DETERMINANTS OF PROFITABILITY IN INDIAN BANKS: A PANEL DATA ANALYSIS

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Abstract

With every passing day, people come across scams and issues related to banks in India. People are perplexed that what determines a nice bank to rely their hard-earned money on. In pursuit of this, the current paper is an attempt to explore the determinants of profitability in banks. Data of 30 Indian commercial banks (including public and private sector banks) are taken for the last five years (FY 2014-15 to 2018-19). Static panel data econometrics is applied with a fixed effect. Profitability is regressed on regulation and NPA in banks. It is found that profitability in an Indian bank is positively related to regulation and negatively related to NPA in banks. The results were startling and significantly contribute to the existing lode of knowledge. The negative association of NPA with profitability is as expected but a positive association of regulation with profitability is a very surprising and encouraging result found in the study. The positive association of regulation with profitability has far-reaching implications for regulation in general and the profitability of banks in particular. These results can be a game-changer as regulation is often criticized to have a big dent in the profitability of the banks. However, the results of this paper support the ongoing debate that regulation has a positive impact on profitability. A study of the profitability of banks with more number of relevant variables and variables which are measured more effectively can be the future scope on the topic..

Key words: Profitability, Regulation, NPA, Banks, Panel Data Analysis

Introduction

A bank has many dimensions. A bank caters to different segments of society. A bank does not come into being because banks need to make profits. Banks also have their social obligations, economic obligation, and national obligations and above all banks needs to be profitable so that it can self-sustain. In India, the nationalization of banks happened in 1969, just to ensure that the multi-tiered goals of a bank remain intact. Private sector banks, by being private carry more risk than the public sector (Government Sector) banks. Public sector banks have their vested interests, besides banking that is to extend their support and contribution to all the segments of the society.

Therefore, regulation becomes one of the most important parts of banking. A bank can have deposits from the public in general. This facility is not vested with any other financial organization. Moreover, the rate of interest on such generic deposits is quite less. However, the volume of deposits is very high. Above all, the larger chunk of the deposits is pure demand deposits where banks need not pay any interests (such deposits are called current account in the common parlance in India). Keeping in view the features attached to being a bank, the issue of regulation becomes more germane and quintessential.

In addition to regulation, another part that impacts the performance of the bank in terms of their long-term sustainability and profitability is non-performing assets (NPA) (Sen and Sen, 2015, Shajahan, 1998). NPA and banks have their inseparable association with each other. Extending loans and advances to business organizations are one of the most important parts of the business model of a bank. The parties, who take the loans also carry the inherent risk of default. The reasons for default or delinquency of the loan repayments are another area of study (Nguyen and Nghiem, 2015). In this paper, the use of NPA is limited to the role of NPA in the performance of the bank. If we dig further and explore the intention for compromise on the asset quality, which may lead to NPA, we find that the vested interest of the managers of the banks takes precedence over the

betterment of the bank. Another intention of compromise on asset quality can be to meet the requisite target of extending the credit. However, irrespective of the intention of compromise on the asset quality, it is seen that it leads to the poor performance of the bank in the long run. However, this paper also wishes to explore whether NPA may lead to better performance of the banks in any way.

As discussed earlier, profitability is not the sole objective of banks but banks cannot ignore not being profitable to remain in business. Therefore, it becomes more pertinent to explore the determinants of profitability in a bank. Athaley et al. (2020) and Singh and Rastogi (2020) discuss this issue in their context but relevance and variables of profitability are important aspects discussed in both the studies. Performance of banks is a multifaceted concept depends on multi-factors which are perfectly interwoven with one another (Ayadi et al., 2016, Bikker, 2010, Callahan and Soileau, 2017, Shajahan, 1998).

Market risk, however, seems incongruous for a bank's performance, surely leave its impact on the performance of the banks (Rastogi, 2010, Rastogi, 2011, Rastogi, 2013, Rastogi, 2014, Rastogi and Athaley, 2019, Rastogi et al., 2019, Rastogi et al., 2018). Banks do not survive in the vacuum. Market corrections or trade cycles impacting the market surely impact the cash flow of the companies which eventually make its impact on the performance of the banks. Unless the market or economy performs, the cash flow is precluded, or at least digression of the cash flow takes place, which eventually impacts on the performance of the banks (especially NPA level change for worse). The inclusive growth of the country is also linked to the banks. The success of the financial inclusion initiative of the Government also largely hinges on the performance of the bank (Rastogi and E, 2018, Rastogi et al., 2020).

The **objective** of the current paper is to explore the determinants of the profitability of the bank. It is believed that the goals of the bank can be many but the plethora of expectation from a bank (linked to the performance of a bank) can only be met when the banks are financially profitable and have the profitability to sustain and survive in the long-run.

The rest of the paper is divided into six more sections (total 7 sections). The introduction section is followed by a review of literature which is followed by the 3rd section on the theoretical model build in the paper. Data and Methodology are discussed in the 4th section followed by Results in the 5th section and Discussion in the 6th section. Paper is concluded in the 7th section along with the limitation and future scope of the paper.

Review of literature

A bank is a kind of social institution which has more than one concurrent goal to serve. An economic agenda of the bank is also in a way relates to the cause of the society in its larger interest. Academic literature on banking is replete with the issues which are directly or indirectly linked to its performance.

Regulation has its impact on the performance of the bank as well as on the profitability of the banks (Agoraki et al., 2011, Barth et al., 2008, Barth et al., 2004a). Regulation is a double-edged sword. It helps in reducing the risk-taking of the bank but simultaneously it impacts the profitability of the bank (Bolt and Tieman, 2004, Chen, 2007). There a few issues concerning the regulation in banks, which are usually part of any discussion. Firstly, it is debated that why regulation should reduce profit. This implies that less regulation is riskier and brings more profitability. However, there is the least evidence that reflects that more risk leads to more profitability (Barth et al., 2008, Barth et al., 2004b). On the other hand, there is a discussion that says that the incumbent regulation is ineffective as it was unable to restrain the world financial crisis of 2007 (Pakravan, 2014, Samitas and Polyzos, 2015). Moreover, Basel III, which is the result of the failure of the financial crisis of 2007 has done more harm than good (Schwerter, 2011). The issue of regulation and its impact on profitability is still a matter of discussion and debate which this paper has helped to provide a direction.

Profitability has always been an important measure to establish the performance of a bank (Bikker and Vervliet, 2018, Ozili and Uadiale, 2017, Trad et al., 2017). Profitability and risk are supposed to move in opposite directions (Balasubramaniam, 2012). Provisioning is considered to be another big dent in the

understanding of the role of risk-taking for the profitability of the bank. (Claessens, 2003, De Lis et al., 2001, Laeven and Majnoni, 2003). Provisioning should manage or hedge the risk but it is considered to be reducing the profitability. This paper is an attempt to figure out what are the determinants and how do they impact the profitability of the bank.

NPA always left its scar on the performance as well as the profitability of the banks (Midthanpally, 2018, Sen and Sen, 2015, Shajahan, 1998). NPA is considered to be the biggest problem of the bank. NPA is a vicious cycle. Banks extend loans to less creditworthy people which leads to NPA. NPA causes profitability to fall and banks become desperate the become profitable. Again, to be profitable, banks extend load to compromised people at lesser rates but the cycle of poor advances to low profitability goes on (Sen and Sen, 2015, Shajahan, 1998).

Some percentage of the total advances are sure to turn into bad debt. Provisioning is the option to take care of that and it may reduce the dent to the profitability of the banks but can be managed in the long-run provided banks do not get trapped by the vicious cycle of extending inferior quality loaning. Provisioning using analytics comes under risk management which is not bad even if it reduces the profit. But having poor quality assets on the book, putting the actual non-performing assets under wrap for years, and misinforming the market of their true position create more issues of corporate governance than of any good to the banks. This debate is still on this paper throws light on the issue of how NPA causes the profitability of the banks.

This paper is an attempt to address the relevant issues of regulation and NPA to determine the performance of the banks (when the performance of a bank is measured by a relatively narrower perspective of *Profitability*). The extant literature is not adequate to reflect upon the association between profitability and its determinants. The gap in such literature is not limited to the concept by the methodology used also needs a different perspective which hitherto not observed in the extant literature.

Econometric Model for Analysis

We believed that profitability in a bank is strongly linked to regulation and level of NPA (Equation-1).

$$NAM = \beta_0 + \beta_1 CAR + \beta_2 NPA + \epsilon \qquad \text{Equatiuon-1}$$

Where:
βs are coefficients in the equation.
CAR is capital adequacy ratio to measure regulation
NPA is non-performing asset to measure risk in the bank
The equation-1 is tested in the paper to explore how regulation (CAR) and NPA are associated with the profitability of a bank.

Data and Methodology

Data for the study is collected from RBI, the central bank of India. RBI website provides an authentic and exhaustive database of banks that fall under its jurisdiction for regulation. The data of 30 Indian banks for 5 years (from FY 2014-15 to 2018-19). The 30 banks were taken based on the availability of the data among all the private and public sector banks operating in India.

Literature is full of instances where to measure profitability, NPA, and regulation NPM (Net Profit Margin), NPA, and Capital adequacy ratio (CAR) respectively are used. The same approach is adopted in this paper (Table 1).

Table 1. Description of Variables

SN	Category	Variable	Notation	Sources

1	Regulation	Capital Adequacy Ratio	CAR	Agoraki et al., 2011, Barth et al., 2008, Barth et al., 2004
3	Profitability	Net Profit Margin	NPM	Bikker and Vervliet, 2018, Ozili and Uadiale, 2017, Trad et al., 2017
5	NPA	Non-Performing Assets	NPA	Midthanpally, 2018, Sen and Sen, 2015, Shajahan, 1998

Note: The regulation category has been represented CAR; the Profitability category is represented by NPM and NPA category is per se the variable to represent itself.

Panel data econometrics is used to establish the relationship (Equation-1). The use of panel data econometrics for studies on banks and its performance is prevalent and therefore the same established method is adopted in this paper (Gonzalez, 2005, Ozili and Uadiale, 2017). Before running the panel data models, the unit root test is conducted on all the three variables used in this study to establish the stationarity of the data. However, it is said that in case group (n) is more than the time (t), testing of stationarity can be ignored, in this paper, we have conducted the panel unit test to explore the stationarity of the variables (Baltagi, 2008, Harris and Tzavalis, 1999, Levin et al., 2002) (Table 2). The null hypothesis of the unit root has been rejected in all the variables tested for the stationarity (Table 2).

Table 2. Panel Unit Root Test (Under the assumption of Cross-Sectional Independence)

	z-statistics	p-value
CAR	-5.9797	.0000
NPM	-8.8863	.0000
NPA	-4.4505	.0000

Notes: Panel unit test is tested using Harris and Tzavalis (1999) Method because of N/T tends to zero condition of LLC Panel Unit root method is not fulfilled in our data (Baltagi, 2008, Levin et al., 2002)

The descriptive statistics of the variables used in the study are reported in Table 3. The correlation matrix posits that the correlation association between NPM and CAR is .67 and significant. The correlation coefficient between NPA and CAR is -.65 (negative) and significant. In addition to this association (correlation) between NPA and NPM is -.80 (negative) and significant. Moreover, the mean CAR is 13.2% with a standard deviation (SD) of 2.37%. Mean NPM in India is 1.75% with the standard deviation of 10.54 reflects the huge variation in profitability in banks. The descriptive statistics of the Profitability of such low mean and high SD is the main motivation for this study. Mean NPA is also 4.79% with an SD of 3.73 %.

Table 3. Descriptive Statistics

Correlation Matrix					
	CAR	NPM	NPA	Mean	SD
CAR	1.00			13.02	2.37
NPM	.67* (.00)	1		1.75	10.54
NPA	-.65* (00)	-.80* (.00)	0	4.79	3.73

Note: Values are correlation coefficients. Values in parenthesis are p-values. * significant at 5%. SD is the standard deviation.

Results

The results of the analysis are reported in Table 4. Profitability is regressed on NPA and CAR (Regulation). The coefficient of NPA is negatively significant (-2.3042) and the coefficient of CAR is positively significant (1.3334). The F-value of the model is large and significant (11.53). R-square, the model fitness, is also reasonably good at 68.66%.

Effect testing for panel data is done and reported in Table 4. The fixed effect is significant but the random effect is insignificant. In addition to this, the Hausman test of panel data is conducted to confirm the effects which are also significant. Baltagi (2008) suggests in such a situation, a Fixed Effect should be applied to regress the panel data. This implies that the individual effect (group effect) is part of the intercept and not part of the error variance. Diagnostic analysis of results exhibits that panel-autocorrelation is not significant however, heteroscedasticity is significant.

Discussion

The role of NPA has always been criticized. It has two broad aspects. First, NPA cannot be reduced beyond a threshold level. Default in advance repayments has multiple reasons which include wilful defaulters (Nguyen and Nghiem, 2015). It is the non-willful defaulters who may have

Table 4. Result of Regression Analysis

	DV: Profitability (NPM)
Constant	-4.5665 [7.7436] (.557)
CAR	1.3334* [.5717] (.0210)
NPA	-2.3042* [.2509] (.0000)
F-test (Model)	11.53 (.0000)
DF	118
R-Square (Adjusted)	.6866
F-test Fixed Effect	2.32 (.045)
Breush-Pagan Test	0.32 (.78)
Hausman Test	7.79* (.0207)
Note: No of observations (n)	150
Wooldridge Autocorrelation Test[1]	.062 (.8094)
Wald test for Heteroscedasticity[2]	687.71* (.0000)

Note: [1] Wooldridge test of autocorrelation in the panel has the null of no autocorrelation (with 1 lag). [2] Wald test of heteroscedasticity has the null of no heteroscedasticity. [ ] presents standard error and ( ) presents p-value.* significant at a 5% level of significance.

genuine reasons for default (e.g. poor trade cycle, a slump in the economy or any firm-specific temporary reasons, etc.) always remain there which constitute bare minimum unavoidable NPA. Second, bankers make efforts to increase their advances to have better profitability in the future. Concomitant to such efforts, a sort of compromise is done by the bankers in terms of the quality of such advances or assets. People of doubtful creditworthiness might be extended the advances constitute another part of NPA. Irrespective of the constituent,

former or the latter, eventually, it has its adverse impact on the profitability of the banks. The results are supported by the other studies as well (Sen and Sen, 2015, Shajahan, 1998).

Regulation is part and parcel of banking across the world. This paper finds that regulation is positively associated with the profitability of the banks. A few findings have supported the results (Bagh et al., 2017, Delis et al., 2011). However, some studies find evidence which is different from this study (Lee and Hsieh, 2013, Nguyen and Nghiem, 2015). In case, we explore the expectations from regulation on the banks, we believe that the regulation should have a positive impact on the profitability of bank performance. The purpose of regulation is to ensure that banks are operating the way they should operate. This is the obvious question that how regulation can negatively impact the profitability of the banks? If this happens temporarily, it may be acceptable. However, if this happens in the long-run, either method of regulation or the banks are not in the right shape. In the normal course, regulation should neither be neutral or negative with respect to the bank performance. The results of this current study not only corroborates the finding the other studies but support the expectation from the regulation of banks.

The findings of the current paper significantly contribute to the extant lode of the knowledge on this topic. This paper demists the role of NPA on the profitability of the banks. The endorsement of the paper for a positive impact of regulation on profitability is another important contribution of the paper. The findings of the paper have several implications: 1) people who criticize that regulation is poor for banking and banks' profitability need to revisit their convictions on this issue; 2) banks can change their perception towards regulation and can believe that regulation if executed factually can in fact support to increase the profitability of the banks; 3) banks need to plan and execute the requirements of the regulation. The regulation especially mandatory regulation is seen as a binding and fulfilment of the regulations are done for the sake of the fulfilment. On the contrary, if regulation is executed for the sake of betterment and reducing the risk of banking operation, there should not be an issue that regulation would eventually be able to support the better performance of the banks; and 4) In addition to this, for the former reason of NPA, it is better to do provisioning using financial analytics so that the adverse impact of NPA is not seen on the profitability of the banks. This is an important application of analytics so match the risk with the expected return and do the risk-hedging and planning accordingly.

Conclusion, Limitation and Future Scope

The current paper discusses the determinants of profitability of banks. It is found that a bank's profitability is positively associated with regulation imposed on the bank. In addition to regulation, a bank's profitability is negatively associated with the NPA of the bank. This paper does not use only two variables (namely regulation and NPA) to test as determinants of profitability. In addition to this, only one proxy of each (regulation and NPA) are taken for testing. Both, more variables and within considered variables an index number (e.g. index to measure regulation and another index to measure NPA) could have been taken to have a better analysis of the concept of the determinants of the profitability in banks.

Analysis of profitability using other possible variables in addition to regulation and NPA can be the future scope on the topic. Moreover, for every variable instead of taking one proxy, indices can be developed and analysis can be done in the futur.

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