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Risk, Financial Stability and Banking

Cross-subsidy in Credit Markets: Micro Level Evidence from Earmarked Rules in Brazil

Carlos V. de Carvalho (BCB/PUC-Rio)
Bruno Martins (BCB-Depep)

BANCO CENTRAL DO BRASIL

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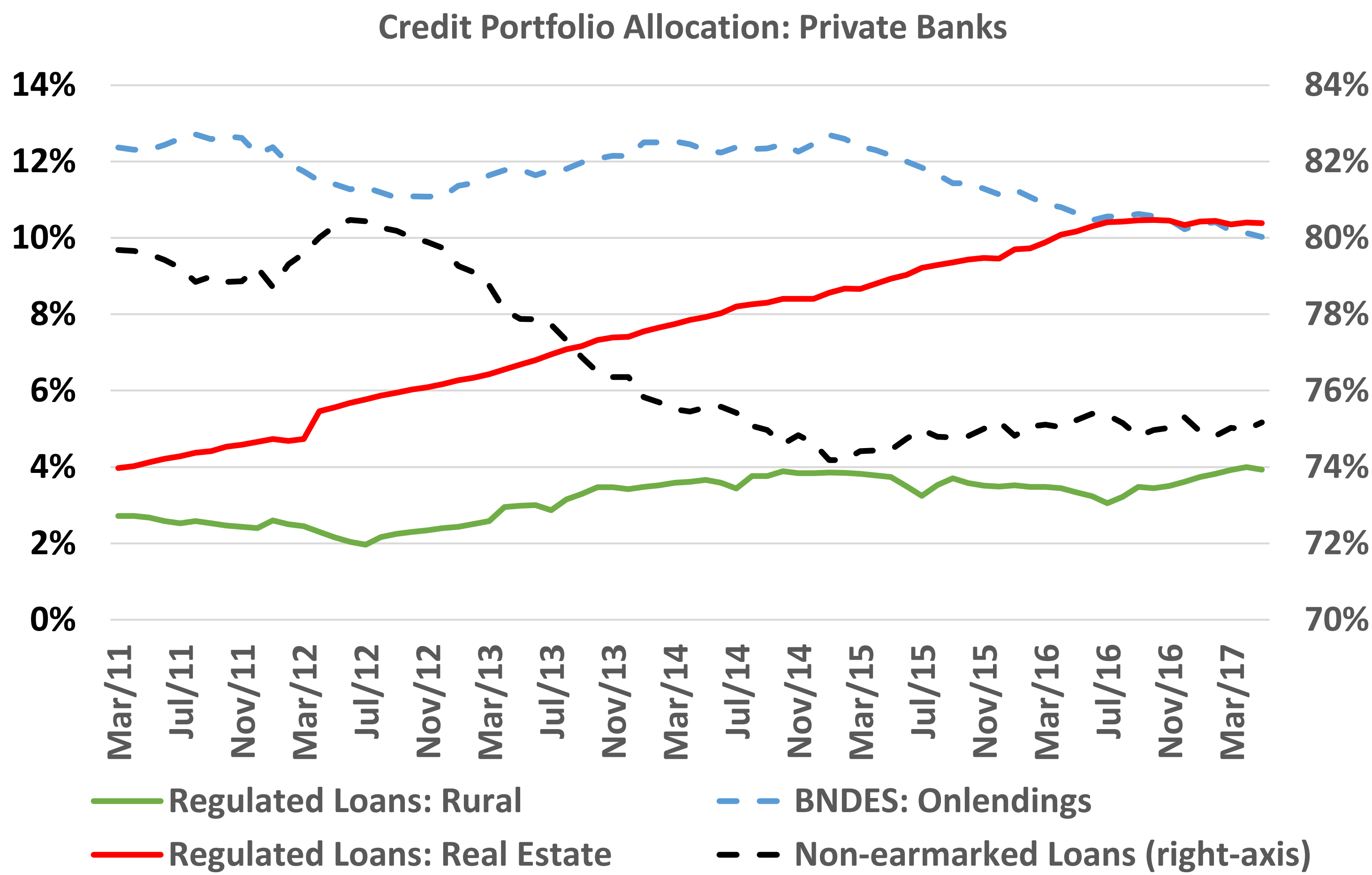
The views expressed in this paper are those of the authors and do not necessarily reflect those of the Central Bank of Brazil.

Motivation

- The participation of regulated lending in banks credit portfolio has increased



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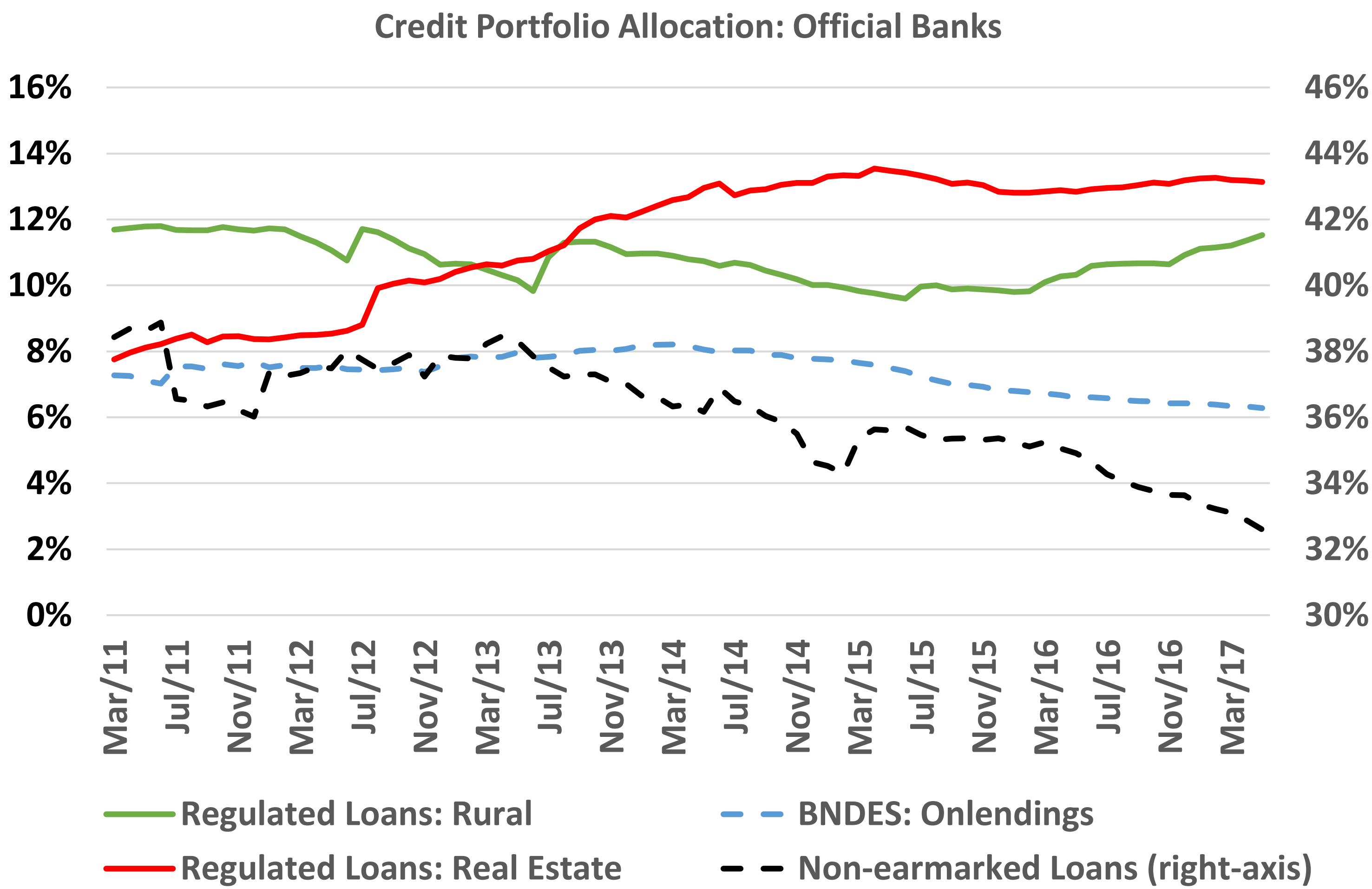
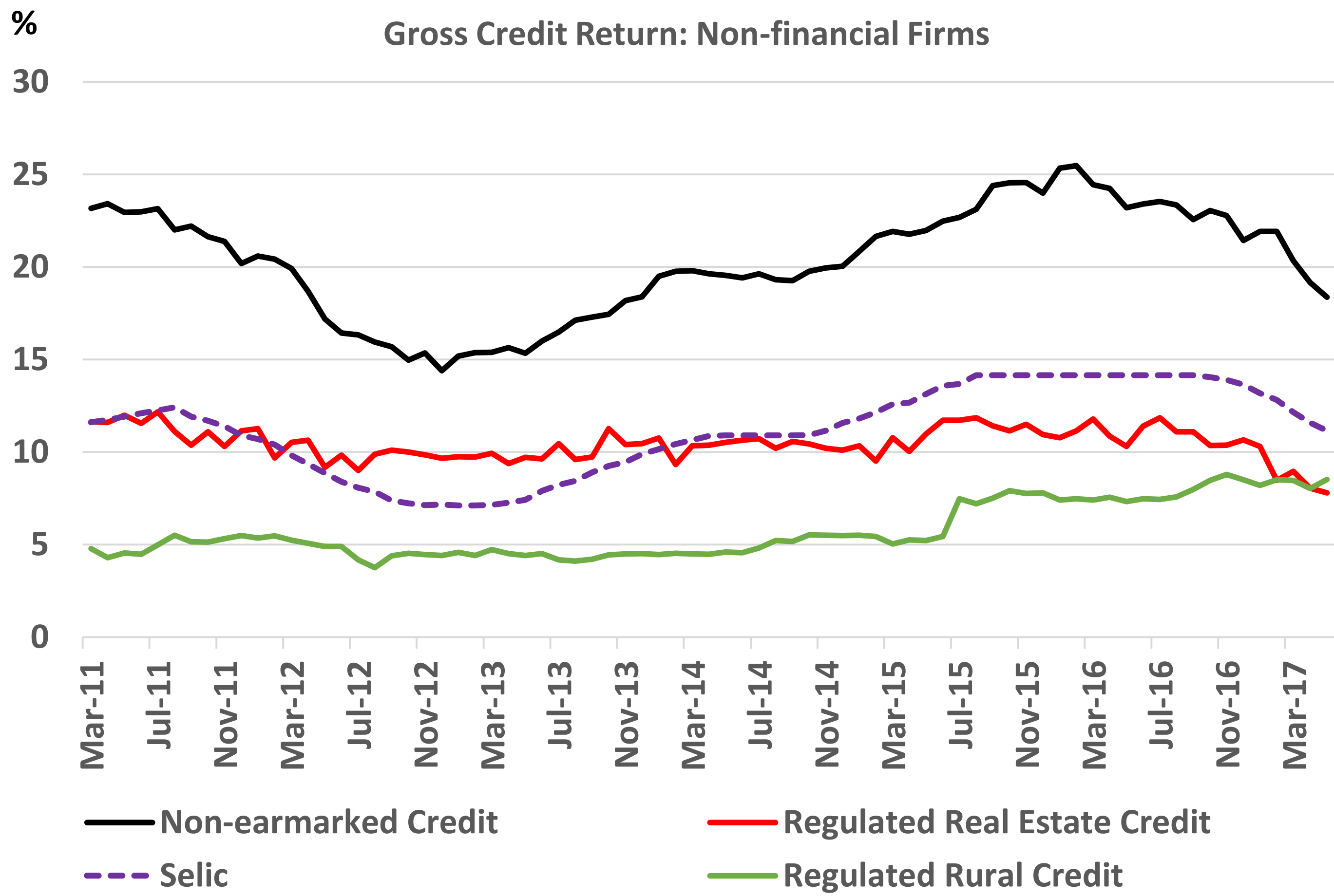


Motivation

- And the return of regulated lending is much lower than that of non-earmarked credit.



Government Intervention in Credit Markets: Rationale

- Social view: socially inefficient private credit market
  - ✓ market failures due to asymmetric information
  - ✓ externalities: socially valuable but unprofitable projects
- Macroeconomic view
  - ✓ stabilizing role could be true for a crisis period
- Enhancing bank competition

Government Intervention in Credit Markets: Potential Adverse Effects

- Bank competition, market segmentation and financial instability
- Prevents the development of capital markets
- Weakens the credit channel of monetary policy
- Fiscal imbalances
- Misallocation of funds
- Cross-subsidy

This paper

- Using loan level data, we investigate the impact of credit regulation on the cost of free-market loans (non-financial firms): the cross-subsidy effects
- We also explore banks heterogeneous responses: regulation vs. ownership

Credit Regulation in Brazil

- Current credit requirements:
  - Real Estate: 65% of savings deposits
    - 80% under SFH system (limits on interest rate - 12% per year)
    - 20% under SFI (market rates)
  - Rural:
    - 34% of demand deposits:
      - at least 10% under Pronaf (loan rate: 2.5% - 5.5%)
      - at least 13% under Pronamp (loan rate: 8.5%)
      - others (loan rate: 9.5%)
    - 74% of rural savings deposits (at market rates, but 95% receives subsidy from National Treasury)
    - 35% of Rural Credit Letters (LCA)
  - Microcredit: 2% of demand deposits

Regulation of Rural Credit Rates

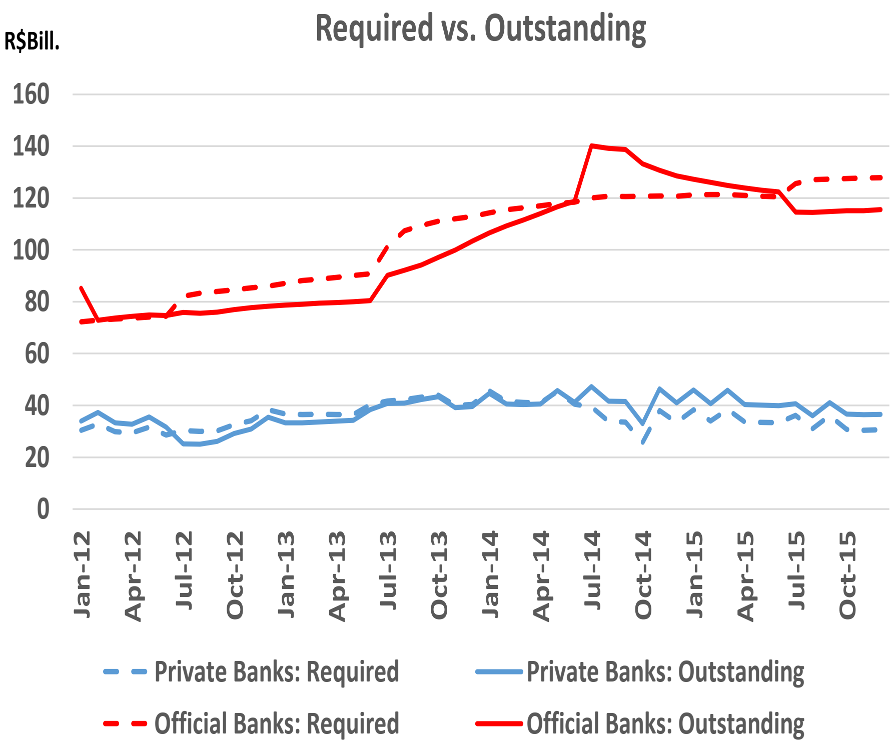
Demand Deposits (Regulated Rates)

Year	Pronaf*	Pronamp	Others
2009/2010	1.5%-5.5%	6,25%	6,75%
2010/2011	1.5%-4.5%	6,25%	6,75%
2011/2012	1.0%-4.5%	6,25%	6,75%
2012/2013	1.0%-4.0%	5,00%	5,50%
2013/2014	1.0%-3.5%	4,50%	5,50%
2014/2015	1.0%-3.5%	5,50%	6,50%
2015/2016	2.5% or 4.5%	7,75%	8,75%
2016/2017	2.5% or 5.5%	8,50%	9,50%

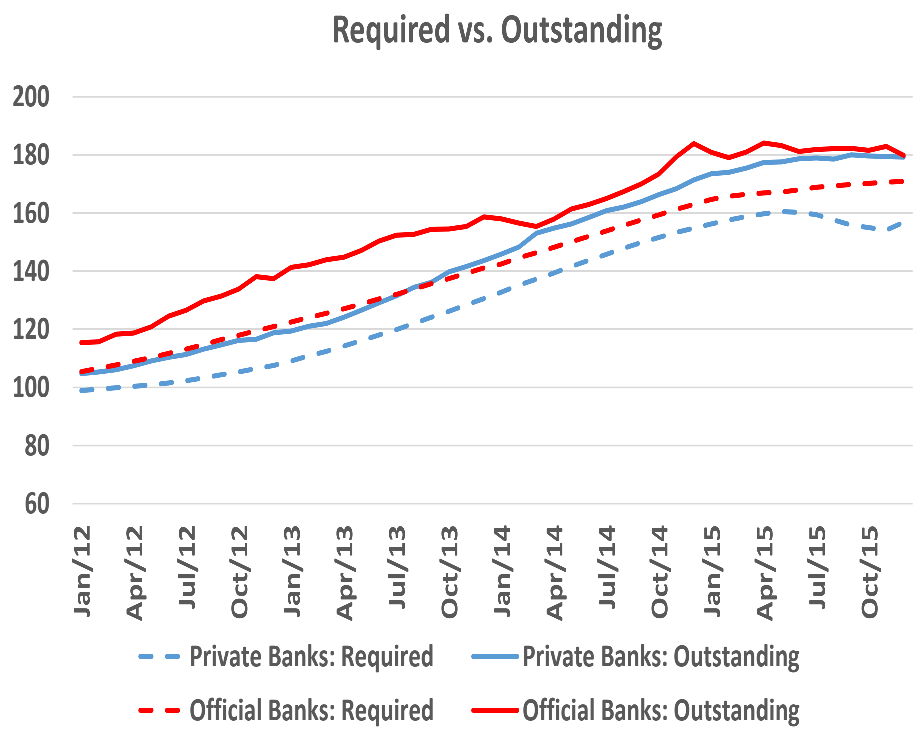
*Weighted factor

Credit Regulation: Required vs. Outstanding

Rural:

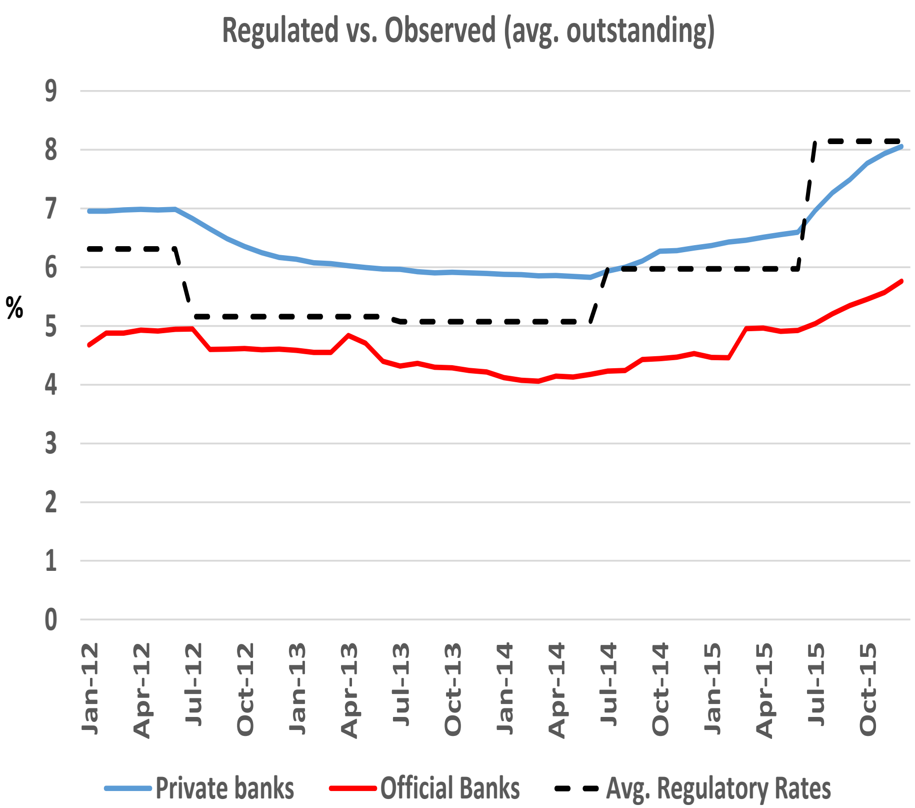


Real Estate:

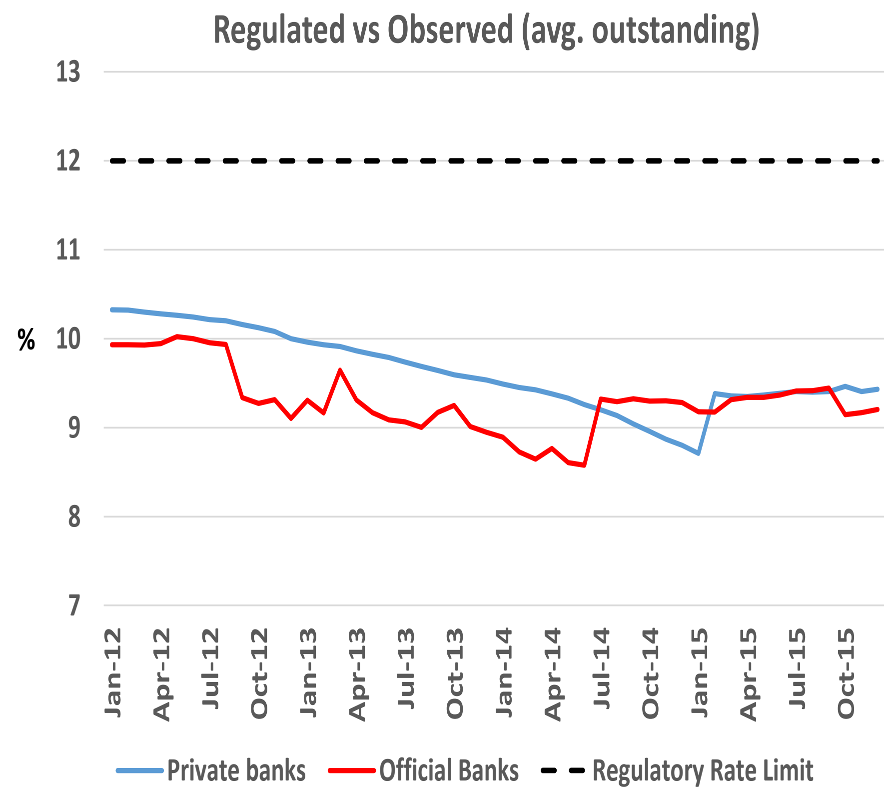


Regulation of Credit Rates

Rural:



Real Estate:



Database

- Sources:
  - Loan level: BCB Central Registry of Credit (SCR)
  - Firm level: Annual Social Information Report (Rais)
  - Bank level: Accounting Database of Brazilian Financial Institutions (Cosif)
- Sample:
  - New non-earmarked loans granted to non-financial firms from January 2012 to December 2015
  - Unbalanced panel at firm-type-bank-month level, totaling 12 financial conglomerates, 36 loan types, 709,085 firms and 8,586,842 observations
- Two measures of banks' credit requirement constraints are calculated:
  1) The outstanding regulated rural credit to total funding ratio
  2) The outstanding regulated real estate credit to total funding ratio

Empirical Strategy

- We identify credit supply behavior by means of regulatory credit shocks:
  - time-varying controls (loan, firm, bank and sector), fixed-effects and heterogeneous responses (bank ownership and regulated credit type)
- Loan-level regressions:

$$Loan\_Rate_{l,f,b,t} = \alpha_{l,f,b} + \alpha_t + \sum_{i=R,RE} \boldsymbol{\rho}^{\boldsymbol{i}} * Reg.Loan_{b,t}^{i} + \sum_{i=R,RE} \boldsymbol{\beta}^{\boldsymbol{i}} * (Reg.Loan_{b,t}^{i} * D_{gov.b}) +$$

$$+ \sum_{i=R,RE} \theta^{i} * Reg.Rates_{b,t}^{i} + \sum_{i=R,RE} \boldsymbol{\delta}^{\boldsymbol{i}} * (Reg.Loan_{b,t}^{i} * Reg.Rates_{b,t}^{i}) +$$

$$+ \sum_{i=R,RE} \boldsymbol{\mu}^{\boldsymbol{i}} * (Reg.Loan_{b,t}^{i} * Reg.Rates_{b,t}^{i} * D_{gov.b}) + controls + \varepsilon_{l,f,b,t}$$

  - fixed effects: firm-loan type ($\alpha_{l,f}$) or firm-bank-loan type ($\alpha_{l,f,b}$)
  - dummies: bank (α_b) and month (α_t)
  - Robust standard errors are clustered at both bank and firm level.

Results

Cross-subsidy in Credit Markets

Dep. variable: New non-earmarked corporate loans rate

Fixed-Effects:	Firm-Loan type		Firm-Bank-Loan type	
	(1)	(2)	(3)	(4)
Rural Rates	18.46***	15.60***	22.09***	15.75***
Reg.Loan (Rural Ratio)	68.81**	60.516**	78.65***	76.25**
Rural Ratio x I_Gov.Banks	-59.79**	-51.25*	-67.711**	-66.61**
Rural Ratio x Rural Rates	-10.29***	-9.19**	-11.81***	-11.37**
Rural Ratio x Rural Rates x I_Gov.Banks	8.55**	7.56**	9.69***	9.61**
Real Estate Rates (RER)	-2.71	-0.05	-2.72	-1.05
Reg. Loan (Real Estate Ratio)	1.80	5.71	1.98	8.59
Real Estate Ratio x I_Gov.Banks	13.99*	15.98**	16.24**	13.91
Real Estate Ratio x RER	-0.14	-0.54	-0.24	-0.65
Real Estate Ratio x RER x I_Gov.Banks	-0.89	-0.86	-1.13*	-1.12
Bank Dummies	Yes	Yes	No	No
Time Dummies	Yes	Yes	Yes	Yes
Firm and loan controls	Yes	Yes	Yes	Yes
Bank controls	No	Yes	No	Yes
Number of firms	722.153	722.153	709.085	709.085
Number of observations	8,792,863	8,792,863	8,586,842	8,586,842

Average Impact: Sample Estimation

Cross-subsidy Evidence: Rural Credit Ratio Simulation

Fixed-effects model:	Static Method	Firm-Loan type		Firm-Bank-Loan type	
Reduction of 1p.p. in Rural Ratio		(1)	(2)	(3)	(4)
Private Banks Lending Rate (p.p.)	-2,07	-2.73	-1.49	-2.89	-3.36
Official Banks Lending Rate (p.p.)	-0,61	-0.85	-1.62	-1.00	-1.44

- Caution: the bank ownership differentials may be biased by the large National Treasury subsidies on regulated rural credit from government-owned banks.

Conclusions

- Our findings indicate that regulated lending is subsidized by market based loans
  - ✓ Regulated rural credit: positive and relevant impact on market based corporate loans rate
    - around 3.4 p.p. reduction for a 1 p.p. decrease in outstanding rural banks loans to total banks debt ratio
    - smaller effects found for official banks (1.4 p.p. reduction)
    - negative effects of regulated rural rates on the estimated impact
  - ✓ Regulated real estate credit: not statistically significant effects
- Institutional arrangement: regulation vs. ownership