THE CAUSAL FACTORS BEHIND RISING NON-PERFORMING ASSETS OF INDIA'S COMMERCIAL BANKS: A PANEL STUDY

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ABSTRACT

Poor performance of India's commercial banks, in the public and private sectors as well as those owned by foreign interests, has been a major concern of the policymakers. Their gross non-performing assets (NPAs), as a proportion of gross advances, were 10.2% as of March 2017, which is reported to have grown to 11.6% in March 2018. The public sector banks (PSBs) have a share of 70% of business, and the ratio of NPAs to gross advances is 15.6%. The Reserve Bank of India's forecast is that the ratio for PSBs would rise to 17.3% by March 2019, of private banks to 5.3%, and of foreign banks to 4.8%. This chapter focuses on causal factors which comprise macroeconomic as well as bank-specific factors, influencing NPA. We undertake a panel approach by using 16 annual observations (from fiscal year 2000–2001 to 2015–2016) for three groups of banks by ownership: public, private, and foreign. The study findings reveal that the macroeconomic and bank-specific factors are important determinants.

Keywords: Non-performing assets; bank-specific factors; macroeconomics factors; banking sector; India; panel analysis

JEL classification: E44; G21; G28

1. INTRODUCTION

India's financial sector with numerous specialized institutions has made considerable strides since the mid-1990s with the introduction of reforms towards liberalization of the economy, gaining the recognition that it is one of sophisticated ones among the developing countries (Mohan & Ray, 2017). However, since its commercial banks have been under serious stress. Non-performing assets (NPAs)[1] of commercial banks in the public and in the private sectors, as a proportion of total assets of the banking system, rose to 9.6% in Fiscal year (FY) 2015–2016 from 5.0% a year earlier (IMF, 2017).[2] The public sector banks (PSBs)[3] which dominate the banking scene to the extent of 70% in terms of share of business have more than 80% of NPA of all commercial banks.

The spurt in India's economic growth during the two decades of the New Millennium was marked by rise in private sector investment in 2015, which grew from 24.3% of GDP in 2000 to 33.3% in 2015 (World Bank, 2016). Much of it was due to the increase in bank credit, which reached a record high at 52.6% of GDP in 2015. (World Bank, 2016). As every coin has two sides, the negative aspects of rapid rise in credit growth began to be felt soon: The loan appraisal procedures were seen to have become weaker, especially those of the PSBs under political pressures. Further, banks in all three groups of ownership became more aggressive with view to increasing their respective shares of business, without much regard to both rigorous loan appraisal procedures as well as strict loan recovery processes. Rising bad loans and the resultant bank failures[4] especially in the private sector were not uncommon, as PSBs were always rescued by the government.

The NPAs of PSBs, according to the *Economic Survey for 2016–2017* (Government of India, 2017), stood at a record level of 12% as of January 2017.[5] The government officially acknowledged that it is higher than in any emerging market and with the sole exception of Russia in the developed world (Government of India, 2017) and more than 80% of the bad loans was in the PSBs. There are various estimates of NPA depending on the types of measurement. An asset quality review (AQR) which was carried out by commercial banks in response to a directive from RBI, bad loans defined as a sum of gross NPA, re-structured assets, and written off accounts, were estimated to be in the range of 17.7% of gross advances in 2015–2016 (Mohan & Ray, 2017).

The latest official figures, according to Annual Economic Survey (2017–2018), show gross NPAs of all three groups (public, private, and foreign) were INR 10.25 trillion or 10.5% of gross loans. The PSBs alone accounted for INR 8.97 trillion, and NPAs for private and foreign banks accounted for the rest (INR 1.28 trillion). Regardless of different procedures of measurement, poor performance of banks has been causing concerns since the late 2016. In this context, a study on the causal factors behind bad loans becomes important not only for the bank managements but also for the central bank, which is the entrusted with the responsibility of maintaining financial stability. The causal factors are divided into two broad categories: (1) macroeconomic determinants,

which affect all banks without any distinction, and (2) bank-specific factors, which affect different banks differently.

The objective of this chapter is to identify the likely determinants and investigate their effect on NPAs in India over the period of FY 2000–2001 to 2015–2016 leaving out the FY 2016–2017, which is considered as an outlier due to the introduction of re-classification efforts.[6] The chapter is organized along the following lines. Section 2 presents the trends in India's NP. Section 3 is a brief literature survey on NPAs and its determinants. Section 4 deals with the sources of the data series utilized and outlines the model and methodology employed. Section 5 reports the empirical results, and the final Section 6 lists the conclusions with policy implications.

2. TRENDS IN INDIA'S NPAS

India's financial sector, as of 2017, comprises 93 scheduled banks[7] of which 27 and 21 are in the public and private sectors, and the rest owned by foreign interests.[8] The other financial sector institutions include cooperative societies, regional rural banks, post office banks, insurance companies, and stock markets (Mohan & Ray, 2017). The growth impact of the commercial banks during the 16-year period of study is well reflected in the rapid rise in deposits and credit disbursed. Their deposits increased from 41.3% in 1999–2000 to 69.5% of GDP in 2014–2015 whereas their advances grew from 24.9% of GDP in 1999–2000 to 51.8% of GDP. As of 2015, PSBs aggregate deposits were around 47.9% of GDP, with a 72.9% of market share. The PSBs disbursed credit (36.3% of GDP) with 71.6% of market share. The private sector banks' aggregate deposits were 12.9% of GDP controlling 19.7% of market share and holding total credit about 10.6% of GDP with 20.8% of market share, and foreign banks' deposits were 2.9% of GDP with market share of 4.4%, together with total credit outstanding at 2.5% of GDP, which amounted to 4.9% of market share.

As the quality of assets was seen to be weakening with the emergence of rising ratio of gross NPA to gross advances since 2013–2014, RBI applied rigorous assessment standards. The newly introduced AQR in mid-2015 revealed that the system-wide gross NPA ratio went up from 5.1% in September 2015 to 7.6% in March 2016 (IMF, 2017).

3. A BRIEF LITERATURE SURVEY

The literature on NPAs is of recent origin, as the interest in the topic was triggered by the studies on banking and financial crises in the United States of America (USA) during the late 1970s, in Latin America (the early 1980s), in East Asia (the mid-1990s), and in the sub-Saharan Africa (the later 1990s). Once the crises are found linked to the impaired assets of the banking system, empirical studies began to mushroom since the early 1990. The theoretical base for the link between impaired assets and financial crisis, which was triggered by banking crisis (Ekanayake & Azeez, 2015) lies in the delegated monitoring authority of financial intermediation (Diamond, 1984). Under this theory, as long as the role

of financial intermediation is carried out in full faith and the funds are held in trust by banks, the system is not expected to fail. It is only so when greed takes over precedence over safety of depositors' funds and banks are tempted to give out risky loans. If the delegated authority is abused by banks, as noted by Diamond (1984), more adverse selection would ensue; and when banks become slack in monitoring the utilization of borrowed funds, loan defaults become the order of the day.[9]

Empirical studies divided the causal factors into two wide categories: macroeconomic factors and bank-specific factors. Macroeconomic determinants include a wide range of variables impacting cash flows of businesses and households. They include economic growth, inflation, real exchange rate, and investment climate affected by expectations of various economic agents. The bank-specific factors include relaxation of credit standards with a desire to capture a greater share of the market. Consequently, this leads to rise in loan defaults if borrowers fail to fulfill debt-servicing obligations on time. In addition, during a credit boom often associated with the expansionary phase of the economy, bank managers tend to take risks, which fall under the description of bad management.

3.1. Macroeconomic Factors

Keeton and Morris (1987) in their investigation of more than 2000 failed commercial banks in the USA attributed the failures to the weakening macroeconomic environment. Studies undertaken by Brownbridge (1998), Salas and Saurina (2002), Rajan and Dhal (2003), Fofack (2005), Jimenez, Salas, and Saurina (2006), Das and Ghosh (2007), Khemraj and Pasha (2009), Ekanayake and Azeez (2015), and Warue (2013) in different countries and mostly as panel studies found an inverse relationship among growth in real GDP (RGDP) and NPA.

Another macroeconomic factor of interest is inflation. Fofack (2005), who found a direct relationship between inflation and NPA in sub-Saharan African countries, argued inflation was responsible for erosion of commercial banks equity over time and therefore higher credit risk, which was confirmed by Warue (2013). However, there is a contrary view. That is inflation in an economy, with heavy import restrictions, would lead to high profits for business enterprises, given the fact that wages and costs of raw materials in the short run do not rise immediately, and consequently, the windfall rise in profit earnings would help loan repayment ability faster and hence NPA would decrease. Given these mixed results, the relationship between inflation and NPA is ambiguous and hence, it is subject to findings of empirical studies.

Since developing countries have to earn foreign exchange for paying for their imports of capital and intermediate goods, they place greater importance on export earning earnings through the promotion of the export sector. Banks in the public and private sectors are encouraged to step up their lending to business enterprises in industries, which showed promise of export earning potential. The recovery of loans from the borrowers, who have borrowed from the banks,

however, depends on their actual export performance, which is determined by the relative export competitiveness reflected in the stability of real exchange rate. Appreciation of exchange rate adversely affects export earnings and vice versa. Keeping the real exchange rate from rising is a task faced by all export-dependent economies, as it involves challenges on both fiscal and monetary policy fronts. Fiscal excesses and monetary expansion render exports uncompetitive to the rest of the world, as they raise the real exchange rate. In these circumstances, the borrowers would not be able to service their loans from banks and as a consequence, NPAs would rise. Thus, the relationship between real exchange rate and NPAs is likely to be one of inverse nature.

3.2. Bank-specific Factors

The bank-specific factors influencing NPAs include poor bank management and aggressive credit policies with eagerness to increase the market share, which would result in rapid credit growth. Keeton (2003) in his study confirmed a positive relationship between growth in credit and NPA, which was attributed to deliberate relaxation of lowering of credit standards, reflecting a risk-taking behavior on the part of management. Failure to enforce high levels of bank efficiency and aggressiveness to enlarge share of business resulted in increasing ratios of NPA to loans (Berger & DeYoung, 1997; Kwan & Eisenbis, 1997; Lee, Lin, Yu, & Zhao, 2017; Misra & Dhal, 2010).

Examining the connection between cost-efficiency and NPA in the context of the Czech banks from 1994 to 2005, Podpiera and Weill (2008) found strong evidence of bad management as a reason for rise in NPA. A study by Hu, Li, and Chiu (2004) concluded that banks with a larger credit-deposit ratio had higher NPA. Salas and Saurina (2002) also concluded by linking all the key variables and observed that rapid credit growth, bank size, capital, and market power were all directly associated with rising NPA. In addition, operating expenditure has been cited as a significant factor in determining NPAs of banks. The literature indicates that total expenditure given rise to by greater allocation of resources to loan recovery measures is inversely related to NPA (Altunbas, Liu, Molyneux, & Seth, 2000; Fan & Shaffer, 2004; Girardone, Molyneux, & Gardener, 2004).

4. DATA, MODEL, AND METHODOLOGY

4.1. Data

The model proposed for the empirical investigation into the causes behind India's NPA is constrained by data availability. The data series on NPA are recent origin, and all of them are in terms of annual observations from 2000 to 2016. While the NPA data series are taken from RBI (2016), all other relevant data series are sourced from ADB (2016) and World Bank (2017). Table 1 presents the statistics on NPAs and gross advance for public, private, and foreign banks in India. It can be noticed that public banks are having the most NPAs among the three groups of banks while foreign banks have the least.

Table 1. NPA and Advances as Percent of GDP and as Percent of Total Advances.

Years	NPA (% of Gross Advance)			Gross Advance (% of GDP)			Advances as Share of Total Advances (%)		
	Public	Private	Foreign	Public	Private	Foreign	Public	Private	Foreign
2000−2001 to 2004−2005 (Ave)	9.22	7.27	1.51	23.74	5.47	2.26	75.55	17.22	7.23
2005−2006 to 2009−2010 (Ave)	2.54	2.55	1.17	37.96	10.16	3.00	74.14	19.95	5.91
2010−2011	2.42	2.50	0.60	40.80	9.71	2.64	76.76	18.27	4.97
2011−2012	3.30	2.15	0.62	40.64	9.98	2.60	76.37	18.75	4.88
2012−2013	3.61	1.83	1.02	45.86	11.58	2.62	76.36	19.28	4.36
2013−2014	4.36	1.80	1.05	46.43	12.11	2.67	75.86	19.78	4.36
2014−2015	4.96	2.12	0.52	45.13	12.92	2.70	74.29	21.26	4.45
2015−2016	9.28	2.85	0.74	42.53	14.42	2.75	71.24	24.15	4.61

4.2. Model and Methodology

Based on the available literature reviewed as above, the foregoing relationship between NPA and its likely determinants can be expressed as follows:

$$\text{NPA} = f(\text{GR}, \text{BS}, \text{REER}, \text{INF}) \tag{1}$$

where NPA is non-performing assets as share of gross assets (%), GR is the real gross domestic product (GDP) growth rate (%), BS represents bank-specific factor, which is proxied by either of the two, GA (gross assets as share of GDP, %) or SH (gross loan as share of business, %), REER is the real effective exchange rate (Index), and INF is the inflation rate (%).

Due to the availability of data, a pooled dataset which consists of a combination of cross-sectional and time-series data is employed. Consequently, the numbers of data points available in this study would subsequently generate additional degrees of freedom and diminish the problems arising from the omitted variables. Therefore, the relationship expressed in Equation (1) can be further formulated into the empirical model based on a panel data framework, which is given below:

$$\text{NPA}_{it} = \beta_0 + \beta_1 \text{GR}_{it} + \beta_2 \text{BS}_{it} + \beta_3 \text{REER}_{it} + \beta_4 \text{INF}_{it} + \varepsilon_{it} \tag{2}$$

where the subscripts i and t represent the three groups of banks (public sector, private sector, and those owned by foreign interests) and time (2000−2001 to 2015−2016 FY), respectively. ε is the error term, and β_0, β_1, β_2, β_3, and β_4 are the coefficients to be estimated. Since the length of time-series data used in this study is not sufficient enough, we are constrained to estimate the specified

Table 2. Macroeconomic Variables Relevant to all Three Groups of Banks.

Years	GR	REER	INF
2000–2001 to 2004–2005 (Ave)	5.65	87.64	3.93
2005–2006 to 2009–2010 (Ave)	8.14	91.98	7.20
2010–2011	10.26	99.13	11.99
2011–2012	6.64	94.34	8.86
2012–2013	5.46	93.21	9.31
2013–2014	6.39	95.46	10.91
2014–2015	7.51	103.34	6.65
2015–2016	8.01	104.29	4.91

regression model using the static panel data method, namely, pooled ordinary least square (POLS) model, instead of the dynamic panel data methods.

4.3. Hypotheses

The following hypotheses are formulated on the foregoing relationship between NPA and the likely determinants:

- NPA and GR move in the opposite direction: higher the growth of the economy, the lower would be NPA.
- NPA and BS (GA and SH) are directly associated. Growth in bank loans, due to aggressive bank credit policies and poor loan appraisal, leads to an increase in loan defaults and hence rise in NPA.
- NPA and REER are directly associated. The lower the REER, the greater is the attractiveness of the country's exports to foreigners and higher would be the export earnings, facilitating better servicing of loans and higher recovery and hence lower the NPA.
- NPA and inflation relationship are ambiguous. The relationship has to be empirically tested.

5. RESULTS AND DISCUSSION

Table 2 shows the data for the macroeconomics variables used in the study. From the table, REER exhibits an increasing trend, which means there is an appreciation in India's currency. The GR and INF show a fluctuation pattern but overall there is an increase in both indicators. The descriptive statistics for the variables used for all three types of banks are presented in Table 3.

Table 4 presents the results based on pooled OLS model. From the table, all the signs for the estimated coefficients in Models 1 and 2 are in line with *a priori* expectations and their size of the coefficients in the models is fairly the same. Moreover, all variables employed in the regression analysis are found statistically significant, at least 10% level, except REER, which is not significant at all.

From the estimated results, we find that NPA is driven by bank-specific factors. Specifically, holding other things constant, a 1% increase in bank-specific

Table 3. Descriptive Statistics.

Variables	Mean			Std Dev			Min			Max		
	Public	Private	Foreign	Public	Private	Foreign	Public	Private	Foreign	Public	Private	Foreign
NPA	1.97	3.90	1.12	3.44	2.60	0.49	1.97	1.80	0.52	12.37	9.64	1.82
GA	20.94	9.30	2.64	9.19	3.04	0.34	20.94	3.37	2.15	46.43	14.42	3.37
SH	71.24	19.21	5.83	2.04	2.41	1.23	71.24	12.75	4.36	79.13	24.15	8.12
GR	7.08	7.08	7.08	2.18	2.18	2.18	3.80	3.80	3.80	10.26	10.26	10.26
REER	92.99	92.99	92.99	5.97	5.97	5.97	86.00	86.00	86.00	104.29	104.29	104.29
INF	6.77	6.77	6.77	2.89	2.89	2.89	3.68	3.68	3.68	11.99	11.99	11.99

Table 4. Results from POLS Model.

Variables	Pooled OLS	
	Model 1 (Robust)	Model 2 (Robust)
GA	0.079***	
	(0.029)	
SH		0.051***
		(0.016)
GR	−0.489***	−0.475**
	(0.232)	(0.203)
REER	0.007	0.032
	(0.073)	(0.065)
INF	−0.485***	−0.433**
	(0.177)	(0.171)
Constant	8.347	5.085
	(6.650)	(5.593)
R^2	0.443	0.545
Adjusted R^2	0.391	0.503
Overall F-test	8.535*** [0.000]	12.878***[0.000]
Observation	48	48
Diagnostic tests		
Multicollinearity (VIF)	1.28	1.26
Cross-section dependence test (Pesaran CD)	0.467 [0.639]	0.187 [0.852]
Normality (Jarque-Bera)	2.303 [0.316]	1.804 [0.406]

Notes: The significance at the 1%, 5%, and 10% levels is denoted by the asterisks ***, **, and *. Figures for standard error figures are in (.), while the figures for *p*-values are in [.].

factors such as GA or SH would stimulate NPA by approximately 0.079% or 0.051%. As regards macroeconomic factors, we find that NPA is influenced by macroeconomic factors, both GR and INF. Increase in the growth rate reduces the buildup of NPA, as increases in cash flows during expansionary phase of the economy, servicing the loans becomes easier, enabling recoveries of installments and interest payments to a greater degree.

The sign of the coefficient of the variable INF confirms that higher the inflation, the less would be the accumulation of NPA. Higher profits during inflation, given the fact that costs of production and wage levels do not increase in the short run, as they take time to adjust to the new price levels, business men get benefitted. Rise in inflation and renders the loan recovery easier during the inflationary phase.

With regard to the other macroeconomic variable, we find the coefficient of REER did not emerge as a significant one. One of the plausible reasons is export earnings were not influenced sufficiently by export competitiveness and there might be other reasons besides REER. Second, banks might not have loan

financed sufficiently a large number of export industries, and third, banks might find it easier to shift the blame to the government's inadequate macroeconomic management for their ills.

Based on the second part of Table 4, we find that overall F-tests for Models 1 and 2 are statistically significant. However, the computed adjusted R^2 for the Model 2 is higher than those of Model 1. This suggests that after correcting the degrees of freedoms, more percentage of the variation in the behavior of NPA could be explained by SH. The diagnostic tests provide evidence that the two models used are free from serious econometric problems.

6. CONCLUSION AND POLICY IMPLICATIONS

This objective of this chapter is to find out the determinants of NPAs of commercial banks in India. Utilizing the available data series with regard to commercial banks in three categories of ownership — public and private sectors, and foreign interests, we employ a panel approach. The data series utilized in the study are of two kinds: bank-specific and macroeconomic related. The bank-specific data are gross advances of banks to borrowers; and macroeconomic variable comprise growth rate of the economy (GR), inflation (INF), and real effective exchange rate (REER). As regards bank-specific variables, we use one of the two proxies alternately: one is gross advances as a percent of GDP, which is GA, and the other is gross advances as a share of total bank business, SH.

Since the number of annual observations is not long enough, the panel study adopts the static panel data approach, namely POLS model, instead of the dynamic panel data methods. There are two models employed: the macroeconomic variables remaining the same in both: one model uses GA and the other uses SH instead of GA.

The results obtained from the panel analyses show that all the hypotheses formulated are confirmed except the one relating to a macroeconomic variable, namely REER. The bank-specific variable (either GA or SH) is confirmed to be directly associated with NPA, confirming that a higher lending level, in terms of gross advances as a proportion of GDP or as a share of total bank advances positively influences NPA. Macroeconomic variables GR and INF are both inversely related to NPA. Higher growth improves cash flows of the borrowers, disposable incomes of households, and revenues earned by business enterprises during expansionary phase of the economy, enabling households and business enterprises to service their loans more easily than during the contractionary phase of the economy. However, REER is found to be of no significance. This finding rejects the claims of banks that exchange rate management was not favoring exports.

The policy implications are clear. Commercial banks have to strengthen their loan project appraisal procedures and should have to follow stricter standards. Though it is said easier than done in the case of the state-owned banks, which are known to be under pressures of politicians and government officials, the only remedy of lasting nature is to privatize them. That will be a challenge before the government as well as opposition parties.

NOTES

1. The term non-performing assets refer to non-performing loans. Both terms are interchangeably used in this chapter.

2. According to another report known as Financial Stability Report issued in June 2018 by Reserve Bank of India (RBI 2018), gross NPAs of all commercial banks, comprising public sector, private, and foreign banks, as a proportion of total assets rose from 9.6% in March 2017 to 10.8% as of March 2018.

3. The term PSB covers (1) fully owned State Banks of India from the days of British India before 1947 and State Banks in the princely states until fully brought in the political fold by 1950 when India became a single entity as the Republic of India; (2) the nationalized banks in 1969, some of which are being partly privatized with majority still retained by the government; and (3) regional rural banks (RRBs) set up later on to serve the agricultural and microenterprise interests, as commercial banks were unable to meet the credit needs (Mohan & Ray, 2017).

4. An IMF study (Mohan & Ray, 2017) reports that 477 financial went into liquidation or amalgamation during 1951–1969 and that liquidation is common in the private sector, whereas the public sector banks are often rescued by re-capitalization.

5. This figure for PSBs alone stands at a much figure. According to an updated Financial Stability Report (RBI 2018), gross NPA as ratio of gross advances of PSBs is 14.5%.

6. The estimated figure as reported by RBI for 2015–2016 was 7.5% rising from 4.2% in 2014–2015. The big jump has been attributed to more vigorous efforts than ever before to re-classify debts, including the cleaning up of banks' balance sheets under the directives of RBI.

7. The term "scheduled banks" was inherited term from the British India days. They refer to banks originally included in the Second Schedule to the RBI Act before Independence in 1947; and those others subsequently added by virtue of having paid up capital and reserves being more than INR 500,000 in the aggregate as per the RBI Act amended in 2008.

8. In this chapter, the terms commercial banks and scheduled banks are used interchangeably.

9. The worst scenario is when the public sector dominates the banking system, as in India. The socialistic policies of various governments (1947–1991) led to nationalization of major banks in 1969 and until the late 1990s (when more private banks were allowed to be set up and foreign banks were allowed entry), and the public sector banks were directed to lend to the designated priority sectors. Borrowers were given generous loans without any due regard to their capability in the use of funds or ability to generate any cash flows to service the loans, let alone returning them. For nearly five decades, the Indian banking system was noted to have "suffered from the imperatives of societal concerns and thus were torn between the dilemma of equity *versus* efficiency" (Mohan & Ray, 2017).

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