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IMPACT OF MACROECONOMIC VARIABLES ON BANKS PROFITABILITY

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ABSTRACT

India was witnessed for the boom during the years 2004 to 2008 and followed by recession during the year 2009 and continued to 2011. Later it slightly recovered during the years 2011 and 2012. And again the years 2012 and 2013 financial year was witnessed for bad economic conditions. Analyzing how the bank's profits were varying under these conditions. For this study the data was chosen from the years 2003 to 2013 because of the pre objective to study the banks profit ability at various macro-economic conditions. As the India experienced the various economic cycle during the past years to till date with extravagant changes in the economy such as boom, recession, inflation motivates me to study the statistical relationship and banking performance (mainly on profitability) dependency on the macro economic factors such as the Inflation, GDP, RBI bank Interest rates, Repo rate, and to what extent the banking profits depend on the economic factors.

The research methodology which has been framed was analytical and descriptive in nature. The required data collected is of primary and secondary in the nature. And the literature has been gathered regarding the Multi regression Analysis. The research was carried out using the multi regression analysis considering the bank's profits as a dependent variable and had collected the data for past 11 years from the RBI website and various macro-economic variables such as GDP, Inflation, Interest rates and monetary policies Repo rate and Bank rate, data for past 11 years.. The important ratios have been calculated for private banks and public banks. The ratios are loan growth rate, deposit growth rate, loan to deposits ratio, operating efficiency ratio that is operating expenses to total income. The data for ratios had been collected from Capitoline Database and had collected for past 9 years.

KEY WORD: *bad economic conditions , macro-economic conditions, statistical relationship and banking performance.*

1.1 INTRODUCTION:

Efficiency and profitability of the banking sector in India has assumed fundamental importance due to intense competition, because of greater customer demands in the economy and changing banking reforms and macro-economic factors. This study attempts to measure the statistical relationship between

the profitability of Indian banks and the macro economic factors such as Inflation, GDP, monitory policies. For this study, I have used banking industry profits data for years 2003-2013 that comes under dependent variable and independent variable such as Indian Inflation, GDP, RBI Bank Interest rates, Repo rate for past 12 years. And I have also calculated the key ratios for banking industry. I know that in the service sector, it is very difficult to estimate the output because, it is intangible. I have framed multi regression equation for profit.

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Hence different Independent variables are being used for measuring banking industrial profitability under various impacts due to independent variables. The public sector banks are not as profitable as other sectors are. In terms of capacity, the smaller banks are globally efficient, but large banks are locally efficient. It means that the operational efficiency banks and profitability are interrelated. It is true that the productivity is not only the individual factor but it is an significant factor which influence to profitability of banks. The crucial factor to increase profitability of banks is to increase productivity. For this we have supported few suggestions to tackle the challenges faced by the banks mainly public sector banks. The banking sector reforms in India were stimulated by the report of the Committee on financial structure, popularly it is known as Narasimham Committee. This committee, which submitted its report in the year 1991, this report has suggested various measures to improve the efficiency and health of banking sector by making it more competitive and vibrant (Ahluwalia, 2002). It affected mainly the productivity of banks which lead to the effect of profits and efficiency of the banks to a large extent (Mohan, 2005). Now more than two decades has been pass by after banking sector reforms, hence it is high time to analyze h o w the new banking policy have affected the banking operations of the different banks.

As banks have very different operating structures than regular industrial companies, it stands to reason that investors have a different set of fundamental factors to consider, when evaluating banks. So for this reason I have calculated the key ratios.

As the India experienced the various economic cycle during the past years to till date with extravagant changes in the economy such as boom, recession, inflation motivates me to study the statistical relationship and banking performance (mainly on profitability) dependency on the macro economic factors such as the Inflation, GDP, RBI bank Interest rates, Repo rate, and to what extent the banking profits depend on the economic factors. The relationship obtained using the statistical tool- multi regression analysis illustrates that to what extent the profits are dependent on the Independent variables such as GDP, Inflation, RBI bank rate, Repo rate and helps to formulate the linear relationship between the dependent variables and the Independent variables. This study also helped me in analyzing the key ratios of banks depending on their loans, deposits, investments and operating efficiency. Mainly this study is to develop a multi regression equation. The main principle of this multi regression is to predict only one single variable from one or more independent variables.

1.2 PROBLEM STATEMENT:

The banking industry is deeply sensitive in profit making with the changes in the macro-economic conditions and monitory policy norms. This study attempts to measure the statistical relationship between the profitability of Indian banks and the macro economic factors such as GDP, monitory policies. For this study, I have used banking industry profits data for the past 12 years, and all banks few ratios which comes under dependent variable and independent variable such as Indian GDP, Inflation, bank rate and repo rate.

1.3.OBJECTIVES:
1. To study the impact of macroeconomic variables on bank's performance.
2. To formulate the linear regression model
3. To calculate and analyze the key ratios of private banks and public banks

1.4 REVIEW OF LITERATURE:

Demirgüç-Kunt and Detragiache (1998) broke down 45-65 created and creating nations. Asking for a multivariate logit display for period 1980-94, results proposed an essential commitment of outer components towards keeping money division emergencies.

Naceur (2003) investigated the benefit of the Tunisian saving money industry... Adjusted board information of about ten noteworthy store banks was taken as the examples for 1980 - 2000 period. Results

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demonstrated that it is unimportant effect of yearly development rate and expansion rate on Tunisian banks.

Staikouras and Wood (2004) contemplated the execution of European Banking industry for a considerable length of time 1994-1998. Utilizing common slightest square strategy and settled impacts show they reasoned that loan cost has a critical positive however development of GDP applies huge negative effect on ROA.

Kosmidou, Tanna, and Pasiouras (2005) focused on productivity of inner U.K business banks. The result demonstrates a powerful confirmed association of all the macroeconomic components. Athanasoglou, Delis, and Staikouras (2006) assessed year 1998-2002 lopsided board of 71-132 South-Eastern European banks by straight relapse. The outcome indicates high profit crosswise over best swelling times and no discernible aftereffect of GDP. Later on, Scott and Arias (2011) contemplated the execution of five greatest banks in United States. They demonstrated that GDP did not specifically modify the benefit level of U.S venture area. Hoffmann (2011) used GMM and pooled OLS estimation approach to find US banks. The last aftereffect of both relapse models demonstrates no generous relationship.

In an ongoing report, Sharma and Mani (2012) estimated the effect on Indian business banks for era 2006-2011. They report that the impact of GDP and swelling on ROA was irrelevant.

Zeitun (2012) explored macroeconomic compelling variables for banks of Gulf Cooperation Council nations. Cross sectional time arrangement board information gave evidence that GDP is emphatically related yet expansion is contrarily related with ROA and ROE proportions.

1.5 RESEARCH METHODOLOGY

For Analyzing the statistical relationship between the dependency of   dependent variable profits, few ratios of all commercial banks and the independent variables (Inflation, GDP, RBI bank Interest rate, Repo rate) I have chosen the multi regression analysis for my study. The period of the study is from 2003-2013 for framing the multi regression equation. And for calculating the ratios the period of the study is from 2006-2014.

Tools Used-Spss and Excel.

Financial tool is calculating the key ratios and statistical tool used is multi regression analysis,correlation and anova.

Data Collection Methods:

This Study mainly considers only secondary data which has been collected from-
1. Reports of RBI website.
2. Financial statements and annual reports of banks.
3. Data collected from Capital line database.
4. Research papers collected from ebsco and google scholar.

1.6 Data Analysis and Interpretation

The consolidated entire listed banking industry's profit was collected from the RBI web site for last 10 years data are employed in the sample of this study. List of banks which have been considered for study is provided in the appendix respectively. The consolidated private and public banks key ratios have been taken for regression analysis. Macroeconomic variables data (GDP, inflation rate, Repo rate, and bank rate) has been taken from RBI website. Present study employs technique of Descriptive statistics, Pearson Correlation and Multi regression. The tools used for data analysis is SPSS and EXCEL.

The table 1 shows the consolidated profits data for last 11 years which is collected from the RBI website.

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TABLE 1: CONSOLIDATED NET PROFIT OF BANKS FOR YEARS 2003-2013

YEARS	NET INCOME (cr)
2013	91164.6551
2012	81658.27
2011	70331.27
2010	57109.25
2009	52749.86
2008	42725.87
2007	31202.61
2006	24581.77
2005	20958.18
2004	22048.37
2003	17025.31

SOURCE:RBI website

The details of the Independent variables in the Table 2 show the details of Independent variables.

TABLE 2

VARIA BLE	VARIABLE NAME	ASSESSMENT	HYPOTHESIZED RELATION WITH PROFITABILITY
INF	Inflation rate	Annual % change in consumer price	+/-
GDP	Real gross domestic product	Annual GDP	+/-
RBI INT	RBI Interest rate	Lending rate adjusted to inflation	+
REPO	Repo rate	Short term lending rate	-

Source: RBI website

The above table shows the various independent variables names such as inflation, real gross domestic product, RBI Interest rate, Repo rate. For the better understanding the names are short formed to Inflation as INF, gross domestic product as GDP, RBI interest rates as the RBI INT and finally the Repurchase rate as REPO. The inflation describes the Annual % change in consumer price, the GPD describes the annual gross domestic production of the country, the RBI interest rates describes the lending rate adjusted to the Inflation rate and finally the Repo rate describes the short term lending rate to banks by RBI or banks borrowing from RBI at the repo rate. The Hypothesized relationship of the Inflation rate with the profitability of the banks is +/-. The Hypothesized relationship of the GDP with the profitability of the banks is +/-. The Hypothesized relationship of the RBI interest rate with the profitability of the banks is +. The Hypothesized relationship of the REPO rate with the profitability of the banks is -.The relationship of repo rate and profitability of banks is negative, which indicates that if the RBI increases the repo rate, then banks borrowing cost increases, so liquidity flow decreases which will lead to the decrease in the banks profit. RBI interest rate is positive because it is mainly for long term funds, where the banks funds will not be misused.

TABLE 3: INDIAN GROSS DOMESTIC PRODUCT FOR 2003-2013

YEARS	GDP in crores	Bank Rate	Inflation Rate	Repo Rate
2013	5617998	9.00%	9.13 %	7.63%

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2012	5482146	9.25%	11.17 %	8%
2011	5247528	6.00%	6.49 %	7.54%
2010	4937004	6.00%	9.47 %	5.63%
2009	4516073	6.00%	14.97 %	4.92%
2008	4158675	6.00%	9.70 %	7.92%
2007	3896634	6.00%	5.51 %	7.63%
2006	3564364	6.00%	6.53 %	6.88%
2005	3253074	6.00%	5.57 %	6.25%
2004	2971463	6.00%	3.78 %	6%
2003	2222726	6.00%	3.72 %	7.05%

Source: RBI web site

The Table 3 shows the shows Indian GPD, and Bank Rate, Inflation Rate and Repo (average for every year. Average is taken based on the 4 quarters data of each year). for the years 2003 to 2013 Source: RBI web site

SPSS OUTPUT AND INTERPRETATION

TABLE 4 -CORRELATION

		profit	Inflation	Gdp	Rbi bank	Repo
Pearson Correlation	Profit	1.000	.605	.953	.752	.301
	Inflation	.605	1.000	.658	.342	-.220
	Gdp	.953	.658	1.000	.616	.240
	Rbi bank	.752	.342	.616	1.000	.464
	Repo	.301	-.220	.240	.464	1.000

Table 4 presents the result of Pearson correlation between all the dependent and explanatory Variables. This table shows the relationship of banks profitability with the macro economic factors such as Inflation rate, GDP rate, rbi bank rate and repo rate.

As per statistics in table 4, most of the variables are strongly and positively correlated with coefficients of correlation more than 0.55. The correlation between the dependent variable profit and the independent variable Inflation is .605 shows the strong and positive correlation. The correlation between the dependent variable profit and the independent variable GDP is .953 shows the strong and positive correlation. The correlation between the dependent variable profit and the independent variable RBI bank rate is .752 shows the strong and positive correlation. The correlation between the dependent variable profit and the independent variable repo is .301 shows the week and positive correlation. Among the entire variables the GDP and the RBI bank rate shows the significant strong and positive relationship with the profits of the bank. And also the correlation between macroeconomic factors; inflation and Repo rate is noticeable with low negative with value -0.220.

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TABLE 5 -MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.976	.953	.921	7335.336

The above table statistics tells how much of the variation in the value of the dependent variable profit is explained by regression model. In the above table the R Square showed is .953, which indicates that 95.3% of the variation in the average Banks Profit can be explained by variability in the Inflation, GDP, RBI bank rate, Repo rate. As I have done the multiple regression analysis it would better to consider the adjusted R square rather than the R square it states that 92.1% of the variation in the average Banks Profit can be explained by variability in the Inflation, GDP, RBI bank rate, Repo rate. We consider adjusted R square because we have multiple independent variables.

TABLE 6 -ANNOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6475425670.308	4	1618856417.577	30.086	.000[b]
	Residual	322842914.082	6	53807152.347		
	Total	6798268584.390	10			

a. Dependent Variable: profit
b. Predictors: (Constant), repo, inflation, rbi Bank rate,gdp

INTERPRETATION:

As per the statistics in the table 6 the column sig show exact significance of .000, so the effect would be statistically significant this states that there is a linear relation among the dependent and independent variables, so further we can subject the data to multiple regression model.

TABLE 7 -COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-64115.065	18302.545		-3.503	.013
	Inflation	-188.888	1060.389	-.025	-.178	.864
	Gdp	.019	.004	.805	5.426	.002
	Rbibank rate	5720.084	2581.152	.278	2.216	.069
	Repo	-682.123	3003.900	-.027	-.227	.828

Y (profit)= -64115.065-188.888 (Inflation)+.019 (GDP)+5720.084 (RBI bank rate)-682.123 (repo)

The above estimated regression equation indicates that profit is negatively related with inflation as it is evident from the negative value of its coefficient (-188.888). The above estimated regression equation indicates that profit is positively related with GDP as it is evident from the positive value of its coefficient (0.019). The above estimated regression equation indicates that profit is positively related with RBI bank rate as it is evident from the positive value of its coefficient(5720.084).The above estimated regression equation indicates that profit is negatively related with repo rate as it is evident from the negative value of its coefficient(-682.12).

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The results indicate that if the inflation goes up by 1 unit the profit will go down by 188.88 units while keeping other parameters constant. If the GDP goes up by 1 unit the profit will go up by 10.019 units while keeping other parameters constant. If the RBI bank rate goes up by 1 unit the profit will go up by 5720.08 units while keeping other parameters constant. If the repo rate goes up by 1 unit the profit will go down by 682.12 units while keeping other parameters constant.

EXCEL OUTPUT AND INTERPRETATION:

TABLE 8-CALCULATION OF LOAN GROWTH RATE

		2014	2013	2012	2011	2010	2009	2008	2007	2006
Public	Total Loans	13.67%	15.84%	16.12%	18.47%	19.69%	25.55%	23.19%	20.74%	13.18%
Private	Total Loans Private	11.95%	17.67%	21.05%	20.61%	13.16%	12.80%	25.45%	29.96%	32.14%

This above table shows the calculation of loan growth rate for the years 2006-2014 that is for past 9 years. Total investments and advances is taken total loans. Then year on year percentage change is calculated using the formula (current year-previous year)/pervious year*100.As we can that the loan growth rate is declining year by year. We can see from the table that for private banks it is declined from 2013 to 2014 i.e, 15.84% to 13.67%.

**INTERPRETATION OF RATIOS**
1. LOAN GROWTH RATE FOR BANKS.
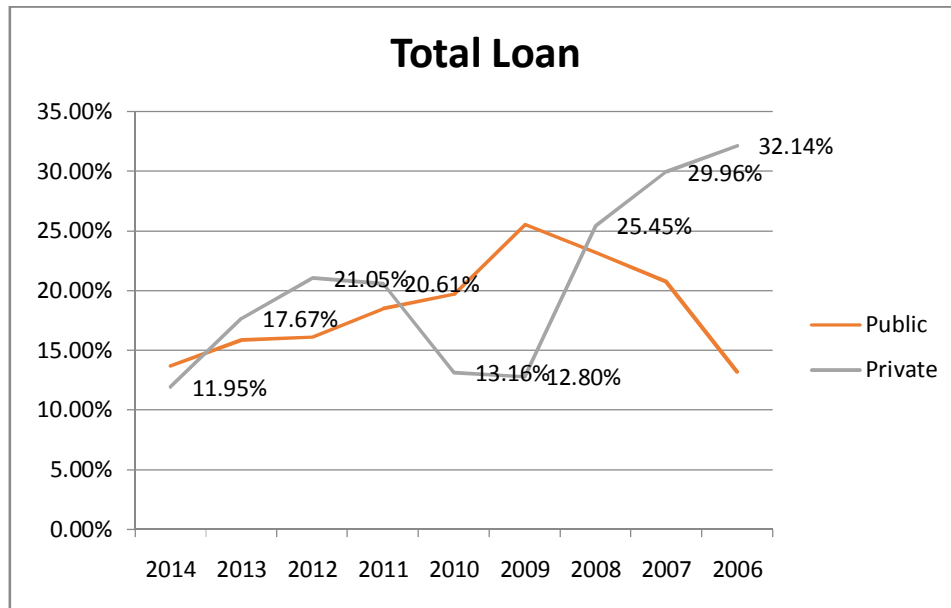
For many of the banks, Loan growth rate is as important as revenue growth rate to most of the industrial companies. So for this reason investor considers this factor, mainly to evaluate the quality of borrowers the bank is serving. Above average loan growth rate indicates that the bank has targeted the new markets or it also indicates that the bank is pricing its money cheaply. Lower loan rate indicates that, the competition for borrowers may induce banks to underprice the loan rates of competing banks in order to attract new customers. From the graph it is seen that private banks loan rates are lower than the public banks.

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TABLE 9 -CALCULATION OF DEPOSIT GROWTH RATE

	Deposits	2014	2013	2012	2011	2010	2009	2008	2007	2006
Public banks	Total deposits growth rate(%)	0.00685	0.1516	0.150	0.144	0.1843	0.1879	0.2722	0.23343	0.2286
Private banks	Total deposits growth rate(%)	0.0506	0.1492	0.160	0.162	0.1781	0.1340	0.1141	0.209	0.313

This above table shows the calculation of deposits growth rate for the years 2006-2014 that is for past 9 years. Total deposits is taken for calculation. Then year on year percentage change is calculated using the formula (current year-previous year)/pervious year*100.As we can that the deposits growth rate is declining year by year. We can see from the table that for private banks and public there is decline from 2006 to 2014.

## 2.INTERPRETATION FOR DEPOSITS GROWTH RATE FOR
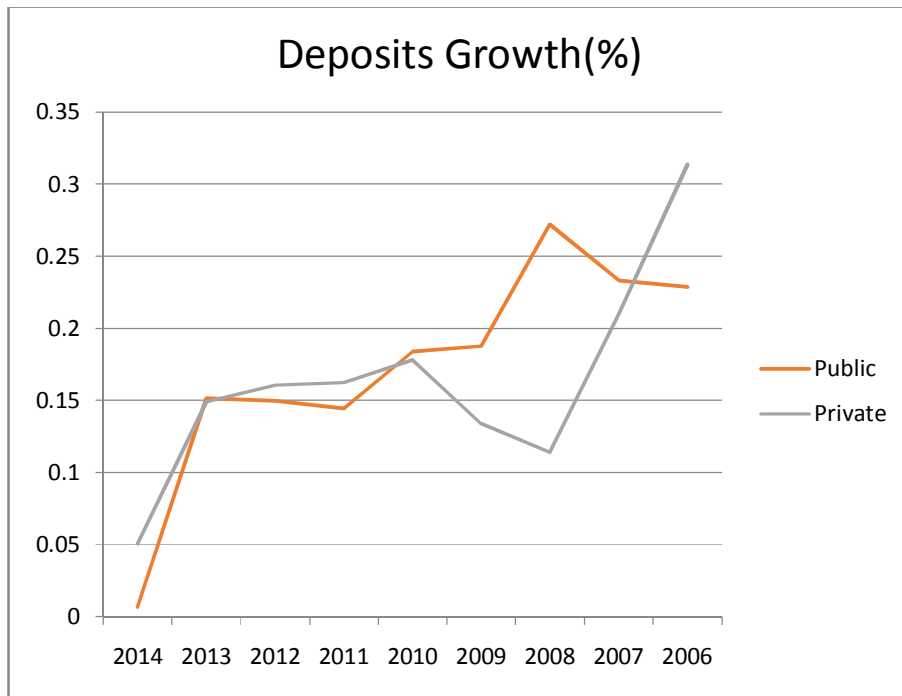
BANKS

Deposits growth is also one of the most common factor for an investor, this gives a sense of idea for an investor that how much of lending a bank can do. There are few more important factors to be considered along with this. First, the cost of funds is very important. Second, the deposit growth has to be analyzed in the terms of loan growth and banks plan for loan growth. Accumulating the deposits for higher rates is actually bad for earnings if the bank cannot profitably deploy those funds.

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TABLE 10-CALCULATION OF LOAN TO DEPOSIT RATIO

	Loan	2014	2013	2012	2011	2010	2009	2008	2007	2006
Public banks	Loan/deposit	- 0.01%	- 1.30%	0.73 %	1.46 %	0.03 %	0.75%	- 1.31%	- 0.12%	- 1.74%
Private banks	Loan/deposit	- 1.12%	- 2.59%	1.39 %	4.15 %	2.37 %	- 0.21%	1.24%	3.70%	- 1.08%

This above table shows the calculation of loan to deposit ratio for the years 2006-2014 that is for past 9 years. The loan to deposit ratio is decreasing year on year.

**3.INTERPRETATION OF LOAN TO DEPOSIT RATIO:**
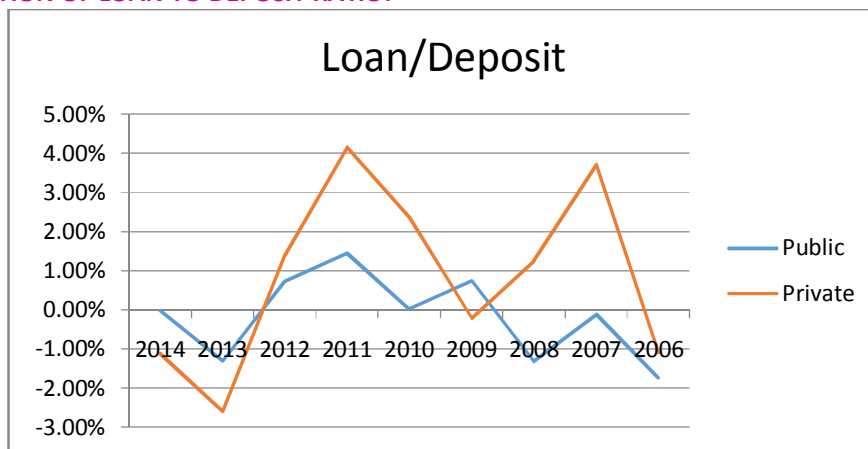
This ratio is commonly used for assessing the banks liquidity by dividing the total loans to total deposits. If this ratio is too high, then it indicates that the banks might not have enough liquidity to cover any unseen fund requirements, if this ratio is too low, then this indicates that the banks may not be earning as much as they could be.

TABLE 11-CALCULATION OF OPERATING EXPENSES TO TOTAL INCOME

	Ratio	2014	2013	2012	2011	2010	2009	2008	2007	2006
Public banks	Operating Expenses / Total Income (%)	17.28	17.43	16.36	16.58	19.73	18.24	17.34	18.95	23.56
Private banks	Operating Expenses / Total Income (%)	21.97	21.75	21.78	22.77	25.4	24.16	23.21	24.83	27.44

This above table shows the calculation of operating expenses to total income 2006-2014 that is for past 9 years. The public banks operating efficiency is better than private banks, because the operating expenses of public banks are lower than the private banks.

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4.INTERPRETATION FOR OPERATING EXPENSES TO TOTAL INCOME

Operating Expenses / Total Income (%)
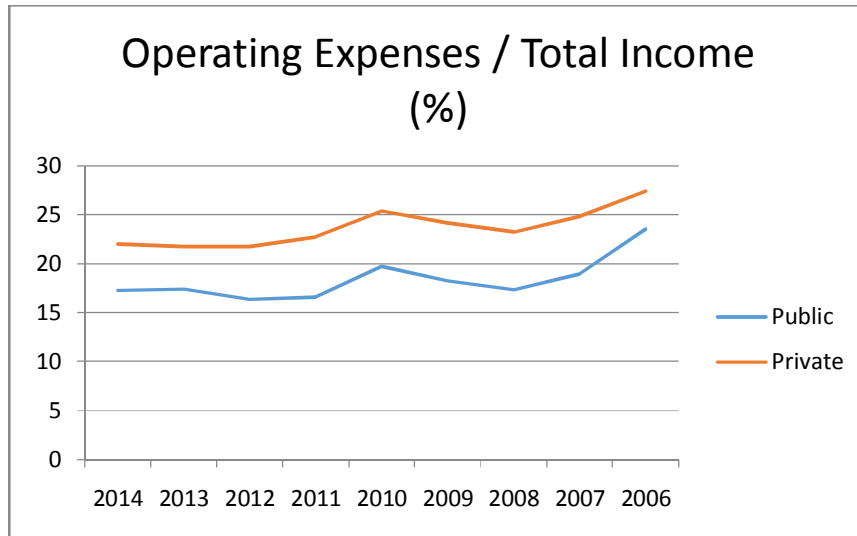
A banks operating efficiency ratio is essentially important and it is equivalent to that of the regular company's operating margin, it mainly measures how much the bank pays on operating expenses, like marketing and salaries. This ratio tells us that, if it is lower than it is better.

1.7 FINDINGS :

Most of the variables are strongly and positively correlated with coefficients of correlation more than 0.55.But the inflation and repo rate has the low negative value ,while in case of other variables they are positively correlated.

The correlation between the dependent variable profit and the independent variable Inflation is .605 shows the strong and positive correlation

The correlation between the dependent variable profit and the independent variable GDP is .953 shows the strong and positive correlation.

The correlation between the dependent variable profit and the independent variable RBI bank rate is .605 shows the strong and positive correlation.

The correlation between the dependent variable profit and the independent variable repo is .301 shows the week and positive correlation.

Among the entire variables the GDP and the RBI bank rate shows the significant strong and positive relationship with the profits of the bank.

And also the correlation between macroeconomic factors; inflation and Repo rate is noticeable with low negative with value -0.220

In the table 9, the column sig show exact significance of .000, so the effect would be statistically significant this states that there is a linear relation among the variables

The equation for the regression line is Y (profit)= -64115.065-188.888 (Inflation)+.019 (GDP)+5720.084 (RBI bank rate)-682.123 (repo)

The R Square showed is .953, which indicates that 95.3% of the variation in the average Banks Profit can be explained by variability in the Inflation, GDP, RBI bank rate, Repo rate.

 We have to see the adjusted R square rather than the R square because of multiple independent variables and it states that 92.1% of the variation in the average Banks Profit can be explained by variability in the Inflation, GDP, RBI bank rate, Repo rate.

The equation for the regression line is Y (profit)= -64115.065-188.888 (Inflation)+.019 (GDP)+5720.084 (RBI bank rate)-682.123 (repo) which explains that 92.1% variation we see in the profit that is by looking at the adjusted R square.

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The loan growth rate and deposit growth is declining year on year.

The operating expenses to the total income is declined from the years for private and public banks, which shows that the banks operating efficiency is good ,as they are using their funds in a proper way.

1.8 RECOMMENDATIONS:

- There is more scope for deposit mobilization .As banks can more focus on increasing the loan growth rate and deposit growth rate.
- Banks have to focus on changing repo rates, if the repo rate decreases then banks borrowing cost reduces which will help the banks for improving their profits.
- Proper utilization on funds will lead to much generation of profits.
- As from the study we can see that 92.1% banks profit is reliable on these macro-economic variables. As the results may also vary in the changes of the economic variables, so the banks have look at these changes.

1.9 CONCLUSION:

There are numerous internal and external factors which influence the profitability of public limited commercial banks in India, but this study employs only four external factors; inflation rate, GDP and interest rate, Repo and investigates their impact on earnings of financial institutions. Four major macroeconomic variables have been incorporated because quantified data of these variables is easily available from secondary resources and in past, these variables have been analyzed most, hence the cumulative study would help in getting a clear picture. After collecting the 11 years (2003-2013) data of all consolidated banking profit using multi regression analysis, it is verified that in general, the among the selected macroeconomic factors Inflation and repo rate do not contribute noticeably to the profits of sampled banks, so in order to maximize the risk-adjusted returns banks have to focus more on other external factors or devise policies to improve the internal factors.

There many important ratios for banks but only key ratios have been considered in order to know their operating structure, but only few fundamental factors are taken in to consideration for evaluating the banks.

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