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Sector-wise Composition and Evolving Structure of Non-Performing Assets in Indian Public Sector Banks: A Phase-wise Analysis (2003–2025)

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Abstract:

This research analyses the evolution of the sector-wise composition of Non-Performing Assets (NPAs) of Indian Public Sector Banks between 2003 and 2025. While most past research on NPAs focused on determining the factors responsible for the level of NPAs in the Public Sector Banks of India, relatively less research has been conducted about the evolution of the composition of NPAs across sectors. This research employs secondary data from various publications of the Reserve Bank of India. Tools such as descriptive statistics, trend analysis, percentage composition analysis, descriptive correlation analysis, and the output of a simple OLS regression are employed in the analysis of the trends in the sector-wise composition of NPAs. The data analysis reveals the significant changes in the composition of NPAs in various stages of the Public Sector Banks of India. The Priority Sector NPAs comprise a considerably higher percentage of NPAs in the early stage of the banks as compared to the Non-Priority Sector NPAs that dominate the composition of NPAs of these banks in the stage of corporate stress after 2014. The observations of the NPAs of Public Sector Banks after 2023 also suggest hints of the changing composition of NPAs according to sectors in these banks. The findings of this study highlight the changing pattern of stress in the Indian banking industry and the need for a sector-wise approach to the management of credit risk of the Public Sector Banks of India regarding the corporations, the agriculture sector, and the MSMEs.

Keywords: Non-Performing Assets (NPAs), Public Sector Banks, Priority Sector NPAs, Non-Priority Sector NPAs, Asset Quality Review

Introduction

The banking sector holds significant importance for the development of the economy as it helps to channelize the savings and investments of the people into productive economic activities. Public Sector Banks (PSBs) play a crucial role in making loans available for sectors such as agriculture, MSMEs, infrastructure projects, and industries that are vital to the Indian economy. Thus, the financial and asset quality of these banks is of great essence for the growth of the country's economy. One of the most pressing issues facing Public Sector Banks in India today is the growing trend of non-performing assets (NPAs). The issue of NPAs in Public Sector Banks in India has undergone many changes over time. During the initial years of the analysis period, the level of NPAs in PSBs was moderate despite the stress that was prevailing in segments like agriculture and MSMEs. However, after 2013, there have been significant changes in the nature of stress in PSBs. The factors that led to the decline in the asset quality of public sector banks include aggressive lending practices, an economic slowdown, poor governance practices, infrastructural development issues, and the credit appraisal processes within the banks. Furthermore, the Asset Quality Review (AQR) that the Reserve Bank of India (RBI) conducted between 2015 and 2016 resulted in the recognition of many stressed assets within PSBs, which led to an increase in the number of NPAs within public sector banks (Mostak Ahamed & Mallick, 2017; Goswami, 2022).

In an attempt to enhance banking stability and asset quality following the bank crisis, various regulatory reform policies and recovery policies have been adopted, such as the IBC, the PCA, recapitalization, and the consolidation of PSBs (Bose et al., 2021). Though it can be argued that these various policies have contributed to a general reduction in corporate NPAs throughout the period since 2018, there has been an increasing trend in the proportion of PS NPAs in recent years. Thus, it is necessary to gain an understanding of the evolution of NPAs within the economy as a whole, as opposed to focusing upon the number of NPAs within the banking

system in general. The number of NPAs within the Priority Sector Loans and the non-Priority Sector Loans may differ based upon the type of loans that were made to those corporations, the economic situation within the country, the policies that are in place, and the success of the recovery process for those corporations (Bose et al., 2021). For instance, loans made to corporate and infrastructure loans may have different characteristics than those loans made to the Priority Sector loans, and there may be an association of the Priority Sector loans with issues like agricultural loans and MSME loans (Gaur & Mohapatra, 2020).

The existing literature on NPAs in the Indian banks primarily focussed on the impact of various macroeconomic determinants on NPAs, profitability of banks, governance issues and bank reforms (Bardhan & Mukherjee, 2016; Mishra et al., 2021). Various studies have attempted to investigate various aspects of NPAs within the Indian banking industry. For instance, Kanyan and Singh (2024) investigated the differences between the NPAs in the Priority and Non-Priority sectors of various Indian banks, while Mishra and Padhan (2024) investigated how various macroeconomic factors impact the NPAs within the Indian banking sector. However, no studies have explored the long-term aspects of the composition of the NPAs of the Public Sector Banks of India specifically. As such, the present study investigates the composition of the NPAs within the Public Sector Banks of India between 2003 and 2025, using data from the Reserve Bank of India (RBI). Thus, by examining the various phases of the Public Sector Banks of India over this period, and investigating aspects like the NPAs of the Priority Sector Public Banks, the Non-Priority Sector Public Banks, the Public Sector Public Banks, and the Total NPAs of the Public Sector Banks of India, the study intends to contribute to the existing knowledge of the Public Sector Banks of India by examining the changes in their banking stress over time.

Review of Literature

The literature on NPAs in Indian PSBs has increased rapidly in response to banking sector troubles and the issues regarding asset quality in the post-liberalization era. Most of the literature discusses the role of macroeconomic and bank-specific factors in creating NPAs in Indian banks. The literature also focuses on the stress faced by the corporate and infrastructure sectors, the role of PSL in creating NPAs in Indian banks, and the impact of regulation-based policies such as AQR, IBC, PCA, and the recapitalization policy in the banking sector. The extensive literature available in the field of NPAs in Indian banks points to the role of various macroeconomic and bank-specific factors in creating these non-performing loans in Indian banks such as the instability in the macroeconomic environment, poor governance in banks, bank inefficiency, slow growth of the GDP of India, high inflation in the country, interest rate hikes by the RBI, and the poor credit assessment policies implemented by Indian banks (Roy, 2014; Memdani, 2017; Mishra et al., 2021; Rahaman & Sur, 2025). Various studies in the past have also pointed to the persistence behavior of NPAs in Indian banks. In other words, the number of loans already declared as NPAs in the past significantly impacts the likelihood of creating more NPA loans in the future by Indian banks (Bardhan & Mukherjee, 2016; Gulati et al., 2019).

There is also some empirical evidence that indicates that the spike in NPAs post-2014 was due to the aggressive loaning activities that the banks used to lend to corporates and infrastructural projects. The risky lending activities to sectors like power, steel, telecom, and infrastructure resulted in high credit risks for the banks when the economies of these sectors crashed during recessions or when there were declines in their investment activities (Nidugala, 2017; Dhananjaya, 2019). Furthermore, the AQR conducted between 2015 and 2016 revealed the extent of the stressed assets that the banks had previously concealed through restructuring of their loans (Mostak Ahamed & Mallick, 2017; Goswami, 2022). Lastly, it was also suggested in the report that public sector banks (PSBs) were more affected than private banks due to their weak governance structures and the influence of politics in their functioning (Biswas & Deb, 2004; Bawa et al., 2019).

Beyond the literature on corporate NPA, there has also been research conducted on the connection between the PSL and NPAs. One set of studies reveals that the PSL is responsible for the deterioration of the asset quality of banks, while another set of studies indicates that the PSL does not lead to an increase in the number of NPAs within banks or have any effect upon the profitability of those banks (Gaur & Mohapatra, 2020). Nevertheless, the crisis that faced the agriculture sector of the country, MSMEs, the waiver of farm loans to those within the agriculture sector, and the impact of the COVID-19 pandemic have created stress within the PSL (Jha et al.,

2019). Finally, there has also been research conducted into the success of the reforms and recovery initiatives that were implemented within the banks following the bank crisis. Studies of the AQR, the IBC, the PCA, the restructuring of banks, and the recapitalization of banks revealed that each of these policies had been successful in recognizing the stressed assets within PSBs (Dar et al., 2021). Furthermore, the PCA was an institution that was established to improve the rights of creditors of those banks.

Some of the studies that have been carried out in this area relate to the differences in NPAs within different sectors of the banking industry. Authors Kanyan and Singh (2024) examined the differences in NPAs between Priority and Non-Priority banking sectors within India's commercial banks using data from the RBI for the period 2008-2021. Various econometric techniques were employed, including ANOVA, regression analysis, FMOLS and DOLS analysis. Although this is an important study regarding the differences in NPAs within banking sectors, there are several differences between this study and the present study. Most notably, the present study will focus exclusively upon Public Sector Banks, as these were the bank that had the majority of NPAs within the Indian banking system. Additionally, the time frame for the study will be longer than that of Kanyan and Singh (2024), with an analysis period of 2003-2025. Finally, while the present study will employ more simplified statistical techniques, it will attempt to contribute to the literature through its investigation of the longer-term aspects of this topic.

Ganesan, NirmalDev, and Sherli (2019) conducted a study on the performance and composition of Priority Sector and Non-Priority Sector NPAs in Indian Public Sector Banks between the years 2007 and 2018. During this period, these researchers established that the Non-Priority Sector was contributing to the NPAs in Public Sector Banks. The research presented in this paper extends the study of Ganesan, NirmalDev, and Sherli (2019) by including observations beyond the period studied by those researchers, as well as by employing a broader analytical framework to examine the issue of the dominance of NPAs within Public Sector Banks according to sector. Additionally, the present study also includes an analysis of emerging trends within the Priority Sector NPA between the year 2022 and 2025, which was outside of the scope of the research that Ganesan, NirmalDev, and Sherli (2019) performed between 2007 and 2018.

The phase-based interpretation of the evolution of NPAs in the Indian banking sector has also been discussed by Das (2021). Das (2021) examined the nature of NPAs in Indian banks by dividing the banking sector's stress into two phases. The first phase consisted of banking stress before 2014, while the second phase comprised the stress caused by the NPAs from the corporate and infrastructure sectors of Indian banks after 2014. The current study adopts a three-phase analysis of NPAs in Public Sector Banks in India, considering the developing trends following the year 2023 resulting from the COVID-19 pandemic. Unlike Das (2021), however, the current study focuses specifically on the changing contributions of Priority Sector NPAs, Non-Priority Sector NPAs, and Public Sector NPAs to the Total NPAs of Public Sector Banks over an extended period.

Despite the abundance of literature available on the various topics related to NPAs in Indian banks such as macroeconomic factors, banking reform measures, and NPA trends, there is a void in the literature regarding the structural composition and changes in the dominance of the various banking sectors with respect to NPAs within the public sector banks over the years. This research study intends to examine this void in the existing literature by investigating the trend and composition of NPAs within the Indian Public Sector Banks from 2003 till 2025.

Although there is a vast amount of literature published on the topic of NPAs in Indian banks, there has been very little work conducted on the evolution of the dominance of sectors with NPAs in the public sector banks over time. The existing literature on this topic revolves around the factors that affect the amount of NPAs within public sector banks. Furthermore, there are only a few studies that discuss the relative importance of Priority Sector banks with NPAs compared to the Non-Priority sector banks with NPAs. Additionally, there is limited literature available on the trends in the various banking sectors with NPAs within public sector banks following the implementation of the Advance Banker's Resolution (AQR) and the preliminary trends within these banks following the COVID-19 pandemic. Thus, this study aims to investigate the trends, the composition, and the structural changes in the number of NPAs within the various banking sectors in public sector banks in India between 2003 and 2025.

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Objectives of the Study

The present study aims to examine the composition, trends, and structure of NPAs of Public Sector Banks of India during the year 2003 to 2025. The specific objectives of the study are to:

1. Analyse the trend and growth of the Total NPAs of Public Sector Banks in India during the study period.

2. Examine the composition of Priority Sector NPAs and Non-Priority Sector NPAs within the Total NPAs of Public Sector Banks during the study period.

3. Describe the correlation between the different categories of NPAs of Public Sector Banks.

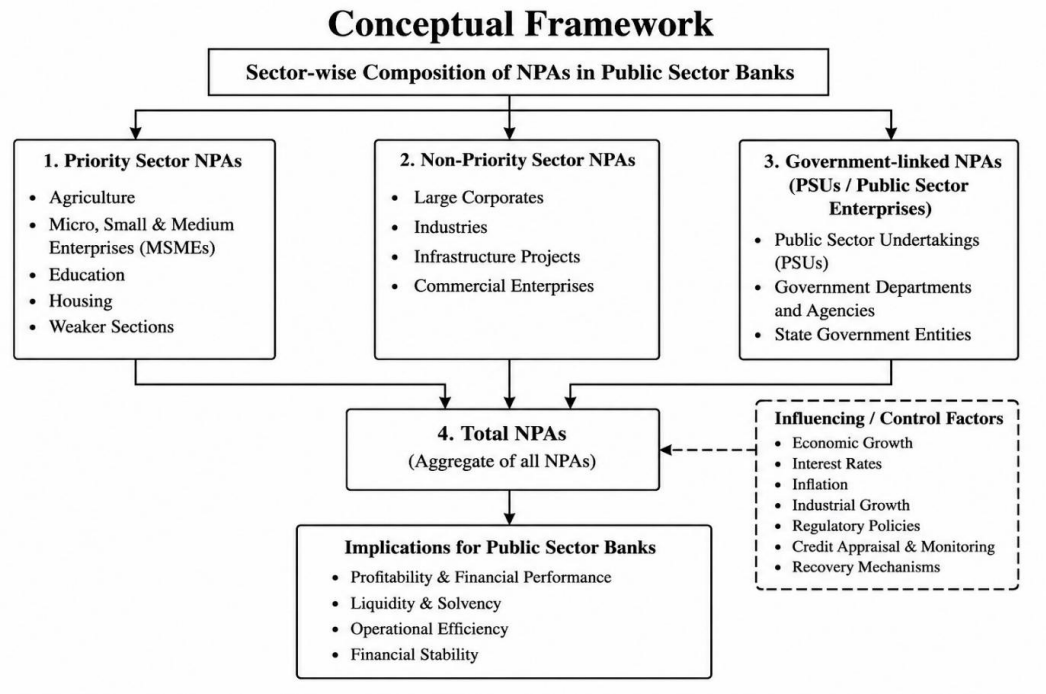
4. Illustrate the association between the Non-Priority Sector NPAs and the Total NPAs of Public Sector Banks through a simple OLS regression.

5. Identify the trend in the dominance of NPAs of Public Sector Banks according to sector during the study period.

Conceptual Framework

The conceptual framework of this study is based on the composition and relationship between the Priority Sector NPAs, the Non-Priority Sector NPAs, the Public Sector NPAs, and the Total NPAs of the Public Sector Banks of India. The concept of Priority Sector NPAs consist of loans provided to individuals involved in agriculture, MSMEs, housing, education, and the weaker sections of society as per the guidelines of the Reserve Bank of India (RBI) for Priority Sector Lending (PSL). The NPA in Non-Priority Sectors consist of loans provided to corporations, industries, infrastructural projects, and commercial firms. Public Sector NPAs consist of loans provided to entities related to the public sectors of the country and that are controlled by the Government of India. Each of these NPAs is impacted by the macroeconomic environment of the country, the regulations of banks and the government, the credit analysis procedures of the bank, and the bank's procedures for the recovery of those loans. Through secondary data collected from publications released by the RBI, this paper will investigate the trend, composition, and statistical relationship of the different types of NPAs of Public Sector Banks in India.

Figure 1 Conceptual Framework of the Study



Source: Developed based on review of literature and study variables.

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Research Methodology

The nature of this research is that of a descriptive and analytical study. The study aims to analyze the different kinds of NPAs of public sector banks in India during the period from 2003 till 2025. The data that will be used for the research will be purely secondary data that will be collected from different publications released by the Reserve Bank of India. These data will be sourced from publications like the Report on Trend and Progress of Banking in India, Statistical Tables Relating to Banks in India, and others. The four main groups of NPAs that will be studied include Priority Sector NPAs, Non-Priority Sector NPAs, Public Sector NPAs, and the Total NPAs of Public Sector Banks in India. The percentage analysis of the composition of the NPAs will be performed during different periods within the research period. The different phases of the public sector banks in India will be considered during the research period based on the crucial changes that have taken place in the banking sector of India. The years from 2003 till 2012 are the stable period for the public sector banks in India. However, the years from 2013 till 2022 were the period of stress for the public sector banks in the country due to various factors including the changes in the corporate sectors and banking reforms. The period after 2023 indicates the current trend in the composition of NPAs in each of the different sectors of the Indian economy following the recovery period that emerged after the COVID pandemic. The different phases for NPAs have been defined based on theoretical considerations rather than statistical tests. For the purpose of this study, the descriptive and compositional analysis method will be used. The methods that will be utilized in analyzing the data from the banks include descriptive analysis, trends analysis, graphical analysis, correlation analysis, and descriptive compositional regression analysis outputs. The correlation analysis will determine the level of movement of the different categories of NPAs. Additionally, the regression model will provide an illustration of the proportional figure of the NPAs within the Non-Priority Sector to the total NPAs within the country. The study does not use any sophisticated econometric time series methods to analyze the data. Since the NPA ratio to the bank is made up of the NPA ratios of the different sectors of the bank, the findings of the study are essentially descriptive. During the study period, there were major changes to the banking sector of India that may impact the PSB data across different years. In April 2017, the State Bank of India (SBI) merged with its associate banks and Bharatiya Mahila Bank, leading to significant changes in the size, structure, and composition of its balance sheet. Further, during 2019-2020, the Government of India combined several public sector banks (PSBs), including Punjab National Bank, Canara Bank, and the Union Bank of India (Dar et al., 2021). These consolidations altered the composition of Public Sector Banks during the study period. Consequently, the changes to the structure of these banks may affect the strict comparability of the data across the years in the study. However, for the purpose of this study, the data on Public Sector Banks will be treated as continuous throughout the study period. This aspect of the data will be discussed as a limitation to the study concerning long-term Public Sector Banks in India.

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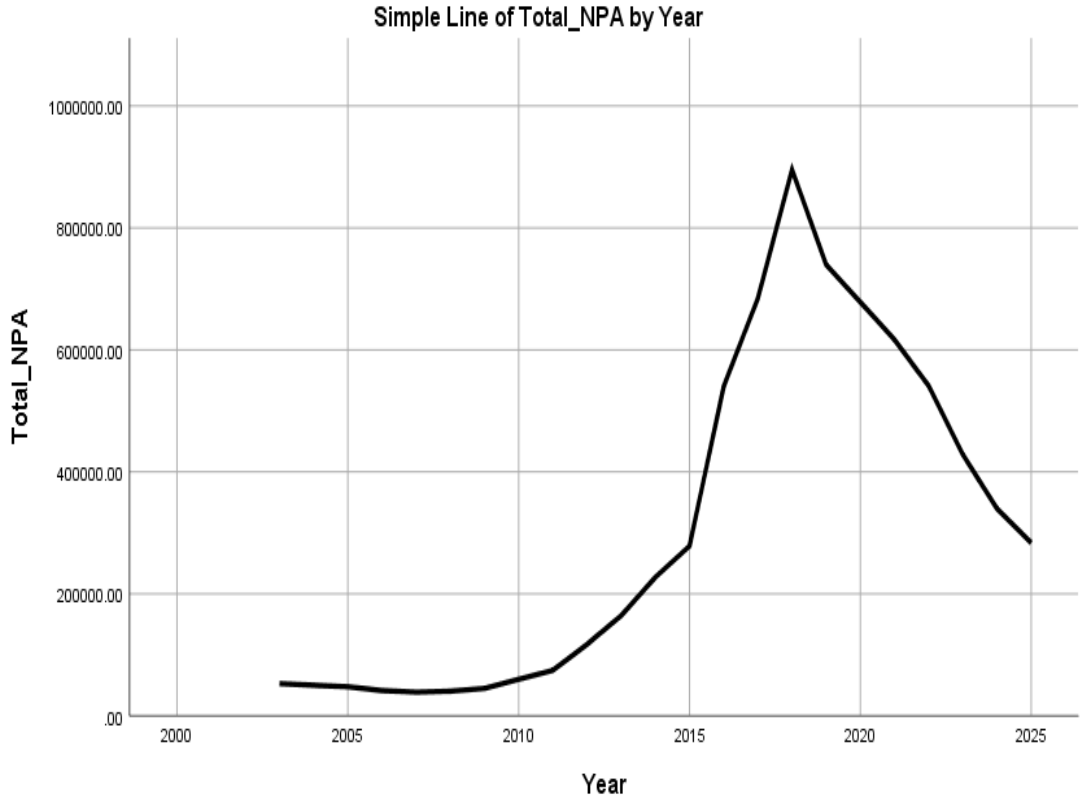
Analysis and Interpretation

Trend Analysis of Total NPAs

Figure 2 — Total NPAs



Source: Computed from RBI Data.

The graph illustrates the trend in the Total NPAs of Public Sector Banks in India from 2003 until 2025. During the period between 2003 and around 2008-2009, the Total NPAs were relatively low and stable. Afterwards, from 2009 until 2014, the Total NPAs began to exhibit a gradual upward movement. However, after 2014, the growth of Total NPAs became more pronounced, indicating increasing stress within the Indian banking sector. During the period between 2015 and 2018, the Total NPAs of these banks experienced a sharp rise and reached nearly ₹9 lakh crore around the year 2018. Such a sharp rise in the Total NPAs in Public Sector Banks is likely the result of default of loans by a number of larger companies, stress within the infrastructure industry, a slowdown of the Indian economy, weaknesses in the credit assessment of many borrowers, and the tough norms for recognizing bank assets that were instituted during the Asset Quality Review of 2015 by the Reserve Bank of India (Dhar & Bakshi, 2015; Bawa et al., 2019; Goswami, 2022).

Following the peak, there was a steady reduction in the Total NPAs for the banks, indicating the improvement in the quality of the assets of the banks and the recovery of the NPAs after the peak period of the study. Various measures like the implementation of the IBC, the capitalization of banks, improved monitoring processes, and recovery of the NPAs contributed to the decline in the volume of NPAs after the peak period of the study (Bose et al., 2021). Even after the decline in the quantity of NPAs, the quantity of these assets remains relatively high within the public sector banks. From the trend analysis of the NPAs within the PSBs, it becomes evident that the PSBs experienced problems with the quality of the assets during the middle portion of the study period; however, the situation started to improve during the later portion of the study period.

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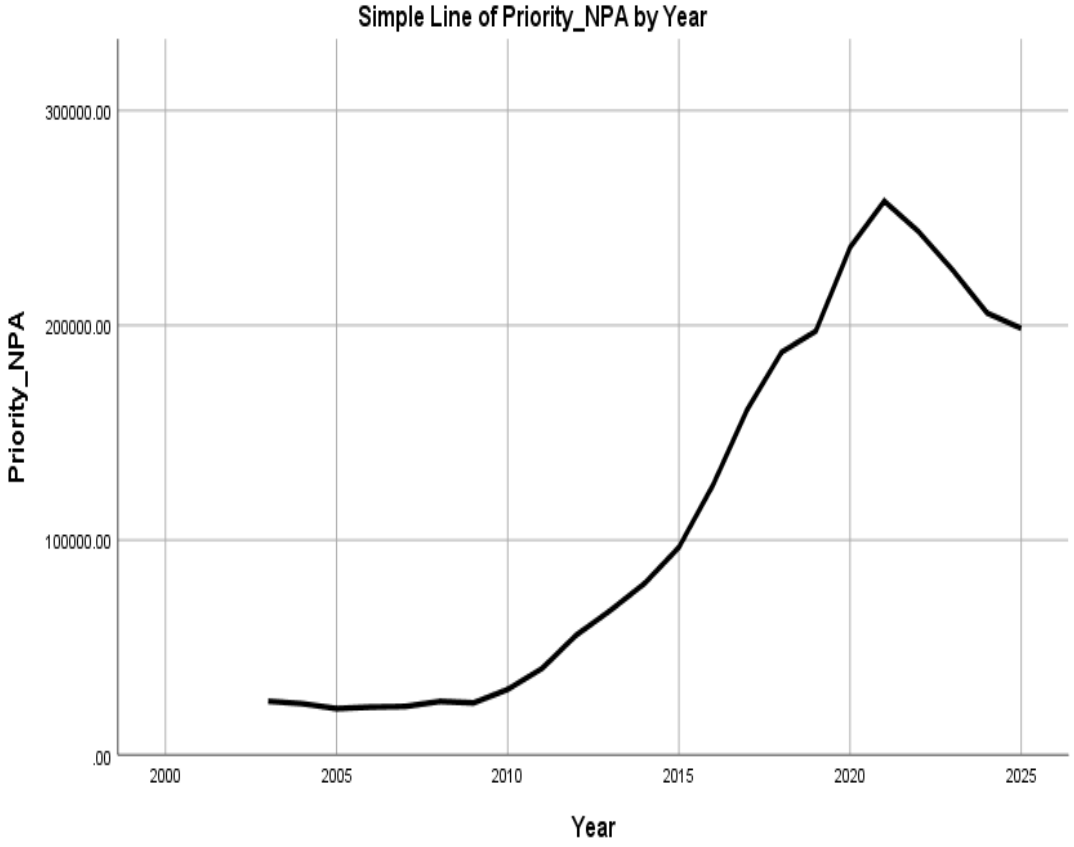
Trend Analysis of Priority Sector NPAs

Figure 3 Trend of Priority Sector NPAs of Public Sector Banks in India (2003–2025)



Source: Computed from RBI Data.

Figure 3 illustrates the trend of Priority Sector NPAs among Public Sector Banks in India between 2003 and 2025. The analysis of the data presented in the graph depicts that the number of NPAs in the Priority Sector was moderate and stable between the years 2003 and 2009. However, there was an increase in the number of Priority Sector NPAs after the year 2010, indicating increased stress among the major sectors of the Priority Sector. An even higher increase in the number of these non-performing loans was seen after the year 2014 due to greater financial stress in the banking industry of India. The increase in the number of Priority Sector NPAs was caused by the economic slowdown in the country, stress in the agricultural sector, the increase in the stress of MSMEs, the increase in the credit exposure of the Priority Sector banks to the above-mentioned sectors, and the stress in the economy resulting from the Coronavirus disease (COVID-19) pandemic (Gaur & Mohapatra, 2020; Kanyan & Singh, 2024). Moreover, the strict norms that were introduced by the Reserve Bank of India for the classification of bank assets might also have been responsible for the increase in the number of these NPAs in the Priority Sector of Public Sector Banks (Goswami, 2022).

However, after the peak period for Priority Sector NPAs, the number of NPAs in these sectors began to decline towards the end of the study period. Such a decline may be the result of various attempts to recover the loans that were in default, the restructuring of these loans, the regulations that were implemented regarding these NPAs, and the revival of the economy that resulted from the pandemic. Even though NPAs within the Priority Sector began to decline gradually over time, the high number of these non-performing loans indicates the presence of credit risk within the lending practices of the Public Sector Banks towards their loans in the Priority Sectors. Thus, overall, the NPAs within the Priority Sector exhibited great variability during the various periods of the banks.

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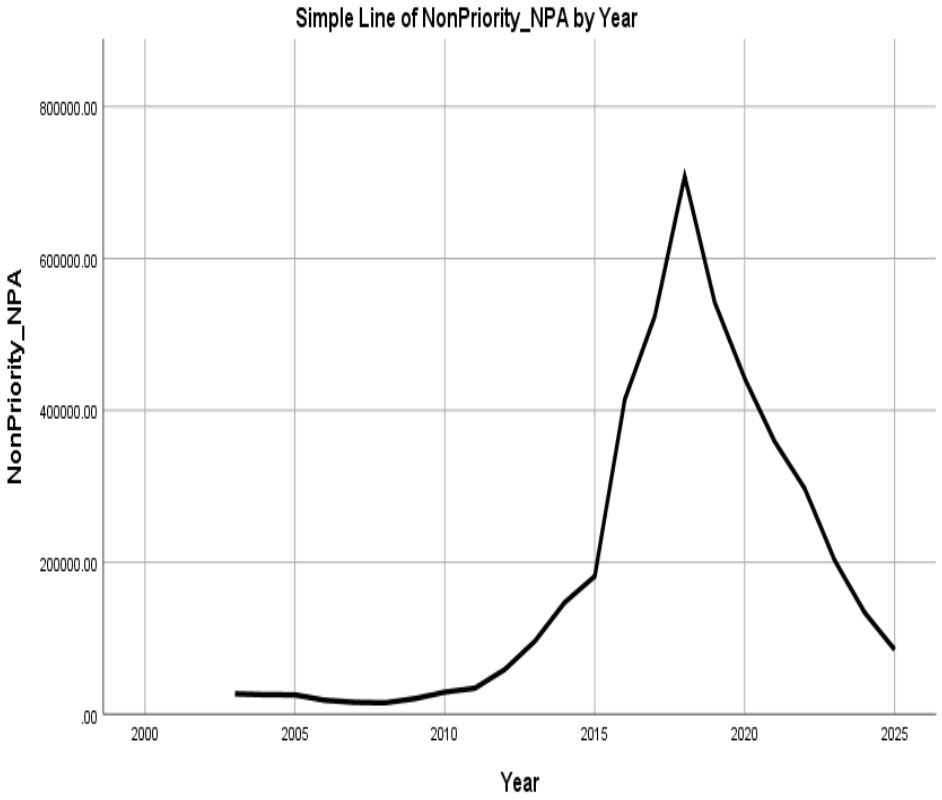
Trend Analysis of Non-Priority Sector NPAs

Figure 4 Trend of Non-Priority Sector NPAs of Public Sector Banks in India (2003–2025)



Source: Computed from RBI Data.

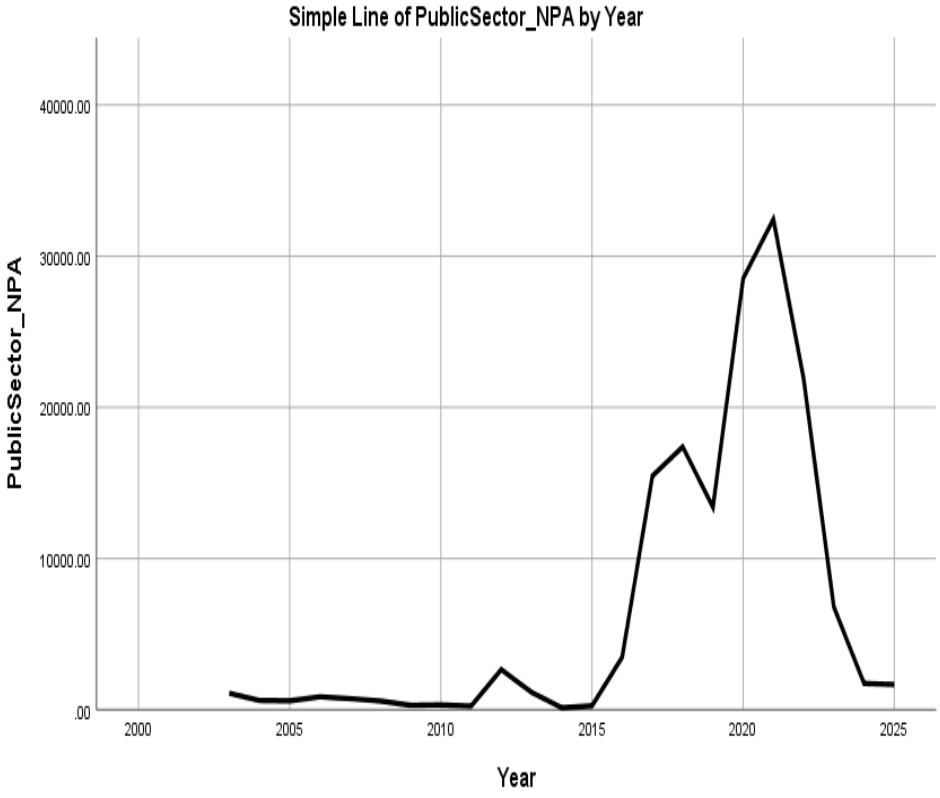
The graph depicts the trend of Non-Priority Sector NPAs of Public Sector Banks in India between the years 2003 and 2025. During the earlier years, the value of NPAs in the Non-Priority Sector was relatively low. The value of NPAs remained consistent in the Non-Priority Sector till about 2010, indicating that the Non-Priority sectors of these banks were not stressed out much financially during this period. However, after 2011, the value of NPAs started to increase in the Non-Priority sectors of these banks persistently. The rapid increase in the value of NPAs in the Non-Priority sectors of these banks was observed after 2014. The value of Non-Priority Sector NPAs peaked in the year 2018 and crossed the value of ₹7 lakh crore. This peak in the value of Non-Priority Sector NPAs could have been due to various factors such as defaults of corporate loans, economic slowdown, stresses within the infrastructure sector, shortcomings in the credit appraisal procedures implemented by the banks, and the strict rules regarding the recognition of bank assets implemented by the Reserve Bank of India (Dhar & Bakshi, 2015; Bawa et al., 2019; Goswami, 2022). The results of this report indicate that the NPAs in the Non-Priority sectors became the major reason for the increase in the total number of NPAs in the Public Sector Banks in India.

The graph illustrates the pattern of Non-Priority Sector NPAs of Public Sector Banks in India from 2003 to 2025. From the graph, it can be noted that there was stability in the Non-Priority Sector NPAs until around the year 2010. This suggests that the Non-Priority Sectors did not face any financial stress until this year between 2003 and 2025. From 2011 until 2014, there was a steady rise in the number of Non-Priority Sector NPAs, but there was a steep rise from 2014 until 2018. During this last year depicted in the graph, the Non-Priority Sector NPAs increased to a peak of ₹7 lakh crore. There are several reasons for the rise in these figures within the Non-Priority Sectors, such as defaults from corporations, an economic slowdown in the country, the infrastructure industry taking a financial downturn, the credit assessment process for loans from banks failing, and the stringent norms to recognize bank assets following the Asset Quality Review of the Public Sector Banks by the

RBI (Dhar & Bakshi, 2015; Bawa et al., 2019; Goswami, 2022). These NPAs within the Non-Priority Sectors have therefore become the main cause of the Total NPAs in Public Sector Banks.

Trend Analysis of Public Sector NPAs

Figure 5 Trend of Public Sector NPAs of Public Sector Banks in India (2003–2025)



Source: Computed from RBI Data.

The above chart highlights the trend in the Public Sector NPAs of the Public Sector Banks in India for the period from 2003 until 2025. During the period between 2003 and 2015, the Public Sector NPAs remained relatively low and stable. During this period, the Public Sector Banks in India exhibited relatively less stress levels. While there were slight variations during these years, the NPAs within the public sector did not significantly rise compared to other categories of NPAs. A significant rise in the NPAs within Public Sector Banks in India existed between 2017 and 2021. During this time, the NPAs within these banks began to reach their peak around the year 2021. Some of the potential reasons for these rising NPAs within the Public Sector Banks include the economic slowdown within the country, the resulting financial stress upon the Public Sector Banks, the rising instances of these banks failing to make payments of loans to companies that had financed them, and the economic impact of the coronavirus pandemic. Additionally, changes in the recognition of the assets of these banks may also have contributed to the rising NPAs for the Public Sector Banks (Dar et al., 2021; Goswami, 2022).

Following the year in which the NPAs within the Public Sector Banks in India peaked around 2021, the NPAs began to decline within these banks after 2021. This decreasing trend in the ratio of NPAs within the Public Sector Banks suggests that there was an improvement in the financial condition of these banks after 2021. Additionally, overall, the Public Sector NPAs within the banks remained relatively low in comparison to the other major categories of NPAs.

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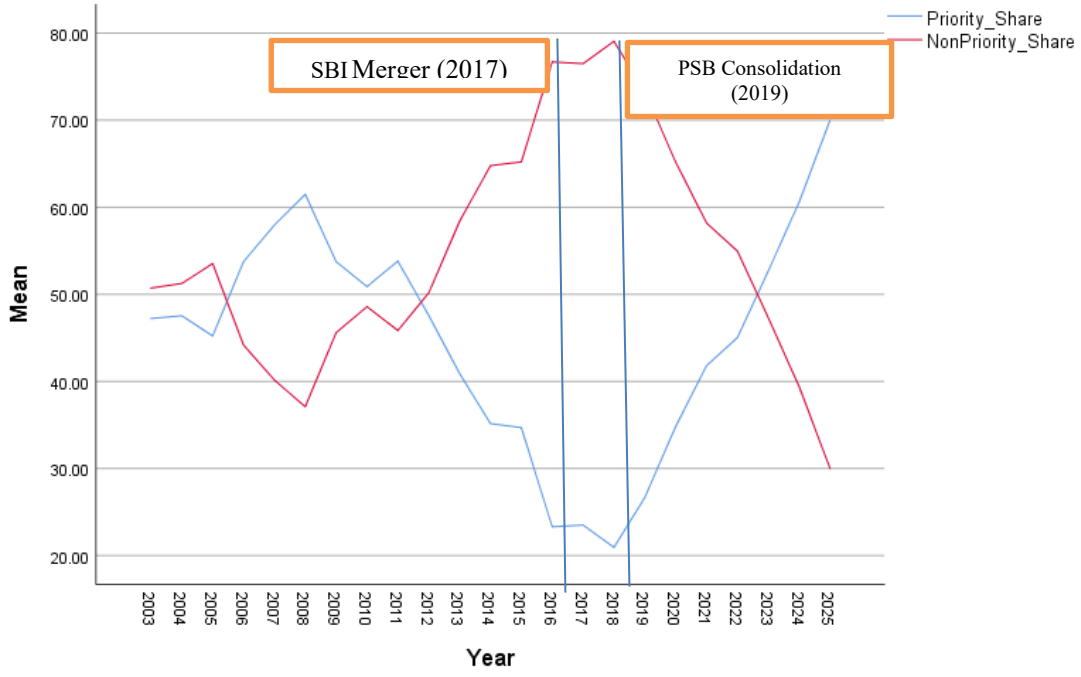
Phase-wise Composition Analysis

Figure 6 Composition Trend of Priority Sector and Non-Priority Sector NPAs within Total NPAs of Public Sector Banks in India (2003–2025)



Source: Computed from RBI Data.

The diagram illustrates the trend of change in the proportion of PRIORITY SECTOR NPAs and NON-PRIORITY SECTOR NPAs in the TOTAL NPAs of Public Sector Banks in India from 2003 until 2025. It is clear from the diagram that there have been some significant changes in the composition of NPAs in terms of the sectors to which they are related. During the period between 2003 and 2012, the banks with NPAs from the priority sectors accounted for a higher proportion of the total NPAs than those from non-priority sectors. However, between 2013 and 2022, the share of NPAs from non-priority sectors increased substantially and to a predominant share of the total NPAs from all Public Sector Banks in India. The peak of this proportion occurred around 2018 when there was a lot of stress in the corporate and infrastructure sectors of the Indian economy (Bawa et al., 2019; Bose et al., 2021). Some of the important developments in the banking sector of India during this time frame include the merger of SBI with ICICI in 2017 and the consolidation of all Public Sector Banks in 2019. Following 2023, there has been a shift in the composition of the NPAs from these banks, with the share of priority sector NPAs increasing and that of the non-priority sectors decreasing. However, the trend is based on a small number of annual observations of the Public Sector Banks. Nonetheless, this diagram illustrates the changes in the composition of NPAs within the Public Sector Banks of India over time.

Table 3 Composition Analysis Across Major Banking Phases

Phase	Period	Priority Share (%)	Non-Priority Share (%)
Phase I	2003–2012	51.92	46.71
Phase II	2013–2022	32.69	67.23

Phase III	2023–2025	61.10	38.90

Source: Computed from RBI Data.

The classifications of the phases that are employed in this study are based upon the major economic and regulatory developments in the Indian banking sector. While it is true that other classifications of the phases may result in some differences in the percentages of the shares of each of the sectors represented, the general distribution of the NPAs according to sector is similar in each phase of the study period. Thus, the differences in the percentages of the shares of the sectors represented in the NPAs is the only factor that may lead to differences in the determination of the change in each of the sectors' contributions to the Total NPAs.

Moreover, an analysis of the changes in the composition of the Total NPAs of PSBs of India according to the sectorial composition of the NPA loans also reveals significant changes over the different phases. During Phase I (2003-2012), the Priority Sector NPAs contributed slightly more to the Total NPAs of the Public Sector Banks of India than the Non-Priority Sector NPAs. The Priority Sector NPAs contributed on average 51.92 percent to the Total NPAs while the Non-Priority Sector NPAs contributed 46.71 percent on average. During Phase II (2013-2022), the NPAs that were in the Non-Priority loan sectors drastically increased to 67.23 percent due to increased stress in corporate and infrastructure loans.

According to Phase III (post-2023), there has been a change in the trends in the composition of the NPAs in the PSBs of India as the percentage of the Priority Sector NPAs has risen to 61.10 per cent. However, there are concerns regarding this change as the data for this phase only comprises three years of observation of the PSBs of India. Thus, these trends are emerging but have yet to be proven as significant changes to the composition of the PSBs of India. This changing trend within the Priority Sector NPAs is likely the result of stress in some of those categories but also through the rapid reduction of the NPAs within the Non-Priority sectors of these banks due to the deleveraging of corporates following the AQR.

Generally, this paper finds that there have been significant changes in the composition of the sector-wise NPAs in the Public Sector Banks of India over time.

Descriptive Statistics

Table 4 Descriptive Statistics of NPAs of Public Sector Banks in India (2003–2025)

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Year	23	2003	2025	2014.00	6.782
Priority Sector NPA	23	21536.00	257858.35	111899.4278	88403.35664
Non-Priority Sector NPA	23	15007.42	708090.00	191402.0491	207800.45827
Public Sector NPA	23	130.35	32438.87	6621.6474	9849.39764
Total NPA	23	38854.36	895601.00	303714.6926	277450.28356
Valid N (listwise)	23				

Note: All NPA values are in ₹ Crore. Source: Computed from RBI Data.

Descriptive Statistics is that table which describes the statistical properties of the NPAs of Public Sector Banks (PSBs) of India for the period between 2003 and 2025 based on 23 observations. The results of this table show

that the type of NPAs having the maximum average is the Non-Priority Sector NPAs with an average of ₹191402.05 crore as compared to other types of NPAs. This indicates the contribution of Non-Priority Sector loans to the NPAs of the Public Sector Banks. However, the maximum level of Non-Priority Sector NPAs was recorded at ₹708090.00 crore for a few years during the research period which reflects the stress that was experienced by the Public Sector Banks in relation to these loans being taken by their customers.

The priority sector non-performing assets (NPAs) have a mean value of ₹111,899.43 crore, which is lower as compared to the non-priority sector NPAs. However, the standard deviation of the priority sector NPAs is high, indicating a marked variation of NPAs within this category across different years. The maximum value of priority sector NPAs is ₹257,858.35 crore. The public sector NPAs have a comparatively lower mean value of ₹6621.65 crore as compared to the other NPAs. The total NPAs have a mean value of ₹303,714.69 crore with a maximum value of ₹895,601.00 crore. The total NPAs also have a high standard deviation, indicating a considerable variation of NPAs within the public sector banks across different years. The descriptive analysis of the data presented here shows that the non-priority NPAs are the largest component of the total NPAs of the public sector banks during the study period.

Since the total NPAs are composed of the NPAs within each of the above-mentioned banking sectors, the results of the correlation and regression analyses are purely descriptive of the relationship between the components of the total NPAs. Thus, the statistical results are presented merely to show the relationship between the components of the NPAs within the public sector banks.

Correlation Analysis

Table 5 Correlation Matrix of NPA Categories of Public Sector Banks in India (2003–2025)

	Priority Sector NPA	**Non-Priority Sector NPA**	**Public Sector NPA**	**Total NPA**
Priority Sector NPA	1	.712**	.775**	.851**
	Sig. (2-tailed): —	Sig.: .000	Sig.: .000	Sig.: .000
Non-Priority Sector NPA	.712**	1	.731**	.975**
	Sig.: .000	Sig. (2-tailed): —	Sig.: .000	Sig.: .000
Public Sector NPA	.775**	.731**	1	.794**
	Sig.: .000	Sig.: .000	Sig. (2-tailed): —	Sig.: .000
Total NPA	.851**	.975**	.794**	1
	Sig.: .000	Sig.: .000	Sig.: .000	Sig. (2-tailed): —

*Note: ** Correlation is significant at the 0.01 level (2-tailed). N = 23 for all variables. Source: Computed using IBM SPSS Statistics.*

The outputs of the correlation analysis indicate a strong positive correlation between Priority Sector NPAs, Non-Priority Sector NPAs, Public Sector NPAs and Total NPAs of Public Sector Banks in the period between 2003 and 2025. As the Total NPAs of all Public Sector Banks is the arithmetic sum of the NPAs in each of the sectors

of those banks, these correlations are indicative of the association between the NPAs of each of the sectors as a whole rather than the individual causes of each of those NPAs.

The results indicate that there is a statistically significant (p = 0.000) positive correlation between each of the categories of NPAs. The Priority Sector NPAs of Public Sector Banks are positively correlated with the Total NPAs of those banks (r = 0.851). The Non-Priority Sector NPAs are also positively correlated with the Total NPAs of those banks, though with a higher correlation coefficient than the other categories of NPAs (r = 0.975). Additionally, the Public Sector NPAs of Public Sector Banks are positively correlated with the Total NPAs of those banks (r = 0.794). Thus, each of the categories of NPAs within the Public Sector Banks appear to be strongly associated with one another during the period between 2003 and 2025.

Simple OLS Regression Output

Table 6 presents the regression analysis outputs for descriptive illustrations only.

Table 6 Model Summary: Non-Priority Sector NPAs and Total NPAs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975[a]	.950	.948	63324.54825

Note: [a] Predictors: (Constant), Non-Priority Sector NPA. Dependent Variable: Total NPA. Source: Computed using IBM SPSS Statistics.

Table 6 presents the regression analysis outputs for descriptive illustrations only.

The model summary table presents the statistical fit and the proportional association that is reflected in the regression output between the Non-Priority Sector NPAs and the Total NPAs of the Public Sector Banks in India during the period of 2003 to 2025. The correlation coefficient value of 0.975 indicates that there is a very strong positive co-movement between the Non-Priority Sector NPAs and the Total NPAs. The value of the coefficient of determination, which is R Square, is 0.950, indicating that the regression output reflects the proportional association between the Non-Priority Sector NPAs and the Total NPAs. Since theTotal NPAs are composed of the NPAs of the various sectors of the PSU banks, this value of the coefficient of determination is indicative of the compositional relationship between these two variables. The Adjusted R Square value of 0.948 indicates that the model retains a high degree of statistical consistency. The Standard Error of the Estimate of around 63324.54825 indicates the average deviation between the observed values of the Total NPAs and the values estimated by the regression model. The model demonstrates a considerable proportionality between the Non-Priority Sector NPAs and the Total NPAs of the PSBs, especially during the periods in which the corporates and infrastructural sectors of the banks were facing considerable stress.

Table 7 Regression Coefficients: Non-Priority Sector NPAs as Predictor of Total NPAs

Model	Variable	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
1	(Constant)	54593.875	18138.018	—	3.010	.007
1	Non-Priority Sector NPA	1.302	.065	.975	20.033	.000

Note: Dependent Variable: Total NPA. Source: Computed using IBM SPSS Statistics.

The table describes the relationship of the compositional nature of the Non-Priority Sector NPAs with the Total NPAs of the Public Sector Banks in India during the years from 2003 until 2025. The Total NPAs in Public Sector Banks comprise the NPAs according to sector, thus, the coefficients for each of these sectors is indicative of the relationship between the two variables, rather than any relationship of causation between them.

The positive unstandardized coefficient (B = 1.302) indicates that high levels of Non-Priority Sector NPAs within the Public Sector Banks correlated with high levels of Total NPAs during the observed period. Furthermore, as the coefficient is higher than 1, it indicates that whenever there was a rise of ₹1 in the Non-Priority Sector NPAs within the Public Sector Banks, the Total NPAs rose to ₹1.30. Such a relationship is likely due to the rise in NPAs in other sectors of the banking system, such as the Priority and Public Sector banks.

Consequently, the standardized coefficient of 0.975 indicates an extremely high positive correlation between the values of the two variables. The extreme values of the t-test statistic of 20.033 and the p-value of 0.000 indicate a very strong correlation between the two variables in the sample data set. The constant value of 54593.875 indicates the total level of NPA when the value of NPA from the non-priority sector is zero.

It must be noted that the values of the regression coefficients should be interpreted in the context of the components of total NPAs of the Public Sector Banks. In general, the regression analysis shows the significant proportionate relationship between the variable NPA of the Non-Priority Sectors and the total NPAs of the Public Sector Banks during the period of study when there was a building stress in the Corporate and Infrastructure Sectors.

Discussion

The current research study investigates the composition, trends, and the proportional correlation of the different types of Non-Performing Assets (NPAs) of the Public Sector Banks (PSBs) of India for the period 2003-2025 based on secondary data collected from several sources of the Reserve Bank of India (RBI). The composition and trending analysis of the NPAs of PSBs of India revealed that the total NPAs of these banks witnessed an increasing trend from 2014 onwards, peaking around the year 2018. These findings indicated a stressful condition of the banking industry of India during the post-AQR period (Bawa et al., 2019; Goswami, 2022).

Between 2003-2012, the PSBs of India had NPAs in their Priority Sector that constituted a slightly larger portion of their Total NPAs as compared to the NPAs arising from their Non-Priority Sector. However, during the period of 2013-2022, the NPAs that were from the Non-Priority Sector of these banks became the major component of their Total NPAs of Public Sector Banks of India, especially during the corporate and infrastructure stress period that afflicted the banking industry of the country (Dhar & Bakshi, 2015; Bose et al., 2021). Thus, these findings indicate that there has been a change in the pattern of stress within the banking system of India during different periods of time. The most recent indicators after 2022, however, suggest that the Priority Sector NPAs are starting to rise as a portion of the Total NPAs of the PSBs of India.

Beyond the AQR framework, it is essential to consider the cause of the increased number of Non-Priority Sector NPAs. The AQR framework would explain the sudden increase in the number of NPAs for priority sectors. However, the causes of the increased number of Non-Priority Sector NPAs before the implementation of the AQR framework had been gradually building up throughout the previous phase of credit expansion within the Indian banking sector. Between 2007 and 2012, Public Sector Banks significantly increased the amount of loans that they offered to the largest corporate groups within the country, as well as to sectors that required significant capital investments, such as the power, the steel, telecom, road, and construction sectors (Nidugala, 2017; Dhananjaya, 2019).

The delays in environmental clearances, land and fuel supplies, and regulatory approvals for several infrastructure and industrial projects adversely affected the repayment capacities of corporate borrowers. The economic slowdown following the global financial crisis had a further adverse impact on the ability of infrastructure companies to repay their loans. The credit appraisal and monitoring mechanisms within the banking sector were inadequate prior to the AQR and contributed to the deterioration of the bank's asset quality (Biswas & Deb, 2004; Bawa et al., 2019). The restructuring of banks and the evergreening of loans delayed the

recognition of stressed assets within the banking system prior to the AQR. Thus, the AQR was primarily aimed at exposing and recognising the stress in the banking system that had existed well before the onset of the NPA crisis.

However, the observations of NPAs following 2022 are based on a limited number of observations and, therefore, should be made with caution. It can be argued that the change in the composition of NPAs is the result of the continuing stress in those lending categories within the Priority Sector, as well as the quicker fall in the levels of NPAs within the non-Priority sector in response to various corporate efforts to deleverage and resolve those NPAs through audit processes.

The rising proportion of Priority Sector loans that are Sectors NPAs within the early observations of the post-2022 period can perhaps be attributed to the stress that developed within the agriculture and MSME loan categories within the post-COVID economic recovery period (Gaur & Mohapatra, 2020; Kanyan & Singh, 2024). Many of the borrowers who had obtained loans in these categories experienced disruptions to their business operations. Factors contributing to these business operation disruptions included fewer economic activities in those economies, disrupted supply chains, rising inflation costs, and reduced household incomes. While various initiatives were undertaken to temporarily alleviate the financial stress of these companies, the risk for their continued nonpayment of loans remains.

At the same time, the compositional shift that has emerged within NPAs in the banking sector may not necessarily be a reflection of deteriorating default behaviour within the Priority Sector lending segments alone. It could also be a consequence of changes within the distribution of loans within the Public Sector Banks. Public Sector Banks have substantially increased their lending within various schemes and within the Priority Sector, such as those focused upon MSMEs, the PM Mudra Yojana, the Kisan Credit Card scheme, as well as other lending initiatives. However, lending to corporates and infrastructure borrowers has been relatively stable within this group of banks. Thus, even with stable default rates within the Priority Sector lending by these banks, the proportion of NPAs within the Total NPAs of these banks may rise due to the increased lending within the Priority Sector. As such, the current trend within the banking sector after 2022 may be due to both the composition of loans that are being made by banks and the defaulting behaviour within the Priority Sector loan segments of those banks simultaneously.

The analysis of the correlation between NPAs of different categories of banks revealed a strong positive correlation between the Priority Sector NPAs, Non-Priority Sector NPAs, Public Sector NPAs and the Total NPAs of the Public Sector Banks. Furthermore, the results of the simple OLS regression model for the study period indicated a strong proportional relationship between the Non-Priority Sector NPAs and the Total NPAs of the Public Sector Banks. Given that the Total NPAs is the arithmetically-composed total of the NPAs within each of these sectors individually, these correlations are indicative of the associations between each of the sectors' NPAs, but not of any relationships between each of the sectors' NPAs and the NPAs within each of the other sectors.

Overall, then, the findings of the study indicate the structure of the NPAs within the Indian Public Sector Banks during each of these periods. The research provides insight into the evolution of the composition of the NPAs within the bank in terms of the phases of the bank and the sectors of those banks, which is otherwise missing in the current literature on the topic. Additionally, while there are some new trends within the NPAs after the year 2022, these findings will require more time to validate the structural changes in the composition of the NPAs within these bank sectors.

Policy Implications

The findings of the study emphasize the necessity of adopting more effective approaches to credit risk management within the PSBs of India. The rise of NPAs in the non-priority sectors indicate the requirement for enhancing the criteria for credit evaluation, valuation of projects, and the policies regarding the monitoring of loans given to companies in the corporate and infrastructural sectors. It is advisable for these banks to enhance their exposure to different sectors of the economy to better manage the risks posed by overexposure to specific

sectors, which include the power, telecommunications, steel, and construction industries. The better supervision of the loans given to large borrowers could prove to be beneficial for the PSBs in the avoidance of future NPAs in these corporate loan portfolios (Dhar & Bakshi, 2015; Dhananjaya, 2019; Bose et al., 2021).

The rise in the percentage of Priority Sector NPAs indicates the need for policies that would address the issues related to agriculture and MSME loans. The agriculture loan sector is impacted by weather, crops failing to bear fruit, the price of agricultural commodities, and the income levels of the agricultural sectors of rural areas. By incorporating measures related to crop insurance, approving loans based on weather reports, and approving MSME loans with flexible repayment schedules during periods of unfavorable weather for agricultural sectors, the ability of those in the agricultural sectors to repay their loans would be improved. Therefore, improving the ability of MSME loans to be restructured and repaid and to gain access to the working capital they require can alleviate the difficulties faced by MSME loan borrowers (Gaur & Mohapatra, 2020; Kanyan & Singh, 2024).

The findings also suggest the importance of adopting technology-driven risk monitoring systems within Public Sector Banks. Adopting technology-driven early warning systems, digital cash-flow monitoring systems, frameworks for predictive risk assessment, and platforms that integrate information regarding the risk of loan borrowers could significantly enhance credit risk management within banks. Additionally, improving the integration of data between banks, credit information agencies, and regulatory institutions could significantly improve the efficiency of regulators in monitoring the risk of high-risk sectors of the economy. Finally, the Reserve Bank of India continues to play an important role in improving the stability of the banking sector of India and the asset quality of Public Sector Banks in India through its monitoring systems and regulatory reforms (Bose et al., 2021; Dar et al., 2021).

Overall, the findings of this research suggest that the establishment of a credit risk management framework for Public Sector Banks in India that is both sector-sensitive and technology-enabled will be important for ensuring the long-term stability of bank assets and public banks in particular.

Conclusion

The following research study aims to examine the composition and evolution of the NPAs of Indian PSBs from 2003 until 2025 by referring to secondary data from different publications of the RBI. The composition of the NPAs of Indian PSBs has evolved over time due to the changes in economic history and the regulatory measures that were implemented during different phases of the Indian economy.

It can be concluded from the findings of this research study that there is a certain dynamism to the composition of the NPAs of Indian PSBs. Such a composition should not be evaluated during a single period within the bank's history. Instead, the composition of NPAs changed over time as a result of different factors. By examining the different time periods within the history of the banks, it is possible to understand the changes that occurred to the composition of the NPAs of those banks over time.

The contributions of this study to the current body of knowledge in the area of NPAs in Indian Public Sector Banks include a shift from the existing studies on the NPAs of Indian PSBs at the aggregate level to the studies on the trend of NPAs in the PSBs on a phase-wise and sector-wise basis. Furthermore, it has become evident from this study that the compositional approach to understanding the NPAs of PSBs is vital to understand the changes in the stress level of the banking sector of India during various regimes.

The preliminary indications regarding a change in the composition of NPAs in Indian PSBs during the recent post-2023 period indicate the need to monitor the stress level of the Priority Sectors of these banks, especially the agriculture and MSME banking sectors. Thus, the findings of this study have crucial policy implications for the authorities responsible for formulating effective strategies for dealing with the NPAs currently existing in Indian PSBs.

Limitations of the Study

The study is based on secondary data that has been collected from various publications of the Reserve Bank of India (RBI). The data collected from these publications is essential to determining the findings of the study. The

study focuses on Public Sector Banks (PSBs) of India and does not include data from Private Sector Banks, Foreign Banks, Regional Rural Banks, or Cooperative Banks of India. The study specifically looks at Priority Sector NPAs, Non-Priority Sector NPAs, Public Sector NPAs, and the Total NPAs within the banking sector of India between the years 2003 and 2025.

The primary methods of data analysis that were used for this study included descriptive statistics, trend analysis, graphical analysis, descriptive correlation analysis, and the use of simple OLS regression outputs as reported within the various publications of IBM SPSS Statistics. As the component of the Total NPAs of India specifically within the public sector banking industry, it is essential to note that the statistical analyses presented in this report are solely for descriptive purposes. Furthermore, more advanced statistical analysis methods were not used for this study. For example, methods like unit root testing, cointegration analysis, and error-correction modeling were not employed in this study. Due to the lack of these methods, it is possible that the data could be spurious as a result of the time-series nature of the data that was published between 2003 and 2025.

In the study, the RBI data used at the sector level might have ignored differences among various Public Sector Banks within the country. Moreover, the use of continuous data from the RBI at the aggregate level for the Public Sector Banks ignores the fact that there were major consolidations within the banking sector of India. For instance, the State Bank of India was merged with other banks in 2017, and many Public Sector Banks were consolidated in 2019 and 2020.

Furthermore, the classifications of the phases that the Public Sector Banks went through were not based on tests for structural breaks in the data but on the existing developments in the banking sector of India. While tests for structural breaks could have been used to confirm the classifications of the different phases of the Public Sector Banks, these tests were not performed due to the limited number of observations available for each year in the Public Sector Banks (N = 23).

Finally, the observations made regarding the period after 2022 are based on a limited number of observations and should, therefore, be interpreted with caution and as emerging trends rather than confirmed shifts in the structure of Public Sector Banks regarding their sector-wise NPAs.

Future Research Directions

The findings of the present study open up several avenues for future research. For instance, future studies can investigate whether the same phase-wise shift in the structure of NPAs that is seen in the Public Sector Banks is also present in the Private Sector Banks, the Foreign Banks, and the Regional Rural Banks.

A comparative study among the various banks of the country may reveal valuable findings regarding the linkage between the ownership structure of the banks and the evolution of their NPAs across different banking sectors.

Furthermore, it would also be interesting for future research to utilise more advanced statistical tools to study the relationship between the various categories of NPAs in the banking sector. For instance, a bank-wise panel data analysis would provide more insight into the relationship between the ownership structure of the banks and the evolution of their NPAs.

Finally, it would also be interesting to study the NPAs of the banks for the period after 2023, as there seems to be a shift in the composition of the NPAs for this period of time. Future research could investigate whether the increase in the share of the Priority Sector Banks' NPAs is part of a structural shift in the composition of their loan portfolios, or whether it is merely a transient phenomenon. It would also be of interest to investigate the impact of the restructuring of the banks after the COVID pandemic on the composition of their NPAs.

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