Credit Allocation When Private Banks Distribute Government Loans

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Background
Bank credit to firms in Brazil

- Free-market credit
  - Average spreads high
  - Main types: working capital, receivables discounting
  - Typically, short-term
- Earmarked credit
  - Interest rates regulated: frequently below monetary policy rates
  - Via BNDES-direct lending or via commercial banks
  - **Indirect BNDES loans:**
    - **Commercial banks select recipient firms**
    - **Funding from BNDES**
    - **Commercial banks bear default risk, but can charge a risk spread**
  - Main types: infrastructure, machinery, agriculture
  - Typically, long-term

What we do

- Study the effects of earmarked lending on spreads in the free market

- Use rich loan-level data on Brazilian firms spanning 12 years
  - Exploit interest rate variation over time for the same bank-firm pair

- With this data, we try to answer these questions:
  - What kind of firm gets earmarked loans ?
  - Is there a bundling of working capital and earmarked loans?
  - **Do private banks increase spreads on working capital loans after the 1st earmarked loan?**

Our preliminary findings

- Private banks are strategic in their selection of earmark recipients
  - Banks select firms that are more difficult to lock-in
  - These firms are larger and with longer relation with the bank
  - Bundle earmarked loans with working capital loans

- After receiving an earmarked loan, recipient firms pay higher spreads (~0.3 pp) in the free market with this bank
  - Results are stronger for high-risk firms, firms with relationship with only one bank, and in concentrated markets

Data

1. Loan-level panel on ‘free-market’ loans to firms by private commercial banks

- Focus on working capital loans from 2005 to 2016
- Only bank-firm relationships that started after 2005
- Detailed information of bank, firm and loan characteristics

2. Earmarked credit relation of firms with private banks

- Timing of firm-bank earmarked credit relation

Characterization of the firms that receive earmarked loans

What kind of firm ?

- ➢Recipients of earmarked loans are firms that:
  - Are larger
  - Are older
  - Have longer relation with the bank
- ➢ Unrelated to credit risk

Table 2. Determinants of earmarked credit relationship

	(1)	(2)	(3)
Firm $size_{fy}$	0.026***	0.026***	0.017***
	(0.004)	(0.004)	(0.003)
Firm age_{fy}	0.004**	0.002	0.004**
	(0.001)	(0.001)	(0.002)
BF $Relation_{fby}$	0.025***	0.027***	0.017***
	(0.008)	(0.009)	(0.005)
BF $Provisions_{fby}$	0.005	0.005	0.005
	(0.006)	(0.006)	(0.006)
$Top3Bank_{by}$	0.005*		
	(0.002)		
BF $Relation_{fby}$ * Firm $size_{fy}$			0.005**
			(0.002)

Is there a bundling of working capital and earmarked loans?

- Banks bundle earmarked loans with free-market loans for firms
  - Larger
  - That have longer relation with the bank
  - With higher credit risk (Working capital)

	Panel A. Bundling with working capital loans		Panel B. Bundling with vehicle financing loans	
	(1)	(2)	(1)	(2)
Firm size$_f$	0.007***	0.005***	0.013***	0.012***
	(0.002)	(0.001)	(0.003)	(0.004)
Firm age$_f$	-0.005	-0.004	-0.005	-0.005
	(0.003)	(0.003)	(0.004)	(0.004)
BF Relation$_{fb}$	0.009***	0.007***	0.017***	0.015***
	(0.003)	(0.002)	(0.002)	(0.003)
BF Provisions$_{fb}$	0.021***	0.021***	-0.010	-0.010
	(0.007)	(0.007)	(0.006)	(0.006)
Top3Bank$_{fb}$	0.057*	0.056*	-0.003	-0.003
	(0.029)	(0.030)	(0.008)	(0.008)
BF Relation$_{fb}$ * Firm size$_f$		0.001*		0.001
		(0.001)		(0.001)

What do banks gain by giving earmarked loans to these firms?

Literature on switching costs, locking-in firms

- Banks may lock-in firms via initially offering low interest rates, and later increase as the relationship with the firm evolves
  - Empirical evidence from Bolivia: Ioannidou and Ongena (JF 2010)
  - Empirical evidence from Brazil: Ornelas et al. (BCB Working Paper 512, 2020)
  - Strategy consistent with existence of switching costs in bank-firm relations

- Do earmarked loans help private banks to lock-in firms?

Empirical strategy: WC spreads after obtaining an earmarked loan

$EarRel = 0$

1st Earmarked loan pair bank x firm

$EarRel = 1$

Spread of working capital BEFORE 1st earmarked loan

Increase?

Spread of working capital AFTER 1st earmarked loan

Regressions estimated using Working Capital Loans only with firms that ever had a n earmarked loan

Years of relation of *f* and *b* at *t*

firm x bank fixed effects

$$spread_{lfbt} = \alpha_1 EarRel_{fbt} + \alpha_2 BF\ Rel_{fbt} + \alpha_{bt} + \alpha_{fb} + \gamma \boldsymbol{C_{b,f}} + u_{lfbt}$$

equals 1 if firm *f* obtained earmarked loan from bank *b* before t

bank x time fixed effects

Loan level control variables

Do banks increase spreads on working capital loans after the 1st earmarked loan?

Effect of earmarked relations on interest rate spreads of working capital loans

Dep Variable: **Spreads**	(1)	(2)	(3)	(4)
$EarmarkRel_{fbt}$	0.341***	0.236***	0.334***	0.589**
	(0.114)	(0.059)	(0.100)	(0.247)
Observations	397,427	297,406	264,639	112,586
R-squared	0.723	0.797	0.839	0.891
Mean interest rate spread	27.13	26.98	27.81	28.56
Firm x Bank FE	Yes	Yes	Yes	Yes
Bank x Month FE	Yes	Yes	Yes	Yes
Loc x Sector x Month FE	No	Yes	No	-
Firm x Year FE	No	No	Yes	-
Firm x Quarter FE	No	No	No	Yes

Heterogeneity - Credit Risk

High-risk firms			Low-risk firms		
(1)	(2)	(3)	(4)	(5)	(6)
1.190***	0.850***	0.487***	0.339	0.280	0.184

Heterogeneity – Local Concentration

High concentration			Low concentration		
(1)	(2)	(3)	(4)	(5)	(6)
0.420**	0.327***	0.378***	0.226**	0.065	0.212**

Heterogeneity by Number of Bank Relationships

Firms with multiple bank relations		
All locations	Locations with high banking concentration	Locations with low banking concentration
(4)	(5)	(6)
0.246**	0.225	0.160*

Firms with single bank relations		
All locations	Locations with high banking concentration	Locations with low banking concentration
(1)	(2)	(3)
0.410**	1.029***	0.295**

Why firms might not switch after the first earmarked loan, despite higher interest rates in new free-market loans?

- There is a lot of persistence on earmarked lending. 90% of firms obtain more than one earmarked loan
- Among these, 95% obtain the second earmarked loan with the same bank
- The median time between consecutive earmarked loans is 9 months (13 months on average)

Possible answer: because of the likelihood of getting more 'cheap' earmarked credit

Final Remarks

- Study the effects of earmarked lending on spreads in the free market
- Banks are able to increase spreads on working capital loans by ~0.3 percentage point after the 1st earmarked loan
- Firms keep the relationship with the bank possibly because of the likelihood of getting more earmarked loans with low interest rates

Thank You

Does relationship duration sensitivity change after the 1st earmarked loan?

BF Rel **before** 1st earmarked loan

BF Rel **after** 1st earmarked loan

	(5)
EverEarmark$_{fb}$	
EarmarkRel$_{fbt}$	0.425**
	(0.207)
BF Rel$_{fbt}$	$\boxed{0.497^{***}}$
	(0.185)
BF Rel$_{fbt}$*EverEarmark$_{fb}$	$\boxed{-0.493^{***}}$
	(0.032)
BF Rel$_{fbt}$*EarmarkRel$_{fbt}$	$\boxed{0.174^{***}}$
	(0.035)
Observations	3,905,486
R-squared	0.724
Sample	All Firms
Firm FE	
Firm-Bank FE	Yes
Bank-Year FE	Yes
Firm-Year FE	No

\+ 0,004

\+ 0,178

BF sensitivity to relationship length:

- Non-recipient firms: +0,497
- Earmarked, **before**: +0,004
- Earmarked, **after**: 0,178

Variables of interest

1. Spreads of loans in the free-market ($Spread_{lfbt}$)
   - Spreads of loans in the free-market for the three products we observe
2. Ever earmarked ($EverEarmark_{fb}$)
   - =1 for all firms f that received or will receive an earmark from bank b
3. Firm earmarked relation ($EarmarkRel_{fbt}$)
   - = 1 if firm f has earmarked loan with bank b at any period before t
   - our POST dummy