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Management of non-performing assets in India: role of risk management practices in the wake of Covid-19

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Management of non-performing assets in India: role of risk management practices in the wake of Covid-19

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Abstract: The purpose of the present study is to analyse the impact of banks' internal practices for risk management, Basel III regulations, Insolvency and Bankruptcy Code (IBC), 2016, and the Covid-19 pandemic on the outcome received in reference to NPA management. The study has worked on primary data collected from the final sample of 111 managerial employees working in domestic commercial banks of India, using a structured questionnaire. For analysing the collected data, statistical tools of exploratory factor analysis (EFA) and structural equation modelling (SEM) comprising of confirmatory factor analysis (CFA) and path analysis, have been used. The results indicate that the banks' internal practices for risk management, regulatory standards and IBC, 2016 are beneficial for the asset quality of banks. On the contrary, emergence and rapid spread of Covid-19 has made the situation of NPA worse and has halted the progress made in NPA management.

Keywords: NPA; non-performing assets; risk management practices; Basel III; insolvency and bankruptcy code; 2016; Covid-19.

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1 Introduction

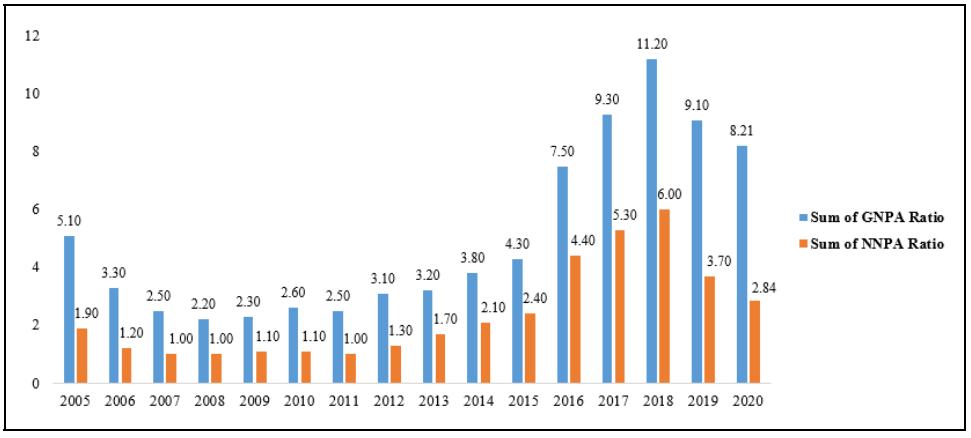
Banking institutions act as the bridge between saver and borrowers, by channelising savings and making them available to the corporates and individuals who are in need of funds. A perilous banking system is a hurdle for economic development and contributes to making an economy vulnerable to internal and external shocks. The primary risk to which banking entities, in particular, are exposed, is the credit risk. The possibility of a borrower defaulting on making the repayment of loan, is known as the credit risk for the lending bank. Non-performing assets (NPA) are the major source of credit risk for banks and generally the two terms are used as synonym for each other. The impact of rising problem loans on banks' profitability is evident because higher NPA requires higher provisions to be made out of banks' profits. Also, the risk associated with banking assets rises with increasing bad loans, due to which banks have to maintain higher regulatory capital. Thus, the further lending capacity of banks gets hampered due to inflating NPA. One of the main functions of the banking entities is to recycle credit or credit creation which also gets adversely impacted because of problem loans.

For India, as can be seen in Figure 1, in the years after global financial crisis 2007–2008, NPA of the Indian scheduled commercial banks have shown a gradual increase. It can be explained as an outcome of the crisis to which Indian economy was not immune. The India banking sector was intertwined with the US banking industry and its sub-prime mortgage problems (Gulati and Kumar, 2016). However, after 2015, a sharp increase in both gross NPA ratio and net NPA ratio can be seen. In the year 2015, RBI reinforced stricter norms for recognising NPA. Under the new norms, banks will have to mark certain assets as non-performing, which prior to these regulations would have been classified as standard assets. The initiation of asset quality review (AQR) in 2015 requires banks to maintain a fully provisioned balance sheet. Due to the resultant transparency in recognising bad loans, reclassification of stressed assets as NPA was done. These changes led to a drastic increase in NPA. The banks have been instructed to follow the stricter rules for identifying and reporting bad loans. It has made the concealment of such problem loans using practices of evergreening much more difficult (Srivastava, 2018; Pandey, 2020). The situation did improve in the financial year 2018–2019 and continues in 2019–2020 as well. Both gross NPA and net NPA ratio declined on average. This improvement in banks' asset quality was brought by the propitious policy environment led by RBI and Government of India, and the Insolvency and Bankruptcy Code (IBC), 2016. Just when the banking sector was recovering from the bad loans issue, the world got hit by Covid-19. In these tough times, in order to tackle the credit situation, RBI introduced the facility of moratorium for the borrowers while simultaneously putting a freeze on asset classification. However, as the effect of these intervening policies fades, the problem of bad loans is expected to crop up again. Evident from the forecasts of stress tests conducted RBI, due to the pandemic, the gross bad loans can reach to its highest in last 2 decades. According to the Financial Stability Report published by RBI in January, the GNPA ratio may reach its highest in last 22 years at 13.5%, by September 2021, under the baseline scenario.

In order to address the issue of NPA, the Indian banking regulator, RBI, has come up with various policy tools and guidelines. In addition to in-house policy regulations, the international best practices have also been adopted. The purpose of these practices has been to make Indian banks more competitive globally so that they can withstand any financial or economic shocks. In this row, India adopted the recommendations of Basel

Accord starting with the implementation of Basel I in 1999. India started following the most recent advisory of BCBS, i.e., Basel Accord III, in 2013 in a phased manner. The guidelines provided by RBI for the banks, with regard to Basel III recommendations, are more stringent than that of the Basel Committee. As per various reports published by RBI and Indian commercial banks, the banking entities have been maintaining the Basel III standards, at a higher level that what is instructed by RBI.

Figure 1 Non-performing assets of Indian banking sector (see online version for colours)



Source: Author's compilation

The purpose of the present study is to examine the impact of banks' internal practices, national policy regulations and international recommendations, on the NPA level. It is important to investigate whether the internal practices of individual banking entity, and national and international policy frameworks are having expected influence on the level of bad loans. The previous studies relevant to this subject matter are limited to the inclusion of banks' internal tools and practices. The national and international policies for NPA management have not been taken into account. Hence, the present study has addressed this issue by including international recommendations made and the policies framed by Indian government for controlling problem loans, in the model for NPA management. The scope of the study covers only public and private sector banks. In order to better understand the mechanism used for controlling NPA and its impact on the level of problem loans, the present work has studied the opinion of banks' managerial employees who are actually responsible for framing, implementing and supervising the application of these management policies and practices. Along with the banks' practices for credit risk management, the qualitative and quantitative tools provided by Basel Accord III, have been taken under consideration. The issue of ongoing Coronavirus pandemic with relation to its impact on NPA management by banks, has also been addressed in the present work.

Rest of the study has been organised as given: After giving a brief background of the study in Section 1, relevant literature has been reviewed in Section 2, where the research carried out by previous authors and the results documented by them on the topic of concern, have been summarised. The section has been concluded by presenting a gap in the literature and how the present work has attempted to fill this gap. The research methodology adopted in the study has been reported in Section 3. Under Section 4,

results of the study have been summarised along the inferences drawn from them. Lastly, Section 5 concludes the study by presenting the summary of the results compared with the previous studies and implications for various stakeholders.

2 Review of literature

Since last few decades, the financial sector has been experiencing major losses because of the unavailability of an "efficient risk management and control system" (Claessens and Köse, 2013). Previous studies have shown the evidences indicating that almost half of the total risk associated with financial sector, and banking entities, in particular, is accounted for by the credit risk (Heffernan, 2005). A banking sector subjected to increased credit risk faces the outcome in the form of inflated NPA. In order to manage credit risk, control bad loans and ultimately improve the loan quality, it is important to have appropriate and efficient practices, policies and regulations in place. However, the studies empirically addressing the issue of credit risk and its management, especially in banking sector are scarce in number (Fatemi and Fooladi, 2006; Sharifi et al., 2019). This section discusses the studies relevant to management of credit risk and NPA, in particular.

2.1 Banks' internal practices for risk management

In order to ensure an efficient management system for overall credit risk and NPA, in particular, it is important to have within the banks, an appropriate environment for credit risk management and a well-constructed credit granting process, among others (Basel, 1999). Establishing an appropriate environment for the management of NPA, requires commercial banks to strategise and put policies in place with clearly defined responsibilities for "developing, reviewing, approving and implementing" such policies (Asfaw and Veni, 2015). The strategies made should be a reflection of the risk profile of banks and should indicate the profitability level that a banks expects to gain at a given level of risk incurred (Nyong'o, 2014). "Banks should ensure that the risks of products and activities new to them are subject to adequate risk management procedures and controls before being introduced or undertaken, and approved in advance by the board of directors or its appropriate committee" (Basel, 1999; Nyong'o, 2014). It is suggested by Basel (1999) that adequate information should be accessible to the lending banks so that a thorough evaluation of the borrowers' risk profile can be done. Hence, before taking the decision to enter into the credit relationship, it is important that banks become familiar with the borrowers and their credit history. Also, borrowers' positive reputation in terms of financial position and creditworthiness should be ensured as well. Evidence from Ethiopian banking sector have been provided by Asfaw and Veni (2015), where the researchers have examined the credit risk management practices and analysed the impact of various components on the performance of these practices. The primary data collected from the final sample size of 114 respondents was used for the purpose of analysis. The study summarised that an efficient credit granting process adds to the performance of credit risk management. In addition to it, an appropriate environment for the management of risk brings significant contribution to the decline in credit risk. Olabamiji and Michael (2018) considered the responses of bank employees for examining the impact of credit management practices on bank performance. The results of the study indicated that implementing and supervising management of credit efficiently can help banks reduce

their bad loans. It has been further stated that in particular, evaluation of potential borrowers, control over credit risk and recovery procedures contributes significantly to the performance of banks. In a more recent study by Sharifi et al. (2019) the impact of various credit risk components has been examined for the bad loans of banks in India. The study provided the conclusion that credit risk identification is the most important principle for ensuring performance of credit risk management practices. Also, early identification of risk helps bring the NPA down. For the micro-financial institutions of Kenya, Paul and Musiega (2020), assessed the impact of credit risk management practices on financial performance. The study concluded that grading and control of credit risk are the important practices bearing influence over performance of such institutions.

On the basis of above discussion following hypotheses have been formulated for the present study:

H_1: Appropriate environment impacts performance of NPA management significantly.

H_{1a}: Bank ownership has moderating impact on the relationship between appropriate environment and performance of NPA management.

H_2: Credit granting process impacts performance of NPA management significantly.

H_{2a}: Bank ownership has moderating impact on the relationship between Credit granting process and performance of NPA management.

2.2 Basel accords and various aspects of banking institutions

Since its introduction in 1988, the regulations of Basel Accords have been examined for their impact on different aspects of banking sector (Kashyap and Stein, 2004; Vousinas, 2015). Even after all the efforts to make the Basel regulations more adaptive to the innovations of the banking sector and risks faced by it, the debate on Basel recommendations is still going on. This section focuses on the studies where the Basel Accords have been discussed in relation to their effectiveness in promoting financial stability, the issues with implementation of Basel Accords, various problems which have Basel regulations as their probable cause.

Regulatory capital requirement was the primary recommendation of Basel I. The recommendation was that banking institutions must hold a specific amount of capital buffer at all times, in order to withstand any economic or financial shock. However, the Accord was criticised for being risk insensitive (Repullo and Suarez, 2008). As against this, researchers have found evidence that though Basel II made the capital requirements more adjusted to the risk profile of banks' operations but it simultaneously reinforces procyclical behaviour in banks (Borio et al., 2001; Catarineu-Rabell et al., 2005). In scenario of economic downturn, the risk weights associated with loan assets increases and so does the capital required for such assets. Further, due to increased bad loans during the stress situation in economy, the capital position of banks' deteriorates. This tend to make banks curtail on their lending supply and also increase the loan price and hence escalate the procyclicality in banks' lending operations (Andersen, 2011). By improving on the quality and quantity of capital to be held by banks, Basel III proposed to ameliorate the banks' ability to respond to losses during stress periods (Swamy, 2013). The impact of meeting regulatory capital requirement of Basel III on banks' performance was empirically tested by Gavalas and Syriopoulos (2014). The study found evidence that

increased proportion of equity capital in relation to assets, is associated with increased loan rates and reduced credit supply. In a study for the banking industry of Ghana, Osei-Assibey and Asenso (2015), analysed the impact of regulatory capital on bad loans and found that banks maintaining higher than minimum required capital, tend to take on more risky loan portfolios, which turns into higher bad loans. Gabr and ElBannan (2018) investigated the impact of Basel II regulations on risk-taking behaviour of banks in Asian countries. The study summarised that with increase in regulatory capital requirements, the entry barriers rise which further reduce the competition. This will have implications on banks' involvement in risky activities and resultantly, risk as measured by NPA ratio declines. Examining the inter-relationship between credit risk management and profitability of banks, Gupta and Sikarwar (2020) undertook the case study of Indian banking sector. The study summarised that maintaining higher capital adequacy ratio is a substantial risk management tool, since it is beneficial for the financial performance of banks. Another similar study was conducted by Akomeah et al. (2020) for banks in Ghana. The study concluded that holding adequate regulatory capital ensures banks' ability to endure financial shocks and hence, provides stability to the banking sector. For the Indian banking sector, Sharifi et al. (2021) examined the inter-relationship between credit risk management and size, ownership and financial performance of banks. For representing CRM, the study used excess regulatory capital. It has been summarised by the researchers that larger banks holding sophisticated resources are also expect to maintain more of excess regulatory capital. The reason is attributed to such banks' riskier loan portfolios. The study has further suggested that the regulators need to align the regulatory standards' requirement as per the risk profile of banks. Restricting banks' credit flow by way of setting higher regulatory capital standards can cause lending to priority sectors to decline.

Basel Accord III supplemented the regulatory risk based capital requirements with a leverage ratio which is based on the total exposure of banks and provide them protection against model risk and any measurement errors. The study by Brei and Gambacorta (2014), was the first to investigate the behaviour of leverage ratio over business cycle. The study has found that the non-risk based leverage ratio is relatively more countercyclical than the risk weighted capital ratios. The study has further stated that the leverage ratio puts a stricter constraint on banks during boom phase whereas relaxes the restrictions during economic downturn. As argued by Dermine (2015), the non-risk based leverage ratio, reduces the probability of bank run caused due to any 'imperfect information' about the asset value of a bank. In a study for European Union banks, Acosta-Smith et al. (2018) investigated the implications of leverage ratio introduced in Basel III alongside the risk-sensitive capital requirements. The study has shown that leverage ratio incentivises banks to take on more risk because due to ignorance for risk in calculating leverage ratio, the risky assets and relatively safer assets providing lower return, are treated alike. However, at the same time, once the banks are bound by the regulations for leverage ratio, the increased involvement in riskier activities get more than offset by the greater ability to absorb losses with availability of higher capital.

The financial crisis of 2007–2009 brought forward the criticality of 'liquidity disruption' and made the regulatory authorities to emphasise on the management of liquidity risk. The Basel Committee answered the issue of liquidity risk by proposing two measures, namely liquidity coverage ratio (LCR) and net stable funding ratio (NSFR). The LCR ensures the availability of highly liquid assets that can be converted into cash easily, in case any stress situation continues for a month. On the other hand, NSFR is the

measure to safeguard banks from long term liquidity problems. In a study of commercial banks in Kenya, Muriithi and Waweru (2017) examined the impact of liquidity risk, as represented by NSFR, on banks' financial performance which is indicated by return on equity. The results of the study summarised that NSFR bears negative and statistically significant influence on ROE. It implies that availability of highly stable funds and reducing maturity mismatch may deteriorate the profitability of banks. L'Huillier et al. (2018) propounded that implementation of NSFR standards provides stability to the banking system. However, the study further warns that the beneficial effect of NSFR on the financial stability of banks gets reduced as the bank become larger. In a cross-sectional study for emerging economies, Mashamba (2018) examined the impact of liquidity regulations of Basel III on banks' profitability. The study concluded that LCR regulations actually bear positive influence on financial performance of banks. The study has further summarised that it is the "funding structure rather than asset composition" that determines bank profitability.

With the backdrop of conclusions drawn by previous studies, the present study has tested following hypothesis:

H_3: Basel III impacts performance of NPA management significantly.

H_{3a}: Bank ownership has moderating impact on the relationship between Basel III and performance of NPA management.

2.3 India's insolvency and bankruptcy code, 2016

In order to address the problem of rising bad loans and related issues, the most recent step taken by Indian government came in the form of Insolvency and Bankruptcy Code (IBC), 2016. It was introduced to resolve corporate insolvency issues and expedite the recovery of bad debt of financial creditors. According to a World Bank report for 2015, in India, for resolving an insolvency a time period of around 4.6 years was taken, as compared to 1 and 1.5 years in the UK and the US (Bang et al., 2019). Hence, there was a need to revise the laws related to corporate insolvency so as to ensure speedy recovery of bad loans and management of overall NPA problem. As a result, IBC, 2016 was passed on 26th May 2016 as a landmark reform, reviving the system of insolvency and bankruptcy. Though the Code has been framed to overcome the shortcomings of previous legislations, it still faces certain challenges. The clearly defined timelines provided for completion of resolution process are a selling point for the Code. However, the same main key feature of the Code has been frowned upon by many users. The Code gives a total of 270 days maximum for reaching to a decision for resolving the insolvency of any corporate debtor. Many companies find this time period insufficient for analysing the financial information and proposing appropriate resolution plan (Umarji, 2016). For example in case of Bhushan Steel, there were only 2 bids received, from Tata Steel and JSW Steel, by the insolvency professional, within the prescribed time limit. In addition to it, the right to move forward the application for Corporate Insolvency Resolution Process (CIRP) has been given to both operational and financial creditors. However, the committee of creditors which decides the future of the corporate debtor in default, is constituted of financial creditors alone. According to Ramamurthy (2016), this may adversely impact the very efficiency of the Code. As happened in the case of Bank of Baroda vs Binani Cement, it was argued by the operational creditors that they should also be permitted to take part in money matters just like other creditors. In order to prove their importance for

the operations of the company, the creditors stopped the material supplies to Binani Cement. Further, because there are no clearly stated guidelines defining the manner in which the decision making process is to be carried out, considerable power on the defaulting debtor has been assumed by the CoC, which might be against public interest (Chaudhary and Kapoor, 2016). In some of the cases, the prudence of CoC has come under question. For example, the CoC in case of Rave Scans rejected the resolution proposals without stating any valid reasons even though INR 0.51 billion were being offered against the debt of INR 0.36 billion (Gupta, 2018).

According to RBI's report on "Trend and Progress of Banking in India" for the year 2019–2020, IBC has dominated over other recovery channels. Out of the total recovery made by banks through various channels in 2019–2020, IBC has contributed the major proportion i.e., 61% which is higher than the 56% recovery made by the Code in 2018–2019. In another report for 2018–2019, RBI stated that out of the total claims filed by banks under IBC, the lenders were able to recover 42.5% of their dues. Comparing the recovery made under IBC with other channels, IBBI Chairperson M S Sahoo commented that financial creditors had to take 57% haircut against their dues. The 190 companies rescued till December 2019 owed financial creditors a total sum of INR 3800 billion, but had assets of value INR 770 billion only at the time of entering into IBC. By the same time 780 companies were sent for liquidation. However, the assets held by 190 companies rescued were 4 times in value as compared to that of liquidated companies. He further stated that due to the threat of losing control of the company, the debtors are behaving in a more disciplined manner and many are going for settlement of their dues "in early stage of the life cycle of a distressed asset". Though the performance of IBC, 2016 is much better as compared to its previous counterparts, but lot of scope for improvement is still left. Banks are accepting the settlement of their dues with huge haircuts and that too after waiting for longer than the time stipulated under the Code. The delay is caused by legislative procedures and infrastructural problems, on which the government needs to work on further.

On the basis of discussion made, following hypotheses have been formulated in the present study:

H_4: Insolvency and Bankruptcy Code, 2016 impacts performance of NPA management significantly.

H_{4a}: Bank ownership has moderating impact on the relationship between Basel III and performance of NPA management.

2.4 The ill-effects of Covid-19

Early in December 2019, the first outbreak of Covid-19 was reported in Wuhan, Hubei Province. Many patients suffering from viral pneumonia were detected to be epidemiologically linked with the Huanan seafood market in Wuhan (Ghosh et al., 2020). Within the last week of February 2020, stock markets globally experienced a dip of about $ 6 Trillion, due to the panic surrounding the pandemic situation and the rational judgement of investors that financial profits of companies will shrink because of the Covid-19 impact (Ozili and Arun, 2020). Being the primary financial intermediary, banking entities were called upon by governments to facilitate the flow of credit to firms so as to help other industries remain afloat during this tough time (Acharya and Steffen, 2020). Deteriorated asset quality can be one of the expected outcomes, once the

pandemic is over because the restoration process of the economies is anticipated to be at slower pace and the impact of current policy measures on banking industry is largely unknown (Demirguc-Kunt et al., 2020). In an empirical work, Demirguc-Kunt et al. (2020) examined the impact of Covid-19 pandemic on the performance of banking sector and compared the results with that of the other corporates. The results concluded that the adverse impact of this global situation is more prominent and long lasting for the banking institutions as compared to the non-bank financial entities and non-financial sector. In their work for the economy of Indonesia, Disemadi and Shaleh (2020) summarised that the financial performance and repayment capacity of the debtors have degraded because of the economic downturn during pandemic. The study further states that this situation with debtors can transform into credit risk for the banking entities very easily. In India, to keep the businesses solvent amid the nationwide lockdown and to alleviate the distress of diminishing debt servicing ability of borrowers, RBI announced the availability of 3 months moratorium (extended for another 3 months) on the loan repayments becoming due between the lockdown. Subramanian and Felman (2020) stated that about one-third firms from industrial and services sector came forward to avail the benefits of moratorium on their loans. On the downside, as per the estimations of RBI in Financial Stability Report for July 2020, gross NPA ratio is expected to increase from 8.5% in March 2020 to 12.5% in March 2021, under the baseline scenario.

Hypotheses mentioned below have been framed for the present study:

H_5: Covid-19 impacts performance of NPA management significantly.

H_{5a}: Bank ownership has moderating impact on the relationship between Covid-19 and performance of NPA management.

2.5 Research gap

Though the studies exploring banking sector in transition economies are voluminous, the issue of risk taking and risk management have not been studied well (Haselmann and Wachtel, 2007). In addition to it, very few academicians and researchers have explored the effectiveness of various risk management practices and regulations for controlling bad loans. Thus, after reviewing the extensive literature discussed above, certain gaps have been identified. It was seen that strength and the contribution of banks' internal practices, in the overall credit risk management system, have been assessed by many researchers. However, these studies (Olabamiji and Michael, 2018; Paul and Musiega, 2020) have examined the impact of different risk management practices on the performance of banks. A very few studies like Sharifi et al. (2019) have researched how well these practices are able to impact the management of NPA. From the various tools and policy frameworks provided by Basel committee, capital adequacy norms are generally used by studies like Gabr and ElBannan (2018), Gupta and Sikarwar (2020) and others, to explain bank profitability or in some cases, banks' NPA. However, tools like leverage ratio, LCR and NSFR, provided in Basel Accord III, have not been studied in terms of their impact on the management of bad loans. Lesser number of studies have empirically explored the working and outcomes of IBC, 2016 for the banking institutions. Lastly, a very limited amount of research has been carried out to quantify the impact of Covid-19 on the banks' asset quality. Hence, in order to fill this gap of grave importance, the present study has aimed to examine the impact of banks' internal risk management

practices, national and international policy regulations, and Covid-19 on banks' asset quality.

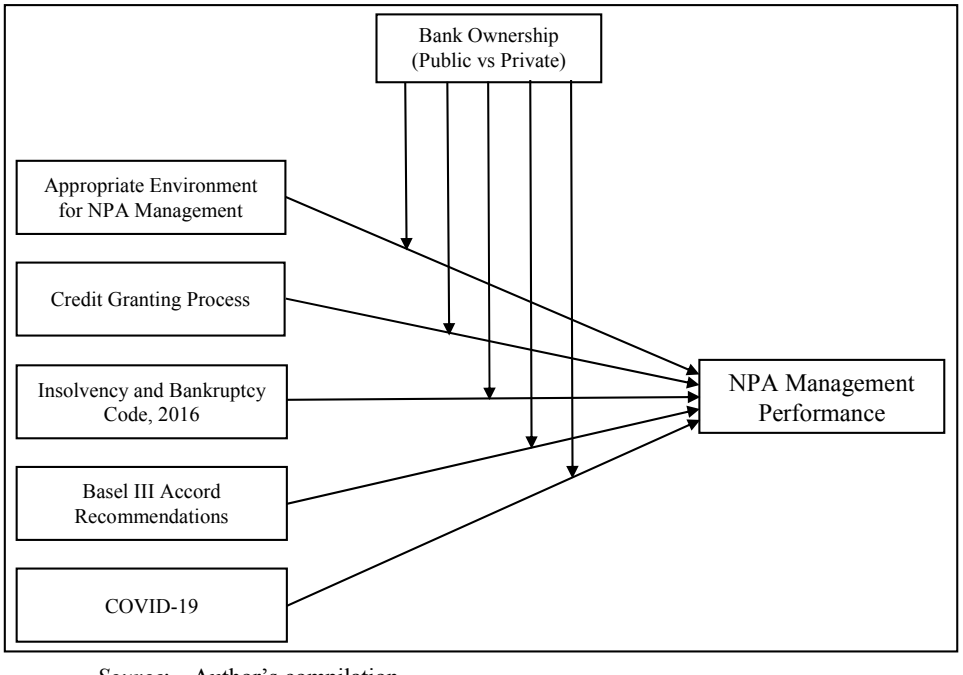
3 Research methodology

This section presents the research methodology applied for making the required analysis. It includes the sub-section for hypothesis formulated for the achievement of stated objectives, research model proposed, description and measurement of variables selected and information regarding population, sample size and data sources.

3.1 Objective

The present work has been carried out with the objective to examine the impact of banking entities' internal risk management practices and policy regulations for NPA management on the level of NPA (Figure 2). In addition to this, keeping in view the recent changes, the impact of Covid-19 on NPA has also been investigated. The role of bank ownership has been included in the analysis as well. For this purpose, bank ownership i.e., public vs. private, has been treated as the moderating variable.

Figure 2 Research Model for analysing impact of various factors on NPA management performance



Source: Author's compilation

3.2 Measurement scales used

In order to estimate the dependent and independent variables used in the present study, scales established by previous literature on relevant subject matter have been used (Refer Appendix 1). The statements used by existing studies have been modified for better understanding of Indian respondents.

The scales have been measured on a 5-point Likert scale, where score of 1 indicates strong disagreement with the statement and 5 indicates strong agreement with the statement. The initial draft of the questionnaire was then shared with the academicians of related fields and industry experts for their suggestions on understanding and consistency of the statements, clarity and interpretation of the language, and any other aspects which need improvement. The feedback gathered was thoroughly worked upon and suitable suggestions were applied for the betterment of the questionnaire.

3.3 Data collection and sampling decision

For the purpose of the present study, primary data has been collected from managerial level employees working in public and private sector banks in India. Structured questionnaires have been used to collect required data so as to get information regarding the perception and opinion of bank managerial employees about various aspects of the study. The questionnaire consisted of 5 statements for each of the variables, except Covid-19 which has been represented by 3 statements. As suggested by Sekaran and Bougie (2003), once the questionnaire was designed, pilot testing was done in order to give the questionnaire a more structured form and to ensure its validity and reliability. Minimum number of respondents required for pilot testing lies within the range 20-50 (Rossi et al., 2013). Hence, for the present study, pilot testing has been conducted by taking a sample of 24 respondents. Reliability of the scale items considered for various constructs has been tested using Cronbach's Alpha. Internal consistency of the scales is established with a Cronbach's Alpha score higher than 0.70 (Pallant, 2010). The pilot testing results indicated that all the variables used are reliable and can be used for further study, as the value of Cronbach's Alpha for individual construct and overall statements is above the required threshold of 0.70. For the final data collection, an online survey approach was followed for collecting the data and thus, the questionnaires were mailed to the managerial employees in the form of Google Forms.

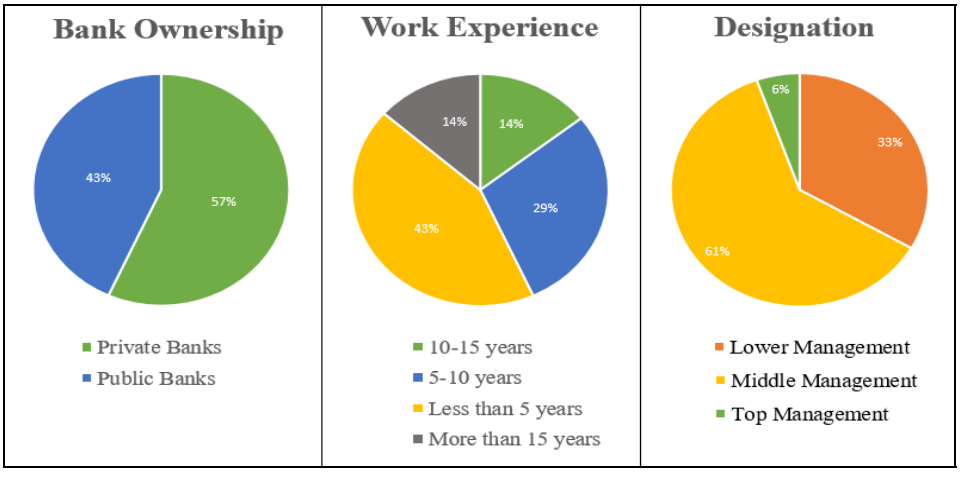
Selection of an adequate sample is critical for efficient conduct of analysis, and provide outcomes which are accurate and can be applied on the population studied (Bartlett et al., 2001). For collecting the data non-probability convenience sampling has been used. The questionnaire was shared with 240 managerial employees working in Indian commercial banks, through Google Forms. From the total 240 communicated questionnaires, 124 responses were received. The collected raw data has been coded and further checked for missing values, outliers and unengaged responses. Since all the statements in the online questionnaire had been made mandatory, thus, there were no missing values in the data. Also, in a Likert scale data where respondents are given a set number of options to choose from, the presence of outliers is generally not found. Unengaged responses were identified by calculating respondent wise standard deviation (SD) and the respondents were removed from the sample set in case their SD is less than 0.50. 13 responses were eliminated on account of unengagement of the respondents. Hence, the final sample size used for the purpose of analysis consisted of 111 responses,

making the effective response rate to be 46.25%. The rule of thumb recommended for minimum response rate required is of 20% (Malhotra and Grover, 1998). Thus, the response rate of the present study is higher than the recommendation made in this regard. In relation to adequate sample size, Schikorski and Stevens (1997) stated that if multiple regression is to be applied, then in that case 15 observations per construct are sufficient. Hence, sample size employed in the present study, i.e., 111, is more than the threshold specified above.

3.4 Demographic profile of respondents

Examining demographic profile of respondents may help recognise the background and level of understanding of the people whose opinions have been considered for the purpose of analysis. The final sample size is of 111 respondents. The demographic profile of these respondents has been summarised on the basis of their designation, work experience they have and the type of bank they work in (Figure 3).

Figure 3 Demographic summary of respondents (see online version for colours)



Source: Author's compilation

Figure 3 shows that more of private banks' (57%) managerial employees have provided their response for the questionnaire, as compared to the public banks (43%). Major proportion of respondents, i.e., 43%, have less than 5 years of experience, 29% holds 5-10 years of experience, 14% of the respondents are working in banks from 10-15 years and same proportion of respondents have more than 15 years' experience of working in banks. Out of the total 111 respondents, largest proportion of respondents (61%) belong to the middle management level, followed by lower management level, whereas only 6% of the respondents are from top managerial level.

4 Results and findings

The discussion regarding results and findings of the analysis performed, has been made under this section. SPSS 21.0 has been used for preliminary analysis and exploratory

factor analysis (EFA). For conducting confirmatory factor analysis (CFA) and path analysis, use of AMOS 24.0 has been made.

4.1 Preliminary tests

Normality

The data which is normally distributed or has a Gaussian distribution is characterised by most of the data points lying near the mean value and only few data points lie far from mean. When presented on a graph, the normally distributed data shows a bell shaped curve. The present study has employed Skewness and Kurtosis in order to examine if the data for various scale items is normal. Skewness of data ranging between –1 to +1, is acceptable and 0 Skewness implies perfectly normal data. It is found that the data is normal according to the Skewness measure, because the Skewness of the data is ranging between –0.891 to 0.921. The dataset having kurtosis less than –3 or more than +3, is known to be either playkurtic or leptokurtic, respectively. The highest kurtosis score calculated is 2.810 and the lowest kurtosis is –1.080. It implies that the data is mesokurtic and thus, can be considered normally distributed. Hence, the data used for present study is declared to be normally distributed as estimated using Skweness and Kurtosis.

Multicollinearity

The rule of thumb available in respect of multicollinearity states that VIF score equal to or more than 10 and the Tolerance level of 0.10 or less, implies the existence of multicollinearity (Neter et al., 1989; O'brien, 2007). As per the results of the study, none of the scale items have the VIF score higher than 10 or Tolerance level less than 0.10. Hence, it can be implied that the data has no multicollinearity issue.

4.2 Diagnostic tests

Before conducting EFA, it is imperative to perform various diagnostic tests for checking the reliability and validity of the data. The results of these tests have been summarised in Table 1.

Table 1 Diagnostic tests for exploratory factor analysis

Purpose	*Test performed*	*Findings*	*Results*
Reliability	Cronbach's Alpha	0.811	The dataset is reliable
Validity	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.824	The sample considered is adequate for conducting EFA
	Bartlett's Test of Sphericity	Chi-square (Approx.) = 2642.876 p-value = 0.000	Scale items have high correlation with each so as to enable aggregating them into components

Source: Author's calculation (SPSS 21.0)

To check for reliability of the data, Cronbach's Alpha (Cronbach, 1951) has been estimated for the whole dataset. It measures the 'internal consistency' reliability of the

scale items. The generally acceptable threshold value of Cronbach's Alpha, over which the reliability of dataset is ensured, is 0.60. The value of Cronbach's Alpha for the dataset used in the present study is 0.811, which implies that the data is reliable. To check if there are any validity concerns in the data, 2 separate tests have been performed. Kaiser-Meyer-Olkin (KMO) test (Kaiser, 1960), is conducted to check adequacy of the sample data used for EFA. The commonly used rule of thumb states that more than 0.50 value of the test statistics implies suitability of EFA for generating the composite components. The value of KMO test of sampling adequacy in the present work, as shown in Table 1, is equal to 0.824, i.e., more than 0.50. Hence, it means that the sample data is suitable for application of EFA. Bartlett's test of Sphericity given by Bartlett (1951), compares the correlation matrix between individual factors, with the identity matrix. It is found that null hypothesis for Bartlett's test of Sphericity has been rejected at 1% significance level. Thus, it implies that the scale items of any particular construct have correlations among themselves high enough to be aggregated into a composite component.

4.3 Exploratory factor analysis

The primary purpose of factor analysis is to summarise data so as to draw interpretations regarding relationships and patterns (Yong and Pearce, 2013). Exploratory factor analysis is one of the main techniques for conducting factor analysis. EFA unveils complex pattern by examining the dataset and testing the predictions. The present study has performed PCA, as it is suitable for extracting important information from the dataset, reduces the size of data by eliminating not so essential information, presents the data in such a form which is easy to describe, and analyses the trends and structure of observations.

Extracting too many factors may result in error variance which not required, whereas continuing with a very few factors may cause leaving valuable common variance out. Hence, Eigen values are to be used as the criteria for extracting an appropriate number of factors. The Eigen value indicates how well a component can summarise the variation in the original data. According to the Kaiser rule, the components having Eigen value higher than 1 should be retained in the analysis (Kaiser, 1960). As can be seen in the results reported in Table 2, the 6 components extracted and retained for the purpose of present study have Eigen Value above 1. Thus, the 28 statements included in the questionnaire have been aggregated into 6 components, which are explaining 77.439% of variance in the data.

Table 2 Components' extraction

Component	*Eigen value*	*Variance explained*	*Cumulative variance explained*
1	8.014	28.622	28.622
2	4.489	16.032	44.654
3	3.448	12.313	56.967
4	2.827	10.095	67.062
5	1.858	6.637	73.700
6	1.047	3.739	77.439

Source: Author's calculation (SPSS 21.0)

Factor loadings represent the strength of relationship between a scale item and the corresponding construct. The results provided in Table 3 shows that all the scale items load highly on the corresponding constructs. The scale items pertaining to all 6 constructs show a factor loading of minimum 0.712. The sign of factor loadings and the association of scale items with constructs is apt as per the previous literature. The results for validity and reliability shows that the composite data of extracted constructs is valid and reliable since for all the constructs, KMO value is above 0.50 and Cronbach's Alpha is more than 0.60.

Table 3 Exploratory Factor Analysis results

Scale items	*Factor loadings*	*Communalities*	*KMO*	*Cronbach's Alpha*
NPM_1	0.730	0.641	0.898	0.920
NPM_2	0.839	0.780		
NPM_3	0.848	0.815		
NPM_4	0.825	0.841		
NPM_5	0.842	0.775		
AEnv_1	0.792	0.697	0.831	0.926
Aenv_2	0.878	0.822		
Aenv_3	0.928	0.877		
Aenv_4	0.845	0.775		
Aenv_5	0.913	0.853		
CGP_1	0.761	0.688	0.812	0.860
CGP_2	0.849	0.756		
CGP_3	0.845	0.755		
CGP_4	0.716	0.602		
CGP_5	0.712	0.548		
Basel3_1	0.759	0.613	0.864	0.891
Basel3_2	0.779	0.735		
Basel3_3	0.817	0.775		
Basel3_4	0.793	0.778		
Basel3_5	0.809	0.748		
IBC16_1	0.855	0.807	0.895	0.943
IBC16_2	0.895	0.840		
IBC16_3	0.871	0.783		
IBC16_4	0.811	0.791		
IBC16_5	0.914	0.902		
COV1	0.864	0.868	0.741	0.938
COV2	0.820	0.899		
COV3	0.825	0.920		

Source: Author's calculation (SPSS 21.0)

4.4 Structural equation modelling

Structural equation modelling (SEM) comprises of a group of statistical techniques which can be employed to examine association between single or multiple independent variables and single or multiple dependent variables. SEM is a combination of 2 types of analysis or models, i.e., CFA and path analysis. Under CFA, measurement model is examined which is concerned with the relationship between measured variables and factors (or constructs). On the other hand, path analysis works on structural model, which examines the hypothesised association between various constructs.

4.4.1 Confirmatory factor analysis

Confirmatory factor analysis (CFA) examines the association between indicators or scale items and constructs, while allowing for free inter-correlation (Gerbing and Anderson, 1988). While using such already developed and tested scales, it is important to verify whether the scales are suitable and can actually be used for the current population. For this purpose, CFA can be conducted which analyses if the original structure of scale-factor association can be implemented for use in relation to current population (Harrington, 2009).

Model identification

The model identification can be established using the degree of freedom by calculating the difference between number of distinct sample moments and number of distinct parameters to be estimated. A positive degree of freedom indicates existence of an over-identified model. In the present case, calculated degree of freedom is coming out to be 335, as the number of distinct sample moments is 406 and parameters to be estimated are equivalent to 71. Hence, it implies that the model used in the present study is over-identified.

Convergent validity

Convergent validity is the measure which indicates the strength of correlation between various measures of a construct (Byrne, 1994). Thus, the items measuring same construct should have high covariance among themselves, for being valid measures. For ensuring convergent validity, composite reliability (CR) and average variance extracted (AVE) should be higher than 0.70 and 0.50 respectively. The related results have been reported in Table 4.

Table 4 Convergent and discriminant validity

Constructs	*Composite reliability* (*CR*)	*Average variance extracted* (*AVE*)	*Maximum shared variance* (*MSV*)	*Average shared variance* (*ASV*)
NPM	0.922	0.705	0.293	
AEnv	0.924	0.712	0.074	
CGP	0.865	0.564	0.178	
Basel3	0.899	0.641	0.293	
IBC16	0.944	0.773	0.319	
COV	0.940	0.839	0.319	

Source: Author's calculation (AMOS 24.0)

As per the estimated results, both the conditions required for establishing Convergent Validity have been met.

Discriminant validity

Ensuring discriminant validity implies that the constructs of the model are not very strongly correlated with the constructs that are used to represent different measures (Campbell, 1960). The methods to establish discriminant validity, as proposed by Fornell and Larcker (1981) and supported by Hair et al. (2010), states that AVE should be greater than MSV and ASV. Additionally, square root of AVE greater than the correlation coefficients between constructs, i.e., the diagonal items in the correlation matrix should be greater than the non-diagonal items.

From the results presented in Tables 4 and 5, it can be inferred that discriminant validity is present in the data.

Table 5 Correlation between constructs and square root of respective average variance extracted

	NPM	*Aenv*	*CGP*	*Basel3*	*IBC16*	*COV*
NPM	**0.840**					
Aenv	0.272	**0.844**				
CGP	0.330	0.153	**0.751**			
Basel3	0.541	0.121	0.422	**0.801**		
IBC16	0.055	0.070	0.238	0.289	**0.879**	
COV	–0.374	–0.123	–0.015	–0.229	–0.565	**0.916**

Source: Author's calculation (Amos 24.0)

Recently, the criteria proposed by Fornell and Larcker (1981) have been criticised and disapproved by Henseler et al. (2015). The study mentioned that the Fornell and Larcker criteria lacks the ability to establish the presence of discriminant validity and thus, provided a new measure to ensure "discriminancy among the constructs under study" (Ab Hamid et al., 2017). The measure provided by Henseler et al. (2015) makes use of Heterotrait-Monotrait (HTMT) ratio of correlation, which according to the authors provides higher specificity and sensitivity rates as compared to the earlier Fornell and Larcker criteria. In HTMT matrix, a value closer to 1 indicates concerns for discriminant validity for data. A more restrictive threshold of 0.85 has been used by many authors, like Kline (2015). The results of HTMT analysis have been presented in Table 6.

Table 6 HTMT Analysis

	NPM	*AEnv*	*CGP*	*Basel3*	*COV*
NPM					
AEnv	0.332				
CGP	0.341	0.184			
Basel3	0.539	0.154	0.449		
COV	0.349	0.093	0.039	0.203	

Source: Author's calculation (AMOS 24.0)

The results suggest that none of the *constructs* have very high HTMT correlation ratio and the highest is found between NPM and Basel3, with magnitude 0.577. Thus, the results imply that there is no multicollinearity issue and discriminant validity is present in the data.

Model fit

The accuracy of the proposed model to showcase the relationship between measured constructs and their indicators, is established by various model fit indices (Weston and Gore, 2006). Absolute fit indices are the earliest in the line of substitute indices that explored to fill the gap made by overall fit indices. Absolute fit examines if the observed data is reflected approximately by the proposed model (Kenny and McCoach, 2003). The absolute fit indices do not judge the fitness of actual model with any previous yardstick model (Jöreskog and Sörbom, 1993). Various indices using which absolute fit of a model can be determined, includes, normed Chi-square, RMSEA, and SRMR. Table 7 can be referred for the model fit indices calculated and their idle threshold.

Table 7 Model fit indices

Measures	*Model fit indices*	*Findings*	*Recommended threshold/value*	*Results*
Absolute fit	Normed Chi-square (CMIN/DF)	1.471	Less than 3.00	Acceptable model fit has been achieved
	RMSEA	0.065	Less than 0.07	
	SRMR	0.064	Less than 0.05	
Incremental fit	NFI	0.831	More than 0.80	Acceptable model fit has been achieved
	IFI	0.939	More than 0.90	
	TLI	0.930	More than 0.90	
	CFI	0.938	More than 0.90	
Parsimonious fit	PClose	0.025	Less than 0.05	Acceptable model fit has been achieved
	PNFI	0.736	More than 0.50	
	PCFI	0.831	More than 0.50	

Source: Author's calculation (AMOS 24.0)

Incremental fit indices are also known as comparative or relative fit indices (Miles and Shevlin, 2007). This set of indices makes use of chi-square for comparing its value with that of some baseline model in which all the observed variables are uncorrelated (Hair et al., 2010). Various statistics included in incremental fit indices are NFI, IFI, TLI and CFI. Parsimonious model fit indices try to take under consideration model fit along with the complexity of the model and thus, they are similar to adjusted R-square in regression analysis. Two of the model fit indices in this category, proposed by Mulaik et al. (1989) are PGFI and PNFI. According to the results calculated and the idle threshold of various indices, model fit has been ensured in the study under all 3 categories and the proposed model can be said to have adequate fitness.

4.4.2 Path analysis

The methodology of path analysis was first introduced by Sewall Wright in 1920s and then gradually developed over the years (Wright, 1921). The technique is a variant of multiple regression and is generally used by researchers to examine casual patterns in a pre-specified casual model (Stage et al., 2004). Some of the recent studies like Firli and Dalilah (2021), Nguyen et al. (2021) and Prajogo et al. (2021) have used this method for establishing causal relationship between variables. In the present study, the impact of various independent variables on the predicted variable has been interpreted on the basis of 2 criteria, i.e., significance of regression coefficient at 5% significance level and a critical ratio of greater than +/– 1.96. The results of the overall sample have been reported in Table 8.

Table 8 Path analysis results: complete sample ($N = 111$)

NPM	*Standardised Estimates*	*Unstandardised estimates*	*Standard error*	*Critical ratio*
AEnv	0.154	0.193**	0.080	2.418
CGP	0.222	0.277***	0.092	3.015
Basel3	0.469	0.401***	0.063	6.400
IBC16	0.459	0.280***	0.049	5.654
COV	–0.522	–0.401***	0.062	–6.524
R^2		0.572		

**Significant at 5%; ***Significant at 1%.

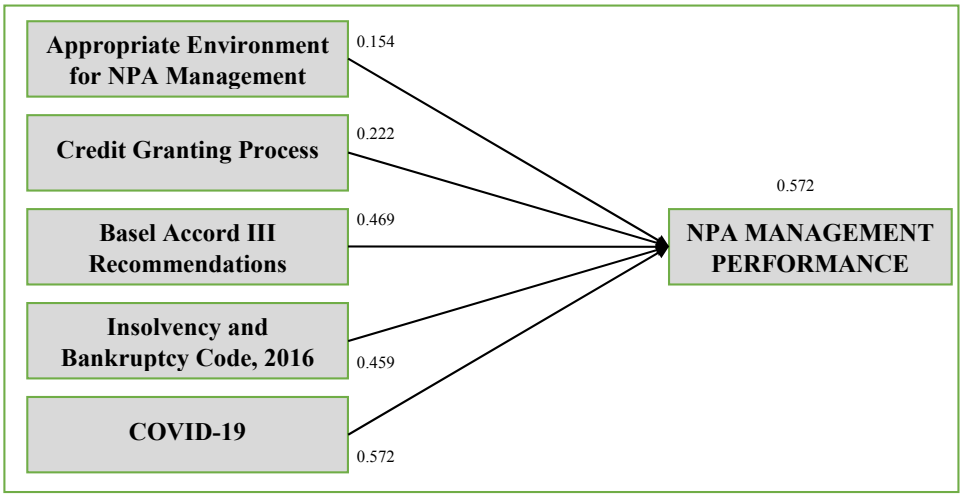
Source: Author's calculation (AMOS 24.0)

The tabulated results show that the R^2 for the model analysed for the overall sample is equal to 0.572, which implies that the independent variables are able to explain 57.20% of variation in performance of NPA management. All the predicting variables are found to have critical ratio higher than +/– 1.96 and are significant at 1% significance level. AEnv is found to have a positively significant impact on the performance of NPA management. A unit increase in the presence of an appropriate environment can bring beneficial results for NPA management of 0.193 units. It implies that having policies framed, implemented and supervised by senior management can be primary tool for ensuring positive change in asset quality of banks. Similar influence of a sound credit granting process (CGP) can be seen on the dependent variable, NPM. Better defined credit policy and clearly stated and followed guidelines for extending loans can help manage NPA by bringing a positive change of 0.277 units. It shows that in addition to having strict policy formulation for NPA management, it's honest implementation is also critical for enhanced credit quality. All the rules for granting credit should be followed rigorously by staff members at all the levels. The respondents have shown agreement that implementation of Basel III recommendations are advantageous for management of NPA. According to the responses received, a percent increase in the application of Basel regulations can help manage bad loans better by almost 0.40%. Thus, the banks following Basel III recommendations and maintaining required standards can be expected to better manage their loan portfolio. Introduction of IBC, 2016 has helped banks manage their problem loans. By ensuring speedy recovery of loan losses, the code

has contributed towards better management of NPA. The results of the present study have confirmed the same. It implies that respondents have agreed that IBC has inculcated the disciplined credit habits due to which repayment of loans has improved. Lastly, the impact of Covid-19 on NPA management is found to be negatively significant. Due to the pandemic of Coronavirus, management of problem loans has been adversely affected by 0.40 units. Though the government and RBI have come up with solutions to help borrowers suffering with losses due to Covid-19, because of which they are not able to meet their financial obligations. However, the lenders are still seem to be getting adversely impacted.

Standardised regression coefficients have been presented in the path diagram shown in Figure 4. As implied from the given path diagram, the adverse impact of COV is most prominent in comparison to all other independent variables, followed by the positive influence of Basel3 and IBC16. In addition to banks' internal practices, Aenv and CGP also have beneficial impact for performance of NPA management, however, impact of later is higher than that of former.

Figure 4 Path diagram for the overall sample (see online version for colours)



Source: Author's compilation

Moderation effect of bank ownership

In order to see if there is any difference between perception of employees working in private and public sector banks, with respect to the impact of independent variables on the dependent NPA management, bank ownership has been considered as the moderating variable. The results of the analysis have been reported in Table 9.

As is evident from the results reported, in case of public sector banks the predicting variables are better able to explain the variation in the dependent variable. The standalone results for public and private banks show that the outcome of NPA management is significantly impacted by the internal environment of banks and their process for extending loans, Basel III regulations, introduction and implementation of IBC, 2016, and ill-effects of Covid-19. A comparison between the regression results of public and private banks provides that the impact of the used independent variables on the dependent

variable is similar in nature in terms of the direction of impact. However, magnitude of this impact is different for the 2 sets of sample respondents. The results of the t-test for moderation effect of bank ownership have been tabulated in the last part (c) of Table 11. Interpreting the results for unstandardised regression coefficients, it can be stated that the positive impact of banks' internal environment is higher for the private banks as compared to the public banks. However, the respondents belonging to public sector banks shows greater believe that having clearly set guidelines for providing credit is highly beneficial for management of problem loans. The positive impact of Basel III regulations is also higher in the public sector banks. However, according to the same set of respondents, public sector banks are more affected by the pandemic in terms of their NPA management progress. Both, public and private banks have equally benefitted from the implementation of IBC, 2016, since the moderation effect of bank ownership is not significant in case of IBC16.

Table 9 Path analysis with moderation effect of bank ownership

	(a) Public sector banks (N = 48)				*(b) Private sector bank (N = 63)*				*(c) Moderation results*	
NPM	*Stand. est.*	*Unstand. est.*	*Stand. error*	*Critical ratio*	*Stand. est.*	*Unstand. est.*	*Stand. error*	*Critical ratio*	*t-value*	*p-value*
AEnv	0.198	0.233**	0.102	2.281	0.106	0.547***	0.101	5.415	2.187	**
CGP	0.270	0.665***	0.116	5.732	0.170	0.226**	0.105	2.152	2.806	***
Basel3	0.482	0.594***	0.080	7.425	0.421	0.306***	0.106	2.887	2.169	**
IBC16	0.448	0.251***	0.064	3.934	0.466	0.328***	0.078	4.205	0.763	0.447
COV	–0.490	–0.645***	0.083	–0.771	–0.555	–0.368***	0.093	–3.957	–2.222	**
R^2		0.649				0.492				

**Significant at 5%; ***Significant at 1%.

Source: Author's calculation (AMOS 24.0)

The results for the hypothesis framed have been summarised in Table 10.

Table 10 Summary of the analysis performed with dependent variable: NPA management performance

Hypothesis tested	*Independent variable*	*Findings*	*Results*	*Literature evidence*
Hypothesis 1	Appropriate Environment for NPA Management	(+) Significant	H_0 rejected	Sharifi et al. (2019), Gabr and ElBannan (2018), Olabamiji and Michael (2018), Taiwo et al. (2017) and Maria and Eleftheria (2016)
Hypothesis 1a	Appropriate Environment for NPA Management (Moderation effect)	(+) Significant	H_0 rejected	
Hypothesis 2	Credit Granting Process	(+) Significant	H_0 rejected	
Hypothesis 2a	Credit Granting Process (Moderation effect)	(+) Significant	H_0 rejected	
Hypothesis 3	Basel Accord III Recommendations	(+) Significant	H_0 rejected	

Table 10 Summary of the analysis performed with dependent variable: NPA management performance (continued)

Hypothesis tested	*Independent variable*	*Findings*	*Results*	*Literature evidence*
Hypothesis 3a	Basel Accord III Recommendations (Moderation effect)	(+) Significant	H_0 rejected	
Hypothesis 4	Insolvency and Bankruptcy Code, 2016	(–) Significant	H_0 rejected	
Hypothesis 4a	Insolvency and Bankruptcy Code, 2016 (Moderation effect)	(–) Insignificant	H_0 failed to rejected	
Hypothesis 5	Covid-19	(–) Significant	H_0 rejected	
Hypothesis 5a	Covid-19 (Moderation effect)	(–) Significant	H_0 rejected	

Source: Author's compilation

5 Conclusion

5.1 Summary

The results of the study show that having an appropriate environment in terms of Directors' responsibility and bank staff's understanding for management of overall credit risk is advantageous for addressing the issue of problem loans. In order to better manage the rising NPA, banks should have in place clearly defined guidelines for extending loans. The credit policy should be well structured and stated so that exposure to the risk of bad loans can be reduced. The international body of BCBS has provided its recommendations for strengthening the financial position of banking institutions, in the form of Basel Accord III. According to the perception of bank employees analysed in the present work, the tools of Basel III regulations are indeed helpful in managing the issue of bad loans. The opinion of respondents have supported the belief that with the introduction of IBC, 2016, banks are able to control their loan losses better. By ensuring speedy recovery of bad loans and resolving corporate insolvencies in a time bound manner, the Code has helped banks in particular, to minimise their losses due to bad loans. In the year 2020, economies worldwide got affected by the Coronavirus pandemic. Indian banking sector was no exception to the adverse effects of Covid-19. The problem of increasing NPA got worsened due the pandemic.

In the present study, role of bank ownership has also been analysed. The impact of banks' internal practices for risk management, Basel III recommendations and Covid-19 on NPA management has been compared between public and private sector banks. The results for moderation analysis implies that benefits of having appropriate environment for risk management are more for the private banks. On the other hand, a firm and sound credit granting process help manage NPA better in public sector banks as compared to the private banks. As per the responses of bank employees, Basel III regulations show greater positive impact on NPA management in public sector banks. However, the higher adverse impact of Covid-19 on controlling NPA is also been found for public banks. The

Insolvency and Bankruptcy Code, 2016, has helped both public and private banks equally, in terms of NPA management. By emphasising on stricter credit discipline among the corporate debtors, the Code has contributed towards higher quality loan assets for lending banks.

5.2 Implications

The present study and results derived can be of interest to the future researchers, academicians, individual bank's management, the central banks and investors as well. Interested parties can take relevant cues from the findings of the present work. Drawing inferences from the results presented, bank managers should work more efficiently on their internal practices for risk management. Senior management and board of directors should focus on strategising for management of NPA and should implement required policies. These policies should be regularly reviewed and updated in order to ensure that the banks can stay resilient in case of any unexpected loan losses. Additionally the results have stated that implementing the Basel III recommendations can bring substantial advantage for managing problem loans. Hence, the RBI can be recommended to ensure maintenance of these standards by all the commercial banking entities more strictly. Also, prior to disbursing any loan, guidelines should be followed strictly and potential borrowers should be screened properly. More attempts by RBI are required for NPA management in the wake of Covid-19. Banks are still suffering from huge bad loans and the situation is expected to be worse. Results of the present study have also shown that Covid-19 is acting as a hurdle causing banks' performance in terms of NPA management to decline.

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Appendix 1

Table A1 Statements used for dependent and independent variables

Constructs	*Statements*	*Reference from*
NPA Management Performance	*With the help of efficient NPA management practices, the bank has ensured:*	Shafique et al. (2013)
	1 Compliance with RBI's standards and norms for NPA management	Sharifi et al. (2019)
	2 Adherence to NPA management practices and thus, avoided penalties levied by RBI	
	3 Reduction in proportion of loans extended to highly defaulting sectors	
	4 Significant reduction in NPA	
	5 Increased and speedy recovery from NPA accounts	
Appropriate Environment for NPA Management	*To ensure appropriate environment in the bank for NPA management:*	Basel Committee (1999)
	1 Board of directors regularly review and update NPA management strategies	Asfaw and Veni (2015)
	2 Responsibility for implementation of required strategies lies with the senior management alone	
	3 Board of directors and senior management supervises the credit risk exposure of the bank	
	4 Bank's staff takes necessary precautions against possibility of credit risk	
	5 Authority and responsibility for NPA management is understood by all the staff members	
Credit Granting Process	*Before granting the loan:*	Hussain and Al-Ajmi (2012)
	1 Probability of loss from any loan account is examined	Masood and Fry (2012)
	2 Credit screening methods are followed	
	3 Characteristics of the borrowers are analysed	
	4 Applicant's data is checked for reliability	
	5 Borrowers with low quality credit history are asked for collateral	

Table A1 Statements used for dependent and independent variables (continued)

Constructs	*Statements*	*Reference from*
Insolvency and Bankruptcy Code, 2016	*Being an NPA Management tool, IBC, 2016 has:*	Chaudhary and Kapoor (2016)
	1 Helped improve financial health of the bank	Gupta (2018)
	2 Provided fair and transparent process for NPA resolution	
	3 Helped in reducing the delay in resolution process of NPA	
	4 Helped in making higher recovery from NPA accounts	
	5 Instilled better sense of credit discipline in defaulting borrowers	
Basel III Accord Recommendations	*Following standards and norms prescribed by Basel III, the bank has maintained:*	Masood and Fry (2012)
	1 Supervisory review process and market discipline	Sharifi et al. (2019)
	2 Higher core capital adequacy ratio	
	3 Leverage ratio	
	4 Liquidity coverage ratio	
	5 Net stable funding ratio	
COVID-19	*During the Coronavirus pandemic:*	Demirguc-Kunt et al. (2020)
	1 Financial performance of debtors has been affected by the pandemic	Disemadi and Shaleh (2020)
	2 Recovery of loan has remained unaffected of COVID-19	
	3 Credit quality of the bank has not declined	

Source: Author's compilation from relevant literature