Two Decades Of Trend Analysis In Non-Performing Assets: A Bibliometric Synthesis

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ABSTRACT

Banks are the lifeblood of any financial system. However, a growing problem of Non-Performing Assets (NPAs) across the globe is jeopardising financial stability and economic performance. NPAs indicate how well a bank is managing the loans, and the recent COVID-19 pandemic has significantly impacted this metric, not just in India but globally. Both public and private sector banks are feeling the strain of rising NPAs and understanding the ill effects. But a recent rise in unpaid loans, known as Non-Performing Assets (NPAs), has reduced the bank's profitability tremendously leading to a hike in NPA and reduced profitability over a prolonged period. This research examines NPAs using 5246 academic publications ranging from 2001 to 2023 data extracted from Open Alex. Using a database of research articles, we'll analyse these materials and identify trends with the help of VOS viewer software and r package. These tools will visually map citation analysis and bibliometric analysis between cited works, related publications, and frequently used keywords. By doing this, we aim to uncover patterns and gain a deeper understanding of NPA trends and their development over a period ranging from twenty-three years of in-depth analysis.

Keywords: Non-Performing Analysis, Banks Performance, Bibliometric Analysis, Citation Analysis and VOS Viewer.

INTRODUCTION

Non-performing assets (NPAs) are loans that turn bad over a prolonged period and remain unpaid. This happens when borrowers can't or won't make their payments, leaving the bank with an asset that isn't bringing in any income. Borrowers might skip out on payments deliberately (default), or they might be struggling due to a bad economy that's hurting their business. For banks, this signifies a potential partial or complete loss of the loan asset. NPAs serve as a measure of a bank's efficiency in converting deposits into loans and subsequently recovering them. Banks failing to recover loans impacts various aspects of a bank's financial statements, including reduced interest income, increased provisioning for NPAs, heightened capital requirements, and diminished profits. Thus, the escalation of NPAs poses a significant concern for banks, emphasizing the need to identify determinants of NPAs before loans deteriorate into this category.

The increasing occurrence of non-performing advances can substantially impede banks' performance by constraining their earnings, thus diminishing profitability. Typically, a loan becomes an NPA when a borrower defaults on repayment, leading to unproductive assets and potential loss of principal capital for banks. This decline in interest income directly

affects profitability, while the failure to recover principal capital may erode the bank's capital base. Beyond a certain threshold, the combined effect of these factors can jeopardize a bank's stability. Academics have extensively examined NPA determinants, particularly focusing on a bank's efficiency, loan growth, and profitability.

Previous studies by scholars such as [1,2,3,4], have primarily investigated the relationship between a bank's efficiency and NPAs, using operational ratios to gauge operational capability. These studies have found empirical evidence suggesting a positive correlation between lower efficiency and NPAs. Subsequently, scholars like [5,6,7,8,9,10] have explored the impact of loan growth on NPAs, revealing that aggressive loan expansion often leads to higher NPAs due to increased credit risk exposure. Additionally, some authors, such as [11], have delved into the relationship between bank profitability and NPAs, highlighting a negative correlation. However, NPAs are not solely influenced by operational capability, business development, and profitability. Factors such as a bank's capital adequacy, solvency, and liquidity also play significant roles, as recognized by researchers in the field.

Researchers like [12,13] have highlighted the connection between a bank's financial health and NPAs. Banks with strong capital reserves (well-capitalized) are more likely to take calculated risks when lending, potentially leading to lower NPAs. In contrast, a bank's solvency (ability to meet its obligations) can be threatened by high NPAs, making it difficult to repay depositors. Previous studies haven't always examined all these factors together to understand their combined impact on NPAs. Newer research is filling this gap by analysing 31 financial ratios that reflect a bank's operational efficiency, growth, liquidity, capital adequacy, profitability, and solvency. These studies aim to identify early warning signs before loans turn bad.

It is concerning that NPAs have increased in India. Studies on the Indian banking sector indicate that in 2014, Gross Non-Performing Assets (NPAs) were 3%; in 2015, they were 4%. 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 such as China (1.5%), Mexico (2.5%), and Brazil (3.3%), even if it was still below the global average of 4.3%.

The Reserve Bank of India's (RBI) tougher restrictions may have contributed to the increase in non-performing assets (NPAs) in Indian banks. The goal of these new regulations was to stop banks from holding off on identifying problematic loans. Banks used to be able to restructure troubled loans to keep them off the NPA. However, the RBI's approach treated restructured loans similarly to NPAs, requiring banks to set aside provisions by 2016. This impacted both NPA figures and bank profits. This rewrite clarifies the cause-and-effect relationship between the new RBI guidelines and the rise in NPAs. It also highlights the potential downside of the stricter regulations, impacting bank earnings.

By utilising easily accessible software tools, network analysis offers a more advanced approach to visualisation and analysis. Overlap analysis should be done before starting a literature search to avoid duplication and validate results from redundant literature sources. Ultimately, academics can improve the quality and efficacy of literature reviews and advance scholarly knowledge in the field of non-performing assets (NPAs) and banks by implementing systematic approaches and integrating network analysis. This study stimulated research into green finance, investments, and the economy during a twenty-three-year period from 2001 to 2023 by examining screening, thematic investing, and engagements across research topics, countries, and authors using the VOS-viewer and r software package. 5246 articles from various journals and the Open Alex website were examined for this study.

LITERATURE REVIEW

This extensive study examined the complex relationship between non-performing assets (NPAs) and Indian private banks' financial performance. The study carefully investigated the effect of poor loans on profitability, acknowledging that non-performing assets (NPAs) are a crucial indicator of a bank's general health. The study used a thorough statistical analysis, focussing on five private banks that operated in the Indian financial landscape between 2013 and 2017. Descriptive statistics and t-tests were used to evaluate the impact of non-performing assets (NPAs) on bank performance. The research showed a concerning trend of rising non-performing assets (NPAs), posing serious threats to the stability of the banking industry despite banks' coordinated attempts to recover these non-performing assets. The results clearly showed how negatively NPAs affect profitability, highlighting the pressing need for efficient management techniques. While complete eradication of NPAs may be an elusive goal, the research underscored the potential for significant improvements in bank performance through strategic interventions to enhance NPA management. In conclusion, this study provides valuable insights into the critical role of NPA management in safeguarding the financial health of private banks in India. By

understanding the detrimental impact of NPAs on profitability and implementing effective strategies to address this issue, banks can mitigate risks, enhance their financial resilience, and contribute to the overall stability of the Indian banking system [14].

The study looked at the relationship between NPAs and bank profitability as well as the elements that affect "value-at-risk" and the bottom line of banks that operate in developing and emerging nations. Through the analysis of panel data covering the years 1997 to 2009, the researchers questioned widely held beliefs regarding the factors that contribute to poor lending. The study discovered that, in contrast to common opinion, rural branches and priority sector lending did not significantly contribute to non-performing assets (NPAs). Rather, the degree of bad loans was more significantly influenced by the general state and performance of the industries these banks served. The study also showed that compared to their private sector counterparts, public sector banks were more successful at managing bad loans. While private banks exhibited resilience through the implementation of advanced risk management techniques, public sector banks benefited from government support and regulatory oversight. Moreover, the research identified factors such as capital adequacy and investment activities as key drivers of bank profitability. Surprisingly, the size of a bank's assets did not have a significant impact on its financial performance. These findings offer valuable insights into effective risk management strategies and profitability enhancement for banks operating in emerging markets [15].

The study also looked at nonperforming assets (NPAs) as a gauge of the banking industry's general health, with a particular emphasis on the growth trends of different banks between 2010 and 2017. The State Bank of India (SBI) and its subsidiaries, as well as other nationalised banks, are increasingly contributing to the industry's total NPA levels. This was examined in the study. The researchers compared the performance of various bank types by utilising the geometric mean to calculate the average NPA growth rate. The results showed that, compared to nationalised banks and SBI subsidiaries, private banks typically display lower NPA growth rates, indicating better handling of problematic loans. In contrast, nationalized banks and SBI faced higher NPA growth rates, indicating potential issues with their loan management practices. These insights provide valuable information for investors seeking to assess the post-financial crisis health and profitability of various banks within the Indian banking sector [16].

Another study looked at the connection between NPAs and several financial indicators to find out how poor loans affect the profitability of banks. With data from the Reserve Bank of India, the study concentrated on the five banks that had higher non-performing assets (NPAs) during 2014–2015 and 2018–2019. The study's correlation and multiple regression analysis revealed that public sector banks had far higher NPA percentages than private banks, underscoring the significance of proactive approaches to bad credit management. The study noted that more research is necessary to provide a more thorough understanding of the factors impacting non-performing assets (NPAs), given the intricacy of evaluating NPAs. The study recommended expanding the scope of future research to include a broader range of banks, financial metrics, and macroeconomic factors during the same time period (2014-2019). This would provide a more robust analysis and offer valuable insights into the dynamics of NPAs and their impact on bank profitability [17].

Lastly, the analysis evaluated how NPAs affected Indian commercial banks' profitability from 2005 to 2019. The study, which used information from 39 public and private sector banks, discovered that an increase in NPAs had a very negative impact on profitability. Moreover, rising operating expenses made the drop in profitability much worse. The study suggested that in order to enhance their financial performance, banks should give priority to initiatives that lower NPAs and operating expenses [18]. Similar to the last analysis, this one concentrated on four particular Indian banks: two private sector banks (Axis Bank and Kotak Mahindra Bank) and two public sector banks (State Bank of India and Canara Bank). The study used several indicators, including Return on Assets (ROA)%, Gross NPA%, Net NPA%, and Net Profit, to examine data from 2017 to 2021. The results showed that NPAs disproportionately impacted public sector banks, underscoring the vital significance of efficient NPA management for guaranteeing the general stability of the Indian economy. [19].

RESEARCH METHODOLOGY

Objective of Study

1. To systematically explore the existing literature on the NPA of banks; and
2. To explore the contribution of researchers and key fields undergoing NPA effect in banks.

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The Sample

To conduct bibliometric analysis, we initially searched through prominent databases such as Web of Science (WoS), Scopus, and SSRN, including all renowned journals listed in the Open Alex databases. To ensure comprehensive coverage of publications related to NPA and Banks worldwide between 2001 and 2023, we employ the keyword combination "Non-Performing Assets" AND "Bank". The combined results from these sources reveal a total of 5246 publications, as depicted in Figure 1.

The Tool

This study uses the 'VOS viewer' software to create graphical representations of bibliographic data through a visual mapping process [20]. There are several bibliometric approaches used, such as the bibliographic coupling (BC) described by [21], in which two papers cite a third document (e.g., Studies A and B both cite Study C). According to [22], co-citation happens when two articles are cited in the same third document (e.g., Study C cites both Studies A and B). In addition, terms that appear frequently in journal publications are identified by analysing the co-occurrence of keywords.

Conceptual Framework

This comprehensive research aims to systematically identify and collect relevant literature on non-performing assets (NPAs), a critical issue within the financial sector. By employing bibliometric analysis using VOS viewer, the study will create networks and clusters of keywords, authors, and countries of origin, as well as analyze the cited documents. This in-depth analysis covers a period of 23 years, from 2001 to 2023, and includes a total of 5246 documents, as depicted in the accompanying graph. Through cytometric analysis, the study will identify and construct a network based on the top 20 most cited documents related to NPAs. This network will provide valuable insights into the key concepts, theories, and research methodologies that have shaped the field of NPA research. Additionally, the research will investigate the sources of these highly cited documents, including journals, conferences, and books. By analyzing the contributions of the leading 20 authors involved in NPA research, the study will identify the key individuals who have made significant advancements in this field.

Furthermore, the study will identify the top 20 countries that have made significant contributions to the field of NPA research, based on the number of documents produced and their corresponding citations. This analysis will provide valuable information about the geographical distribution of NPA research and the regions that have been most active in studying this important topic. In summary, this research will provide a comprehensive overview of the existing literature on NPAs, identify key trends and patterns in the field, and highlight the contributions of leading researchers and institutions. The findings of this study will be valuable for academics, policymakers, and financial professionals interested in understanding the complexities of NPAs and developing effective strategies for managing them.
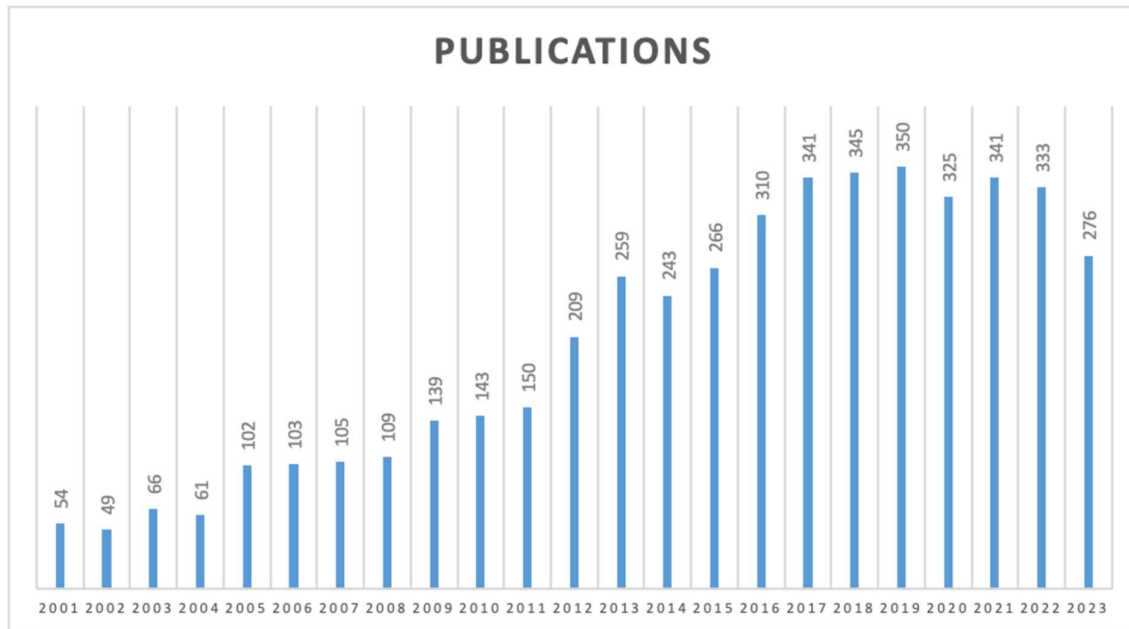
Figure 1: Publication Distribution from 2001-24

The main information revealed in Table 1 below using the r package reveals that there is no annual growth rate as the documents get obsolete quickly over the period and the banking industry is dynamically changing itself by way of innovation. The average age of the contributed study is just 11 years and the future trends do not discount any records for decision making. The study also revealed that domestic and international research bear less credibility in terms of both reference and citations.

Table 1: 'Main Information using r package'

'Description'	Results
'MAIN INFORMATION ABOUT DATA'	
'Timespan'	1810:2025
'Sources (Journals, Books, etc)'	3128
'Documents'	5623
'Annual Growth Rate %'	0
'Document Average Age'	11.2
'Average citations per doc'	18.06
'References'	93127
'DOCUMENT CONTENTS'	
'Keywords Plus (ID)'	5941
'Author's Keywords (DE)'	5941
'AUTHORS'	
'Authors'	14251
'Authors of single-authored docs'	1631
'AUTHORS COLLABORATION'	
'Single-authored docs'	1936
'Co-Authors per Doc'	2.94
'International co-authorships %'	0
'DOCUMENT TYPES'	
'Article'	5623

RESULTS and ANALYSIS

Journal Distribution

Table 2: 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

While finance seems like the obvious field for research on Non-Performing Assets (NPAs) in banks, a surprising trend emerges when looking at the top publishers. Table 1 shows that social science journals dominate the list, with the Social Science Research Network (SSRN) leading the pack with 228 publications in our sample. Even PLOS One, a multidisciplinary science journal, ranks high with 42 publications. Notably, traditional finance journals are entirely absent from the top 20. This suggests that researchers might be approaching NPAs from a broader perspective that considers social and economic factors alongside financial ones. Interestingly, even science discipline journals have a limited presence. The table reveals that well-known journals like Global Business Review, IIM Kozhikode Society & Management Review, and even Nature have fewer publications on this topic.
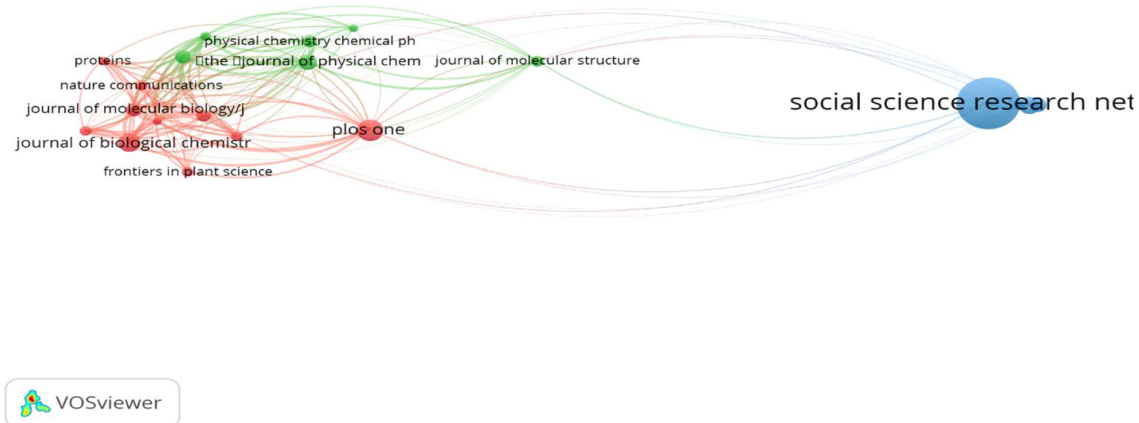
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Figure 2: VOSviewer Network based on Journals based on Citation

The study in Fig. 2. shows that SSRN, PLOS One, Global Business Review, IIM Kozhikode journal was able to be a part of the top 20 list. The dominance of social science journals in NPA research (as shown in Table 1) highlights a surprising gap. Despite the critical importance of NPAs to bank health and financial stability, mainstream economics and finance journals seem to have limited interest in this area. This is concerning because government policies and regulations are often based on NPA levels. There's a clear need to bridge this gap and elevate NPA research within mainstream finance. Two factors support this urgency:

The Growing Problem: NPAs in public and private initiatives, priority sector lending, and debt recovery have risen significantly in recent years. Between 2001 and 2023 alone, Indian banks have grappled with over Rs. 1,03,973 Crores in NPAs. This massive burden underscores the need for academic solutions.

Emerging Interest: A growing number of researchers from various disciplines are showing interest in NPAs. This indicates the potential for impactful research, especially considering the current lack of substantial literature. Traditionally, research has focused on bank profitability and performance ratios, neglecting crucial areas like recovery mechanisms, risk management, and economic factors.

By focusing more on risk mitigation strategies and the economic drivers of NPAs, researchers can bridge this critical gap and provide valuable insights for policymakers and financial institutions.

Author's Country of Origin

Examining the roots of the interest in NPA in accordance with banking, research reveals the underlying motivations propelling its development. A thorough analysis of the nationalities of authors, as illustrated in Fig. 3, reveals a distinct trend. The significant strides in this domain predominantly originate from scholars originating from India, the US, the UK, China and several other advanced countries. It's surprising that researchers from India and the US feature prominently, given the influential presence of international institutions like the World Bank, RBI and UN as the robust collaborative ties between these entities and US, foster an environment conducive to such research pursuits. The documents from India are 1037 with a citation weight of 7132 and the US with documents of 728 and a citation weight is 33693. This means that the quality of research conducted in the given fields of NPA is more robust because other researchers are following their work. The benchmarking is also done in terms of policy formulation when the policymakers consult papers from US and UK.

The United States and the United Kingdom have a long history of dominance in the global banking sector. Their banks are major players, setting policies and driving innovation worldwide. This is reflected in Figure 1, where lighter shades represent earlier contributions. Interestingly, pioneering research on NPAs originated from these three regions (India, US, and UK), with subsequent studies emerging from other parts of the world. This suggests a pattern of knowledge diffusion,

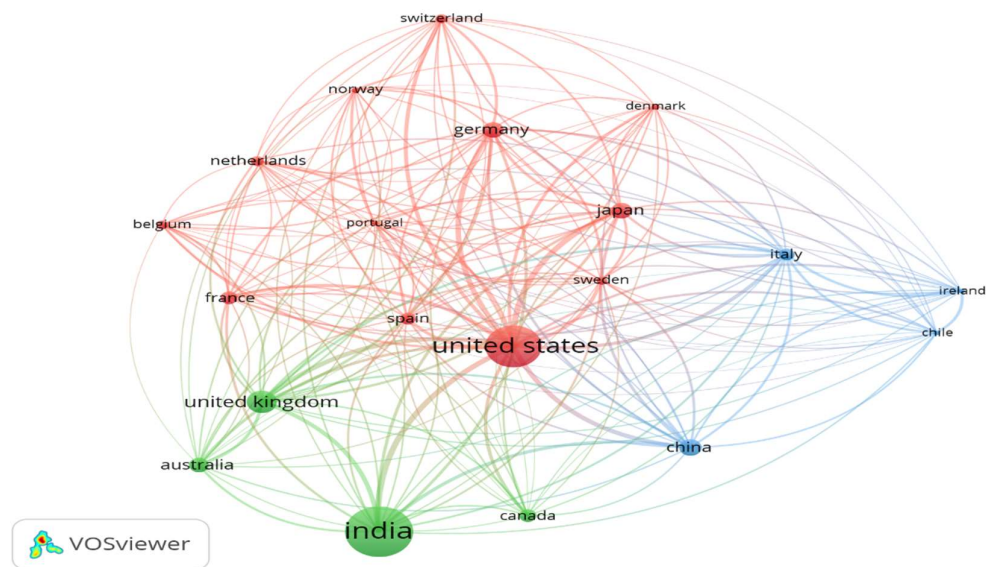where initial research sparked further investigations in other regions.

Figure 3: VOSviewer Network of Countries based on Citation

Table 3 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 3: 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'	'Denmark'	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.
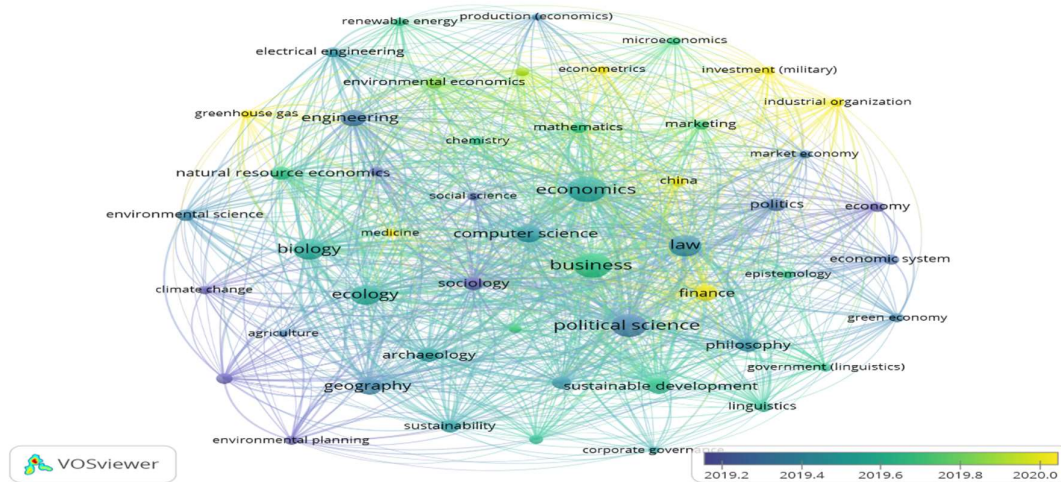
Keywords Analysis

Figure 4: VOSviewer Network of Keywords based on Citation

Table 4 reveals some interesting trends in NPA research. While "Finance" is certainly relevant, it's not the only discipline leading the conversation. The top 20 keywords showcase a wider range of fields, including Economics, Business, Political Science, Law, and even Computer Science. This suggests that researchers are approaching NPAs from a multifaceted perspective, considering not just financial factors but also economic, legal, and political influences.

The focus on keywords like "recovery" and "loan disbursement" highlights the practical application of NPA research in policy formation. However, the table also reveals a gap in areas like Finance, Investments, and Sustainable Development. This presents an opportunity for researchers to delve deeper and explore how sustainable banking practices can help mitigate NPAs.

Table 4: 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'

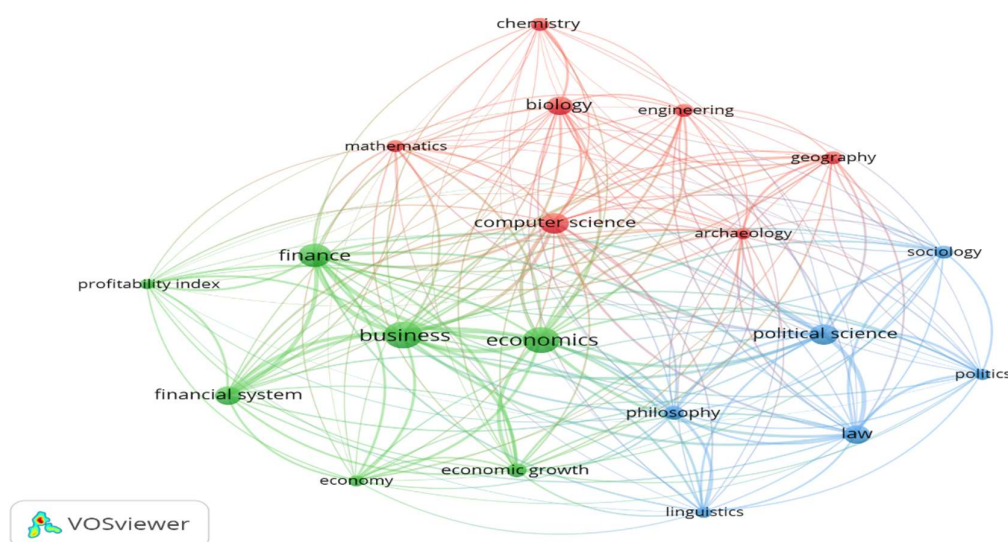| '8330'	"Sociology"	'52522'	'5492'
'6010'	"Natural Resource Economics"	'59158'	'5299'
'6851'	"Politics"	'54861'	'5241'
'8829'	"Sustainability"	'54182'	'4854'
'2711'	"Economic Growth"	'49759'	'4696'
'3056'	"Environmental Economics"	'49035'	'4238'
'3092'	"Environmental Science"	'36911'	'4185'
'5505'	"Mathematics"	'33573'	'3764'

Figure 5: VOSviewer Network of Keywords based on Citation

Researchers are increasingly focused on understanding the multifaceted impact of non-performing assets (NPAs) on the banking sector. This includes examining how NPAs affect a bank's long-term viability, its profitability, and its ability to grow. India, in particular, stands out as a significant contributor to NPA research, despite the ongoing challenges it faces in managing these bad loans.

The importance of this research is evident in the emphasis placed on reducing NPAs through various measures, such as provisions, regulations, and standardized policies. While keywords like "Market," "Finance," and "Investment" may not be among the top ten keywords (as shown in Table 3), Figure 5 clearly demonstrates their prominence. This highlights the need for further research that focuses specifically on addressing NPAs from a financial perspective.

By analyzing the keywords associated with NPA research, we can gain a deeper understanding of the broader implications of this issue. It is clear that NPAs are closely linked to sustainable banking practices, stock prices, and overall profitability. Addressing NPAs requires a comprehensive approach that involves strong policy initiatives, contributions from economists and financial experts, and a holistic understanding of the interconnectedness between NPAs and various aspects of the banking sector.

Beyond the direct financial consequences, NPAs can have significant implications for the overall stability and development of an economy. When banks are burdened with high levels of bad loans, they may be less able to lend to businesses and individuals, which can hinder economic growth. Additionally, NPAs can lead to a loss of confidence in the banking system, which can have negative consequences for both consumers and investors.

Therefore, it is imperative for policymakers, regulators, and bank management to prioritize the effective management of NPAs. This requires a combination of preventive measures, such as rigorous credit risk assessment and early intervention, as well as remedial actions to recover or write off bad loans. By addressing the issue of NPAs, banks can improve their financial health, contribute to the overall stability of the economy, and enhance the confidence of

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stakeholders.

CONCLUSION

The present study conducted a bibliometric synthesis on a subset of 5246 publications spanning from 2001 to 2023 to evaluate the breadth of literature concerning Non-Performing Assets (NPA) and their impact on bank performance. Various relational methods such as 'citation analysis', 'co-authorship analysis', 'keyword, co-occurrence analysis', 'bibliographic coupling analysis', and 'co-citation mapping analysis' were employed to scrutinize the long hauled research literature. Some researchers have delved into topics like the adoption and efficacy of profitability management, monetary policy, financial ratios, and stock performance, as well as strategies for their control and management. Others have concentrated on mitigating bank risk or NPA through recovery management and maintaining balance in asset liability management. The bibliometric and co-citation analyses generated a research front map aimed at managing NPA in banks and mitigating associated risks.

The primary research avenues identified cluster around examining the advantages and hurdles related to NPA and bank performance, implementation strategies, and exploring the critical factors influencing a bank's efforts to reduce NPA. Future research will likely expand into these areas, given that a majority of the analyzed publications were empirical studies conducted on banks globally, with a particular focus on India, the USA, and the UK.

Moreover, the "bibliographic synthesis" yielded valuable insights into identifying articles, sources, and writers with similar keyword sets, underscoring the growing interest of businesses and governments in the management, reduction, and mitigation of non-performing assets (NPA) indicators in banks. It is still up for contention whether corporate governance, financial performance ratios, asset and loan expansions, strong recovery processes, and capped interest rates are beneficial in lowering non-performing assets (NPA). Although there has not been much scholarly focus on fintech and digital banking services and their implications for bank risk and NPA management, these developments have a substantial impact on a number of bank hazards. The adoption of fintech activities has intensified due to the COVID-19 pandemic, which may have an effect on bank risk. To better understand the dynamics of NPA in banks and assess the effectiveness of regulatory measures such as macro-prudential regulations and capital requirements, thorough revisions are necessary. Additionally, there is a need for improved measurement of loan risk to manage NPA effectively.

The analysis suggests that a majority of publications are empirical, emphasizing the importance of theoretical contributions to NPA measurement and bank risk management. Notably, research on bank risk is more prevalent in the USA and other developed nations. The current study can guide future research by identifying key trends and areas for investigation. Utilizing multiple databases like WoS, SSRN, and Scopus can offer a more comprehensive overview of NPA literature. Furthermore, examining author collaboration and the knowledge-creation process within the research community can shed light on how collaboration influences NPA research in banks.

Conflict of Interest
All authors declare that there are no conflicts of interest related to the publication of this paper. We have fully disclosed any financial or personal relationships that could potentially bias our research or findings. To further ensure the integrity of our work, we have taken steps to minimize potential conflicts of interest. For example, we have avoided working on

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this project with individuals or organizations that have a vested interest in the outcomes of our research. Additionally, we have carefully considered any potential personal biases that may have influenced our work and have taken steps to mitigate their impact. By taking these measures, we have strived to maintain the objectivity and impartiality of our research.

Author Contributions

All authors contributed significantly to the research presented in this manuscript. The first author conceived and designed the study, led the data collection process, and conducted the data analysis and interpretation. The second author played a pivotal role in writing the manuscript and providing essential revisions. All authors have reviewed and approved the final version of the manuscript.

Ethics Approval

This study was conducted in accordance with ethical guidelines, adhering to the principles of self-determination and obtaining necessary approvals. The research protocol was reviewed and approved by the head of the institution, ensuring that the study was conducted in a responsible and ethical manner. Data was collected from a reputable online source, and informed consent was obtained from all participants involved in the study. This ensured that participants were aware of the study's purpose, potential risks and benefits, and had the opportunity to provide voluntary consent to participate.

By following these ethical guidelines, we have strived to protect the rights and well-being of the participants, maintain the integrity of the research, and ensure that the findings of the study are reliable and trustworthy.

Abbreviation

NPA: Non- Performing Assets

SUGGESTION

This study has significant implications for both academics and practitioners in the field of banking. From an academic perspective, it contributes to our understanding of the existing literature on non-performing assets (NPAs) in banks by providing insightful analyses, trend evaluations, and a comprehensive overview of the various research themes and methodologies. By identifying seminal articles and highlighting areas that require further investigation, the study serves as a valuable resource for researchers interested in exploring the topic of bank NPAs. Moreover, the study offers guidance for future research endeavours. It highlights the need to investigate novel ways to reduce NPAs, recommends possible journals for publishing, and underscores the need for more theoretical and targeted contributions to the subject of bank nonperforming assets. Future studies in these areas can help create better approaches to managing non-performing assets (NPAs) and improving bank performance.

For practitioners, this study provides a comprehensive and up-to-date overview of the evolution of NPAs in banks over the past two decades. This understanding of bank NPA dynamics can help banks improve their financial performance, implement effective strategies to reduce the burden of bad loans and enhance their overall resilience. Furthermore, the results hold significance for banking regulators, as they might use these perspectives to formulate efficacious risk mitigation strategies, guarantee the steadiness of the banking sector, and safeguard the welfare of depositors and additional stakeholders. In summary, this study provides insightful information about the intricate problem of NPAs in banks. The study advances understanding in this area by giving a thorough summary of the body of literature, highlighting important research themes, and making recommendations for further investigation. In addition, the results hold practical significance for regulators and banks alike, assisting them in mitigating the difficulties presented by non-performing assets (NPAs) and enhancing the general soundness and stability of the banking sector.

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