On the Real Effects of Bank Bailouts:
Micro-evidence from Japan

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Background

- Government bailouts during banking crises are intensely disputed
  - Necessary to avoid recessions
  - Ineffective if lack of confidence (inefficient credit freezes)
  - Unnecessary and damaging if firms lack growth opportunities
- Lots of opinions but scarce empirical evidence

This paper

- Quantifying the real (direct) effects of bank bailouts
  - Do firms benefit?
  - Which firms benefit?
- Exploits the Japanese experience for a micro-econometric analysis of bank bailouts

Institutional background

- Japan ideal environment for the following reasons
  - Real estate driven crisis similar to the current U.S. crisis
  - Various interventions affecting different subsets of banks
  - Data available to link banks benefitting from bailouts and their borrowers
    - → Crucial to evaluate the real effects

Government interventions for bank rehabilitation

- Three rounds of government recapitalizations and private capital injections affected banks with heterogeneous financial conditions
  - Both within and across rounds
  - Strength of relationships between firms and affected banks differs
- We can test theories suggesting that the size of capital injections and banks' ex post ability to meet capital requirements matter

Theories

- Large capital injections needed to solve debt overhang problems
  - Philippon and Schnabl (2010); Bhattacharya and Nyborg (2011)
- Bank capitalization matters for bank lending policies
  - Diamond and Rajan (2000); Diamond (2001)
  - (Still) Undercapitalized banks may call back loans from profitable borrowers
  - (Still) Undercapitalized banks evergreen loans to insolvent borrowers

Testing the Theories

- Two crucial proxies
  - The size of the bailouts relative to the banks initial financial conditions
  - Banks' ex post capitalizations

Empirical approach

- Bailouts do not affect random banks
- How severe are selection problems when we consider the effects on bank clients?
  - Not much
    - Crisis orginates from a shock to real estate, largely unrelated to the profit opportunities of exporting firms
      - E.g., Gan (RFS, 2007 and JFE, 2007) use the Japanese crisis as a natural experiment for a negative shock to collateral unrelated to firm investmet opportunities
  - All banks above a certain size were ”persuaded” to participate
- Nevertheless, our empirical approach can deal with selection problems

Empirical approach

- Our main tests identify the supply of credit and are immune from selection problems
- Do intervened banks extend larger loans than other banks to the same borrower?
  - Firms have multiple relationships
  - Can include firm*year and bank fixed effects

Empirical Approach

- The results on the supply of credit inform the rest of the analysis on corporate valuations and policies

Empirical approach

- Effects of the event announcements on abnormal returns of bank clients

Empirical Approach

- Do firms that are related to banks that benefit from government interventions shed fewer jobs, invest and grow more after the interventions?

Data

- Nikkei NEEDS Financial dataset
  - NEEDS Bank Loan data to listed companies
  - Bank balance sheets
  - Firm balance sheets
  - Price data
  - Info on mergers, recapitalizations, capital reductions
- News searches and various report for establishing the sequence of events
  - Main sources: BIS report by Nakaso (2001) and Hoshi and Kashyap (2008)

Summary of results

- The size of the capital injections is crucial for the success of bank bailouts.
  - Capital injections that are sufficiently large to reestablish bank capital requirements increase the supply of credit and spur investment
  - Not only do capital injections that are too small fail to increase the supply of credit, but they also encourage the evergreening of non-performing loans and favor investment by unviable “zombie” firms.

Recapitalization Rounds

	(1) ΔLoan	(2) Loan Increase	(3) ΔLoan	(4) Loan increase
First Recapitalization Bank k*Loans from Bank k	49.16***	0.571***	57.27***	0.625***
	(3.37)	(0.046)	(3.55)	(0.046)
Second Recapitalization Bank k *Loans from Bank k	58.19***	0.656***	61.74***	0.665***
	(3.66)	(0.052)	(3.72)	(0.053)
Third Recapitalization Bank k *Loans from Bank k	-2.48	-0.238**	-9.04	-0.351***
	(9.30)	(0.095)	(9.52)	(0.098)
Private Recapitalization Bank k *Loans from Bank k	-12.36***	-0.055*	-12.62***	-0.067**
	(2.45)	(0.030)	(2.54)	(0.032)
Loans from Bank k	-94.58***	-0.417***	-94.48***	-0.370***
	(2.10)	(0.019)	(2.30)	(0.021)
Bidder Bank k *Loans from Bank k	8.19***	0.097***	12.24***	0.092***
	(2.48)	(0.028)	(2.59)	(0.029)
Target Bank k *Loans from Bank k	-1.76	0.039	4.66	0.094
	(6.42)	(0.077)	(6.91)	(0.082)
Fixed effects	Firm, Bank, Year	Firm, Bank, Year	Firm*Year, Bank	Firm*Year, Bank
Observations	151697	151697	151697	151697
R-squared	0.189	0.152	0.300	0.278

Considering the heterogeneity of recapitalizations is important

The Size of the Capital Injections

	(1) ΔLoan	(2) ΔLoan	(3) ΔLoan	(4) ΔLoan	(5) ΔLoan	(6) Loan increase	(7) ΔLoan	(8) ΔLoan
Loans from Bank k *Government Capital Injection Size	2.856***	8.742***						
	(0.591)	(0.989)						
Loans from Bank k * Government Capital Injection Size * Undercapitalized Bank-Def 1		-8.034***						
		(1.168)						
Loans from Bank k* Capital Injection Size			1.979***	3.698***	4.400***	0.066***		5.583**
			(0.433)	(0.615)	(0.611)	(0.008)		(0.596
Loans from Bank k * Capital Injection Size *Undercapitalized Bank-Def 1				-3.337***	-3.760***	-0.060***		
				(0.849)	(0.862)	(0.011)		
Recapitalization Bank k*Loans from Bank k							51.02***	
							(2.794)	
Recapitalization Bank k*Loans from Bank k * Undercapitalized Bank-Def 2							-17.12*	
							(8.799)	
Loans from Bank k * Capital Injection Size * Undercapitalized Bank-Def 3								-6.445**
								(0.921
Private recapitalization Bank k* Loans from Bank k	-2.224	-2.687						
	(2.434)	(2.538)						

Who Benefits?

	(1) ΔLoan	(2) Loan Increase	(3) ΔLoan	(4) ΔLoan	(5) ΔLoan
Loans from Bank k* Capital Injection Size	4.755***	0.070***	4.357***	4.264***	3.234**
	(0.621)	(0.008)	(0.617)	(0.643)	(1.040)
Loans from Bank k * Capital Injection Size *Undercapitalized Bank-Def 1	-4.091***	-0.063***	-3.665***	-3.563***	-3.704**
	(0.943)	(0.011)	(0.867)	(0.896)	(1.628)
Zombie Firm* Loans from Bank k* Capital Injection Size	-11.789***	-0.116***			
	(3.342)	(0.041)			
Zombie Firm* Loans from Bank k * Capital Injection Size *Undercapitalized Bank-Def 1	11.670***	0.113**			
	(3.629)	(0.045)			
Same Keiretsu* Loans from Bank k* Capital Injection Size			0.669		
			(3.485)		
Firm shareholdings of Bank k* Loans from Bank k * Capital Injection Size				4.050	
				(5.913)	
Firm shareholdings of Bank k* Loans from Bank k * Capital Injection Size*Undercapitalized Bank-Def 1				-6.182	
				(11.64)	
Bank k Shareholdings of the Firm*Loans from Bank k * Capital Injection Size					-15.711
					(14.889)
Bank k Shareholdings of the Firm*Loans from Bank k * Capital Injection Size *Undercapitalized Bank-Def 1					22.038
					(21.792)

Allocational Effects

- Zombie firms (as defined by Caballero, Hoshi and Kashyap, 2008) benefit from too small recapitalizations that leave banks undercapitalized
- Banks that meet they capital requirements after the capital injections reduce loans to zombie firms

Are results specific to Japan?

- The data suggest no
  - No evidence that firms belonging to financial keiretsu are treated differently after their bank receives a capital injection
  - No evidence that cross-shareholdings between banks and firms matter

Announcement Effects

Loans from Banks Affected by the First Recapitalization	0.748***	0.746***				
	(0.125)	(0.124)				
Loans from Banks Affected by the Second Recapitalization	-0.151	-0.151				
	(0.367)	(0.367)				
Loans from Banks Affected by the Third Recapitalization	-0.657***	-0.655***				
	(0.055)	(0.054)				
Injection Exposure			0.315***	0.324***	0.299***	0.239***
			(0.045)	(0.036)	(0.039)	(0.043)
Undercapitalized Injection Exposure			-0.288***	-0.287***	-0.235***	-0.182***
			(0.033)	(0.031)	(0.031)	(0.046)
Zombie Firm* Injection Exposure				-0.252		
				(0.172)		
Zombie Firm* Undercapitalized Injection Exposure				0.193		

Real Effects

	(1) ΔFinDebt/TA	(2) ΔCash/TA	(3) Growth of Employment	(4) Growth of Employment	(5) Investment	(6) Investment
Injection Exposure	0.0445***	0.157	0.0002	0.0003	0.0078**	0.0084***
	(0.0168)	(0.100)	(0.0014)	(0.0015)	(0.0032)	(0.0032)
Undercapitalized Injection Exposure	-0.0585**	-0.140	-0.0001	0.0000	-0.0069*	-0.0167**
	(0.0244)	(0.128)	(0.0018)	(0.0018)	(0.0036)	(0.0068)
Zombie Firm* Injection Exposure				-0.0017		-0.0078**
				(0.0040)		(0.0037)
Zombie Firm* Undercapitalized Injection Exposure				0.0002		0.0185**
				(0.0044)		(0.0076)

Conclusions

- Ill-designed interventions may increase the misallocation of credit
- Concerns because the size of government recapitalizations is often constrained by fiscal and political considerations
- Work in progress: Effects of capital injections on the restructuring on bank clients