MACROECONOMIC INDICATORS AS THE KEY FACTORS OF INDIAN PUBLIC SECTOR BANKS' PROFITABILITY

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ABSTRACT

Like all businesses, banks make profit by earning more money than what they pay in expenses. The traditional measures of the profitability of any bank are its return on assets (ROA) and return on equity (ROE). In this context, this study investigates the effect of macroeconomic variables on the profitability of public sector banks in India for years 2009 to 2015. Regression analysis by OLS was applied on the data to examine the effects of four major macroeconomic variables, namely, GDP, inflation rate, WPI & exchange rates on profitability of the banks. The study findings indicated that GDP at market price had negative effect on profitability of public sector banks as measured through ROA. Further, except inflation rate, other two economic indicators, WPI and exchange rate had also negative influence on profitability.

Key Words: ROA, GDP, Inflation, WPI, Exchange rate, Public sector banks

JEL Classification: C22, E66, M21

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Introduction

The banking industry is the repository of savings of a nation contributed by millions of people (Industry Snapshot, 2004). Thus a bank plays an intermediary role between savers and borrowers. Hence the margin of a bank arises out of the difference in interest paid to depositors and charged to borrowers. The Indian Banking Sector has been undergoing rapid changes. It has witnessed a paradigm shift after the financial sector reform in 1991. The banks realised that profit will be under pressure with the introduction of prudential norms and asset classification (Gopalakrishnan, 2005). There was a clear shift on the emphasis from growth to profit; and on a clean, transparent and healthy balance sheet as opposed to the large-sized ones of the earlier years. As the foreign exchange and money markets were gradually deregulated, competition intensified; the net results of the bank will be under tremendous pressure. Now the banks are looking for new avenues to meet the challenges posed to them. They have realised that they had no option but to address the needs of the customers effectively to survive in the highly competitive market. Regulatory, structural and technological factors are significantly changing the banking environment (Angur, Natarajan & Jahera, 1999). N. Vittal, the Central Vigilance Commissioner, in his talk delivered at BECON, Calcutta, 2001, highlighted that monetary and credit policy, macro economic policy, foreign investment policy and overall market environment are all putting pressure on the bank's margin. He put more emphasis by expressing that the main problem of Indian Banking system is nothing but, the non-performing assets (NPA). Hence in the emerging environment two aspects become important: monetary and credit policy is for better corporate governance and the macro-economic policies for innovativeness and developing competitive edge.

The banking industry in India comprises scheduled commercial banks (SCBs), co-operative banks and regional rural banks (Shainesh & Sharma, 2003). The SCBs in India are classified as Public Sector Banks, Private Sector Banks, and Foreign Banks. The major commercial banks can be grouped into State Bank group, nationalized banks, foreign banks and other private banks. Further the private banks can be separated as newly formed and old private banks. Both public and private sector banks gradually expanded the usage of banking services through Automated Teller Machines (ATMs), home banking, Internet banking and tele-banking. The three major external forces that affect competition in financial services industry are: increasing

internationalization, change in the regulatory environment, and the accelerating impact and pervasiveness of information technology (Sachdev & Verma, 2004). There are three major tasks that a market oriented manager in financial service must accomplish. First one is identification of the key strategic success factors and building unique strategy of own accordingly. Secondly, the ability of making a system capable of creating and implementing plans built around the company's strategy. Thirdly, the manager must have the ability to use the free market forces in its departmental base and infuse and defuse it throughout the organization (Sachdev & Verma, 2004).

Cataclysmic structural reforms in Indian economic system following the Government's policy of economic liberalization and tumbling of trade barriers coupled with metamorphic liberalized policy in the financial sector in lines with Narasimhan Committee recommendations leading to replacement of regulated, over administered banking industry by greater degree of operational autonomy, triggered by competitive environment in the financial sector in the country with market forces deciding the future of banking and other financial institutions (Debasish, 2003). Public sector banks (PSB) having being recognized as harbinger of economic development and enjoyed hither to monopolistic position with over 70 per cent of market share are facing tremendous challenges stemming out of liberalization and globalization.

An effective and efficient functioning of the banking sector requires sound and favorable macroeconomic environment in the country. However, in this era of globalization it is imperative for the banking sector to be strongly integrated with the global economy. Increased integration and growing macroeconomic fluctuations require more attention to be paid to the link between the noises that these fluctuations represent and the bank's own development (Simiyu C N et al, 2015). Various research studies show that commercial banks play a major role in the economic resource allocation of developing countries like India. They contribute to economic growth of the country by making funds available for economic investors to borrow as well as financial deepening in the country (Otuori, 2013). The profitability of commercial banks can be affected by both internal and external factors which are nothing but bank specific and macroeconomic variables (Flamini et al, 2009). The internal factors are individual bank characteristics which affect the bank's profitability, these factors are basically influenced by the internal decisions of

management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks. Hence, in order to survive in the long run, it is important for a bank to examine the effect of macroeconomic factors affecting its profitability so that it can take initiatives for further improvement.

In this context, the present research paper is aimed at finding out the nature and extent of impact of Indian macro economic indicators like GDP, inflation, WPI and exchange rate upon the overall financial profitability of major public sector banks operating in India.

Literature Review

Many factors are responsible to affect the profitability of banks in India. These factors are not only bank specific but also industry specific. Banking performance in terms of profitability is also affected by the macro economic variables. First and foremost, the financial environment and development level of a country affects bank's performance. Banks' specific factors which represent the internal efficiency of any bank ought to be analyzed and improved first; then only the macro and external factors could be faced (Bhatia A et al, 2012). Based on the study by Alfani L et al, 2013, price exchange rate and the inflation rate does not provide a significant evidennce to put impact on the private banking profitability, but bank management must give attention to the macro economic factors continuously. The higher the risk associated with the macroeconomic indicators like GDP, interest rates and inflation, the lower the return on banks profitability (Osamwonyi I O et al, 2014). Bank management should know how macroeconomic policies affect the operation of banks to ensure judicious use of deposits and maximization of profit which ultimately impact positively on the economy. Bank's profitabilty can be measured in a better way by calculating return on asset and most significant factors influencing ROA of Indian public sector banks are spread, operating expenses, provisions & contingencies and non interest income (Dutta S et al, 2013). In Indian banking industry, it has been found that interest income of the bank get affected by the economic and financial cycles and deposits and advances get affected by the macroeconomic indicators (Sharma E et al, 2012). The study done by Luthra M et al, 2014 shows that exchange rate, inflation, GDP growth rate affect banking index positively whereas gold prices have negative impact on BSE Bankex but none of them have significant impact on Bankex in India. Indian public sector banks are gradually being operated

with high productivity and low profitability when compared with private sector banks (Saini N, 2014). Therefore, Indian public sector banks need to be more alert about the impact of key macro economic indicators. To strengthen the position further, the Indian public sector banks must struggle to greatly enhance efficiency through a control over increasing non-interest income, and maximizing business per employee and per branch (Pandya H et al, 2014). It was found that public perception variables do not have a concluding influence on sustainable banks profitability, at least in the short term (Iustina Alina BOITAN, 2015). A high level of economic freedom index is not necessarily a precursor of sustainable banks' profitability. The study done by Pandi T D et al, 2014 shows that the banking sector in India has responded very positively in the field of enhancing the role of market forces regarding measures of prudential regulations of accounting, income recognition, provisioning and exposure. Most of the variability in banks credit risk and profitability is due to differences between banks, where as macroeconomic variables are found to exert a strong impact on banks risk and profitability (Marianne Gizycki, 2001). In order to maximize the risk-adjusted returns banks have to focus more on various other non macro economic external factors or devise policies to improve the internal factors (Kanwal S et al, 2013).

Design and Methods of Study

Research design is the blueprint or comprehensive master plan for the collection, measurement and analysis of data to arrive a conclusion. The current study is mainly based on secondary data and is exploratory in nature. There are two types of data considered over here, one for annual return on asset (ROA) in percentage of different public banks in India indicating the profitability of banks, and another category of data includes Gross Domestic Product (GDP) at market price with base year 2004-05 in rs. Billion, average inflation rate based on CPI, Wholesale Price Index (WPI) of all commodities with base year of 2004-05 & exchange rate of Indian rupee with US dollar at the end of financial year, indicating the overall economy of the country. All these secondary data have been collected from the annual reports and websites of respective banks, the website of Reserve Bank of India and Indian Banking Association andtheir bulletins. The time span of data for analysis was from 2009 to 2015. In total there were 26 public sector banks of India considered in the present study.

The data collected through various secondary sources were entered into an Excel spread sheet and then transferred to SPSS data sheet for further processing. One way ANOVA was first made to confirm the existance of significant difference among ROAs of different banks under study keeping the broad objectives in mind. Simple linear regression analysis was used to analyze the impact of each determinant separately on the ROA of public sector banks.

Key Variables of the Study

Dependent variable for the purpose of study is Return on Assets (ROA) of banks. ROA indicates the profitability of banks as it reflects as to how well a bank's management is using the bank's real investment resources to generate profits. It is calculated as:

ROA= Net Income/Total Assets

There are four independent variables in the study namely, Gross Domestic Product (GDP) at market price with base year 2004-05 in rs. Billion, average inflation rate based on CPI, Wholesale Price Index (WPI) of all commodities with base year of 2004-05 & exchange rate of Indian rupee with US dollar at the end of financial year.

Gross domestic product at market prices is the sum of the gross values added of all resident producers at market prices, plus taxes less subsidies on imports. It can be defined in three ways:
- GDP is equal to the sum of the gross added values of the various institutional sectors or of the various branches of activity plus taxes and minus the subsidies on products (which are not attributed to the sectors and branches of activity)

- GDP is equal to the sum of the final domestic uses of goods and services (final effective consumption, gross fixed capital formation, variations in stocks) plus exports and minus imports
- GDP is equal to the sum of uses in the operating accounts of the institutional sectors: payment of salaries, taxes on production and imports minus subsidies, gross operating margin and mixed income.

Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or

changed at specified intervals, such as yearly. It is the overall general upward price movement of goods and services in an economy.

The Wholesale Price Index or WPI is the price of a representative basket of wholesale goods of a country. The purpose of the WPI is to monitor price movements that reflect supply and demand in industry, manufacturing and construction. This helps in analyzing both macroeconomic and microeconomic conditions.

Exchange rate is the price of one currency in terms of another currency. Exchange rates can be either fixed or floating. Fixed exchange rates are decided by central banks of a country whereas floating exchange rates are decided by the mechanism of market demand and supply.

Hypotheses of the Study

The current study attempts to test four research hypotheses which are given below:

H_1: There exists a significant impact of GDP at market price on return on assets of Indian public sector banks.

H_2: There exists a significant impact of average inflation rate based on CPI on return on assets of Indian public sector banks.

H_3: There exists a significant impact of Wholesale Price Index (WPI) of all commodities with base year of 2004-05 on return on assets of Indian public sector banks.

H_4: There exists a significant impact of exchange rate of Indian rupee with US dollar at the end of financial year on return on assets of Indian public sector banks.

Results and Discussions

Data about return on assets of 26 public sector banks operating in India were considered, which includes SBI and its associate banks and all other major public banks. A significant variation has been observed in ROAs of all these banks based on different types of public sector banks through one way ANOVA (F = 3.168, $p < 0.01$, Table-1).

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Table 1 : One Way ANOVA showing the impact of different public sector banks on ROA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.594	25	.344	3.168	.000
Within Groups	16.927	156	.109		
Total	25.521	181			

A simple linear regression analysis was run to see the impact of various macroeconomic indicators on the ROA of the public sector banks. First regression was run by including GDP at market price with base year 2004-05 in rs. billion as independent variable and ROA as dependent variable. The results of this analysis are shown in table 2. From this table for the year 2009- 15, it is found that more than 50% of variation in the dependent variable was explained by GDP for all the banks except central bank of India, IDBI bank, Syndicate bank, UCO bank, United bank, State Bank of Bikaner & Jaipur and State Bank of Hyderabad. However, GDP has no significant impact on ROAs of Bank of Maharashtra, Central Bank of India, IDBI Bank, Syndicate Bank, UCO Bank, United Bank, State Bank of India, State Bank of Bikaner & Jaipur and State Bank of Hyderabad. This can be explained by the fact that though economic investment is an important factor in a nation's GDP growth, even more important is greater respect for government laws and contracts. The business environment, regulation and laws concerning conduct of business are important for banks to thrive.

Table 2   Regression Analysis Showing the Impact of GDP on ROA

Banks	Output Results of Simple Linear Regression Analysis					
	R^2	F	B (Unstandardized	Std. Error	t	Remarks
Allahabad Bank	0.717	12.662*	-0.000011	0.000	-3.558*	H_1 supported
Andhra Bank	0.687	10.968*	-0.000015	0.000	-3.311*	H_1 supported
Bank of Baroda	0.657	9.591*	-0.000010	0.000	-3.096*	H_1 supported
Bank of India	0.710	12.258*	-0.000013	0.000	-3.501*	H_1 supported
Bank of Maharashtra	0.513	5.265	-0.000005	0.000	-2.294	H_1 rejected
Canara Bank	0.705	11.953*	-0.000011	0.000	-3.457*	H_1 supported
Central Bank of India	0.419	3.607	-0.000010	0.000	-1.899	H_1 rejected
Corporation Bank	0.874	34.643*	-0.000016	0.000	-5.885*	H_1 supported
Dena Bank	0.715	12.562*	-0.000011	0.000	-3.544*	H_1 supported

IDBI Bank	0.305	2.189	-0.000004	0.000	-1.479	H$_1$ rejected
Indian Bank	0.944	83.987*	-0.000018	0.000	-9.164*	H$_1$ supported
Indian Overseas Bank	0.838	25.975*	-0.000015	0.000	-5.096*	H$_1$ supported
Oriental Bank of Commerce	0.755	15.378*	-0.000009	0.000	-3.921*	H$_1$ supported
Punjab National Bank	0.917	54.954*	-0.000014	0.000	-7.413*	H$_1$ supported
Punjab & Sind Bank	0.989	467.724*	-0.000016	0.000	-21.626*	H$_1$ supported
Syndicate Bank	0.001	0.003	-0.000000	0.000	-0.052	H$_1$ rejected
UCO Bank	0.210	1.33	-0.000003	0.000	-1.154	H$_1$ rejected
Union Bank	0.965	138.186*	-0.000012	0.000	-11.755*	H$_1$ supported
United Bank	0.234	1.530	-0.000011	0.000	-1.237	H$_1$ rejected
Vijaya Bank	0.643	9.012*	-0.000005	0.000	-3.002	H$_1$ supported
State Bank of India	0.505	5.091	-0.000004	0.000	-2.256	H$_1$ rejected
State Bank of Bikaner & Jaipur	0.281	1.957	-0.000001	0.000	-1.399	H$_1$ rejected
State Bank of Hyderabad	0.189	1.168	-0.000003	0.000	-1.080	H$_1$ rejected
State Bank of Mysore	0.756	15.472*	-0.000009	0.000	-3.933*	H$_1$ supported
State Bank of Patiala	0.658	9.612*	-0.000007	0.000	-3.100*	H$_1$ supported
State Bank of Travancore	0.938	75.159*	-0.000016	0.000	-8.669*	H$_1$ supported
* $p < 0.05$						

Table 3 represents the output results of simple linear regression analysis by taking average inflation rate based on CPI as independent variable and ROA as dependent variable. From this table it is found that inflation rate has positive significant impact on ROA of few banks like, Andhra Bank, Bank of Maharashtra, Central Bank of India, Corporation Bank, Dena Bank, Indian Bank, Punjab National Bank, Union Bank, Vijaya Bank, State Bank of India and State Bank of Travancore.

Table 3   Regression Analysis Showing the Impact of Inflation on ROA

Banks	Output Results of Simple Linear Regression Analysis					
	R^2	F	B (Unstandardized	Std. Error	t	Remarks
Allahabad Bank	0.496	4.921	0.096	0.043	2.218	H$_2$ rejected
Andhra Bank	0.692	11.254*	0.161	0.048	3.355*	H$_2$ supported
Bank of Baroda	0.460	4.253	0.087	0.042	2.062	H$_2$ rejected
Bank of India	0.347	2.652	0.094	0.058	1.628	H$_2$ rejected
Bank of Maharashtra	0.922	59.360*	0.075	0.010	7.705*	H$_2$ supported
Canara Bank	0.436	3.868	0.097	0.049	1.967	H$_2$ rejected

Central Bank of India	0.486	4.725*	0.117	0.054	2.174*	H_2 supported
Corporation Bank	0.749	14.888*	0.162	0.042	3.858*	H_2 supported
Dena Bank	0.680	10.610*	0.114	0.035	3.257*	H_2 supported
IDBI Bank	0.372	2.961	0.050	0.029	1.721	H_2 rejected
Indian Bank	0.676	10.435*	0.161	0.050	3.230*	H_2 supported
Indian Overseas Bank	0.371	2.948	0.109	0.063	1.717	H_2 rejected
Oriental Bank of Commerce	0.542	5.906	0.083	0.034	2.430	H_2 rejected
Punjab National Bank	0.725	13.175*	0.133	0.037	3.630*	H_2 supported
Punjab & Sind Bank	0.560	6.352	0.129	0.051	2.520	H_2 rejected
Syndicate Bank	0.113	0.637	0.023	0.028	0.798	H_2 rejected
UCO Bank	0.028	0.146	0.012	0.032	0.382	H_2 rejected
Union Bank	0.708	12.117*	0.115	0.033	3.481*	H_2 supported
United Bank	0.309	2.237	0.136	0.091	1.496	H_2 rejected
Vijaya Bank	0.693	11.292*	0.060	0.018	3.360*	H_2 supported
State Bank of India	0.680	10.645*	0.050	0.015	3.263*	H_2 supported
State Bank of Bikaner & Jaipur	0.442	3.962	0.015	0.008	1.990	H_2 rejected
State Bank of Hyderabad	0.194	1.203	0.032	0.030	1.097	H_2 rejected
State Bank of Mysore	0.532	5.683	0.078	0.033	2.384	H_2 rejected
State Bank of Patiala	0.542	5.926	0.073	0.030	2.434	H_2 rejected
State Bank of Travancore	0.640	8.886*	0.145	0.049	2.981*	H_2 supported
* $p < 0.05$						

Table 4 shows the results of regression analysis by taking WPI of all commodities with base year of 2004-05 as independent variable and ROA as dependent variable. From this table it is seen that WPI has reverse significant impact on ROA of many banks except few like Bank of Maharashtra, Central Bank of India, IDBI Bank, Syndicate Bank, UCO Bank, United Bank, State Bank of India, State Bank of Bikaner & Jaipur and State Bank of Hyderabad.

Table 4   Regression Analysis Showing the Impact of WPI on ROA

Banks	Output Results of Simple Linear Regression Analysis					
	R^2	F	B (Unstandardized	Std. Error	t	Remarks
Allahabad Bank	0.696	11.451*	-0.012	0.004	-3.384*	H_3 supported
Andhra Bank	0.676	10.431*	-0.017	0.005	-3.230*	H_3 supported
Bank of Baroda	0.619	8.112*	-0.011	0.004	-2.848*	H_3 supported
Bank of India	0.655	9.504*	-0.014	0.004	-3.083*	H_3 supported

Bank of Maharashtra	0.465	4.338	-0.006	0.003	-2.083	H$_3$ rejected
Canara Bank	0.735	13.889*	-0.013	0.004	-3.727*	H$_3$ supported
Central Bank of India	0.470	4.427	-0.012	0.006	-2.104	H$_3$ rejected
Corporation Bank	0.854	29.273*	-0.018	0.003	-5.410*	H$_3$ supported
Dena Bank	0.642	8.954*	-0.012	0.004	-2.992*	H$_3$ supported
IDBI Bank	0.243	1.609	-0.004	0.003	-1.268	H$_3$ rejected
Indian Bank	0.936	73.184*	-0.020	0.002	-8.555*	H$_3$ supported
Indian Overseas Bank	0.786	18.400*	-0.017	0.004	-4.296*	H$_3$ supported
Oriental Bank of Commerce	0.701	11.715*	-0.010	0.003	-3.423*	H$_3$ supported
Punjab National Bank	0.897	43.525*	-0.016	0.002	-6.597*	H$_3$ supported
Punjab & Sind Bank	0.980	245.010*	-0.018	0.001	-15.653*	H$_3$ supported
Syndicate Bank	0.006	0.032	0.001	0.003	0.178	H$_3$ rejected
UCO Bank	0.234	1.529	-0.004	0.003	-1.236	H$_3$ rejected
Union Bank	0.974	184.37*	-0.014	0.001	-13.578*	H$_3$ supported
United Bank	0.226	1.815	-0.013	0.010	-1.347	H$_3$ rejected
Vijaya Bank	0.628	8.448*	-0.006	0.002	-2.907*	H$_3$ supported
State Bank of India	0.455	4.176	-0.004	0.002	-2.044	H$_3$ rejected
State Bank of Bikaner & Jaipur	0.226	1.458	-0.001	0.001	-1.207	H$_3$ rejected
State Bank of Hyderabad	0.203	1.277	-0.004	0.003	-1.130	H$_3$ rejected
State Bank of Mysore	0.811	21.475*	-0.010	0.002	-4.634*	H$_3$ supported
State Bank of Patiala	0.610	7.821*	-0.008	0.003	-2.797*	H$_3$ supported
State Bank of Travancore	0.959	116.284*	-0.019	0.002	-10.784*	H$_3$ supported
* $p < 0.05$						

Table 5 shows the results of regression analysis by taking exchange rate of Indian rupee with US dollar as independent variable and ROA as dependent variable. From this table it is found that exchange rate has negative significant impact on ROA of many banks except few like Bank of India, Bank of Maharashtra, IDBI Bank, Indian Overseas Bank, Syndicate Bank, UCO Bank, United Bank, State Bank of India, and State Bank of Bikaner & Jaipur.

Table 5   Regression Analysis Showing the Impact of Exchange Rate on ROA

Banks	Output Results of Simple Linear Regression Analysis					
	R^2	F	B (Unstandardized	Std. Error	t	Remarks
Allahabad Bank	0.924	61.222*	-0.045	0.006	-7.824*	H$_4$ supported

Andhra Bank	0.927	63.530*	-0.064	0.008	-7.971*	H_4 supported
Bank of Baroda	0.898	44.106*	-0.042	0.006	-6.641*	H_4 supported
Bank of India	0.274	1.886	-0.029	0.021	-1.373	H_4 rejected
Bank of Maharashtra	0.349	2.677	-0.016	0.010	-1.636	H_4 rejected
Canara Bank	0.957	111.288*	0.049	0.005	-10.549*	H_4 supported
Central Bank of India	0.593	7.284*	-0.044	0.016	-2.699*	H_4 supported
Corporation Bank	0.871	33.816*	-0.060	0.010	-5.815*	H_4 supported
Dena Bank	0.776	17.367*	-0.042	0.010	-4.167*	H_4 supported
IDBI Bank	0.489	4.793	-0.020	0.009	-2.189	H_4 rejected
Indian Bank	0.891	40.868*	-0.063	0.010	-6.393*	H_4 supported
Indian Overseas Bank	0.487	4.742	-0.043	0.020	-2.178	H_4 rejected
Oriental Bank of Commerce	0.861	30.966*	-0.036	0.006	-5.565*	H_4 supported
Punjab National Bank	0.902	46.169*	-0.051	0.007	-6.795*	H_4 supported
Punjab & Sind Bank	0.682	10.706*	-0.049	0.015	-3.272*	H_4 supported
Syndicate Bank	0.001	0.005	-0.001	0.010	-0.074	H_4 rejected
UCO Bank	0.248	1.646	-0.013	0.010	-1.283	H_4 rejected
Union Bank	0.744	14.54*	-0.040	0.011	-3.813*	H_4 supported
United Bank	0.404	3.383	-0.053	0.029	-1.839	H_4 rejected
Vijaya Bank	0.938	76.055*	-0.024	0.003	-8.721*	H_4 supported
State Bank of India	0.183	1.120	-0.009	0.008	-1.058	H_4 rejected
State Bank of Bikaner & Jaipur	0.533	5.701	-0.006	0.002	-2.388	H_4 rejected
State Bank of Hyderabad	0.570	6.638*	-0.019	0.007	-2.577*	H_4 supported
State Bank of Mysore	0.850	28.419*	-0.034	0.006	-5.331*	H_4 supported
State Bank of Patiala	0.780	17.689*	-0.030	0.007	-4.206*	H_4 supported
State Bank of Travancore	0.770	16.773*	-0.055	0.013	-4.095*	H_4 supported

* $p < 0.05$

Conclusion

The study concludes that though GDP indicates the economic growth of the country, its increase does not have a positive effect on profitability of many Indian public sector banks. But it is expected to have a significant positive relation on bank profitability. As the study showed a positive significant impact of inflation on few public banks' profitability in terms of ROA, government should take necessary improvements in implementing monetary policy. Simillar type of policy concerns should also be made related to WPI. Lastly, it is implicated from the study that the rise in exchange rate influences bank profitability (ROA). As the value of the Indian rupees (INR) against the US dollar decreases, it has a positive impact on the exports of the

country. While due to the decrease in the value of INR, the imports become dearer and expensive for the country. Further rise in exchange rate would mean an increase or decrease in foreign exchange earnings and gains by banks which improves or retards their profitability (Simiyu C N et al, 2015). Government should implement sustainable macroeconomic policies that will promote sustainable growth of banks in India (Osamwonyi I O et al, 2014). The importance of macroeconomic variables cannot be over-emphasized in the role performed by public sector banks to contribute effectively to the growth and the profitability of banks.

References

[1]   Alfani Lery & Rustandar Irvan (2013), "The Impact of Inflation to Private Banking Profitability", *International Journal of Science and Research*, Vol 2, Issue 3, pp: 469-472

[2]   Angur, M. G., Nataraajan, R. and Jahera, J. S. (1999); "Service Quality in the Banking Industry: An assessment in a Developing Economy"; *International Journal of Bank Marketing*; Vol. 17, No.3; pp. 116-123

[3]   Bhatia A, Mahajan P, Chander S (2012); "Determinants of Profitability of Private Sector Banks in India", *Journal of Commerce and Accounting Research*, Vol 1, Issue 2, pp: 14-22

[4]   Debasish Sathya Swaroop (2003); "Prime discriminators of profitability in the Indian commercial banks"; *Prajnan*; Vol. XXXI; No. 4; pp. 301-312

[5]   Dutta S, Gupta N, Rao P H (2013), "Determinants of Return on Assets of Public Sector Banks in India: An empirical study", *Pacific Business Review International*, Volume 5, Issue 11, pp: 23-28.

[6]   Flamini, C., Valentina C., McDonald, G., Liliana, S. (2009). "The Determinants of Commercial Bank profitability in Sub-Saharan Africa". *IMF Working Paper*.

[7]   Gopalakrishnan, S. (2005); "Customer Service and Grievance Redressal Mechanism", *The ICFAI Journal of Banking Law*, Vol. III, No. 4, (October), pp.29-30.

[8]   Industry snapshot (2004): Private sector bank industry; Report; October

[9]   Iustina Alina BOITAN (2015), "Determinants of sustainable banks' profitability: Evidence from EU countries", *Financial Studies*, pp: 21-39

[10]   Luthra M and Mahajan S (2014), "Impact of Macro factors on BSE Bankex", *International Journal of Current Research and Academic Review*, Vol 2, No 2, pp: 179-186

[11]　Marianne Gizycki (2001), "The effect of macroeconomic conditions on banks risk and profitability", *Research Discussion Paper, System Stability Department, Reserve Bank of Australia,* pp: 1-32

[12]　Neha Saini (2014), "Measuring the profitability and productivity of banking industry: A case study of selected commercial banks in India", *Prestige International Journal of Management & IT- Sanchayan,* Vol. 3(1), pp: 53-61

[13]　Osamwonyi I O & Michael C I (2014), "The impact of macroeconomic variables on the profitability of listed commercial banks in Nigeria", *European Journal of Accounting Auditing and Finance Research,* Vol.2, No.10, pp: 85-95

[14]　Otuori, O. H. (2013). Influence of exchange rate determinants on the performance of commercial banks in Kenya. European Journal of Management Sciences and Economics, 1(2), 86-98.

[15]　Pandi T. Durai and Vellingiri P (2014), "Factors determining profitability of public sector banks in India", *International Research Journal of Agriculture and Rural Development,* Vol 3, No 1, pp: 79-90

[16]　Pandya H & Parmar C (2014), "Profitability Analysis of Selected Nationalised Banks in India", *Global Journal for Research Analysis*, Vol 3, Issue 3, pp: 10-14

[17]　Sachdev S. B and Verma H.V (2004); "Relative importance of service quality dimensions: A multi-sectoral study"; Journal of Services Research; Vol. 4; No.1; (April-Sept); pp. 59-81

[18]　Sara Kanwal & Muhammad Nadeem (2013), "The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan", *European Journal of Business and Social Sciences*, Vol. 2, No.9, pp: 186-201

[19]　Shainesh G and Sharma Tanuja (2003); "Linkages between service climate and service quality- A study of banks in India"; IIMB Management Review; September; pp. 74-81

[20]　Sharma E and Mukta Mani (2012), "Impact of macroeconomic and financial market indicators on the banking sector: Some evidence from India", *International Journal of Research in Finance & Marketing,* Vol 2, Issue 2, pp: 172-185

[21]　Simiyu, C N., Ngile L (2015, Effect of macro economic variables on profitability of commercial banks listed in the Nairobi security exchange, *International Journal of Economics, Commerce and Management,* Vol III, Issue 4, pp: 1-16

[22]　Vittal, N (2002); "Challenges before the Indian banking sector"; Talk delivered at BECON; 16.01.; Calcutta