CHAPTER VI

PROFITABILITY

One major perspective of the financial sector reforms is to improve profits and profitability of banks after reforms. This chapter deals with the profitability of the banks. The chapter is divided into five sections. The first section explains average operating income and expenditure by bank-group. Section two examines bank profitability through three measures of profitability. Section three analyses the regression estimates. Section four gives trends in NPAs by bank group. Section five concludes with summary main points.

6.1 Introduction:

The term profit is an accounting concept which is defined as the difference between total earnings from all earning assets and expenditure on managing entire asset-liabilities portfolio. Profitability is a relative measure where profit is expressed as a ratio, generally as a percentage. It depicts the relationship of absolute amount of profit with various other factors. Profitability of commercial banks is pro foundation for product innovation, diversification and efficiency of the commercial banks (Hempell, 2002). Profitability of banks is governed by several factors, some are endogenous, some are exogenous to the system and yet structural (Angadi & Devraj 1983). Profitability is necessary for a bank to maintain ongoing activity and for its shareholders to obtain fair returns. The definition of profitability and its determinants varies among the studies. In other words, the determinants of profitability of bank may vary from bank size specific variables to financial structure variables to legal and institutional variables to macro economic variables and so on.

6.2 Structure of operating income and expenditure of the Bank-groups:

It will be pertinent to see the structure of income and expenditure of the banks for the period under study. A detailed analysis of the operating income and total cost will indicate the nature of profits or losses of the banks over the period. The operating income for selected years are shown below in the **Table 6-1** and

(a) Operating Income:

The relative contribution of interest earned component of operating income remained more or less the same over the period for both the bank groups. However there were changes in the components of the operating income. A substantial change in interest on investment was observed for both the bank groups, although there were changes in other components. For the State Bank group, income on investment has increased from 19.71 per cent in 1991-92 to 31.75 per cent in 1995-96 and further to 43.37 per cent in 1999-00 and to 40.28 per cent in the financial year 2003-04. However, in the financial year, 2006-07, there was a slight decline in the income on investment to 25.74 per cent. Similar pattern was discernible for the public sector bank group. Interest on investment of the PSBs which was 25.22 per cent in 1991-92 increased to 34.59 per cent in 1995-96, to 40.58 per cent in 1999-00, to 37.65 per cent in 2003-04 and 27.50 per cent in 2006-07. Interest or discount on advances or bills increased over the period although there was a sharp decline in the financial year 2003-04 for both the bank groups. This decline was followed by a rise in the net profits on sale and revaluation of investment. In all, the contribution for the PSBs in terms of interest income was higher than that of the state bank groups. No major differences existed among the banks groups in terms of other sources of income. [**Table 6-1**]

Table 6-1

Composition of Operating Income by Bank group

(Per cen

Panel A: Operating Income of the Banks in 1991-92

	Items	SBI & its Associates	Other PSBs Group	All Banks
	(1)	(2)	(3)	(2) & (3)
I.	**Interest Earned**	**87.69**	**90.27**	**89.26**
(a)	Interest discount on advances/bills	53.34	55.06	54.38
(b)	Income on Investments	19.71	25.22	23.06
(c)	Interest on balances with RBI and other inter-bank funds	10.92	9.47	10.05
(d)	Others	3.72	0.51	1.77
II.	**Other Income**	**12.31**	**9.73**	**10.74**
(a)	Commissions, exchange & brokerage	---	---	---
(b)	Others	---	---	---
	Total Income (I + II)	**100.00**	**100.00**	**100.00**
		(Rs. 13429 crore)	**(Rs. 20734 crore)**	**(Rs. 34163 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cen

Panel B: Operating Income of the Banks in 1995-96

	Items	SBI & its Associates	Other PSBs Group	All Banks
	(1)	(2)	(3)	(2) & (3)
I.	**Interest Earned**	**83.21**	**89.15**	**86.87**
(a)	Interest discount on advances/bills	44.60	48.19	46.81
(b)	Income on Investments	31.75	34.59	33.50
(c)	Interest on balances with RBI and other inter-bank funds	5.21	5.47	5.37
(d)	Others	1.66	0.90	1.19
II.	**Other Income**	**16.79**	**10.85**	**13.13**
(a)	Commissions, exchange & brokerage	11.18	6.55	8.32
(b)	Others	5.61	4.30	4.80
	Total Income (I + II)	**100.00**	**100.00**	**100.00**
		(Rs. 20567 crore)	**(Rs. 33098 crore)**	**(Rs. 53665 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cer

Panel C: Operating Income of the Banks in 1999-00

	Items	SBI & its Associates	Other PSBs Group	All Banks
	(1)	(2)	(3)	(2) & (3)
I.	**Interest Earned**	**85.81**	**88.37**	**87.41**
(a)	Interest discount on advances/bills	44.31	42.72	40.96
(b)	Income on Investments	43.37	40.58	39.32
(c)	Interest on balances with RBI and other inter-bank funds	6.28	4.24	4.67
(d)	Others	6.04	0.84	2.47
II.	**Other Income**	**14.19**	**11.63**	**12.59**
(a)	Commissions, exchange & brokerage	10.04	5.03	6.91
(b)	Others	4.16	6.59	5.68
	Total Income (I + II)	**100.00**	**100.00**	**100.00**
		(Rs. 34015 crore)	**(Rs. 56886 crore)**	**(Rs. 90901 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cen

Panel D: Operating Income of the Banks in 2003-04

	Items	SBI & its Associates	Other PSBs Group	All Banks
	(1)	**(2)**	**(3)**	**(2) & (3)**
I.	**Interest Earned**	**78.93**	**79.97**	**79.57**
(a)	Interest discount on advances/bills	31.32	39.30	36.29
(b)	Income on Investments	40.28	37.65	38.64
(c)	Interest on balances with RBI and other inter-bank funds	5.25	1.96	3.20
(d)	Others	2.08	1.06	1.45
II.	**Other Income**	**21.05**	**20.03**	**20.43**
(a)	Commissions, exchange & brokerage	8.10	4.21	5.68
(b)	Others	12.97	15.83	14.75
	Total Income (I + II)	**100.00**	**100.00**	**100.00**
		(Rs. 51876 crore)	**(Rs. 85712 crore)**	**(Rs. 137603 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cen

Panel E: Operating Income of the Banks in 2006-07

	Items	SBI & its Associates	Other PSBs Group	All Banks
	(1)	(2)	(3)	(2) & (3)
I.	**Interest Earned**	**87.84**	**89.75**	**89.07**
(a)	Interest discount on advances/bills	56.36	58.87	57.98
(b)	Income on Investments	25.74	27.50	26.88
(c)	Interest on balances with RBI and other inter-bank funds	4.84	2.80	3.52
(d)	Others	0.89	0.57	0.69
II.	**Other Income**	**12.16**	**10.25**	**10.93**
(a)	Commissions, exchange & brokerage	10.39	4.74	6.74
(b)	Others	1.77	5.51	4.19
	Total Income (I + II)	**100.00**	**100.00**	**100.00**
		(Rs. 64137 crore)	**(Rs. 117469 crore)**	**(Rs. 181606 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

...mponent of the total cost of the banks were found to decline marginally for both the bank groups. For the state bank group, interest expenditure was 72.08 per cent in 1991-92 which declined to 65.32 per cent in 1995-96 and further to 67.93 per cent in 2006-07. The interest expenditure of PSBs was 73.22 per cent of the total expenditure in 1991-92, 68.21 per cent in 1995-96, 65.16 per cent in 1999-00, 66.62 per cent in 2003-04 and 70.70 per cent in 2006-07. The interest paid on deposits still increased marginally over the periods. For the state bank groups, interest paid on deposits increased from 54.30 per cent in 1995-96 to 57.46 per cent in 2006-07 and for the public sector banks from 60.13 per cent in 1995-96 to 64.77 per cent in 2006-07.

On the other hand, operating expenditure registered an increase for both the bank groups. The operating expenditure of State Bank of India and its associates group was 27.92 per cent in 1991-92 which increased to 32.07 per cent in 2006-07 with different variations over the period. Similar is the case of the other 19 public sector banks group. Depreciation on banks' property was found to increase for both the bank groups over the period. No differences were found for both the bank groups in terms of general expenses, as it was less than 10 per cent in all the periods. Marginal increase was found in the payments and provisions to employees for both the bank groups. [**Table 6-2**]

Table 6-2

Bank-group wise composition of total cost for selected time periods from 1991-92 to 2006-07

(Per cen

Panel A: Total cost of banks in 1991-92			
Items	**SBI & its Associates**	**Other Public Sector Banks**	**All Banks**
(1)	**(2)**	**(3)**	**(2) & (3)**
III. Interest Expended	**72.08**	**73.22**	**72.62**
(a) Interest on deposits	---	---	---
(b) Others	---	---	---
IV. Operating Expenses	**27.92**	**26.78**	**27.38**
(a) Payments to and Provisions for employees	19.62	18.46	19.07
(b) General Expenses	7.65	7.60	7.63
(c) Depreciation on Bank's Property	0.65	0.72	0.68
Total Expenses (III + IV)	**100.00 (Rs. 10255 crore)**	**100.00 (Rs. 18367 crore)**	**100.00 (Rs. 38878 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cen

Panel B: Total cost of banks in 1995-96

Items	SBI & its Associates	Other Public Sector Banks	All Banks
(1)	(2)	(3)	(2) & (3)
III. Interest Expended	**65.32**	**68.21**	**67.17**
(a) Interest on deposits	54.30	60.13	58.03
(b) Others	9.14	11.02	8.07
IV. Operating Expenses	**34.68**	**31.79**	**32.83**
(a) Payments to and Provisions for employees	25.88	23.19	24.16
(b) General Expenses	8.10	7.74	7.87
(c) Depreciation on Bank's Property	0.70	0.86	0.80
Total Expenses (III + IV)	**100.00 (Rs. 16644 crore)**	**100.00 (Rs. 29453 crore)**	**100.00 (Rs. 46096 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cent

Panel C: Total cost of banks in 1999-00

Items	SBI & its Associates	Other PSBs Group	All 27 Banks
(1)	(2)	(3)	(2) & (3)
III. Interest Expended	**70.62**	**65.16**	**67.02**
(a) Interest on deposits	66.69	61.98	63.59
(b) Others	3.93	3.17	3.43
IV. Operating Expenses	**29.38**	**26.05**	**27.18**
(a) Payments to and Provisions for Employees	21.03	19.16	19.80
(b) General Expenses	6.76	5.85	6.16
(c) Depreciation on Bank's Property	1.59	1.04	1.22
Total Expenses (III +IV)	**100.00 (Rs. 28175 crore)**	**100.00 (Rs. 54449 crore)**	**100.00 (Rs. 82624 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cent)

Panel D: Total cost of banks in 2003-04

Items	SBI & its Associates	Other PSBs Group	All 27 Banks
(1)	(2)	(3)	(2) & (3)
III. Interest Expended	**67.67**	**66.62**	**67.02**
(a) Interest on deposits	64.03	63.01	63.40
(b) Others	3.65	3.60	3.62
IV. Operating Expenses	**32.33**	**33.38**	**32.98**
(a) Payments to and Provisions for Employees	22.26	23.21	22.85
(b) General Expenses	7.63	8.49	8.16
(c) Depreciation on Bank's Property	2.44	1.68	1.97
Total Expenses (III +IV)	**100.00 (Rs. 37528 crore)**	**100.00 (Rs. 60599 crore)**	**100.00 (Rs. 98127 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

(Per cen

Panel E: Total cost of banks in 2006-07

Items	SBI & its Associates	Other PSBs Group	All 27 Banks
(1)	**(2)**	**(3)**	**(2) & (3)**
III. Interest Expended	**67.93**	**70.70**	**69.71**
(a) Interest on deposits	57.46	64.77	62.17
(b) Others	10.47	5.93	7.54
IV. Operating Expenses	**32.07**	**29.30**	**30.29**
(a) Payments to and Provisions for Employees	21.01	18.86	19.62
(b) General Expenses	9.20	8.81	8.94
(c) Depreciation on Bank's Property	1.87	1.64	1.72
Total Expenses (III +IV)	**100.00 (Rs. 49845 crore)**	**100.00 (Rs. 90400 crore)**	**100.00 (Rs. 140245 crore)**

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

banks:

examined through three profitability parameters, namely return on assets (ROA), return on equity (ROE) and profit margin (PM).

(i) **Return on assets (ROA)**: It is an indicator of profitability which measures the profit of a firm in relation to its total assets. It reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per rupee of assets and indicates how effectively the bank's assets are managed to generate revenues. It is defined as the ratio of profit after tax to total assets of a bank for a given time period. It is expressed as:

$$ROA = Profit\ after\ tax/Total\ assets$$

(ii) **Return on equity (ROE):** Return on equity measures the rate of return on shareholders' equity. It is a measure of efficiency. It indicates how well a firm manages its investment funds to generate earnings growth. It is defined as the ratio of profit after tax to the average value of net worth. However, this ratio alone cannot be used to judge the financial performance without considering the other profitability ratios mentioned above. It is expressed as:

$$ROE = Profit\ after\ tax/Net\ worth\ (capital + reserves)$$

(iii) **Profit Margin:** This ratio is a good index of operating efficiency. It shows the profit margin of banks' operations. It is defined as the ratio of net profit as percentage to total income of the bank. It measures how much profit is made out of every rupee of income of a firm in a given period. A high profit margin indicates a more profitable operations and control over its costs of production. It is expressed as:

$$Profit\ Margin = Net\ Profit/Total\ Income$$

Definition of variables

In the banking literature there are many profitability ratios that are being used by the researchers in measuring bank performance. In this current study three most popular proxies of profitability namely Return on assets (ROA), Return on equity (ROE) and profit margin are employed. Five bank-specific variables and one industry-specific variable were taken as explanatory variables. These variables are size, capital strength, credit quality, management of funds, efficiency and market structure.

Table 6-3

of dependent and explanatory variables

Variables	Description	Notation
Dependent Variables:		
Profitability	Return on assets (%)	ROA
	Return on equity (%)	ROE
	Profit Margin (%)	PM
Independent Variables		
Size	Total Assets (Rs.in crore)	*Asset Size*
Capital Strength	Ratio of equity to total assets (%)	*Capital*
Credit Quality	Ratio of provisions to total assets (%)	*Crisk*
Efficiency	Net interest income (Spread) (%)	*Efficiency*
Cost	Operating cost to total assets ratio (%)	*Cost*
Market structure	Four-firm concentration ratio (%)	*Concentration*

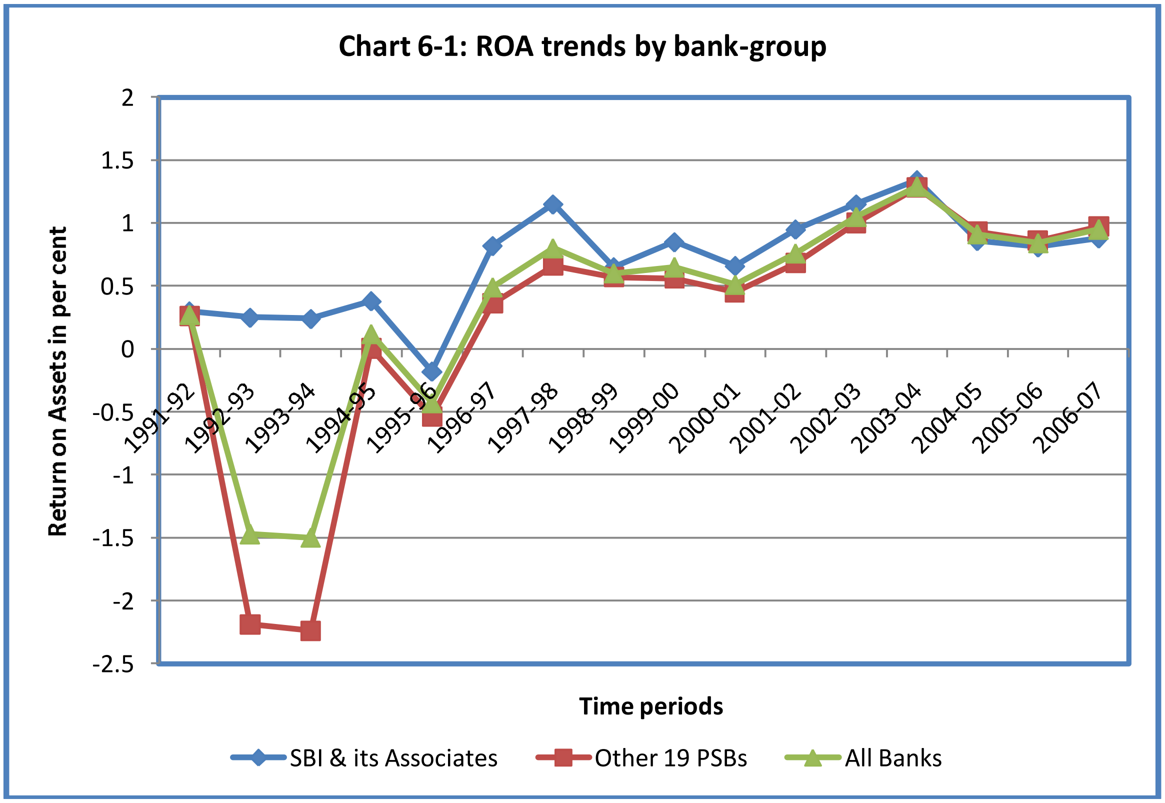
6.4 <u>Trends of the Profitability ratios</u>

In this section trend of the profitability ratios ROA, ROE and Profit Margin are analyzed along with a chart.

6.4.1 <u>Trends of Return on assets (ROA):</u>

Return on assets (ROA) across the bank groups showed that the ratio was minimum and even negative in the early part of the 90's, till 1995-96. ROA across the banks turned positive values in 1996-97 and reached the peak level of 1.29 in 2003-04. It hovered around 1 per cent for all the banks during the period 2004-05 to 2006-07. State Bank and its associates group reported better performance of return on assets than the public sector banks. The state bank group witnessed positive values of the return on assets in the early part of the 90's except in the financial year 1995-96, in which the State Bank of Saurashtra made a loss 48 per cent of its total earnings. However, the performance was improved in the subsequent financial years and ROA reached the peak level of 1.34 per cent in 2003-04 and thereafter hovered around the value of 1 per cent. The public sector banks have poor performance in terms of return on assets than the SBI group. After the financial sector reforms 1991, the ROA of the PSBs were turned negative till the financial year 1995-96. Twelve out of the nineteen banks did earn loss in the financial year 1992-93, and further 13 banks did loss in 1993-94 and only 3 banks in the financial year 1996-97. PSBs witnessed a positive trend of ROAs in 1996-97, ent in the financial year 2003-04, and thereafter fluctuated

Chart 6-1]



Source: Table 6-3 under Section 6.6.

Table 6-4

) by bank group from 1991-92 to 2006-07

(Per cent)

Year	SBI & its Associates	Other 19 PSBs	All Banks
(1)	(2)	(3)	(4)
1991-92	0.30	0.26	0.27
1992-93	0.25	-2.19	-1.47
1993-94	0.24	-2.24	-1.50
1994-95	0.38	0.003	0.12
1995-96	-0.18	-0.54	-0.43
1996-97	0.82	0.36	0.49
1997-98	1.15	0.66	0.80
1998-99	0.65	0.57	0.60
1999-00	0.85	0.56	0.65
2000-01	0.66	0.45	0.51
2001-02	0.95	0.68	0.76
2002-03	1.15	1.00	1.05
2003-04	1.34	1.28	1.29
2004-05	0.86	0.93	0.91
2005-06	0.81	0.86	0.84
2006-07	0.88	0.97	0.95
Bank group-wise Return on Assets (ROA) in each sub-period:			
1991-92 to 1994-95	0.30	-1.04	-0.64
1995-96 to 1998-99	0.61	0.26	0.37
1999-00 to 2002-03	0.90	0.67	0.74
2003-04 to 2006-07	0.97	1.01	1.00

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

ty (ROE):

banks registered a declining trend in the first two years after the reforms, 1991 and even turned negative for the public sector bank group. Banks recovered losses in 1996-97and earned 11.25 per cent on equity. Banks reached a peak level of return on equity of 25.37 per cent in 2003-04. However the return on equity hovered around the value of 17 per cent during 2004-05 to 2006-07. In short, the return on equity of the banks improved with fluctuation after the financial sector reforms. The performance of the State Bank group is comparatively better than that of the public sector banks. For the SBI group the return on assets fluctuated till the financial year 1995-96 in which the State Bank of Saurashtra made a huge net loss. However unlike the return on assets, the return on equity did not turn negative, with 4.55 per cent in 1996-97. It made up its losses in 1996-97 and reached the peak level of 28.29 per cent in 2003-04. In 2006-07 the ROE of the state bank group is 18.11 per cent.

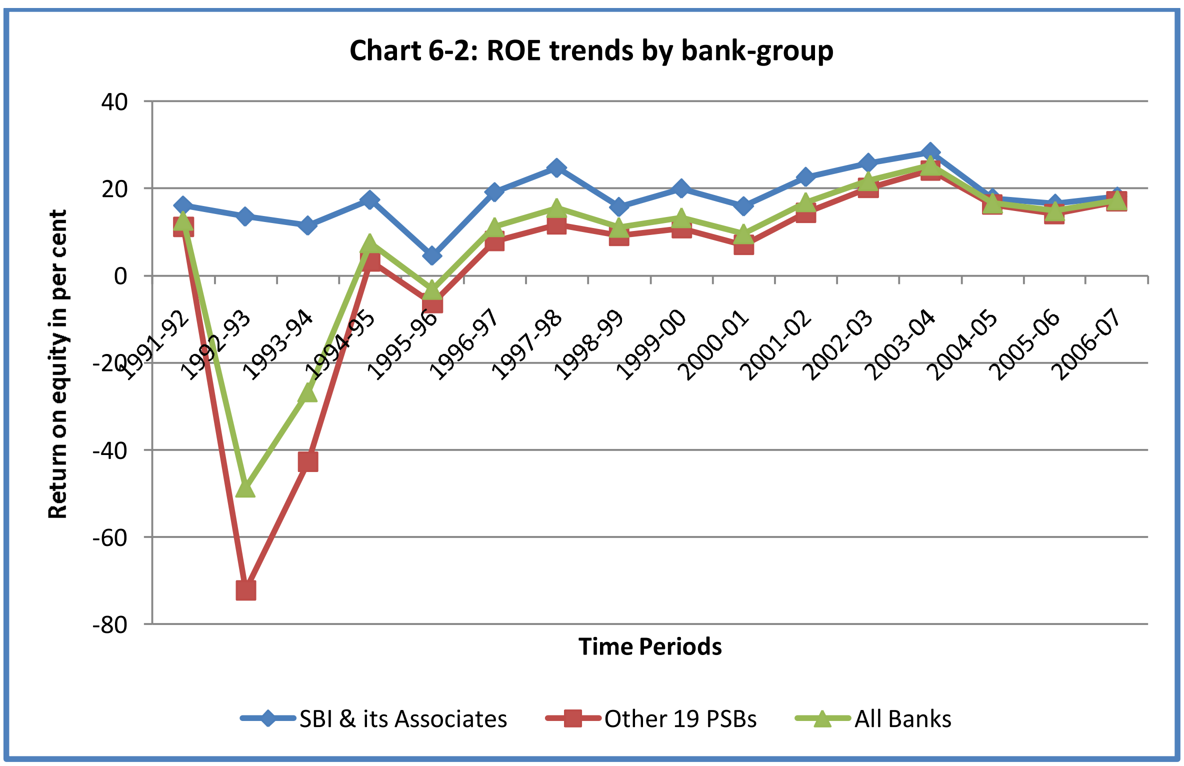


Chart 6-2: ROE trends by bank-group

Source: Table 6-4 under section 6.6.

on the other hand made losses on equity in the early part he financial year 1996-97 that this bank group started recovering from their losses with 7.91 per cent on equity. It also recorded peak level from equity earnings in 2003-04, with a value of 24.13 per cent. In 2006-07 its ROE is 17.01 per cent. On average the ROE of the banks improved after the reforms. The trend of return on equity for each bank group and overall banks is depicted in **Chart 6-2**.

Table 6-5

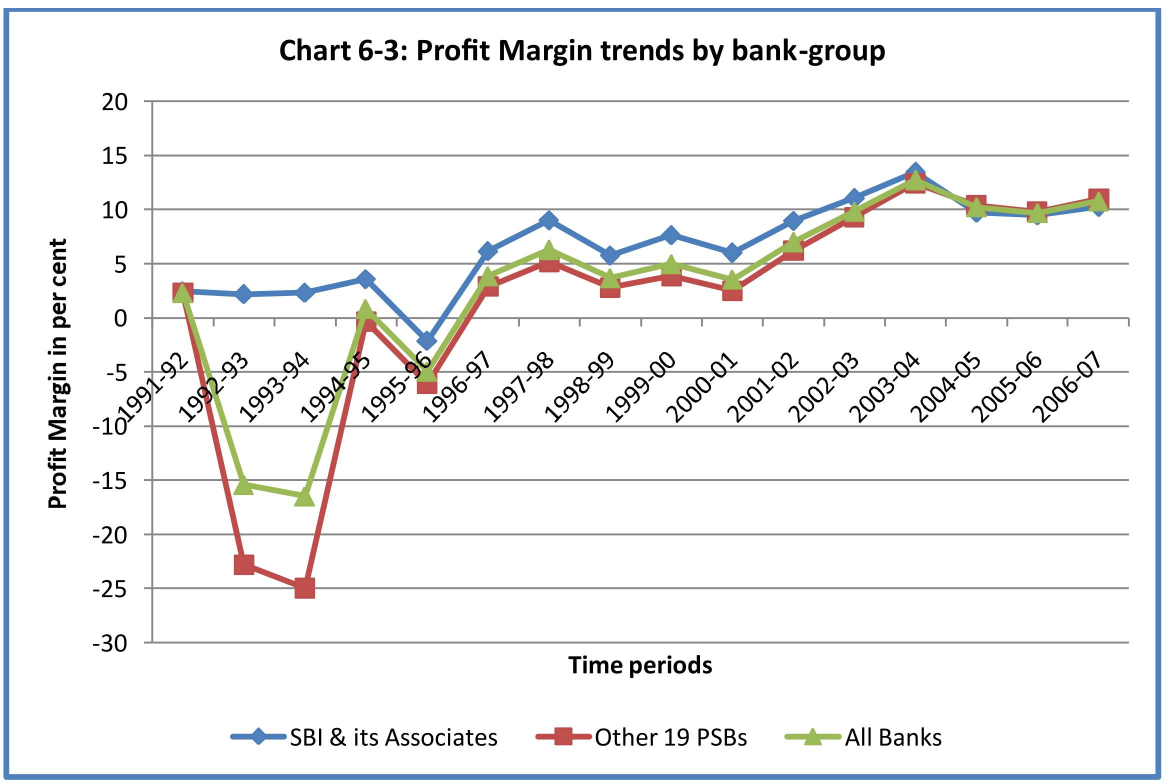
Return on equity by bank group from 1991-92 to 2006-07 *(Per cent)*

Year	SBI & its Associates	Other 19 PSBs	All Banks
(1)	(2)	(3)	(4)
1991-92	16.06	11.18	12.63
1992-93	13.56	-72.23	-48.61
1993-94	11.50	-42.68	-26.63
1994-95	17.40	3.33	7.50
1995-96	4.55	-6.33	-3.11
1996-97	19.18	7.91	11.25
1997-98	24.75	11.72	15.58
1998-99	15.74	9.19	11.13
1999-00	19.96	10.86	13.35
2000-01	15.93	7.04	9.68
2001-02	22.63	14.47	16.89
2002-03	25.84	20.12	21.82
2003-04	28.29	24.13	25.37
2004-05	17.79	16.27	16.72
2005-06	16.48	14.17	14.86
2006-07	18.11	17.01	17.33
Bank group-wise Return on Equity (ROE) in each sub-period:			
1991-92 to 1994-95	14.63	-25.10	-13.13
1995-96 to 1998-99	16.06	5.62	8.71
1999-00 to 2002-03	21.09	13.12	15.48
2003-04 to 2006-07	20.17	17.90	18.57

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

PM):

banks increased from 2.33 per cent in 1991-92 to 10.77 per cent in the financial year 2006-07 although there were losses in some financial years after the reforms and fluctuations in earnings. Likewise the ROA and the ROE, it reached its peak level in 2003-04 with 12.75 per cent. The State bank group showed a constant per cent of profit after the reforms till 1994-95. But it made losses in the financial year 1995-96. However, from the financial year, 1996-97 it recovered losses and made earnings over the period. The public sector group also made up its losses from 1996-97 although there were losses in the early part of the reforms. No major differences were found in the earnings of both the bank group except the PSBs made losses in the early part of the reforms. The trend of the profit margin for both the bank group and all banks together is shown in **Chart 6-3**.



Source: Table 6-5 under section 6.6.

Table 6-6

... Bank group from 1991-92 to 2006-07

(Per cent)

Year	SBI & its Associates	Other 19 PSBs	All Banks
(1)	(2)	(3)	(4)
1991-92	2.43	2.30	2.33
1992-93	2.19	-22.81	-15.40
1993-94	2.32	-24.98	-16.48
1994-95	3.58	-0.33	0.83
1995-96	-2.13	-6.11	-4.93
1996-97	6.16	2.89	3.86
1997-98	9.04	5.17	6.32
1998-99	5.78	2.80	3.68
1999-00	7.64	3.86	4.98
2000-01	6.03	2.50	3.55
2001-02	8.96	6.21	7.02
2002-03	11.08	9.30	9.83
2003-04	13.48	12.44	12.75
2004-05	9.74	10.41	10.22
2005-06	9.48	9.79	9.70
2006-07	10.28	10.98	10.77
Bank group-wise Profit Margin (PM) in each sub-period:			
1991-92 to 1994-95	2.63	-11.46	-7.28
1995-96 to 1998-99	4.71	1.19	2.23
1999-00 to 2002-03	8.43	5.47	6.34
2003-04 to 2006-07	10.75	10.90	10.86

Source: Statistical Tables relating to Banks of India, Reserve Bank of India, Various Issues.

dology:

e Profitability ratios of the 27 public sector banks as well as in bank group-wise analysis are identified and analyzed. Three measures of profitability are, Return on Assets (ROA), Return on Equity (ROE) and Profit Margin (PM). The independent variables chosen are size variable, capital strength variable, credit quality variable, efficiency variable, cost variable and industry specific measure of market structure as given by four firm concentration ratios.

Hypotheses:

Asset Size:

Bank size is measured by total assets. Bank size variable is used to capture the economies or diseconomies of scale in banking. It is believed that growing bank size is positively related to bank profitability.

H_1: The Size has a positive impact on bank profitability.

Capital Strength:

It is one of the main determinants of bank performance. Banks with higher capital to assets ratio are considered relatively safer compared to with lower ratios. The ratio shows ability of the bank to withstand losses. It is expected that the higher the ratio, the lower the need of external funding and therefore the higher the profitability of the bank.

H_2: Equity to total assets ratio is positively related to bank profitability.

Credit Quality:

A higher loan loss provisions over total advances goes together with a lower credit quality, and hence, a lower profitability.

H_3: The ratio of provisions to total loans is negatively related to bank profitability.

Efficiency (Spread):

The net interest rate spread is the difference between interest earned on loans, securities and other interest earning assets and the interest paid on deposits and other interest bearing liabilities. An increase in the value will imply a reduction in the cost of funds.

H_4: Net interest spread is positively related to bank profitability.

ating cost to total assets. It is used to measure the impact of efficiency on bank profitability. Higher cost-income ratio is associated with lower profitability.

H_5: Cost-income ratio is negatively related to bank profitability.

Market Structure:

Market structure in the banking industry is measured by the bank concentration variable. It is defined as the ratio of four largest firms' assets to total assets in the entire banking industry. It is assumed that higher concentration is associated with tougher competition, which goes together with higher profitability.

H_6: Concentration has positive impact on profitability

Regression equation:

The variables are defined in detail in the earlier section 6.3. The study is based on the regression analysis of the entire time span, for SBI group, other 19 PSBs group and finally for all the 27 banks together. In order to empirically examine the effects of bank-specific variables and industry-specific variable on bank profitability, a linear regression model given in (6.1) is used.

$$\Pi_{i,t} = \boldsymbol{\alpha} + \beta_0\, Assets\ Size + \beta_1 Capital + \beta_2\, Crisk + \beta_3 Concentration + \beta_4\, Cost + \beta_5\, Efficiency + \mu_{\ it} \qquad (6.1)$$

where,

$\Pi_{i,t}$ is a measure of profitability of each bank group i (or for all banks) at time t, and the variables on the right side are the explanatory variables (bank-specific and industry specific variables) as outlined above in the **Table 6-3** under section 6.3. All the variables are measured in terms of percent except for asset size, which is measured in terms of rupees crore. μ_{it} is the error term with its usual properties of constant mean and minimum variance.

Table 6-7

assets (ROA) by bank group during the period from 1991-92 to 2006-07

Panel A: All Banks

Explanatory variables	Coefficients	Standard error	t-values	*R-Square*
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Asset Size	-9.684	0.000	-.897	.888
Capital Strength	-0.048	0.040	-1.189	
Credit Quality	0.015	0.068	0.214	
Efficiency	0.935	0.129	7.230*	
Cost	-0.800	0.141	-5.686*	
Concentration	0.099	0.102	0.973	

*, *significant at 1 percent level*

Panel B: SBI & its associates

Explanatory variables	Coefficients	Standard error	t-values	*R-Square*
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Asset Size	7.129	0.000	1.371	.929
Capital Strength	-0.124	0.067	-1.841	
Credit Quality	-0.080	0.079	-1.013	
Efficiency	0.820	0.215	3.808*	
Cost	-0.389	0.131	-2.960**	

*, ** *significant at 1 per cent and 5 per cent level respectively.*

Panel C: Public Sector Banks

Explanatory variables	Coefficients	Standard error	t-values	*R-Square*
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Asset Size	- 2.025	0.000	- 0.080	.934
Capital Strength	- 0.014	0.054	- 0.258	
Credit Quality	0.039	0.090	0.432	
Efficiency	1.049	0.132	7.918*	
Cost	- 0.980	0.160	- 6.416*	

*, *significant at 1 percent level*

Table 6-8

...n on equity (ROE) by bank group during the period 1991-92 to 2006-07

Panel A: All Banks

Explanatory variables (1)	Coefficients (2)	Standard error (3)	t-values (4)	*R-Square* (5)
Asset Size	0.001	0.000	3.519*	.847
Capital Strength	- 4.786	1.090	- 4.391*	
Credit Quality	6.675	1.844	3.621*	
Efficiency	5.378	3.505	1.535	
Cost	- 16.100	3.815	- 4.220*	
Concentration	- 9.674	2.756	- 3.510*	

** significant at 1 per cent level*

Panel B: SBI & its associates

Explanatory variables (1)	Coefficients (2)	Standard error (3)	t-values (4)	*R-Square* (5)
Asset Size	1.651	0.000	1.215	.957
Capital Strength	-7.552	1.765	- 4.280*	
Credit Quality	-1.298	2.059	- 0.630	
Efficiency	19.922	5.633	3.537*	
Cost	-11.126	3.434	-3.240**	

**, ** significant at 1 per cent and 5 per cent level respectively*

Panel C: Public Sector Banks

Explanatory variables (1)	Coefficients (2)	Standard error (3)	t-values (4)	*R-Square* (5)
Asset Size	8.341	0.000	0.084	.775
Capital Strength	-5.473	2.124	- 2.577**	
Credit Quality	2.168	3.538	0.613	
Efficiency	0.735	5.216	0.141	
Cost	-28.130	6.281	- 4.479*	

**, ** significant at 1 per cent and 5 per cent level respectively.*

Table 6-9

...gin (PM) by bank group during the period 1991-92 to 2006-07

Panel A: All Banks

Explanatory variables	Coefficients	Standard error	t-values	*R-Square*
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Asset Size	0.000	0.000	- 2.069**	.908
Capital Strength	- 0.749	0.397	- 1.889	
Credit Quality	- 0.449	0.671	- 0.669	
Efficiency	10.183	1.276	7.982*	
Cost	- 8.775	1.388	- 6.320*	
Concentration	2.179	1.003	2.712**	

*, ** *significant at 1 per cent and 5 per cent level respectively*

Panel B: SBI & its associates

Explanatory variables	Coefficients	Standard error	t-values	*R-Square*
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Asset Size	8.913	0.000	1.805	.958
Capital Strength	- 1.527	0.642	- 2.381**	
Credit Quality	- 1.297	0.749	- 1.733	
Efficiency	9.305	2.048	4.544*	
Cost	- 5.028	1.248	- 4.027*	

*, ** *significant at 1 per cent and 5 per cent level respectively.*

Panel C: Public Sector Banks

Explanatory variables	Coefficients	Standard error	t-values	*R-Square*
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Asset Size	3.474	0.000	0.122	.930
Capital Strength	- 0.469	0.606	- 0.774	
Credit Quality	0.721	1.010	0.714	
Efficiency	11.624	1.489	7.807*	
Cost	- 9.391	1.793	- 5.238*	

* *significant at 1 per cent level*

ity: Regression Estimates

the regression results of the three determinants of profitability measures based on bank specific and industry specific variables.

6.6.1 Determinants of Return on Assets (ROA)

The regression results for the determinants of profitability measure ROA are reported in **Table 6-7**. In the first panel of the Table, panel - A, regression results for all the 27 banks together are given. In the overall bank analysis, concentration variable is incorporated in among the explanatory variables chosen in order to see the effect of industry specific variable. The regression results for all the banks altogether indicated that the estimated coefficients of the cost variable (-0.800) and efficiency variable (0.935) are found to be significant at the 1 per cent level and both the coefficients possess theoretically expected signs. Other variables are found to be insignificant.

In the Panel B, the regression results for the SBI and its associated banks are reported. Only two regression coefficients of efficiency and cost parameters are found significant at 1 per cent and 5 per cent level respectively. Also, the theoretical expected signs for both the significant coefficients were also true with cost coefficient with negative sign, i.e. (-0.389) and the efficiency as measured by spread with a positive sign, i.e. (0.820).

In the bottom panel, Panel C, the regression results for the 19 PSBs is reported. Similar to the SBI group, two estimated regression coefficients are found to be significant. The values of the estimated coefficients of the cost variable are (-0.980) and efficiency parameter (0.132), both significant at 1 per cent level and both with the theoretically expected sign.

In sum, efficiency and cost parameters are the two factors that influenced the profitability (ROA) of the banks over the period of study. There is no statistical significance of other coefficients of the explanatory variables. Hence, the hypotheses H_4 (Net interest spread is positively related to bank profitability) and H_5 (cost-income ratio is negatively related to bank profitability) are accepted for ROA as profitability measure in case of both the bank groups and all banks together.

eturn on Equity)

r ROE as a measure of profitability is reported in **Table 6-8**. In the analysis of overall 27 banks, all the coefficients of the explanatory variables except for the efficiency parameter are found significant at the 1 per cent level. While the coefficients of cost and asset size variables gave theoretically expected signs, the coefficients of capital strength and credit quality and concentration possess theoretically opposite signs although they are significant at 1 per cent level.

Panel B gives the regression results for the SBI and its associated bank group. Three estimated coefficients of the explanatory variables are found to be significant. These are the capital strength, cost variable and efficiency parameters and significant at 1 per cent, 5 per cent and 1 per cent level respectively. All the significant coefficients are giving theoretically expected signs except for the capital strength, which has a negative sign, i.e. (-7.552). It shows that the ratio of equity to total assets influenced negatively the (ROE) profitability of the SBI and its associated bank group.

For the public sector group, only the estimated coefficients of capital strength variable and cost parameter are found to be significant at 5 per cent and 1 per cent level respectively. However, the estimated coefficient of capital strength variable is negative, the same results produced in case of the SBI group when ROE is taken as profitability measure.

In sum, the overall analysis of the banks revealed that variables capital strength the credit quality and concentration have negative impact on the profitability of all the banks when ROE is used as a measure of profitability. And the profitability (ROE) of all the banks is directly related to the asset size and cost efficiency. The hypothesis H_5 (cost-income ratio is negatively related to bank profitability) is accepted for each bank group and for all banks together. Further, the hypothesis H_4 (Net interest spread is positively related to bank profitability) is accepted in case of the SBI and its associates group. But, the hypothesis H_2 (Equity to total assets ratio is positively related to bank profitability) is rejected in case of each bank group and all banks together for ROE as profitability measure.

largin (PM)

r Profit Margin (PM) as a dependent variable is reported in **Table 6-9**. In the first panel A, an overall analysis of all the 27 banks was carried out. Four out of the six estimated coefficients are found to be significant. These coefficients are viz. asset size, cost, efficiency and concentration. All the estimated significant coefficients gave theoretically expected signs. Regression results for SBI and its associated group is given in Panel B. Three estimated coefficients are found to be significant. These estimated coefficients are capital strength, cost and efficiency variables. The estimated coefficients of cost of and efficiency are significant at 1 per cent level and have theoretically expected signs. However, the estimated coefficient of the capital strength parameter significant at the 5 per cent level but does not have theoretically expected sign i.e. a value of (-1.527). This implied that the profitability of the SBI and its associated bank group is inversely related to the ratio of equity to total assets and positively related to the cost of funds and efficiency when measured terms of Profit Margin.

Regarding the other 19 PSBs group, two estimated coefficients namely, cost and the efficiency parameters are found to be significant at the 1 per cent level and both possess the theoretically expected signs. To say, the profitability of profit margin of all the banks together over the period is influenced positively by the asset size, cost of funds and efficiency. The hypotheses H_4 (Net interest spread is positively related to bank profitability) and H_5 (Cost-income ratio is negatively related to bank profitability) is accepted for each bank group and for all the banks together. Further, the hypotheses H_1 (Size has a positive impact on bank profitability) and H_6 (Concentration has negative impact on profitability) are also accepted in case of all the banks together. But the hypothesis H_2, that equity to total assets ratio is positively related to bank profitability is rejected in case of the SBI and its associates group when profitability is measured in terms of Profit Margin (PM).

6.7 Non-Performing Assets of the Banks:

In line with the international practices and as per the recommendations made by the Committee on the Financial Sector Reforms (Chairman Shri M. Narasimham), the Reserve Bank of India has introduced, in a phased manner, prudential norms for income and provisioning for the advances portfolio of the banks consistency and transparency in the published accounts. Banks are urged to ensure that while granting loans and advances, realistic repayment schedules may be fixed on the basis of cash flows with borrowers. An analysis of the trend of non-performing assets of the banks would be meaningful for banks' profitability appraisal.

An asset becomes non-performing when it ceases to generate income for the bank. Earlier an asset was considered as non-performing asset (NPA) based on the concept of '**Past Due**'. A non-performing asset was defined as credit in respect of which interest and/ or installment of principal has remained '**past due**' for a specific period of time. The specified period was reduced in a phased manner:

Year ended March, 31	Specified period
1993	four quarters
1994	three quarters
1995	two quarters
2001	one quarter

An amount is considered as past due, when it remains outstanding for 30 days beyond the due date. However, with effect from March 31, 2001 the past due concept has been dispensed with and the period is reckoned from the due date of payment.

With a view to moving towards international best practices and to ensure greater transparency, 90 days overdue norms for identification of NPAs have been made applicable from the year end March 31, 2004. With effect from March 31, 2004, a non-performing asset shall be a loan or an advance where

i. Interest and / or installment of principal remain overdue for a period of more than 90 days in respect of a Term Loan.
ii. The account remains out of order for a period of more than 90 days, in respect of an Overdraft/ Cash Credit.
iii. The bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted.

agricultural advances, a loan granted for short duration
s will be treated as NPA if the installment of principal or
interest remains overdue for two crop seasons (one crop season).

Categories of NPAs:

Banks classify their assets into standards and non performing assets. And banks are required to classify nonperforming assets further into three categories based on the period for which the asset has remained nonperforming and the realisability of the dues:

- **(i)** **Substandard Assets:** With effect from 31 March, 2005, an asset is would be classified as sub-standard if it remained NPA for a period less than or equal to 12 months.
- **(ii)** **Doubtful Assets:** With effect from March 31, 2005, an asset would be classified as doubtful if it has remained NPA for more than 12 months.
- **(iii)** **Loss Assets:** A loss asset is one where loss has been identified by the bank or internal or external auditors or the RBI inspection but the amount has not been written off wholly or partly.

The trends of NPA is depicted in **Table 6-10** and **Chart 6-4** below for each bank group is reported for the period from 1995-96 to 2006-07. It is visible from the **Table 6-10** that the ratio of net NPA to net Advances for all the 27 PSBs was 9.76 per cent in 1995-96 and grew to 10.13 per cent in 1996-97. However, the net NPA to net advances ratio shows a declining trend for all the 27 banks from 1997-98 (9.21 per cent) continuously till 2006-07 (at 0.93 per cent). In the case of SBI and its associates group, the net NPA was 8.65 per cent in 1995-96 and rose to 9.46 per cent in 1996-97. Thereafter from 1997-98, the net NPA shows a continuous declining trend till 2006-07 with a net NPA of 0.87 per cent. Similar is the trend of other nineteen public sector banks group. The ratio of net NPA to net advances for this bank group was 10.23 per cent in 1995-96, higher than the SBI group, and slightly increased to 10.41 per cent in 1996-97. Thereafter, the net NPA trend of this bank group declines continuously and reached the level of 0.93 per cent in 2006-07. [**Table 6-10**]

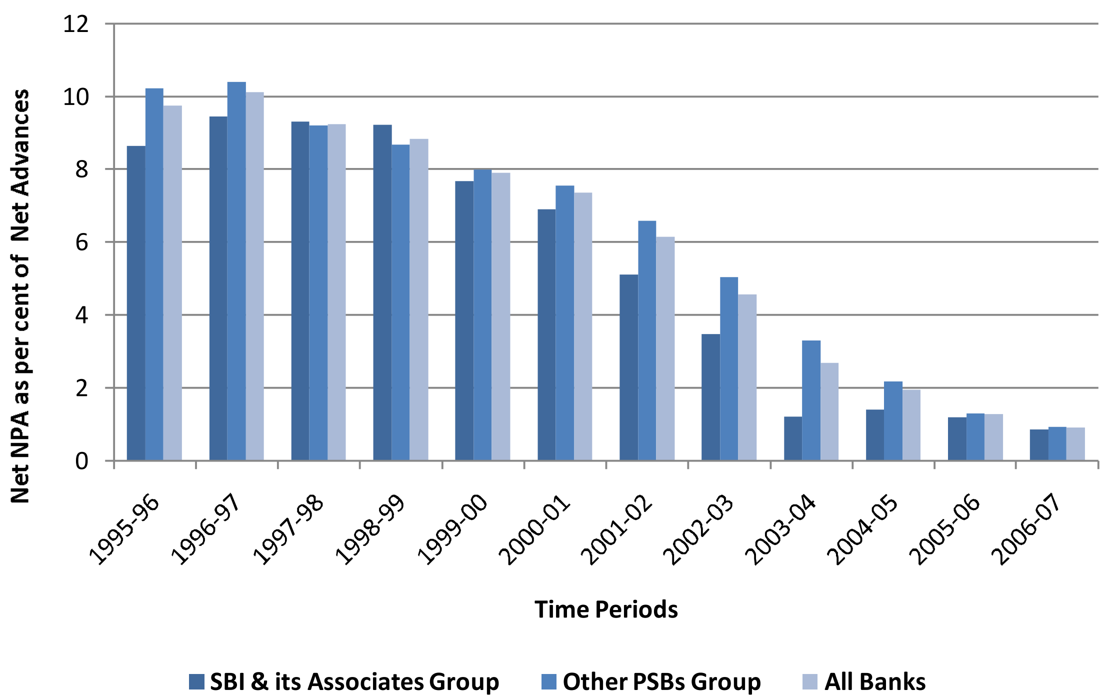
Table 6-10

NPAs) as a per cent of Net Advances by Bank Group

Year	SBI & its Associates Group	Other PSBs Group	All Banks
1995-96	8.65	10.23	9.76
1996-97	9.46	10.41	10.13
1997-98	9.31	9.21	9.24
1998-99	9.22	8.68	8.84
1999-00	7.68	8.00	7.91
2000-01	6.90	7.56	7.36
2001-02	5.11	6.60	6.16
2002-03	3.48	5.04	4.58
2003-04	1.22	3.31	2.69
2004-05	1.40	2.19	1.95
2005-06	1.20	1.31	1.28
2006-07	0.87	0.93	0.91

Source: Statistical Tables relating to Banks of India, Various Issues, Reserve Bank of India.

Chart 6-4: Trends in NPAs by bank-group



Source: Table 6-10 in Section 6.10.

PAs for each bank group it is observed that both the bank heir balance sheets over time particularly after the second phase of the financial sector reforms. The decline in the net NPA ratio is significant for each bank group as there is a continuous declining trend with the onset of the second phase of financial sector reforms. This shows that the quality of assets of banks improved substantially after the implementation of prudential norms of the reforms.

6.8 Main Points:

Based on the three profitability measures, the profits of the banks are analyzed for the entire period 1991-92 to 2006-07. Regression is fitted for each of the profitability parameter based on bank-specific explanatory variables. The explanatory variables included are asset size, ratio of equity to total assets, ratio of provisions to total assets, spread, operating cost to total assets and four-firm concentration ratio. The analysis is carried out for each bank group - SBI and its associated group and the other 19 PSBs group and all banks. For the dependent variable ROA, determinants are cost and efficiency variables are found significant at the 5 per cent and 1 per cent level respectively for the SBI bank group, and at 1 per cent level for other PSBs group, and all banks significant at 1 per cent level. Other variables which do posses theoretically expected signs are not significant and hence excluded from the analysis.

Regarding the profitability measure ROE, the determinants are cost and efficiency and capital strength parameters for the SBI group. The cost and efficiency parameter do posses theoretically expected signs but the capital strength variable posses theoretically opposite sign. In case of other 19 Public Sector Bank group, two parameter estimates – the efficiency variable and the capital strength variable, which are the determinants of profitability are found significant at 1 per cent and 5 per cent level respectively. Like the SBI group, the estimated coefficient of the capital strength parameter is negative. The regression results for all banks with ROE as dependent variable gave different estimate than that of ROA. All the variables except efficiency parameter of the determinants of profitability (ROE) are found significant at the 1 per cent level although the sign of the capital strength variable is negative. In case of ROE as a measure of profitability, the most of the variables explained profitability of all banks.

ty measure Profit Margin (PM), the cost and efficiency mining variables for both the bank groups. But in case of the SBI group, the capital strength parameter is also a determinant but has negative sign. For the whole bank analysis, four determinants of profitability are cost variable, efficiency variable, size variable and the industry specific variable concentration. However, the sign of the concentration parameter is positive as against the expected negative coefficient.

Irrespective of measure of profitability is taken, the cost variable was found to be determinant of profitability for each bank group and whole banks for the study period. The efficiency parameter was also found to be a determinant of profitability except for ROE and in case of 19 PSBs group. Other estimated coefficients either do not posses theoretically expected signs or were not found significant. To sum up, cost and the efficiency parameters are the two variables that fairly influenced the profitability of each bank group and for whole bank irrespective of the measure of profitability. Other variables do influence the profitability of the banks depending on the measure of profitability chosen.