm level to capture credit demand shocks.

Summary Statistics (Firm Level)

	Firm Export Status (Post-Crisis)					
	$x_j = 0$			$x_j = 1$		
	Avg.	Median	Std. Dev.	Avg.	Median	Std. Dev.
Pre Crisis Variables						
Sov. Debt Exposure $\overline{E}_{j2001}$	0.083	0.075	0.048	0.085	0.077	0.048
Foreign Currency Exposure $\overline{FC}_{j2001}$	0.216	0.238	0.085	0.232	0.250	0.074
Public Banks Network$_{j2001}$	0.339	0.000	0.448	0.173	0.000	0.328
Dom. Private Banks Network$_{j2001}$	0.323	0.000	0.439	0.435	0.263	0.442
Number of Banks$_{j2001}$	1.47	1.00	0.94	1.88	1.25	1.30
Avg Age Relationships$_{j2001}$ (months)	20.75	25.25	7.47	20.39	24.13	7.15
Export Indicator$_{j2001}$	0.000	0.000	0.000	0.605	1.000	0.489
Firm Debt$_{j2001}$ (real, 000s)	45.41	10.78	115.02	115.29	31.41	321.06
Contemporaneuous Variables						
Sov. Debt Exposure $\overline{E}_{jt}$	0.199	0.186	0.124	0.184	0.182	0.104
Foreign Currency Exposure $\overline{FC}_{jt}$	0.142	0.128	0.105	0.159	0.153	0.098
Public Banks Network$_{jt}$	0.313	0.000	0.447	0.174	0.000	0.349
Dom. Private Banks Network$_{jt}$	0.323	0.000	0.439	0.435	0.263	0.442
Number of Banks$_{jt}$	1.37	1.00	0.82	1.68	1.00	1.14
Avg Age Relationships$_{jt}$ (months)	43.04	45.00	20.05	43.26	45.00	20.05
New Relationship Indicator$_{jt}$	0.321	0.000	0.455	0.333	0.000	0.449
Firm Debt$_{jt}$ (real, 000s)	45.74	7.41	105.47	87.94	14.87	160.98
Change in Loans ΔL_{jt}	-0.023	-0.020	0.522	0.011	-0.024	0.746

Credit Supply Shock: Bank-Firm links

$$\Delta \ell_{ijt} = \rho_{jt} + \delta_1 E_{i2001} + \delta_2 FC_{i2001} + \delta_3 R_{ijt-1} + \delta_4 X_{it-1} + e_{ijt}$$

where:

- ρ_{jt} are firm/month fixed effects
- X_{it-1}: bank-level controls
- R_{ijt-1}: pair-level controls

- Identification strategy relies on firms operating with more than one bank

Relationship Level Effects

Dep. Variable			$\Delta \ell_{ijt}$	
Government Exposure				
Sov. Debt Exposure 01	-0.202***	-0.192***	-0.135***	-0.135***
	(0.000)	(0.000)	(0.000)	(0.000)
FC Exposure 01		-0.915***		0.241
		(0.000)		(0.157)
Relationship Characteristics				
Age Pair$_{ijt-3}$			-0.00334***	-0.00341***
			(0.000)	(0.000)
Rank Bank$_{ijt-3}$			-0.0396***	-0.0397***
			(0.000)	(0.000)
Bank Controls	yes	yes	yes	yes
Firm×Time FE	yes	yes	yes	yes
Period	2003-2005	2003-2005	2003-2005	2003-2005
No Observations	1,023,966	1,023,966	1,023,966	1,023,966
R-squared	0.199	0.199	0.199	0.199

Firm-Level Data: Network Effects

$$\Delta L_{jt} = \rho_{st} + \alpha_1 \overline{E}_{j,2001} + \alpha_2 \overline{FC}_{j,2001} + \alpha_3 X_{j2001} + \alpha_4 \overline{N}_{j,2001} + \alpha_5 X_{jt-3} + \alpha_5 \overline{N}_{j,t-3} + \epsilon_{jt}$$

- $\overline{N}$: Banking Network characteristics.

Firm Level Effects

Dep. Variable	ΔL_{jt}			
Government Exposure 2001				
Sov. Debt Exposure 01 $\overline{E}_{j2001}$	-0.194***	-0.211***	-0.274***	-0.290***
	(0.000)	(0.000)	(0.000)	(0.000)
Foreign Currency Exposure 01 $\overline{FC}_{j2001}$		-0.131***		-0.118***
		(0.002)		(0.005)
Bank Network Characteristics				
Size Network (Dep Mkt Share)$_{j2001}$	0.182***	0.211***	0.168***	0.194***
	(0.001)	(0.000)	(0.002)	(0.000)
Public Banks Network$_{j2001}$	0.0142**	-0.00638	0.00196	-0.0165*
	(0.022)	(0.469)	(0.750)	(0.060)
Dom. Private Banks Network$_{j2001}$	0.00851	0.00228	0.0210***	0.0154**
	(0.170)	(0.723)	(0.001)	(0.016)
Relationship Network Characteristics				
Avg Age Relationships$_{j2001}$	0.00195*	0.00261**	0.00153	0.00213*
	(0.063)	(0.017)	(0.143)	(0.051)
Share Top 2 Banks$_{j2001}$	0.119***	0.120***	-0.256***	-0.253***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of Banks$_{j2001}$			-0.0308***	-0.0306***
			(0.000)	(0.000)
New Relationship Indicator$_{jt-3}$			0.0725***	0.0727***
			(0.000)	(0.000)
Firm Characteristics				
Export Indicator$_{j2001}$	0.122***	0.122***	0.133***	0.133***
	(0.000)	(0.000)	(0.000)	(0.000)
Sector × Time FE	Yes	Yes	Yes	Yes
Period	2003-2005	2003-2005	2003-2005	2003-2005
Bank Controls	Yes	Yes	Yes	Yes
Other Firm Controls	Yes	Yes	Yes	Yes
No Observations	1,979,087	1,979,087	1,968,321	1,968,321
R-Squared	0.005	0.005	0.006	0.006

Firm Level Effects by Export Status

	ΔL_{jt}			
	Export Status (Post-Default)			
Dep. Variable	$x_j = 0$	$x_j = 1$	$x_j = 0$	$x_j = 1$
Government Exposure 2001				
Sov. Debt Exposure 01 $\overline{E}_{j2001}$	-0.241***	0.197	-0.320***	0.155
	(0.000)	(0.444)	(0.000)	(0.550)
Foreign Currency Exposure 01 $\overline{FC}_{j2001}$	-0.117***	-0.256	-0.106**	-0.179
	(0.006)	(0.304)	(0.012)	(0.468)
Bank Network Characteristics				
Size Network (Dep Mkt Share)$_{j2001}$	0.177***	0.764**	0.154***	0.981***
	(0.001)	(0.035)	(0.004)	(0.007)
Public Banks Network$_{j2001}$	-0.00130	-0.0106	-0.0119	-0.00887
	(0.884)	(0.853)	(0.178)	(0.876)
Dom. Private Banks Network$_{j2001}$	0.00236	0.0389	0.0151**	0.0483
	(0.718)	(0.223)	(0.019)	(0.131)
Relationship Network Characteristics				
Avg Age Relationships$_{j2001}$	0.00288***	-0.00644	0.00229**	-0.00466
	(0.009)	(0.292)	(0.036)	(0.446)
Share Top 2 Banks$_{j2001}$	0.0684**	0.279***	-0.320***	0.328*
	(0.011)	(0.002)	(0.000)	(0.069)
Number of Banks$_{j2001}$			-0.0322***	0.00578
			(0.000)	(0.699)
New Relationship Indicator$_{jt-3}$			0.0679***	0.121***
			(0.000)	(0.000)
Sector × Time FE	Yes	Yes	Yes	Yes
Period	2003-2005	2003-2005	2003-2005	2003-2005
Bank Controls	Yes	Yes	Yes	Yes
Other Firm Controls	Yes	Yes	Yes	Yes
No Observations	1,848,580	130,507	1,838,966	129,355
R-Squared	0.005	0.011	0.006	0.011

Firm Level Effects on Impact (2003)

	ΔL_{jt}			
	Export Status (Post-Default)			
Dep. Variable	$x_j = 0$	$x_j = 1$	$x_j = 0$	$x_j = 1$
Government Exposure 2001				
Sov. Debt Exposure 01 $\overline{E}_{j2001}$	-0.298***	0.0313	-0.412***	-0.110
	(0.000)	(0.943)	(0.000)	(0.802)
Foreign Currency Exposure 01 $\overline{FC}_{j2001}$	-0.305***	-0.743*	-0.285***	-0.567
	(0.000)	(0.067)	(0.000)	(0.160)
Bank Network Characteristics				
Size Network (Dep Mkt Share)$_{j2001}$	0.466***	1.962***	0.367***	2.109***
	(0.000)	(0.002)	(0.000)	(0.001)
Public Banks Network$_{j2001}$	-0.0486***	-0.271***	-0.0599***	-0.253**
	(0.000)	(0.006)	(0.000)	(0.010)
Dom. Private Banks Network$_{j2001}$	0.0126	-0.0312	0.0282***	-0.0230
	(0.218)	(0.592)	(0.005)	(0.690)
Relationship Network Characteristics				
Avg Age Relationships$_{j2001}$	0.00922***	0.0168*	0.00926***	0.0185*
	(0.000)	(0.087)	(0.000)	(0.056)
Share Top 2 Banks$_{j2001}$	0.000241	0.346**	-0.645***	0.391
	(0.995)	(0.019)	(0.000)	(0.185)
Number of Banks$_{j2001}$			-0.0538***	0.00454
			(0.000)	(0.853)
New Relationship Indicator$_{jt-3}$			0.109***	0.160***
			(0.000)	(0.001)
Sector × Time FE	Yes	Yes	Yes	Yes
Period	2003	2003	2003	2003
Bank Controls	Yes	Yes	Yes	Yes
Other Firm Controls	Yes	Yes	Yes	Yes
No Observations	672,277	43,703	669,061	43,304
R-Squared	0.010	0.018	0.012	0.019

Probability of Starting a New Relationship

Dependent Variable	Probability of New Relationship (post-crisis)			
Government Exposure 2001				
Sov. Debt Exposure 01 $\overline{E}_{j2001}$	0.322***	0.273***	0.272***	0.289***
	(0.000)	(0.000)	(0.000)	(0.000)
Foreign Currency Exposure 01 $\overline{FC}_{j2001}$			-0.154***	0.122***
			(0.000)	(0.000)
Banking Network Characteristics				
Public banks network$_{j,2001}$	-0.0138***	-0.00739	-0.0364***	0.0118*
	(0.001)	(0.105)	(0.000)	(0.069)
Private domestic banks network$_{j,2001}$	-0.0631***	-0.101***	-0.0775***	-0.0956***
	(0.000)	(0.000)	(0.000)	(0.000)
Network size (Dep.Mkt.share)$_{j,2001}$	-0.145***	0.00860	-0.0934***	-0.0186
	(0.000)	(0.824)	(0.007)	(0.638)
Relationship Characteristics				
Avg Age Relationship$_{j,2001}$	-0.0182***	-0.0148***	-0.0168***	-0.0154***
	(0.000)	(0.000)	(0.000)	(0.000)
Share top 2 banks$_{j,2001}$	-0.0564***	-0.0700***	-0.0589***	-0.0708***
	(0.000)	(0.000)	(0.000)	(0.000)
Exporter in 2001	0.00991	0.0103	0.00943	0.0107*
	(0.117)	(0.104)	(0.136)	(0.092)
Sector × Time FE	yes	yes	yes	yes
Other Bank/Network Controls	no	yes	no	yes
Other Borrower Controls	yes	yes	yes	yes
Period	2003-2005	2003-2005	2003-2005	2003-2005
N	1,979,087	1,979,087	1,979,087	1,979,087
R-squared	0.082	0.087	0.083	0.087

Extensive Margin of Exports

Dependent Variable	Probability of Export $x_j = 1$ (post-crisis)			
Government Exposure 2001				
Sov. Debt Exposure 01 $\overline{E}_{j2001}$	-0.0333*	-0.0636***	-0.0421**	-0.0687***
	(0.069)	(0.001)	(0.021)	(0.001)
Foreign Currency Exposure 01 $\overline{FC}_{j2001}$			-0.0270**	-0.0384***
			(0.018)	(0.006)
Banking Network Characteristics				
Public banks network$_{j,2001}$	-0.0577***	-0.0541***	-0.0616***	-0.0602***
	(0.000)	(0.000)	(0.000)	(0.000)
Private domestic banks network$_{j,2001}$	-0.00899***	-0.00872***	-0.0115***	-0.0105***
	(0.000)	(0.002)	(0.000)	(0.000)
Network size (Dep.Mkt.share)$_{j,2001}$	0.173***	0.131***	0.182***	0.140***
	(0.000)	(0.000)	(0.000)	(0.000)
Relationship Characteristics				
Avg Age Relationship$_{j,2001}$	0.000121	-0.0000341	0.000369	0.000159
	(0.783)	(0.939)	(0.403)	(0.724)
Share top 2 banks$_{j,2001}$	-0.130***	-0.129***	-0.130***	-0.128***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Debt$_{j,2001}$	0.00890***	0.00901***	0.00888***	0.00904***
	(0.000)	(0.000)	(0.000)	(0.000)
Sector × Time Fixed Effects	yes	yes	yes	yes
Other Bank/Network Controls	no	yes	no	yes
Other Firm Controls	yes	yes	yes	yes
Period	2003-2005	2003-2005	2003-2005	2003-2005
N	1,979,087	1,979,087	1,979,087	1,979,087
R-squared	0.149	0.149	0.149	0.149

Firm-Level Effects - Borrowers Default

Dependent Variable	Borrowers Default (post-crisis)			
Government Exposure 2001				
Sov. Debt Exposure 01 $\overline{E}_{j2001}$	0.407***	0.387***	0.0993**	0.259***
	(0.000)	(0.000)	(0.012)	(0.000)
Foreign Currency Exposure 01 $\overline{FC}_{j2001}$			-0.903***	-0.964***
			(0.000)	(0.000)
Banking Network Characteristics				
Public banks network$_{j,2001}$	-0.0118**	-0.0288***	-0.145***	-0.181***
	(0.040)	(0.000)	(0.000)	(0.000)
Private domestic banks network$_{j,2001}$	-0.300***	-0.330***	-0.380***	-0.373***
	(0.000)	(0.000)	(0.000)	(0.000)
Network size (Dep.Mkt.share)$_{j,2001}$	-0.586***	-0.256***	-0.266***	-0.0309
	(0.000)	(0.000)	(0.000)	(0.568)
Relationship Characteristics				
Avg Age Relationship$_{j,2001}$	0.00433***	0.00826***	0.0125***	0.0130***
	(0.000)	(0.000)	(0.000)	(0.000)
Share top 2 banks$_{j,2001}$	-0.308***	-0.333***	-0.319***	-0.324***
	(0.000)	(0.000)	(0.000)	(0.000)
Exporter in 2001	-0.421***	-0.417***	-0.417***	-0.415***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Debt$_{j,2001}$	0.00894***	0.00687***	0.00810***	0.00768***
	(0.000)	(0.000)	(0.000)	(0.000)
Sector × Time FE	yes	yes	yes	yes
Other Bank/Network Controls	no	yes	no	yes
Other Firm Controls	yes	yes	yes	yes
Period	2003-2005	2003-2005	2003-2005	2003-2005
N	2,078,412	2,078,412	2,078,412	2,078,412
R-squared	0.151	0.157	0.165	0.166

Concluding Remarks

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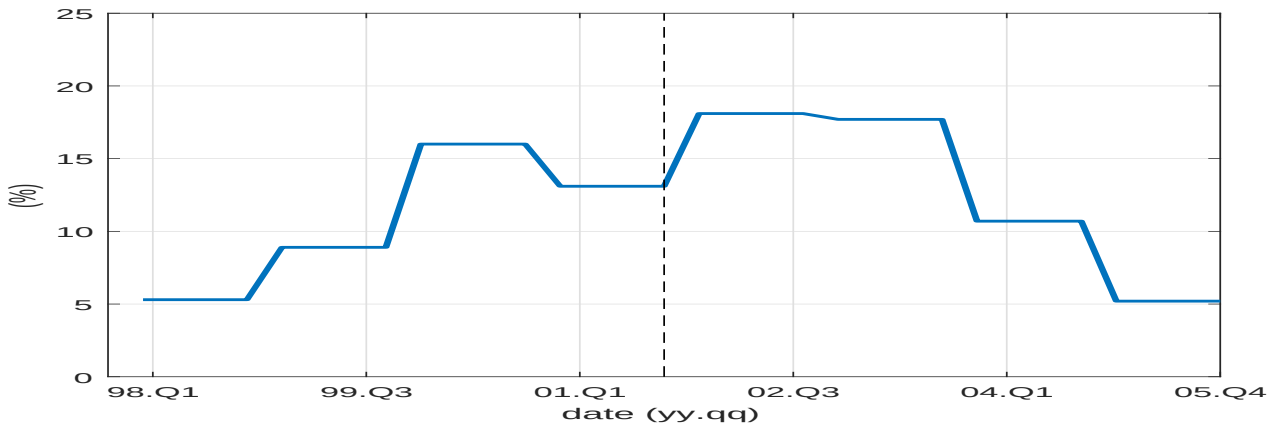
- Exporters are able to undo the effects by generating new banking relationships over time
- Real effects found in the probabilities of new relationships, becoming an exporter, and defaulting

Fraction of Loan Portfolio in Default



Distribution of Banking Relationships

Pre-Default / Devaluation						
	Fraction of Firms			Fraction of Loans		
# Banking Relationships	All	Export Status $x_j = 0$	Export Status $x_j = 1$	All	Export Status $x_j = 0$	Export Status $x_j = 1$
1	69.86	71.06	51.81	34.69	37.48	21.13
2	19.28	18.92	24.60	27.42	27.18	28.58
3	6.24	5.91	11.19	15.64	15.32	17.17
4	2.63	2.39	6.30	10.31	9.39	14.78
5	1.03	0.90	2.96	5.34	4.77	8.12
6-10	0.95	0.80	3.09	6.36	5.67	9.70
> 10	0.02	0.02	0.05	0.24	0.19	0.52
Post-Default / Devaluation						
	Fraction of Firms			Fraction of Loans		
# Banking Relationships	All	Export Status $x_j = 0$	Export Status $x_j = 1$	All	Export Status $x_j = 0$	Export Status $x_j = 1$
1	76.20	77.18	61.72	41.64	43.90	23.97
2	16.15	15.69	22.92	27.02	26.64	29.86
3	4.71	4.43	8.87	14.47	13.75	20.06
4	1.71	1.58	3.57	7.94	7.52	11.25
5	0.67	0.61	1.52	4.27	3.97	6.66
6-10	0.55	0.49	1.38	4.54	4.13	7.93
> 10	0.01	0.01	0.02	0.10	0.09	0.26

Note: *Pre-default /devaluation* corresponds to year 2001. *Post-default/devaluation* corresponds to the average of years 2003-2005. Export Status x_j takes a value of 1 if the firm exports between 2003-2005. Fraction of Firms corresponds to the ratio of firms in a given bin to the total number of firms. Fraction of Loans corresponds to the ratio of loans in a bin to total loans.
Source: Central Bank of Argentina.

Distribution of Age of Banking Relationships

	Fraction of Banking Relationships							
	Year 2001		Year 2003		Year 2004		Year 2005	
Age Relationship (months)	Export Status $x_j = 0$	Export Status $x_j = 1$	Export Status $x_j = 0$	Export Status $x_j = 1$	Export Status $x_j = 0$	Export Status $x_j = 1$	Export Status $x_j = 0$	Export Status $x_j = 1$
1-5	5.42	5.80	3.47	4.12	6.00	6.61	2.09	4.50
6-10	7.39	9.34	2.56	3.12	5.67	4.89	5.56	6.34
11-15	5.45	6.06	6.63	5.78	3.51	4.30	7.76	6.26
16-20	6.92	7.25	1.42	1.67	2.48	2.83	5.94	4.71
21-25	74.82	71.55	4.18	4.56	7.36	6.72	3.41	4.12
26-30			4.28	4.60	0.00	0.00	2.58	2.85
31-35			6.12	7.81	3.73	3.85	2.70	2.93
36-40			4.58	5.07	3.91	4.15	5.04	4.43
41-45			5.75	6.27	3.97	4.58	1.86	2.30
46-50			61.00	56.99	4.97	6.10	3.38	3.57
51-55					4.50	4.54	3.19	3.45
56-60					10.42	9.82	4.96	5.38
61-65					43.48	41.60	3.39	3.59
66-70							4.75	4.94
71-75							43.40	40.64

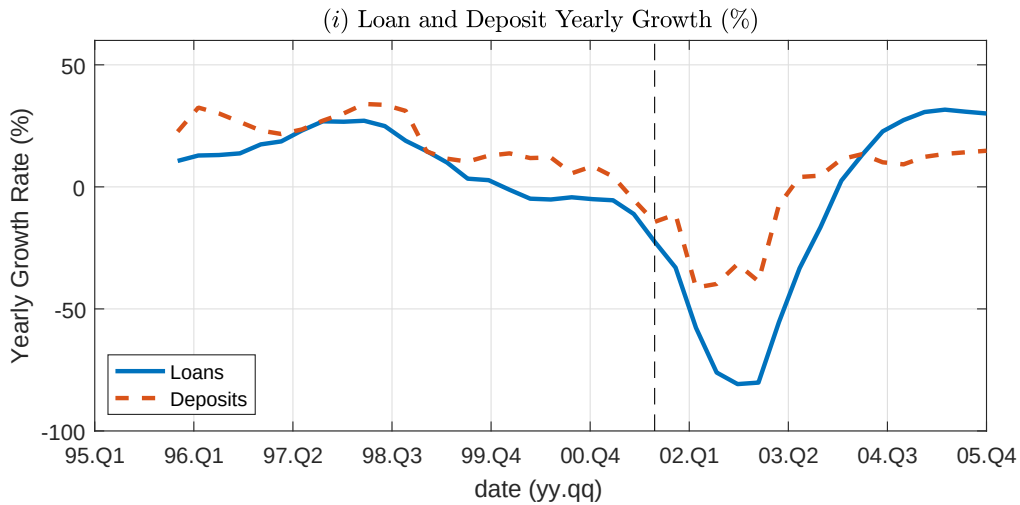
Note: Export Status x_j takes a value of 1 if the firm exports between 2003-2005. Fraction of Firms corresponds to the ratio of firms in a given bin to the total number of firms.
Source: Central Bank of Argentina.

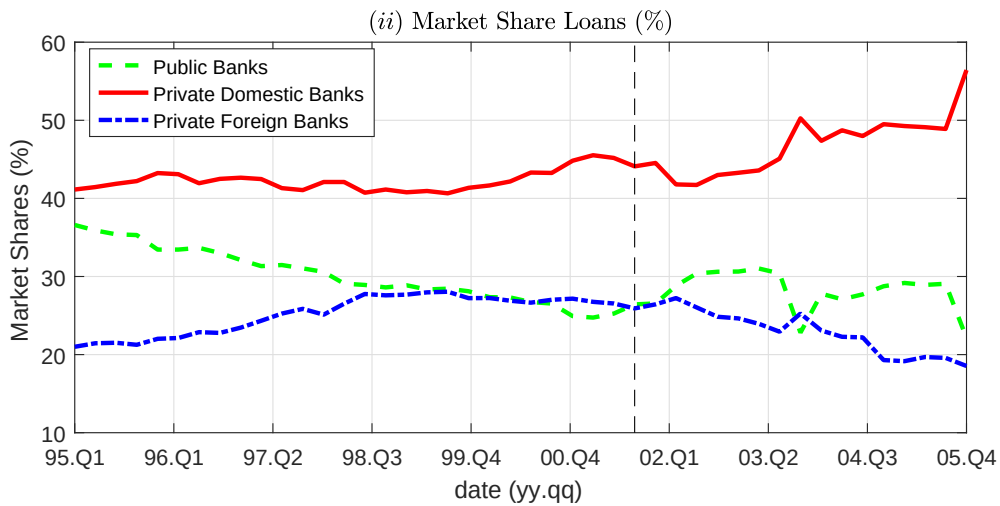
Allocation of Bank Credit by Sector

Sector	All Banks	Public	Private	Foreign
Wholesale & Retail	27.3	27.3	27.0	33.0
Agriculture	18.3	18.3	16.0	6.4
Construction	6.4	6.4	7.2	6.7
Transportation and warehousing	6.2	6.2	6.1	8.7
Food	5.9	5.9	5.4	5.0
Textiles	4.7	4.7	4.8	4.7
Real estate and rental	4.1	4.1	5.5	5.2
Services	3.1	3.1	3.7	2.9
Machinery	2.9	2.9	3.0	3.3
Metal-mechanic	2.8	2.8	2.9	3.2
Manufacturing	2.6	2.6	2.6	3.7
Chemical Products	2.3	2.3	2.5	3.4
Rubber products	2.1	2.1	2.1	2.9
Paper products	1.8	1.8	1.8	2.0
Other manufacturing	1.7	1.7	1.9	1.4
Other	1.5	1.5	1.1	0.7
Editorial and Printing	1.4	1.4	1.5	1.7
Hotels and restaurants	1.1	1.1	1.4	1.1
Automobiles	1.0	1.0	1.1	0.9
Mineral non-metallic	0.9	0.9	0.9	1.0
Oil & Mining	0.6	0.6	0.5	0.7
Educational services	0.5	0.5	0.5	0.9
Utilities	0.5	0.5	0.4	0.2
Fishing	0.2	0.2	0.1	0.2
Oil refining	0.0	0.0	0.0	0.1
Tobacco products	0.0	0.0	0.0	0.0

Source: Central Bank of Argentina.

Credit/Deposits and Banking Industry Dynamics





Loan Growth and Exposure to Sovereign Debt and Foreign Currency