



# **REPORT ON CURRENCY AND FINANCE 2006-08**

**The Banking Sector in India:  
Emerging Issues and Challenges**



“The findings, views, and conclusions expressed in this Report are entirely those of the contributing staff of the Department of Economic Analysis and Policy (DEAP) and should not necessarily be interpreted as the official views of the Reserve Bank of India”.



# EFFICIENCY, PRODUCTIVITY AND SOUNDNESS OF THE BANKING SECTOR

December 09, 2008



# Motivation

- ◆ Efficiency and Growth
- ◆ Efficiency - strengthening of capital buffer and soundness
- ◆ Efficiency estimates - Leading Indicators



# Concept and Measures

## Concept of Productivity and Efficiency

- ◆ Productivity - ability to produce maximum possible output with given inputs and technology.
- ◆ Efficiency - normative concept - compares performance with the market leader.

## Measures of Productivity and Efficiency

- ◆ Accounting Measures – Various Financial Ratios
- ◆ Economic Measures – Non-Parametric Techniques - Data Envelope Analysis



# Accounting Measures

(per cent)

Ratio	Year	Domestic Banks				Foreign Banks
		Public Sector Banks		Private Banks		
		State Bank Group	Nationalised Banks	Old Private Banks	New Private Banks	
Operating Cost to Assets	1991-92	2.48	2.67	2.97	*	2.26
	1998-99	2.7	2.63	2.22	1.74	3.39
	<b>2006-07</b>	<b>1.98</b>	<b>1.67</b>	<b>1.88</b>	<b>2.11</b>	<b>2.78</b>
Labour Cost per Unit of Earning Assets	1991-92	2.41	2.34	2.86	*	1.08
	1998-99	2.7	2.52	1.83	0.39	1.37
	<b>2006-07</b>	<b>1.51</b>	<b>1.23</b>	<b>1.26</b>	<b>0.71</b>	<b>1.56</b>
Non-Labour Cost per Unit of Earning Assets	1991-92	1.02	1.05	1.17	*	2.18
	1998-99	1.09	0.91	1.07	1.88	3.27
	<b>2006-07</b>	<b>0.79</b>	<b>0.7</b>	<b>0.96</b>	<b>1.8</b>	<b>2.36</b>
Cost to Income Ratio	1991-92	47.44	67.51	58.96	*	30.91
	1998-99	62.41	68.29	65.13	48.69	56.61
	<b>2006-07</b>	<b>52.8</b>	<b>49.36</b>	<b>50.72</b>	<b>52.59</b>	<b>44.64</b>
Other income (Non-interest) to Total Income	1991-92	12.31	9.73	9.62	*	22.72
	1998-99	14.39	10.44	11.04	14.43	19.35
	<b>2006-07</b>	<b>12.16</b>	<b>10.47</b>	<b>12.1</b>	<b>19.58</b>	<b>27.8</b>

\*: First published balance sheet data of new private sector banks were available from the year ended March 1996.



# Accounting Measures

(per cent)

Ratio	Year	Domestic Banks				Foreign Banks
		Public Sector Banks		Private Banks		
		State Bank Group	Nationalised Banks	Old Private Banks	New Private Banks	
Intermediation Cost	1991-92	5.92	5.66	6.13	*	13.28
	1998-99	3.49	4.23	3.86	4.36	6.32
	<b>2006-07</b>	<b>2.97</b>	<b>3.32</b>	<b>3.63</b>	<b>3.61</b>	<b>5.5</b>
Net Interest Margin (spread)	1991-92	3.8	2.86	4.01	*	3.9
	1998-99	2.85	2.78	2.17	2.01	3.52
	<b>2006-07</b>	<b>2.79</b>	<b>2.58</b>	<b>2.74</b>	<b>2.36</b>	<b>3.74</b>
Business per Employee (Rs. Lakh)	1991-92	42.99	46.37	33.48	*	199.47
	1998-99	102.45	107.67	138.78	793.78	504.81
	<b>2006-07</b>	<b>435.52</b>	<b>490.21</b>	<b>486.02</b>	<b>818.02</b>	<b>995.09</b>
Business per Branch (Rs.Crore)	1991-92	10.53	8.27	4.87	*	149.96
	1998-99	24.92	19.23	19.04	66.34	349.04
	<b>2006-07</b>	<b>77.14</b>	<b>62.78</b>	<b>52.31</b>	<b>293.96</b>	<b>1004.1</b>
Return on Assets	1991-92	0.21	0.33	0.57	*	1.56
	1998-99	0.51	0.37	0.46	1.05	1.01
	<b>2006-07</b>	<b>0.82</b>	<b>0.83</b>	<b>0.69</b>	<b>0.92</b>	<b>1.65</b>
Return on Equity	1991-92	12.72	10.45	26.77	*	42.26
	1998-99	11.1	6.26	8.41	16.66	10.96
	<b>2006-07</b>	<b>15.3</b>	<b>14.65</b>	<b>10.32</b>	<b>13.57</b>	<b>13.86</b>

\*: First published balance sheet data of new private sector banks were available from the year ended March 1996.



# Accounting Measures

- ◆ Significant improvement in efficiency/productivity almost all bank groups in the post-reform period particularly after the late 1990s.
- ◆ In term of quantum, improvement varied across bank groups.





# Accounting Measures

- ◆ Cost to Asset ratio, Labour and Non-labour cost Ratios
  - lowest in domestic banks particularly nationalised banks
  - Highest in case of foreign banks
- ◆ Cost to income ratio
  - lowest for foreign banks reflecting sizeable off-balance sheet exposure.
- ◆ Intermediation cost and NIM
  - Lowest for new private sector banks
  - Highest in case of foreign banks
- ◆ Other income to total income
  - Highest in case of foreign and new private sector banks
- ◆ Business per employee and per branch
  - highest in case of foreign and new private sector banks.
- ◆ Return on Assets
  - highest in case of foreign banks followed by new private banks.



## Productivity/Efficiency of Commercial Banks in Select Countries

(per cent)

Country	Operating Cost to Total Assets	Cost to Income Ratio	Ratio of Personnel Expenses to Earning Assets	Ratio of Non-Labour Cost to Total Earning Assets	Net Interest Margins	Ratio of Other Operating Income to Total Income	Return on Assets	Return on Equity	Capital to Total Assets Ratio	Ratio of Impaired Loans to Gross Loans
<b>ADVANCED ECONOMIES</b>										
USA	1.88	58.94	0.62	1.43	1.94	47.07	0.99	12.00	8.90	0.68
Canada	2.57	65.53	1.41	1.47	1.76	24.39	0.95	18.28	6.49	0.51
UK	1.39	55.64	0.63	0.81	1.06	4.73	0.53	15.43	5.80	1.38
Italy	2.30	59.29	1.12	1.19	2.03	5.30	0.74	12.66	8.67	5.47
France	1.37	64.50	0.66	0.66	0.64	17.52	0.54	14.39	5.04	2.62
Germany	1.59	68.13	0.80	0.77	0.96	7.89	0.48	13.34	5.22	3.83
Japan	1.48	51.48	0.36	1.07	1.25	*	0.50	8.83	*	2.84
<b>EMERGING ECONOMIES</b>										
Mexico	6.02	52.68	*	7.21	7.66		2.53	19.21	14.41	2.00
Chile	3.16	51.39	1.51	1.95	4.13	1.31	1.38	16.68	11.36	0.81
Korea	2.07	48.96	0.93	1.57	2.72	6.28	0.98	14.86	7.77	0.97
Thailand	3.21	55.82	0.84	2.50	3.30	5.87	0.68	8.10	10.74	9.28
Philippines	3.87	61.97	1.36	3.17	3.91	12.29	1.22	10.65	13.14	8.03
Malaysia	1.91	41.60	0.72	1.31	2.15	17.69	0.99	13.53	9.45	6.52
Indonesia	3.97	53.21	1.71	2.85	5.90	-	1.56	14.72	12.12	6.79
Brazil	7.13	57.06	2.59	5.25	8.37	26.68	1.85	18.00	12.38	8.97
Russian Federation	5.93	54.22	2.16	4.84	5.10	34.88	2.33	17.12	15.91	1.84
China	1.43	41.98	0.52	1.04	2.30	3.90	0.62	11.83	6.84	2.76
<b>Memo :</b>										
<b>RANGE</b>	<b>1.37 - 7.13</b>	<b>41.60 - 68.13</b>	<b>0.36 - 2.59</b>	<b>0.66 - 7.21</b>	<b>0.64 - 8.37</b>	<b>1.31 - 47.07</b>	<b>0.48 - 2.53</b>	<b>8.10 - 19.21</b>	<b>5.04- 15.91</b>	<b>0.51-9.28</b>
<b>India</b>	<b>2.97</b>	<b>56.09</b>	<b>1.20</b>	<b>1.99</b>	<b>3.00</b>	<b>15.88</b>	<b>0.85</b>	<b>14.76</b>	<b>8.29</b>	<b>2.55</b>

\*: Data is not available, or if available, is with a very small sample, and hence not considered for analysis.

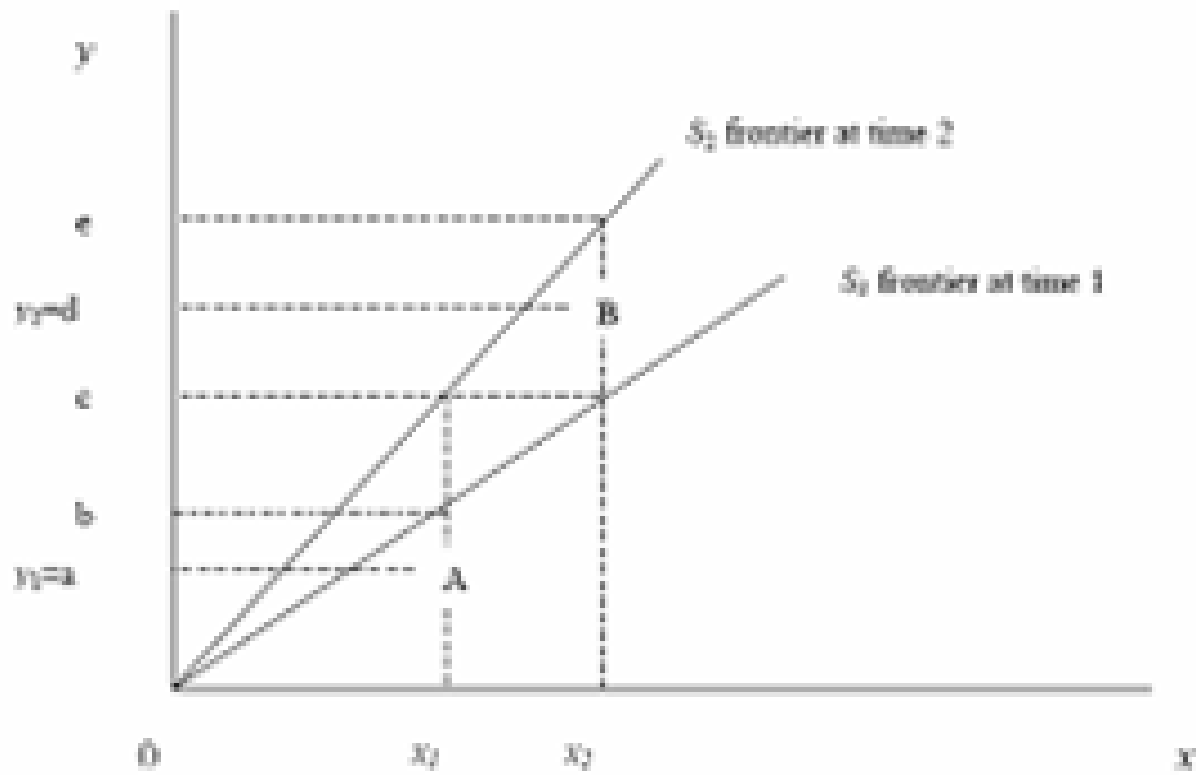


# Economic Measures

- ◆ By following DEA approach, a best practice frontier representing optimal utilisation of resources is prepared and efficiency of each bank is measured relative to this frontier.
- ◆ To estimate best practice frontier labour, fixed assets, deposits and borrowings were treated as inputs while credit, investments and asset equivalent of off-balance sheet exposure were used as outputs.



Figure 1





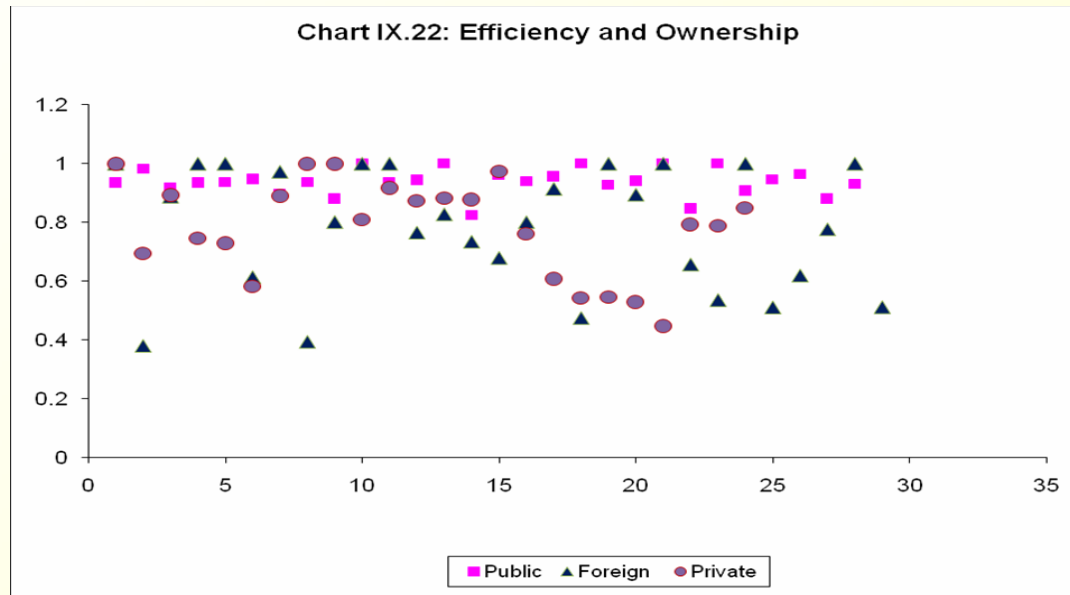
## Economic Measures - Efficiency Estimates

- Significant improvement across the bank groups after initiation of reforms.
- During 2006-07, State Bank Group was most cost efficient followed by new private, nationalised, foreign and old private banks.
- Average efficiency of foreign bank group is also low because the group comprise a large number of small banks with very low efficiency levels.



# Economic Measures

## Efficiency and Ownership





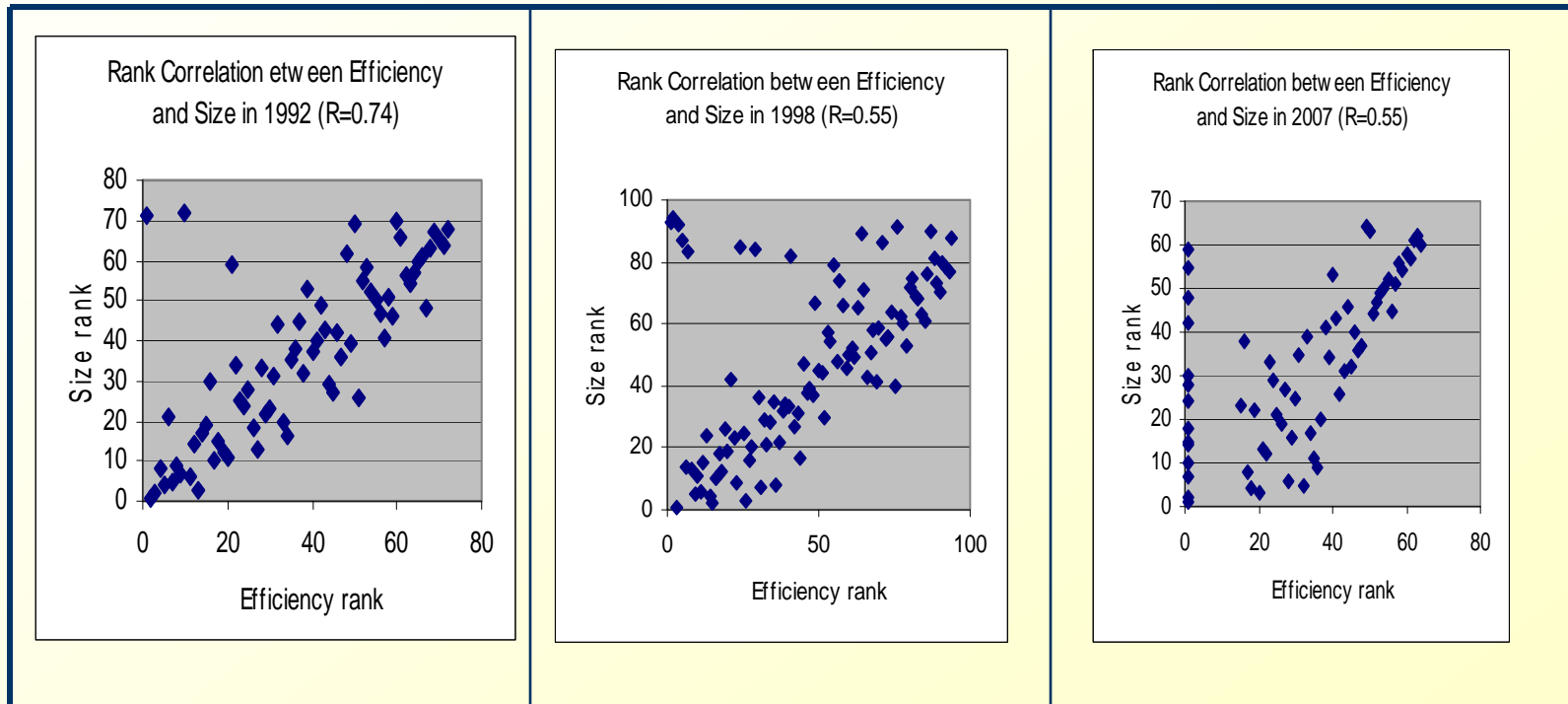
**Efficiency Ranks of Banks**

Sr.No.	Efficiency Rank	Efficiency Score (1 - Most Efficient) (0 - Least Efficient)	Bank Group	Sr.No.	Efficiency Rank	Efficiency Score (1 - Most Efficient) (0 - Least Efficient)	Bank Group
1	2	3	4	5	6	7	8
1	1	1	Public Sector	41	25	0.894	Foreign Bank
2	1	1	Public Sector	42	26	0.892	Private Sector
3	1	1	Public Sector	43	27	0.889	Private Sector
4	1	1	Public Sector	44	28	0.888	Foreign Bank
5	1	1	Public Sector	45	29	0.882	Private Sector
6	1	1	Private Sector	46	30	0.881	Public Sector
7	1	1	Private Sector	47	31	0.88	Public Sector
8	1	1	Private Sector	48	32	0.877	Private Sector
9	1	1	Foreign Bank	49	33	0.873	Private Sector
10	1	1	Foreign Bank	50	34	0.849	Private Sector
11	1	1	Foreign Bank	51	35	0.847	Public Sector
12	1	1	Foreign Bank	52	36	0.827	Foreign Bank
13	1	1	Foreign Bank	53	37	0.825	Public Sector
14	1	1	Foreign Bank	54	38	0.809	Private Sector
15	1	1	Foreign Bank	55	39	0.801	Foreign Bank
16	1	1	Foreign Bank	56	40	0.801	Foreign Bank
17	1	1	Foreign Bank	57	41	0.793	Private Sector
18	2	0.982	Public Sector	58	42	0.788	Private Sector
19	3	0.974	Private Sector	59	43	0.776	Foreign Bank
20	4	0.972	Foreign Bank	60	44	0.765	Foreign Bank
21	5	0.965	Public Sector	61	45	0.761	Private Sector
22	6	0.963	Public Sector	62	46	0.745	Private Sector
23	7	0.956	Public Sector	63	47	0.734	Foreign Bank
24	8	0.947	Public Sector	64	48	0.729	Private Sector
25	9	0.946	Public Sector	65	49	0.694	Private Sector
26	10	0.944	Public Sector	66	50	0.679	Private Sector
27	11	0.941	Public Sector	67	51	0.656	Foreign Bank
28	12	0.939	Public Sector	68	52	0.619	Foreign Bank
29	13	0.937	Public Sector	69	53	0.613	Foreign Bank
30	14	0.936	Public Sector	70	54	0.607	Private Sector
31	15	0.936	Public Sector	71	55	0.581	Private Sector
32	16	0.936	Public Sector	72	56	0.544	Private Sector
33	17	0.935	Public Sector	73	57	0.542	Private Sector
34	18	0.93	Public Sector	74	58	0.536	Foreign Bank
35	19	0.928	Public Sector	75	59	0.528	Private Sector
36	20	0.917	Public Sector	76	60	0.511	Foreign Bank
37	21	0.917	Private Sector	77	61	0.511	Foreign Bank
38	22	0.914	Foreign Bank	78	62	0.474	Foreign Bank
39	23	0.908	Public Sector	79	63	0.445	Private Sector
40	24	0.897	Public Sector	80	64	0.393	Foreign Bank
				81	65	0.379	Foreign Bank



# Economic Measures

## Efficiency and Size

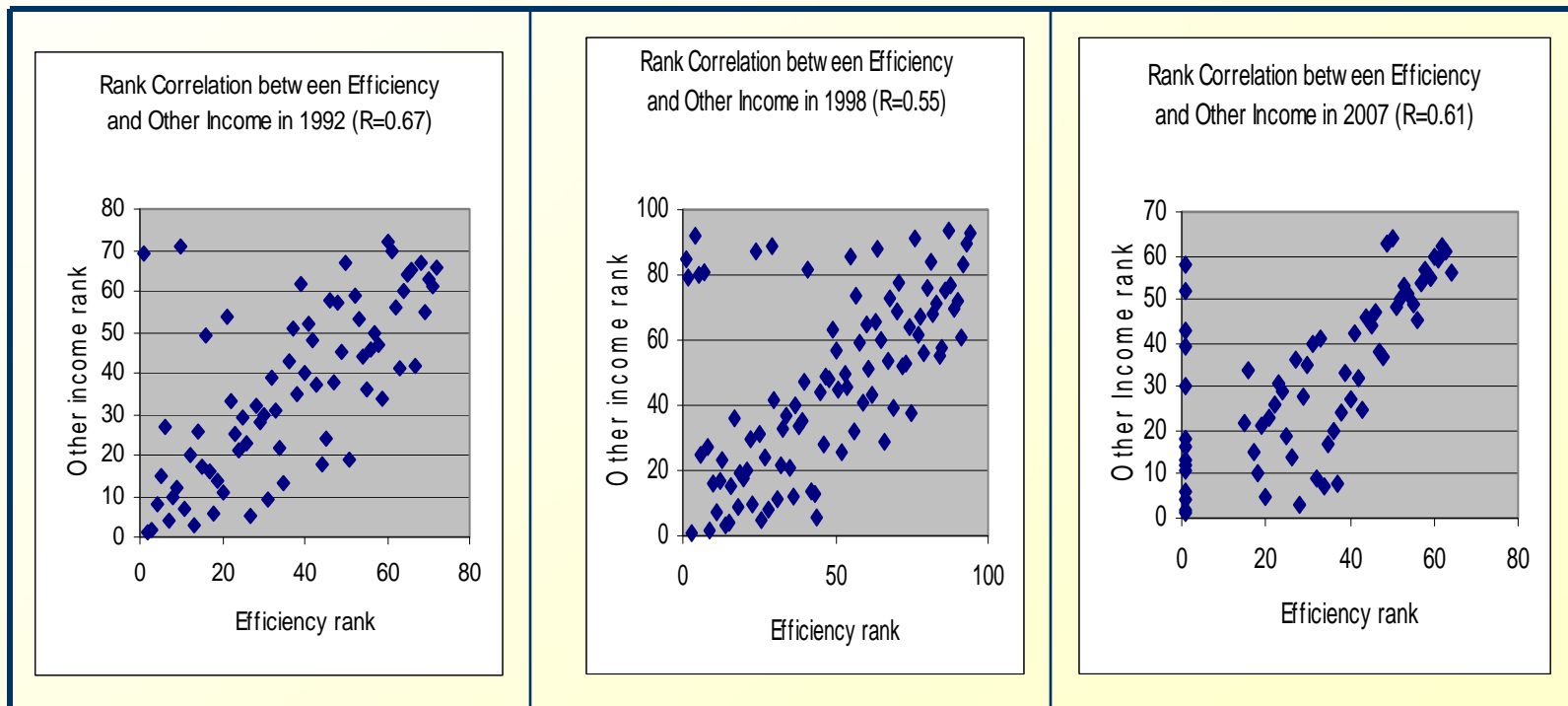






# Economic Measures

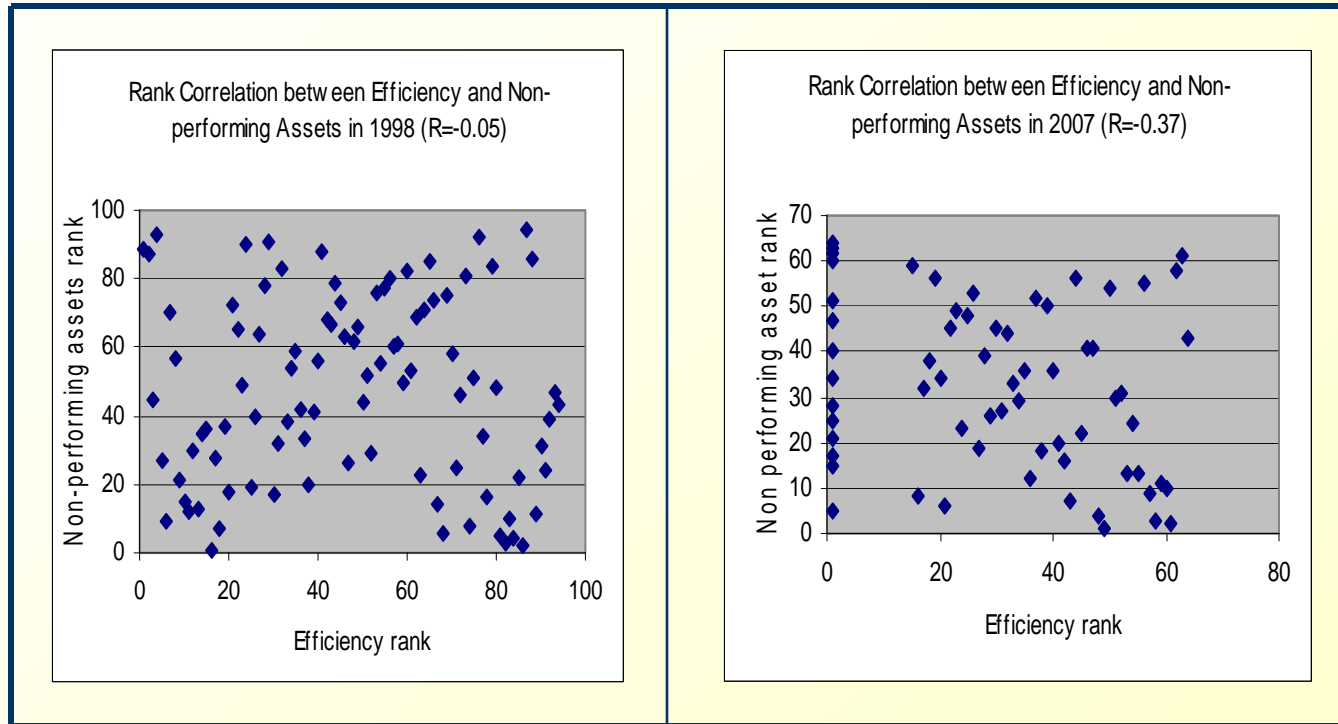
## Efficiency and Other Income





# Economic Measures

## Efficiency and NPAs



*More rigorous analysis in terms of panel regression show a negative relation between efficiency and NPAs*

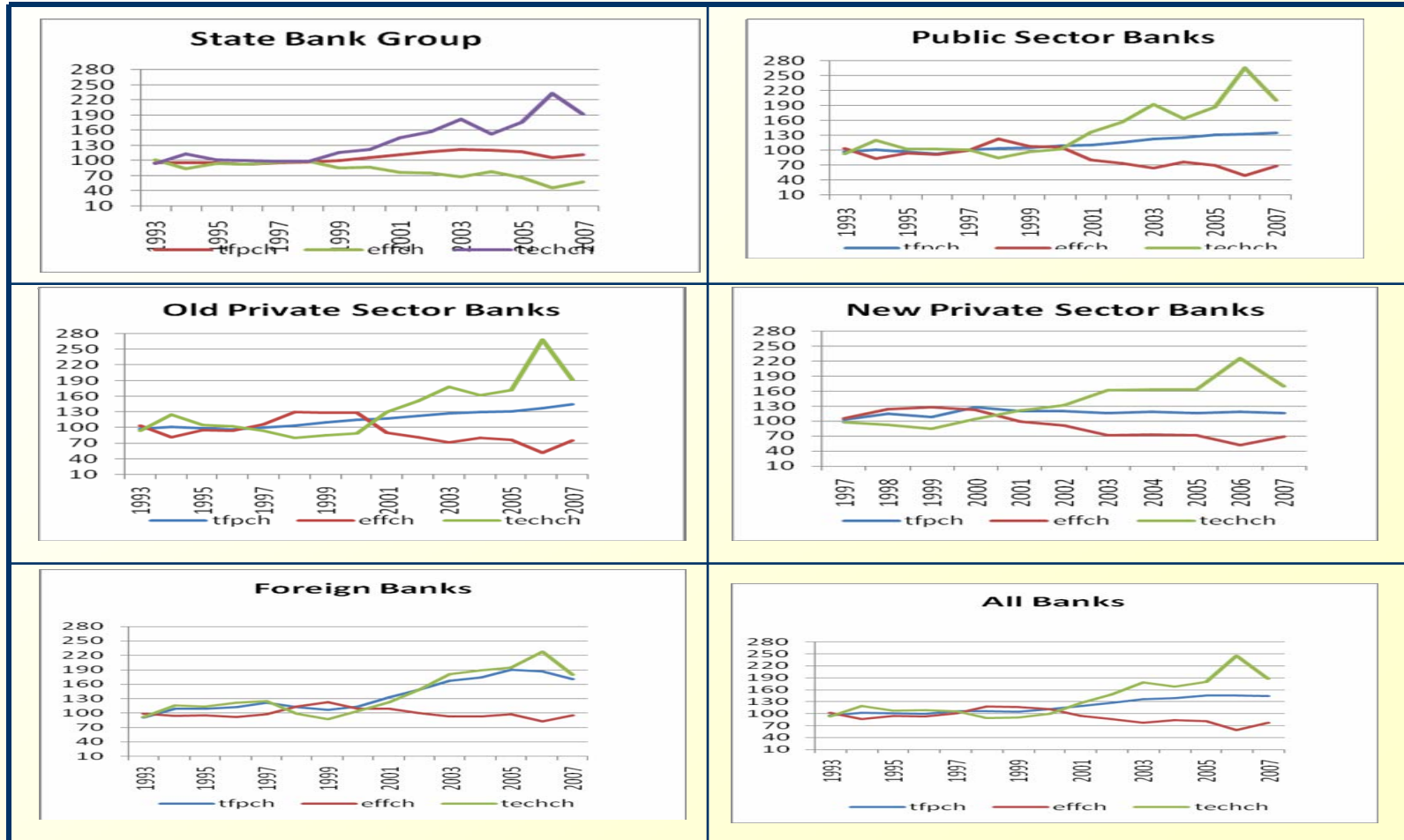


## Economic Measures - Productivity Estimates

- Productivity is measured by computing Malmquist Index.
- There has been across the board rise in productivity, especially after 1997-98.
- During 2006-07, the largest improvement was witnessed in the case of foreign banks followed by old private and nationalised banks.
- Productivity estimates could be broken into two – technological improvement (innovation) and technical efficiency (catching up).



# Economic Measures – Productivity Estimates





## Economic Measures - Productivity Estimates

- Relative trends in these components reveal that rise in productivity was largely on account of technological improvement or innovation in the industry.
- Banks were slow to catch up with steep rise in technical progress (innovation)



# Soundness

- Capital Adequacy
- Non-Performing Assets

*Across the board improvement in case of both the ratios*



# Soundness

## CRAR of Various Bank Groups

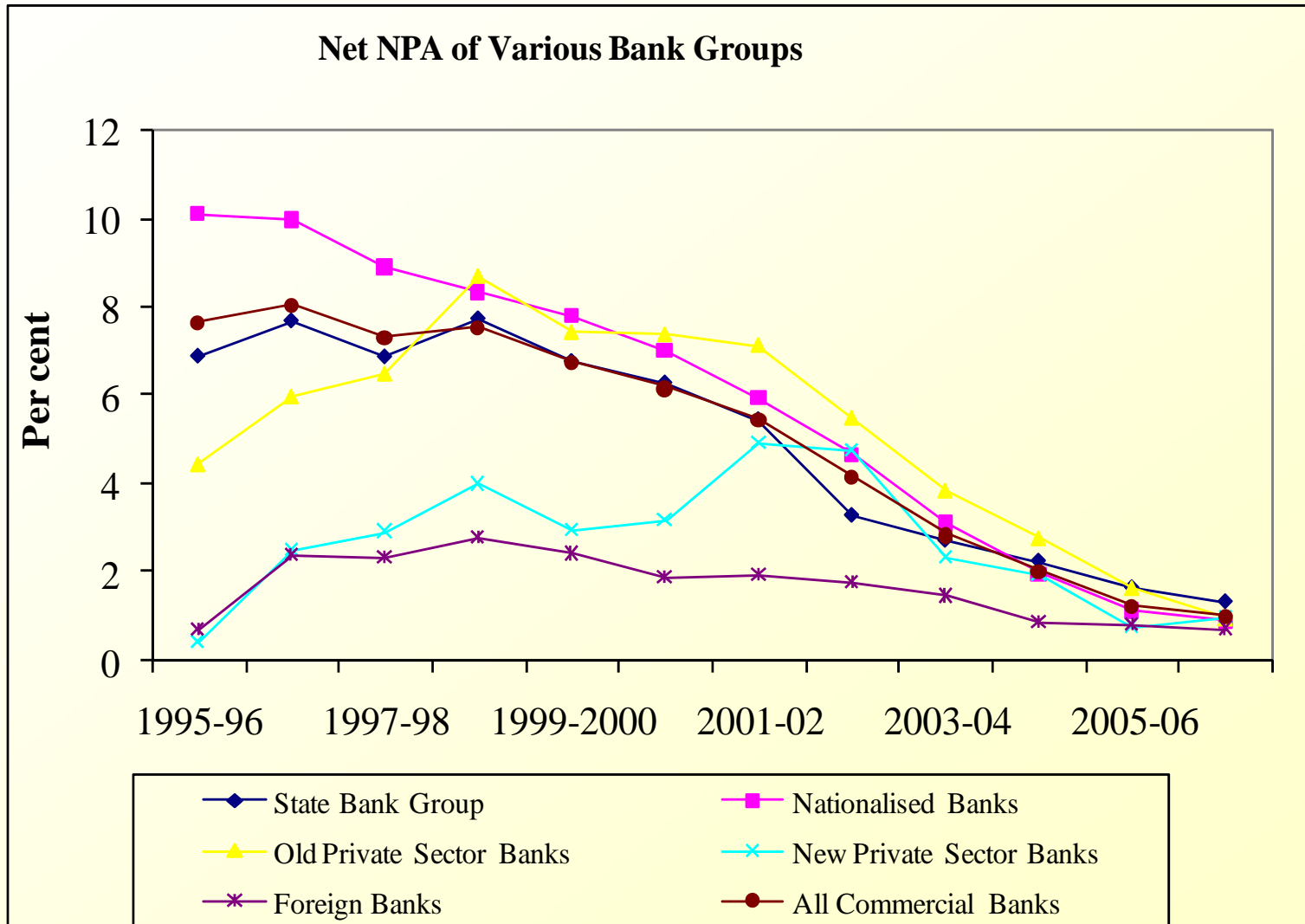
(Per cent)

End-March	State Bank Group	Nationalised Banks	Old Private Sector Banks	New Private Sector Banks	Foreign Banks	All Commercial Banks
1997	11.64	<b>7.45</b>	8.07	14.39	14.67	8.7
2001	12.94	<b>10.32</b>	14.21	11.94	16.17	13.07
2002	<b>13.19</b>	<b>10.77</b>	12	<b>10.3</b>	14.37	11.51
2003	14.01	<b>12.14</b>	13.19	8.8	18.53	12.28
2004	13.57	<b>13.23</b>	14.38	11.3	19.82	13.89
2005	12.06	<b>13.1</b>	12.16	12.46	17.42	14.07
2006	11.9	<b>12.19</b>	5.54	12.36	15.75	12.61
2007	12.42	<b>12.01</b>	13.66	12.17	13.8	12.88

Source: Computed from Statistical Tables Relating to Banks in India (RBI).



# Soundness







# Soundness and Efficiency

- Bad Luck Hypothesis
  - ◆ *Macro down turn and NPAs*
- Bad Management Hypothesis
- Skimping hypothesis
  - ◆ *Inadequate monitoring – cost saving*



# Soundness and Efficiency

## Granger Causality Tests

Sample 1996-2006

Null Hypothesis	F- statistic	P-value
NPA does not granger cause TE	3.04	0.028
TE does not granger cause NPA	5.73	0.001



# Soundness and Efficiency

- Empirical results show that efficiency level impact NPA and vice-a-versa.
- Poor macro economic performance and bad management caused NPAs



## Way Forward

- ◆ Need to reduce Intermediation cost
- ◆ Need to bring down Operating cost
- ◆ Need to improve labour productivity
- ◆ Need for enhanced diversification
- ◆ Need of catch up with enhanced technological capacity.