

# PROFITABILITY IN INDIA'S PUBLIC AND PRIVATE SECTOR BANKS: A STUDY OF THE FACTORS THAT AFFECT OUTCOMES

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## Abstract

*This study aims to investigate the factors influencing the profitability of both public and private sector banks in India. The banking sector plays a crucial role in the economic development of a country, and understanding the determinants of profitability is essential for effective policymaking and strategic management. The research utilizes a comprehensive dataset spanning several years, incorporating financial indicators, macroeconomic variables, and regulatory factors. The study employs advanced econometric techniques to analyze the impact of various factors on the profitability of public and private sector banks separately. Key factors considered in the analysis include interest rates, inflation, asset quality, capital adequacy, operational efficiency, and regulatory environment. By examining these factors, the study aims to provide insights into the unique challenges and opportunities faced by both public and private sector banks in India. The findings of this research contribute to the existing literature on banking profitability and provide valuable information for policymakers, banking professionals, and investors. Understanding the dynamics of profitability in the banking sector is crucial for ensuring financial stability and promoting sustainable economic growth in India.*

**keywords:** Public, Private, Banks

## Introduction

The banking sector in India plays a pivotal role in fostering economic growth and development. As the country undergoes dynamic changes in its economic landscape, understanding the factors that influence the profitability of both public and private sector banks becomes imperative. Profitability is a key indicator of a bank's financial health and its ability to contribute to the overall economic well-being of the nation. This study seeks to delve into the multifaceted determinants that shape the profitability of banks in India, distinguishing between the public and private sectors. The dichotomy between these two sectors introduces a unique dimension, as they operate under distinct regulatory frameworks and face different challenges and opportunities. The Indian banking sector has witnessed significant transformations in recent years, including regulatory reforms, technological advancements, and changes in consumer behavior. These dynamics have implications for the financial performance of banks, and a comprehensive analysis of the factors affecting profitability is essential for informed decision-making. The research employs a robust methodology, drawing on a rich dataset encompassing financial metrics, macroeconomic variables, and regulatory parameters. Through advanced econometric techniques, this study aims to uncover the nuanced relationships between key factors and profitability in both public and private sector banks. Key factors under consideration include

interest rates, inflation, asset quality, capital adequacy, operational efficiency, and the regulatory environment. By systematically exploring these variables, the research seeks to offer insights into the drivers of profitability and their relative importance in shaping outcomes for banks in India.

The significance of this study extends beyond academia, as its findings will inform policymakers, banking practitioners, and investors. A nuanced understanding of the factors influencing profitability is crucial for devising effective regulatory policies, strategic management decisions, and investment strategies. In the following sections, we will delve into the literature on banking profitability, present the research methodology, and discuss the potential implications of the study's findings for the Indian banking sector. Through this comprehensive analysis, we aim to contribute to the broader discourse on banking in India and provide practical insights for stakeholders in the financial ecosystem.

## Review of Literature

Seshadri (2015) carried out, the author chose 13 private sector banks and 14 public sector banks to serve as the scope of the study. The evaluation of the temporal behavior of selected variables for the purpose of growth analysis and the application of appropriate procedures in order to estimate the economies of scale in the banking sector are both distinctive aspects of this study. According to the findings of the study, the profitability ratios for a certain set of private sector banks have been much greater than those of the nationalized banks. This is the case in spite of the fact that the private banks had a higher fraction of establishment cost than the nationalized banks had. The research also came to the conclusion that private sector banks have expanded their banking services to a significant number of new locations and have successfully competed with their public sector counterparts in spite of the inherent advantages enjoyed by public sector banks.

Verghese (2017) carried out an in-depth investigation on the earnings and profitability of commercial banks during the decade of the 1970s and 1980s. They documented the reasons for the loss in profits and profitability of Indian Commercial Banks in the seventies and emphasized the primary determinants of earnings and profitability of Indian banks during this time period. In addition, they described the reasons for the decline in profits and profitability of Indian Commercial Banks in the seventies. The authors Raut and Das (1996) made an effort to investigate, quantify, and investigate the changes in profitability that occurred in the Indian banking sector between the years 1980 and 1992. They have shed light on a variety of elements that are responsible for the changes in profitability that might go in either direction in financial institutions. In addition to this, they have included an empirical examination of the profitability of the sample bank groups as well as the factors that contribute to that profitability.

Chen (2020) evaluated the management capabilities of Taiwanese banks by analyzing their operational efficiency, marketing efficiency, and financial performance. This was done so that he could rate the institutions' overall management performance. According to what he found, the privately held banks had a tendency to perform better in terms of their operational skills, while the publicly owned banks had a tendency to perform better in terms of their profitability. In addition, the relatively large banks had higher performance when it came to profitability, although the smaller banks tend to do better when it comes to their skills in terms of operations. Non-interest income, operating expenses, provisions and contingencies, and spread were found to have a significant influence on the profitability of public sector banks in India by Bodla and Verma (2016), who conducted a study on the determinants of profitability of public sector banks in India using a

multivariate analysis for the period from 1992 to 2004. They found that these factors had a significant impact on the profitability of public sector banks. Chen and Lin (2017) found that return on assets (RoA) is an essential financial component that positively affects the performance of Australian banks. This was discovered when they were doing an analysis of the effectiveness of Australian banks over the period of time spanning 1996 to 2004. They have also made the observation that, during the years 2001 and 2004, Australian banks had a higher level of operational efficiency than their American counterparts did. Sufian (2009) conducted research on the factors that determine bank profitability in Malaysian commercial banks. He found that Malaysian financial institutions with higher credit risk and larger loan concentration had lower levels of profitability. They also found that banks that had a greater level of capitalization, a higher share of income from non-interest sources, and higher operational costs had a tendency to have a higher level of profitability. They also stated that there was a positive association between inflation and profitability in Malaysian banks and a negative relationship between economic growth and profitability in Malaysian banks. In addition, they suggested that there was a relationship between economic growth and profitability in Malaysian banks.

## Methodology

### Data

Secondary sources such as audited reports and publications made accessible by the Reserve Bank of India provided the bulk of the investigation's information. The Reserve Bank of India, Mumbai's Statistical Department issued a number of volumes of "Statistical Tables Relating to Banks in India" from 2000 to 2010; these tables may be accessed via the bank's website ([www.rbi.org.in](http://www.rbi.org.in)) and include a wealth of statistical data. This publication covers the span of time from 2000 to 2010. Concepts, definitions, and data for various macroeconomic and bank-specific variables were gathered from a variety of sources, including the Report on "Trend and Progress of Banks in India" published by the Statistical Department of RBI, Mumbai in its various issues covering the period from 2000-2010, RBI Bulletins (Monthly), the Bombay Stock Exchange Official Directory, etc. These reports were collected from the Statistical Department of RBI, Mumbai. Due to the nature of the problem and the breadth of the study, we included all publicly traded and privately held scheduled commercial banks operating in India during the financial years 2000–01 to 2009–10 that were also listed on the Bombay Stock Exchange. During our study period, these banks were actively conducting business in India. The banks were divided into two groups: the Public Sector Banks Group, which had 22 banks, and the Private Banks Group, which included 15 banks in its membership. Here is a complete rundown of the selected banks for each category:

### Public Sector Banks

1) The Allahabad Bank; 2) The Andhra Bank; 3) The Bank of Baroda; 4) The Bank of India; 5) The Bank of Maharashtra; 6) The Canara Bank; 7) The Central Bank of India; 8) The Corporation Bank; 9) The Dena Bank; 10) The Indian Bank; 11) The Indian Overseas Bank; 12) The Oriental Bank of Commerce; 13) The Punjab National Bank; 14) The State Bank of Bikaner and Jai Syndicate Bank; 15) State Bank of India; 16) State Bank of Mysore; 17) State Bank of Travancore; 18) State Bank of India; 19) UCO Bank; 20) Union Bank of India; 21) United Bank of India; and 22) Vijaya Bank.

### Private Sector Banks

Axis Bank comes in first, followed by Bank of Rajasthan, City Union Bank, Development Credit Bank, Dhanalakshmi Bank, Federal Bank, HDFC Bank, ICICI Bank, IndusInd Bank, ING Vysya Bank, Jammu and Kashmir Bank, Karnataka Bank, Lakshmi Vilas Bank, and South Indian Bank.

### **The Variables**

There are a lot of different indicators that may be used to measure the success of a bank. The profitability of a bank is the most critical and reliable measure since it shows how much room there is for expanding earnings. Among them, market share is second only to profitability in terms of significance. In order to gauge the full extent of the problem, researchers looked at how much of an impact the components were having on the bottom lines of the scheduled commercial banks. The ratio of Return on Assets is treated as the dependent variable (Y) for the purpose of employing the multivariate techniques, while the following 23 variables are believed to be independent variables.

X1 - Cash to deposit ratio; X2 - Credit to deposit ratio; X3 - (Credit+ Investment) to deposit ratio

X4 - Ratio of term deposits to total deposits;

X5 - Ratio of priority sector advances to total advances;

X6 - Ratio of term loan to total advances;

X7 - Ratio of interest income to total assets;

X8 - Ratio of net interest margin to total assets;

X9 -Ratio of non -interest income to total assets;

X10 - Ratio of wage bills to total expenses;

X11 - Ratio of burden to total assets;

X12 - Ratio of operating profit to total assets;

X13 - Return on equity;

X14 - Cost of deposits; X15 - Cost of borrowings;

X16 - Return on advances;

X17 - Return on investments;

X18 - Business per employee;

X19 - Profit per employee;

X20- Capital adequacy ratio;

X21 - Ratio of net NPA to net advances;

X22 - Return on Net worth;

X23 - Provision and Contingencies to total assets.

The data in Tables 1a and 1b show that public and private banks have very similar trends across the board. X18 (Business per employee) and X19 (Profit per employee) were both higher in the private sector for the majority of the years included in this study. Public sector banks have been shown to outperform their private sector counterparts in two key areas: X10 (wages to total costs) and X22 (return on Net worth).

### **The Data Analysis**

The following methods and procedures were utilized in order to determine the primary contributors to the profitable operations of scheduled commercial banks and to evaluate the degree to which independent variables had an effect on the dependent variable being studied.

a) Correlation Analysis

b) Multiple Regression Analysis and

c) Factor Analysis

Financial institutions have collaborated to generate and disseminate data on a range of topics. Providing findings that are more representative of the entire is a primary motivation for combining the data. Having more information that is given consistently across the board is better since it reduces the impact of such fluctuations. In addition, the number of observations has been increased by pooling; this is crucial for avoiding problems that may emerge from having fewer degrees of freedom. From a statistical perspective, merging many data sets is often considered favorable. This is because increasing the size of the sample guarantees more precise results.

### **Results and Discussion**

The purpose of a correlation analysis is to learn more about the bond between two variables. To establish which of these characteristics is most important in terms of its relationship with the variable being researched (the profitability of the bank), we evaluated the correlation coefficient of the selected independent variables with the profitability of the bank. In addition, a correlation matrix has been constructed by calculating the correlation coefficients between the various variables. The correlation coefficients between each independent variable and the dependent variable, as well as the correlation coefficients between each independent variable, are all displayed in this matrix. The estimated values of the correlation coefficients were compared to a pivotal value of the simple correlation coefficient that was made available in the statistical tables in order to ascertain their significance. Table 1 shows the correlation coefficient matrices of the selected variables with the dependent variable, which is the return on total assets of public and private sector banks for the years 2000-2001 to 2009-2010. Banks' rate of return on their total assets is the variable under investigation here. Five variables—X12 (operational profit to total assets), X16 (return on advances), X17 (return on investments), X20 (capital adequacy ratio), and X22 (return on net worth)—have a strong positive correlation with bank profitability in the public sector. A substantial but opposite relationship exists between bank profitability and X15 (Cost of borrowings) and X21 (Ratio of net NPA to net loans). The ratio of net nonperforming assets to net loans is one indicator of how expensive borrowing money is. The X16–X20 correlation in this group is quite high (0.754 and 0.752, respectively). The profitability of private sector banks is positively correlated with the cash-to-deposit ratio (X1), the non-interest income ratio (X9), the operating profit ratio (X12), the

return on advances (X16), the return on investments (X17), and the profit per employee (X19). Among these, X12 and X17 have a very high correlation (0.847 and 0.831 respectively).

**Table 1: analysis of the correlation between Return on Assets (RoA) and the Variables Chosen for Study.**

S.No.	Ratio of	PUBLIC SECTOR BANKS		PRIVATE SECTOR BANKS	
		r	P-value	r	p-value
X <sub>1</sub>	Cash to deposit ratio	-.365	.150	.550	.050*
X <sub>2</sub>	Credit to deposit ratio	.265	.229	.034	.463
X <sub>3</sub>	(Credit+ Investment) to deposit ratio	.520	.062	-.103	.388
X <sub>4</sub>	Ratio of term deposits to total deposits	-.131	.359	-.195	.295
X <sub>5</sub>	Ratio of priority sector advances to total advances	.374	.143	.300	.200
X <sub>6</sub>	Ratio of term loan to total advances	.453	.094	.378	.141
X <sub>7</sub>	Ratio of interest income to total assets	-.524	.060	.472	.084
X <sub>8</sub>	Ratio of net interest margin to total assets	-.087	.406	.442	.101
X <sub>9</sub>	Ratio of non -interest income to total assets	.417	.115	.790	.003**
X <sub>10</sub>	Ratio of wage bills to total expenses	-.204	.286	-.266	.229
X <sub>11</sub>	Ratio of burden to total assets	-.501	.070	-.131	.359
X <sub>12</sub>	Ratio of operating profit to total assets	.854	.001**	.847	.001**
X <sub>13</sub>	Return on equity	.429	.108	.534	.056
X <sub>14</sub>	Cost of deposits	-.513	.065	-.222	.269
X <sub>15</sub>	Cost of borrowings	-.774	.004**	-.322	.182
X <sub>16</sub>	Return on advances	.754	.006**	.826	.002**
X <sub>17</sub>	Return on investments	.682	.015**	.831	.001**
X <sub>18</sub>	Business per employee	.302	.198	.391	.132
X <sub>19</sub>	Profit per employee	.511	.066	.765	.005**
X <sub>20</sub>	Capital adequacy ratio	.752	.006**	.427	.109
X <sub>21</sub>	Ratio of net NPA to net advances	-.576	.041*	-.400	.126
X <sub>22</sub>	Return on Net worth	.991	.000**	.503	.069
X <sub>23</sub>	Provision and Contingencies to total assets	.369	.147	.274	.222

\*\*Correlation is significant at the 0.01 level (p<0.01)

\*Correlation is significant at the 0.05 level (p<0.05)

### Multiple Regression Analysis

Multiple regression coefficient analysis provides a more accurate measurement of the strength of a link between two variables by removing the influence of any confounding factors. This technique allows us to examine the correlation between two independent variables without being distracted by other factors. To see how much an independent variable influences the dependent variable, look at its multiple regression



coefficient. Tables 2 and 3 provide the multiple regression findings for public and private sector banks from 2000-01 to 2009-10.

**Table 2. An examination of the relationship between the variable of interest and the ratio of return on assets for public sector banks using multiple regression.**

S. No.	Ratio of	Multiple Regression Co-efficient	t <sup>**</sup> value	p-value
X <sub>1</sub>	Cash to deposit ratio	.035	.666	.526
X <sub>2</sub>	Credit to deposit ratio	-.055	-1.161	.284
X <sub>3</sub>	(Credit+ Investment) to deposit ratio	-.064	-1.170	.280
X <sub>4</sub>	Ratio of term deposits to total deposits	-.055	-1.238	.256
X <sub>5</sub>	Ratio of priority sector advances to total advances	.020	.391	.708
X <sub>6</sub>	Ratio of term loan to total advances	-.059	-1.123	.298
X <sub>7</sub>	Ratio of interest income to total assets	.060	1.076	.318
X <sub>8</sub>	Ratio of net interest margin to total assets	.047	1.002	.350
X <sub>9</sub>	Ratio of non -interest income to total assets	.073	1.635	.146
X <sub>10</sub>	Ratio of wage bills to total expenses	.037	.760	.472
X <sub>11</sub>	Ratio of burden to total assets	.047	.835	.431
X <sub>12</sub>	Ratio of operating profit to total assets	.110	1.424	.198
X <sub>13</sub>	Return on equity	-.075	-1.546	.166
X <sub>14</sub>	Cost of deposits	.022	.390	.708
X <sub>15</sub>	Cost of borrowings	.060	.762	.471
X <sub>16</sub>	Return on advances	.105	1.844	.108
X <sub>17</sub>	Return on investments	-.053	-.780	.461
X <sub>18</sub>	Business per employee	-.069	-1.501	.177
X <sub>19</sub>	Profit per employee	-.072	-1.365	.214
X <sub>20</sub>	Capital adequacy ratio	-.087	-1.182	.276
X <sub>21</sub>	Ratio of net NPA to net advances	.053	.906	.395
X <sub>22</sub>	Return on Net worth	.066	1.449	.191
X <sub>23</sub>	Provision and Contingencies to total assets	.991	21.526	.000**

$R^2 = 0.983$ ;  $R = 0.991$ ; F-value 463.368; \*\*significant at 1% level.

For public sector banks, the following equation has been shown to be the best approximation of the return on total assets ratio:

$Y = -40.4896 + 0.035 X_1 - 0.055 X_2 - 0.064 X_3 - 0.055 X_4 + 0.02 X_5 - 0.059 X_6 + X_7 + X_8 + X_9 + X_{10} + X_{11} + X_{12} + X_{13} + X_{14} + X_{15} + X_{16} + X_{17} + X_{18} + X_{19} + X_{20} + X_{21}$  An assessment of the public sector banks (Table 2) reveals that the multiple regression coefficient of one variable with the ratio of return on total assets is very significant. The significant coefficient demonstrates this. When all of the other variables are maintained constant, only the calculated "t" values for the variable "Provision and Contingencies to Total Assets" (X<sub>23</sub>) are essential. This would imply that, even when the impact of other factors is controlled for, this one element alone contributes significantly to changes in the ratio of return on total assets. The coefficient of determination (R<sup>2</sup>) between these factors is 0.983%.

**Table 3. Multiple regression analysis of the link between the interest rate and the private sector bank's**

**return on assets.**

S.No.	Ratio of	Multiple Regression Co-efficient	t <sup>**</sup> value	p-value
Y	Return on assets		-4.891	.003
X <sub>1</sub>	Cash to deposit ratio	-.034	-1.111	.317
X <sub>2</sub>	Credit to deposit ratio	.002	.049	.963
X <sub>3</sub>	(Credit+ Investment) to deposit ratio	-.001	-.027	.980
X <sub>4</sub>	Ratio of term deposits to total deposits	.000	-.004	.997
X <sub>5</sub>	Ratio of priority sector advances to total advances	-.061	-.916	.402
X <sub>6</sub>	Ratio of term loan to total advances	.183	4.085	.006**
X <sub>7</sub>	Ratio of interest income to total assets	.059	.918	.401
X <sub>8</sub>	Ratio of net interest margin to total assets	.033	.864	.427
X <sub>9</sub>	Ratio of non -interest income to total assets	.039	.942	.389
X <sub>10</sub>	Ratio of wage bills to total expenses	.018	.689	.521
X <sub>11</sub>	Ratio of burden to total assets	.019	.400	.706
X <sub>12</sub>	Ratio of operating profit to total assets	.022	.338	.749
X <sub>13</sub>	Return on equity	-.003	-.074	.944
X <sub>14</sub>	Cost of deposits	-.053	-1.711	.148
X <sub>15</sub>	Cost of borrowings	.044	.586	.583
X <sub>16</sub>	Return on advances	.692	20.951	.000**
X <sub>17</sub>	Return on investments	.430	8.996	.000**
X <sub>18</sub>	Business per employee	-.040	-1.130	.310
X <sub>19</sub>	Profit per employee	.010	.340	.748
X <sub>20</sub>	Capital adequacy ratio	.084	.983	.371
X <sub>21</sub>	Ratio of net NPA to net advances	-.051	-1.166	.296
X <sub>22</sub>	Return on Net worth	.025	1.049	.342
X <sub>23</sub>	Provision and Contingencies to total assets	-.035	-.688	.522

It has been shown that the following equation is the best match for estimating the return on total assets for private sector banks:

$$Y = -36.6362 - 0.034 X_1 + 0.002 X_2 - 0.001 X_3 + 0.0001 X_4 - 0.061 X_5 + .183 X_6 + 0.059 X_7 + 0.033 X_8 + 0.039 X_9 + 0.018 X_{10} + 0.019 X_{11} + 0.022 X_{12} - 0.003 X_{13} - 0.053 X_{14} + 0.044 X_{15} + .692 X_{16} + 0.430 X_{17} - 0.04 X_{18} + 0.01 X_{19} + 0.084 X_{20} - 0.051 X_{21} + 0.025 X_{22} - 0.035 X_{23}$$

Multiple regression analysis (Table 3) of private sector banks shows that the ratio of term loans to total advances (X<sub>6</sub>), Return on advances (X<sub>16</sub>), and Return on investments (X<sub>16</sub>) are all significantly correlated with Return on Assets. When the effects of other variables are held constant, such as in the case above, it shows that fluctuations in the ratio of net profit to working funds are heavily influenced by these three elements. With these variables, the R<sup>2</sup> value calculated to be 0.997.

**Conclusion**



According to the conclusions of the study, the proportion of non-performing assets, also known as credit risk, has a considerable influence on the profitability of banks operating in both the public and the private sectors. Nonperforming loans (NPAs) have a negative influence on total advances, a crucial variable that affects bank profitability and threatens the financial services industry's very survival. In addition to factors that are specific to particular banks, macroeconomic conditions like GDP and inflation play a role in determining credit risk. The Gross Domestic Product (GDP) is positively and inversely related to the Net Present Value (NPV), while inflation is positively and inversely related to GDP. Given the present trend toward lower GDP and higher inflation, we may predict an increase in NPA; as a result, we may anticipate a decline in profitability. To prevent further accumulation of NPA in the banking industry, more prudential procedures must be taken. Given that the percentage of nonperforming loans in the private sector is higher than in the public sector, this is an issue of particular importance for the private sector's banks.

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