Internal Determinants of Profitability of Scheduled Commercial Banks in India: An Analysis Using Panel Regression Model

Sanjaya Jena, Research Scholar, Sambalpur University. E-mail: jsbro7686@gmail.com

Prof. Padmabati Gahan, Professor, Department of Business Administration, Sambalpur University.

ABSTRACT: In the present study attempt has been given to determine how capital adequacy, assets quality, managerial efficiency, liquidity and priority sector lending influence profitability of scheduled commercial banks operating in India. A balanced least-square dummy variable panel regression model has been used for analysis purpose. Return on Assets Ratio (ROAR) is taken as proxies for profitability; Capital to Risk Weighted Assets Ratio (CRAR) as proxy for capital adequacy; Net Non-Performing Assets to Net Advance Ratio (NPAR) as proxy for assets quality; Return on Advances adjusted to cost of fund Ratio (RADR), Return on Investment adjusted to cost of fund Ratio (RINR) and Burden to Total Income Ratio (BTAR) as proxy for managerial efficiency; Total Cash, Balance with RBI and Short Term Investment to Total Deposit Ratio (CDR) as proxy for liquidity; Priority Sector Lending to Total Advances Ratio (PSLR) as proxy for social responsibility. ROA is taken as dependent variable. CRAR, NPAR, RADR, RINR, BTR, CDR and PSL are taken as independent variables. Data of 16 years from 2004-05 to 2019-20 of 12 public sector, 16 private sector and 17 foreign sector banks operating in India have been taken in to account. The result shows that CRAR is significant at 8.16 % level of significance with a low degree of association. NPAR of the banking industry is negatively related with the profitability and the coefficient is -0.1764 indicates that 17.64 % of variation in ROA of scheduled commercial bank is caused by the changes in non-performing assets with negative impact. Return on Advances is positively related with ROA. The coefficient is 0.29 means 29% variation in ROA is due to the variation in RADR. Liquidity ratio CDR is positively related with ROA though the coefficient value is quite low i.e. 0.02. It put question mark on the maintenance of high liquidity ratio so far as profitability is concern. The influence of PSLR on profitability is questionable.

Key Words:, Assets Quality, Capital Adequacy, Determinants of Bank Performance, profitability, Liquidity, Managerial Efficiency.

I. INTRODUCTION

In every economic activities profit plays an important role. The survival and growth of an organization, small or big, depends on the profit that the organization earned. Profitability is used as key performance indicator in the performance evaluation process of various organizations. So far as banking industry is concern, banks operating in India are also business undertakings. Like other firms or joint stock companies, banks have to fulfill several interests of their stake holders. Most of the interest of the stake holders can be fulfilled only if a bank earns sufficient profit. Earning of profit depends on several factors. Identification of the factors which influence the profitability and quantification of the influence may helps to formulate a better strategy to accelerate the profitability of banks operating in India. One of the international organisation, though not policy maker but policy adviser, known as Bank for International Settlement (BIS), established in the year 1930, providing its continuous effort to strengthen banks all over the world and financial stability since its inception. One of the measures proposed by the said organisation in the recent decades is Basel Norms. First it came up with Basel I in the year 1988 followed by Basel II and in the recent years as Basel III. In these norms the organisation is worried about the capital adequacy, assets quality, liquidity and earning efficiency of banks and suggested some important performance guidelines. So far as India in concern, RBI who is also known as the regulator of banks in India, adopted Basel guidelines from the year 1999 and instructed banks operating in India to adopt Basel norms through circular from time to time. In the present study attempt has been given to determine how capital adequacy, assets quality, managerial efficiency, liquidity and priority

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sector lending influence profitability of scheduled commercial banks operating in India.

II. REVIEW OF LITERATURE

As banking sector is an important part of financial market and plays an important role in accelerating the GDP of a nation, this particular topic has been the centre of attraction in the recent years. Vector Murinde and Joran Kariisa-Kasa (1997) has found that the performance of East African Development bank was not satisfactory over the period of study. They have also concluded that capital structure of the bank was not sound during the study period. Most of the measuring variables shown a declining trend. The reason of these weak performances has not been analyzed in the study which provides scope for further research. K.R. Shanmugam and A.Das (2004) have concluded about the improved performance of SBI and foreign bank as compare to other sample banks. Saovanee Chantapong (2005) has carried out a research with an objective to provide a comparative study of the performance of domestic and foreign bank in Thailand in term of profitability and other characteristic after the financial crisis. In the study the author has concluded that both domestic and foreign banks have increased their performance after financial crisis 1997. Foreign banks' profitability is more than domestic banks. Due to non-availability of data recent data has not taken in to account which encourages further study with larger time period. Mohammed Omran (2007), documented that bank with private ownership has performed well in each scale of measurement. However, the study suffers from a limitation of taking just one year in pre-privatization period. Sample size was also small. Xiaaochi Lin and Yi Zhang (2009) reported about the weak performance of state owned bank as compare to private owned banks. Nader Naifar (2010) concluded that expenses management, ownership structure and banks loan are the major factors which influence the bank profitability. Chen-Jui Huang and Jwu-rong Lin (2011) found that ROA of all banks fall over the year of study. Zainab Dabo (2012) examined about the financial performance of Nigerian banks before and after the financial sector reform and found a significant positive effect of liberalization on Nigerian bank performance and consolidation exercise. Sunil Kumar (2013) in a study concluded that cost efficiency of Indian public sector bank has been increased after the period of de-regulation. Noman A.H.M. et al. (2015) have conducted that Credit risk, cost efficiency, GDP growth and real interest rate effects profitability negatively; and capital adequacy, liquidity, size, inflation and stock market turnover effect profitability positively. Mehmet S.T. and Nimet H.T. (2016) found that the ratios of net fees and commissions to total expenses and interest from loans to interest on deposits have positive effect on ROA and ROE. The ratio of equity and long term loans to total assets impact positively. Interest from loans to interest on deposits impact positively on ROA and ROE. Amene T.B. and Alemu G.A.(2019) found a positive relationship between ROA with CAP (Capital) and negatively with ROE (Return on Equity). ASQ (Assets Quality) is negatively related with ROA and ROE. LIQ (Liquidity) and BS (Business Size) are positively related with ROA and ROE. From the review of literature it is found that rare work have been carried out measuring the effect of variables such as priority sector lending and human resource cost on profitability. Rare work also found determining factors which influence profitability using LSDV panel regression model taking recent data on India banking industry.

III. OBJECTIVES OF THE STUDY

Though the main objective of the study is to determine the factors that affect profitability of scheduled commercial banks operating in India, the specific objectives are as follows:

- To investigate the existence of co-integration between the performance indicator variables taken under the study.
- To determine the relationship that exists between capital adequacy, assets quality, managerial efficiency, liquidity, priority sector lending and profitability of scheduled commercial banks of India.

IV. HYPOTHESES OF THE STUDY

1. H_0 : There is no co-integration among the performance indicator variables.

2. H_0 : There is no relationship exist between profitability and capital adequacy, assets quality, managerial efficiency, liquidity and priority sector lending of scheduled commercial bank of India.

V. RESEARCH METHODOLOGY

In the present study, Return on Assets Ratio (ROAR) is taken as proxies for profitability; Capital to Risk Weighted Assets Ratio (CRAR) as proxy for capital adequacy; Net Non-Performing Assets to Net Advance Ratio (NPAR) as proxy for assets quality; Return on Advances adjusted to cost of fund Ratio (RADR), Return on Investment adjusted to cost of fund Ratio (RINR) and Burden to Total Income Ratio (BTAR) as proxy for managerial efficiency; Total Cash, Balance with RBI and Short Term Investment to Deposit Ratio (CDR) as proxy for liquidity; Priority Sector Lending to Total Advances Ratio (PSLR) as proxy for social responsibility. Table 1 shows more detail on the performance indicator taken under the study.

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Table 1: Selected Performance Indicator Variables

Measuring Variables	Proxy For	Calculation Formula	Remarks
ROAR (Dependent)	Profitability	Net profit after tax / Total Assets	Higher the ratio better the performance
CRAR (Independent)	Capital Adequacy	(Tier-I Capital + Tier-I Capital) / Risk Weighted Assets	Higher the ratio better the performance and expected a positive relationship
NPAR (Independent)	Assets Quality	Net NPA/Net Advances	Lower the ratios better the performance and expected a negative relationship
RADR, RINR and BTAR (Independent)	Managerial Efficiency	(Interest Income-Cost of Advances)/Total Advances), (Investment Return – Investment Expenses)/ Total Investment, Burden/Total Income	Higher the ratio betters the performance and expected a positive relationship for RADR and RINR. Lower the ratios better the performance for BTIR.
CDR (Independent)	Liquidity	(Total Cash and Cash equivalent) /Total Deposit	Higher the ratio better the performance and expected a positive relationship
PSL(Independent)	Social Responsibility	Priority Sector Advances/ Total Advances	Higher the ratio better the performance and expected a positive relationship

Source: Author's Presentation

A balanced least-square dummy variable panel regression model has been used to determine the effect of capital adequacy, assets quality, managerial efficiency, liquidity and priority sector lending on profitability. ROA is taken as dependent variable. CRAR, NPAR, RADR, RINR, BTR, CDR and PSL are taken as independent variables. Three groups of banks i.e. public, private and foreign banks are taken with a sample size of 12, 16 and 17 respectively. Data of 16 years from 2004-05 to 2019-20 are taken as period of the study. Nine assumptions such as Stationary of variables, Multicollinearity, Heteroscadasticity, Autocorrelation, Co-integration, Specification error, Zero mean value of error term, Normal distribution of error term, and Parameter linearity of linear regression model are tested and found fulfilled. Assuming the constant slope coefficient and different intercept of cross section units panel regression is run. For this purpose a panel regression model is used which is stated as bellow:

$$y_t = \alpha_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + u_t$$

where,

y_t is ROA

$x_1, x_2, x_3, x_4, x_5, x_6, x_7$ are CRAR, NPAR, RADR, RINR, BTAR, CDR and PSL respectively.

$\beta_1, \beta_2, \beta_4, \beta_3, \beta_5, \beta_6 \& \beta_7$ are the regression coefficients of the seven independent variables respectively.

α_0 is intercept

$u_t$is error term.

The slope coefficient will show the degree of association between dependent variable and the independent variables.

VI. ASSUMPTION DIAGNOSIS OF PANEL REGRESSION MODEL.

Panel data regression model is chosen under the study to establish the relationship between the profitability performance indicator component with those of capital adequacy, assets quality, managerial efficiency and liquidity performance indicator components. Taking time and resources in to consideration, nine general assumption of OLS regression and one specific assumption of panel regression are focused in the present study. The said general and specific assumptions are as follows:

1. General Assumption of OLS regression model
   a) No unit root among the variables
   b) No perfect multi co-linearity between independent variables.
   c) Homoscedasticity of error term.
   d) No auto-correlation between error terms.
   e) Co-integration among the independent and dependent variables.
   f) Zero mean value of error term of the model.
   g) Normal distribution of error term.
   h) Model is linear in parameter.
   i) Model is correctly specified.
2. Specific Assumption of panel regression model.
   a) The slope coefficients are constant but intercept varies over cross section units.

If the models fulfill all the assumptions, than a meaningful conclusion can be drawn about the behavior of the variables taken under the study. If any assumption is not fulfilled than the techniques prescribed by statisticians and researchers as a remedial measure can used.

VII. RESULTS OF THE DIAGNOSIS.

Regressing one non- stationary time series with another non-stationary time series or in other word presence of unit root may offer spurious result. To test the presence the unit root in the variables, in the present study LLC and IPS test has been used (Levin, Lin and Chu (2002) and Im, Pesaran and Shin (2003)). The results of the said test shows that the p value of LLC and IPS statistics for all the variables are bellow the critical value of 0.05 at 5% level of significance. So the null hypotheses of unit root for all the taken variables are rejected and alternative hypotheses are accepted. It can be concluded that all the variables are stationary at level data. Presence of multicollinearity

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among the variables in the regression model may not exhibit a proper slope coefficient for the variables. According to Gujarati (2016) if the Variance Inflating Factor (VIF) of a variable is more than 10 then presence of multicollinearity may be assumed. The VIF factor of the variables and a correlation matrix shows that RINR and BTAR are highly correlated with other variables. So eliminating these two variables from the model shows better result. To test the Homoscedasticity, White's Heteroscadasticity test is used with the null hypothesis of Homoscedasticity. The p value of White's Heteroscadasticity is higher than the critical value 0.05. As the p value is above the critical value of 0.05, the null hypothesis is retained. So it can be concluded that the error terms are homogenous in nature. To test the presence of auto correlation, Durbin Watson test has been used. The result of the test shows that the calculated value of Durbin-Watson d value falls in between the upper and lower value in the Durbin-Watson critical value. So, it can be concluded that there is no autocorrelation present in the error terms. A meaning full regression can only be obtain if the variables taken under a regression model are integrated. To test the co-integration among the variables Johansen co-integration test is used. The trace statistics of Johansen co-integration test shows that MacKinnon-Haug-Michelis p value for all the variables are significant having value lower than 0.05. The Max-Eigen test statistics shows that MacKinnon-Haug-Michelis p value for all the variables are significant. So the null hypothesis of no co-integration is rejected and the alternative hypothesis is accepted and concluded that co-integration exist between the variables taken under the model. The mean value of error term should be zero and normally distributed to be accepted as a good model. In the present model the mean value of the error term comes to zero. The p value of the Jarque –Bera test is more than the critical value. So, the hypothesis of normal distribution is accepted and it can be concluded that the distribution of error term is normal. As the powers of all the betas taken for slope coefficient are not more than 1, it can be said that the model is linear in parameter. If the Durbin Watson statistic is more than the R^2 value of the model then it can be assumed that there is no specification error in the model. The Durbin Watson value is more than the R^2 value. So it can be concluded that the models is correctly specified. In the specific assumption of panel regression model it is assumed that the slope coefficients are constant over cross section units and time but different intercept for all the cross section units individually. In other word it is assumed that the slope coefficient of all the three groups such as public, private and foreign sector banks are all same. But they vary in intercepts. To measure the individual intercept and common slope coefficient for all the three groups of bank, dummy variables are introduced in the regression equation. Three dummies have been used to study the bank group specific effect. The intercept term is eliminated to save the model from dummy variable trap.

VIII. RESULTS OF THE PANEL REGRESSION MODEL

The results of the regression model taken under the study are presented bellow in table 1.

Table 2: Results of

$$y_t = \alpha_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_6 x_6 + \beta_7 x_7 + u_t$$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRAR	0.009414	0.005340	1.762803	0.0816
NPAR	-0.176402	0.014443	-12.21366	0.0000
RADR	0.289205	0.032136	8.999394	0.0000
CDR	0.024069	0.002655	9.065271	0.0000
PSLR	-0.012036	0.008147	-1.477316	0.1433
C	2.587554	0.380428	6.801691	0.0000

Root MSE	0.197702	R-squared	0.920807
Mean dependent var	1.001465	Adjusted R-squared	0.916093
S.D. dependent var	0.706467	S.E. of regression	0.204641
Akaike info criterion	-0.270783	Sum squared resid	3.517730
Schwarz criterion	-0.104129	Log likelihood	18.18525
Hannan-Quinn criter.	-0.203579	F-statistic	195.3390
Durbin-Watson stat	1.909705	Prob(F-statistic)	0.000000

Author's Calculation Using Eviews

The table 1 shows that R^2 is high at 0.920 means 92 % of variation in dependent variable is due to the collective variation in dependent variables and indicating a high degree of association among the dependent and independent variables. The Durbin Watson value is 1.909 which is more than the R^2 value indicating no specification error. The Durbin Watson statistic is more

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than the upper limit of the Durbin Watson table value indicating no autocorrelation. The taken Equation is satisfying all the basic assumption of linear regression model. Hence is taken as final model for analysis purpose.

The result shows that capital to risk weighted assets is significant at 8.16 % level of significance with a low degree of association. Non-performing assets of the banking industry is negatively related with the profitability and the coefficient is -0.1764 indicates that 17.64 % of variation in ROA of scheduled commercial bank is caused by the changes in non-performing assets with negative impact. Return on Advances is positively related with ROA. The coefficient is 0.29 means 29% variation is due to the variation in RADR. Liquidity ratio CIDR is positively related with ROA though the coefficient value is quite low i.e. 0.02. It put question mark on the maintenance of high liquidity ratio so far as profitability is concern. The influence of PSLR on profitability is questionable.

Fixed Effect Model

The results of the fixed effect regression model are presented bellow in table 2

Table 3: Results of

$$y_t = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_6 x_6 + \beta_7 x_7 + \alpha_1 d_1 + \alpha_2 d_2 + \alpha_3 d_3 + u_t$$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRAR	-0.009307	0.006610	-1.407935	0.1629
NPAR	-0.172075	0.016559	-10.39144	0.0000
RADR	0.282998	0.035433	7.986866	0.0000
SATAR	-0.027936	0.008639	-3.233815	0.0018
PSLR	-0.013842	0.008909	-1.553748	0.1241
D1	2.970467	0.829415	3.581398	0.0006
D2	3.019746	0.896554	3.368169	0.0012
D3	2.878282	0.648082	4.441233	0.0000

Root MSE	0.197324	R-squared	0.921109
Mean dependent var	1.001465	Adjusted R-squared	0.914374
S.D. dependent var	0.706467	S.E. of regression	0.206726
Akaike info criterion	-0.230161	Sum squared resid	3.504311
Schwarz criterion	-0.007956	Log likelihood	18.35724
Hannan-Quinn criter.	-0.140555	Durbin-Watson stat	1.897482

Author's Calculation Using Eviews

From the table 5.40 it can be observed that the R^2 is 0.921 which shows a high degree of association between the dependent and independent variables. Durbin Watson statistic is more than the table value of Durbin Watson critical value at 5 % level of significance. Durbin Watson statistics is more than the R^2 value indicates no autocorrelation in the model. The p values of all the three groups of banks are significant indicating the profitability function of three groups of banks are homogeneous. The data are penalable and the result of the panel regression model can be generalized for all the three groups of banks.

IX. CONCLUSION

As the main objective of the study is to establish the relationship between the profitability of schedule commercial banks and the capital adequacy, assets quality, managerial efficiency and liquidity. It is concluded that co-integration exist among the variables taken under the study. assets quality, managerial efficiency and liquidity are significantly influence profitability. Low quality assets affect profitability negatively, Return on advance effect profitability positively. Liquidity also effect profitability positively. Increasing priority sector lending put negative effect on profitability. The profitability behaviour of the three groups of banks is same.

REFERENCE

[1] Amene T.B. and Alemu G.A. (2019) "Determinants of financial performance in private banks: A case in Ethiopia". African Journal of Business Management, Vol. 13(9), 2019, pp. 291-308.

 DOI : 10.35291/2454-9150.2021.0274

[2] Chen-Jui Huang and Jwu-rong Lin (2011) "Financial liberalisation and banking performance : An analysis of Taiwan' former top ten banks " Applied Economic Letters, 18:12, pp.1111-1120.

[3] K.R. Shanmugam and A.Das(2004) Efficiency of Indian commercial banks during the reform period, Applied Financial Economies, 14:9, pp.681-686.

[4] Mehmet S.T. and Nimet H.T. (2016), "Internal Determinant of Bank Profitability: Evidence from Turkish Banking Sector.International Journal of Economic Perspectives, 2016, Volume 10, Issue 1, pp.37-49.

[5] Mohammed Omran (2007) "Privatization, state ownership and bank performance in Egipt ".world development vol.35 no 4 pp 714-733.

[6] Naifar, N. (2010) 'The determinants of bank performance: an analysis of theory and practice in the case of an emerging market', Int. J. Business Environment, Vol. 3, No. 4, pp.460–470.

[7] Noman A.H.M. et al. (2015) The Effect of Bank Specific and Macroeconomic Determinants of Banking Profitability: A Study on Bangladesh (2015), International Journal of Business and Management; Vol. 10, No. 6

[8] Saovanee Chantapong (2005). comparative study of domestic and foreign bank performance in Thailand, Economic Change and Restructuring 38, pp.63-83.

[9] Sunil kumar (2013) Banking reform and evoluation of cost efficiency in Indian public sector banks, Econ Change Restruct, 46: pp.143-182.

[10] Syed Qasim Shah and Rizwan Jan (2014) "Analysis of financial performance of private banks in pakistan" Procedia-Social and Behavioral sciences 109, pp.1021-1025.

[11] Victor Murinde and Joran Kariisa-Kasa (1997). The financial performance of the East African Development Bank: A retrospective analysis Accounting, Business & Financial History,7:1, pp.81-104.

[12] Xiaochi Lin and Yi Zhang (2009) Bank ownership reform and bank performance in china. Journal of banking and finance 33, pp.20-29.

[13] Zainab Dabo (2012) The impact of financial liberalization on performance of commercial banks in Nigerian. Procedia-Social and Behavioral sciences 62 (2012) pp.548-55

WEBSITES

www.rbi.org.in, www.ifbi.com, www.ipfp.in, www.imf.org.in

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