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

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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.
Current literature focuses on bank bailouts and ex-ante bank risk-taking behavior.

Public bailout policies and competition: Gropp, Hakenes and Schnabel (2010) identify two main effects “market discipline” and “charter value”.


Analyze the behavior of public sector banks and competitor private sector banks *during the 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.
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.
Timeline: Crisis of 2008

Stock Index Performance for NSE NIFTY and BSE Sensex
between Jan '07-Feb '09
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 4.09%, PSBs: 4.29%, Private sector banks: 3.83%.
Realized Returns: Private Sector Banks

Realized Return = $-0.434 - 6.62 \times \text{MES}$

$R^2 = 0.297$
Realized Returns: Public Sector Banks

Realized Return = $-0.883 + 6.13 \times \text{MES}$

$R^2 = 0.461$
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: Private Sector Banks

Deposit Growth = 0.499 - 9.07 * MES
R-squared = 0.265
Deposit Growth: Public Sector Banks

Deposit Growth = 0.15 + 1.44 \times MES

R-squared = 0.175
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

<table>
<thead>
<tr>
<th></th>
<th>(1) Demand Deposits</th>
<th>(2) Term Savings</th>
<th>(3) Term Savings</th>
<th>(4) Deposits in India</th>
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</thead>
<tbody>
<tr>
<td>PSB</td>
<td>0.0567</td>
<td>0.145*</td>
<td>0.259*</td>
<td>0.160*</td>
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<tr>
<td></td>
<td>(1.13)</td>
<td>(2.82)</td>
<td>(3.76)</td>
<td>(7.12)</td>
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<tr>
<td>Pvt</td>
<td>-0.365</td>
<td>0.783*</td>
<td>0.287*</td>
<td>0.550*</td>
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<tr>
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<td>(-1.64)</td>
<td>(3.15)</td>
<td>(3.12)</td>
<td>(2.95)</td>
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<tr>
<td>MES*PSB</td>
<td>0.436</td>
<td>3.461*</td>
<td>-2.254</td>
<td>1.743*</td>
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<tr>
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<td>(0.37)</td>
<td>(2.99)</td>
<td>(-1.56)</td>
<td>(2.91)</td>
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<tr>
<td>MES*Pvt</td>
<td>11.55***</td>
<td>-14.87**</td>
<td>-3.524</td>
<td>-9.784***</td>
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<td>(1.82)</td>
<td>(-2.26)</td>
<td>(-1.49)</td>
<td>(-1.86)</td>
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<tr>
<td>$R^2$</td>
<td>0.326</td>
<td>0.757</td>
<td>0.780</td>
<td>0.791</td>
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</tbody>
</table>

$t$ statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < .01$
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 mild 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?
Advances Growth: Private sector banks

Advances Growth = 0.366 − 5.32 * MES
R−squared = 0.0878
Advances Growth: Public sector banks

Advances Growth = 0.144 + 1.73 * MES
R-squared = 0.28
## Discipline in Lending Rates?

<table>
<thead>
<tr>
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<th>(1) 08Q1</th>
<th>(2) 08Q2</th>
<th>(3) 08Q3</th>
<th>(4) 08Q4</th>
<th>(5) 09Q1</th>
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<tbody>
<tr>
<td>PSB</td>
<td>13.08*</td>
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<td>13.98*</td>
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<td>12.80*</td>
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<td>(102.06)</td>
<td>(62.67)</td>
<td>(194.75)</td>
<td>(138.12)</td>
<td>(102.88)</td>
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<tr>
<td>Pvt</td>
<td>12.06*</td>
<td>12.71*</td>
<td>13.49*</td>
<td>13.63*</td>
<td>12.85*</td>
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<td>(22.18)</td>
<td>(24.60)</td>
<td>(25.25)</td>
<td>(25.88)</td>
<td>(20.70)</td>
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<tr>
<td></td>
<td>(-0.87)</td>
<td>(-1.40)</td>
<td>(0.66)</td>
<td>(-0.33)</td>
<td>(-1.90)</td>
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<tr>
<td>MES*Pvt</td>
<td>72.25*</td>
<td>63.93*</td>
<td>66.31*</td>
<td>63.32*</td>
<td>77.50*</td>
</tr>
<tr>
<td></td>
<td>(4.59)</td>
<td>(5.99)</td>
<td>(5.12)</td>
<td>(4.99)</td>
<td>(4.79)</td>
</tr>
<tr>
<td>R²</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

* t statistics in parentheses * p < 0.10, ** p < 0.05, *** p < .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: 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.