Government guarantees and bank vulnerability during the Financial Crisis of 2007 – 09: Evidence from an Emerging Market

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Research Question

- Do government guarantees distort market competition during a crisis?
- **Evidence from India**: Did government ownership help Public Sector Banks (PSBs) outperform the private-sector banks or was it government guarantees?
  - Indian Bank Nationalization Act: Explicit guarantee for PSBs
  - We compare public and private sector bank performance during the crisis period of Jan 2007-Feb 2009.
- Concern: State-owned PSBs through crisis-time guarantees may have captured significant market-share and crowded out private sector.

Motivation: A theme worldwide...

- **Evidence from the US**: (Acharya, Nieuwerburgh, Richardson and White (2011))
  - GSEs: Implicit government guarantees.
  - Since 1990s among riskier banks (risk-taking on the government put!).
  - Hard landing in the recent crisis, but not for GSE creditors.
  - Post-crisis: crowding out of private market in mortgages.
- **Evidence from EU:** Fiorentino, De Vincenzo, Heid, Karmann and Koetter(2009)
  - Italy: State owned banks were less efficient (pre-crisis).
  - Germany: Savings banks were better performers pre-crisis but state owned German Landesbank badly hit during the recent crisis.

Key Results

1. Ex ante systemic risk (exposure to market-wide crash) and ex post performance for the two sectors are strikingly different.
   - PSBs had greater ex ante systemic risk and yet outperformed private sector banks on the stock market.
2. Flight of deposits from private firms to PSBs
   - PSBs with *greater* systemic risk had higher deposit growth.
   - Evidence of riskier PSBs *increasing* deposit rates to attract deposits.
   - Growth in long maturity deposits for PSBs.
3. Riskier PSBs also made more advances but at lower lending rates.
   - But, riskier private sector banks made fewer advances at higher lending rates.
4. Post-crisis worse performance of assets for PSBs.
   - Post-crisis PSBs experienced a greater restructuring of loans.

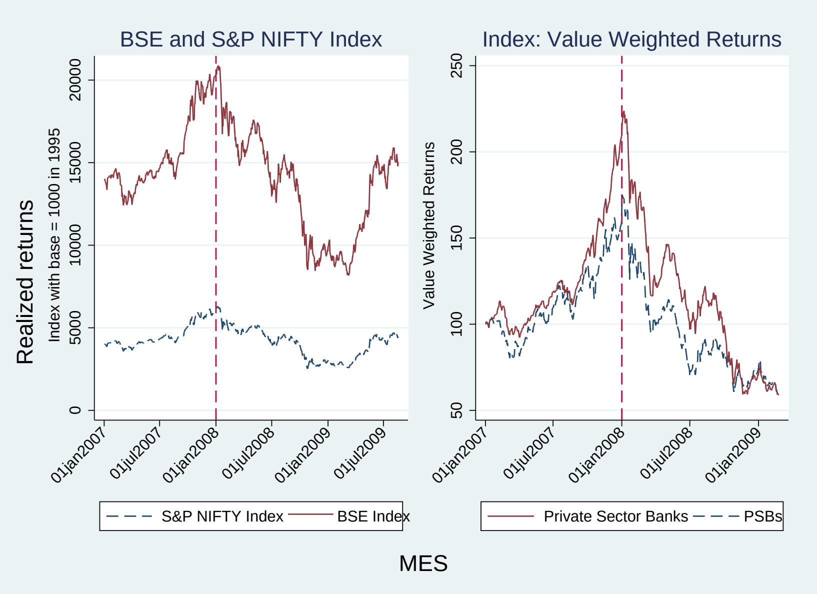
Data

- Reserve Bank of India provides (annual) data for 50 banks.
- Our systemic risk measure is based on stock market data.
- We use 38 banks which are publicly listed in our analysis.
- 17 Private sector banks , 21 Public Sector Banks.
- Market return based on the S&P CNX NIFTY Index.

India: Crisis of 2008

- Triggered by global financial crisis of August 2007
- NIFTY fell nearly 60% from its peak in January 2008.
- Strong performance of Indian financial firms.
  - Capitalization: High CRAR of 13%
  - Quality of assets: NPL ratio decreased to 2.3% 2008.
  - Profitability: Higher ROA of 1% as of March, 2008.
- Attributed to high regulation preventing excessive risk taking.
- Attributed also to the presence of state-owned banks.
- Deposit insurance: Each depositor insured up to a maximum of Rs.100,000

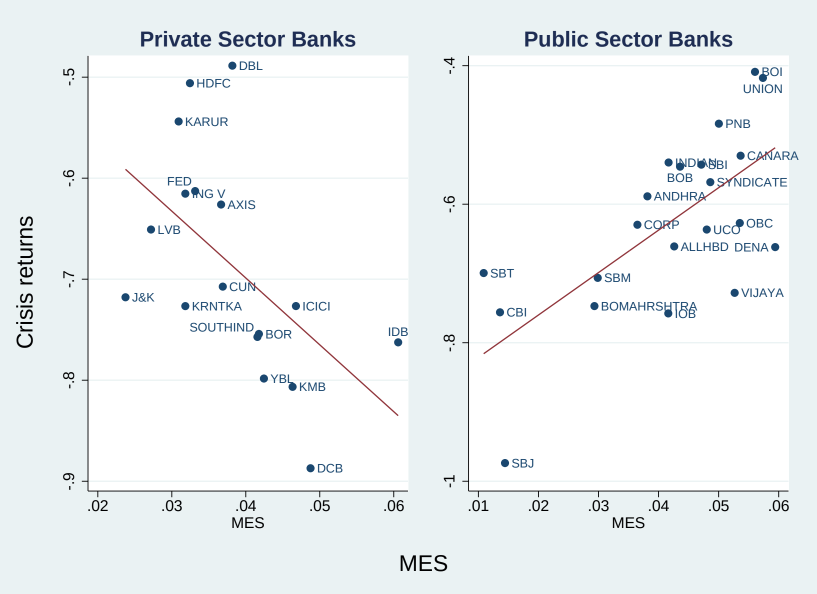
Timeline: Crisis of 2008



Measure of Systemic Risk: MES

- Captures tail dependence of stock return on the market as a whole.
- Marginal Expected Shortfall: Negative of the average returns for a given bank in the 5% worst days for the market returns (S&P CNX NIFTY index) during the pre-crisis period from Jan-Dec 2007.
- Contribution of each firm to systemic risk in the event of a crisis.
- Found in a series of research papers at NYU-Stern to help explain performance in a crisis of banks across the world
- Overall average MES of 4.00%, PSBs: 4.14%, Private sector banks : 3.83%.

Crisis Returns



Crisis Returns

	(1)	(2)	(3)	(4)
PSB	-0.63***	-0.88***	-1.79***	-1.51***
	(0.03)	(0.08)	(0.43)	(0.27)
Pvt	-0.69***	-0.43***	-1.22***	-0.90***
	(0.03)	(0.10)	(0.16)	(0.15)
MES*PSB		6.13***		4.88***
		(1.91)		(1.75)
MES*Pvt		-6.62**		-5.33**
		(2.54)		(2.25)
Log Assets*PSB			0.10**	0.06**
			(0.04)	(0.02)
Log Assets*Pvt			0.05***	0.04***
			(0.01)	(0.01)
N	38	38	38	38
Adj R-squared	0.967	0.979	0.975	0.982

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

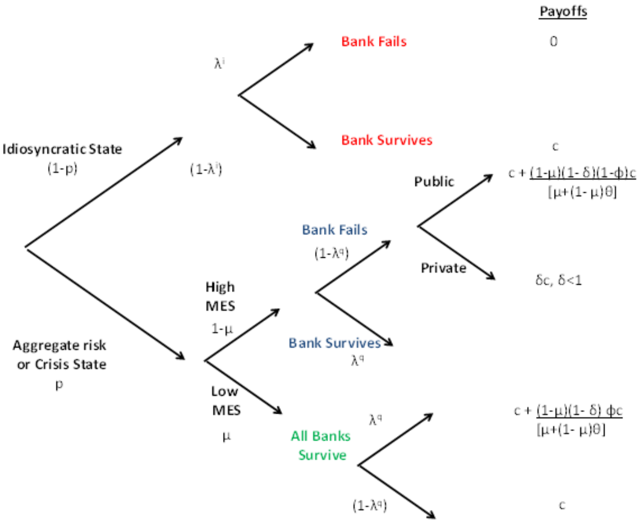
Evolution through the Crisis: Pre- and Post- Bailout

	(1) Pre-bailout Returns	(2) Bailout Returns	(3) Post-bailout Returns
PSB	-2.11**	-0.03	-0.00
	(0.81)	(0.03)	(0.06)
Pvt	-0.17	-0.02	-0.16*
	(0.30)	(0.04)	(0.09)
MES*PSB	25.58	2.78***	-4.78***
	(16.48)	(0.55)	(1.31)
MES*Pvt	-23.71***	3.39***	-1.92
	(8.49)	(1.10)	(2.08)
N	37	37	37
Adj R-squared	0.829	0.813	0.842

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Intuition: A simple calculation



$$\frac{d\Delta V^{PSB}}{dp} > 0 \text{ for } \phi < 0.5, \ \frac{d\Delta V^{Pvt}}{dp} < 0 \text{ for all } \phi$$

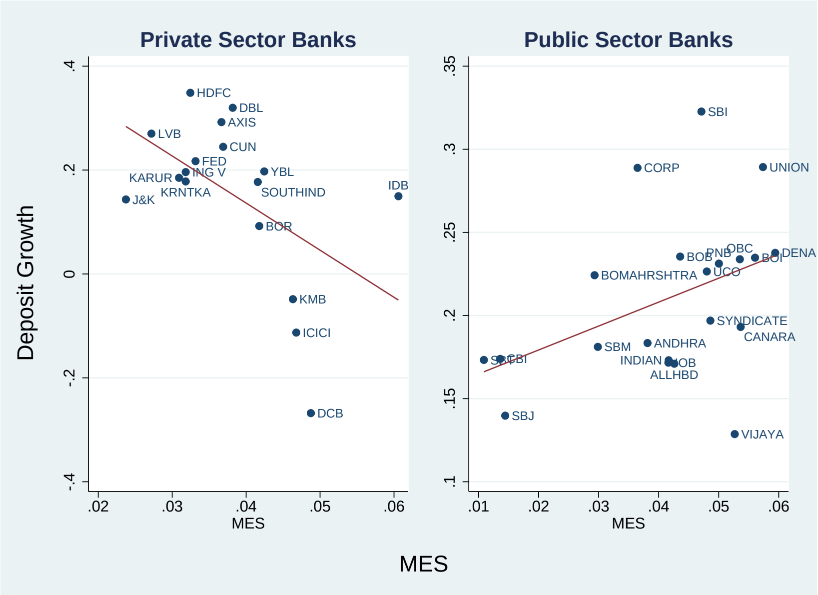
What could explain returns?

- Above calculations imply
  - As probability of crisis $\uparrow$ Franchise value $\downarrow$ with MES for private sector banks.
  - Only when $\phi < 0.5$, Franchise value $\uparrow$ with MES for public sector banks!
- What could explain transfer from private sector banks to PSBs (δ)?
  - Depositors flee from private to public sector banks.
  - Explicit government backing $\Rightarrow$ PSBs perceived safer.
- What could explain low ϕ?
  - High MES PSBs take aggressive steps to capture gap left by the failing private sector banks, for e.g. PSBs increase deposit rates to attract deposits.

Deposit Growth

- Helps understand the relationship between realized returns and systemic risk
- Depositors shifted capital out of private sector banks to PSBs
- Results also suggest maturity-shortening for private sector banks
- Flight-to-Safety: Following Lehman, Infosys transferred Rs. 10 billion in deposits from ICICI to SBI in Q3-2008 (Economic Times (2009))
- BUT: Depositors shifted capital out of high-MES private banks to high-MES PSBs!
- Deposit insurance: Each depositor insured up to a maximum of Rs.100,000 ($1850)

Deposit Growth during the crisis



Deposit Growth during the crisis

	(1)	(2)
PSB	0.15^{***}	0.35^{***}
	(0.02)	(0.04)
Pvt	0.50^{***}	0.89^{***}
	(0.18)	(0.18)
MES*PSB	1.44^{***}	
	(0.49)	
MES*Pvt	-9.07^{*}	
	(5.08)	
Crisis Returns*PSB		0.22^{***}
		(0.05)
Crisis Returns*Pvt		1.07^{***}
		(0.28)
N	38	38
Adj R-squared	0.785	0.861

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Deposit Growth Post-Crisis: Does it revert back?

	2-year deposit growth	
PSB	0.15***	0.40***
	(0.02)	(0.07)
Pvt	0.12	0.03
	(0.13)	(0.27)
MES*PSB	2.49***	
	(0.60)	
MES*Pvt	1.27	
	(3.18)	
Crisis Returns*PSB		0.24**
		(0.09)
Crisis Returns*Pvt		-0.19
		(0.38)
N	38	38
Adj R-squared	0.745	0.745

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Deposit Growth: By type

- Limited data availability of deposit rates: Quarterly data.
- Exploit differences in deposit types.
- Types of deposits: Demand deposits (short term), term deposit rates (longer term) and savings.
- Savings Rate are heavily government regulated.
- PSBs (and private sector banks) have discretion in setting deposit rates for demand and term deposits.

Deposits Growth (by type) and maturity

	(1) Demand Deposits	(2) Term Deposits	(3) Savings Deposits	(4) Deposits in India
PSB	0.057	0.145^{***}	0.259^{***}	0.160^{***}
	(0.050)	(0.051)	(0.069)	(0.022)
Pvt	-0.365	0.783^{***}	0.287^{***}	0.550^{***}
	(0.223)	(0.249)	(0.092)	(0.187)
MES*PSB	0.436	3.461^{***}	-2.254	1.743^{***}
	(1.183)	(1.158)	(1.444)	(0.598)
MES*Pvt	11.548^{*}	-14.866^{**}	-3.524	-9.784^{*}
	(6.348)	(6.589)	(2.373)	(5.255)
N	38	38	38	38
Adj R-squared	0.326	0.757	0.780	0.791

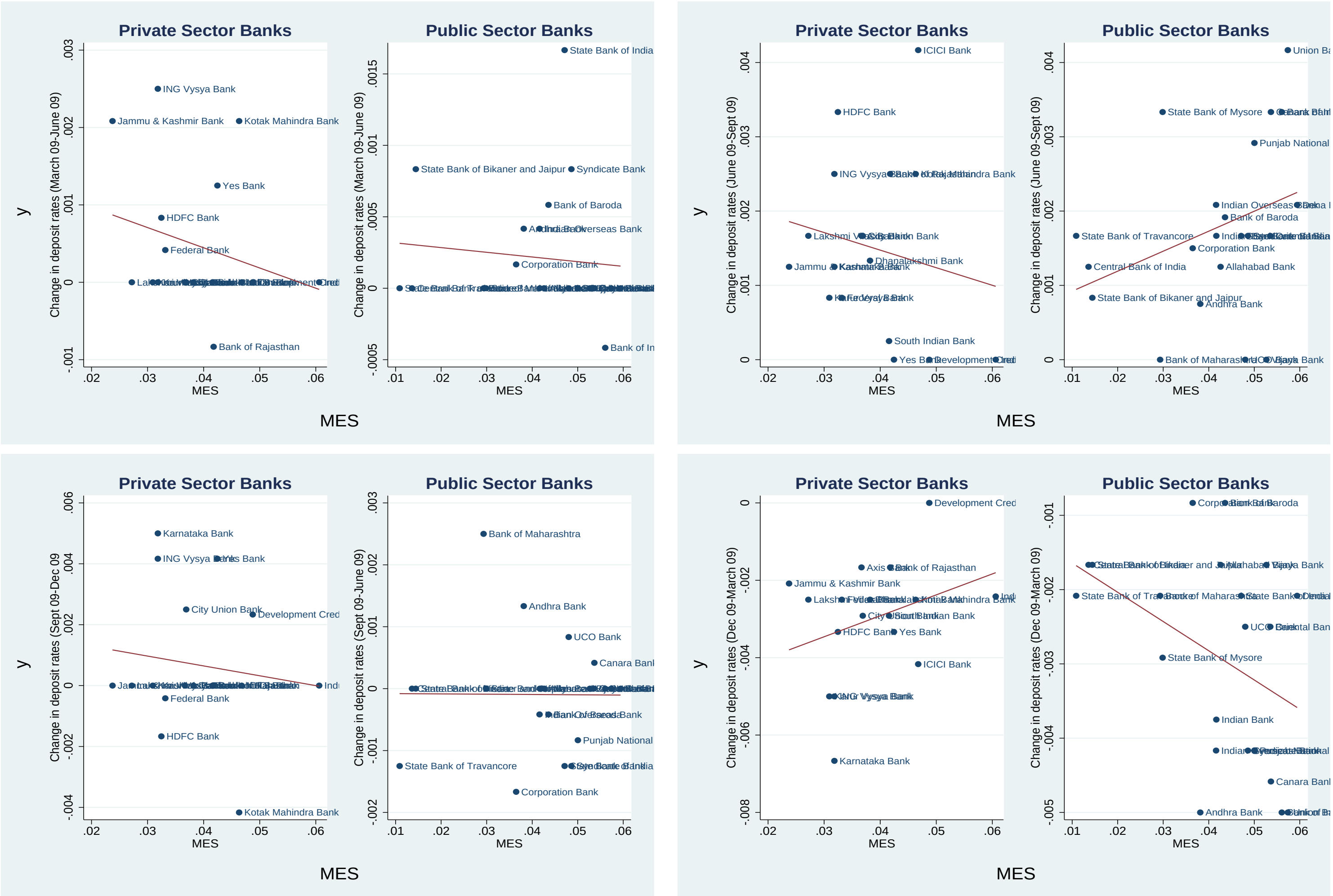


Figure C3. : Deposit Rates versus MES for long term maturities

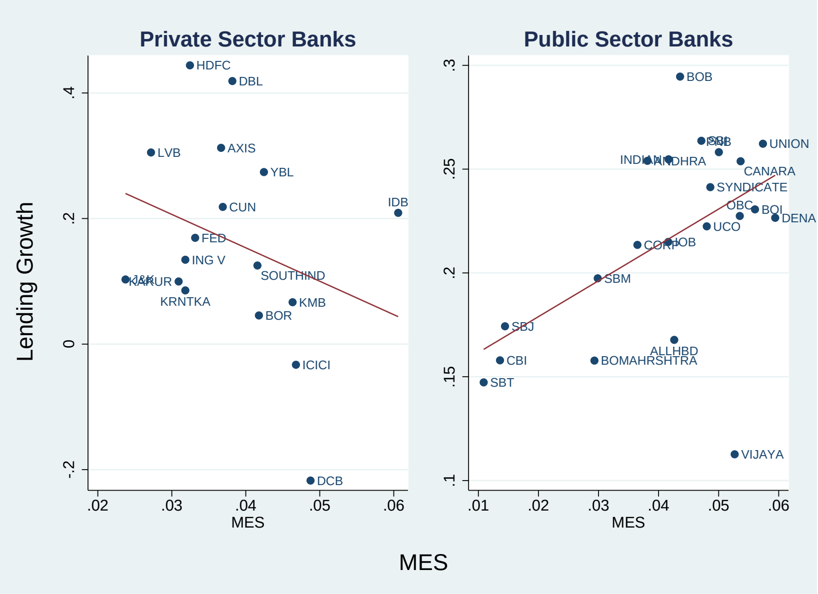
Panel B

	(1)	(2)	(3)	(4)
PSB	0.29*	0.22	-0.03	-0.37**
	(0.15)	(0.15)	(0.53)	(0.15)
Pvt	0.80	-0.10	1.76	-1.32***
	(0.58)	(0.42)	(2.14)	(0.44)
MES * PSB	-3.09	9.69**	-0.69	-11.81***
	(4.94)	(3.68)	(11.26)	(4.22)
MES * Pvt	-12.18	18.27	-34.49	9.49
	(17.79)	(12.47)	(57.41)	(9.68)
Number of Observations	15	32	19	37
Adj R-squared	0.414	0.822	-0.005	0.835

Deposit Growth: Summary

- Maturity shortening for riskier private sector banks: Higher demand deposit growth
- Riskier PSBs had higher term deposit growth.
- Savings deposits don't exhibit observed trends.
- Deposits outside India are government regulated and don't exhibit observed trends.
- Above results possibly imply that riskier PSBs increased deposit rates to attract deposits.
- Direct deposit rates are noisy but show evidence consistent with above results.
- Next step: Does this increased borrowing translate to increased lending? Further, do higher borrowing costs translate to higher lending rates?

Lending during the crisis



Lending during the crisis

	(1)	(2)	(3)	(4)
	Overall	Priority and Public Sector	Banks	Others
PSB	0.144***	0.008	-0.890	0.271***
	(0.014)	(0.059)	(1.133)	(0.048)
Pvt	0.366**	0.214	-3.097	0.496**
	(0.175)	(0.162)	(2.067)	(0.237)
MES*PSB	1.727***	3.954***	8.713	-0.784
	(0.434)	(1.330)	(22.073)	(1.155)
MES*Pvt	-5.323	-2.004	76.101	-8.329
	(4.773)	(3.617)	(47.002)	(6.746)
N	38	38	38	38
Adj R-squared	0.752	0.613	-0.011	0.687

Lending rates during the crisis

	(1) Q1 2008	(2) Q2 2008	(3) Q3 2008	(4) Q4 2008
PSB	13.054***	13.278***	13.954***	13.247***
	(0.112)	(0.208)	(0.072)	(0.096)
Pvt	12.060***	12.887***	13.577***	13.741***
	(0.686)	(0.696)	(0.716)	(0.673)
MES*PSB	-2.739	-6.728	1.966	-0.789
	(3.370)	(4.730)	(2.160)	(3.398)
MES*Pvt	69.072***	56.701***	60.972***	57.449***
	(18.163)	(14.360)	(15.945)	(14.840)
N	38	38	38	38
Adj R-squared	0.999	0.998	0.999	0.999

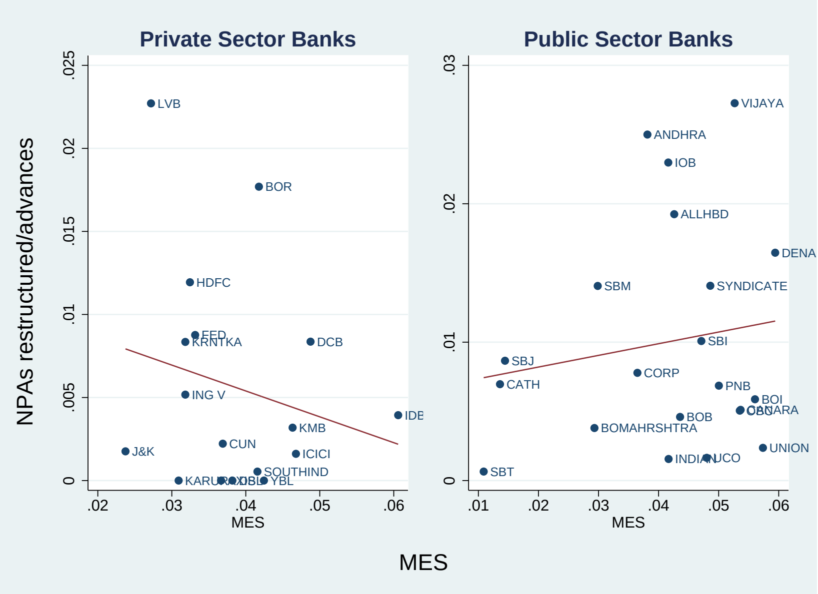
Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Post Crisis Loan Performance

- Non-performing Assets (NPA) to advances show weak cross-sectional heterogeneity between private and public sector banks.
- However, NPA may not fully capture the extent of deterioration in asset quality.
- Loans may be restructured before being classified as NPAs.
- Between March 2008 to March 2015, higher MES Private sector banks had lower restructured and NPA loans.

NPAs and Restructured loans to advances



NPAs and Restructured loans to advances

	(1) + (2) NPA and Restructurings/ Advances	(1) NPAs/ Advances	(2) Restructurings/ Advances
PSB	0.094***	0.035***	0.058***
	(0.013)	(0.0034)	(0.011)
Pvt	0.11***	0.047*	0.060***
	(0.027)	(0.025)	(0.0067)
MES * PSB	-0.12	-0.036	-0.081
	(0.29)	(0.075)	(0.23)
MES * Pvt	-0.90***	0.060	-0.96***
	(0.32)	(0.28)	(0.15)
Number of Obs.	298	298	298
Adj R-squared	0.154	0.041	0.656

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Robustness Checks

- Placebo tests outside of the crisis e.g. 2004 vs. 2005, 2005 vs. 2006 and 2006 vs. 2007.
- Stability of MES over time.
  - Stability of MES rankings across time.
  - Alternative measures of risk: Beta, volatility.
  - Exposure to global markets: Not explained by global beta.
- Results similar in other crisis (Dotcom crash).

Conclusion

- Access to government guarantees provides stability.
- Analysis suggests this results in crowding out of private sector during crisis periods.
- Consistent with greater market discipline of private sector banks and lack thereof of state-owned banks.
- Lack of level-playing field
  - Changes seem to be permanent and do not revert back following the crisis.