

DETERMINANTS OF PROFITABILITY OF INDIAN PRIVATE AND PUBLIC SECTOR BANKS

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ABSTRACT

The present study attempts to determine the major factors affecting the profitability of Indian private and public sector banks. The study consists of 13 Indian private and 23 Indian public sector banks. The sample of the study has been taken for the period of 2007 to 2016. Levin-Lin-Chu test and Panel data regression model have been used to analyze the results. Profitability of banks has been measured by return on net worth. Equity assets ratio, capital assets ratio, non-performing loans to loans ratio, capital adequacy ratio, loan to assets ratio and cost to income ratio have been used as independent variables. The results of panel data regression model reveal that equity assets ratio, capital assets ratio, non-performing loans to loans ratio, loan to assets ratio and cost to income ratio are significant while capital adequacy ratio is not a significant determinant of profitability of Indian private banks. Looking on to the profitability of Indian public banks, equity assets ratio, non-performing loans to loans ratio, capital adequacy ratio and cost to income ratio are significant while capital assets ratio and loan to assets ratio are non-significant determinants.

Keywords: Capital, Determinant, Non-Performing Loan, Profitability.

INTRODUCTION

Today banks have become a significant aspect of the Indian economy. So, a special attention should be given to banking industry. Banking Industry of India is one of the developed banking across the world. Banks play a vital role in mobilization of deposits and disbursement of credit to the various parties. Indian banking system is categorized into four major parts which are Reserve Bank of India, Commercial Banks, Cooperative Banks and Foreign Banks. In India, there are total 21 public and 23 private sector banks. Majority of shares of public banks is in the hands of government, on the other side majority stake of private banks is held by private shareholders. All banks in India are managed and controlled by Reserve bank of India. Being the important pillar of Indian economy, banks should be financially solvent. Financial stability of an economy is largely dependent on profitability of banks. So, profitability of the banks is also imperative. In the banking industry, the use of financial ratios is well renowned. Financial ratio analysis helps the banks in identification of various causes of change in their deposits, loans, advances, income, expenditure, profits over a period of time. In the present study impact of various financial ratios i.e. capital assets ratio, equity assets ratio, capital adequacy ratio, non-performing loans to loans ratio, cost to income ratio and loan to assets ratio on profitability of Indian private and public banks have been shown. So, that the banks can give more attention on those determinants which affect the profitability most.

LITERATURE REVIEW

Malik *et al.* (2016) investigated the impact of liquidity on profitability of private sector banks in Pakistan by using OLS. The empirical results found the significant relationship between liquidity and ROE of banks. Maqsood *et al.* (2016) investigated the impact of liquidity on profitability of banking sector in Pakistan by using regression. The empirical results found significant relationship between liquidity management and profitability. Kamran *et al.* (2016) investigated the determinants of profitability of banks in Pakistan by using panel data regression. The empirical results found that both internal factor i.e. assets, loans, equity, deposits and external factors i.e. GDP, inflation, market capitalization have significant impact on profitability. Mittal and Lavina (2016) examined the impact of different CAMEL ratios on profitability of SBI group in India. The study used panel data regression. The empirical results found that net non performing assets to net advances and operating profit as % of working funds are the significant determinants of profitability. Seenaiah *et al.* (2015) examined the determinants of profitability of Indian banks for the period of 1995-2012. The empirical results found that operating profits, wage bills, non performing assets and net interest margin are the key determinants of profitability of Indian banks. Pandya (2014) identified the major determinants of profitability of selected Indian banks by using correlation, multiple

regression etc. The result found that each bank has different determinant of profitability. Tariq *et al.* (2014) found the determinants of commercial banks profitability in Pakistan by using panel data regression model. The study covered data starting from 2004-2010. The results found that capital strength, assets quality and bank size are the key determinants of banks profitability. Inflation had shown negative relationship with bank profitability. Bateni *et al.* (2014) found the major determinants of capital adequacy ratio in the banks of Iran. The study used panel data regression model. The empirical results found that there is a negative relationship between CAR and bank size while positive relationship between CAR and equity ratio, loan asset ratio, ROA and ROE. Almazari (2014) examined the effect of internal factor on banks profitability i.e. Saudi Arabia and Jordan banks by using correlation and regression. The empirical results found significant relationship between ROA and cost income ratio, banks size in case of Saudi Arabia banks. In case of Jordan banks, Cost income ratio found to be significant determinant of profitability. Olalekan and Adeyinka (2013) examined the impact of capital adequacy ratio on profitability of domestic and foreign banks in Nigeria for the period of 2006-2010. The empirical results found that Capital adequacy is a positive and significant determinant of profitability. Dutta *et al.* (2013) identified the determinants of ROA in Indian public sector banks through regression. The empirical results found that spread, operating expenses, provisions & contingencies and non interest income are the key determinants of ROA. Swamy (2012) investigated the determinants of profitability of commercial banks by using panel data regression. The empirical results found that capital adequacy and investment activity are the key determinants of profitability of commercial banks. Said and Tumin (2011) investigated the impact of financial ratios on performance of commercial banks in Malaysia and China by using regression analysis. The empirical results found that operating ratios have significant impact on performance of banks in China but not in Malaysia.

RESEARCH OBJECTIVE

The objective of the present study is to find out the major determinants affecting the profitability of Indian private and public sector banks. For accomplishing the objective, different financial ratios i.e. equity assets ratio, capital assets ratio, non-performing loans to loans ratio, capital adequacy ratio, loan to assets ratio and cost to income ratio have been used.

HYPOTHESES OF THE STUDY

Following research hypotheses have been framed on the basis of objective:

H₀₁ = Equity assets ratio is not a significant determinant of profitability of selected Indian private and public sector banks.

H₀₂ = Capital assets ratio is not a significant determinant of profitability of selected Indian private and public sector banks.

H₀₃ = Non-performing loans to loans ratio is not a significant determinant of profitability of selected Indian private and public sector banks.

H₀₄ = Capital adequacy ratio is not a significant determinant of profitability of selected Indian private and public sector banks.

H₀₅ = Loan to assets ratio is not a significant determinant of profitability of selected Indian private and public sector banks.

H₀₆ = Cost to income ratio is not a significant determinant of profitability of selected Indian private and public sector banks.

RESEARCH METHODOLOGY

The present study is based on secondary data only. The panel data has been collected from moneycontrol.com, annual report of selected banks and CMIE PROWESS. The sample of the study consists of 13 Indian private sector banks and 23 Indian public sector banks. The period of the study has been taken 2007-2016. Following models have been applied for accomplishing the objectives.

PANEL DATA REGRESSION MODEL

Panel data regression model has been used to show the impact of different selected financial ratios on profitability of selected banks. Profitability of banks has been measured by return on net worth. Equity assets ratio, capital assets ratio, non-performing loans to loans ratio, capital adequacy ratio, loan to assets ratio and cost to income ratio have been used as independent variables. Before applying panel regression model, Levin-Lin-Chu test has been adopted to check the stationarity of panel data. Intercorrelation matrix of independent variables has been formulated to check the multi- collinearity.

Panel data regression equation is here:

$$ROE_{it} = \beta_0 + \beta_1 EA_{it} + \beta_2 CA_{it} + \beta_3 NPL_{it} + \beta_4 CAR_{it} + \beta_5 LA_{it} + \beta_6 CI_{it} + e_{it}$$

ROE_{it} is the return on net worth for bank i at time t, EA_{it} is the equity assets ratio for bank i at time t, CA_{it} is the capital assets ratio for bank i at time t, NPL_{it} is the non-performing loans to loans ratio for bank i at time t, CAR_{it} is the capital adequacy ratio for bank i at time t, LA_{it} is the loan to assets ratio for bank i at time t, CI_{it} is the

cost to income ratio for bank i at time t , e_{it} is the error. β_0 is constant term of the regression equation, β_s are the coefficients of the model.

RESULTS

Levin-Lin-Chu test has been used to check the stationarity of all explanatory variables of private and public banks in table 1. Probability values of all variables are less than significance level i.e. 5 %. So, by rejecting the null hypothesis it is found that all the variables are stationary. Table 2 and 3 reveal the intercorrelation matrix of independent variables in private and public banks respectively. It is used to check the multi-collinearity of independent variables. Presence of this problem can cause our significant variables as insignificant.

Table 1: Levin-Lin -Chu test

Null Hypothesis: Presence of unit root in the series (data is not stationary).

Alternate Hypothesis: Absence of unit root in the series (data is stationary).

Name of the Variable	Statistics	Probability
Equity assets ratio	-10.2865	0.0000
Capital assets ratio	-3.37722	0.0004
Non-performing loans to loans ratio	-34.8257	0.0000
Capital adequacy ratio	-2.92875	0.0017
Loan to assets ratio	-2.74755	0.0030
Cost to income ratio	-5.19889	0.0000
Return on net worth	-1.85488	0.0318
Note: User-specified lags: 1, significance level is 0.05		

Source: Data analysis

The variables which have correlated value more than 0.80 can cause multi-collinearity problem¹. There is no problem of multi-collinearity as shown by table 2 and 3. To determine the major factors affecting the profitability of Indian private and public banks, panel data regression model has been applied. As per table 4 and 5, the results of Hausman's test show that random effect model is appropriate to continue the study because the probability value of the test is more than 0.05 significance level. As per the results shown in table 6, the value of adjusted R Square is 0.696737. It shows that 69% variations in dependent variable i.e. return on net worth are caused by independent variables. The value of Durbin-Watson statistics (1.277825) is less than 2, which solves the problem of auto-correlation.

Table 2: Inter-Correlation Matrix of Independent Variables in Indian Private Sector Banks

	Cost to income Ratio	Capital Adequacy Ratio	Non-performing loans to loans Ratio	Equity Assets Ratio	Capital Assets Ratio	Loan to Assets Ratio
Cost to income Ratio	1					
Capital Adequacy Ratio	-0.28567	1				
Non-performing loans to loans Ratio	0.430088	-0.20157	1			
Equity Assets Ratio	-0.05414	0.721062	0.057802	1		
Capital Assets Ratio	0.002485	0.5831	0.023047	0.746608	1	
Loan to Assets Ratio	-0.00757	-0.24718	0.057229	-0.09307	-0.38151	1

Source: Data analysis

The probability value of F statistics (0.0000) is statistically significant. It shows the significance of our model. As per table 6, capital assets ratio and loan to assets ratio show positive while equity assets ratio, non-performing loans to loans ratio, capital adequacy ratio, and cost to income ratio show negative relationship with profitability (ROE) of private banks. The probability values of EA, CA, NPL, LA and CI are statistically significant at 5 %. So, by rejecting the null hypothesis, it is concluded that EA, CA, NPL, LA and CI are significant determinants of profitability of Indian private banks. The probability value of CAR is not statistically significant. So acceptance of null hypothesis stimulates that CAR is not a significant determinant of profitability of Indian private banks. The regression results for determining factors affecting profitability of Indian public sector banks have been shown in table 7. As per results, the value of adjusted R square i.e. 0.823602 shows that 82% variations in profitability of Indian public sector banks are explained by explanatory independent variables.

Table 3: Inter-Correlation Matrix of Independent Variables in Indian Public Sector Banks

	Cost to income Ratio	Capital Adequacy Ratio	Non-performing loans to loans Ratio	Equity Assets Ratio	Capital Assets Ratio	Loan to Assets Ratio
Cost to income Ratio	1					
Capital Adequacy Ratio	-0.39231	1				
Non-performing loans to loans Ratio	0.325805	-0.50393	1			
Equity Assets Ratio	-0.3339	0.210353	0.036565	1		
Capital Assets Ratio	-0.16022	0.102016	0.061562	0.306818	1	
Loan to Assets Ratio	-0.08541	0.044626	-0.14495	0.045639	0.003224	1

Source: Data analysis

Selection Criteria between Fixed Effect Model Vs. Random Effect Model

Table 4: Correlated Random Effects- Hausman Test in Case of Indian Private Banks

Test Summary	Chi-Sq Statistics	Chi-Sq. d.f.	Prob.
Cross-section random	0.782028	6	0.9925

Source: Data Analysis

Table 5: Correlated Random Effects- Hausman Test in Case of Indian Public Banks

Test Summary	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Cross-section random	8.786419	6	0.1860

Source: Data Analysis

Table 6: Random-Effects Regression Results for Determining Factors Affecting Profitability of Indian Private Sector Banks

Adjusted R Square - 0.696737, Number of observations - 130, Durbin-Watson -1.277825 F- statistics - 50.39547, F-sign.- 0.0000		
Variable	Regression Coefficient	Prob. Value
EA	-1.214150*	0.0000
CA	0.192129*	0.0117
NPL	-3.554881*	0.0000
CAR	-0.071617	0.7197
LA	0.166655*	0.0313
CI	-0.391514*	0.0000

Source: Data Analysis, the asterisks * shows that estimates are significant at 5 %

Table 7: Random-Effects Regression Results for Determining Factors Affecting Profitability of Indian Public Sector Banks

Adjusted R Square - 0.823602, Number of observations-230, Durbin Watson- 1.835667 F- statistics -179.1998, F-sign.- 0.0000		
Variable	Regression Coefficient	Prob. Value
EA	-1.037754*	0.0263
CA	-0.006950	0.9683
NPL	-4.828698*	0.0000
CAR	0.795637*	0.0215
LA	-0.059568	0.1461
CI	-0.340546*	0.0000

Source: Data Analysis, the asterisks * shows that estimates are significant at 5 %

The Durbin-Watson statistics i.e. 1.835667 is close to 2 solves the problem of autocorrelation. The F- significance reveals the validity of our model. As per table 7, capital adequacy ratio shows positive while equity assets ratio, capital assets ratio, non-performing loans to loans ratio, loan to assets` ratio and cost to income ratio show negative relationship with profitability (ROE) of public banks. The probability values of EA, NPL, CAR and CI are statistically significant at 5 %. So, by rejecting the null hypothesis, it is concluded that EA, NPL, CAR and CI are significant determinants of profitability of Indian public banks. The probability value of CA and LA are not statistically significant. So acceptance of null hypothesis stimulates that CA and LA are not significant determinants of profitability of Indian public banks.

DISCUSSION

The central part of the study focuses on the main determinants of the profitability of Indian private and public sector banks. As per the previous studies, Kamran *et al.* (2016) found that assets, loans, equity, deposits are significant determinants of profitability of banks. Seenaiyah *et al.* (2015) found that non-performing assets is a significant determinant of profitability of Indian banks. If we go through the study of Bateni *et al.* (2014), the researcher found that equity assets ratio, loan assets ratio and capital adequacy ratio had shown positive relationship with ROE in banks of Iran. Almazari (2014) found significant relationship between cost to income ratio and return on assets in banks of Saudi Arabia. Significant and positive relationship had been found between capital adequacy ratio and profitability of banks (Olalekan and Adeyinka 2013, Swamy 2012). While the empirical results of existing study found that:

- Capital assets ratio and loan to assets ratio show positive while equity assets ratio, non-performing loans to loans ratio, capital adequacy ratio, and cost to income ratio show negative relationship with profitability (ROE) of private banks. It implies that if capital assets ratio and loan to assets ratios increases then profitability of private banks will also increase. On the other side, growth in equity assets ratio, non-performing loans to loans ratio, capital adequacy ratio and cost to income ratio will decline the profitability of private banks in India. So the study suggests that private banks should increase the capital assets ratio and loan to assets ratio in order to make the banks profitable.
- As per regression, the researcher finds that equity assets ratio, capital assets ratio, non-performing loan to loans ratio, loan to assets ratio and cost to income ratio are significant while capital adequacy ratio is not a significant determinant of profitability of Indian private banks. It implies that the private banks should focus to increase all significant ratios so that private banks could be more profitable.
- If we go through the results of public banks, it implies that capital adequacy ratio shows positive while equity assets ratio, capital assets ratio, non-performing loans to loans ratio, loan to assets` ratio and cost to income ratio show negative relationship with profitability (ROE) of public banks. It states that public banks should increase capital adequacy ratio to enhance the profitability position. Regression results show that equity assets ratio, non-performing loans to loans ratio, capital adequacy ratio and cost to income ratio are significant while capital assets ratio and loan to assets ratio are not significant determinants of profitability of Indian public banks. So the public banks of India should keep in consideration all the significant ratios.

CONCLUSION

The present study finds the determinants of profitability of Indian private and public sector banks. It concludes that equity assets ratio, capital assets ratio, non-performing loan to loans ratio, loan to assets ratio and cost to income ratio are significant while capital adequacy ratio is not a significant determinant of profitability of Indian private banks. On the other side, equity assets ratio, non-performing loans to loans ratio, capital adequacy ratio and cost to income ratio are significant while capital assets ratio and loan to assets ratio are not significant determinants of profitability of Indian public banks. This study helps the selected private and public banks to give more attention on significant variables because these variables affect the profitability.

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