



Do Credit Unions Provide Access to Credit in Dire Times?

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Motivation I

- Interruptions on bank lending activity can transmit negative shocks to the real sector
 - Hoshi and Kashyap (1990)
 - Paravisini (2008)
 - Chava and Purnanandam (2011)
- Most recent empirical work focuses on lending behavior of *commercial* banks during the financial crisis of 2008/2009
- Limited empirical evidence on role of other types of banks available
- Diversity is important for financial sector stability (Wagner, 2011)

Motivation II

- We study the transmission of liquidity shocks in the Brazilian banking market using the financial crisis of 2008/2009 as a natural laboratory
- We explore *credit unions* (CUs) as they are prototypical local lenders with a distinct membership-based governance structure
 - members are both the owners and customers
 - members provide both the demand for and supply (by equity and deposits) of loanable funds
 - advantage: self-organized relaxation of credit constraints
 - downside: members can withdraw capital during dire times
- We study the role of CUs during the financial crisis:
 - Whether CUs cut back less on lending compared to non-CUs in order to support their members (*insurance effect*) or
 - CUs reduce lending more due to lack of capital because members walk away and withdraw their capital (*equity effect*)
- Empirical question which of the two effects is stronger

Institutional Setting

- Historically, CUs provided financial services to farmers, small firms and poorer households
- In recent years, loans and services provided by CUs has been increasing
- As of 2015, CUs have over 223 million members around the world (WOCCU, 2016)
- First CU of Latin America was founded in Brazil in 1902
- As of 2015, CUs in Brazil have 7.8 million members. The network of CUs represents around 20% of bank branches in Brazil
- CUs play an important role in Brazilian financial system

Identification Strategy

- Identification challenge: simultaneous nature of the *bank lending channel* (credit supply) and the *firm borrowing channel* (credit demand)
- We study the transmission of liquidity shocks in the Brazilian banking market using the financial crisis of 2008/2009 as a natural laboratory → Difference-in-differences approach
- We use data on firm-bank-quarter level that helps us investigating the impact on the intensive margin of the *same* firm at the *same* point in time for CUs versus non-CUs
- We control for:
 - demand shocks using firm-time fixed effects
 - unobserved cross-sectional heterogeneity at the bank-firm level
 - time-variant bank-specific determinants of credit supply

Empirical Strategy

To study whether the *insurance effect* or the *equity effect* is stronger, we run the following specification:

$$Y_{ibt} = \alpha_{it} + \alpha_{ib} + \beta CU_b * Crisis_t + X_{bt} + \varepsilon_{ibt}$$

where

- Y_{ibt} = *Amount, Maturity, Interest or Collateral*, and risk measures of *Risk or Future default*
- α_{it} = firm-time fixed effects
- α_{ib} = firm-bank fixed effects
- CU is a dummy, takes the value 1 if bank b is a credit union and 0 otherwise
- $Crisis$ is a dummy, equals 1 between 2008:Q3 to 2010:Q2 and 0 between 2006:Q3 to 2008:Q2
- X_{bt} = controls for a set of observable characteristics of bank b at time t such as size of the bank, ratio of liquid assets, fixed assets, deposits, capital ratio, non-performing loans to total assets, and return on equity

Data I

- We cover 4 years around the crisis. Sample is split at Lehman Brothers' collapse in September 2008
 - pre-crisis 2006:Q3 to 2008:Q2
 - crisis 2008:Q3 to 2010:Q2
- We use a rich dataset from the Central Bank of Brazil. Credit register includes information on outstanding loans of each borrower with financial institutions above a threshold of BRL 5,000
- Quarterly balance sheets of all banks and CUs
- Merge datasets using public bank identification number
- Public firms and financial firms are excluded (e.g., interbank loans)
- Observations where loans are overdue by more than 90 days are excluded

Data II

- Since identification strategy relies on comparison between CUs and non-CUs at the same time, we select firms that borrow from one CU and one non-CU in the pre-crisis and crisis period
- We track 43,852 firms and 1,001 banks that together result in 191,829 bank–firm pairs
- After applying our filters we end up with a total of 1,446,903 observations
- Data level is a triplet on the firm–bank–time dimensions which helps us investigating the impact on the intensive margin of the *same* firm at the *same* point in time for CUs versus non-CUs

Descriptive Statistics I

Variable name	Mean	Sd.	Min	Median	Max
Amount	10.29	2.28	0.00	10.46	19.86
Maturity	1.07	1.33	0.00	0.61	23.55
Interest rate	25.36	27.77	0.00	20.00	100.00
Collateral	0.43	0.43	0.00	0.34	1.00
Risk	0.05	0.16	0.00	0.01	1.00
Future default 1 yr	0.02	0.13	0.00	0.00	1.00
Future default 2 yr	0.06	0.24	0.00	0.00	1.00
Future default 3 yr	0.12	0.32	0.00	0.00	1.00
CU	0.34	0.47	0.00	0.00	1.00
Crisis	0.56	0.50	0.00	1.00	1.00
Equity	0.13	0.09	0.00	0.10	1.00
No. of observations					1,446,903

Descriptive Statistics II

Average Loan Amount

Period	CUs	Non-CUs	Double Difference
	Pre-crisis	Crisis	
Pre-crisis	9.6625	10.5747	
Crisis	9.7310	10.5894	
Difference	0.0685	0.0147	0.0538

Intensive Margin Analysis

Variable name	<i>Amount</i>	<i>Maturity</i>	<i>Collateral</i>	<i>Interest</i>
CU*Crisis	0.172***	0.234***	-0.060***	1.661***
<i>Firm-Time FE</i>	Yes	Yes	Yes	Yes
<i>Firm-Bank FE</i>	Yes	Yes	Yes	Yes
<i>Controls</i>	Yes	Yes	Yes	Yes
Observations	1,446,903	1,446,903	1,446,903	1,446,903
R-squared	0.793	0.838	0.764	0.746

***, **, * correspond to one, five and ten percent level of significance.

Risk and Loan Performance

Variable name	<i>Risk</i>	<i>Future default 1 yr</i>	<i>Future default 2 yr</i>	<i>Future default 3 yr</i>
CU*Crisis	-0.020***	0.006***	0.014***	0.007***
<i>Firm-Time FE</i>	Yes	Yes	Yes	Yes
<i>Firm-Bank FE</i>	Yes	Yes	Yes	Yes
<i>Controls</i>	Yes	Yes	Yes	Yes
Observations	1,446,903	1,446,903	1,446,903	1,446,903
R-squared	0.723	0.883	0.949	0.979

***, **, * correspond to one, five and ten percent level of significance.

Heterogeneous Effect of the Bank Equity Ratio

Variable name	<i>Amount</i>	<i>Maturity</i>	<i>Collateral</i>	<i>Interest</i>	<i>Risk</i>	<i>Future Default 1 yr</i>	<i>Future Default 2 yr</i>	<i>Future Default 3 yr</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CU*HighEquity*Crisis	0.231***	0.061	0.017	2.399*	0.004	0.001	-0.004	-0.005*
<i>Firm-Time FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm-Bank FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,446,903	1,446,903	1,446,903	1,446,903	1,446,903	1,446,903	1,446,903	1,446,903
R-squared	0.793	0.838	0.765	0.747	0.723	0.883	0.949	0.979

***, **, * correspond to one, five and ten percent level of significance.

Conclusions

- *Insurance effect* seems to dominate the *equity effect*
- CUs seem to provide insurance to their members during crisis by reducing lending to a lesser extent compared to non-CUs
- However, this may increase future default rate on CUs portfolios
- If the CUs are better capitalized, they are able to manage risk better
- CUs may be able to decrease the propagation of negative effects from transmission of negative liquidity shocks to the real economy
- Financial sector diversification is important for stability of the financial system