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CONTENTS

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Editorial Note

The world is passing through a severe economic turbulence. There is a downturn in the business worldover and the performance indicators of many countries are showing a downward trend. The dynamics of the global businesses is also taking its toll on the performance of Indian business houses. The prices of most of the necessities have sky rocked and on the foreign front the value of the rupee has been constantly depreciating. The unstable political situations in many states is adding to the cup of sorrows the country is facing in the recent times.

The policy makers and the planners are at crossroads to laydown a longterm growth plan. The existing knowledge bank with the nation is seemingly inadequate to address and overcome the crises situation arising in the different sectors. In this context research on the variety of problems being faced by the different sectors and studies aimed at going to the root cause of the problems gain importance. The present volume of SAJMR is a humble contribution in this direction. The interdisciplinary nature of the articles encourages the researchers to take a broader view of the research problems and give a new insight into the problems being encountered in India in particular and the world at large. This interdisciplinary approach of the journal has been maintained since its inception five years ago. The research articles included in this issue too fall under this category. Articles dealing with transport sector management to the individual organization studies dealing with business are published in this issue. Any branch of knowledge cannot be said to be in tune with times if it does not have link with the information technology era. Accordingly a book review dealing with database management has been specially selected for the issue.

We are sure that the research articles with their applied methodology will serve as guide to new researchers and contribute to give new insight into the respective field of study.

Dr. T. V. G. Sarma
Editor

The Impact of Bank-Specific and Macroeconomic Variables on the Profitability of Public Sector Banks in India : A Panel Study

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Abstract: Banking industry is one of the key industries to promote the growth of an economy. Public sector banks are playing a vital role since independence in growth of Indian economy. So, the profitability of these banks is an important issue and hence we have taken up a study on determinants of profits of public sector banks in India during the period 2000-01 to 2010-11. Here in this study we employed panel regression models and the Fixed effects model is found to be more suitable in explaining the determinants of bank profits.

Key words: Public Sector Banks, Profitability, Macro Economics, Panel Regression.

1.0 Introduction

Indian banking sector being a financial institution, plays an important role in economic development. Banking system in India exists for the last four centuries in one form or the other. Due to the initiative of British India of government, Reserve Bank of India (RBI) came into existence in 1935. Later, the banks were classified as Scheduled Banks and Non-Scheduled Banks based on their capital and reserves; i.e. banks with capital and cash reserves of Rs.5 lakhs were classified as Scheduled Banks, and banks which didn't meet the criteria were classified as Non–Scheduled Banks. In 1946, the Indian Banks Association (IBA) was formed to promote inter–banking cooperation and also to promote exchange of ideas from one bank to the other, in order to have a healthy banking system.

After independence several changes took place in the Indian banking system. In 1940, the Banking Regulation Act was formed to protect the interest of the depositors. In 1955, State Bank of India (SBI) was established by taking over the Imperial Bank of India, and it became a subsidiary bank to RBI. In 1959, a few new banks were established such as Bank of Indore, Bank of Mysore, Bank of Bikaner, Bank of Patiala, Travancore Bank and Saurashtra Bank, and became subsidiaries of SBI. In 1969, 14 major scheduled commercial banks were nationalized. In order to control the credit delivery of banks, government nationalized 6 more banks in 1986.

Ever since the nationalisation of banks from the year 1969 to 1990, banking sector faced several problems such as lack of capital (cash, interest earnings), high default rates in primary sector (agriculture sector), etc. The poor management of banks led to bankruptcy of many banks. The economic performance was very slow till 1990 due to slow growth rate of GDP, decline in industrial production, high unemployment rate, high budget deficit, and high current account deficit. In order to improve the economic situation, the government appointed a committee in 1991, which was headed by Narasimham. This committee recommended many reforms for improvement of economic activity.

The economic reforms in 1991, in India also brought a few reforms in banking sector which helped to enhance the performance of the banks. The main objectives of these reforms

were Liberalisation, Privatisation and Globalisation (LPG) which lead to establishment of many private and foreign banks in India.

Both the private and foreign banks were performing considerably well by having good amount of capital. The RBI stringent rules and competition from private and foreign banks had a negative impact on the public sector banks. Later the performance of public sector banks improved due to several acts such as cut in CRR, SLR rates, RBI suggestions for income recognition, asset classification and establishment of the Board of Financial Supervision and recapitalisation of public-sector banks. These changes resulted in public sector banks becoming competitive with the private and foreign banks. Many researchers conducted studies on the performance of Indian banking sector for different periods. However, only a few studies have been conducted with regard to the performance of Indian public sector banks. Some studies have undertaken to investigate the relationship between the profits of banks to only bank-specific variables such as credit-deposit ratio, bank's size, interest income, non-interest income, operating expenses, business per employee, expenses per employee, etc. Some other studies have taken both bank-specific and macroeconomic variables. There are some studies like Rakhe (2010), Badola and Verma (2006), who undertook their studies to know the determinants of profitability of banks and observed that expenses are negatively related to banks' profit. The non-interest income for banks comes from various sources such as commission, rent received, fee income etc., and these are positively related to profit of banks. This was observed in the analysis by Manoj.P.K (2010), Rashmi Shankar and Paroma Sanyal (2007). The major source of banks' income is from interest income and this is nothing but the difference between lending rates and deposit rates. As the interest income goes up, the banks' profit increases and this is proved in the analysis of P.Athanasoglou (2008). The size of the banks can be classified by their total assets. These are classified into two kinds; one is performing assets and the other is non-performing assets. The performing assets act as a positive determinant for the banks' profit and the non-performing assets (NPAS) act as a negative determinant. Anupam Mehrotra (2012) showed similar result. The total lending of the banks to the total deposit is called credit deposit ratio (CD ratio). As the ratio increases, the banks can earn more profits. Hence the CD ratio is a positive factor for banks' profit, and the same was observed in Reetu Kapoor and R.C. Dangwal (2012) in their study. The most important macroeconomic variable is broad money supply (M3). Broad Money consists of Time Deposits & Narrow Money. When money supply rises, the demand for commodities will rise. In order to meet the demand firms increase the investment by borrowing from banks. By lending to the firms, banks gets income in the form of rate of interest, and it will be added to profits. Hence there exists a positive relationship between the rise in money supply and banks' profit. Sudin Haron (1996) examined the profitability of Islamic Banks and showed that there exists a positive relation between money supply and banks' profit. Economic growth plays an important role in banking sector and also acts as a key determinant for banks' profit. One of the key indicators for capturing the economic growth is Index of Industrial Production (IIP). The growth in the Economy will motivate the firms to invest in business. One of the sources of investment is borrowing from banks. When borrowing increases, banks will earn more income. So, with the rise in economic growth, the economic activities increase and this leads to rise in demand for loans. Hence, banks earn profits. Rajesh Kumar Singh and Sakshi Chaudary (2009), analyzed data on Indian banks' profit showed that there was a positive impact on banks' profit. Similar relationship was found in studies of Williams (2002), Scott and Arias (2011). The borrowers' default rate is known as credit risk. Credit risk can occur at any point of time. As the credit risk goes up, the banks earn less profit. Hence, there exists a

negative relationship. It was shown by Rakhe P.B. (2010) in his analysis on the performance of foreign banks in comparison with the other Indian banks.

Almost all studies that have been conducted so far to understand the profitability of banks in India have included all types of banks i.e. public sector, private and foreign banks. However, the public sector banks differ in several respects in their characteristics to private or foreign banks. So, the present study tries to understand the role of bank-specific variables such as credit-deposit ratio, operating expenses, non-performing assets and macroeconomic indicators in the profits of public sector banks in India exclusively by analysing the panel data from 2000-2001 to 2010-2011.The paper is organised as follows: section 2 gives the data, variables, and methodology, in section 3 we present the empirical results and discussions, section 4 gives summary and conclusions.

2. 0 Data and Methodology

2.1 Data and Variables

In accordance with the scope and objective of our study, the panel data has been obtained from the 21 public sector banks balance sheets and RBI for the period 2000-01 to 2010-2011. A few banks were not included viz. IDBI Bank Ltd, Punjab and Sind Bank, State Bank of Patiala, State Bank of Hyderabad, and United Bank of India, as data was not available fully for the entire period of the study.

In this study, we considered the variables Net-Profit, Non-Performing Assets (NPAS), Money Supply (M3), Operating Expenses (OPEX) which are measured in crores of rupees, Prime Lending Rates (PLR) in percentage, Index of Industrial Production (IIP) in index form and Credit –Deposit Ratio (C/D Ratio) annually from 2000-2001 to 2010-2011.

2.2 Methodology

In this section we present briefly the econometric methodologies and models used in this study.

2.2.1 Panel unit root test

The Hadri panel unit root test is similar to the KPSS unit root test, and has a null hypothesis of no unit root in any of the series in the panel. Like the KPSS test, the Hadri test is based on the residuals from the individual OLS regressions of y_{it} on a constant, or on a constant and a trend. For example, if we include both the constant and a trend, we derive estimates from:

$$y_{it} = \delta_i + \eta_i t + \epsilon_{it}. \quad \text{.....2.1}$$

Given the residuals $\widehat{\epsilon_{it}}$ from the individual regressions, we form the LM statistic;

$$LM_1 = \frac{1}{N}\sum_{i=1}^{N}(\sum_t S_i(t)^2/T^2)/\bar{f}_0) \quad \text{.....2.2}$$

Where $S_i(t)$ is the cumulative sums of the residuals

$$S_i(t) = \sum_{s=1}^{t}\widehat{\epsilon_{it}}. \quad \text{.....2.3}$$

and f_{i0} is the average of the individual estimators of the residuals spectrum at frequency zero:

$$\bar{f}_0 = \sum_{i=1}^{N}\frac{f_{i0}}{N}.. \quad \text{.....2.4}$$

Alternative form of the LM statistic for heteroscedasticity across i :

$$LM_2 = \frac{1}{N}(\sum_{i=1}^{N}(\sum_t S_i(t)^2/T^2)/f_{i0}). \quad \text{.....2.5}$$

Hadri shows that under mild assumptions,

$$Z = \frac{\sqrt{N}}{\zeta}(LM - \xi) \rightarrow N(0,1). \quad \text{.....2.6}$$

Where $\xi = \frac{1}{6}$ and $\zeta = \frac{1}{45}$ if the model only includes constants (η_i is set to 0 for all i), and $\xi = \frac{1}{15}$ and $\zeta = \frac{11}{6300}$ otherwise.

The Hadri panel unit root tests require only the specification of the form of the OLS regressions: whether to include only individual specific constant terms, or whether to include both constant and trend terms.

2.2.2 Panel Data Models

Panel data has several advantages over conventional cross sectional or time series data in economic and financial research. The basic panel data model can be written as

$$y_{it} = \alpha^* + \beta' X_{it} + \rho' Z_{it} + u_{it}.$$
$$i = 1,2, \ldots \ldots N, t = 1,2, \ldots \ldots T$$
.....2.7

Where X_{it} and Z_{it} are $K_1 \times 1$ and $K \times 2$ vectors of exogenous variables, unobserved variables; $\alpha^* \beta \text{ and } \rho$ are 1×1, $K_1 \times 1$ and $K \times 2$ vectors of constant respectively; and the error term u_{it}. is independently, identically distributed over *i* and *t*.

In these models we can treat the specific effects as fixed or random and the associated estimation methods for linear static models as

$$y_{it} = \beta' X_{it} + \alpha^*{}_i \lambda_t + u_{it}.$$
$$i = 1,2, \ldots \ldots N, t = 1,2, \ldots \ldots T$$
.....2.8

Most often we wish to use panel data to estimate the dynamic behaviour relationships as models containing lagged dependent variables as

$$y_{it} = \gamma y_{i,t-1} + \beta' X_{it} + \alpha^*{}_i + \lambda_t + u_{it}$$
$$i = 1,2, \ldots \ldots N, t = 1,2, \ldots \ldots T$$
.....2.9

Now there is a choice between static model and dynamic model depending on circumstances and appropriateness of the problem under study. Also we can have fixed effect model or random effect model in the linear static model depending on the effects $\alpha^*{}_i$ and λ_t be treated as fixed or random.

2.2.2.1 Fixed Effects Model

In the fixed effects approach, for the individual *i* in the time period *t* the model may be written as

$$\Delta y_{it} = \sum_{j=2}^{k} \beta_j \Delta_{ijt} + \delta + u_{it} - u_{it-1}$$
.....2.10

Then we apply OLS to obtain the estimators of the model.

2.2.2.2 Random Effects Model

In the random effects approach we may write the model as

$$y_{it} = \beta' X_{it} + \alpha^*{}_i + \lambda_t + \nu_{it}.$$
.....2.11

Where ν_{it} *is* $\alpha_i + u_{it}$

This model is also known as error component model, since the variance of ν_{it} is

$$\sigma^2 \nu_{it} = \sigma^2 \alpha_i + u_{it} = \sigma^2{}_\alpha + \sigma^2{}_u + 2\sigma_{\alpha u}$$
$$= \sigma^2{}_\alpha + \sigma^2{}_u \quad \forall\, i \text{ and } t \ldots\ldots 2.12$$

2.2.2.3 Dynamic Model

The dynamic panel model may be represented by $y_{it} = \gamma y_{i,t-1} + \beta' X_{it} + \alpha^*{}_i + \lambda_t + u_{it}$

.....2.13

The interpretation of the model depends on the assumptions and behaviour of initial values y_{i0}. There are several estimation methods available to estimate the dynamic models such as Generalised Least Squares (GLS), Maximum likelihood estimation (MLE), Instrument variables method (IV) and Generalised Method of Moments (GMM) etc.

The GMM estimation method introduced by Hansen (1982) is popular method among the econometricians. In GMM method we utilise them moment conditions and it involves need to specify (i) instruments Z, (ii) choosing the weighting matrix H and (iii) determining an estimator for ^. A wide range of specifications may be viewed as specific cases in the GMM frame work. Here we utilised the specifications used by Arellano and Bond (1991) in our estimation. (For details see Cheng Hsiao (2003)).

3.0 Empirical Analysis

In this section, we present the results of this study. The summary statistics of the variables is given in table3.1. The estimation results of panel data models namely Fixed effects model (FE), Random effects model (RE) and Dynamic model (GMM) are provided in table 3.2.

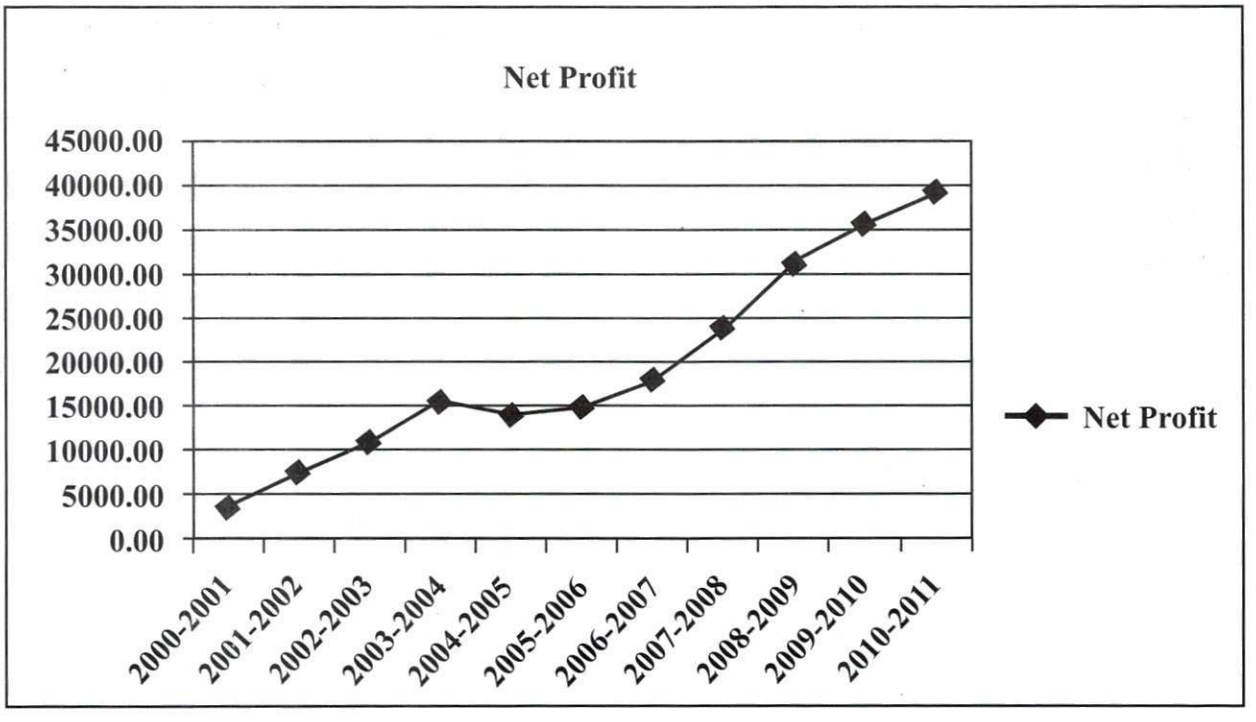
3.1 Summary Statistics

Table 1 Summary Statistics

Sl.no	Variables	Mean	Median	Maximum	Minimum	Std.Dev	Skewness	Kurtosis
1	Net Profit	19321.30	15091.31	39125.40	3889.210	11432.21	0.501830	2.060830
2	CD ratio	0.626072	0.664874	0.753223	0.485433	0.108588	-0.18458	1.256404
3	M3	3247768	2719519	6499548	1313220	1762937	0.619437	0.060799
4	opex	49769.50	43673.87	102905.6	24568.93	23178.39	1.1629.5	3.573851
5	IIP	138.0355	141.60	165.48	108.620	15.996	-0.134	2.488
6	PLR	11.059	11.130	12.500	8.8800	1.0733	-0.4475	2.630053
7	NPAS	45422.10	46518.87	64013.98	34815.77	8983.713	0.556570	2.59.673

From the table.3.1 it can be observed that on an average ever year the profits of the banks are 19321.30 crores, the maximum and minimum profits are 39125.40 crores and 3889.210 crores respectively. The credit deposit ratio (CD ratio) on an average is 0.62. The maximum credit deposit ratio for every year is 0.75 and minimum ratio is 0.48. The operating expenses are important determinant for banks' profit and average expenses for every year are 49769.50 crores, the maximum expenses incurred by all banks are around 102905.6 crores, and minimum expenses are 24598.39 crores. Money supply acts as positive determinant for banks' profit the average amount is 3247768 crores. The maximum amount of money supply in the economy is 6499548 crores and minimum is 1313220 crores. The index of industrial production (IIP) is one of the good measures for the economic growth and its average production is 138.03, maximum is 165.48 and minimum production is 108.62. On an average the prime lending rate is 11.06 percent, maximum rate is 12.50 percent and the minimum rate is 8.88 percent. The maximum value of NPAS is 64013.98 crores, minimum value is 34518.77 crores and average NPAS value is 45422.10 crores.

Fig. 1 Net Profits of the Indian Public Sector Banks from 2000-2001 to 2010-2011



From the table.3.1, and fig.3.1 one can observe that profits of public sector banks have been increasing from 2000-2001 to 2010-2011except for the year 2004-2005 where it has decreased marginally. This decline could be because of some reasons such as declined in the yield on government securities from 5.92 percent to 4.78 percent, increase in the cost of fund from 5.00 percent to 5.7 percent, increase in CRR from 4.50 to 5.00 (50 basis points), increase in the repo rate from 6.00 to 6.25 (25 basis points), decline in the Return on advances from 7.9 percent to 7.2 percent, decline in the Return on investments from 8.5 percent to 8.00 percent, decline in the Return on funds from 8.2 percent to 7.5 percent. But from the year 2005-2006 to 2010-2011, the profits increase may be due to rise in yield rate on government securities, Return on advances, Return on investments, Return on funds, Interest income and other income. The cost of borrowing and cost of funds were also declined.

Table 2 Empirical Results of Fixed Effects, Random Effects and Dynamic Model

Variables	Fixed effects (FE)	Random effects model (RE)	Dynamic model (DM)
C	-8.712501 (-7.046484)	-6.644282 (-5.746435)	-2.839679 (-1.724837)
LNNPAS	-0.190511 (-2.759477)	-0.168050 (-2.597103)	-0.250291 (-1.988740)
LNM3	0.849594 (4.233874)	0.094889 (0.654695)	-0.263599 (-1.592197)
LNOPEX	0.185836 (0.999637)	1.026307 (10.20418)	0.787118 (3.663608)
LNCDRATIO	-0.459390 (-1.098541)	0.439684 (1.203989)	0.896236 (2.069797)
D(D(LNPLR))	-0154064 (-1.034340)	-0.450914 (-3.312559)	-0.270737 (-1.113321)
LNIIP	0.880846 (3.556458)	0.702477 (2.964031)	0.481687 (1.563198)
AR (1)	----------	----------	0.481687 (7.590790)
R^2	0.917228	0.719103	0.878566
Adj. R^2	0.903608	0.709634	0.873117
D h	----------	----------	-0.0455
D W stat	1.720133	1.396995	1.892631
F-Statistic	67.34094	75.9431	---------
Instrument Rank	----------	----------	8.000000

To analyse the Banks' profit, we have used three different models of the panel data namely fixed effects model, random effects model and dynamic model.

The table.3.2 shows the results of all three models namely fixed effects model, random effects model and dynamic model. This study observes that fixed effects model is more suitable in explaining the determinants of banks' profit through the regression measures such as R^2 and F- values. The variables money supply (M3), index of index of industrial production (IIP) are positively significant whereas Non-performing assets (NPAS) negatively significant. The prime lending rate (PLR), operating expenses (opex) and credit deposit ratio (CD ratio) are not found to be statically significant.

The economic activity affects banks' profits to a great extent. When there is good economic activity, it attracts the investors to invest more in the business and earn more profits. In order to increase the industrial production, they borrow from banks. So, there may be a positive relation between the banks' profit and industrial growth. In this study we have taken index of industrial production (IIP) which is a good proxy for the economic activity. The results of this study are in consistent with the theoretical explanation and also with the observations of Rajesh Kumar Singh and Sakshi Chaudary (2009)

The money supply plays an important role in the economy. When money supply increases in the economy, it indicates that people are having more money on their hand. Too much rise in money supply is a not good sign for economic growth. In order to control the money supply, banks will increase the interest rate. By doing this, people will get attracted to bank interest rate and excess money will be deposited in the banks. This will control the money supply in the economy. Out of total rise in deposited amount, banks invest in the bonds and securities and hence banks earn some dividends and these dividends are added to banks' profit. Due to this reason we can expect a positive relation between banks' profit and money supply. Our result also supports this point of view.

The NPAS are the default amount of borrowers and when this increases, this will eaten away profits of the banks. If the banks are having huge NPAS, the banks cash inflows will decline which will lead to decline in lending capacity of banks and when lending capacity comes down, the bank's profits will fall. So, the NPA's will have a negative relationship with banks' profit. Our results are in accordance with the theoretical explanation as well as in consistent with the empirical analysis of Badola and Verma (2006) on Indian banks' profit.

4. 0 Conclusion

As banking sector is one of the financial institutions in India, it plays a key role in financial development as it leads to the economic growth and vice versa. Since economic growth and banking sector performance are related, it is necessary to know the factors which determine the performance of the banking sector. There are many factors which influence the performance of the banking sector both internally and externally. Though there are several studies on the determinants of profits of banks in many countries including India and these studies concluded that profitability of banks depends on many variables such as non-interest income, provision and contingencies and other determinants. However, there is no common opinion on the determinants of profitability of banks in India, in this study, we used panel data models, Viz. fixed effects, random effects and dynamic model to find the determinants of profits of public sector banks in India. The results of these models suggest that the fixed effects model is found to be more suitable for this data as it is able to capture the effects of the

explanatory variables on the banks' profit and the relationship between the explanatory and depend variable are theoretically consistent. This study observes positive and statistically significant variables like index of industrial production (IIP), money supply (M3) and the negatively related variable is non-performing assets (NPA).

Hence, we conclude that, in order to maintain the profits in a consistent manner, banks have to pay enough attention to the changes in money supply and should take necessary steps to decrease the non-performing assets.

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