

Unveiling The Drivers of Credit Risk in Indian Banking: A Systematic Literature Review

Albert Lalrinsanga Hauhnar and Gurram Ramakrishna

¹Research Scholar, Department of Commerce, Mizoram University, Tanhril, Aizawl, Mizoram, India

²Assistant Professor, Department of Commerce, Mizoram University, Tanhril, Aizawl, Mizoram, India

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*Corresponding author: Gurram Ramakrishna (grk8183@yahoo.co.in)

Abstract: The banking sector provides vigor to the economic activity. Many ascribe poverty to the lack of access to investment credits by banks owing to the limited spread of formal banks in the developing economy. From this perspective, risks that are immanent to banking activities can hamper the economic growth and cause economic downturn. Credit risk, which is inherent to banking activity, is certainly one of the risks that can fracture the banking sector and is widely discussed among policymakers and researchers. This research aims to provide a systematic review of literature on the determinants of non-performing assets (NPAs) in the Indian banking sector. An in-depth understanding of the latter would allow investors, bank regulators, and bank managers to better anticipate bank's failure. The present study reveals a wide array of thoughts that shaped the argument of NPAs determinant and subsequently revealing the areas in which research is silent. It also proposes a promising future research agenda for academicians to advance their research.

Keywords: Banks' credit risk; commercial bank; Indian banking sector; literature review; loan problem; non-performing assets (NPA)

INTRODUCTION

The banking sector provides vigor to the economic activity as it provides credit and makes it possible for businesses and families to save, invest, and increase their spending, all of which contribute to economic growth. Many ascribe poverty to the lack of access to investment credits by banks owing to limited spread of formal banks in the developing economies. From this perspective, risks that are immanent to banking activities can hamper the economic growth and cause economic downturn. Credit risk is certainly one of the risks that can fracture the banking sector. However, credit risk is inherent to banking activity, and is mostly conveyed by the level of bank's non-performing assets (NPA, henceforth). An asset becomes non-performing when it ceased to provide income for the owner. Over optimism and over extension of credit by banks which resulted in too much debt accumulation has triggered the beginning of various financial crises; the Credit Crisis of 1772, the Asian Crisis of 1997, the Financial Crisis of 2007-08, and more recently the Sri Lankan economic crisis.

The goal of the present study is to clarify the causes of NPA in India that will help steer future research and deepen our understanding of the factual determinants of NPA in the Indian banking sector. Furthermore, this study aims to outline significant future research directions on the factors that influence credit risk in the Indian banking sector. To achieve such objectives, this study will survey, analyze and critically assess relevant articles, books and reports with an emphasis on recent findings for evidence on the determinants of credit risk among banks in India. The rest of the article is arranged as follows: Section 2 brings forth

the summary of the Indian Banking sector. Section 3 provides a background on the definition and provisioning norms of NPAs. Section 4 describes the identification strategy for literature collection and analysis. Section 5 presents the findings discusses the conflicting arguments documented in the literature Section 6 highlight the major impediments to current research and provide avenues for future research. Section 7 concludes.

OVERVIEW OF INDIAN BANKING SECTOR

The Indian banking sector has made rapid progress since nationalization in 1969. According to the Reserve Bank of India (RBI), as of 1st January, 2022 there are 12 Public Sector Banks, 21 Private Sector Banks and 46 Foreign Banks operating in India. The amount of deposits and credit of Scheduled Commercial Banks (SCBs) in 1969 was Rs. 46460 crore and Rs. 3599 crore while as of 31st March, 2022 it stood at Rs. 14052929 crore and Rs. 10445683 crore respectively.

The government of India initiated a social-banking program and simultaneously introduced schemes that made bank loans available to the poor at highly subsidized rate. In fact, the primary objective for the nationalization of banks was to ensure that credit availability match the wider development agenda of the government and banks were required to give the priority sector a third of their outstanding credit by the year 1979 (Kochar, 2011). The priority sector includes agriculture, small scale industries and small borrowers. The government introduced laws that compelled banks to operate a specific number of branches

in rural or semi-urban regions for every branch operated in a metropolitan or urban centre in an effort to eradicate poverty in the rural region. This was achieved through the use of an “entitlement formula”. The entitlement formula was initially 1:2, i.e., for every two branches opened in the rural or semi-urban centers, banks were allowed to open one office in a metropolitan or urban center. This was later changed to 1:4 in 1977.

Due to the previous strategies' inability to significantly reduce poverty, the Sixth Five Year Plan (1980–1981) adopts the Integrated Rural Development Program (IRDP). The IRDP aims to give rural poor people access to employment through the acquisition of productive assets or suitable skills that would create additional income on a consistent basis and allow them to escape poverty. Subsidies and bank credit are two forms of assistance. Small and marginal farmers, agricultural laborers, and rural artisans living below the poverty line make up the majority of the target audience. The subsidy pattern is 25% for small farmers, 33% for marginal farmers, agricultural labourers, and rural craftsmen, and 50% for Scheduled Castes/Scheduled Tribes families and physically challenged people. 50.99 million families have been served by the IRDP since the program's commencement through 1996–1997 at a cost of Rs. 11434.27 crore. The entire amount invested at this time was Rs. 28047.65 crore, of which Rs. 9669.97 crore was allocated as a subsidy and Rs. 18377.68 crore as credit. 44.75 percent of the total families helped by this programme were from Scheduled Castes or Scheduled Tribes, and 27.07 percent were headed by women.

More recently, aiming to provide economic relief to the people and business affected by the covid-19 pandemic, the union budget 2020-21 provided Rs.1.1 lakh crores loan guarantee scheme to the covid effected sector. The health sector would receive Rs 50,000 crore, and the other sectors, including tourism, will receive Rs 60,000 crore. The scheme allows for a maximum loan size of Rs. 100 crore and a maximum guarantee term of 3 years. The highest interest rate that banks may charge for these loans is 7.95%. There will be loans available for other industries with an

8.25% p.a. interest cap. As a result, compared to the standard interest rates without a guarantee of 10–11%, loans made accessible under the scheme will be significantly less expensive. The Emergency Credit Line Guarantee Scheme (ECLGS), which was introduced in May 2020 as a component of the Aatma Nirbhar Bharat Package, will now be expanded by Rs 1.5 lakh crore. Scheduled Commercial Banks would receive a guarantee for loans made to new or existing Non-Banking Financial Companies (NBFC) and Micro-Finance Institutions (MFIs) for up to Rs 1.25 lakh to about 25 lakh small borrowers. Instead of emphasising debt repayment, the strategy concentrates on fresh lending. The number of lenders, need that borrowers belong to joint liability groups, and limits on household income and debt are only a few of the existing RBI requirements that MFIs will follow while making loans to borrowers. Another feature of the scheme is that all borrowers (including defaulter upto 89 days) will be eligible (PIB, 2021). The union budget 2021-22 provided additional credit for Micro and Small Enterprises of Rs. 2 lakh crores to be facilitated under the Credit Guarantee Trust for Micro and Small Enterprises (PIB, 2022).

NON-PERFORMING ASSETS: DEFINITIONS AND PROVISIONING NORMS.

NPA is characterised as an advance where either or both of the interest or principal payments (in the case of term loans) have remained unpaid for a predetermined amount of time. *Interest payments in respect of term loans, an account will be classified as NPA if the interest applied at specified rests remains overdue for more than 90 days (RBI, 2021).* Non-performing assets are classified as follows (RBI, 2001):

- **Substandard Assets:** These are assets which have remained NPA for a period less than or equal to 12 months.
- **Doubtful Assets:** These are assets which have remained NPA for more than 12 months.
- **Loss Assets:** These are assets which are considered uncollectible although there may be some salvage or recovery value.

The Reserve Bank of India oversees the regulation of banks doing business in India. Banks must set aside enough money in case the value of their investments, loans, or other assets decreases. A percentage of the profits is set aside as provisions for the depreciation of the assets. 100 percent of the outstanding balance should be allocated for loss assets. For loans and advances not covered by the realizable value of a security, a 100% provision must be made for doubtful debt. For the secured portion of a doubtful asset, provision is to be made as follows:

Table 3.1 Time period of Asset Remaining in Doubtful Category	Percentage of Provision
Up to one year	20%
One to three years	30%
More than three years	100%

Source: Vaidyanathan (2013)

A provision of 10% of the total outstanding must be made for defective assets, without taking into account the availability of security or Export Credit Guarantee coverage. An extra 10% provision must be made in the case of unsecured exposure under the subpar category, bringing the total to 20%. It's probable that deteriorating assets will go into default as a result of shifting business cycles and the economy. As proactive measure, banks are required to make provision in respect of substandard assets as follow:

- Direct advances to agricultural land Small and Medium Enterprises 0.25 per cent.

- All other loans and advances 0.40 percent.

Additionally, banks must establish a strategy for floating provisions for advances and investments separately. Only with the agreement of the bank's board and the RBI may such a provision be utilised to make provisions in impaired accounts in the event of eventualities and extreme circumstances. In addition, with the Board of Directors' permission and in accordance with a policy that has been consistently followed over time, companies may voluntarily make extra provisions at rates above the regulatory minimum standard. Despite the numerous regulatory frameworks that banks follow, the NPA in India is significantly higher compared with other major economies.

METHODOLOGY

To have a thorough understanding on the factors that contribute to non-performing assets in the Indian banking sector, a rigorous and systematic search was undertaken among literatures with the same or similar objectives. The final review includes only peer-reviewed literature published between 2011-2021 by reputable publishers such as Sage, Emerald, Wiley, etc. A total of 18 articles were selected for reviewing.

ANALYSIS AND FINDINGS

Owing to the importance of a healthy credit system in an economy and how it impacted economic growth, the topic of NPA has gained a lot of interest among researchers. Previous authors such as Bardhan and Mukherjee (2016), Goswami (2021), Kaur and Kumar (2018), T.K. Jayaraman et al (2018) and Thiagarajan et.al (2011) have categorized the determinants of credit risk into macroeconomic variables and bank specific variables. The hypotheses on the determinants of NPA in the Indian banking sector are mainly tested against commercial banks grouped by their ownership category. Massive credit risk studies have been devoted to public sector banks, most likely due to their size and greater involvement to the lending crisis. Table 5.1 lists the articles that are associated with the different ownership category of banks.

Table 5.1: Publishing activity by ownership category of banks.

Types of bank	Sample of Literature
Public Sector Bank	Attu and Dwivedi, 2012; Goswami, A., 2021; Dash, M., 2019; Thiagarajan et.al., 2011; Sharifi et.al., 2021; T.K. Jayaraman et al., 2018; Roy., 2014; Kadanda and Raj., 2018; Satyajit., 2015; Bardhan & Mukherjee., 2016; Bardhan et.al., 2019; Memdani., 2017; Kaur & Kumar., 2018; Goyal & Bhati., 2017; Ramesh, K., 2019)
Private Sector Bank	Attu and Dwivedi, 2012; Goswami, A., 2021; Dash, M., 2019; Thiagarajan et.al., 2011; Sharifi et.al., 2021; T.K. Jayaraman et al., 2018; Roy., 2014; Bardhan & Mukherjee., 2016; Bardhan et.al., 2019; Memdani., 2017)
Foreign Banks	Attu and Dwivedi, 2012; Goswami, A., 2021; T.K. Jayaraman et al., 2018; Roy., 2014; Bardhan & Mukherjee ., 2016; Bardhan et.al., 2019; Memdani., 2017)

Table 5.2: Publishing activity by variable types

Determinants	Proxy	Sample of the literature
A. Macroeconomics Variables		
Economic Growth	Gross Domestic Product	Bardhan & Mukherjee., 2016; Goswami, A., 2021; Goyal & Bhati., 2017; Kadanda and Raj., 2018; Kaur & Kumar., 2018; Mishra et al., 2020; Roy ., 2014; T.K. Jayaraman et al., 2018; Thiagarajan et.al., 2011)
	Per capita Gross Domestic Product	Memdani ., 2017)
	Gross National Product	Satya., 2015)
Inflation	Annual percentage of Consumer Price Index	Bardhan & Mukherjee ., 2016; Kaur & Kumar., 2018; Memdani., 2017; Mishra et al., 2020; T.K. Jayaraman et al., 2018; Thiagarajan et.al., 2011)
	Percentage change in GDP deflator	Goswami, A., 2021)
	Annual percentage of Wholesale Price Index	Roy., 2014)
Exchange rate	Nominal Effective Exchange rate	Bardhan & Mukherjee., 2016; Goyal & Bhati., 2017; Kaur & Kumar., 2018; Mishra et al., 2020; Roy., 2014)

Unemployment	Rate of unemployment in the nation	Kaur & Kumar., 2018)
Monetization	Bank notes loses its legally enforceable validity	Mishra et al., 2020)
Index of production	Index of Industrial production	Kaur & Kumar., 2018; Mishra et al., 2020)
	Index of Agricultural production	Kaur & Kumar., 2018)
B. Bank Specific Variables		
Lagged NPA	Written-off previous years' NPA	Aradhan & Mukherjee., 2016; Thiagarajan et.al., 2011)
CRAR	Capital to risk weighted assets ratio	Aradhan et.al., 2019; Bittu and Dwivedi, 2012; Das., 2021; Kadanda and Raj., 2018; Kaur & Kumar., 2018; Ramesh, K., 2019; Reddy., 2015; Singh., 2015; Satyajit., 2015;)
Credit Growth	Percent change in the current year loans and advances with previous year's by the bank.	Aradhan et.al., 2019; Bittu and Dwivedi, 2012; Goswami, A., 2021; Reddy., 2015; Thiagarajan et.al., 2011);
Bank's profitability	Return on Assets	Bittu and Dwivedi, 2012; Das., 2021; Goswami, A., 2021; Kadanda and Raj., 2018; Kaur & Kumar., 2018; Mishra et al., 2020; Ramesh, K., 2019; Reddy., 2015; Satyajit., 2015; Sharifi et.al., 2021; Singh., 2015)
	Return on Investment	Kaur & Kumar., 2018; Mishra et al., 2020)
	Return on Equity	Kaur & Kumar., 2018; Mishra et al., 2020)
	Return on advances	Kaur & Kumar., 2018)
	Interest margin to total assets	Kaur & Kumar., 2018)
	Net Interest Margin	Mishra et al., 2020; Roy., 2014; Satyajit., 2015)
Income	Interest Income	Das., 2021)
	Non-Interest Income	Das., 2021; Goswami., 2021; Ramesh, K., 2019)
Loan Security	Ratio of Secured Loans to Total Loans	Das., 2021; Ramesh, K., 2019)
	Ratio of Unsecured Loans to Total Loans	Satyajit., 2015)
Lending to Priority sector	Whether priority sector includes agriculture, small scale industries and small borrowers.	Das., 2021; Memdani., 2017; Ramesh, K., 2019; Satyajit., 2015; ; Reddy., 2015)
Credit Deposit Ratio	Proportion of funds lent by the bank out of the total amount raised through deposits	Kaur & Kumar., 2018; Ramesh, K., 2019; Satyajit., 2015)
Bank size	Natural logarithm of bank's total assets	Goswami, A., 2021; Kadanda and Raj., 2018; Memdani., 2017; Reddy., 2015; Sharifi et.al., 2021; Thiagarajan et.al., 2011)
Gross advances	Total loans of the bank	Boyal & Bhati., 2017; Memdani., 2017; Mishra et al., 2020; T.K. Jayaraman et al., 2018)
Ownership category of Banks	Commercial banks in India are classified into public sector banks, private sector banks and foreign banks.	Goswami., 2021; Mishra et al., 2020; Reddy., 2015; Sharifi et.al., 2021)
Leverage Ratio		Kaur & Kumar., 2018)
Reserve & Surplus		
Loan maturity		Ramesh, K., 2019)

Credit concentration		pswami, A., 2021; Memdani., 2017)
Provisions and contingencies		ishra et al., 2020; Kadanda and Raj., 2018)
Inefficiency	Ratio of expenses to total assets	pswami, A., 2021; Thiagarajan et.al., 2011; T.K. Jayaraman et al., 2018; Kadanda and Raj., 2018; Ramesh, K., 2019; Reddy., 2015)
Solvency		pswami, A., 2021; Kaur & Kumar., 2018)
Bank branch growth		Thiagarajan et.al., 2011)
Excess capital	Actual capital (for credit risk) -Required minimum capital (for credit risk)	arif et.al., 2021; Kadanda and Raj., 2018; Satyajit., 2015);
Investment-Deposit Ratio		satyajit (2015)
Cost of fund		Kaur & Kumar (2018)
Loans to non-priority sector	Loans to non-priority sector/total loans	
Operating Cost		Das (2021)

DETERMINANTS OF NPAs: REVIEW OF RESEARCH

The frequently studied determinants of NPAs among the Indian banking sector are categorized into bank specific variable and macroeconomic variable as follows:

BANK SPECIFIC VARIABLES

Loan Security

Banks provide most of the loans on a security basis. Contrary to the dominant understanding that the higher the loans share backed by collaterals, the lower the NPA. Studies in India have agreed the positive relationship between value of collaterals and NPA. Ramesh (2019) conducted a study among 21 PSBs in India from 2010 to 2017 and claimed that the collateral value and NNPA have a positive relationship between them and that a collateral value significantly influences the NNPA. This finding was later confirmed by Das (2021) who studied 45 Indian SCBs from the time period 2005 to 2020. He documented that the share of secured lending in total lending is found to have statistically significant relationship with the NPAs (Das, 2021). He explained that such a scenario can happen when the valuation of a collateral declines substantially due to a fall in asset price which leads to loan failures, as the amount of loan to be repaid is much higher than the collateral (Das, 2021). In the same line, Satyajit (2015) who studied the relationship between unsecured loan and NPA among 27 PSB between 2001 and 2005 found no significant relationship between these two variables. The author claims that whenever an advance is lent to the borrower, the ability and willingness to repay the loan is much more important than the value of security that the borrower can deposit (Satyajit, 2015).

Capital to Risk-weighted Assets ratio

Banks are required to maintain a minimum Capital to Risk Weighted Assets Ratio (CRAR) of 9 per cent on an ongoing basis (RBI, 2022). This is made in line with the regulatory requirement of BASEL II norms. Bittu and Dwivedi, (2012) in their study among 70 banks in India have found that the average CRAR of these banks is above 12%. CRAR

is a prudential indicator of credit risk and several authors have studied its impact on NPA. Many articles have hypothesized that a well capitalized bank will exhibit lower NPAs. As hypothesized, authors such as Reddy (2015), Kandanda and Raj (2018) and Satyajit (2015) have discovered as negative and significant link between NPAs and CRAR which demonstrate that higher the capital, lower will be the level of NPAs. Bardhan et.al (2019) has estimated that the threshold effect of capital adequacy ratio on non-performing assets ranges between 10 and 12 per cent for alternative measures of NPAs. They propose that beyond the critical threshold, CRAR exerts negative and significant impact on NPAs of Indian banks and below the threshold, impact is insignificant. However, Bittu and Dwivedi (2012) have suggested a positive relationship between CRAR and credit risk which means that if CRAR increases, the default risk of banks also increases.

Lagged NPA

Several authors have studied the carry over effect of NPA from the previous year to the current year. In their analysis of 22 public sector banks and 15 private sector banks over the years 2001 to 2010 in India, Thiagarajan et al. (2011) found that lagged NPA contributes positively to present NPA in both public sector and private sector banks. Since the lagged NPA is the major contributing factor for the current NPA, the commercial banks must have prudent credit policies to avert any ill affect of the credit risk (Thiagarajan et.al, 2011). This finding was again confirmed by Kandanda and Raj (2018) who also documented a positive influenced between NPA and lagged gross NPA among Indian public sector banks. The researcher justified that the past NPAs contributes to current NPA possibly because in India the process of recovery or write-off of the NPAs happens in significant time lag (Kandanda and Raj, 2018).

Bank's performance

Bank's performance is a key bank specific determinant of NPAs. Several studies attempted to identify the causality effect between bank's performance and banks' credit risk.

Bank's performance is measured by profitability measures such as return on assets (ROA), return on equity (ROE), net interest margin (NIM) and return on investment (ROI). Goswami (2021) in his study of Indian bank-level data spanning over the period of 19 years from 1998/1999 to 2016/17 found an inverse relationship between banks' profitability (ROA) and NPA. This suggests that if the profitability of Indian bank(s) increases, they engage themselves in more prudent lending, with more careful screen and monitors the borrowers, which may lead a reduction in the risk defaults (Goswami,2021). This study is consistent with the findings of Das (2021) who suggest that lower earnings drive excessive risk taking or that undertaking risky projects in order to maximize the earnings by the banks results in NPAs. These results were supported by Kaur and Kumar (2018), Ramesh (2019), Kandanda and Raj (2018) and Reddy (2015).

In sharp contrast to the aforementioned studies, Satyajit (2015) and Mishra (2019) argued that profitability measures such as ROA, ROE and NIM to be statistically insignificant in explaining the movement in NPAs. The authors attribute this outcome to the bank's reaction to pressures for revenue creation; instead of launching riskier lending offerings, banks may respond to the pressures for revenue creation by turning to other non-credit revenues like non-asset-based income, treasury income, and fee-based income.

Bank size

Bank size is another determinant of NPAs that has been frequently examined. It is taken as the ratio of total assets of the bank to total assets of the banking sector. Thiagarajan et.al (2011) who studied bank level panel data of 22 public sector banks and 15 private sector banks for the period from 2001 to 2010 found a significant negative correlation between bank size and NPAs. Reddy (2015) also indicated that smaller banks are vulnerable to high proportion of NPAs. However, studies conducted using more recent data documented a contrast result. Kandanda and Raj (2017) have documented a positive relationship between bank size and GNPA and suggested that large banks are relatively inefficient in managing their asset portfolio. Goswami (2021) also suggested that large banks take excessive risk and extend their credit without proper screening and monitoring of the borrower's creditworthiness. This finding is also supported by Memdani (2017).

Bank's efficiency

Low efficiency is viewed by the bad management hypothesis as a symptom of bad managerial effectiveness. It predicts that reduced efficiency exerts a positive influence on non-performing loans. This hypothesis was supported by an abundant amount of literature that addressed the relationship between operating ratio and NPAs. Kadanda and Raj (2018) documented a positive and significant relationship between the contemporaneous level of operating ratio and GNPA through their study consisting of data collected from 21 PSBs from a period span from March 2009 to March 2017 resulting in 189 firm-year observations. In other words, inefficient banks have a higher incidence of NPAs (Reddy, 2015). This finding is

consistent with T.K. Jayaraman et al.(2018), Goswami (2021) and Thiagarajan et.al 2011.

However, the lagged operating ratio gives a significant negative coefficient which indicates that relatively efficient banks subsequently accumulate more NPA in the following years (Kadanda and Raj, 2018). Banks may deliberately choose to incur lower cost in the short run by saving on spending devoted to screening loan customers, appraising collateral, and monitoring and controlling borrowers after loans are issued (Kadanda and Raj, 2018). The result could also indicate that higher total operating expenditure devoted to recovery of loans reduces the non-performing loans in the long run (T.K. Jayaraman et al. 2018).

Credit growth

A large body of literature attempted to address the connection between bank's credit growth and problem loan. Scholars have particularly investigated if credit risk is pro-cyclical; wherein credit quality got compromised as a result of the aggressive lending during the upturn of the business cycle, thus increasing the credit risk. Aggressive lending is to be done by banks either for the fulfillment of socioeconomic objectives or due to political or government intervention for fulfillment of annual credit plans (Goyal & Bhati, 2017). T.K Jayaraman et.al (2018) support this idea and suggest through their research conducted on the commercial banking sector from 1999 to 2015 that increase in loans by banks reflecting the risk-taking behavior and aggressive credit policies results in higher non-performing loan. Additionally, using aggregate data on the Indian banking industry between 1998 and 2017, a study conducted using two-step system generalized method of moment (GMM) documented that previous year credit growth have a significant positive impact on asset quality which lead to credit creation of NPAs for banks in the future years (Goswami,2021). The positive relationship between credit growth and NPAs was also supported by Kandanda and Raj (2018) and Mishra et.al (2020). Other scholars have found a compelling result suggesting a negative association between credit growth and NPA (Reddy, 2015; Bardhan et.al 2019). Reddy (2015) suggested that more lending may have develop expertise in effectively managing credit risk and hence exhibit lower NPAs.

MACROECONOMIC VARIABLES

Economic Growth

Aggregate economic activity of a country is measured by GDP. A large branch of literature used GDP growth to reflect the country's economic condition and justify the deterioration of banks' loan quality (Goswami, A.,2021; Thiagarajan et.al,2011; Das and Gosh,2007; T.K. Jayaraman et al.,2018; Mishra et al.,2020; Roy,2014; Kadanda and Raj,2018; Bardhan & Mukherjee,2016; Memdani,2017; Goyal & Bhati,2017). One strand of literature argues that the contemporaneous growth of GDP and NPA are indirectly associated. For instances, in research conducted among 22 public sector banks and 15 private sector banks in India for the period from 2001 to 2010, Thiagarajan et.al (2011) found that current GDP had a significant negative influence on the current NPA. Roy

(2014) confirms the aforementioned findings through his study among 5 cross sections of bank groups for 17 years of time series data collected starting from FY 1995-96 to FY 2011-12. He provides evidence that current GDP and GDP (1 lag) has a negative relationship with NPA, which implies that with decrease in economic growth the NPA level increases (Roy, 2014). These results were further supported by Bardhan & Mukherjee (2016), Memdani (2017), T.K. Jayaraman et al., (2018).

Conversely, an opposing strand of the literature reports a positive or insignificant relationship between GDP growth and NPA (Goyal & Bhati, 2017; Kadanda and Raj, 2018; Mishra et al., 2020). Goyal & Bhati, (2017) in their study among Indian Public Sector Banks for the period of 2009 to 2016 found a significant positive correlation with Net NPA of Public Sector Banks in India. They explained that when GDP increases, demand of loans/advances also increases and bank extended loans to the borrowers, if banks are not following systematic risk management practices and proper and close pre-sanction appraisal and post sanction follow-ups than loan account turns to NPA accounts (Goyal & Bhati, 2017). In the same vein, Kadanda and Raj, (2018) who conducted a study among Indian PSBs found that one and two lagged GDP to be positively affecting the GNPA. However, Mishra et al., 2020 who studied the determinants of NPAs for Indian banks by using a panel dataset for 40 public and private banks in India, for the period March 2010 to June 2019 found GDP growth to be statistically insignificant in explaining the movement in NPAs. This suggests that booms and recessions in the Indian economy have not been a significant role-player in influencing the NPAs of Indian banks, during the period of the study (Mishra et al., 2020).

Exchange rate

Theoretically, currency depreciation makes the country's product and services more competitive abroad and thereby increasing the amount of export. In fact, the uncertainties surrounding the fluctuation on the value of currency can be a significant source of credit risks among banks. Authors such as Roy (2014); Bardhan & Mukherjee (2016); Goyal & Bhati (2017); Mishra et al., (2020) studied the impact of exchange rate on bank loan. Goyal & Bhati (2017) in their study among Public sector banks found that exchange rate significantly correlated with Net NPA of PSU banks in India, which indicates that when exchange rate increased, Net NPA of Public Sector Banks has also been increased significantly during the study period. Likewise, Roy (2014) studied 5 cross sections of Indian bank groups and provides evidence that currency appreciation leads to more NPA. Recent studies present confirmation to the aforementioned relationship, stating that exchange rate has a positive relationship with NPA in India (Bardhan & Mukherjee, 2016; Mishra et al., 2020) With a rise in the exchange rate (i.e., depreciation of the domestic currency, INR), such borrowers are exposed to higher debt servicing costs, thus increasing the likelihood of defaults on their loan and interest payments (Mishra et al., 2020).

Demonetization:

On 6th November 2016, Prime Minister Narendra Modi

declared the currency notes of Rs.500 and Rs.1000 would cease to be legal tender. The two denominations were 86% of all the currency in circulation at the time in terms of value. Though the main objective was to curb black money, GDP growth rate started declining sharply in the post-demonetization years. Lack of cash led to an immediate decline in sales and production among small and medium enterprises in the short run. The banking sector is the most affected sector as demonetization brings many opportunities as well as threat. As such, demonetization could potentially have a significant impact on the banking industry specifically in the area of NPA. However, Mishra et.al 2020 who studied 40 public and private banks in India for the period of 2010 to 2019 found no significant relationship between demonetization and NPAs.

IMPEDIMENTS TO CURRENT RESEARCH AND AVENUES FOR FUTURE RESEARCH

Owing to the high percentage of NPA on gross loans, the issue of credit risk has gained a lot of attention among researchers in the previous decade. Though extensive researches have existed, the challenges of banks' credit risk remain to exist unresolved. A thorough understanding on the contemporaneous determinants of NPA in the Indian banking sector will help policy makers and bankers sketch strategic action plan, suitable to manage the imminent threat of credit risk and ensure a sustainable and rapid economic growth. Against this backdrop, this section provides boulevard for guiding future research in this field.

Deepen research on the impact of political and government intervention on the Banking industry.

This review indicates that a vast amount of research is skewed towards bank macroeconomic variable, with little attention paid to government intervention on the banking sector. In fact, the basic idea behind bank nationalization in 1969 was to collaborate with the government policies in providing financial assistance to the government's priority sector. The government of India initiated a social-banking program and simultaneously introduced schemes that made bank loans available to the poor at highly subsidized rate. Though such schemes might aid to the economic development, the ability to absorb financial shocks arising out of the increased credit risk might be compromised. Thus, as an avenue for future research and to guide the advancement of policy making, this review suggested incorporating the governmental policies while investigating the factor that influences bank's credit risk.

Further investigate the impact of un-quantified determinants.

One of the issues that need to be brought into attention is the paucity of qualitative research in identifying the determinants of bank credit risk. Though a plethora of quantitative data facilitate the use of advanced quantitative analysis, un-quantified determinants such as empathy, analytical ability, risk attitude and preferences of bank managers could conceivably impact the credit risk of banks. Furthermore, it would be interesting to explore the additional qualitative characteristics of managers such as job satisfaction, working environment, reliability and

consistency impacted the bank's credit risk.

Expand the research to different bank group

The literature review is concentrated mainly on the study of public sector bank, private sector bank and foreign bank. Other bank groups such as regional rural bank, small finance banks and payment banks were not represented in the literature included the study. Though the smaller bank groups look diminutive compared with the larger groups; hence, exclusion of such may seem logical. However, each bank groups were conceptualized to perform different objectives and are obligated to perform under divergent regulations. As such, each bank groups might be facing credit risk which might be unique from other bank groups.

Deepen research in identifying the most suitable econometric models adaptable for the Indian banking system.

This study reveals that there is no consensus among authors towards the determinants of bank credit risks. One possible interpretation behind this is the divergence in the use of econometric model. Future study should focus on the most suitable econometric model for the Indian Banking industry. Given that one of the reasons behind the mixed results is endogeneity problems, the application of more advanced econometric models such as the General Methods of Moments estimation (GMM) as it avoids endogeneity issues and is considered a powerful econometric estimation technique (Naili and Lahrichi, 2019).

Further investigate the effect of regulatory and supervisory practices of Central Bank on NPAs.

The Board for Financial Supervision (BFS) was constituted under RBI (BFS) Regulations 1994 to give undivided attention to the prudential supervision and regulation of banks, financial institutions and non-bank financial institutions in an integrated manner. In an effort to regulate banking regulations and strengthening the international banking system, India adopted the Basel-I guidelines in 1999. Though Basel –II guidelines are yet to be fully implemented in India, Basel-III has been implemented from 1st April, 2013 in a phase manner. The primary focus of all such banking reforms is to promote a more resilient banking industry. Thus, future researches should focus on the role of stringency and frequent alteration in the banking regulation on the improvement of bank asset quality. In addition to that, close attention needs be paid to potential impact of the new capital adequacy ratio, leverage rate, net stable fund rate and liquidity conversion ratio.

CONCLUSION:

The ambition of the present study is to clarify the determinants of credit risk in the Indian banking system by providing a comprehensive review of the literature of NPAs in the Indian banking sector. The article has important policy implications for stability of the Indian banking system. It reveals a wide array of thoughts that shaped the argument of NPAs determinant, inducing the regulators to adjust their prudential norms. It also aid subsequent researcher by detecting the areas in which research is silent, yet it has some limitations. Some variables have been discussed by limited authors. This can be explained by the

fact that the Indian banking sector has gone through a lot of phases recently, thus making it difficult for researchers to keep track of certain variables. Such drawbacks can be overcome by introducing larger sample size.

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