# Indian Bank Profitability Drivers Include: A Study of Dynamic Panel Data

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## Introduction

Due to increasing total national output growth rates, Indian banking has recently gained increased attention. Unlike banks in wealthier countries, Indian banks escaped the global financial crisis relatively undamaged. Despite the fact that India is a large emerging economy, little effort is put into finding the sources of bank advantage. A study of Indian banking execution before and after the global monetary emergency will be of significant importance in this context. Bank performance is measured using a variety of monetary measures. Return on normal resources is a commonly used metric to determine profitability. In addition to returns on normal resources, returns on value are evaluated. Banks are striving to earn additional revenue by extending non-premium pay in response to the growing burden on intermediation, which has resulted in a loss of net revenue edge. The percentage of non-interest income to operational income is used to determine revenue diversification. Indian banks were found to have a lower ratio of diversification strategies than banks in developed countries. With net interest margins (NIM) in India under pressure, it's likely that banks will look for ways to enhance earnings through diversification. NPLs are also being investigated in terms of cost effectiveness (Pod Piera and Weil, 2008), management quality, and macroeconomic variables such as interest rates, fiscal deficits, and GDP growth (Beck et al , 2015; Kauko, 2012; Nkusu, 2011) The Arellano and Bond estimator is based on moment conditions, with the lags of the dependent variable and the first differences of the exogenous variables used as a first-differenced equation. This technique has a significant advantage because it tackles endogeneity, heteroscedasticity, and autocorrelation (Arellano & Bover 1995; Lee et al 2012) From 2006-2007 to 2012-2013, data was collected from both commercial and public sector banks in India. Contrasts in execution in light of possession have long sparked public discussion and intellectual interest. The goal of this study is to evaluate the Indian financial industry's presentation, which covers both community banks and private community banks. Private area banks that prioritise innovation have better execution, according to consensus. This article examines the impact of ownership, non-performing assets, bank size, cost-to-pay ratio, and pay enhancement on productivity as measured by ROAA and ROE.

In the past, data envelopment analysis (DEA) was used significantly by Indian banks for execution assessment. We have sent unique board information that also eliminates the endogeneity problem while employing slack levels and slack contrasts of the regressors as instruments. The following is the outline of the paper:

Area 2 depicts Indian banking and organisation. The writing audit is examined in Section 3, and the philosophy and information are presented in Section 4. Segment 5 covers model specifics, whereas Segment 6 presents experimental data. Area 7 brings everything together and provides administrative advice and recommendations. A bank has several features. A bank is in charge of many aspects of society. A bank does not show up on the premises where banks make money. Banks have social, financial, and public commitments, among other things, and all banks should be productive with the goal of self-maintenance. Banks were nationalised in India in 1969 to ensure that the multi-layered aims of a bank could be salvaged. Private area banks represent a larger risk than public area (government sector) banks because they are private. Apart from banking, public area banks have a personal interest in assisting and committing to everyone in the community. As a result, policy becomes one of the most important aspects of banking. A bank can accept deposits from the general public. This office is unaffiliated with any other financial institution. Furthermore, such conventional stores have a very low interest rate. Whatever the case, the number of stores is astronomically enormous. Most importantly, the majority of the stores are pure interest stores, meaning banks are not required to pay any interest (such stores are called current record in the normal speech in India) With the advantages of having a bank in mind, the question of guidelines becomes even more important.

The goal of the research is to determine the factors that influence bank productivity in India, such as bank explicit features, banking industry factors, and macroeconomic factors. The article uses data from Indian public and private banks for the years 2006-2007 to 2012-2013. More than 90% of all deposits are held by these two banks.

India's scheduled business bank business. The review takes into account the investigation into the unique board information. Bank explicit elements, banking industry factors, and monetary variables are among the dependent components, whereas bank explicit elements, banking industry factors, and monetary variables are among the autonomous factors. Nonperforming loans and the cost-to-pay ratio are two bank explicit factors that influence bank benefit and enhancement metrics without affecting bank productivity.

The purpose of this research is to investigate the elements that determine a bank's productivity. When banks are monetarily advantageous and have the productivity to sustain and get by, the numerous assumptions from a bank (related to the bank's presentation) must be met.

The remainder of the paper is split into six sections (out of a total of seven) The presenting section is followed by a writing audit, which is then followed by the third segment on the paper's hypothetical model form. Research and methods are discussed in the fourth segment, followed by results in the fifth segment and discussion in the sixth segment. In the seventh component, the paper is deduced, together with the obstruction and the study's future scope.

Historically, profitability has been a key criterion for assessing a bank's performance (Bikker and Vervliet, 2018, Ozili and Uadiale, 2017, Trad et al , 2017) Risk and profitability are supposed to be mutually incompatible (Balasubramaniam, 2012) Provisioning is considered as another another key flaw in the understanding of risk-role taking's in a bank's profitability (Laeven and Majnoni, 2003; Claessens, 2003; De Lis et al , 2001) Provisioning is designed to control or hedge risk, but it's also thought to lower profits. This article attempts to identify the determinants and their impact on the bank's profitability. NPAs have always had an impact on the performance and profitability of banks (Midthanpally, 2018, Sen and Sen, 2015, Shajahan, 1998) Nonperforming assets are the bank's biggest problem (NPAs) NPA is an endless cycle. Nonperforming assets are created when banks issue loans to clients who are less creditworthy (NPAs) NPAs reduce profitability, and banks become desperate to make a profit. To stay profitable, banks extend credit to those with credit problems at reduced rates, yet the cycle of poor advances to low profitability persists (Sen and Sen, 2015, Shajahan).
, 1998)

## Review of Literature

Bank performance has been extensively studied, with previous study looking into numerous factors that influence bank success. We see in banking literature that bank benefit is measured by return on average assets (Bapat 2013)

Rivard and Thomas (1997) – ROAA is preferred since it is unaffected by high value multipliers and targets a larger chunk of a company's ability to earn returns on its resource allocation. The bank's approach decisions, as well as wild parts of the economy and unofficial laws, all influence ROAA. We recently noticed that ROAA has maintained its status as a proportion of benefit (Apergis 2014; Menicucci et al 2016) According to the conclusions of a study on the impact of ownership on ROAA and other proficiency barriers, privatisation isn't enough for countries to drastically transform (Bonin et al 2005)

Tan and Floors (2012) – They investigated the causes of low productivity using a two-stage summary technique. According to Chronopoulos and colleagues (2015), guideline modifications influenced both the level and the industriousness of bank productivity in the United States between 1984 and 2010. Cost administration was revealed as a variable impacting bank productivity while evaluating bank benefit using ROAA and value productivity using ROE (Islatince 2015). Experts have evaluated the impact of both internal and external variables on bank benefit.

According to Duca and McLaughlin (1990), differences in bank productivity are connected to fluctuations in credit risk. The benefit proficiency rank is compared to the application of ROE. ROE is a factor in allocating value to different resource classes (Berger et al 2005)

Previously, resource quality, bank capital, ownership, monetary construction, size, non-performing advances (NPL), credit store proportion, proprietorship, size, financial aspects, and growing were all studied as possible causes of bank execution. Because their primary banking business was struggling, banks desired expansion. According to the analysis, charge-based compensation varied by bank type in Germany, with commitment to expense-based pay reaching 133 percent for cooperatives, 154 percent for investment funds banks, and 36 percent for business banks. The benefits of memory enhancement for various sorts of income, data lopsidedness reduction, and settling pay (Shim 2013) Broadening's impact on bank execution has been studied (DeYoung and Roland 2001; Stiroh 2004; Stiroh and Adrienne 2006; Mercieca et al 2007) Busch and Kick (2015) revealed that charge business has a considerable impact on risk changed profits from value and overall resources for German all-inclusive banks. Edirisuriya et al. (2015) found strong evidence that enhancement is beneficial to Australian bank displays. DeYoung and Tara (2004) discovered that very small banks are less interested in non-premium pay, whereas large institutions are more interested. In any event, development is hampered by the recognition that growing US bank engagement in contemporary industry leads to excessive risk taking. According to a study of Chinese banks from 1996 to 2006, improvement was associated with reduced benefits (Berger et al 2010)

Possession was reliant on thorough investigation. When the government intervenes in the financial sector, scientists and strategists are quick to analyse the impact of improvement in possession on bank execution. Jensen and Meckling (1976) argued for dispersed possession as a means of increasing efficiency. Burkart et al., 1997; Kyle and Jean-Luc, 1991) relate possession to abundance observation (Pinteris 2002; Altunbas et al 2001) The link between possession and bank execution has been re-energized recently (Ochi and Saidi 2012) The impact of size is also explored while looking at the effect of proprietorship on bank execution. Analysts have voiced a significant desire to focus on appropriation by bank size (Goddard et al 2014; Hughes et al 2001)

Feng and Serlitis (2010), as well as Wheelock and Wilson (2010), have demonstrated the existence of economies of scale in US banks (2000). Bank size, specialist production, and scale efficacy are all linked, according to Drake and Hall (2003). Hungarian banks prefer massive banks because they are more effective, according to Hasan and Marton (2003). According to the data, smaller banks were more active in non-premium producing operations, which can be linked to improved specialisation and accessibility of various administrations. 2013 (Karray and Chichti) The Syrian bank study's real findings demonstrated a positive relationship between bank size and production. The review was based on the ward Eurasian Bus Rev 123 variable as a return on normal resources (ROAA) Goddard et al., Kosmidou and Pasiouras (2005), and Flamini et al (2009) Studies by Naceur and Goaied (2008) and Sufian and Habibullah revealed mixed results (2009). When looking at the association between bank size and execution, there were rarely any distinct results. Gunjan (2007) was unable to show a clear link between bank efficacy and bank size in the Indian setting. According to Barra et al's (2016) analysis, friendly banks' specialised output in Italy lags behind that of other banks during global monetary conditions. A comparison of the degrees of progress between larger and smaller universities was also attempted. According to a board of Pakistani banks, larger banks are better than smaller banks. Increased effort as well as the size of credit portfolios contributed to this. Afanasieff et al. affirm the importance of the GDP growth rate in 2012 (Afzal and Mirza) (2002) In contrast, Naceur (2003) finds no effect of financial development on bank output. According to Demirguc-Kunt and Huizinga, financial resources with a larger component size are less beneficial (1999). According to Neely and Wheelock, state-level financial activity has an impact on bank income (1997). The consequences of the late global monetary emergency have been thoroughly examined. Most financial regions around the world were negatively affected by the current global monetary emergency, which lasted from 2007 to 2009. (Mirzaei 2013)

As a result, scientific research on the relationship between spending and risk is in debate. From one standpoint, there is agreement on the negative relationship between interest and charge business collaboration. In any event, there has been a lot of discussion over the causality of opportunities. Stronger competition in the traditional retail business leads to reduced revenue margins, according to Valverde and Fernández (2007), Lepetit, Nys, Rous, and Tarazi (2008a; 2008b), and Albertazzi and Gambacorta (2009). According to Lepetit et

According to al (2008a), banks use credit as a misery chief to increase non-premium pay through clever marketing. For example, Van Ewijk and Arnold (2013) defy conventional logic. Overall, they disagree that shifting action plans from revenue to expenditure compensation allows banks to benefit from the latter's higher agility, despite increased competition and reduced margins in key modern financial industry sectors. Analysts should be cognizant of endogeneity difficulties when displaying non-interest pay. Campa and Kedia (2002),

DeYoung and Rice (2004), and Laeven and Levine (2005) all use an instrumental variable technique to deal with infer stable assessors and account for endogeneit

## Methodology for research

Nationalized Banks (25), Government Banks (1), Private Sector Banks (20), Foreign Banks (43), Cooperative Banks (95150), and Regional Rural Banks (68) make up the Indian banking sector. Nationalized banks and a single government bank have been grouped together as Public Sector Banks. In terms of loans and advances, public sector banks have a market share of 73.7%, while private banks have a market share of 18.6%. Foreign banks account for 5.2% of the market, while Regional Rural Banks and Cooperative Banks account for 2.5%. Nationalized banks and public sector banks operate in the same regulatory and economic context, accounting for 92.3% of the banking business in 2012 (Foreign banks' share). Foreign banks and cooperative banks were not included in our analysis due to their smaller market share, large numbers, and distinct operating environments. Data was gathered from the Centre for Monitoring Indian Economy (CMIE) data base from March 1999 to March 2015, as well as economic variables from the World Bank's World Development Indicators database. Strata 12 was used to examine it.

### Sample Size

Our final data set contains 490 observations for 39 banks with an average data period of 12 .56 years after removing the outer layers of data

### Variables

The dependent variable of ROA2 is compared to three categories of independent variables: bank specific, industry specific, and economy specific variables. Table 1 shows the variables in detail as well as the foundation for their calculation.

The influence of a dominant position held by one or a few companies in the industry is considered by HHI. If the score is +1800, the monopolistic position of one or more players in the industry is explained. As shown in Table 2, we found HHIjto be insignificant for all of the years. Because the HHI index was less than 1800 throughout the study period, it was not considered an independent variable. Furthermore, we eliminated the cash reserve ratio, statutory liquidity ratio, and inflation from our study due to their substantial colinearity with the other independent variables.

## Statistical Tool Adopted

It's worth noting that static panel models don't allow us to examine the potential for dynamism in business profitability. This enables us to assess dynamic panel estimators. Furthermore, these models have more control over endogeneity, allowing us to assess the level of modification of genuine factors that affect Indian bank performance.

## Negative Hypothesis

- $H_{O1}$=There is no significant relationship between current year ROA and its 1st year lag
- $H_{O2}$=There is no significant relationship between current year ROA and its 2nd year lag
- $H_{O3}$=There is significant relationship between current year ROA and its 3rd year lag
- $H_{O4}$=There is no significant relationship between size of a bank and ROA
- $H_{O5}$=There is no significant relationship between solvency of a bank ROA
- $H_{O6}$=There is no significant relationship between loan to deposit ratio of a Bank and ROA
- $H_{O7}$=There is no significant relationship between non-interest expenses of a bank and ROA
- $H_{O8}$=There is no significant relationship between employee productivity of a bank and ROA
- $H_{O9}$=There is no significant relationship between CAR of a bank and ROA
- $H_{O10}$=There is no significant relationship between GDP growth of India and ROA

# ANALYSIS AND RESULT

## Analysis

Our findings are inconsistent when compared to past studies in this field. Tables 5 and 6 demonstrate that ROA has a strong positive association with ROA last year, but a negative relationship with ROA two and three years later. It appears that bank profitability has a two-year cyclical pattern. Banks' cyclical loan distribution and provisioning of nonperforming assets at defined times could explain such outcomes. Shehzad et al. (2013) identified a significant profit differential between OECD and non-OECD countries. They have not, however, put it through a two- or three-year delayed profitability test.

At a 5% significance level, the size of a bank has a negative relationship with profitability. Larger banks are more profitable, according to Pasiouras and Kosmidou (2006), and Alicia et al Shehzad et al (2009); (2013). Because the study was carried out in European, Chinese, and OECD countries, the findings may be influenced by differences in economic conditions in different countries. India's major banks suffer from operational inefficiencies. Because they offer fewer goods and are more efficient, smaller banks perform better.

Our solvency ratio findings were also corroborated by Dietrich & Wanzenried (2014) and Pasiouras and Kosmidou (2014). (2007) A higher solvency ratio correlates to a better ROA in a significant positive connection. Because its cost of funding is lower, an older, well-capitalized bank is more profitable.

We discovered that, contrary to Albulescue's (2015) findings, ROA has a negative and significant relationship with the Loan to Deposit ratio. Our support for our findings is unmatched.

**Table 4:** Pairwise correlation

| Variables | ROA | Size | Solvency ratio | Loans to deposit ratio | Expense ratio | Productivity | CAR | GDP growth |
|---|---|---|---|---|---|---|---|---|
| ROA | 1 | | | | | | | |
| Size | −0.111 | 1 | | | | | | |
| Solvency ratio | 0.668 | −0.113 | 1 | | | | | |
| Loans to deposit ratio | 0.075 | 0.437 | 0 | .146 | 1 | | | |
| Expense ratio | 0.266 | −0.360 | 0 | .444 | −0 .445 | 1 | | |
| Productivity | 0.071 | 0.441 | 0 | .262 | 0 .435 | −0 .321 | 1 | |
| CAR | 0.386 | 0.102 | 0 | .290 | 0 .393 | −0 .211 | 0 .142 | 1 |
| GDP growth | 0.017 | 0.086 | 0 | .002 | 0 .147 | −0 .026 | −0 .004 | 0 .096 |

Data for this analysis was gathered from the CMIE database. CMIE stands for the Centre for Monitoring India's Economy. ROA: Return on Asset, CAR: Capital Adequacy Ratio, GDP: Gross Domestic Product

**Table 5**: Dynamic panel least square analysis result

| Variables | Coefficient and significance |
|---|---|
| L1 .ROA | 0 .5102*** |
| L2 .ROA | −0 .0953*** |
| L3 .ROA | −0 .1091*** |
| Size | −0 .0008** |
| Solvency ratio | 0 .0413*** |
| Liquidity ratio | −0 .0049** |
| Expense ratio | −0 .0410** |
| Productivity | −0 .0002** |
| CAR | 0 .0001*** |
| GDP growth | −0 .0006*** |
| Bank category | 0 .01449* |
| Year_dum | 0 .0003 |
| _cons | 0 .0073 |
| Wald Chi | 1892 .12*** |
| Sargan test | 31 .47045 |
| AB test order 1 | −4 .0378*** |
| AB test order 2 | −0 .91487 |
| Number of obs | 491 |
| Number of groups | 50 |

(2) In this GMM equation, the Wald test compares the null hypothesis of overall non-significant of the explanatory variables against the alternative hypothesis of overall significance of the explanatory variables. (3) The Sargan test's c2 distribution

The null hypothesis of significance of the validity of the instruments used is pitted against the alternative hypothesis of non-validity of the instruments used (4) The AB test order 1 test, which has a normal distribution N, is used to test the null hypothesis of absence (0,1).

The theory of first order autocorrelation contrasts the alternative hypothesis of first order autocorrelation (5) The AB test order 2 test contrasts the null hypothesis of no second order autocorrelation to the alternative hypothesis of second order autocorrelation using the N (0,1) normal distribution (6) ***significant at 1% significance; **significant at 5% significance; *significant at 10% significance

The CMIE database provided the data for this investigation. GMM stands for generalised method of movement; CAR stands for capital adequacy ratio; ROA stands for return on asset; GDP stands for gross domestic product.

The capital adequacy ratio is abbreviated as CAR, ROA stands for return on asset, and GDP stands for gross domestic product. Banks frequently make risky loans in order to maximise fund utilisation, resulting in a higher NPA and lower ROA. The bank is in good shape, with a loan-to-deposit ratio of 76.8% (RBI, 2016). India beats other industrialised countries in terms of fund utilisation. On the other hand, the amount of stressed assets in India's banking industry is a source of concern.

The expense ratio is the proportion of non-interest spending to total income, often known as management efficiency. According to our data, ROA and expenditure ratio have a significant negative association. The vast majority of previous research has reached the same result as we have. Albulescue (2015); Capraru and Inhatov (2014); Pasiouras and Kosmidou (2015) (2006)

According to our data, the ROA of the post- and pre-subprime crisis years were identical. We learn that India's banking sector was less affected by the subprime crisis than the rest of the globe, and that it had no effect on their performance. Furthermore, during these ages, a variety of compensatory economic factors may have resulted in a modest difference in their ROA. Both managers and scholars will benefit from this research. As a result of financial sector changes in the 1990s, Indian banks followed the prescription of privatisation. While Boateng et al. (2015) examined both banking and economic factors in their study, we examined banking industry characteristics such as ownership and scale in addition to banking and economic factors.

In India, the impact of privatisation banks was variable. Despite the fact that the 2008–2009 financial crisis harmed global banks, a previous study found that Indian banks were unharmed. During this time, public sector banks' performance was equivalent to private sector banks'. Our primary focus is on the factors that influence bank profitability. Nonperforming loans, the cost-to-income ratio, and diversification were all factors taken into account. Non-performing loans are a reason for concern because they have previously been linked to bank failures.

Financial failures and crises Economic downturns and macroeconomic volatility are exacerbated. If NPL rises over tolerable levels, the regulator should be concerned. The cost-to-income ratio is an important efficiency metric. The percentage of non-interest revenue to operational income was used to calculate diversification. Diversification can be assessed using a variety of factors. Gambacorta et al. (2014), for example, define diversity as the percentage of non-interest income to total revenue, whereas Mostak (2017) computes diversification using the Herfindahl–Hirshman metric and refers to it as focus. The greater the value, the more focused it is; the lower the value, the more diverse it is. Bancassurance income differs significantly between public and private sector banks. For example, 26 public sector banks earn Rs 73 billion, whereas 20 private

sector banks get Rs 196 billion. According to the research, diversification has little impact on bank profitability as measured by ROAA and ROE.

During the research period, the public sector's performance deteriorated, and the rising number of non-performing assets has a negative impact on bank profitability. Banks must generate higher profits from the same assets as a result of increasing capital requirements following the global financial crisis. Nonperforming loans (NPLs) have increased dramatically in public sector banks in recent years, and effective bad debt management is important to maintaining profitability. Nonperforming loans (NPLs) have been identified as a threat to banking stability, and regulators have highlighted concerns about worsening asset quality in Indian banks, particularly public sector banks. Among the difficulties include direct lending in priority sector credit and government influence in distorting credit culture, particularly for public sector banks. It is suggested that public sector banks should focus on enhancing profitability characteristics rather than growing balance sheet size.

## CONCLUSION

Our findings on last year's ROA, solvency ratio, expense ratio, CAR, and bank category are similar with other countries' past research. Size, liquidity, productivity, and GDP growth all lead to a new conclusion that differs from past research conclusions. As a result, India's financial climate differs from that of other nations. In Indian banks, non-fee income is higher; credit appraisal and debt collection mechanisms are poor, resulting in a higher NPA rate. Banks are unable to benefit from economic expansion due to these problems. The Reserve Bank of India is taking significant moves in this direction. Bankers usually advocate for greater liquidity to help their businesses grow, but our research shows that they should instead concentrate on correct credit evaluation and loan recovery to boost profits.

The banking industry in the United States is used to test a paradigm for determining the origins of firm-level rent persistence. According to an analysis of the sources of persistence in the banking industry, market power in output markets derived from impediments to product market competition generated persistence at the low end of the distribution, whereas market power in input markets derived from informational opacity generated persistence at the high end. Surprisingly, both of these market power sources have remained significant in recent years. Furthermore, regulatory spatial limits appear to have had little impact on persistence at either end of the spectrum. Despite the numerous changes in the industry, these figures illustrate that the banking industry's competitiveness has remained stable in recent years.

According to our findings, local, state, and regional shocks continue to produce persistence at both the high and low ends of the distribution. Furthermore, it appears that banks with a high degree of off-balance sheet activity or a significant percentage of assets engaged in consumer, commercial, or real-estate loans benefited the most from the current macroeconomic expansion. These data suggest that risk has not dropped considerably in recent years despite improved geographic diversification and the use of financial engineering methods to minimise risk.

the banking industry's sensitivity to regional/macroeconomic shocks These findings also provide insight into the banking industry's recent record earnings. Because market dominance remains due to barriers to product market competition and informational opacity, rents acquired through the adoption of new technology or the provision of new services in recent years may not have vanished anytime soon. If there had been no market power, these gains would have been passed on to customers in the form of lower pricing. Our finding that the banking industry is susceptible to regional/macroeconomic shocks points to another possible explanation for the industry's recent performance.

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