

The Impact of Financial Derivatives on Financial Performance of Commercial Banks in India

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Abstract - The increasing propensity of commercial banks to take part in derivative activities is one of the notable developments in the present-day financial markets. Latterly, the financial innovation improvements, deregulation and development of the financial markets, and banks' margins decreases, due to low-quality loan applicants, motivate the commercial banks to provide advanced services and products to expand their profits. Profits from traditional banking activities has been decreasing whilst the competitiveness of markets have been increasing thus forcing banks to undertake derivative activities. The study involved an in-depth analysis of financial derivatives and its effects on the financial performance of commercial banks and thus descriptive research design was found to be appropriate. Secondary data about the commercial banks' notional number of derivatives, total assets, liquidity ratio and total shareholders' equity was collected from the Bank Annual reports (2014-2018) and analyzed using multiple regression. Return on Assets (ROA) was used as the proxy for financial performance while financial derivatives, liquidity ratio and shareholders' equity ratio were the predictor variables. The findings of the study indicated that there is a significant relationship between the financial performance (ROA) of commercial banks in India and financial derivatives. Additionally, the negative nature of the relationship means that a unit change(increase) in financial derivatives will result to a decrease in financial performance of commercial banks in India. Consequently, therefore, financial derivatives should be properly used in a manner that is instrumental to the goal of a sound and safe banking system in India.

Keywords: Financial Derivatives, Commercial Banks, Return on Assets.

I. INTRODUCTION

Financial derivatives are widely used concept to manage the risk in financial markets and financial sectors. These financial derivatives are contractual agreements of future exchange of assets whose present values are equal. However, the value of the contractual agreements will change over the period of the contract as factors determining the market valuations change the value of each side of the contract. The increasing fluctuation in financial markets creates an additional source of uncertainty and risk and ultimately affects the profitability and value of the commercial banks. Banks often need different strategies to manage the risk of their balance sheet. Derivatives are one of the most popular techniques which are used to minimize the risk. The aim of this study is to analyze the usage of financial derivatives and to find any impact on financial performance of commercial banks. The usage of financial derivatives by commercial Banks has grown greatly in the past few years and it is expected to increase more and more in future.

II. REVIEW OF LITERATURE

S. Gautami and NallaBalaKalyan (2018) analyzed that impact of financial derivatives both futures and options on the underlying market volatility. The findings imply that there is an increase in the stock performance in futures market. As derivatives market offers more return, with the prevarication of interest rate risk and swap over rate risk with maximum profits and minimum loss. It has been noticed that there has been attentiveness about derivatives trading amongst the investors in India

Nan Hu, Peng Liang (2018) discussed using news reflected in the stock market as a benchmark for the public information of suppliers. The result of the study was significant incremental information revelation in the credit default swap market of the customers. The information revelation is more significant during the periods when either suppliers or customers announce their earnings. The study arguments are 1) when facing suppliers' earnings announcements, investors actively seek insider information revealed by customers' CDS trading; and 2) when

customers announce their earnings, the insider information revealed by customers' CDS trading is pushed to the equity investors of the suppliers.

Bedendo and Bruno (2012) shows that credit derivatives have less benefits and flaws than loan sales and securitization. Thus, the riskiness of the latter instruments is higher and banks that engage on those activities face higher risk of default during the crisis

Gorton and Rosen (1995) study derivative activities at commercial banks during 1985 and 1993. They find that the change in net incomes due to the change in interest rate is partially offset by the opposite change in net incomes from the interest rate risk hedge through swaps, and thus derivatives help mitigate most of the systematic risks at commercial banks.

Sasidharan. K, Alex k. Mathews (2005) This paper evaluates the growth of Indian stock derivatives market and examines the opportunities and challenges ahead. The paper consists of six parts covering Market and products, Turnover, Arbitrage opportunities, Challenges, Participation, Conclusions. Lack institutional participation, high investment cost, poor IT infrastructure to exploit the arbitrage opportunities and lack of knowledge about arbitrage by the retail investors are the key reasons for the high return in this segment.

Suprava Sahu (2016) study focuses on the theoretical aspect of the use of Interest Rate Derivatives (IDR) and testing empirically on four top tier Indian commercial banks. The result shows that banks are using the IDRs as a very handy tool for hedging and managing interest rate risks. Interest rate risk can be seen as one of the most important forms of risk, that banks face in their role as financial intermediaries. There are various recent developments and innovation in financial theory, increased computerization, and changes in foreign exchange markets, credit markets and capital markets have contributed to the need to supplement traditional methods to measure and manage interest rate risk with more recent methods. Interest rate risk can thus be controlled optimally by using of derivatives along with traditional methods, in order for banks to experience less interest rate uncertainty, and to increase their lending activities, which can result in greater returns and higher overall profitability.

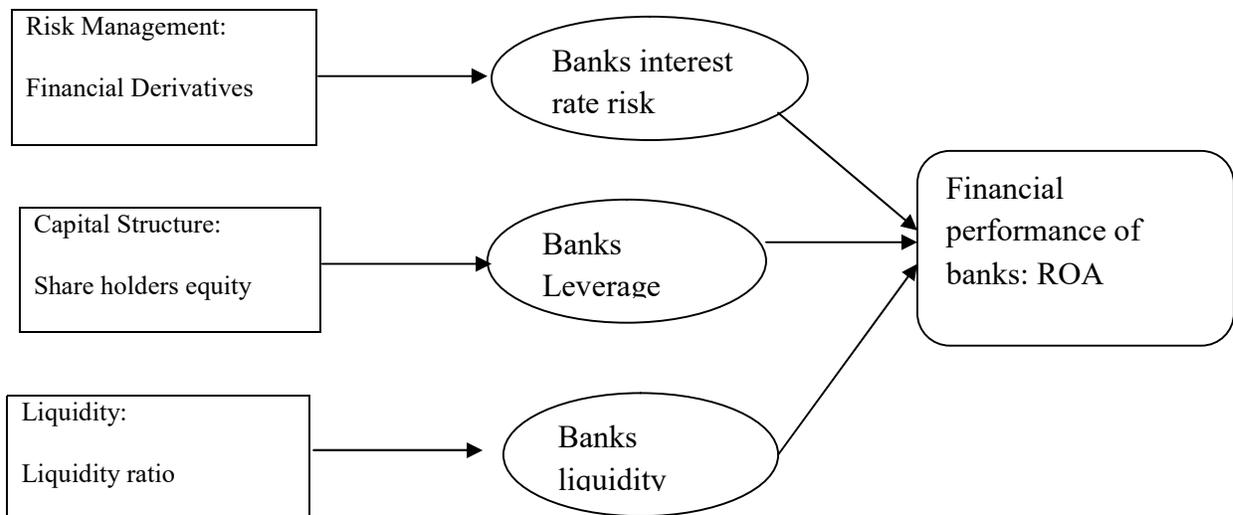
III. RESEARCH METHODOLOGY

The study adopted a descriptive research design. In this study, descriptive research design was used to achieve this by describing the data and characteristics about the population of phenomenon being studied; derivative trading. That is, it was used to find out the current state of the financial performance of banks listed at the NSE, their level of involvement in financial risk management. Convenience sampling technique is adopted for the current study. The period of the study is 5 years i.e.; 2014 -2018 data considered for the analysis and used descriptive statistics and regression analysis to analyze the data.

Objective of the study

The objective of the study is to determine the impact of financial derivatives, Capital structure and liquidity on the financial performance of select commercial banks in India.

Conceptual frame work



IV. DATA ANALYSIS AND INTERPRETATION

Return on assets

The cumulative return on assets earned by commercial banks in India yearly between 2014-2018 was obtained from the bank's annual reports.

$$\text{Return on Assets} = \text{Net Income} / \text{Total Assets}$$

Table 1: Return on Assets

BANK	2014	2015	2016	2017	2018
SBI	0.6	0.63	0.42	0.38	-0.18
HDFC	1.72	1.73	1.73	1.68	1.64
BOB	0.68	0.47	-0.8	0.19	-0.33
ICICI	1.64	1.72	1.34	1.26	0.77

From the above table it is evident that HDFC has highest Return on Asset value in the years 2015 and 2016 where the value stood at 1.73% and the least value was recorded by Bank of Baroda in the year 2016 at -0.8%. In SBI the Return on Asset value was highest in the year 2015 with the value 0.63% while in HDFC the Return on Asset notional value was highest in the year 2015 and 2016 with the value 1.73% coming to BOB the Return on Asset notional value was highest in the year 2016 with the value -0.8% and ICICI the Return on Asset notional value was highest in the year 2015 with the value 1.72%

Liquidity Ratio

As a measure of commercial bank's ability to meet obligations when they fall due, liquidity exerts an impact on financial performance through affecting costs related to financing. The Indian commercial banks' liquidity was measured by the liquidity ratios as indicated in the reports. These are tabulated as shown below, alongside a visual illustration of the periodic trend.

$$\text{Liquidity Ratio} = \text{Quick Assets} / \text{Quick}$$

Table 2: Liquidity Ratio

BANK	2014	2015	2016	2017	2018
SBI	13.81	11.02	10.89	11.94	13.83
HDFC	8.55	12.69	14.51	11.19	17.48
BOB	24.05	20.78	18.27	19.38	21
ICICI	11.31	13.81	14.97	16.31	20.44

From the above table it is evident that BOB has highest Liquidity ratio value in the year 2016 where the value stood at 24.05% and the least value was recorded by HDFC in the year 2016 at 8.55%. In SBI the Liquidity ratio value was highest in the year 2018 with the value 13.83% While in HDFC the Liquidity ratio value was highest in the year 2018 with the value 17.48% coming to BOB the Liquidity ratio value was highest in the year 2014 with the value 24.05% and ICICI the Liquidity ratio value was highest in the year 2018 with the value 20.44%

Shareholder's Equity Ratio

Considering the use of debts may lead to better management, the ratio of total equity to total assets (shareholders equity ratio) is used to control for bank's leverage. This data was obtained from the annual reports issued by the industry regulator. Tabulated below are the findings.

$$\text{Shareholder's equity ratio} = \frac{\text{Total assets} - \text{Total liabilities}}{\text{Total assets}}$$

Table 3: Shareholder's Equity Ratio

BANK	2014	2015	2016	2017	2018
SBI	6.59	6.27	6.38	6.95	6.34
HDFC	8.84	10.50	10.25	10.29	9.99
BOB	5.46	5.57	5.99	5.8	6.03
ICICI	12.31	12.45	12.45	12.95	11.36

From the above table 4.4 it is evident that ICICI has highest shareholder's equity ratio value in the year 2017 where the value stood at 12.95% and the least value was recorded by BOB in the year 2014 at 5.46%. In SBI the shareholder's equity ratio value was highest in the year 2018 with the value 6.95% while in HDFC the shareholder's equity ratio value was highest in the year 2015 with the value 10.5% coming to BOB the shareholder's equity ratio value was highest in the year 2018 with the value 6.03% and in ICICI the shareholder's equity ratio value was highest in the year 2017 with the value 12.95%.

Financial derivatives

One of the determinants of commercial banks financial performance has been cited as the banks risk management. Financial derivatives present a powerful tool for managing risks faced by commercial banks in conducting their ordinary businesses. The data on financial derivatives cumulatively held in the Indian banking sector was obtained from the Bank's annual reports.

Table 4: Financial derivatives

BANK	2014	2015	2016	2017	2018
SBI	0.6	0.63	0.42	0.38	-0.18
HDFC	1.72	1.73	1.73	1.68	1.64
BOB	0.68	0.47	-0.8	0.19	-0.33
ICICI	1.64	1.72	1.34	1.26	0.77

From the above table 4.2 it is evident that ICICI has highest financial derivative notional value in the year 2018 where the value stood at ₹ 7,00,992.00 and the least notional value was recorded by Bank of Baroda in the year 2018 at ₹ 40,993.23. In SBI the financial derivative notional value was highest in the year 2018 with the value of ₹ 4,15,317.38 while in HDFC the financial derivative notional value was highest in the year 2018 with the value of ₹ 308,463.47 coming to BOB the financial derivative notional value was highest in the year 2016 with the value of ₹ 2,00,266.31 and in ICICI the financial derivative notional value was highest in the year 2018 with the value of ₹ 7,00,992.00.

Regression Analysis

Regression analysis involves many techniques used for modeling and analyzing various variables with the focal point being the relationship between one or more independent variables and a dependent variable. A multiple linear regression method of analysis was used in the study as it describes the extent of linear relationship between the dependent variables and a number of other independent variables. This assisted in understanding the changes in the value of the dependent variable when any one of the independent variables is varied while the other independent variables are held constant.

Mathematically the linear regression line was expressed using the following equation

$$\text{Performance}_{it} = \alpha + \beta_1 \text{DER}_{it} + \beta_4 \text{EA}_{it} + \beta_6 \text{LIQ}_{it} + \epsilon_{it}$$

Where:

Performance_{it}= Return on Assets of bank ith at time t.

DER_{it}= Derivative activities of bank ith at time t. Derivative activities are approximated by the notional value of the contracts. Forwards, swaps and options are combined to be one variable.

EA_{it}= shareholder's equity to total assets of bank ith at time t.

LIQ_{it}= liquid assets to total assets of bank ith at time t.

ϵ_{it} = random error-term.

β_i the systematic risk for bank ith over the period ending at time t

The study employed return on assets as a proxy for profitability. The ratio of equity to total assets was used to control for bank's leverage since the use of debts may lead to better management. The liquid assets to total assets ratio was used to measure the bank's liquidity position.

β_i was used to measure bank's exposure in terms of foreign exchange rate and interest rate risks due to derivative activities. These variables are included since derivative activities have been widely used as a tool for banks in hedging against foreign exchange rate exposures and interest rates risk.

H1: There is significant impact of financial derivatives on the financial performance of the select commercial banks in India.

Table 4.5: Regression Analysis

<i>Regression Statistics</i>	
Multiple R	0.870849382
R square	0.758378646
Adjusted R square	0.713074642
Standard error	0.420546318
Observations	20

From the above table it is evident that the commercial banks ROA and their financial derivatives, liquidity ratio, and shareholder's equity ratio are highly correlated, as suggested by the coefficient of correlation R, whose value of 0.870 indicates a strong positive correlation. A reasonably high portion of the variation in the ROA from year to year is explained by the variation in the financial derivatives, liquidity ratio, and the shareholder's equity ratio from year to year, as suggested by the coefficient of determination's (R Square) value of 0.758. Thus approximately 75.8% of the variation in the dependent variable is attributable to the study's independent variables. The regression model obtained was further tested for significance. Tabulated below are the results obtained.

Table : ANOVA

	Df	SS	MS	F	Significance F
Regression	3	8.88174772	2.96058257	16.73977087	3.436E-05
Residual	16	2.82974728	0.17685921		
Total	19	11.711495			

Predictors: (Constant), LIQ, DER, EA; Dependent Variable: ROA

From the above table we can interpret that the F statistic computed to test the significance of the resulting regression model has a significance value of 0.000003436. Given that this is below the 0.05 significance level at which the model was tested for significance, the model has been significant in describing the relationship between commercial banks ROA between 2014-2018 and their financial derivatives, liquidity and shareholder's equity ratios over the same period. Besides the test of significance of the regression model, the coefficients of the regression model obtained were also tested for significance. The results of the significance tests are as tabulated below.

Table 4.7 Regression coefficients

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-0.88625064	0.6013807	-1.4736932	0.159965976	2.1611208	0.388619
DER	-2.5512E-06	9.065E-07	2.81430653	0.012467757	-4.47E-06	-6.3E-07
LIQ	-0.02225013	0.02483181	0.89603336	0.383518178	0.0748912	0.030391
SER	0.316171553	0.05488984	5.76011056	2.92601E-05	0.1998103	0.432533

From the above table 4.7, we can interpret that the coefficients of the regression model including the constant, shareholder's equity ratio, financial derivatives are significant except liquidity ratio. The significance values of the t statistic used in testing their significance are below the 0.05 significance level at which the significance tests were performed. Thus, the changes that occurred in ROA of the commercial banks with changes in the other variables that were independent were significant. From the findings above, financial derivatives have significant impact on the ROA at 5% level of significance as indicated by the p values; $0.012 < 0.05$.

$$ROA = -0.886 - 2.551E-6DER + 0.3161SER - 0.022LIQ$$

The coefficients and their signs are of particular importance. The regression coefficients shows that a unit increase in shareholder's equity ratio led to increase ROA by 0.316 units. Likewise a unit increase in liquidity ratio led to decrease in ROA by 0.022 units. On the contrary, a unit increase in financial derivatives led to decrease in ROA by 2.5512E-06 units. From the findings above, financial derivatives have no significant impact on the ROA at 5% level of significance as indicated by the p values; $0.0124 < 0.05$.

Descriptive statistics was computed for both metrics measuring Indian commercial banks financial performance of and the result were as tabulated below

Table 4.8 Descriptive Statistics

BANK	N	MIN	MAX	MEAN	STD. DEV.
DER	20	40,993.23	7,00,992.00	2,50,713.28	155800.283
ROA	20	-0.8	1.73	0.8645	0.76522856
LIQ	25	8.55	24.05	15.3205	4.12550176
SER	25	5.46	12.95	8.6385	2.67976543

The result for the study period 2014-2018 shows that the total derivative among the 4 commercial banks in India is 2,50,713.28 with a standard deviation of 155800.283. The total shareholders' equity ratio is 8.638 with a standard deviation of 2.6797 and the mean for the commercial banks' liquidity ratio is 15.32 with a standard deviation of 4.12

V. CONCLUSION

The commercial banks ROA and their financial derivatives, liquidity ratio, and shareholder's equity ratio are highly correlated. A reasonably high portion of the variation in the ROA from year to year is explained by the variation in the financial derivatives. The regression coefficients shows that a unit increases in financial derivatives led to a decrease in ROA by $-2.733E-6$ units.

Financial derivatives have significant impact on the ROA at 5% level of significance as indicated by the p values. A strong positive correlation was found between India's commercial bank's ROA, financial derivatives, shareholder's equity ratio and liquidity ratio between 2014-2018. Consequently, therefore, financial derivatives should be properly utilized in a manner that is instrumental to the goal of a sound and safe banking system in India.

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