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Impact of Macroeconomic Determinants on Profitability of Indian Commercial Banks

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Abstract

Banking system is one of the important pillars of financial system. Failure of any bank creates contagion effect in the economy. Therefore, it is very important to measure financial performance of banking sector. The performance was mostly measured by profitability. The profitability affected by various determinants, which can be fairly categorized into Macroeconomic determinants and internal determinants. Macroeconomic determinants are very important because they impact the financial performance of banks but they are not under the control of banks. Banks' management will able to understand the significant external determinants and modified their strategic decisions in such a way that optimal performance can be achieved. The aim of the present study was to examine the impact of Macroeconomic determinants on the profitability of listed commercial banks of India for period from 2009-2010 to 2014-2015. Bank profitability measures were considered as: Return on Assets (ROA) and Return on Equity (ROE). Gross Domestic Product (GDP), Interest Rate and Inflation were used as independent variables to analyze the impact on the dependent variable i.e., ROA and ROE of listed Indian Commercial Banks. All listed commercial banks in were taken as a sample except one banks due unavailability of data. Total 39 listed banks were considered for present study. Correlation and Multiple Regression Analysis were used. The empirical findings revealed that GDP, Interest Rate and Inflation all the three Macroeconomic determinants have an insignificant positive impact on profitability of listed commercial Indian banks.

Keywords: Profitability, Macroeconomic Determinants, ROA, ROE, GDP, Interest Rate, Inflation.

Introduction

Banking sector is one of important pillar of financial system of any country. Banks mobilize savings and supply funds to deficit sector of the economy; they are the oil for the wheels that keep the economy turning. In India banks have leading role in planning and implementing the financial policies of government. Banks has also played very important role in financial inclusion of country. Schemes like; Pradhanmantri Jan-Dhan yojna, Pradhanmantri Jeenan Jyoti Bima yoja are few of the schemes which was offered under the umbrella of financial inclusion. The basic objective of the commercial banks is to maximize profit and this can be fulfilled only when sufficient revenue is generated. Generation of higher revenue will in turn provide higher profits.

Banking sector contributes towards GDP by credit creation and factor payments. Therefore, Analysis of financial performance of commercial banks has been of great interest of academic research, Ongore and Kusa, 2013[1]. The profitability of banks is affected by various factors. Determinants which affect the financial performance of banks can be classified into three categories i.e; Bank-Specific determinants, Macroeconomic determinants and Industry Specific determinants. Macroeconomic determinants are not under the control of bank's management; in fact banks should consider these factors while making strategic decisions which can counter negative impact and can leveraged the positive impact of those determinants. Financial institution needs to understand the significant external determinants and its relationship with financial performance; so they can adapt the changes in positive manner.

Current Scenario of Banking Industry in India: The Indian Banking Industry can be categorized into non-scheduled banks and scheduled banks. Scheduled banks constitute of commercial banks and co-operative banks. There are about 67,000 branches of Scheduled banks spread across India. As far as the present scenario is concerned the Banking Industry in India is going through a transitional phase. The Public Sector Banks (PSBs), which is foundation of Indian Banking sector account for more than 78 per cent of the total banking industry assets. Total 24 public sector banks were operating in India as on 31/03/2014. Unfortunately they are burdened with excessive Non Performing assets (NPAs), massive manpower and lack of modern technology. On the other hand the Private Sector Banks are making tremendous progress. Total 16 private sector banks were operating in India as on 31/03/2014. They are leaders in Internet banking, mobile banking, phone banking, ATMs. As far as foreign banks are concerned they are likely to succeed in the

Indian Banking Industry, http://business.mapsofindia.com/india-industry/ banking.htmlsthash.Y6Xg5PEU.dpuf[2].

Present study aims to explore the Macroeconomic determinants with the help of existing literature and also analyzing its impact on the profitability of Indian commercial banks.

External Factors: External factors identified and employed in a study are as follows but not limited to these factors only: Inflation, Real Gross Domestic Product and Real Interest Rate, Kanwal and Nadeem, 2013[3]. In another study Real GDP, Interest Rate and Exchange Rate were considered as external determinants, Kiganda, 2014[4]. Another study, Gross Domestic Product, Interest Rate and Inflation were found to be affecting bank performance, Riaz and Mehar, 2013[5].

Literature Review: A Study was conducted to examine impact of bank specific and macroeconomic factors on profitability of Korean banks. Total number of commercial banks in the sample varied from 11 banks in 1992 to 29 banks in 2000 due to entry and exit of the commercial banks in Korea. 1992-2003 was considered period of the study. It was found that lower liquidity level tend to exhibit higher profitability. Higher diversification showed positive relation and impact of credit risk; overheads had negative relation with banks' profitability. Inflation displayed a pro-cyclical impact and industry concentration had positive and significant relation with profitability. Korean banks had been relatively more profitable during the pre-crisis compared to the post financial crisis, Sufian, 2011[6].

A study was conducted to analyze the impact of external variables on profitability of public limited commercial banks in Pakistan for the years 2001- 2011. The result showed that there exist strong positive relationship of real interest rate with return on assets (ROA), return on equity (ROE) and equity multiplier (EM). Secondly, real GDP is found to have an insignificant positive effect on return on assets ROA, but an insignificant negative impact on return on equity ROE and equity multiplier (EM). On the other hand, it was found that Inflation rate had a negative relation with all 3 profitability measures. Overall, the selected macroeconomic factors were found to have a negligible impact on earnings of commercial banks, Kanwal and Nadeem, 2013[3].

A study analyzed the potential impact of external factors on profitability of Chinese banks. 10 Chinese listed banks taken as sample for the study and period of the study was 1998-2012. Correlation and Regression were used as statistical tools for the data analysis purpose. Return on Assets (ROA) considered as dependent variable and GDP, inflation rate, money supply growth, interest rates and total market capitalization of stock as explanatory variables. The results revealed that Economic growth, inflation, interest rates and money supply growth have positive correlations with bank profitability, while total market capitalization of stock had negative correlations with bank profitability, Pan and Pan, 2014[7].

A study was conducted was to established effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus to understand country and bank specific characteristics. 5 years from 2008-2012 were considered as sample. Ordinary Least Square method was employed to establish the relationship between macroeconomic factor and bank profitability. The results found real GDP, inflation and exchange rate have insignificant effect on bank profitability in Kenya with Equity bank in focus at 5% level of significance, Kiganda, 2014[4].

Another Study investigated the effect of macroeconomic variables on financial profitability of listed commercial banks in the Nairobi Securities Exchange (NSE). All the 10 listed banks were considered and period of study was 2001 to 2012. Random Effect Model and Fixed Effects model were applied as a statistical tool. Gross Domestic Product (GDP), Exchange rates, and interest rates considered as an Independent variables and Return on Assets as dependent variable. The study found that real GDP growth rate had positive but insignificant effect; real interest rates had a significant negative influence on profitability and the exchange rate had positive significant effect on the profitability of listed commercial banks on Nairobi Securities Exchange, Simiyu and Ngile, 2015[8].

Rationale: The banking environment in India has undergone many regulatory and financial reforms in the past decades. These reforms have brought many structural changes in the sector such as interest rate deregulation, Basel II Norms and introduction of base rate, etc. These changes have encouraged competition among the banks. Structural changes affect the external determinants such as GDP, interest rate and inflation. Due to above mentioned illustrative macroeconomic determinants, it is interesting and important field to analyze impact of external determinants on the financial performance of listed commercial banks in India. So it would be very important area to explore and analyze the impact of external determinants on financial performance of listed Indian commercial Banks.

Research Objectives: i. To explore the Macroeconomic determinants affecting the financial performance of commercial banks in India. ii. To evaluate the impact of Macroeconomic determinants on the financial performance of commercial banks in India.

Methodology

The Study: The study is empirical and exploratory and in nature. The study relates to analysis of Impact of Macroeconomic determinants on profitability of commercial banks in India.

Key Variables: Dependent Variable: The present study applies one dependent variable which is Profitability. Two measures of profitability were undertaken namely, Return on Equity (ROE) and Return on Assets (ROA).

Independent Variable: The study deployed following three Macroeconomic determinants: Gross Domestic Product (GDP), Interest Rate (INTERESTRATE) and Inflation (INFLATION).

Study Sample: All the listed commercial banks i.e. Thirty nine banks were considered as sample banks except one banks due unavailability of data. The period of the study was 6 years (2009-2010 to 2014-2015).

Data Collection: The data and necessary information was collected from financial statements and balance sheets of the selected banks for the study period. In addition, the data was also collected from Annual Reports, Books, research papers, articles, journals, Internet, etc.

Statistical Tools: Correlation and Multiple Linear Regression were used to analyze the relationship and find significant effect of Macroeconomic determinants on profitability.

Models: Following 2 models of multiple regression analysis were used to analyze the impact of Macroeconomic determinants on the ROE and ROA.

Model 1, $ROA = \beta0 + \beta1GDP + \beta2INFLATION + \beta3INTERESTRATE + \varepsilon$
Model 2, $ROE = \beta0 + \beta1GDP + \beta2INFLATION + \beta3INTERESTRATE + \varepsilon$

Where; ROA = Return on Assets, ROE = Return on Equity, β0 = Intercept, GDP = Gross Domestic Product, INFLATION = Inflation, INTERESTRATE = Interest Rate, ε = Error term. β0 = Intercept.

The above mentioned terms are measured as follows: ROA = Net Profit / Total Assets, ROE = Net profit / Stockholders' Equity. GDP = Annual Growth Rate of Gross Domestic Product (%), Inflation = Annual Growth Rate of Wholesale Price Index of India (%), Interest Rate = Annual Base Rate (%).

Hypothesis: The respective Null and Alternative Hypotheses are as follows: i. **H01**: There exists an insignificant impact of Gross Domestic Product (GDP) on Return on Assets (ROA), ii. **H11**: There exists a significant impact of Gross Domestic Product (GDP) on Return on Assets (ROA), iii. **H02**: There exists an insignificant impact of Interest Rate on Return on Assets (ROA), iv. **H12**: There exists a significant impact of Interest Rate on Return on Assets (ROA), v. **H03**: There exists an insignificant impact of Inflation on Return on Assets (ROA), vi. **H13**: There exists a significant impact of Inflation on Return on Assets (ROA), vii. **H04**: There exists an insignificant impact of Gross Domestic Product (GDP) on Return on Equity (ROE), viii. **H14**: There exists a significant impact of Gross Domestic Product (GDP) on Return on Equity (ROE), ix. **H05**: There exists an insignificant impact of Interest Rate on Return on Equity (ROE), x. **H15**: There exists a significant impact of Interest Rate on Return on Equity (ROE) , xi. **H06**: There exists an insignificant impact of Inflation on Return on Equity (ROE), xii. **H16:** There exists a significant impact of Inflation on Return on Equity (ROE).

Results and Discussion

Model-1: Correlation (Model 1, ROA): Referring to the Table-1 Correlation Matrix Regarding ROA relating to macroeconomic variables, it was found that there was an insignificant positive correlation (0.490 at 5% level of significance) between: Yearly growth rate of Gross Domestic Product (GDP) and ROA. It showed that if Gross Domestic Product increases than ROA will also increases and, vice versa. It seems very rationale too; if economy improves and grows at faster pace than definitely it requires higher amount of capital and greater credit creations. This will enhance the banking business and it may result in higher level of profitability for banking sector. Here positive relationship supports the same.

Table-1
Correlation Matrix Regarding Model 1, ROA

		ROA	GDP	INTERESTRATE	INFLATION
ROA	Pearson Correlation	1	.490	.121	.636
	Sig. (2-tailed)		.324	.819	.175
	N	6	6	6	6
GDP	Pearson Correlation	.490	1	.156	-.051
	Sig. (2-tailed)	.324		.768	.924
	N	6	6	6	6
INTERESTRATE	Pearson Correlation	.121	.156	1	-.526
	Sig. (2-tailed)	.819	.768		.283
	N	6	6	6	6
INFLATION	Pearson Correlation	.636	-.051	-.526	1
	Sig. (2-tailed)	.175	.924	.283	
	N	6	6	6	6

Interest Rate (.121, at 5% level of significance) had insignificant positive correlation with ROA. Results revealed that if Base Rate (Interest Rate) increases than ROA also increases and vice versa. Base Rate is the minimum rate of interest which is to be charged by banks during their lending activities. Increase in Base Rate implied that yield on advances for banks will also increases. There is a cut throat competition in banking sector due to which entire burden of increased interest rate is passed on to the customer, but rates of deposits are not increased in the same proportion. It results in higher profitability measure i.e., ROA of banks. Here, positive relationship supports the same.

Inflation (0.636 at 5% level of significance) had insignificant positive correlation with ROA. It was found that if yearly growth rate of Wholesale Price Index (Inflation) increases than ROA also increases and vice versa. Interest Rate equation consists of real interest rate and inflation, if inflation increases than interest rate also increases as per equation and vice versa. Higher interest rate ultimately improves the margins and profitability for banks because loans are provided on floating rates, where deposits are taken on fixed rates. Positive relationship depicts the same results.

Regression Model

Table-2
Heteroskedasticity test for ROA Model 1

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of ROA
chi2 (1) = .06
Prob > chi2 = 0.8005

Table 3
Regression Model Summary[b] of Model 3, ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
3	.944[a]	.891	.727	.073967	.891	5.431	3	2	.159	3.289

a. Predictors: (Constant), Inflation, GDP, Interestrate, b. Dependent Variable: ROA

Table 4
Analysis of Variance (ANOVA[a]) for Model 3, ROA

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	.089	3	.030	5.431	.159[b]
	Residual	.011	2	.005		
	Total	.100	5			

a. Dependent Variable: ROA, b. Predictors: (Constant), Inflation, GDP, Interestrate.

Table 5
Coefficients of Regression Model 3, ROA

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
3	(Constant)	-.487	.491		-.993	.425	-2.598	1.624		
	GDP	.034	.018	.452	1.910	.196	-.043	.111	.974	1.026
	Interestrate	.085	.043	.549	1.974	.187	-.100	.269	.706	1.416
	Inflation	.046	.013	.948	3.444	.075	-.011	.103	.722	1.385

a. Dependent Variable: ROA

As per Table-4 Coefficients of Regression Model of ROA, the values of Volatility Index Factor (VIF) (Collinearity Statistics) is greater than .10 and less than 10, for GDP (1.026), Interest Rate (1.416), and Inflation (1.385). It implied that the problem of multicollinearity did not exist among the independent variables. Hence, their selection as independent variables stood justified. As per Table-2 Regression Model Summary of ROA, value of Durbin Watson Test was 3.289 which were greater than the Upper Limit Value (2.102 at 5% level of significance); it implied that the problem of autocorrelation did not exist. As per Table-2 Heteroskedasticity test for ROA Model 1, the p-value > 0.05, null hypothesis is not rejected. Hence, it can be concluded that there is no heteroskedasticity in dataset. As per Table 3, Regression Model Summary of ROA, the adjusted R-square (.727 or 72.70%), so 72.70% of the variation in the dependent variable (ROA) is explained by the independent variables i.e., Gross Domestic Product (GDP), Inflation, and Interest Rate. This implied that the model so applied was good fit.

The Regression Model (1) was as follows: ROA= **–**.0487 + .034 GDP +.085 INTERESTRATE +**.**046 INFLATION + ε

As per Table-5 Coefficients of Regression Model of ROA, analysis showed that Gross Domestic Product (GDP) (.034, at 5% level of significance) was insignificant and positively affecting ROA. It implied that if yearly growth rate of Gross Domestic Products (GDP) increases than ROA will also increases. It is very rationale too if economy expansion happens than it requires greater level of support from financial system especially from financial institution like Banks. Economy expansion ultimately enhances banking business and converted into higher level of profitability and margins for banks. Here positive relationship revealed the same, but insignificant relationship depicts its impact on ROA will not be as major as it has to be. So null hypotheses **H01**: There exists an insignificant impact of Gross Domestic Product (GDP), Inflation, and Interest Rate, on Return on Assets (ROA) was accepted and alternative hypotheses **H11:** There exists a significant impact of Gross Domestic Product (GDP), Inflation, and Interest Rate, on Return on Assets (ROA) was rejected.

Interest Rate (.085, at 5% level of significance) was insignificant and positively affecting ROA. Results revealed that if Base Rate (Interest Rate) increases than ROA also improved. Base Rate is minimum rate of interest on which banks can perform their lending activities. Improvement in base rate ultimately enhances spreads and profitability of banks. Here correlation and regression results are contradictory, but due to insignificant relationship in both the cases results can be neglected. So null hypotheses **H02:** There exists an insignificant impact of Interest Rate on Return on Assets (ROA) was accepted and alternative hypotheses **H12**: There exists a significant impact of Interest Rate on Return on Assets (ROA) was rejected.

Inflation (.046, at 5% level of significance) was insignificant and positively affecting ROA. Results revealed that if Wholesale Price Index (Inflation) increases than ROA also improved. Real Interest Rate and Inflation are the two components of Inflation and increase in inflation ultimately increases the interest rates. Banks assets are majorly on floating rate bases and liabilities are on fixed rate bases, higher inflation converted more profitability and spreads for banks. Here, results support the same but insignificant relationship exists. So null hypotheses **H13:** There exists an insignificant impact of Inflation on Return on Assets (ROA) was accepted and alternative hypotheses **H03**: There exists a significant impact of Inflation on Return on Assets (ROA) was rejected.

Table 6
Correlation Matrix Regarding Model 2, ROE

		ROE	GDP	INTERESTRATE	INFLATION
ROE	Pearson Correlation	1	.572	.236	.519
	Sig. (2-tailed)		.236	.653	.292
	N	6	6	6	6
GDP	Pearson Correlation	.572	1	.156	-.051
	Sig. (2-tailed)	.236		.768	.924
	N	6	6	6	6
INTERESTRATE	Pearson Correlation	.236	.156	1	-.526
	Sig. (2-tailed)	.653	.768		.283
	N	6	6	6	6
INFLATION	Pearson Correlation	.519	-.051	-.526	1
	Sig. (2-tailed)	.292	.924	.283	
	N	6	6	6	6

Model -2: Correlation (Model 2, ROE): Referring to the Table Correlation Matrix Regarding ROE relating to external factors, it was found that there was a significant positive correlation (0.572 at 5% level of significance) between: Yearly growth rate of Gross Domestic Product (GDP) and ROE. It showed that if Gross Domestic Product increases than ROE will also increases and, vice versa. It seems very rationale too; if economy improves and grows at faster pace than definitely it requires higher amount of capital and greater credit creations. This enhances banking business and its penetration in Indian economy and turn out to be greater level of profitability for banking sector. Here significant positive relationship supports the same.

Interest Rate (.236 at 5% level of significance) had insignificant positive correlation with ROE. Results revealed that if Base Rate (Interest Rate) increases than ROE also increases and vice versa. Base Rate is the minimum rate of interest below which bank cannot perform their lending activities. Increase in Base Rate implied that improvement in lending rates and higher level of margins or profitability for banks. Here, positive relationship supports the same.

Inflation (0.519 at 5% level of significance) had insignificant positive correlation with ROE. It was found that if yearly growth rate of Wholesale Price Index (Inflation) increases than ROE also increases and vice versa. Interest Rate equation consists of real interest rate and inflation, if inflation increases than interest rate also increases as per equation and vice versa. Higher interest rate ultimately improves the margins and profitability for banks because loans are provided on floating rates, where deposits are taken on fixed rates. Positive relationship depicts the same results.

Regression Model

Table 7
Heteroskedasticity test for ROE Model (Model 2)

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of ROE
chi2 (1) = .03
Prob > chi2 = 0.8576

Table 8
Regression Model Summary[b] of Model 2, ROE

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
4	.944[a]	.891	.728	1.899428	.891	5.450	3	2	.159	3.102

a. Predictors: (Constant), Inflation, GDP, Interestrate, b. Dependent Variable: ROE.

Table 9
Analysis of Variance (ANOVA[a]) for Model 2, ROE

Model		Sum of Squares	Df	Mean Square	F	Sig.
4	Regression	58.983	3	19.661	5.450	.159[b]
	Residual	7.216	2	3.608		
	Total	66.199	5			

a. Dependent Variable: ROE, b. Predictors: (Constant), Inflation, GDP, Interestrate

Table 10
Coefficients of Regression Model 2, ROE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
4	(Constant)	-23.801	12.597		-1.889	.199	-78.003	30.401		
	GDP	1.012	.460	.520	2.199	.159	-.968	2.991	.974	1.026
	Interestrate	2.417	1.099	.611	2.198	.159	-2.314	7.148	.706	1.416
	Inflation	1.072	.340	.867	3.154	.088	-.390	2.535	.722	1.385

a. Dependent Variable: ROE

As per Table-10 Coefficients of Regression Model of ROE, the values of Volatility Index Factor (VIF) (Collinearity Statistics) is greater than .10 and less than 10, for GDP (1.026), Interest Rate (1.416), and Inflation (1.385). It implied that the problem of multicollinearity did not exist among the independent variables. Hence, their selection as independent variables stood justified. As per Table-8 Regression Model Summary of ROE, value of Durbin Watson Test was 3.102 which were greater than the Upper Limit Value (2.102 at 5% level of significance); it implied that the problem of autocorrelation did not exist. As per Table 7 Heteroskedasticity test for ROE Model 1, the p-value > 0.05, null hypothesis is not rejected. Hence, it can be concluded that there is no heteroskedasticity in dataset. As per Table 3, Regression Model Summary of ROA, the adjusted R-square (.728 or 72.80%), so 72.80% of the variation in the dependent variable (ROA) is explained by the independent variables i.e., Gross Domestic Product (GDP), Inflation, and Interest Rate. This implied that the model so applied was good fit.

The Regression Model (4) was as follows: ROE= −23.801 + 1.012 GDP + 2.417 INTERESTRATE +1.072 INFLATION + ε

As per Table-10 Coefficients of Regression Model of ROE, analysis showed that Gross Domestic Product (GDP) (1.012, at 5% level of significance) was insignificant and positively affecting ROE. It implies that if yearly growth rate of Gross Domestic Products (GDP) increases than it will also increase ROE. It can be inferred that if economy is growing than it requires greater level of support from financial system especially from financial institution like Banks. Economy expansion ultimately enhances banking business and converted into higher level of profitability and margins for banks. Here positive relationship revealed the same, but insignificant relationship depicts its impact on ROE will not be as major as it has to be. So null hypotheses **H04**: There exists an insignificant impact of Gross Domestic Product (GDP) on Return on Equity (ROE) was accepted and alternative hypotheses **H14**: There exists a significant impact of Gross Domestic Product (GDP) on Return on Equity (ROE) was rejected.

Interest Rate (2.417, at 5% level of significance) was insignificant and positively affecting ROE. Results revealed that if Base Rate (Interest Rate) increases than ROE also improved. Base Rate is minimum rate of interest on which banks can perform their lending activities. Improvement in base rate ultimately enhances spreads and profitability of banks. Here, results depict the same but insignificant relationship exists. So null hypotheses **H05**: There exists an insignificant impact of Interest Rate on Return on Equity (ROE) was accepted and alternative hypotheses **H15**: There exists a significant impact of Interest Rate on Return on Equity (ROE) was rejected.

Inflation (1.072, at 5% level of significance) was insignificant and positively affecting ROE. Results revealed that if Wholesale Price Index (Inflation) increases than ROE also improved. Real Interest Rate and Inflation are the two components of Interest rate and increase in inflation ultimately increases the interest rates. Lending activities of Banks are usually performed on floating rate bases and deposits are accepted by banks on fixed rate bases, higher inflation gives more profitability and spreads for banks. Here, results support the same but insignificant relationship exists. So null hypotheses **H06**: There exists an insignificant impact of Inflation on Return on Equity (ROE) was accepted and **H16**: There exists a significant impact of Inflation on Return on Equity (ROE) was rejected.

Discussion

Two regression models i.e., ROE and ROA were employed. ROA Model explained variation upto 89.1% and 72.7% according to R Square and Adjusted R Square respectively. ROE Model explained variation upto 89.1% and 72.8% according to R Square and Adjusted R Square respectively. It showed that both models were good fit. On comparison of the two models, based on the Explanatory Power (R Square and Adjusted R Square), both the Models i.e. ROA and ROE models were almost equally efficient while analyzing the impact of Macroeconomic determinants on profitability of commercial banks in India. Hence for judging Macroeconomic determinants i.e. GDP, Interest Rate and Inflation, affecting profitability of banks, both the models appeared justified and appropriate model.

Conclusion

ROA had no positive significant Correlation with any Macroeconomic determinants. ROA had insignificant positive Correlation with Gross Domestic Product, Interest Rate and Inflation. No variables have significant and insignificant Correlation with ROA.

ROE had no positive significant Correlation with any Macroeconomic determinants. ROE had insignificant positive Correlation with Gross Domestic Product, Interest Rate and Inflation. No variables have significant and insignificant Correlation with ROE.

In case of Regression Model regarding predicting ROA, it was concluded that independent variable viz., Gross Domestic Product (GDP), Inflation and Interest Rate had positive impact on ROA. Regression model regarding predicting ROE, it was concluded that independent variable viz.; Gross Domestic Product (GDP), Inflation and Interest Rate had positive impact on ROE. Both Regression Models (ROE and ROA) are good fit to predict impact of Macroeconomic determinants on profitability of banks. Here the impact of all the independent variables of profitability measures was insignificant.

Suggestions: Gross Domestic Product had positive impact on bank's profitability, so banks should fully leverage this opportunity by tapping rural sector of the Indian economy. They can offer microfinance products to the urban and rural area to

enhance profitability and tapping India's growth story. Variables interest rate deposit products should be offered to grab the full advantage of interest rate fluctuation and it will ultimately reduce the risk, which ultimately enhances profitability of banks. Bank should deploy any of the Regression Model (ROA or ROE) to enhance for better predictability.

Implications: The research employs that ROE and ROA may be taken as dependent variable which can be predicted through taking different independent variables. It can be inferred that GDP, Inflation and Interest Rate are cyclical indicators of the economy. If they are in upward trend, it will positively affect the banking sector. Other financial performance measures such as; Economic Value Added, Earning before Interest and Tax, Tobin's Q may be considered for determining financial health of the banks. Both models are justified for analyzing the impact of Macroeconomic determinants on financial performance of banking industry.

Limitations of the Study: Six years (2009-2010 to 2014-2015) data were considered for the research. Non-listed banks were not considered for the study. Only 3 Macroeconomic determinants were considered as sample for the study and internal factors were out of preview.

Future Scope of the Study: Larger time period and non listed banks may be considered as sample for more comprehensive results. Internal determinants and more Macroeconomic factors may be considered for the future study purpose and to improve the models. These models may also be useful to study the banks of other countries. Categorization of banks may be done such as new banks V/s. Old Banks; big size banks V/s. small size banks for comparison purpose.

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