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A Bibliometric Analysis of 23 Years of Research on the Impact of Non-Performing Assets on Bank Performance

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Abstract

The foundation of every financial system is its banks. However, non-performing assets (NPAs) are becoming a bigger issue worldwide, endangering both economic performance and financial stability. The recent COVID-19 epidemic has had a major influence on non-performing assets (NPAs), a measure of a bank's loan management performance, both in India and globally. Growing non-performing assets (NPAs) are putting pressure on banks in both the public and private sectors. However, a recent increase in non-performing assets (NPAs), or unpaid loans, has drastically lowered the bank's profitability and increased NPA. 5246 scholarly articles from 2001 to 2023 are used in this study to analyse non-performing assets (NPAs). With the use of technological tools, we will examine these materials using a database of research publications and spot tendencies. Citation analysis and bibliometric analysis between cited works, relevant publications, and often used keywords will be graphically mapped using these tools. By doing this, we want to identify trends and learn more about NPA trends and their effects.

Keywords: *Non Performing Analysis (NPA), Banks Performance, Bibliometric Analysis, Citation Analysis*

INTRODUCTION

Loans that fail are known as non-performing assets (NPAs). When borrowers are unable or unwilling to make their payments, the bank is left with an asset that isn't generating any revenue. Borrowers may intentionally miss payments (default) or be having financial difficulties as a result of a weak economy that is negatively impacting their company. This means that banks may lose the loan asset whole or in part. NPAs are a measure of how well a bank converts deposits into loans and then recovers those debts. A bank's financial statements are affected in a number of ways when loans are not recovered, including lower interest revenue, more NPA provisioning, higher capital needs, and lower profitability. As a result, banks are quite concerned about the rise in non-performing assets (NPAs), which highlights the need of determining the factors that contribute to NPAs before loans fall into this category.

The growing number of non-performing advances may significantly hinder banks' operations by limiting their profits and lowering profitability. When a borrower defaults on a loan, it usually becomes an NPA, which leaves banks with unproductive assets and perhaps primary capital loss. Profitability is immediately impacted by this drop in interest revenue, and the bank's capital base may be weakened if primary capital cannot be recovered. The cumulative impact of these elements may endanger a bank's stability after a certain point. Scholars have studied NPA drivers in great detail, with a particular emphasis on a bank's profitability, loan growth, and efficiency.

The link between a bank's efficiency and non-performing assets (NPAs) has been the main focus of previous research by academics including Berger and DeYoung (1997), Podpiera and Weill (2008), Li et al. (2007), and Breuer (2006). These studies used operational ratios to measure operational capabilities. Empirical data from these research points to a positive relationship between NPAs and decreased efficiency. Scholars who have since studied the relationship between loan growth and non-performing assets (NPAs) include Salas and Saurina (2002), Sinkey and Greenawalt (1991), Clair (1992), Hess et al. (2009), Borio et al. (2001), and Keeton (1999). Their findings indicate that aggressive loan expansion frequently results in higher NPAs because it increases exposure to credit risk. Furthermore, some writers have

examined the connection between bank profitability and non-performing assets (NPAs), pointing to a negative link (Bhatia, Mahajan, & Chander, 2012). However, operational competency, company growth, and profitability are not the only factors that affect non-performing assets (NPAs). According to experts in the industry, other important factors include a bank's capital sufficiency, solvency, and liquidity.

Scholars such as Gonzalez-Hermosillo et al. (1997) and Louiz et al. (2012) have emphasised the relationship between non-performing assets (NPAs) and a bank's financial stability. Well-capitalized banks are more inclined to take measured risks when making loans, which might result in fewer non-performing assets (NPAs). On the other hand, significant NPAs may jeopardise a bank's solvency, or capacity to fulfil its responsibilities, making it difficult to reimburse depositors.

Prior research hasn't always looked at all of these elements at once to see how they affect NPAs as a whole. By examining 31 financial measures that represent a bank's operational effectiveness, growth, liquidity, capital adequacy, profitability, and solvency, more recent studies are bridging this gap. The goal of these investigations is to find early warning indicators before loans go problematic.

The increase of non-performing assets (NPAs) in India has raised concerns. Research on the Indian banking sector indicates that gross non-performing assets (NPAs) increased from 3% in 2014 to 4% in 2015. This issue was mostly caused by public sector banks, especially the State Bank of India (SBI) group. In 2015, India's total non-performing asset (NPA) ratio was greater than rising nations like as China (1.5%), Mexico (2.5%), and Brazil (3.3%), although it was still lower than the world average of 4.3%.

The Reserve Bank of India's (RBI) more stringent policies may be somewhat to blame for the increase in non-performing assets (NPAs) in Indian banks. The purpose of these new rules was to stop banks from postponing the identification of problematic loans. In the past, banks could keep troubled loans off the NPA list by restructuring them. Nonetheless, the RBI's strategy required banks to make provisions for restructured loans by 2016 and regarded them similarly to non-performing assets. This had an effect on bank profitability as well as NPA numbers. This revision makes it clearer how the new RBI rules and the increase in non-performing assets (NPAs) are related. It also draws attention to the possible negative effects of the more stringent rules on bank profits.

By using easily available software tools, network analysis offers a more advanced approach to visualisation and analysis. Doing overlap analysis before to starting literature searches helps to avoid duplication and enables the confirmation of results using duplicate literature sources. In the end, researchers may improve the quality and efficacy of literature reviews and advance academic knowledge in the field of NPA and banks by using methodical approaches and integrating network analysis. This study stimulated research into green finance, investments, and the economy during a 23-year period from 2001 to 2023 by examining screening, thematic investing, and engagements across research topics, nations, and authors using VOS-viewer software. The research includes a review of 5246 publications from journals in a variety of subjects and the Openalex website.

METHODS AND DATA

We first do bibliometric analysis by searching through well-known databases including Web of Science (WoS), Scopus, and SSRN, as well as all of the esteemed journals that are featured in the Openalex databases. We use "Non Performing Assets" AND "Bank" as a keyword combination to guarantee thorough coverage of articles on NPA and banks globally between 2001 and 2023. As shown in Figure 1, the aggregate findings from various sources indicate 5246 articles in total.

This research uses the VOS viewer software to create graphical representations of the bibliographic data (Van Eck & Waltman, 2010). Numerous bibliometric methods are used, such as the bibliographic coupling (BC) theory put out by Kessler in 1963, which states that two papers reference the same third document (for example, Studies A and B both cite Study C). According to

Small (1973), co-citation happens when two articles—for example, Studies A and B are both mentioned by Study C—are quoted from the same third document. Furthermore, keywords' co-occurrence is examined to find phrases that appear often in journal articles.

This paper's objectives are to find and gather documents related to "NPA" by applying bibliometric analysis to the pertinent, gathered, and compiled literature using VOS viewer and creating keyword networks and clusters, author contributions, along with their countries of origin and cited documents. In all, 5246 documents were employed in the study, which spans 23 years of research from 2001 to 2023, as the graph below illustrates. Cytometric analysis will be used to discover and create the network, and the top 20 most referenced academic papers related to "NPA" will be used. Along with focussing on the sources of the most referenced papers, the research will make conclusions based on the top 20 writers that helped create the documents related to "NPA." Finally, we will determine the top 20 nations from whence these papers came, based on the quantity of documents submitted and the number of citations they got.

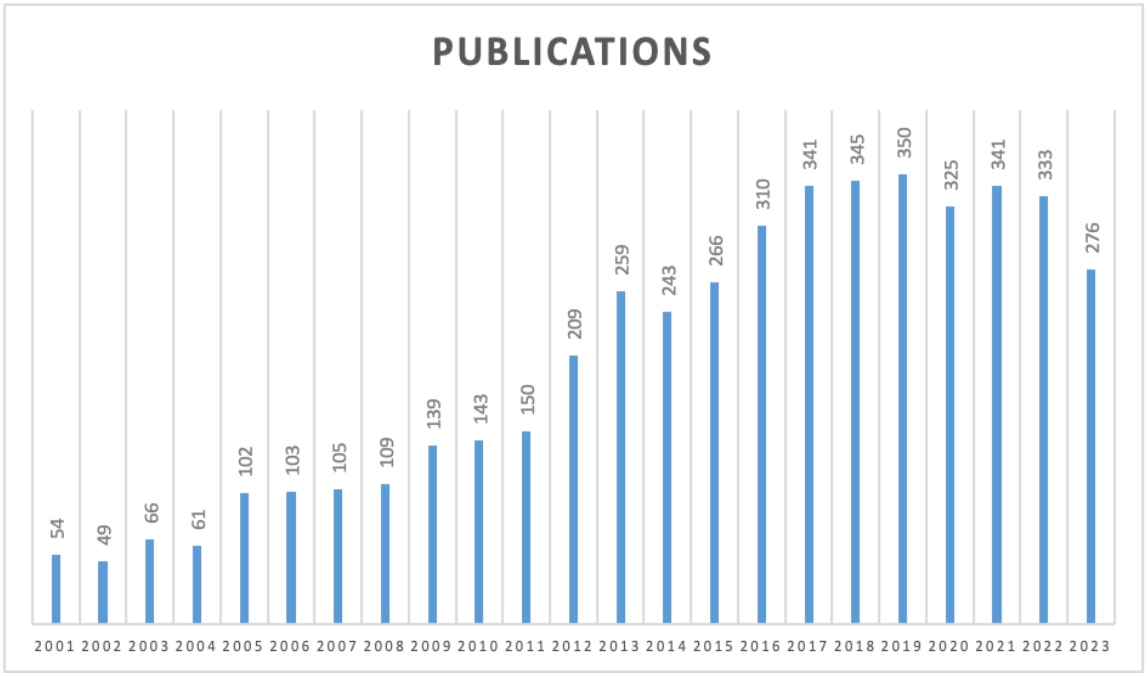

Fig:1 Publication Distribution from 2001-24

Journal Distribution

RESULTS

Table-1: Author's Creation for Top 20 Journals

Item Id.	Journal	Link Weight	Total Link Strength	Documents	Citation
2120	Social Science Research Network	7	362	228	465
1898	PLOS One	19	1009	42	1619
1253	Journal of Biological Chemistry	15	1886	30	2231
770	Global Business Review	7	356	25	235
2296	Vision	4	187	17	61
1450	Journal of Molecular Biology	15	1928	15	1293

1059	International Journal of Molecular Sciences	15	1864	15	241
1953	Proceedings of the National Academy of Sciences of the United States of America	18	1718	13	2314
1863	Physical Chemistry Chemical Physics	15	1037	12	231
1456	Journal Of Molecular Structure	16	420	11	182
1752	Nature	18	1016	9	3763
676	FEBS letters	15	981	9	864
1755	Nature Communications	15	459	9	659
725	Frontiers In Plant Science	13	416	8	274
837	IIM Kozhikode Society & Management Review	7	204	8	29
1967	Proteins	14	805	7	241
1274	Journal Of Chemical Physics Online /Journal Of Chemical Physics	15	1989	7	210
1275	Journal Of Chemical Theory And Computation	14	365	6	199
273	Biochimica et Biophysica ACTA. Biomembranes	15	1750	6	157

Although it would appear that the most natural area for study on non-performing assets (NPAs) in banks would be finance, a startling pattern shows up when examining the leading publications. With 228 papers in our sample, the Social Science Research Network (SSRN) is at the top of the list, as Table 1 demonstrates. With 42 articles, even the interdisciplinary scientific magazine PLOS One has a high ranking. Notably, none of the top 20 include any typical financial periodicals. This implies that scholars may be taking a more comprehensive approach to NPAs, taking into account social and economic aspects in addition to financial ones. It's interesting to note that there aren't many science-related publications. According to the data, there are less articles on this subject in prestigious journals like Global Business Review, IIM Kozhikode Society & Management Review, and even Nature.

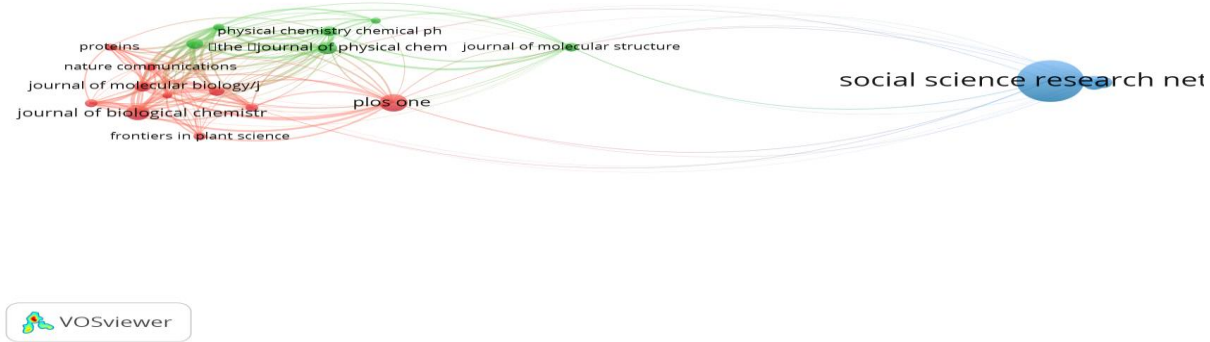

Fig. 2. VOSviewer Network based on Journals based on Citation

According to the analysis in Figure 2, the top 20 list included the journals SSRN, PLOS One, Global Business Review, and IIM Kozhikode. A startling gap is shown by the predominance of social science publications in NPA research (Table 1). NPAs seem to be of little interest to mainstream economics and finance journals, despite their crucial role in bank health and financial stability. This is troubling since NPA levels are often the basis for laws and regulations. Closing this gap and promoting NPA research in mainstream finance is obviously necessary. This urgency is supported by two factors:
The Increasing Issue: In recent years, non-performing assets (NPAs) in priority sector loans, public and private efforts, and debt recovery have increased dramatically. Indian banks have struggled with non-performing assets (NPAs) of more than Rs. 1,03,973 crores between 2001 and 2023 alone. The need for scholarly answers is highlighted by this enormous weight. Growing Interest: Researchers from a wide range of fields are becoming more interested in NPAs. This suggests the possibility of significant study, particularly in light of the dearth of considerable

literature at the moment. Research has historically ignored important topics including recovery mechanisms, risk management, and economic issues in favour of concentrating on bank profitability and performance statistics. Researchers can close this crucial gap and provide insightful information to financial institutions and regulators by concentrating more on risk mitigation techniques and the economic factors that contribute to non-performing assets.

Author's Country of Origin

Research identifies the fundamental drivers of the growth of interest in non-performing assets (NPAs) in line with banking. A detailed examination of the writers' nationalities, as shown in Fig. 3, identifies a clear pattern. Scholars from China, the US, the UK, India, and a number of other developed nations are mostly responsible for the notable advancements in this field. Given the significant influence of global organisations like the World Bank, RBI, and UN, as well as the strong working relationships between these organisations and the US that support such research endeavours, it is remarkable that scholars from India and the US are featured prominently. The US has 728 papers with a citation weight of 33693 while India has 1037 papers with a citation weight of 7132. This indicates that because other researchers are pursuing their work, the quality of research carried out in the designated NPA domains is more stable. When policymakers review US and UK papers, benchmarking is also done in terms of policy formation.

In the global banking industry, the United States and the United Kingdom have long had a dominant position. Their banks are influential, influencing global innovation and policy. Figure 1 illustrates this, with lighter hues indicating earlier contributions. It's interesting to note that early studies on NPAs came from the US, UK, and India, with later study coming from other countries. This points to a pattern of knowledge transmission in which preliminary studies inspired more study in other
areas.

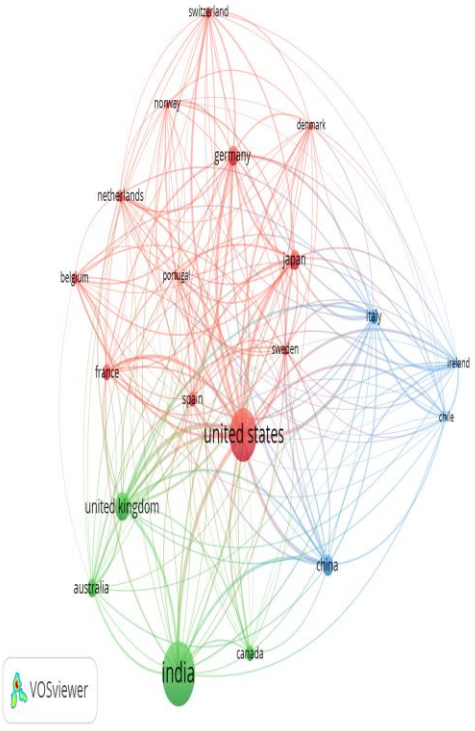

Fig. 3. VOSviewer Network of Countries based on Citation

Table 2 displays a summary of the top 20 countries ranked by their Total Link Strength (TLS), which encompasses Documents and Citations within our dataset. It's evident that among the nations contributing to the advancement of green finance, India emerges as the foremost publisher in related literature, leading the list with a TLS of 24003, accompanied by 1037 documents and 7132 citations up to 2023. Following closely is the United States, with a TLS of 52801 contributing 728 documents and 33693 citations. Lastly, the United Kingdom secures the third position with a TLS of 23940, 258 documents, and 9046 citations.

Table-2: Author's Creation for Top 20 Countries

Item Id.	Countries	Total Link Strength	Documents	Citations Weight
42	India	24003	1037	7132
118	United States	52801	728	33693
117	United Kingdom	23940	258	9046
21	China	19081	156	5286
50	Japan	22498	131	8747
35	Germany	21886	128	4522
5	Australia	9532	123	3841
19	Canada	7450	100	2878
34	France	11821	93	4292
48	Italy	17120	87	2508
103	Spain	10952	80	2961
72	Netherlands	7102	66	4279
107	Switzerland	10406	54	3314
9	Belgium	6758	52	1702
106	Sweden	12558	46	2648
77	Norway	6998	29	1888
28	Denmar k	7794	24	1883
85	Portugal	7170	22	652
20	Chile	8745	14	353
46	Ireland	9207	12	394

Non-performing assets (NPAs) are a major concern for India's banking system. They strain the financial performance of banks, impacting the entire financial ecosystem. India's economic growth relies heavily on a healthy banking system, so addressing NPAs is crucial. NPAs weaken banks financially and mentally (referring to morale and confidence).

Overdependence on traditional lending practices, unlike developed nations, contributes to the problem. Banks need to diversify their income sources by offering fee-based services and products. The Credit Information Bureau (CIBIL) established in 2001 is a step in the right direction. By facilitating data sharing among banks, CIBIL can help prevent borrowers from taking out multiple loans against the same assets, which previously contributed to rising NPAs.

Keywords Analysis

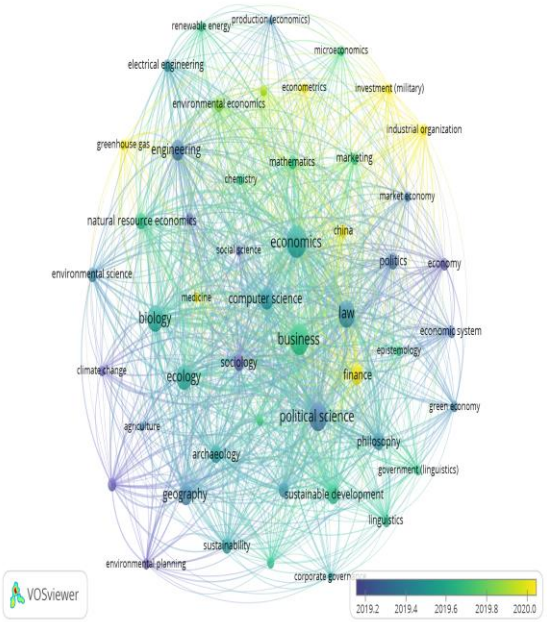

Fig. 4. VOSviewer Network of Keywords based on Citation

Some intriguing tendencies in NPA research are shown in Table 3. "Finance" is undoubtedly important, but it's not the sole field driving the discussion. A broader variety of disciplines are represented by the top 20 terms, including business, political science, economics, law, and even computer science. This implies that scholars are examining non-performing assets (NPAs) from a variety of angles, taking into account not just financial aspects but also economic, legal, and political implications.

The emphasis on terms like "loan disbursement" and "recovery" draws attention to how NPA research is used in practice when formulating policy. The chart does, however, also show gaps in areas such as sustainable development, investments, and finance. Researchers now have the chance to investigate further how sustainable banking practices might reduce non-performing assets (NPAs).

Table-2: Author's Creation for Top 20 Keywords

Item No.	Keywords	Total Link Strength	Occurrence
'2750'	"Economics"	'186202'	'19388'
'963'	"Business"	'165863'	'17867'
'6848'	"Political Science"	'151945'	'15977'
'5058'	"Law"	'142766'	'14124'
'764'	"Biology"	'132690'	'13046'
'2688'	"Ecology"	'123905'	'11747'
'1650'	"Computer Science"	'82293'	'9501'
'3839'	"Geography"	'81190'	'8254'
'2994'	"Engineering"	'73915'	'8104'
'3422'	"Finance"	'70196'	'7404'
'418'	"Archaeology"	'63204'	'5986'
'6658'	"Philosophy"	'59243'	'5873'
'8330'	"Sociology"	'52522'	'5492'
'6010'	"Natural Resource Economics"	'59158'	'5299'
'6851'	"Politics"	'54861'	'5241'
'8829'	"Sustainability"	'54182'	'4854'
'2711'	"Economic Growth"	'49759'	'4696'
'3056'	"Environmental Economics"	'49035'	'4238'
'3092'	"Environmental Science"	'36911'	'4185'
'5505'	"Mathematics"	'33573'	'3764'

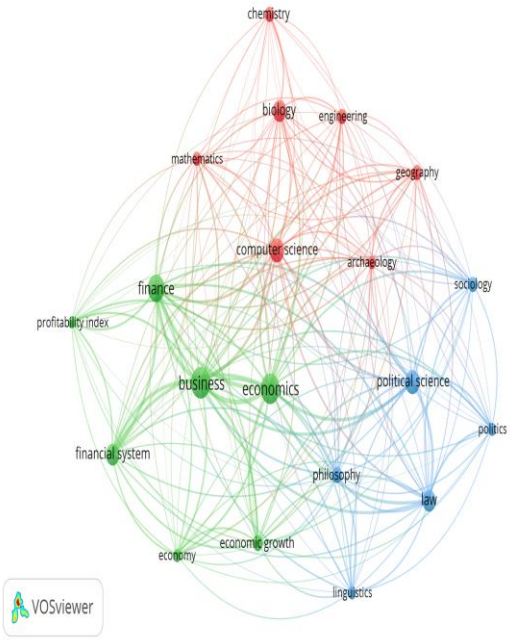

Fig. 5. VOSviewer Network of Keywords based on Citation

Researchers are increasingly interested in understanding the impact of NPAs on various aspects of banking. This includes how NPAs affect a bank's ability to operate sustainably, its profitability, and its overall growth. Interestingly, India stands out as a major contributor to NPA research, even though managing NPAs remains a significant challenge for the country.

The importance of this research is reflected in the focus on reducing NPAs through various measures, such as provisions, regulations, and standardized policies. While "Market," "Finance," and "Investment" don't rank among the top ten keywords (Table 3), Figure 5 shows their prominent presence. This highlights the need for more research on tackling NPAs from a purely financial perspective.

By analyzing keywords, we gain valuable insights into the broader concept of NPAs. It's clear that NPAs are intricately linked to sustainable banking practices, stock prices, and overall profitability. Addressing this issue requires strong policy initiatives and contributions from economists and financial experts, as NPAs extend beyond just the realm of sustainability.

CONCLUSION

The current research assessed the scope of the literature on non-performing assets (NPA) and their effects on bank performance by doing a bibliometric analysis on a selection of 5246 papers published between 2001 and 2023. To examine the current literature, a number of relational techniques were used, including co-authorship analysis, citation analysis, keyword co-occurrence analysis, bibliographic coupling analysis, and co-citation mapping analysis. The acceptance and effectiveness of profitability management, monetary policy, financial ratios, stock performance, and methods for managing and controlling them are some of the subjects that some scholars have studied. Others have focused on recovery management and asset-liability management balance in order to reduce bank risk or non-performing assets. A research roadmap for managing non-performing assets (NPA) in banks and reducing related risks was produced by the bibliometric and co-citation analyses. The main study directions that were found centre on analysing the benefits and challenges associated with non-performing assets (NPA) and bank performance, implementing solutions, and investigating the key elements that impact a bank's NPA reduction efforts. Given that the bulk of the examined papers were empirical studies on banks worldwide, with a special emphasis on India, the USA, and the UK, future study is probably going to go further into these areas. Additionally, knowledge gained from the bibliographic study assisted in locating publications, sources, and writers that used similar keyword sets, underscoring the growing interest of corporations and governments in controlling, lowering, and mitigating bank non-performing assets (NPA) indicators. It is still up for dispute whether policies like corporate governance, financial performance ratios, asset and loan expansions, strong recovery processes, and regulated interest rates are successful in lowering non-performing assets (NPA). Although there hasn't been much scholarly focus on fintech and digital banking services and their implications for bank risk and non-performing asset (NPA) management, their introduction also has a substantial impact on a number of bank hazards. Bank risk may be impacted by the COVID-19 pandemic's acceleration of the adoption of fintech activities. Comprehensive modifications are required to better understand the dynamics of non-performing assets (NPA) in banks and evaluate the efficacy of regulatory measures like capital requirements and macroprudential legislation. To successfully manage non-performing assets (NPAs), better loan risk assessment is also required.
The bulk of articles, according to the study, are empirical, highlighting the significance of theoretical contributions to bank risk management and NPA quantification. Interestingly, studies on bank risk are more common in industrialised countries like the United States. By highlighting important patterns and topics for further research, the present study may direct future studies. Using many databases, such as WoS, SSRN, and Scopus, can provide a more thorough review of the literature on NPAs. Additionally, studying author

cooperation and the process of knowledge generation within the research community might help clarify how collaboration affects bank NPA research.

Theoretical and Practical Implications

There are theoretical and practical ramifications to this research. Through perceptive analysis and trend assessments, it enhances the current understanding of NPA literature in banks from an academic standpoint. It highlights understudied regions within each study field and provides a basic resource for researchers interested in exploring bank non-performing assets (NPA) concerns by identifying essential works. Additionally, it provides direction for future research activities by emphasising the need for more theoretical contributions in the field of bank non-performing assets (NPA), recommending possible journals for upcoming publications, and highlighting the importance of investigating novel approaches to reduce NPA in order to improve the efficacy and efficiency of future bank performance while maintaining stability. This report provides practitioners with a thorough and current assessment of how non-performing assets (NPA) have changed in banks over the last 20 years. Improvements in financial well-being and the use of successful solutions to reduce NPA burdens may be facilitated by such insights into bank NPA dynamics. Furthermore, the results are significant to banks regulators, who may use them to help develop risk management guidelines and maintain industry stability.

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