State Ownership and Systemic Risk: Evidence from the Indian Financial Sector during 2007-09

Viral V. Acharya
NYU Stern, CEPR and NBER
(with Nirupama Kulkarni, Hass School of Business, UC Berkeley)

December 20, 2010

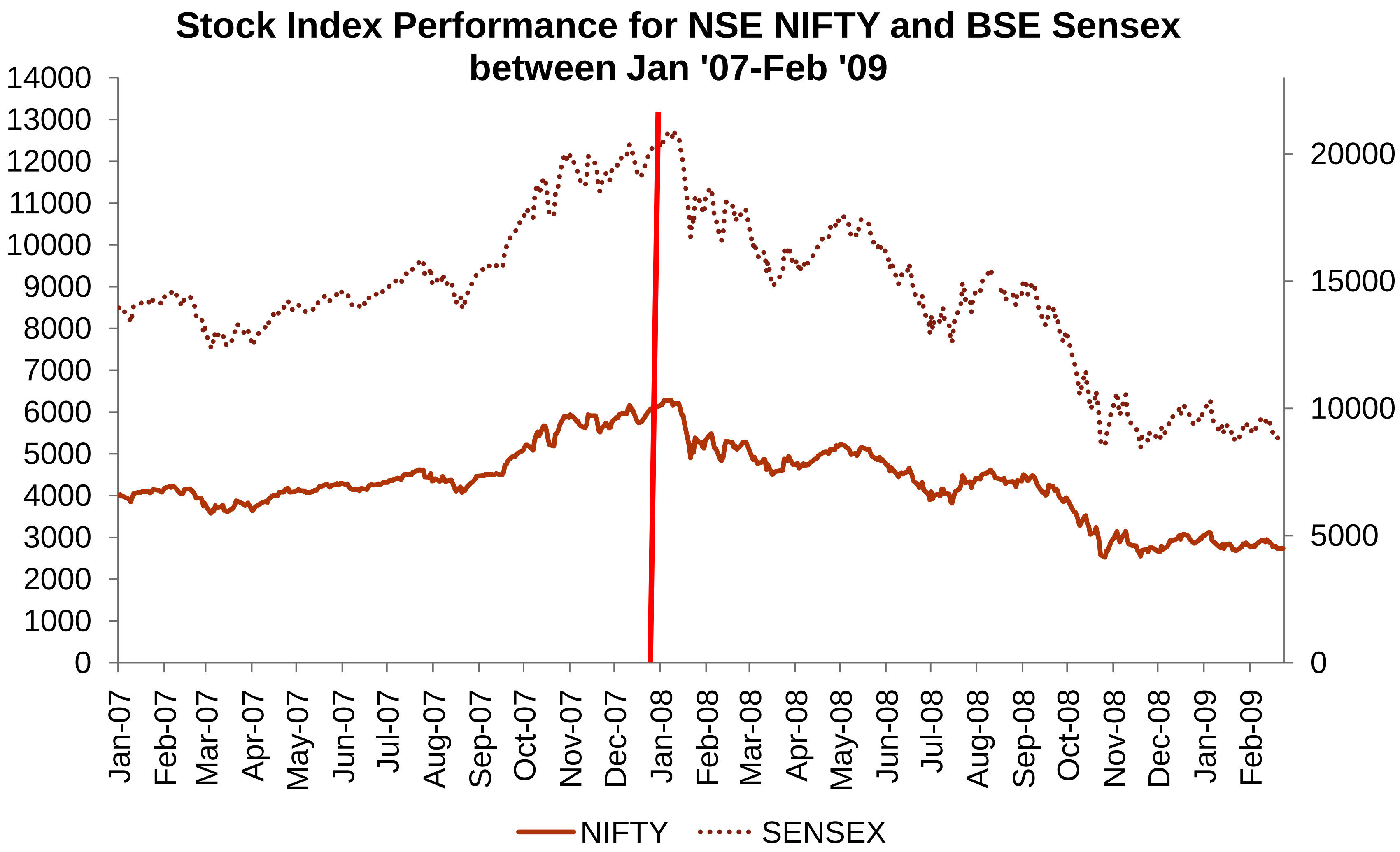
Introduction

- We compare public and private sector performance during the crisis period of 2007-09.
- Did government guarantees help PSBs outperform?
- We relate systemic risk exposure of financial firms to crisis period based on
  - Realized returns
  - Deposit Growth
  - GOI capital injections

Key Results

- *Ex ante* systemic risk and *ex post* performance for the two sectors are strikingly different.
- Public sector firms outperformed private sector firms.
- Public sector firms with greater risk performed better.
- PSBs with greater systemic risk received greater GOI support.

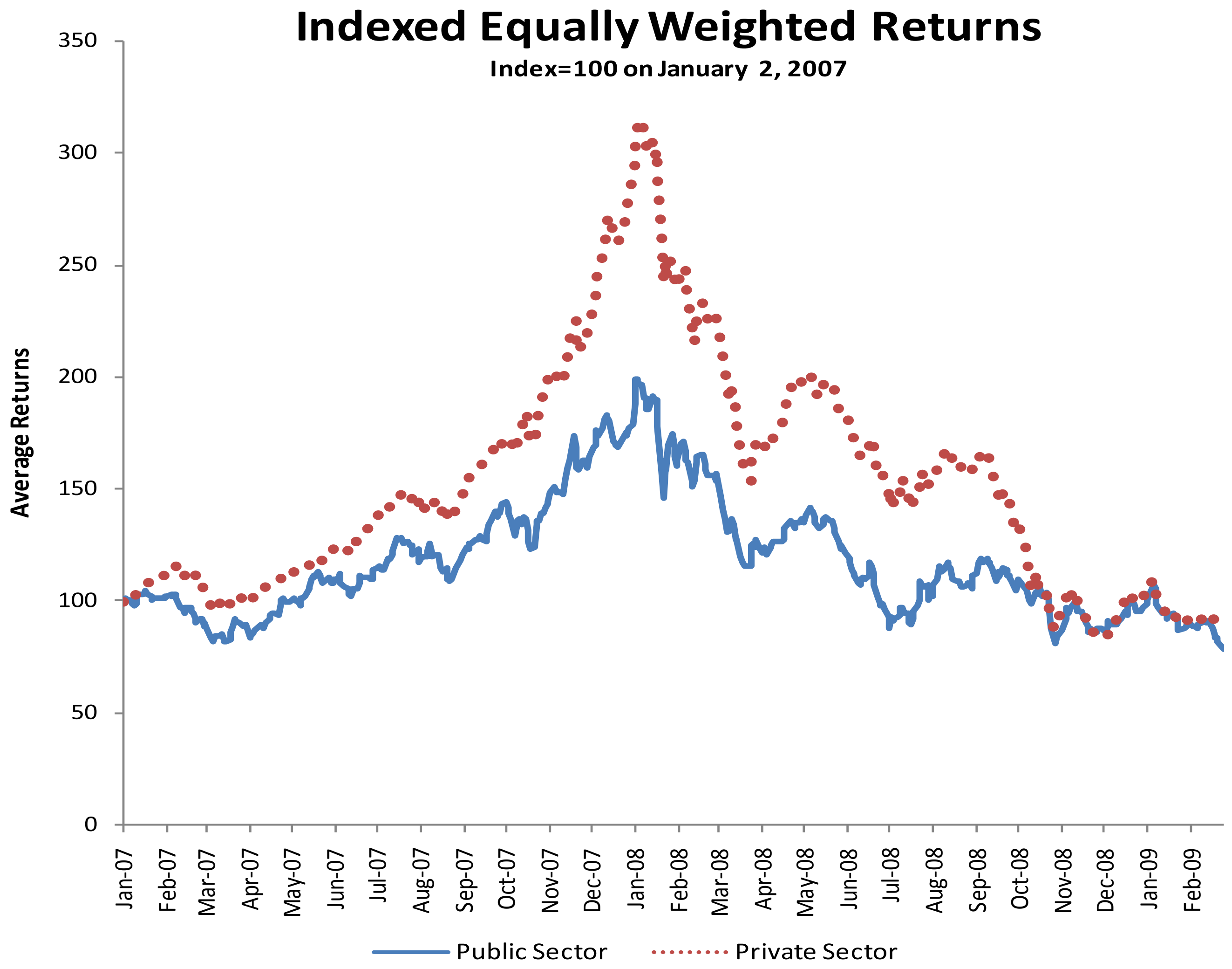
Crisis of 2008



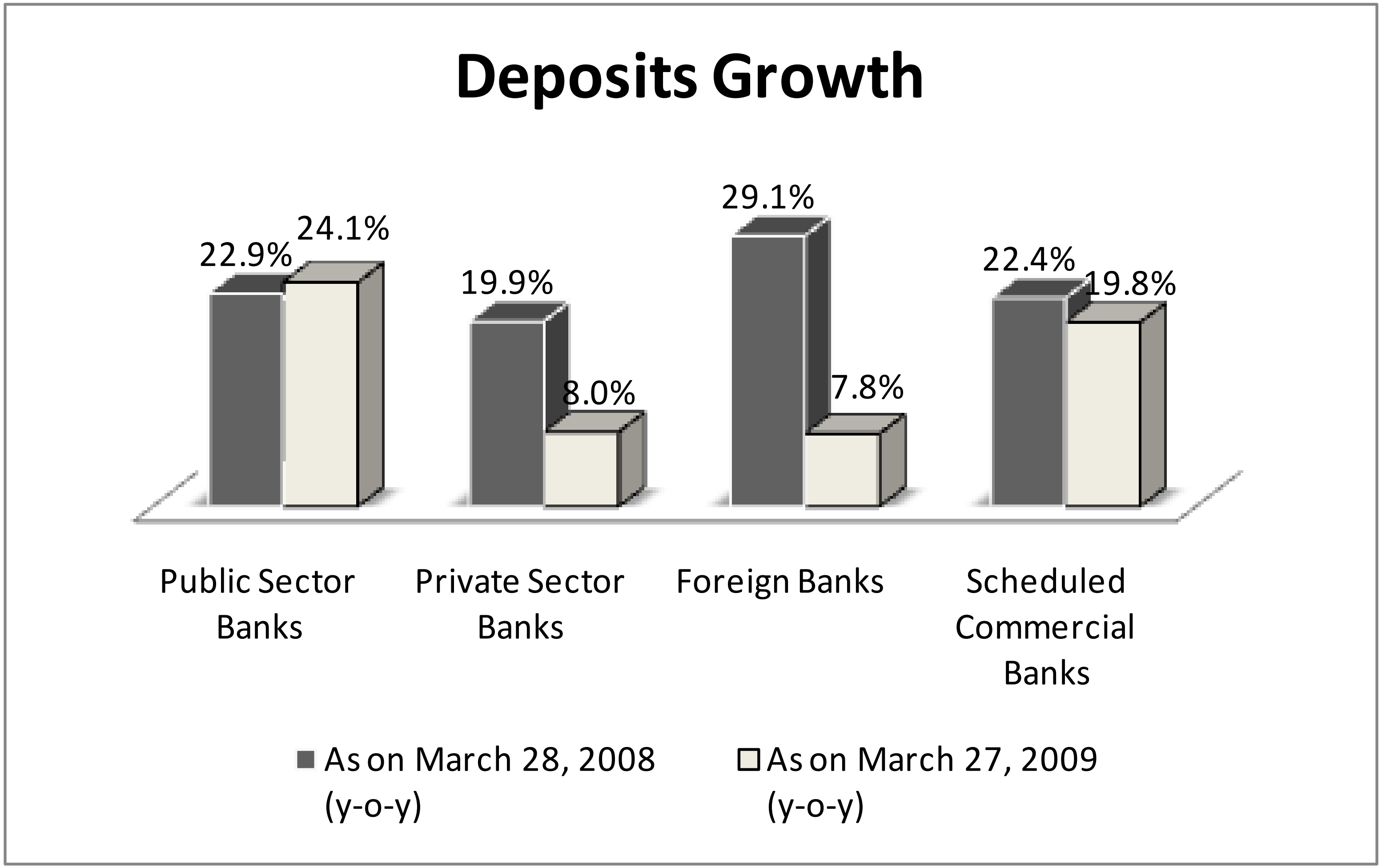
India: Crisis of 2008

- 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% (globally 8.2% to 17.7%).
  - ❑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.

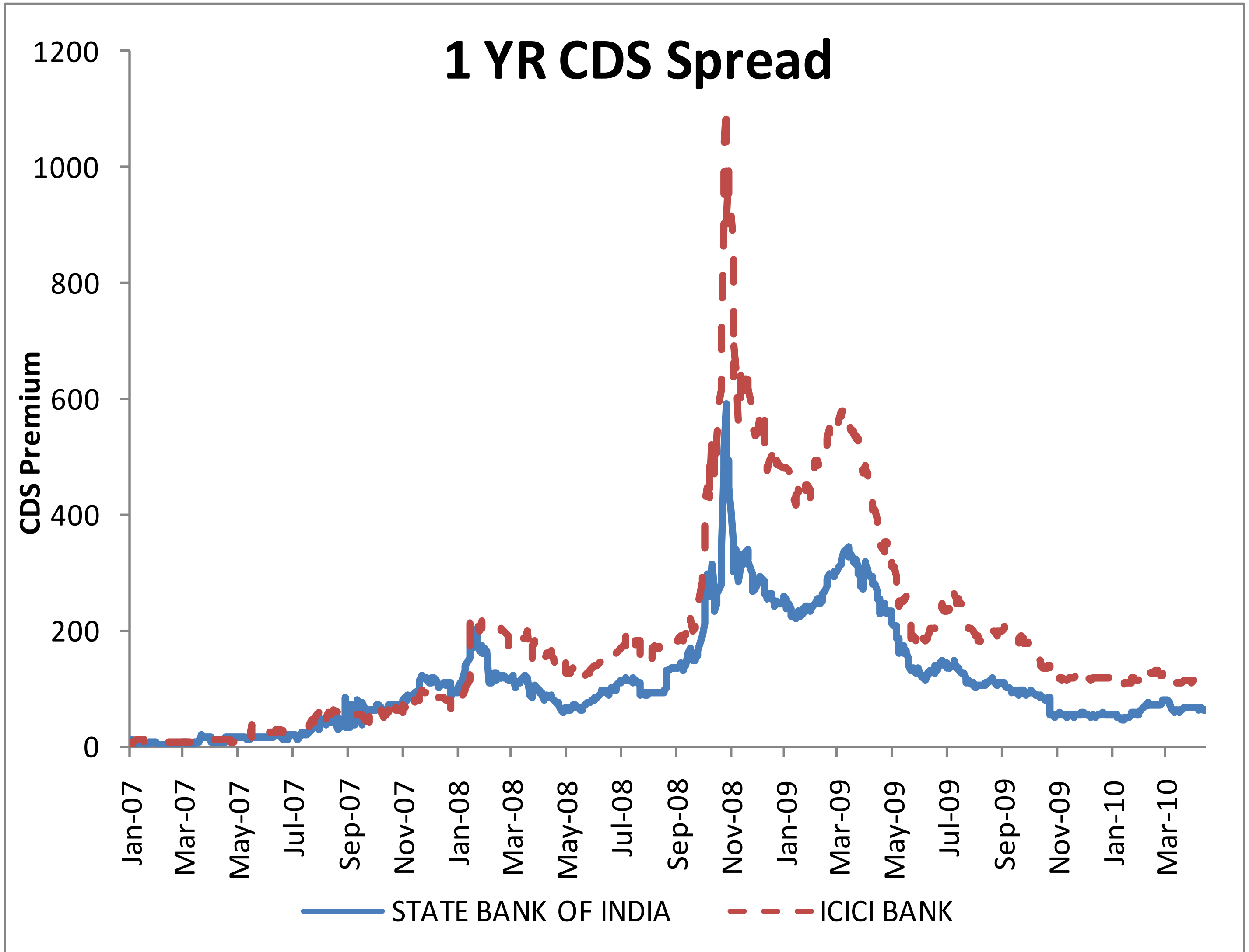
Public and Private Sector Performance: Realized Returns



Public and Private Sector Performance: Deposit Growth



Case in Point: ICICI versus SBI



Political Implications

- The ruling party leader, Sonia Gandhi, claimed that "*public sector financial institutions have given our economy the stability and resilience we are now witnessing in the face of the economic slowdown.*"

- Finance minister, P. Chidambaram, echoed these sentiments by claiming India's PSBs were strong pillars in the world's banking industry.

Source: Frontline, 2008

Motivation

- PSBs more stable or more government-guaranteed?
  - Indian Bank Nationalization Act: Explicit guarantee for PSBs.
  - Outperformance of PSBs due to implicit/explicit sovereign backing?
  - Did capital gravitate from private banks to PSBs?

Systemic Risk measure: MES

- *Marginal Expected Shortfall* (MES) measure
  - Captures tail dependence of stock return on the market as a whole.
  - 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.

- Overall average MES of 3.79% for all firms in our analysis.
  - PSB : 4.34%
  - Private sector banks : 3.58%.

Descriptive statistics: MES, $MES and Deposit Growth

	I. Public Sector Banks			II. Private Bank Sector Banks		
Number of banks	19			51		
	Realized Return	**MES**	**$MES (INR crores)**	**Realized Return**	**MES**	**$MES (INR crores)**
Mean	-59.76%	4.34%	396.21	-72.39%	3.58%	224.50
Median	-61.27%	4.26%	159.94	-75.71%	3.30%	24.42
Std	9.80%	1.17%	675.34	15.64%	1.40%	592.69
Min.	-74.71%	2.01%	46.52	-93.63%	0.71%	0.40
Max.	-40.89%	6.67%	3053.32	-30.92%	6.99%	3734.96
Value Weighted	-54.93%	4.63%	1470.67	-68.34%	4.14%	1658.74

	I. Public Sector Banks	II. Private Sector Banks
Number of banks	22	17
	Deposit Growth	**Deposit Growth**
Mean	24.90%	17.73%
Median	23.45%	20.33%
Std	8.89%	17.11%
Min.	13.73%	-23.51%
Max.	53.98%	41.72%
Value Weighted	30.22%	7.97%

Results:

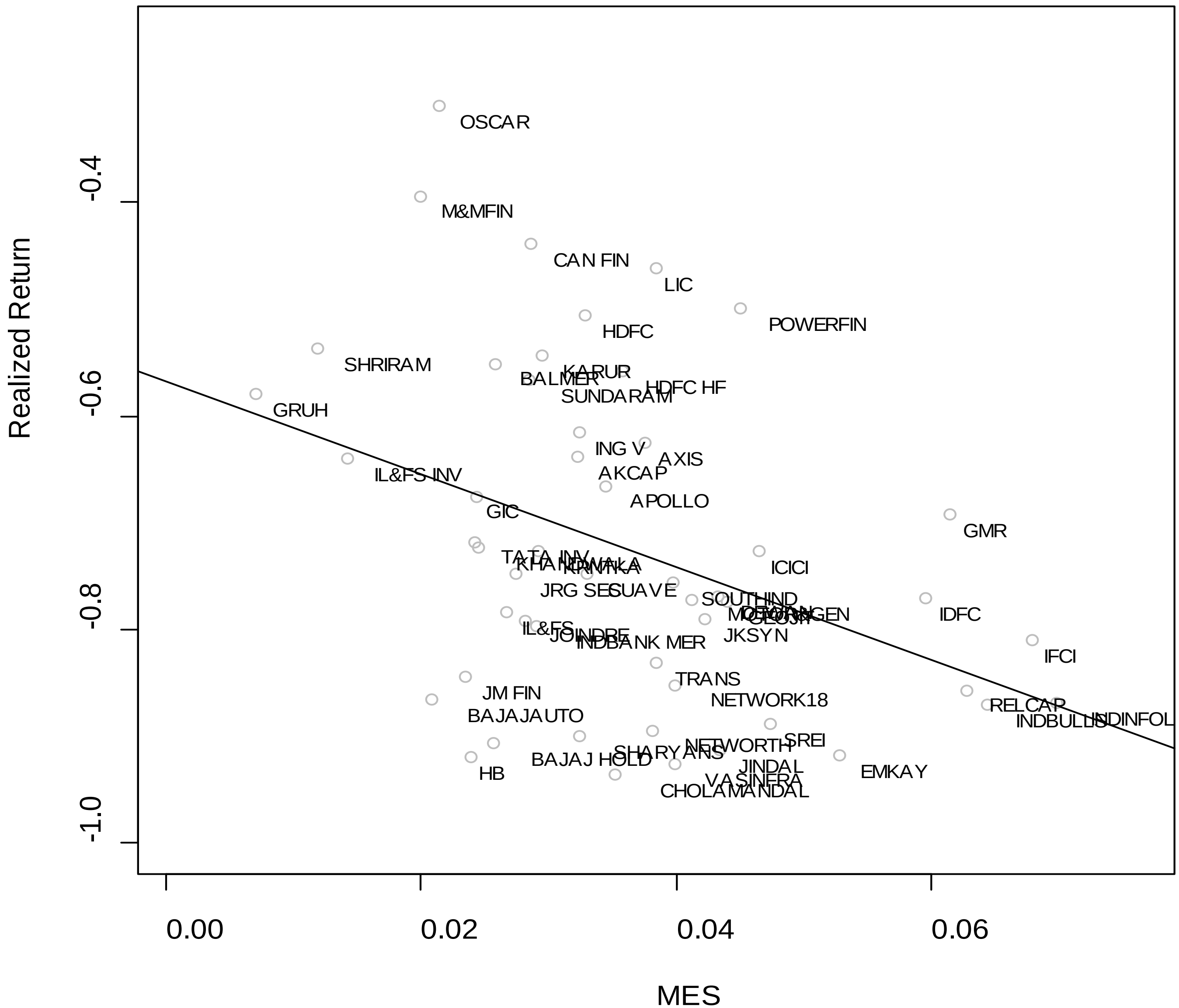
- Relate pre-crisis systemic risk to crisis performance:

- Realized Returns:
  - 70 financial institutions: Public (19 firms), Private (51 firms)

- Deposit growth:
  - 39 banks: PSBs (17), Private sector banks (22)

- Impact of GOI guarantees

Realized Returns: Private Sector Firms



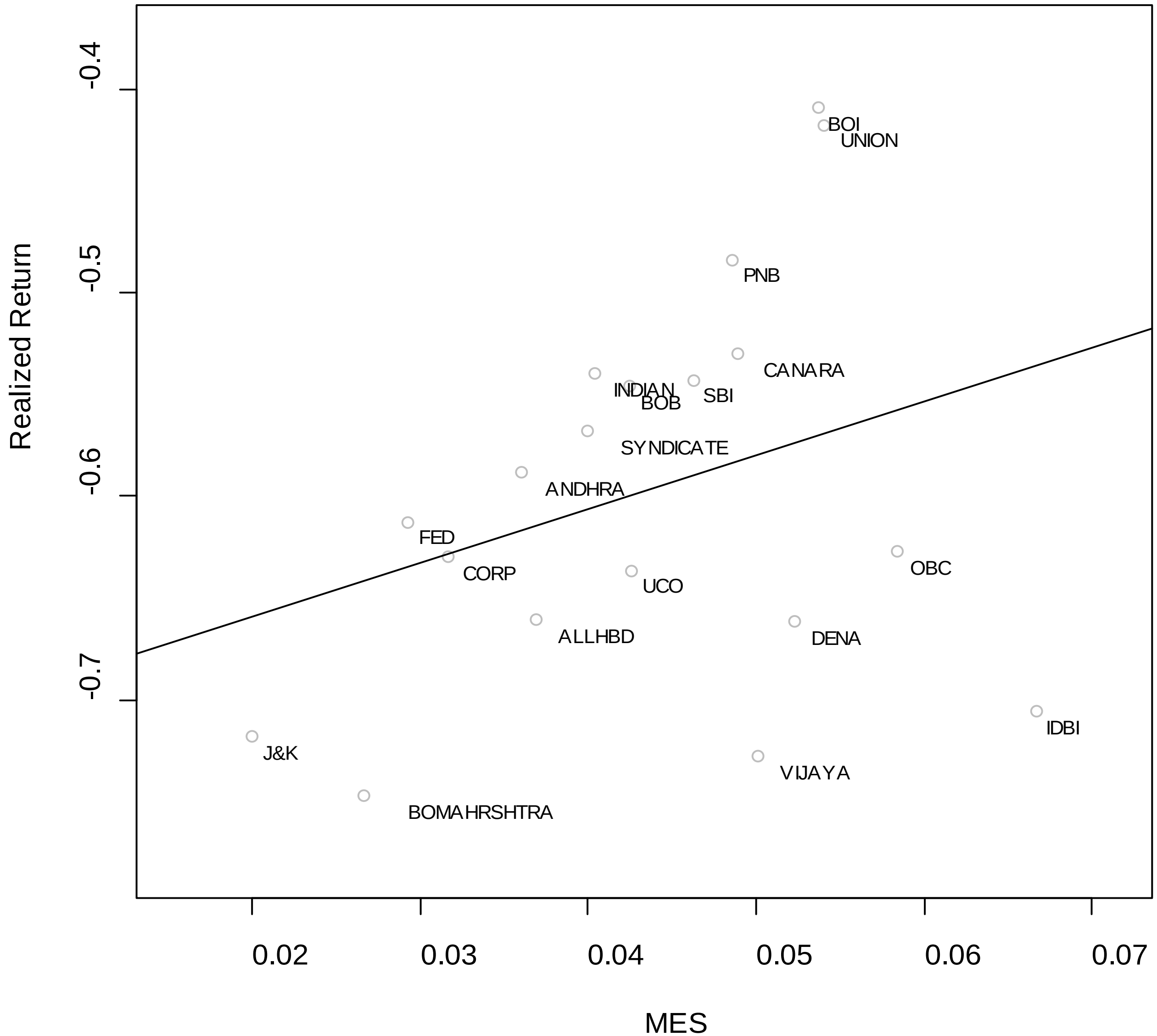
Realized Returns: Private Sector Banks

- Banks with higher MES fared poorly.

- Pre-crisis MES explains realized returns (R^2 of 14.52%).
  - Reliance Capital: High MES (6.28%), low return (-86%).
  - IL&FS: Low MES (1.42%), Higher return (-64%).

- Pre-crisis returns (proxy for leverage) negatively impact realized returns.

Realized Returns: Public Sector Firms



Realized Returns: Public sector financial firms

- Firms with higher MES performed better.

- MES* explains nearly 23.27% of returns.
  - SBI (similar to ICICI): Low MES (4.63%), low return (-54%).
  - Union Bank: High MES (5.41%), higher return (-42%)

- Attributed to greater implicit/explicit government backing.

* With outlier IDBI excluded

Results: Realized Returns

	MES		LVG		PreCrisis Returns		Assets		Multiple Regression (Incl. LVG)		Multiple Regression (Incl. Assets)	
	PSBs*	Private Banks	PSB	Private Banks	PSB	Private Banks	PSBs	Private Banks	PSB	Private Banks	PSB	Private Banks
Intercept	-0.71	-0.56	-0.53	-0.72	-0.57	-0.68	-0.87	-0.85	-0.63	-0.56	-0.83	-0.71
t-stat	*-8.04*	*-9.68*	*-7.41*	*-30.19*	*-12.46*	*-24.58*	*-3.27*	*-8.96*	*-6.58*	*-9.73*	*-3.07*	*-7.63*
MES	2.59	-4.44							3.65	-3.55	2.51	-4.51
t-stat	*1.31*	*-3.00*							*1.82*	*-2.25*	*1.15*	*-2.85*
LVG (E-04)			-7.17	-0.06					-9.26	-0.11		
t-stat			*-1.08*	*-0.21*					*-1.37*	*-0.41*		
PreCrisis Returns					-0.05	-0.02			-0.04	-0.02	-0.06	-0.01
t-stat					*-0.83*	*-2.42*			*-0.79*	*-1.57*	*-1.04*	*-1.00*
Assets (E-02)							2.03	1.31			1.00	2.00
t-stat							*1.02*	*1.48*			*0.55*	*2.01*
Adj. R^2	4.05%	14.52%	1.0%	-2.08%	-1.82%	9.36%	0.27%	2.46%	10.51%	15.45%	0.62%	22.27%
Deg. of freedom	16	46	16	46	16	46	16	46	14	44	14	44

* With IDBI included

Realized Returns: Robustness Checks

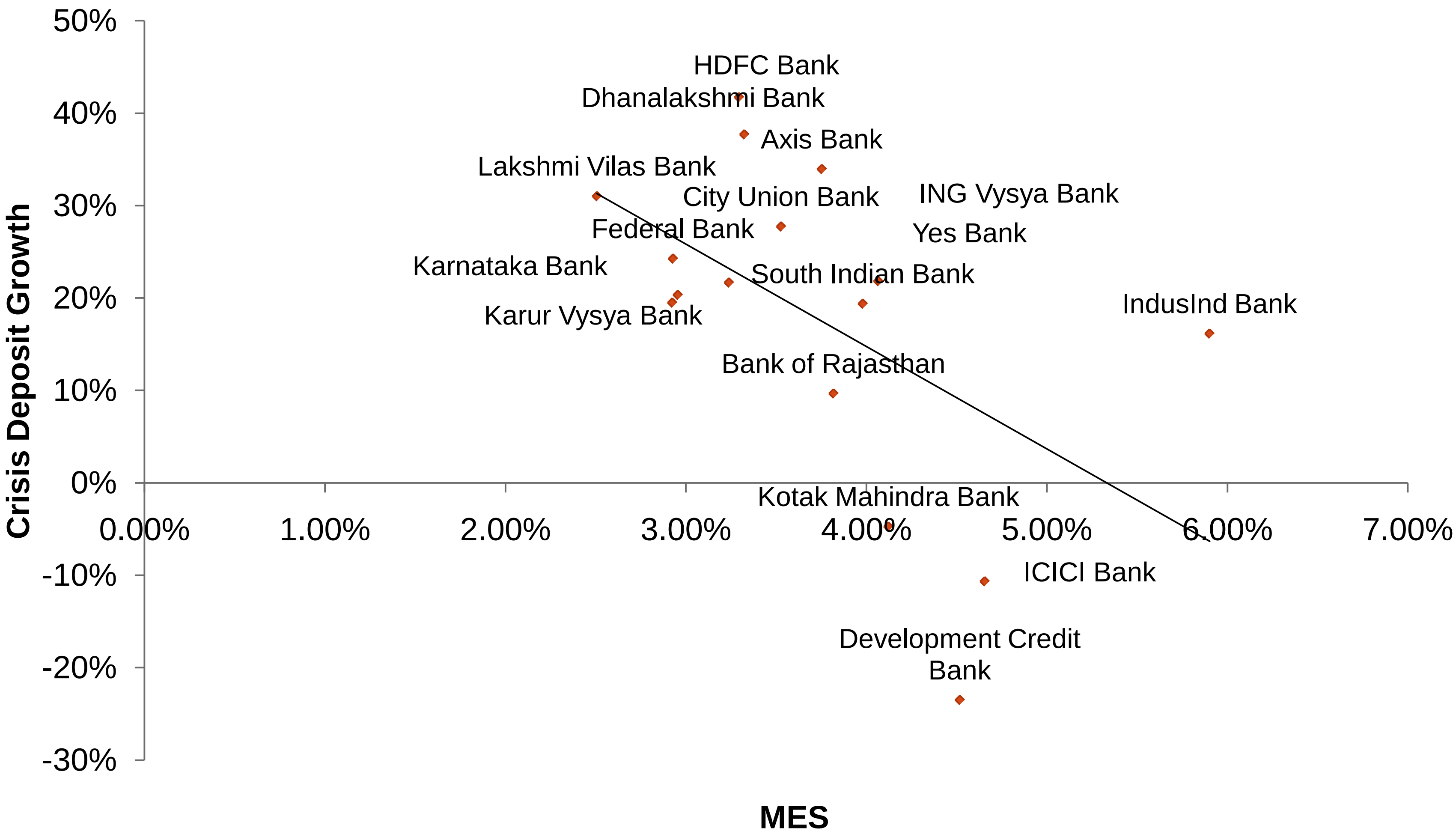
- Same banks were systemically important in 2006 and 2007.
  - MES Ranking for 2006 strongly related to 2007 (R^2 of 17.6%).
  - $MES Rankings far more stable(R^2 of 92.5%).
- Similar results obtained with BSE SENSEX.
- Placebo tests outside of the crisis
  - 2004, 2005, 2006 and 2007 do not show similar trends.
  - Government guarantees are more important during crises.

Results: Deposit Growth

- Trends similar to realized returns.
- Depositors shifted capital out of private banks to PSBs.
- “Flight-to-Quality”: Following Lehman, Infosys transferred Rs. 10 billion in deposits from ICICI to SBI in Q3-2008*.

*Economic Times (2009).

Deposit Growth: Private Sector Firms

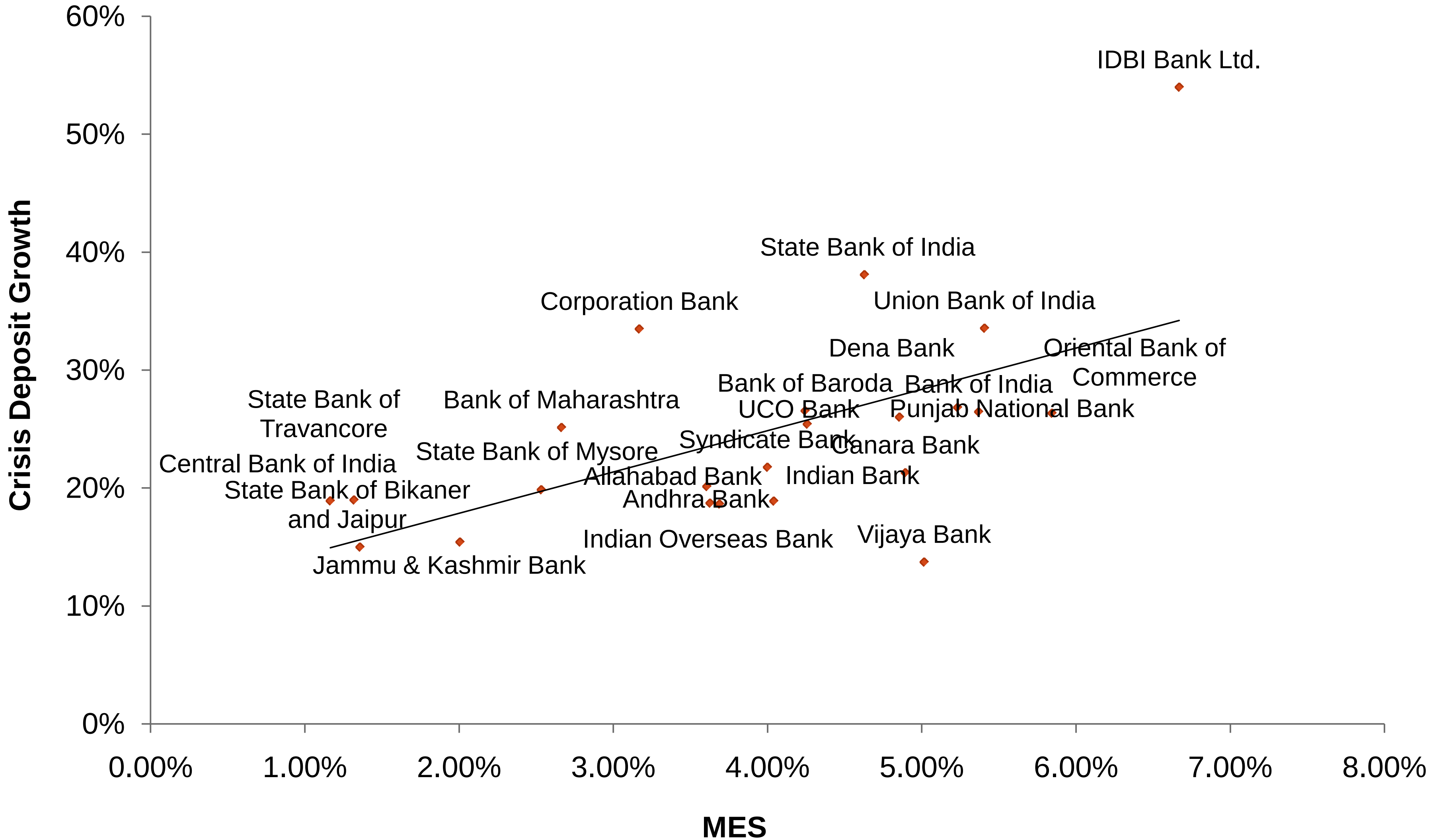


Deposit Growth: Private Sector Firms

- MES explains a large proportion of deposit growth (R^2 of 15.19%).

- Firms with high systemic risk performed poorly.
  - Indusland bank : High MES (5.90%), Low growth (16%).
  - Axis bank: Low MES (3.75%), High growth (34%).

Deposit Growth: Public Sector Firms



Deposit Growth: Public Sector Firms

- Depositors reward firms with greater systemic risk.
- MES coefficient explains deposit growth (R^2 of 28.78%).
- High systemic risk implies greater likelihood of bailout.
  - State Bank of India: High MES (4.63%), high growth (38%).
  - Andhra Bank: Low MES (3.61%), low growth (20%).

Results: Deposit Growth

	MES		LVG		PreCrisis Returns		Assets		Multiple Regression (Incl. LVG)		Multiple Regression (Incl. Assets)	
	PSB	Private Banks	PSB	Private Banks	PSB	Private Banks	PSB	Private Banks	PSB	Private Banks	PSB	Private Banks
Intercept	0.11	0.48	0.24	0.21	0.22	0.24	-0.08	0.32	0.09	0.46	-0.11	0.50
t-stat	*2.43*	*3.01*	*12.30*	*4.16*	*5.66*	*3.21*	*-0.42*	*0.86*	*1.73*	*2.62*	*-0.61*	*1.35*
MES	3.40	-8.49							3.29	-6.74	2.97	-7.71
t-stat	*3.08*	*-1.97*							*3.04*	*-1.23*	*2.60*	*-1.47*
LVG (E-08)			2.01	-30.10					1.87	-13.10		
t-stat			*1.36*	*-1.19*					*1.51*	*-0.47*		
PreCrisis Returns					0.04	-0.06			0.03	-0.02	0.03	-0.02
t-stat					*0.92*	*-1.03*			*0.75*	*-0.37*	*0.88*	*-0.34*
Assets (E-02)							2.46	-1.13			1.60	-0.19
t-stat							*1.65*	*-0.38*			*1.18*	*-0.07*
Adj. R^2	28.78%	15.19%	3.95%	2.46%	-0.74%	0.37%	7.58%	-5.63%	32.14%	4.61%	29.04%	3.03%
Deg. of freedom	20	15	20	15	20	15	20	15	18	13	18	13

Capital Injection in PSBs

- GOI announced fiscal stimulus in December 2008.
- Promised capital to PSBs to help maintain CRAR of 12%.
  - Dec. 2008: GOI requested Rs.1700 cr. from World Bank
  - Dec .2008-Feb. 2009, announced capital injection in 4 PSBs: UCO Bank (Rs. 450 cr.), Central Bank of India (Rs. 700 cr.) and Vijaya Bank (Rs. 500 cr.).
  - 2008-2009: Injected Rs. 250 cr. in United Bank of India.
- 2010-11 budget allocates Rs. 16,500 cr. to help maintain Tier- 1 capital ratio of 8%.
  - IDBI Bank (Rs. 3,119 cr.), Central Bank (Rs. 2,016 cr.), Bank of Maharashtra (Rs. 590 cr.), UCO Bank (Rs. 375 cr.) and Union Bank (Rs. 111 cr.)

Explicit government guarantee:

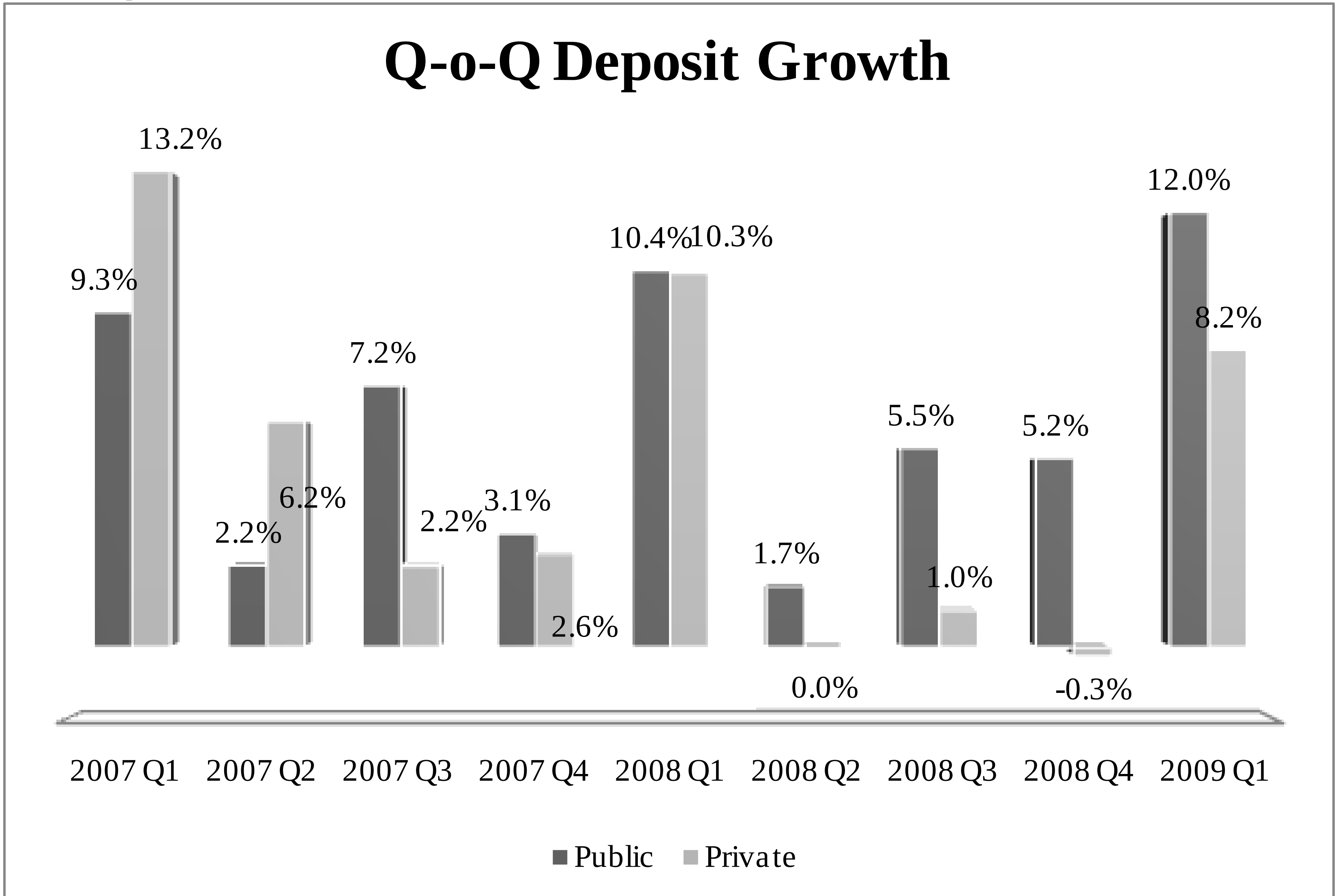
- Capital injections determined based on PSB funding requirements.
- Poor performing PSBs more likely to receive GOI support.
- PSBs receiving capital (except Union Bank) had Tier-1 capital < 8%.
  - Bank of Maharashtra (6.1%), Central Bank of India (7.0%), UCO Bank (6.5%), Union Bank of India (8.2%), Vijaya Bank (7.7%), IDBI Bank (6.8%).
- Among the riskier banks.
  - MES: IDBI (6.67%), Union Bank of India (5.41%), Vijaya Bank (5.02%), UCO (4.26%)
  - IDBI: Received highest capital injection of Rs 3,119 crores.

Implicit government guarantees: Q-o-Q Realized Return

- As the crisis deepened, government guarantees became important and riskier PSBs outperformed in Q3 & Q4, 2008

	Q1 2008		Q2 2008		Q3 2008		Q4 2008		Q1 2009	
	PSB	Private Sector	PSB	Private Sector	PSB	Private Sector	PSB	Private Sector	PSB	Private Sector
Intercept	-0.27	-0.33	-0.21	0.21	-0.10	-0.16	-0.32	-0.21	-0.15	-0.08
t-stat	*-3.80*	*-4.95*	*-2.58*	*1.34*	*-0.61*	*-2.07*	*-3.62*	*-3.52*	*-2.01*	*-1.53*
MES	-2.12	-3.01	-0.82	-8.75	7.43	2.18	5.22	-1.47	-1.73	-2.99
t-stat	*-1.34*	*-1.75*	*-0.46*	*-2.17*	*2.04*	*1.06*	*2.63*	*-0.95*	*-1.07*	*-2.19*
Adj. R-squared	4.22%	3.97%	-4.57%	6.93%	14.98%	0.23%	24.77%	-0.20%	0.78%	7.06%
Deg. of freedom	17	49	17	49	17	49	17	49	17	49

Implicit government guarantees: Q-o-Q Deposit Growth



Related Literature

- Bank behavior in the presence of bailouts: Penati and Protopapadakis (1988), Perotti and Suarez (2002), Cordella and Yeyati (2003).
- Likelihood of bank bailouts: Brown and Dinç (2009), Acharya and Yorulmazer (2007).
- Bailout of U.S. banks: Veronesi and Zingales (2009).
- Our paper examines markets reaction when the guarantee is explicit (as for PSBs) and when no such guarantee exists (as for private sector banks) during crisis period.

Conclusion

- Access to government guarantees provides stability.
- Our analysis suggests this results in crowding out of private sector.
- Policy implications: Caution against delaying privatization of Indian financial sector
- Several examples of state-owned or –guaranteed "banks" going bad: GSEs in the United States, Landesbanken in Germany and Cajas in Spain