

Holistic Performance Assessment of Indian Private Sector Banks: An Empirical Study with Multiple Model Approach

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ABSTRACT

Banks play an important role in the economic growth of each country, especially private banks. This is the performance study of the three main private banks, namely listed on the National Stock Exchange (NSE), including the Bombay Stock Exchange (BSE). The financial measures are used for the statistical analysis of the performance of banks. Three key indicators, the performance of assets (ROA), Q model Tobin (price / book value), return on equity (ROE), an important performance ratio. The data relating to the use by investors for the period from 2008 to 2018 selected banks. A multiple regression technique was used to identify the three indicators of financial performance, bank size, credit risk, asset management, operating efficiency and debt ratio. The results show that all selected measures have an impact on the financial performance of private commercial banks.

1. Introduction

Especially in the financial markets (Guisse, 2012). It becomes a capital for innovation, infrastructure and job creation, as well as for all wealth. It is now an integral part of our society, both in the industry and in the individual consumer. Over the past three decades, the Indian banking system has achieved several notable achievements. Most striking is the long distance traveled in the most remote corners of the country. The turning point of the integrated approach to risk management. (Economic Times, June 20, 2017). The banks existing created as part of risk management assets and matching liabilities, and credit derivatives. Banks strive for maximum profitability and are responsible for improving share value (public banks maintain capital ratio at 8.5%) on the one hand (Economic Times June 20, 2017) and on the other hand, to improve customer satisfaction. The banking sector can play a role in sustainable economic growth. In this context it is important to understand and evaluate the performance of banks in monetary terms, which can be done using financial ratios. In general, gains are reflected in return on investment, return on equity, return on investment, operating income, earnings before interest and tax, net asset value, etc. from the bank.

The bank's performance is a major concern for each country's trade and development. It has to deal with many transactions. The parties concerned, investors, shareholders and other stakeholders should be aware of the financial capacity of a bank to provide loans, loans and investments. The RBI and the government have crossed hands to find different ways to implement international capital standards. In this scenario, it is important to analyze the financial situation of banks, analyze the index, revise the logical method and predict the future position of banks. In addition, this will strengthen the bank's ability to improve its efficiency and performance. These indicators contribute not only to decision making, but also to the status of banks and their market performance relative to other banks. Therefore, this study focuses on financial

performance in three main areas. By establishing a secure relationship between variables, a company can analyze its financial performance in terms of profitability. The study focuses on measuring the performance of three private sector banks i.e. ICICI, HDFC and AXIS by considering their ratios as base for making calculations.

2. Literature Review

Sharifi and Akhter (2016) considered the Loan the term as a barometer of the progress of a financial institution, such as commercial banks. who are also the pinnacle of bank credit in terms of mobilized deposits. A high deposit rate indicates that banks are making better use of their deposits and vice versa. In addition, the result of this measure reflects the Bank's ability to make the best use of available resources. In a performance study die of banks in the public sector based on the display ratio of credit deposits, died in secondary data are based, 26 banks die in the public sector for a period of seven years (2008-2015) recognized revenue is . Data were analyzed using a descriptive statistics and panel regression model. Their results and analysis show that CDR has a positive impact on the public bank's financial performance.

In their study, **Jilkova and Stranska (2017)** analyzed the Czech Republic's influence on banking market performance and profitability based on selected determinants. They focused on measuring banking performance and profitability using the methodology of the multiple linear regression model. You not only want to have the general relevance of the model, but also to have a specific, larger and less important impact on the dependent variable variation. Its work is in light of the structure of the Czech banking sector, which focuses on performance and profitability and also compares to the selected banking sector and indicators from other countries.

Pandya (2015) analyzes the impact of priority progress on planned commercial banks on their profitability. Author, considers all this in commercial banks under Indian control. Proportion of senior sector advances over total PSATA (PSATA) of all commercial banks during the IP as an

independent variable, while return on investment (ROA), return on investment (ROI), return on equity (ROE), the ratio of operating income to total assets (OPTA) and the ratio of interest income to total assets (INTTA) were used as dependent variables. Linear regression models were used to study the relationship between different variables and dependent variables. The study shows that there is a statistically significant relationship between PSATA and ROI, ROA, OPTA, INTTA. The results of this exercise prioritized progress in the sector and the profitability of banking supervision. In addition, the study shows that priority advances in ROA and ROI influence banks. The author is for these banks. Beware, you need to prove it is the priority sector, otherwise it would affect the profitability of banks.

Narwal and Pathneja (2015) examined the different determinants of bank productivity and profitability in India. They examined the performance of the public and private sectors in terms of productivity and profitability over two different periods (2003-2004 to 2008-2009 and 2009-2010 to 2013-2014). A regression analysis was used to determine the determinants of different banking groups. The study results show that private sector banks are more productive during the entire study period of the public sector banks, nor are significant differences in the profitability of two banking groups. The higher productivity of private sector banks can be explained by better use of technology than by public sector banks.

Adam (2014) will use the Bank's financial performance for research and funding in the Kurdistan region of Iraq over the period 2009-2013. The author used a statistical tool to analyze various variables that would affect the overall banking system if these variables are significantly correlated with bank performance. The study results show that Banco Erbil's financial position is positive and that some of its financial factors influence the Bank's financial performance. The author also notes that the Bank's overall financial performance in terms of liquidity ratios, asset quality or credit performance, profitability (NPM, ROA and ROE) is improving. The study also suggests a number of recommendations for developing and improving certain banking operations, increasing bank profitability and improving the bank's financial performance.

Sarokolaei (2012) conducted the research to predict the performance of 10 Iranian banks using the multilateral regression method and the artificial neural network, and possibly both. They have collected financial data from 10 Iranian banks over the past four years to the most reliable sources. The regression method was used to determine the relationship between calculated return on investment efficiency (ROA) and each variable. The results of the multi-linear regression method represent a positive relationship between efficiency and three different variables: size, cost / income ratio and inflation rate. They also used ROA as output from the artificial neural network and 7 different inputs were used to identify the model according to the predictor variables. Finally, the performance of these two methods is measured using the mean square prediction error (MSPR). The survey results show that the amount of MSPR in multilinear regression method is much less than the amount of MSPR the method of artificial neural network and concludes

that this regression method performs better than the neural networks to predict the efficiency of Banks.

Karim and Alam (2013) measured the performance of the private sector in Bangladesh based on financial ratios that show credit growth, concentration of credit, credit standing with unsatisfactory performance, liquidity gap analysis and the proportion of liquidity. Return on investment (ROA), return on equity (ROE), net interest margin (NIM). A multiple regression analysis was performed to determine the impact on credit risk, operating efficiency and asset management, as well as to create an appropriate regression model to predict the future financial performance of these banks.

Jha and Hui (2012) in relation to financial performance, different commercial banks managed by the owner in Nepal based on their financial characteristics and determined to be as determinants of performance, based on the financial data of the CAMEL model, with base in the revealed expectations. It is in addition, you can use a multivariate econometric model to model two regression models and estimate the impact on financial viability. The authors note that banks are much less efficient, while domestic private banks are as effective as foreign-owned banks. In addition, the estimation results show that the return on capital significantly depends on the capital ratio, interest expense and net interest margin. The equity rate is a lot about the equity rate of in Kenya, a similar study was conducted on the weakening ownership structure of banking performance (Ongore&Kusa, 2013). The study was performed using multiple linear regression models and generalized least squares panel data for estimation. The results show that the effect of macroeconomic variables was not conclusive. In addition, the moderating role of property identity aimed at negligible benefits.

Alam (2011) compared the financial performance of public and private banks in Pakistan over three years. They analyzed bank size, profitability ratios, debt ratios, liquidity ratios, and asset quality measures as analysis variables. According to the study, state-owned banks are based on the highest ROA and ROE ROI scores, debt and liquidity and private banks on key measures of size and quality of the first capitalized scores. Similarly, an Indonesian study on bank performance in Hadiwidjaja (2013) found that capital, wealth, income and liquidity ratios had a significant impact on earnings growth.

Commercial bank performance in the United Arab Emirates was reviewed by **Al-Tamimi (2011)**. For the study, the selected banks were classified as small and large, depending on the balance sheet total. The study includes 15 large banks and 23 small banks. The results showed that large banks preferred to cut so small. The results show that capital adequacy (ratio of equity to total assets) is the main indicator of bank ranking performance. The study shows that these banks are fragmented, which is not a good development. To effectively improve operations and reduce waste, the study recommended merging banks.

The influence of financial numbers on performance was perceived by **Almazari (2011)**. The result shows that there is a positive correlation between performance and size, utilization and operational efficiency, which was also significantly confirmed by regression analysis. Results are therefore a way of promoting a strategy, promoting an efficient financial system.

The above bibliographic study clearly shows that it is very important for any decision to know the performance of banks. Most studies focus on measuring bank performance by analyzing the statistical model. The analyzes also show that business financial performance depends on certain key factors, such as sales, profitability, capital, liquidity and risk, which may be directly or indirectly related. By establishing a close relationship between variables, policy makers or investors can analyze their financial performance in terms of liquidity, profitability and profitability (Ramaratnam& Jayaraman, 2010). Banks may also increase shareholders' equity by 2019 to implement Basel III standards. According to the RBI (trading time of June 20, 2017), the entire banking sector needs a capital of 5 million rupees , which in turn goes to banks, which would limit its solvency. In this situation, it is essential to examine bank performance. This study makes an attempt with India's large private banks (Hindustan Times, March 2, 2017), i.e. HDFC, ICICI, and AXIS banks under the age of three Dimension Viz Performance based on internal performance, market performance and income based performance using statistical model analysis.

3. Research And Hypothesis

3.1 Objectives

The main objective of the study is to analyze the financial performance of selected private banks in India. The specific objectives are:

1. Measure bank internal performance by ROA;
2. Review market-based performance using Tobin's Q;
3. Examine and understand the amount of revenue a bank has returned in the form of a return on equity.

3.2 Data and Methodology

The purpose of this study is to study the financial efficiency of three large private sectors.Banks, namely HDFC, ICICI and AXIS BANKS in India, listed on both BSE and NSE.Among the private sector banks in India, three were selected for their assets, market capitalization and profits (source: Bloomberg database, March 2018 annual accounts), which are indicators of bank performance. As a result, this study includes only three banks.The data (financial ratios) come from secondary sources, namely Bloomberg and the bank's annual reports, for the 12-year period 2008 to 2018.

3.3 Methodology

The analysis incorporates three regression models to achieve the above objectives. These models will measure the financial performance of selected private commercial banks in India. A correlation was made to find the association between the variables in each case before determining the regression models. The first regression model is the return on investment (which measures internal financial performance), the

second Tobin Q determination model (which measures market-based financial performance) and the third model for determining return on investment. (which measures a bank's revenue value, which is returned based on five identical explanatory variables, bank size , credit risk, operating efficiency, asset management, and debt ratio.

3.4 Variables in the Study

- ROA, return on assets;
- Tobin Q = the ratio between banks' market value and book value of equity;
- ROE = return on equity;

The five variables included in our study are bank size (total asset record), credit risk, operating efficiency, asset management, and debt ratio.

4. Analysis and conclusions

4.1 Analytical Framework

Multiple linear regression analysis is a technique for modeling the linear relationship between a dependent variable and one or more independent variables. This is one of the most commonly used statistical methods. The banking and financial literature analyzes the results of banking performance (Ongore and Kusa, 2013, Sharifi and Akhter, 2016). The study has three independent variables based on the five common independent variables. The general form of the multiple regression equation is: $Y = P_0 + P_1 X_1 + P_2 X_2 + \dots + P_k X_k + e$

Where
 Y = dependent (declared variable)
 $X_i = i^{th}$ independent (independent variable), $i = 1, 2, \dots, k$
 $P_0, P_1, P_2, P_3, \dots, P_k$ are the partial regression coefficients of the respective independent variables. This is the least squares estimation method from the input data. i ($i = 1, 2, k$) indicates how the dependent variables change when the independent variable e, X_i ($i = 1, 2, k$) changes, whereas the other independent variables constant. If dependent and independent variables are indicated in the logarithmic information, the β coefficients can be interpreted as elastic elements. Thus, these coefficients show the percentage change in the dependent variable when the independent variable varies by 1%.

4.2 Empirical Results of Three Models

First Model

As a result, null and alternative hypotheses can be defined as the first target.

H_0 : Bank size, credit risk (CR), operational efficiency (OE), asset management (AM) and debt ratio (DR) do not affect ROA.

Table 1 show that ROA is positively correlated with asset management. All other explanatory variables are negatively correlated.

Correlations							
		ROA	Credit risk	Operational efficiency	Asset Management	Log(TA)	Total debt/TA
Pearson	Correlation	1	-0.467**	-0.453**	0.625**	0.212	-0.337*

ROA	Sig. (2-tailed)		0.004	0.006	0.000	0.214	0.045
	N	36	36	36	36	36	36

This indicates that the ROA increases as the asset management value and bank size increase.

Table-2
Multiple Regression Model

Model	Nonstandard Coefficients		Standardized coefficients	T	Follow
	B	Std. Error	Beta		
(Constant)	0798	1062		0.752	0.458
credit risk	-0.268	0.053	-0.622	-5.085	0.000
operational efficiency	-1.263	0429	-0.371	-2944	0006
investment management	22206	6047	0378	3672	0.001
Protocol (AT)	0.233	0.138	0.228	1682	0103
Total Debt / TA	-0.006	0007	-0.122	-0.926	0.362

The Dependent variable: ROA

Model is $ROA = P_0 + P_1CR + P_2 OE + P_2AM + P_2Bank\ size + P_2DR + e$

i.e., $ROA = 0.798 - 0.268CR - 1.263OE + 22.206 AM + 0.233Bank\ Size - 0.006DR$

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.885 ^a	0.784	0.748	0.175534727

a. Predictors: (Constant), Total debt/TA, Asset Management, Operational efficiency, Credit risk, Log(TA)

The R value defined in Table 3 above explained that 74.8% of the dependent variable (ROA) through the explanatory variables. This indicates a good sense of the regression model.

Table 4 indicates results of ANOVA with reference to Null Hypothesis at significance level selected (0.00 0<0.05). Thus, a

null hypothesis is accepted, indicating that the credit risk; Operating efficiency, asset management, bank size and leverage ratio have a significant impact on the internal financial performance (ROBS) of some private sector banks.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.355	5	0.671	21.779	0.000 ^b
	Residual	0.924	30	0.031		
	Total	4.280	35			

a. Dependent Variable: ROA
b. Predictors: (Constant), Total debt/TA, Asset Management, Operational efficiency, Credit risk, Log(TA)

In addition, the importance of each explanatory variable for ROA can be assessed using the t-sig value shown in Table 2. Table 2 shows that the explanatory variables credit risk, operating efficiency and asset management have a significant influence. ROA (p value) <0.05, while bank size and debt ratio do not significantly affect ROA (p value > 0.05).

Second Model

According to the second destination, the value zero can be given as follows:

H_0 : Bank size, credit risk, operational efficiency, asset management and debt ratio do not affect Tobin's Q.

Correlations		Tobin's F	credit risk	operational efficiency	investment management	Protocol (AT)	Total Debt / TA
	Pearson Correlation	1	-0.512 **	0.244	0038	-0.490 **	-0.689 **
Tobin's F	Follow (2 swans)		0.001	0151	0825	0002	0.000
	N	36	36	36	36	36	36

** Correlation is significant at 0.01 (bilateral)
* Correlation is significant at 0.05 (bilateral)

Table 5 shows that Tobin's Q correlates positively with operating efficiency and asset management, while negatively correlates with the other three variables. This indicates that Tobin's Q increases as operational efficiency and asset

management value increase, while the value of the other three variables decreases. The table therefore indicates that between credit risk and credit risk, bank size and debt ratio are specific.

**Table 6
TOBIN Q MODEL ESTIMATE**

	model	Nonstandard Coefficients		Standardized coefficients	T	Follow
		B	Std. Error	beta		
	(Constant)	12484	5194		2404	0023
	credit risk	0004	0258	0003	0017	0.987
2	operational efficiency	-2.212	2098	-0.199	-1054	0300
	investment management	-6.183	29574	-0.032	-0.209	0836
	Protocol (AT)	-0.960	0.677	-0.288	-3.418	0.016
	Total Debt / TA	-0.104	0.033	-0.616	-3.128	0004

The. Dependent variable: Tobin's Q

After estimation, the template can be customized as follows:

$$\text{Tobin's Q} = P_0 + P_1 \text{CR} + P_2 \text{E} + P_2 \text{AM} + P_2 \text{Seat size} + P_2 \text{DTT} + \text{and Tobin ie Q} = 12,484 + 0,004 \text{CR} - 2,212 \text{OE} - 6,183 \text{AM} - 0,960 \text{Seat size} - 0.104 \text{DTT}.$$

The adjusted R value in Table 7 above clearly shows that 43.3% of the variation in the dependent variable (Tobin's Q) is explained by the explanatory variables. This indicates a reasonably good sense of the regression model.

**Table 7
MODEL SUMMARY**

Model	R	R square	R square adjusted	Std. Estimation Error
2	0.717 ^a	0.514	0.433	0.858484908

The. Predictors: (constant), Total Debt / TA, Asset Management, Operational Efficiency, Credit Risk, log (AT)

**Table 8
MEANING OF THE YEAR MODEL OF TOBIN Q**

model	sum of squares	df	Square means	fa	Follow	
2	regression	23376	5th	4675	6344	0.000 ^b
	residual	22110	30	0.737		
	global	45.486	35			

The. Dependent variable: Tobin's Q
B. Predictors: (constant), Total Debt / TA, Asset Management, Operational Efficiency, Credit Risk, Protocol (TA)

Table 8 presents the results of the ANOVA technique, in which our null hypothesis was applied in comparison with an alternative hypothesis. Sigma is at a significant level of 5% (0.000 < 0.05). Credit risk, operating efficiency, asset management, bank size and leverage therefore have a significant impact on the market-related financial performance

(Tobin 'Q) of some private sector banks. In addition, it may die, meaning that each explanatory variable from the Tobin Q database in table 6 ts- ig value is evaluated . Seat size and gear have a significant impact on Tobin 'Q (p values < 0.05), while the other three variables have no significant effect on Tobin' Q (p values > 0.05).

Third model

**Table 9
CORRELATION VALUES AMONG ROE, BANK SIZE, OE, CR, AM AND DR**

Correlations

	ROE	Credit risk	Operational efficiency	Asset Management	Log(TA)	Total debt/TA
Pearson Correlation	1	-0.790**	0.225	0.271	-0.548**	-0.638**
ROE	Sig. (2-tailed)	0.000	0.187	0.110	0.001	0.000
	N	36	36	36	36	36

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

For the third objective of our study, the null hypothesis was assumed as follows:

H_0 : Independent variables do not influence the RE.

Table 9 shows that capital is positively correlated with operating efficiency and asset management. with three other explanatory variables, it has a negative correlation. This indicates that ROE increases with operational efficiency and

asset management value, while in others three variables decrease. The table therefore indicates that the correlation between ROE and credit risk, bank size and debt ratio is specific.

Table 10 nROE ESTIMATE

Model	Nonstandard Coefficients		Standardized coefficients	t	Follow
	B	Std. Error	beta		
(Constant)	49703	12694		3915	0.000
credit risk	-3.186	0630	-0.622	-5060	0.000
operational efficiency	-3.123	5129	-0.077	-0.609	0.547
investment management	263,533	72.287	0.377	3646	0.001
Protocol (AT)	-4990	1654	-0.410	-3018	0.005
Total Debt / TA	0018	0.081	0030	0225	0.823

Dependent variable: ROE

The estimate shows the ROE model as

$$ROE = P0 + P1CR + P2 OE + P2AM + P2Bank size + P2TDT + e \text{ i.e., } ROE = 49.703 - 3.186CR - 3.123OE + 263.533AM - 4.990Bank Size + 0.018TDT$$

Table 11 MODEL SUMMARY				
model	R	R square	R square adjusted	Std. Estimation Error
3	0.884 ^a	0.782	0.746	2,098347911
The. Predictors: (constant), Total Debt / TA, Asset Management, Operational Efficiency, Credit Risk, log (AT)				

The adjusted R² value in the table above clearly shows that 11 74.6% of the dependent variable (ER) variation by the explanatory variables is reported. This indicates a very good sense of the regression model. Management, bank size and leverage have a significant impact on the ROE (amount of revenue a bank generates in shares) of selected private sector banks.

Furthermore, the importance of each variable for the reasons ROE may be evaluated the aid of the values TS as shown in Table 10. This shows that the explanatory variables credit risk, asset management and bank size have a significant impact on ROE (p values <0.05), while the other two variables have no significant effect on ROE (p values > 0.05).

5. Discussion and conclusion

The study of bank performance in three species. First, the internal performance; second, market driven performance; and third, a bank's income, which is returned in the form of equity.

The ROA study the performance internal, called the profitability or productivity. With ROA, banks are a valuable tool for measuring progress against specific goals. The ROA quote indicates the extent to which management or the bank uses general capitalization or company or bank resources to generate more revenue (profits). The higher the return, the more efficient the bank's management or asset base. ROA valuations include all assets of a company, including those related to creditors, as well as those resulting from investor contributions. Adding appointments makes ROA even more valuable as an internal measurement tool. Another current internal ROA use is to evaluate the advantages of investing in a new system compared to the extension of an existing system. The best option, which ideally increases

productivity and revenues and reduces equipment costs, led to a specific ROA rate.

At the top of the results is the credit risk, the efficiency operational and asset management. There is a positive correlation between ROA and asset management and bank size, while there is a negative correlation with credit risk, operating efficiency and debt ratio. Asset management has a very strong positive correlation with ROA because it makes sense that the return on investment will be higher as asset management becomes more efficient. For the second model Tobin Q is the ratio of the market value of the share capital of a bank for the cost of replacing the bank's actions (ie, the market assessment report for purposes of revision replacement), the ability Income reflected. Tobin Q means the stock is overvalued. Tobin is Q, not undervalued. For an investor, this means that the market value is higher than the bank's stated book value. that is, the market sells bank assets higher than the specified book value. Inventory is also more expensive than the cost of the asset and its underestimation implies that the market value is lower than the book value indicated by the bank. In other words, the market sells the bank's assets below the stated book value. According to current estimates, Tobin's Q is based (credit risk, asset management, operating efficiency, bank size and leverage ratio) of five modeled variables. Table 6 shows that Tobin 'Q's bank size and debt level are equivalent.

Return on equity (ROE) is one of the key measures of profitability, showing the amount of net income generated as a percentage of equity. You measure a bank's profitability by indicating the profit a bank makes from the money invested by its shareholders. In other words, it can be used to gauge how effectively a bank's management team manages the capital

entrusted by its shareholders. For high growth banks, a higher ROE is expected. The average return on capital in recent years also provides a better overview of the Bank's historical growth. The results in Table 10 show that credit risk, asset management, and bank size have a significant impact on ROE. The operating efficiency and asset management are positively correlated, while the risks of credit and bank size are negatively correlated with the return on

investment. This means that the ROE value would increase if the operational efficiency, asset management, credit risk and size parameters were increased.

In summary, the size of banks, credit risk, operating efficiency and leverage ratio that have a significant impact on internal performance, market performance and bank revenues, which illustrate the financial performance of the three private commercial banks selected in India.

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