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Prof. (Dr.) K.S. Thakur
Vice Chancellor

MESSAGE FROM THE PRESIDENT OF THE INDIAN ACCOUNTING ASSOCIATION

On the occasion of the publication of the latest issue of the Association Indian Journal of Accounting, it is my privilege to extend heartfelt congratulations to the editorial team, contributors, and readers. This journal stands as a testament to our commitment to academic and professional excellence in the dynamic and ever-evolving world of accounting.

In recent years, the accounting field has witnessed significant transformation due to advancements in technology, particularly the rise of Artificial Intelligence (AI). AI is revolutionizing traditional accounting practices by automating routine tasks, enhancing accuracy, and enabling real-time financial analysis. Tools driven by AI are not only streamlining processes such as auditing, compliance checks, and fraud detection but are also empowering accountants to shift their focus from data entry to strategic decision-making and advisory roles.

Beyond AI, developments in blockchain technology, data analytics, and sustainability reporting are reshaping the global accounting landscape. These innovations are fostering greater transparency, accountability, and adaptability, which are critical in today's interconnected financial ecosystems.

Direct Tax Code or The Income Tax Law, 2025 is on the anvil. The Bill has been referred to the Select Committee of the Parliament. I appeal to interested members expert in Taxation field to study it and provide their inputs to me for preparing a note for submission to the select committee on behalf of IAA. The IAA should make its presence felt with the Ministry of Finance Govt. of India. The note may be published in our journal also with due acknowledgement of services of input provider members.

The Association Indian Journal of Accounting serves as a platform to explore and disseminate research and insights into these advancements. This issue, in particular, addresses emerging trends and their implications for professionals, educators, and policymakers. It reflects our Association's mission to remain at the forefront of academic discourse and to equip our members with the knowledge needed to navigate the complexities of the future.

As we move forward, I encourage all our members to continue embracing lifelong learning, collaboration, and innovation. Together, we can leverage the opportunities presented by technology to uphold the highest standards of accounting and financial reporting.

Thank you for your ongoing support and dedication to the Indian Accounting Association.

With best regards,

(Prof. K.S. Thakur)

President, Indian Accounting Association

MESSAGE FROM THE CHIEF EDITOR OF THE INDIAN ACCOUNTING ASSOCIATION

Accounting education is at the verge of sea changes due to technological changes. The use of Artificial intelligence and automation in accounting education has impacted accounting as a whole. Better decisions in business is capable now with the help of data analytics. Many changes can be seen in the accounting curriculum, including forensic accounting, fintech and cyber security. Real life case studies are being extensively used in classrooms to equip students to experience the real life problems. Focus on international accounting standards have given accounting a globalised view. Accounting has partnered with finance, management and other areas to give an interdisciplinary perspective. The need of the hour is to adapt to the changes in accounting and to embrace the changes. The role of academicians, research scholars and students are gaining significance in making the relevant updates. Research scholars can contribute scholarly articles on artificial intelligence in accounting, ESG, fin tech etc. Indian Journal of Accounting provides a platform for research scholars, students, academicians, and policymakers to contribute valuable papers relating to the recent changes in accounting.

Indian Accounting Association has 61 branches across India and around 9000 members. The Indian Accounting Association conducts National Accounting Talent Search Examination every year since 2009 to measure the nationwide accounting knowledge at the junior and senior levels. The best performer in the National Accounting Talent Search Examination is awarded a cash prize of Rs.21000 with a trophy and certificate at the junior level. The cash prize is Rs.25000, trophy and certificate for the senior level. This is usually conducted during February every year. The Indian Accounting Association has recently introduced a model curriculum for the accounting aspirants to provide them with the new insights on the advancements in the accounting field.

I congratulate all the contributors for their commendable articles and look forward to path breaking articles in the field of accounting and finance. I extend my deep sense of gratitude to Prof. Gabriel Simon Thattil for the timely guidance and coordination. My gratitude is due to the Associate Editors, Dr Priya S and Dr Arun Lawrence for their exemplary work. I am indebted to all the panel of reviewers who have done a remarkable job while reviewing the articles and ensured the articles met quality standards.

Dr. Nimi Dev R
Chief Editor

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PFMS IMPLEMENTATION IN KERALA: A GAME-CHANGER FOR EDUCATIONAL FINANCE MANAGEMENT

Ajumol S. S*, Dr Vinod A.S**

Citation: Ajumol, S., & Vinod, A. S. (2025). PFMS Implementation In Kerala: a Game-Changer For Educational Finance Management.*Indian Journal of Accounting (IJA)* (Vol. 57, Issue 1). Doi:https://doi.org/10.63637/ija.v57i01.1-13

ABSTRACT: *The deployment of the Public Financial Management System (PFMS) in Kerala's education sector has resulted in a paradigm shift in financial management techniques. This paper examines the transformative impact of PFMS on the state's educational system, with a focus on enhanced money management, accountability, and transparency. PFMS has effectively reduced students' financial constraints and ensured timely payments through streamlined scholarship disbursement, fostering uninterrupted academic pursuits. The centralization of financial data recording within the system has led to improved overall accountability, reduced the likelihood of fund misuse, and increased transparency.*

Furthermore, PFMS has significantly lightened the administrative burden on finance staff, enabling them to concentrate on strategic financial planning and analysis. The success of PFMS in the education sector paves the way for its potential implementation in other government agencies, offering effective public financial management and governance for the advancement of the country.

Keywords*: Public Financial Management System, Financial Management, Governance, Transparency, Accountability.*

INTRODUCTION

Financial management plays a crucial role in the field of education as it provides the necessary resources for academic progress. Efficient allocation and utilization of funds are essential to support various educational programs, scholarships, infrastructure development, and overall student welfare. However, traditional financial procedures in the education sector often presented numerous obstacles that hindered its smooth functioning.

Before the implementation of the Public Financial Management System (PFMS) in Kerala's educational system, the Department of Education faced significant challenges. Manual financial operations made it difficult to track funds, resulting in delays, errors, and inefficiencies. The lack of a centralized financial system made it challenging for authorities to monitor spending in real-time and make informed decisions, raising concerns about accountability and the potential for financial misuse.

Moreover, the lengthy manual processes put a strain on the finance team, leaving little time for strategic financial planning and analysis. The absence of an automated system for scholarship payments caused financial difficulties for recipients and led to delays,

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impacting their ability to pursue academic goals.

The implementation of the Public Financial Management System (PFMS) has been a powerful tool, poised to revolutionize financial governance in Kerala's education sector. This case study highlights the importance of financial management in the education industry and the difficulties faced prior to PFMS deployment. It illustrates how PFMS became a symbol of progress, overcoming previous constraints, and providing a comprehensive solution to enhance efficiency, transparency, and accountability in managing financial resources for education. The study explores the significant impact that the adoption of PFMS had on transforming the financial landscape of Kerala's education system, creating new opportunities for academic success and ensuring equitable access to educational resources for all students.

STATEMENT OF THE PROBLEM

The article aims to address the problem of inefficiencies in the conventional financial practices of the education sector in Kerala before the implementation of the Public Financial Management System (PFMS). The challenges included manual financial processes leading to delays, errors, and inefficiencies in fund disbursement and tracking. The lack of a unified financial system made it difficult for authorities to monitor expenditures in real-time and make informed decisions. Additionally, the absence of an automated system for scholarship disbursements resulted in delayed payments, affecting students' academic pursuits and causing financial strain on beneficiaries. The study seeks to examine how PFMS emerged as a solution to these challenges, transforming financial governance in Kerala's education sector by streamlining processes, enhancing transparency, and ensuring effective allocation of resources to support educational programs and student welfare.

OBJECTIVES

1. To assess the impact of the Public Financial Management System (PFMS) implementation on financial management practices within the education sector of Kerala.
2. To examine the effectiveness of PFMS in streamlining scholarship disbursement processes and its influence on students' access to timely financial support for their academic pursuits.
3. To evaluate the extent to which PFMS has enhanced transparency and accountability in fund utilization, leading to improved financial governance and resource allocation within the Department of Education.

SCOPE OF THE STUDY

The scope of the study includes a thorough analysis of the implementation of the Public Financial Management System (PFMS) in Kerala's education sector. It focuses on assessing the impact of PFMS on financial management practices, scholarship disbursement, transparency, and accountability within the Department of Education. The study also examines the success factors that contributed to the effective adoption of PFMS and its transformative impact on students' access to educational opportunities.

RESEARCH METHODOLOGY

This study employed a mixed-methods approach to evaluate the effectiveness of the Public Financial Management System (PFMS) in the Department of Education. The methodology combined qualitative interviews and quantitative surveys to provide a comprehensive analysis.

1. Data Collection

Interviews

- **Participants**: Key stakeholders, including 12 administrative officials and financial officers working with PFMS, and 23 students who benefited from the system.
- **Purpose**: To explore PFMS's impact on financial governance, resource allocation, and transparency.
- **Format**: Semi-structured interviews lasting 30–45 minutes.
- **Focus Areas**: Financial challenges before PFMS, observed improvements post-adoption, and recommendations for further enhancement.

Surveys

- **Sample**: 120 student beneficiaries from diverse districts and educational levels who received financial aid through PFMS.
- **Content**: Questions focused on ease of access, timeliness, satisfaction with PFMS, and the impact of timely disbursements on academic performance.
- **Response Rate**: 78%, achieved through online distribution.

2. Data Analysis

- **Thematic Analysis**: Used to analyze interview data, identifying recurring themes related to PFMS's role in improving financial transparency and governance.
- **Descriptive Statistical Analysis**: Applied to survey responses to quantify satisfaction levels, reduction in delays, and improvements in access to educational resources.

3. Study Period

The research was conducted over a two-month period, ensuring a detailed and robust dataset for analysis.

This methodology ensured the study captured both **qualitative insights** and **quantitative**

evidence, offering a balanced evaluation of PFMS's effectiveness.

For a more detailed overview of the data collection tools, please refer to **Appendix A, Appendix B, and Appendix C.**

Evaluation and Inferences of Objectives

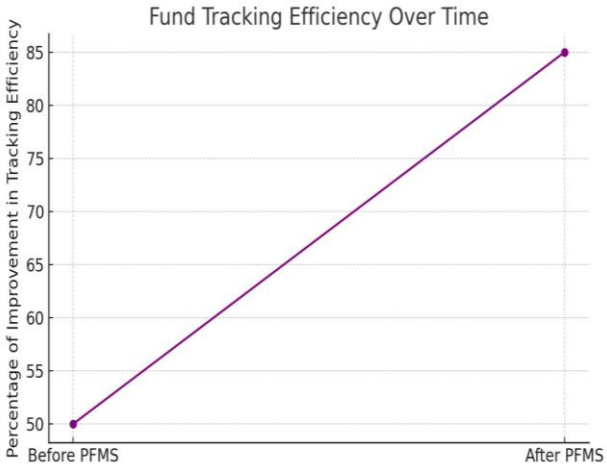
Objective 1: To assess the impact of PFMS implementation on financial management practices within the education sector of Kerala

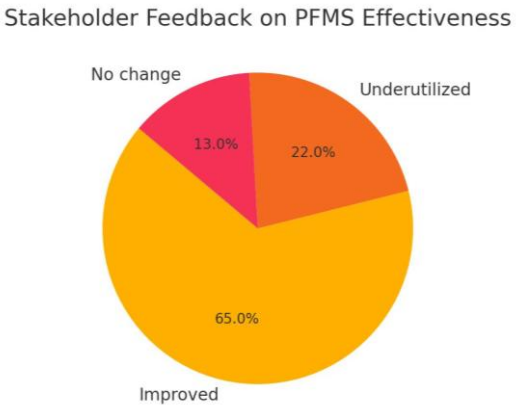
Inference: The implementation of PFMS has had a positive impact on the financial management practices within the education sector of Kerala. Based on the findings from interviews and document reviews, the following key points emerged:

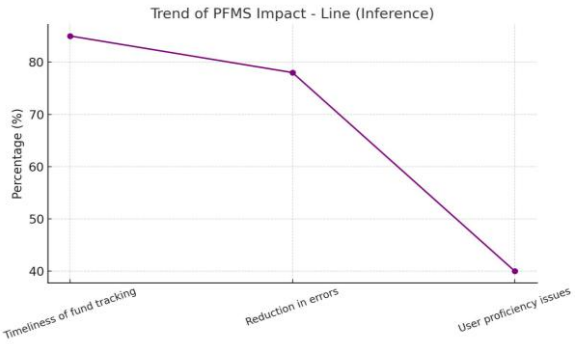
- **Timeliness of fund tracking:** 85% of administrative stakeholders reported that the system improved the speed of tracking funds, enabling more timely financial decision-making.
- **Reduction in errors:** 78% of respondents noted a decrease in errors related to fund allocation and disbursement, emphasizing the system's increased accuracy.
- **User proficiency:** However, 40% of stakeholders indicated limited proficiency in utilizing advanced features of PFMS, which sometimes hindered its full utilization.

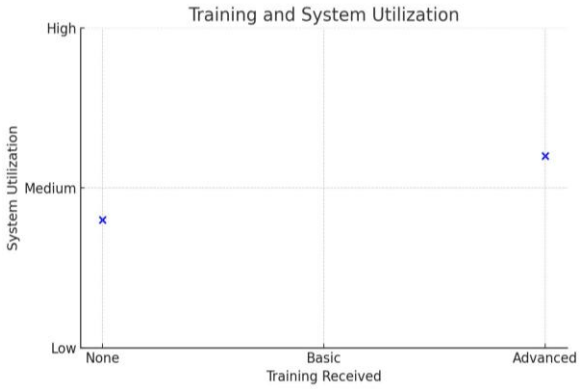
Data: A survey conducted among 35 administrative staff members revealed the following:

- **65**% of respondents reported improved fund tracking and disbursement times.
- **22**% felt that the system was underutilized due to limited training on advanced features.
- **13**% reported no significant change in their financial management practices.









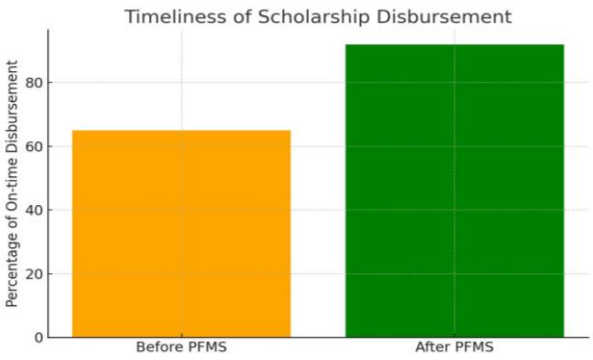
Objective 2: To examine the effectiveness of PFMS in streamlining scholarship disbursement processes and its influence on students' access to timely financial support for their academic pursuits

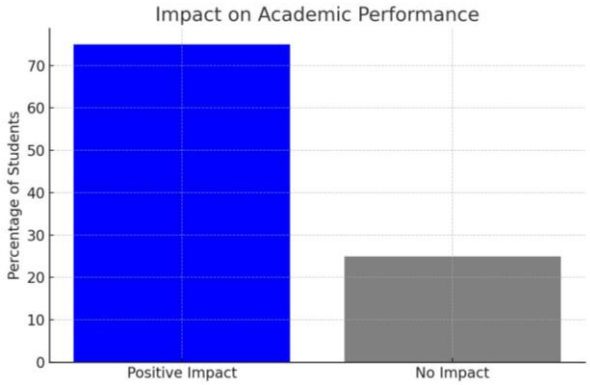
Inference: The survey of 120 student beneficiaries revealed that PFMS has largely streamlined the scholarship disbursement process. However, there is room for improvement in certain areas:

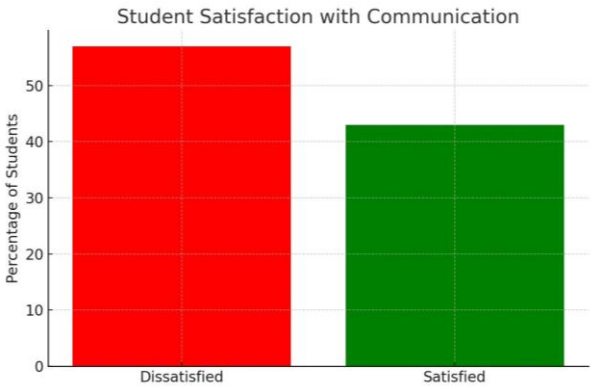
- **Timeliness:** 92% of students reported receiving their scholarships on time post-PFMS implementation, compared to only 65% prior to its implementation.
- **Awareness and Communication:** 57% of students indicated that they did not receive adequate information regarding disbursement timelines or the process itself, highlighting the need for better communication strategies.
- **Impact on academic progress:** 75% of students affirmed that receiving scholarships on time positively affected their academic performance, as it alleviated financial stress.

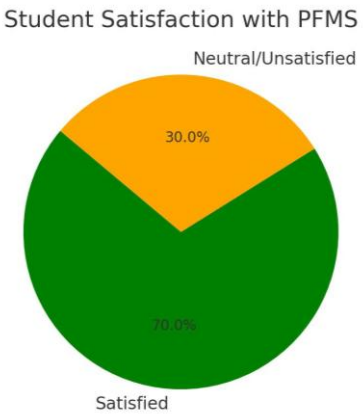
Data: A survey conducted among 120 student beneficiaries resulted in the following:

- **92**% (110 students) confirmed receiving their scholarships on time.
- **57**% (68 students) expressed dissatisfaction with communication about the disbursement process.
- **75**% (90 students) agreed that timely scholarship disbursements had a positive impact on their academic focus and progress.









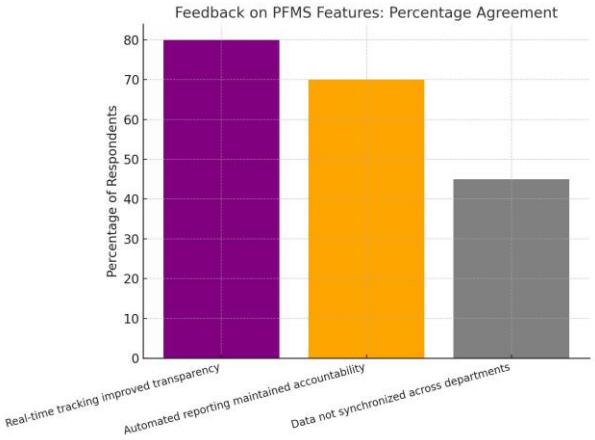
Objective 3: To evaluate the extent to which PFMS has enhanced transparency and accountability in fund utilization

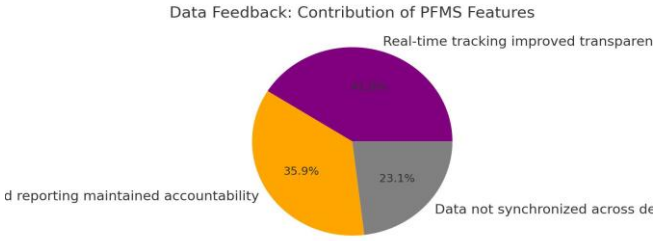
Inference: The implementation of PFMS has contributed to enhanced transparency and accountability, as demonstrated by both qualitative and quantitative data:

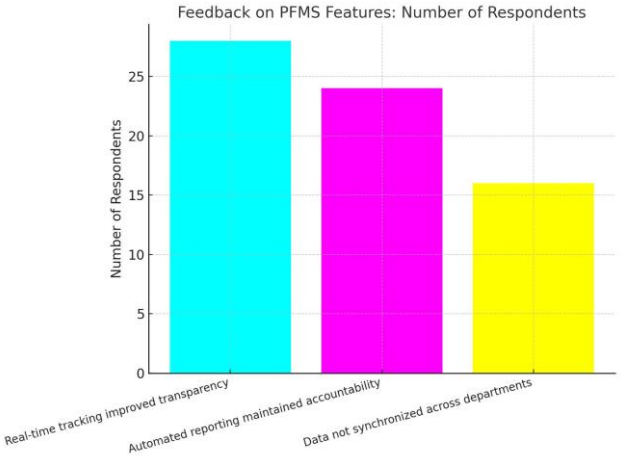
- **Real-time tracking:** 80% of stakeholders reported that the real-time tracking feature of PFMS enabled better monitoring of fund utilization and facilitated early identification of discrepancies.
- **Automated reporting:** 70% of administrative users indicated that automated financial reports have improved accountability by minimizing human errors in report preparation.
- **Challenges in integration:** Despite these advancements, 45% of respondents noted that data integration across different government departments remains inadequate, which limits full transparency in fund allocation.

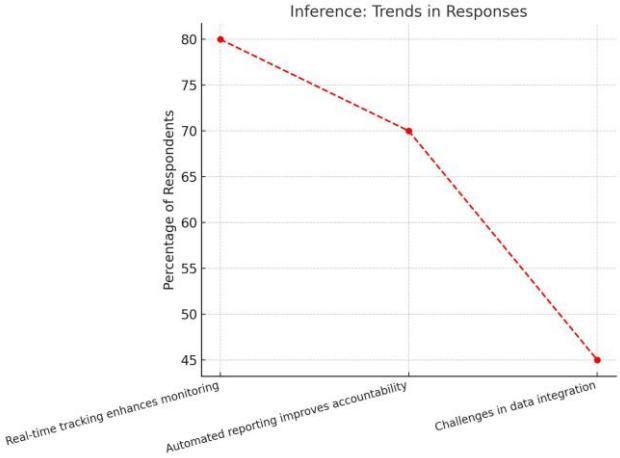
Data: Feedback from 35 administrative staff members provided the following insights:

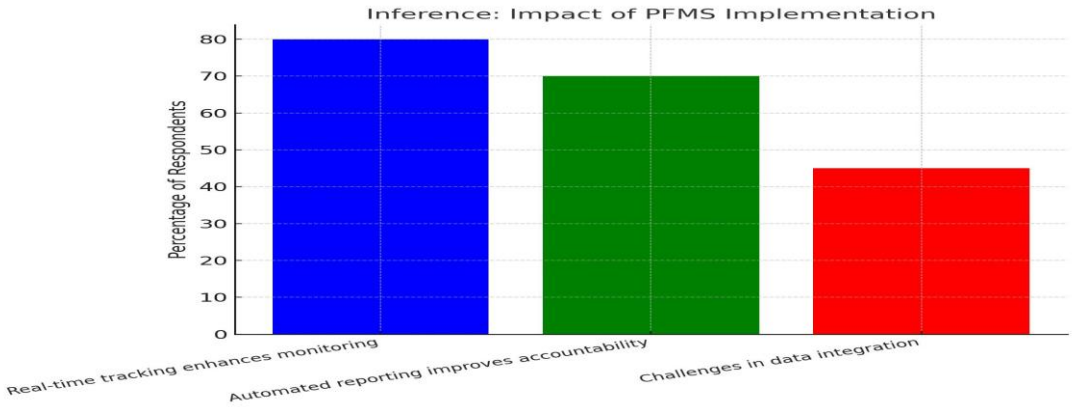
- **80**% (28 respondents) agreed that real-time tracking significantly improved transparency.
- **70**% (24 respondents) found the automated reporting feature helpful in maintaining accountability.
- **45**% (16 respondents) noted that data from various departments were not always synchronized, impeding overall transparency.


Feedback on PFMS Features: Percentage Agreement
Percentage of Respondents
0
10
20
30
40
50
60
70
80
Real-time tracking improved transparency
Automated reporting maintained accountability
Data not synchronized across departments


Data Feedback: Contribution of PFMS Features
Real-time tracking improved transparen
35.9%
23.1%
d reporting maintained accountability
Data not synchronized across de


Feedback on PFMS Features: Number of Respondents
Number of Respondents
0
5
10
15
20
25
Real-time tracking improved transparency
Automated reporting maintained accountability
Data not synchronized across departments


Inference: Trends in Responses
Percentage of Respondents
45
50
55
60
65
70
75
80
Real-time tracking enhances monitoring
Automated reporting improves accountability
Challenges in data integration


Inference: Impact of PFMS Implementation
Percentage of Respondents
0
10
20
30
40
50
60
70
80
Real-time tracking enhances monitoring
Automated reporting improves accountability
Challenges in data integration

Synopsis of Key Findings

Objective	Key Findings	Data Analysis
Objective 1: Impact of PFMS on financial management	Improved fund tracking, reduced errors, limited proficiency in using advanced features	65% improved fund tracking, 22% underutilization due to lack of training
Objective 2: Effectiveness of PFMS in scholarship disbursement	Timely disbursements, communication gaps, positive impact on academic performance	92% received scholarships on time, 57% lacked information, 75% noted positive academic impact
Objective 3: Enhancement of transparency and accountability	Real-time tracking, automated reporting, integration issues	80% improved transparency with real-time tracking, 70% appreciated automated reports, 45% integration issues

FINDINGS

- Pre-PFMS Challenges: The Department of Education faced challenges with manual financial processes, delayed scholarship disbursements, lack of real-time financial data, and accountability concerns before the adoption of PFMS.
- PFMS Implementation Process: The implementation of PFMS in Kerala's education sector involved stakeholder collaboration, customized system development, pilot testing, and sustained support from top-level management.
- Impact on Financial Management: PFMS streamlined financial processes, reduced manual tasks, and provided real-time data visibility. It enhanced transparency, accountability, and efficient resource allocation.
- Timely Scholarship Disbursements: Student beneficiaries reported receiving scholarships promptly through PFMS, alleviating financial burdens and ensuring uninterrupted academic pursuits.
- Equitable Access to Education: PFMS facilitated equal access to educational opportunities, benefiting students from diverse socio-economic backgrounds.
- Administrative Efficiency: PFMS reduced the administrative burden on finance personnel, freeing up time for strategic financial planning and analysis.

SUGGESTIONS

1. **Continuous Capacity Building:** The effectiveness of the Public Financial Management System (PFMS) is highly reliant on the proficiency of its users. Interviews conducted with key stakeholders

revealed a significant gap in training, particularly with regard to newly introduced features and system updates. Several stakeholders indicated that their limited knowledge of advanced system functionalities hampered their ability to fully utilize PFMS. Regular training programs are crucial to address these gaps, ensuring all users—from administrators to beneficiaries—are proficient in using the system. Moreover, training in data analysis will empower stakeholders to make evidence-based decisions, thereby improving the overall efficiency of financial management.

2. **Stakeholder Engagement:** Survey responses from student beneficiaries highlighted a lack of awareness about PFMS and its features, leading to missed scholarship disbursements and delays in financial support. This lack of engagement points to the need for enhanced awareness programs targeting students and educational institutions. A more informed user base would increase participation in the scholarship disbursement process and ensure that more students benefit from timely financial assistance. Furthermore, establishing a feedback mechanism will allow beneficiaries to report challenges and issues in real-time, which can be addressed promptly. This suggestion stems from feedback gathered during the interviews, where stakeholders emphasized the need for such a mechanism to improve service delivery.

3. **Scaling PFMS to Other Departments:** The positive outcomes of PFMS implementation in the education sector have demonstrated its potential to enhance efficiency, transparency, and accountability. Data collected during the study revealed significant improvements in fund tracking and disbursement, making a compelling case for expanding the system to other government sectors. Scaling PFMS to additional departments will standardize financial management practices across the government, reduce inefficiencies, and promote transparency in public fund allocation. The success in the education sector can serve as a model, showing that the system's benefits can be replicated in other areas of governance.

4. **Impact Assessments:** Regular impact assessments are essential to ensure that PFMS remains effective and adaptable to the evolving needs of the education sector. The study found that while the system had a positive impact in the short term, stakeholders expressed a need for ongoing evaluations to assess the system's long-term performance and identify areas for improvement. Periodic impact assessments will help the Department of Education measure the continued effectiveness of

PFMS, make data-driven adjustments, and ensure that the system is meeting its objectives. Regular evaluations will also assist in aligning the system with future challenges in financial governance and public fund management.

5. **Emphasize Data-Driven Decision Making:** PFMS provides access to real-time data and interactive dashboards, yet some officials were found to be underutilizing these features. Interviews revealed that some decision-makers still relied on traditional methods of financial management, which lacked the precision and speed that PFMS's data-driven tools offer. By encouraging the use of PFMS's interactive dashboards and real-time data, decision-makers can make informed and timely financial decisions, enhancing overall financial governance. Additionally, these data-driven insights will support more effective resource allocation and performance evaluation, further optimizing financial management practices.

The suggestions provided above are rooted in the findings of this study, which identified areas where the PFMS can be further optimized to maximize its positive impact. By implementing these recommendations, the Department of Education in Kerala can build upon the existing strengths of PFMS, improving financial management, enhancing transparency, and ensuring equitable access to educational opportunities for all students in the state.

CONCLUSION

The implementation of the Public Financial Management System (PFMS) in Kerala's Department of Education represents a transformative step toward improving financial governance in the public sector. By automating previously manual processes, providing real-time financial tracking, and ensuring greater transparency, PFMS has effectively addressed many of the challenges associated with the older system. Notable outcomes include more efficient scholarship disbursements, improved accountability in fund allocation, and better resource utilization, which have contributed to enhanced educational opportunities for students.

While the implementation of PFMS has been largely successful, there are areas that still require improvement. Initial challenges, such as resistance to change and technological adaptation, highlighted the need for ongoing capacity building and user training. Additionally, ensuring consistent participation from all stakeholders, including educational institutions and students, remains a key focus for the future.

In conclusion, PFMS has achieved its primary objectives and delivered

significant benefits. Its continued success will depend on addressing existing challenges and optimizing its use. With sustained efforts to overcome these hurdles, PFMS can further strengthen its role in enhancing financial management, transparency, and accountability in the public services sector.

Appendix A: In-Depth Interview Guide

This guide presents the questions asked during interviews with key stakeholders in the Department of Education to assess the impact of PFMS.

1. **Introduction:** "Thank you for participating in this interview. We are conducting research on the impact of the Public Financial Management System (PFMS) in Kerala's education sector. Your responses will be kept confidential and used solely for academic purposes. Do you have any questions before we begin?"

2. **Background Information:**

- "Could you describe your role and primary responsibilities within the Department of Education?"
- "How long have you been working in this position, and how has your experience been with financial management practices?"

3. **Pre-PFMS Financial Practices:**

- "What were some of the financial challenges you encountered before the implementation of PFMS?"
- "How did manual processes impact the efficiency and accuracy of fund disbursement and tracking?"

4. **PFMS Implementation:**

- "How would you describe the transition to PFMS in your department? Were there initial challenges?"
- "What training or resources were provided to facilitate the adoption of PFMS?"

5. **Impact of PFMS:**

- "Since the PFMS implementation, what changes have you observed in terms of financial management efficiency?"
- "In your experience, has PFMS improved real-time tracking and transparency in fund management? Could you provide specific examples?"

6. **Stakeholder Impact:**

- "Has the implementation of PFMS affected how funds are allocated and tracked? If so, in what ways?"
- "What feedback have you received from other staff or stakeholders about PFMS's effectiveness?"

7. **Recommendations for Improvement:**

- "Based on your experience, do you have any suggestions to enhance the PFMS processes further?"
- "Are there additional features or improvements you think would benefit the system and its users?"

Appendix B: Student Beneficiary Survey Questionnaire

The following questions were included in the survey administered to student beneficiaries who receive financial aid through PFMS.

1. **Demographic Information:**

- "Please indicate your age."
- "What is your educational level? (High School/Undergraduate)"

2. **Access to Scholarships:**

- "How easy was it to apply for and receive your scholarship or financial support through PFMS?"
- "Did you encounter any challenges with the application or disbursement process?"

3. **Payment Timeliness:**

- "On a scale of 1 to 5, how timely was the disbursement of funds through PFMS?"
- "Have there been delays in receiving your scholarship? If yes, please specify the average delay period."

4. **Impact on Academics:**

- "Has receiving timely financial support via PFMS helped you in your academic pursuits? Please elaborate."
- "Did the availability of these funds have any impact on your academic performance or attendance?"

5. **Satisfaction and Feedback:**

- "Overall, how satisfied are you with the PFMS process for disbursing scholarships? (Rate from 1 to 5)"
- "Do you have any suggestions for improving the PFMS scholarship disbursement process?"

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Accepted: 16, February, 2025

ECONOMIC DISPARITY: A BIBLIOMETRIC ANALYSIS

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Abstract: *The rise of inequality has emerged as a significant global issue, sparking an upsurge in research dedicated to understanding Economic disparity. The study conducted a bibliometric analysis of prior literature to identify key trends in research focused on economic and corporate disparities. The research aimed to highlight leading contributors, including prominent authors, publications, countries, and organizations actively involved in this field. Using VOSviewer for bibliometric analysis and the Dimensions database as the primary research source, the study examined research papers retrieved through targeted keywords "Top income," "Inequality," "Income and Wealth Disparity," and "Disparity in the Corporate Sector." The search yielded 2717 publications, which were refined to 2500 after filtering out duplicates and irrelevant articles.*

The analysis included publication trends by year, co-authorship patterns, co-citation networks, and content themes within the literature. Findings indicated 2023 as the most productive year in terms of publication count, reflecting a growing scholarly interest in this area. The United States leads globally in both the number of publications and citations, while Harvard University ranks as the top organization based on these metrics. Among individual researchers, Edward Nathan Wolff is the most prolific author in terms of publications, while James Joseph Heckman has the highest citation impact. The SSRN Electronic Journal identified as the leading journal by publication volume, while The Quarterly Journal of Economics ranked highest by citations. Finally, the term "Inequality" appeared as the most frequently discussed and relevant topic within the corpus of literature, underscoring its central role in this research field. This bibliometric study provided a comprehensive overview of recent developments and key contributors in the study of Economic Disparity.

Keywords: *Inequality, Disparity, Income and Wealth Disparity, Corporate Sector Disparity, Bibliometric Analysis*

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Introduction

Disparity refers to a pronounced inequality in access, distribution, or outcomes across various dimensions, including income, wealth, education, healthcare, and opportunities. This concept is often explored in social and economic contexts, highlighting the uneven allocation of resources and opportunities among different societal groups. Disparities emerge from a mix of structural, historical, and policy-driven factors that perpetuate inequalities over time (Milanovic, 2016; Piketty, 2014). In economics, the term frequently pertains to income and wealth inequality, where certain groups accumulate resources at significantly higher rates than others, resulting in unequal economic outcomes (Stiglitz, 2012). Geographic and regional disparities are also common, with urban areas typically enjoying better access to services and economic opportunities compared to rural regions (International Labour Organization, 2019). Further, social disparities such as those based on gender, race, or age are also reflected in unequal access to education, healthcare, and employment opportunities. These inequities often stem from entrenched social structures and policies that hinder equality for specific groups (Wilkinson & Pickett, 2009). Major forms of economic disparity include income inequality, wealth inequality, regional disparity, gender inequality, racial or ethnic inequality, and generational inequality. Among these our focus is to explore income and wealth Inequality existing in different areas of the economy. Income inequality arises from disparities in earnings among different segments of the population, driven by factors such as skill levels, education, access to high-paying jobs, and tax policies that may favour certain income groups (Atkinson, 2015). Wealth inequality, on the other hand, reflects the unequal distribution of assets like real estate and investments, which can compound over time, allowing wealthier individuals to accumulate even more resources across generations (Piketty, 2014; Milanovic, 2016).

This disparity is also visible in the corporate sector. The sharply increasing billionaire wealth and rising corporate and monopoly power has boosted inequality to another level. The profits of mega-corporations are used to benefit shareholders, at the expense of workers and ordinary people (Riddell et al., 2024). The impact of income inequality on large and small firms are substantially different. As high-income households save relatively more in stocks and bonds and less in bank deposits. A higher income share of top earners channels funds to large firms, but tightens financing conditions for smaller firms that are mostly bank-dependent. Consequently, large firms expand while small firms create relatively fewer jobs (Drechsel et al., 2022). Hence to understand the level of disparity it was important to do extensive literature review. For doing that it was essential to know which

nation, organisation, researchers are doing prominent work in this area. So, we adopted Bibliometric Analysis.

Bibliometric Analysis

Bibliometric analysis is a statistical method that quantitatively analysis written publications, such as books and articles, to understand how research is produced, organized, and interrelated.

Bibliometric analysis has gained immense popularity in business research in recent years and its popularity can be attributed to the fact that it can handle large volumes of scientific data, and produce high research impact. The data that takes center stage in bibliometric analysis tends to be massive (e.g., hundreds, if not thousands) and objective in nature (e.g., number of citations and publications, occurrences of keywords and topics), though its interpretations often rely on both objective (e.g., performance analysis) and subjective (e.g., thematic analysis) evaluations established through informed techniques and procedures (Donthu et al., 2021).

Bibliometric analysis can help assess how studies on economic disparity and subsequent policy interventions have been received and applied in real-world settings. By examining trends, researchers can forecast future directions in economic disparity research, such as the impact of technology (e.g., fintech) on reducing or exacerbating financial inequality.

In summary, this analysis can help scholars and policymakers understand the landscape of research, assess the impact of existing studies, identify leading contributors, and guide future research and interventions.

Objectives of the Study

1. To identify the most productive year based on publications.
2. To identify the most productive country based on publications and citations.
3. To identify the most productive organisation based on publications and citations.
4. To identify the most significant author based on publications and citations.
5. To identify the most productive journal based on publications and citations.
6. To identify the most relevant term based on publications.

Research Methodology

The study performed bibliometric analysis using VOSviewer. VOSviewer is used to construct networks of scientific publications, scientific journals, researchers, research organizations, countries, keywords, or terms. To construct a network, bibliographic database files and reference manager files can be provided as input to VOSviewer.

In this study, Dimension database was used for research papers. Information was searched using the keywords “Top income, Inequality, Income and Wealth Disparity, Disparity in the corporate sector”. The result showed 2717

publications which were further reduced to 2500 after removing duplicates and irrelevant articles.

The analysis include:

1. Trend Analysis
2. Co-Authorship Analysis
3. Co-citation Analysis
4. Content Analysis

Data Analysis

1. Trend Analysis

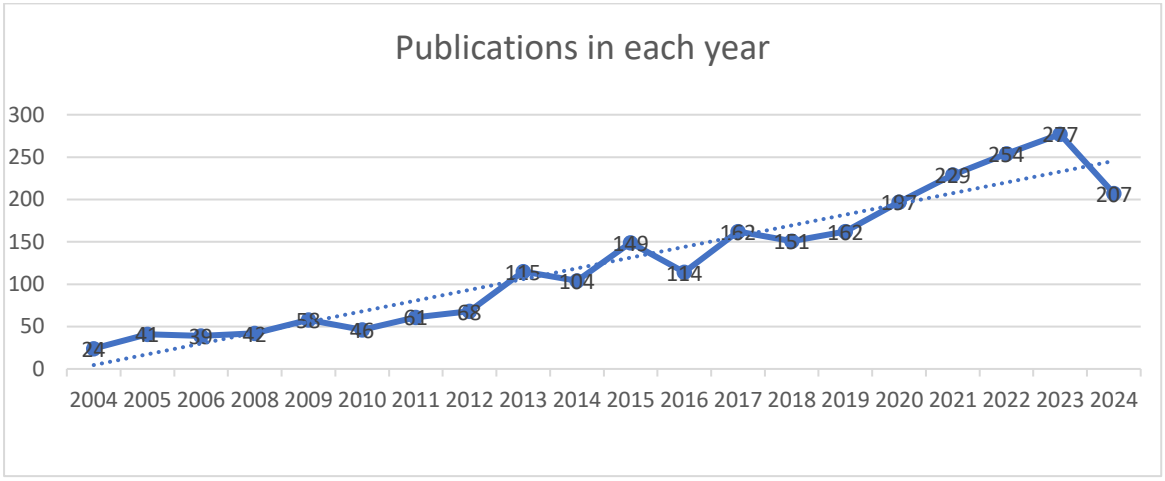

Figure 1 Number of publications from year 2004 to 2024

The visualization showed the number of papers published in each year from 2004 to 2024. A 20-year span was analysed to observe publication trends, revealing a steady rise, with 2023 emerging as the peak year for publication volume.

2. Co-authorship Analysis

2.1 Based on countries

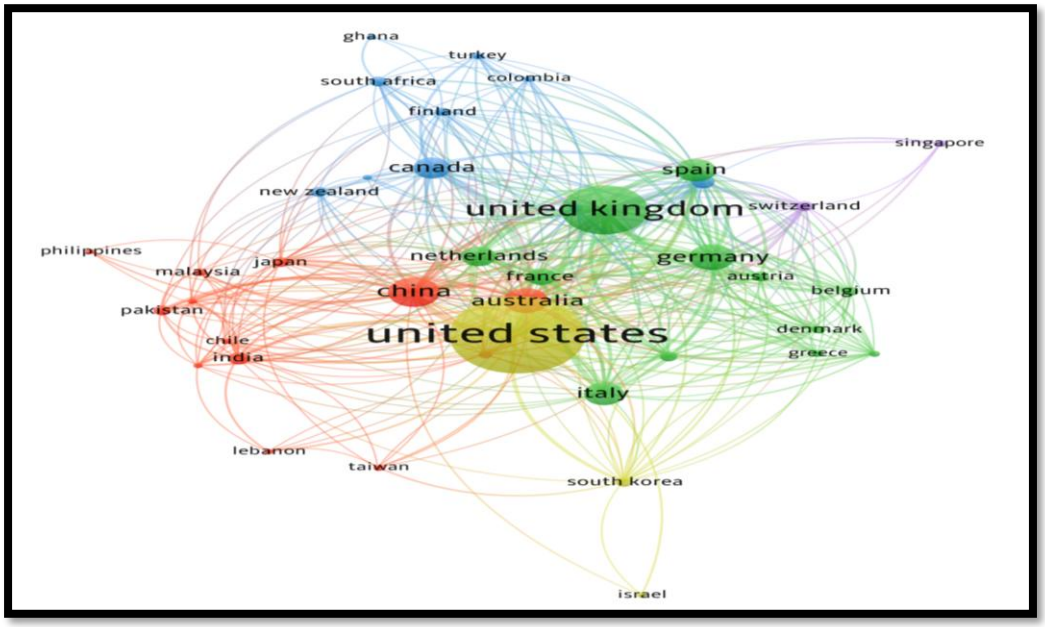

Figure 2 Co-authorship Network visualization based on Countries, Source: VOSviewer

The network visualization represented the Co-authorship analysis based on countries that were most prominent in the publications. Out of the 84 countries, 40 met the threshold. The United States leads in both publication count (666) and citations (111,919). Notably, the top 10 contributing countries are all developed economies, suggesting that research on economic disparity and inequality has garnered considerable interest within these nations.

Table 1 Top 10 Countries based on publications

S. No.	Countries	Documents	Citations
1	United States	666	111919
2	United Kingdom	302	41599
3	China	125	13213
4	Germany	97	13800
5	Australia	92	9977
6	Italy	80	9834
7	Spain	77	7984
8	Canada	70	9427
9	Netherlands	62	9412
10	France	47	4908

2.2 Based on organizations

Out of the 1537 organisations, 133 met the threshold. For each 133 organisations, the total strength of the co-authorship links with other organisations was calculated. The organisations with the greatest total link strength were selected. The visualization

represented the network link and the size of the label represented the number of publications. Harvard University and the World Bank stood out with the highest publications, with Harvard University also leading in citations received. All top 10 organizations were based in developed economies.

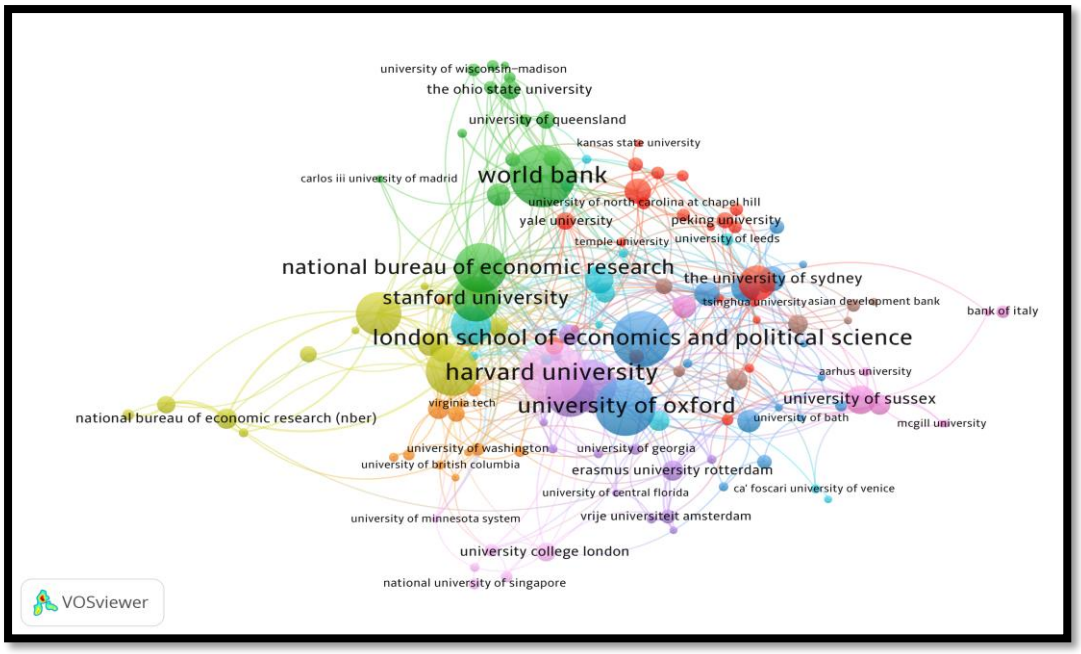

Figure 3 Co-authorship Network visualization based on Organizations

Table 2 Top 10 Organizations based on publications

S. No.	Organizations	Documents	Citations
1	Harvard University	39	11773
2	World Bank	39	6931
3	University of Oxford	36	4372
4	London School of Economics and Political Science	35	6541
5	University of California	33	7071
6	University of Chicago	31	7723
7	National Bureau of Economic Research	31	4506
8	University of Michigan	29	5285
9	Stanford University	28	3983
10	University of Pennsylvania	27	7491

3. Co citation Analysis

The relatedness of researchers is determined based on the number of times they cite each other. In the visualization, the size of the name suggested the number of publications of that researcher. The colours showed the clusters. Highest publication in the area is of Edward Nathan Wolff while most cited work is of James Joseph Heckman

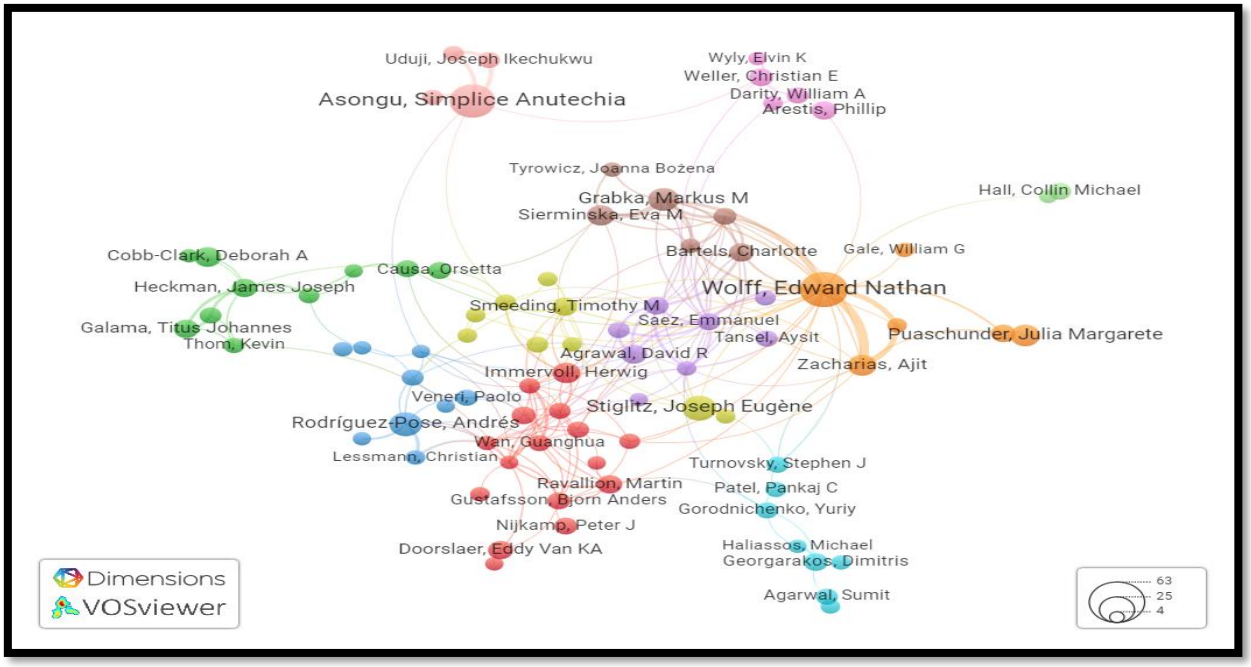

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Figure 4 Co citation Network Visualization

Researchers	Citation links	Total citations	Clusters
83	207	695	11

Table 3 Top Researchers on the basis of publications

S.No.	Author/Researcher	Organisation and Country	Publication
1	Edward Nathan Wolff	New York University, United States	48
2	Simplice Anutechia Asongu	University of Johannesburg, South Africa	43
3	Joseph Eugène Stiglitz	Columbia University, United States	23
4	Andrés Rodríguez-Pose	London School of Economics and Political Science, United Kingdom	21
5	Julia Margarete Puaschunder	Columbia University, United States	18
6	Markus M Grabka	German Institute for Economic Research, Germany	18

7	Ajit Zacharias	Levy Economics Institute of Bard College, United States	17
8	Herwig Immervoll	NA	14
9	Eva M Sierminska	Luxembourg Institute of Socio-Economic Research, Luxembourg	14
10	Eddy Van KA Doorslaer	Erasmus University Rotterdam, Netherlands	13
11	James Joseph Heckman	University of Chicago, United States	13
12	Robert W Fairlie	University of California, Santa Cruz, United States	13
13	Thomas Piketty	Paris School of Economics, France	12

Table 4 Top authors on the basis of Citations

S.No.	Author/Researcher	Organisation and Country	Citations
1.	James Joseph Heckman	University of Chicago, United States	4943
2.	Andrés Rodríguez-Pose	London School of Economics and Political Science, United Kingdom	2816
3.	Emmanuel Saez	University of California, Berkeley, United States	1994
4.	Edward L Glaeser	Harvard University, United States	1750
5.	Annamaria Lusardi	Stanford University, United States	1130
6.	Collin Michael Hall	University of Canterbury, New Zealand	1105
7.	Manfred Lenzen	The University of Sydney, Australia	1030
8.	Joseph Eugène Stiglitz	Columbia University, United States	998
9.	Edward Nathan Wolff	New York University, United States	992
10.	Martin Ravallion	Georgetown University, United States	699
11.	Simplice Anutechia Asongu	University of Johannesburg, South Africa	664
12.	Eddy Van KA Doorslaer	Erasmus University Rotterdam, Netherlands	639
13.	Thomas Piketty	Paris School of Economics, France	625

Prominent Journals in the area of Study

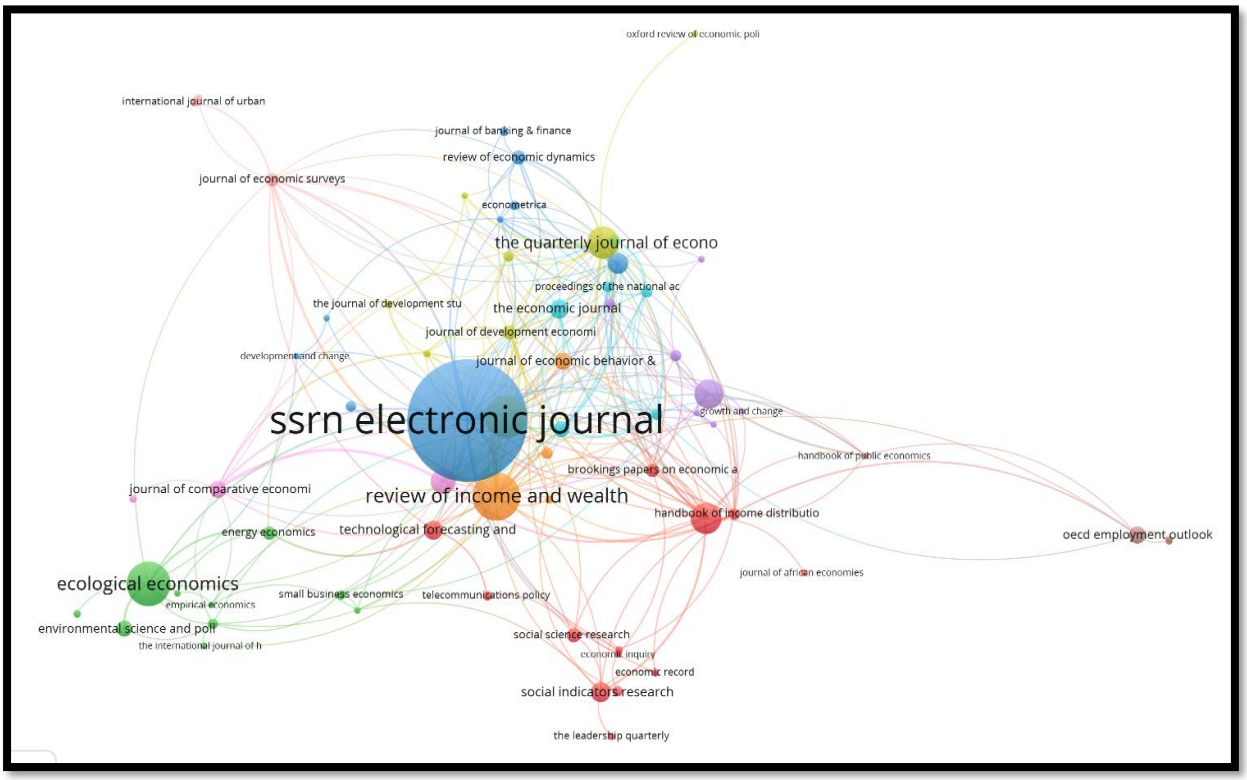

Figure 5 Network Visualization of Sources of Publications, Source: VOS Viewer

The network visualization showed the journals based on publication. SSRN Electronic Journal was found to be most productive journal based on publications. While, The Quarterly Journal of Economics was found to be most productive journal based on citations

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Table 5 Top Journals

S. No.	Source/ Journals	Documents	Citations
1.	SSRN Electronic Journal	90	8181
2.	Review of Income and Wealth	36	3565
3.	World Development	32	4482
4.	The Quarterly Journal of Economics	24	10562
5.	Journal of Public Economics	23	5033

4. Content Analysis

The analysis selected the most relevant terms from the Title and Abstract. Out of the 41914 items, 1436 met the threshold score. For each 1436 items, relevance score was calculated. Based on this, the most relevant items were selected. The network visualization represented the most relevant terms. The term "Inequality" appeared most frequently in the publications, with other significant terms including income inequality, income distribution, disparity, wealth inequality, wealth gap, economic growth, wage inequality, global inequality, and Gini coefficient.

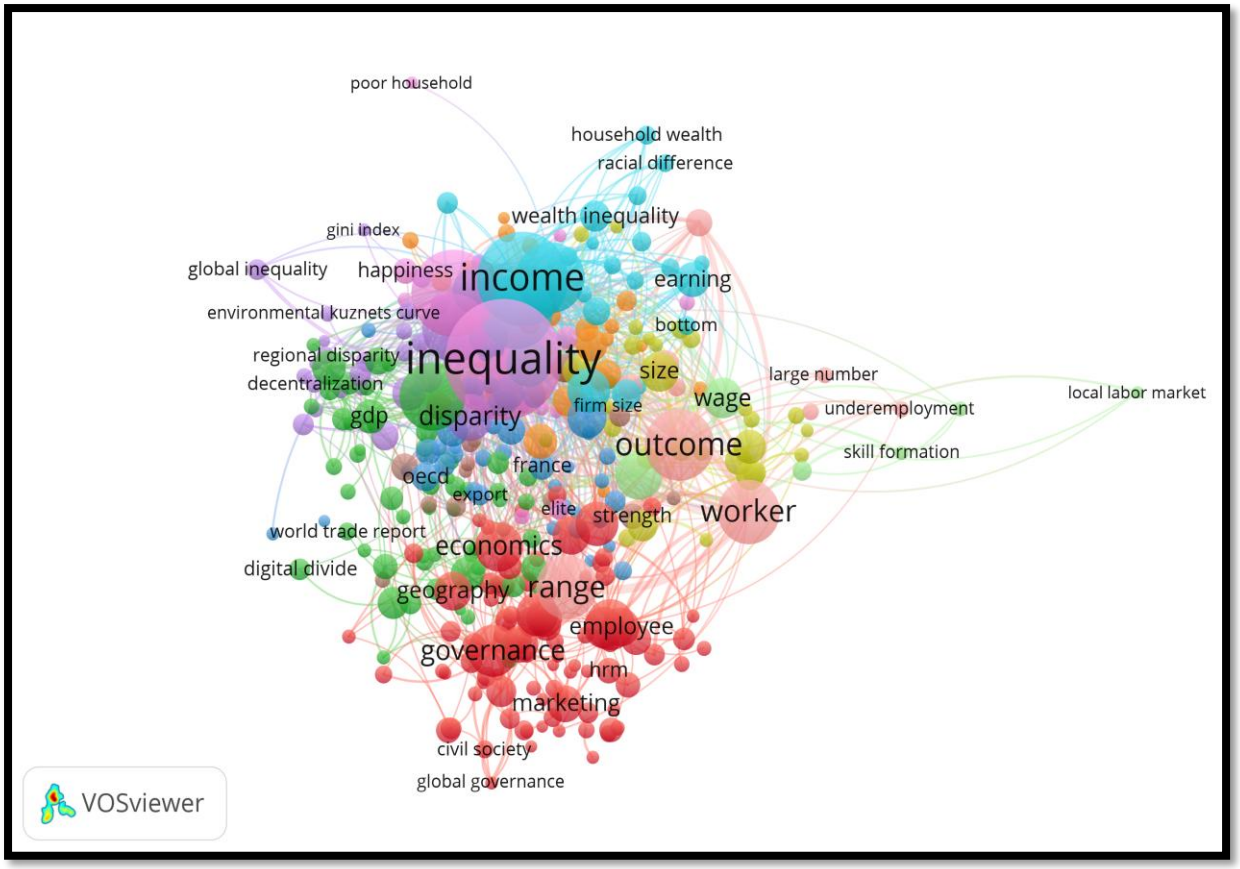

Figure 6 Network Visualization of most relevant terms

Findings of the Study

The bibliometric analysis performed in the study concluded that the researchers are showing rising interest to address the problem of disparity or inequality at global level. The findings have been summarised as follows.

The most productive year on the basis of publications.	2023
The most productive nation on the basis of publications	United States
The most productive nation on the basis of citations	United States

The most productive organisation on the basis of publications	Harvard University and World Bank
The most productive organisation on the basis of citations	Harvard University
The most significant author on the basis of publications	Edward Nathan Wolff
The most significant author on the basis of citations	James Joseph Heckman
The most productive journal on the basis of number of publications	SSRN Electronic Journal
The most productive journal on the basis of number of citations	The Quarterly Journal of Economics
The most relevant term on the basis of publications	Inequality

Conclusions

This bibliometric analysis offered valuable insights for scholars and policymakers into the research landscape on economic disparity, helping to assess the impact of existing studies, recognize key contributors, and strategically inform future research and policy interventions. Over the past 20 years, interest in addressing global disparities have grown, as seen in the increasing volume of publications. However, the bulk of research originates from developed countries, particularly the United States and the United Kingdom. This trend highlighted a gap in studies from developing nations, such as India, suggesting an opportunity for Indian researchers to expand this field within their own context. Such contributions could significantly benefit India's economy and society by addressing region-specific challenges and contributing to a broader understanding of economic inequality. Additionally, this analysis has identified key reference works and leading journals in the field, providing a solid foundation for Indian researchers looking to engage deeply with the subject.

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GST BUOYANCY AND ECONOMIC GROWTH: A COMPARATIVE ANALYSIS OF SELECT INDIAN STATES

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Abstract:*The Goods and Services Tax (GST), introduced in India in 2017, replaced multiple indirect taxes with a unified tax system aimed at simplifying tax compliance and boosting economic growth. This study focuses on GST buoyancy, which measures the responsiveness of tax revenues to changes in economic activity, particularly Gross State Domestic Product (GSDP). Using data from 2017 to 2023, the study examines GST collections in selected Indian states across CGST, SGST, and IGST. The findings reveal that states like Maharashtra, Kerala, and Karnataka demonstrate high tax buoyancy, reflecting efficient revenue growth. However, some states face challenges, with GST revenue growth lagging behind economic expansion. The analysis highlights the role of GST in improving tax compliance and transparency, while also addressing the variations in economic performance and tax revenues across states. Overall, GST has shown potential for long-term economic stability, but regional disparities need further attention.*

Keywords: *GST, Tax Buoyancy, GSDP, CGST, SGST, IGST, Revenue Growth*

Introduction

The Goods and Services Tax (GST) in India, introduced on July 1, 2017, is a comprehensive, multi-stage, destination-based tax that has replaced a number of indirect taxes that were previously levied by the central and state governments. The GST is designed to simplify the tax structure, increase tax compliance, and boost revenue collection by creating a unified market across India. GST has not only streamlined tax administration by replacing numerous indirect taxes but also created a platform for boosting revenue through enhanced compliance and transparency.

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The Goods and Services Tax (GST) is a comprehensive indirect tax reform designed to unify India's taxation system by replacing various indirect taxes with a single tax structure. The theoretical foundation of GST is grounded in the principle of creating a destination-based, value-added tax system where tax is levied at each stage of production and consumption, ultimately borne by the end consumer. GST's impact on Gross Domestic Product (GDP) is multifaceted. By reducing the cascading effect of taxes (tax-on-tax), GST enhances economic efficiency, leading to improved productivity and competitiveness, which positively affects GDP.

Furthermore, GST simplifies compliance, broadens the tax base, and encourages formalization of the economy, all of which contribute to higher revenue collections. These improvements have the potential to stimulate investment and consumption, which are key drivers of GDP growth. By creating a more transparent and uniform tax system, GST can reduce economic distortions and improve the ease of doing business, further boosting GDP. The GST system, when effectively implemented, aims to create a direct link between economic growth and increased tax revenues, improving both short-term fiscal buoyancy and long-term economic sustainability.

GST Buoyancy refers to the responsiveness of tax revenue growth to changes in economic activity, measured through Gross Domestic Product (GDP) or state output. It reflects the efficiency of GST in capturing economic growth and converting it into tax revenue. GST buoyancy, which measures the responsiveness of tax revenue to economic growth, has been a critical area of study. While initial buoyancy was lower than expected, recent data suggests improvements, indicating better alignment with economic activity.

Tax buoyancy is a fundamental concept in fiscal economics, offering a window into how tax revenues react to shifts in economic conditions and deliberate policy interventions (Aashish, 2024)[1]. Different states in India exhibit varying levels of economic development, industrialization, and consumption patterns, all of which directly influence their GST revenue collection.

Review of Literature

Alka (2018) The study analyzed interstate tax buoyancy using the Ordinary Least Squares method for 27 Indian states, focusing on their own tax revenues from 2005 to 2016. The buoyancy coefficients for the States' Own Tax Revenue (SOTR) were found to be statistically significant and notably high, although they varied across states. Tax revenue buoyancy estimates were calculated

in relation to the state's domestic product, known as GSDP.

Udai Lal Paliwal, et.al, (2019) The study finds that following the introduction of GST, India's tax revenue has become less responsive to changes in GDP. This suggests that the tax burden on consumers and corporations has decreased post-GST implementation, aligning with the government's rationale for introducing the tax.

Sanjeev Gupta (2022) the study reveals that, in most Sub-Saharan African (SSA) countries, long-term tax buoyancy tends to remain close to one. However, fragile states experience lower short-term buoyancy, primarily due to institutional weaknesses. Personal income tax shows especially low short-term buoyancy, falling significantly below one. Moreover, tax responsiveness is adversely affected by factors such as central government debt and the shadow economy.

Aruna M & Prof. Padmavathi (2022) The study analyzed both short-term and long-term tax buoyancy using the Nerolvian Partial Adjustment mechanism. The findings show that long-term tax buoyancy is positive and exceeds one, suggesting that the growth rate of tax revenue will surpass the income growth rate during the study period.**S Prasanth & Priyanka Dasgupta (2024)** This study assesses the impact of GST on revenue (GDP) and key fiscal indicators like the fiscal deficit. The findings highlight positive tax responsiveness after GST implementation, with tax revenues increasing in line with GDP growth. Regression analysis reveals that indirect tax collections significantly influence India's fiscal deficit. Despite initial challenges, GST has developed into an effective system, stabilizing revenues and driving long-term economic growth.

Duragesh Pujari, et.al, (2024) The study uses dummy regression models to examine tax revenue buoyancy in India from 1970 to 2022, focusing on the effects of fiscal reforms. The findings show a significant tax revenue buoyancy coefficient for the central government, indicating a strong correlation with GDP. However, dummy variables representing key policy changes and global crises were not statistically significant. State governments demonstrated tax revenue buoyancy, positively affected by the New Economic Policy.

Objectives of the study

- To examine the growth in revenue generation through SGST, CGST, and IGST in selected Indian states.
- To analyse and compare the GST buoyancy trends among selected Indian states.

Scope and Methodology of the Study

This study employs an analytical approach to examine the impact of GST on the economy, with a focus on the growth of SGST, CGST, and IGST across selected Indian states from 2017 to 2023. The analysis based on the secondary data sources such as articles, journals, periodicals, reports from the Reserve Bank of India (RBI) and GST statistics. To evaluate the trends in GST revenue and its relationship with GDP, percentage growth rates are computed annually. The states were selected based on stratified sampling method based the revenue generated by the states in zonal wise, such as the southern and central regions.

The data analysed with the help of CAGR, Coefficient of Correlation, R-Squared and Linear Regression Analysis. Additionally, time series analysis and buoyancy ratio are used to study the growth of SGDP on GST revenues and its implications on economic growth.

Limitation of the study

This study covers only a few selected states in India, focusing on the time period from 2017 to 2022, i.e., 5 years. It does not include the analysis of tax revenues and GSDP prior to the implementation of GST.

Data Analysis

Compound Annual Growth Rate (CAGR): It provides a smooth annualized rate of growth over a time frame, removing the volatility of year-to-year fluctuations. In this it's Calculated the Compound Annual Growth Rate (CAGR) for CGST, SGST and SGST from 2017-18 to 2022-23 for each state. The results show the annual growth rate percentage over the 6-year period.

Table-1: CGST Revenue of Selected States – CAGR

(Rs. in Crores)

States	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	CAGR (%)
Haryana	5,372	8,520	9,560	8,795	11,269	13,730	**20.644**
Uttar Pradesh	7,240	12,846	14,258	13,506	16,876	19,809	**22.300**
West Bengal	6,296	11,270	12,613	11,784	14,501	17,655	**22.902**
Karnataka	10,226	17,316	19,824	18,187	22,697	28,448	**22.707**
Maharashtra	27,204	45,351	50,683	44,847	59,243	72,880	**21.785**
Chandigarh	239	348	387	302	366	461	**14.041**
Madhya Pradesh	3,222	5,719	6,413	6,309	7,280	8,428	**21.205**
Goa	646	1,008	1,051	782	1031	1,509	**18.493**
Bihar	1,184	2,596	3,255	3,208	3793	4,553	**30.915**
Kerala	3,428	5,208	6,081	5,728	7100	9,279	**22.037**

Source: Compiled from GST Statistics

The CAGR results from 2017-18 to 2022-23 indicate strong growth in CGST collections across the selected states, with all states showing annual growth rates above 20%. West Bengal (22.9%) and Uttar Pradesh (22.3%) led the growth, while Bihar, with a CAGR of 30.9%, showed exceptional performance. Maharashtra maintained a solid 21.8% growth despite its large base, reflecting economic resilience and improved tax compliance across the board.

Table-2: SGST Revenue of Selected States – CAGR

(Rs. in Crores)

States	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	CAGR (%)
Haryana	8,536	12,690	13,922	11,960	15,116	18,143	**16.276**
Uttar Pradesh	11,481	19,970	22,043	19,725	23,766	27,366	**18.972**
West Bengal	8,971	14,888	16,815	14,937	18,164	21,514	**19.118**
Karnataka	14,696	23,416	26,472	23,237	28,660	35,429	**19.243**
Maharashtra	36,396	56,939	62,275	53,344	70,516	85,532	**18.636**
Chandigarh	346	497	556	410	507	629	**12.698**
Madhya Pradesh	4,764	8,033	8,841	8,225	9,433	10,937	**18.082**
Goa	918	1,449	1,529	1,080	1418	2,018	**17.062**
Bihar	2,362	4,872	5,842	5,370	6083	7,543	**26.140**
Kerala	5,491	8,270	9,457	8,338	9887	12,311	**17.524**

Source: Compiled from GST statistics

The CAGR results from 2017-18 to 2022-23 show steady growth in SGST collections across the selected states, with all states experiencing annual growth rates around 16-19%. West Bengal (19.1%) and Karnataka (19.2%) demonstrated the highest growth, while Maharashtra maintained a strong growth rate of 18.6%. This reflects positive economic activity and consistent tax collection efforts in these regions.

Table-3: IGST Revenue of Selected States – CAGR

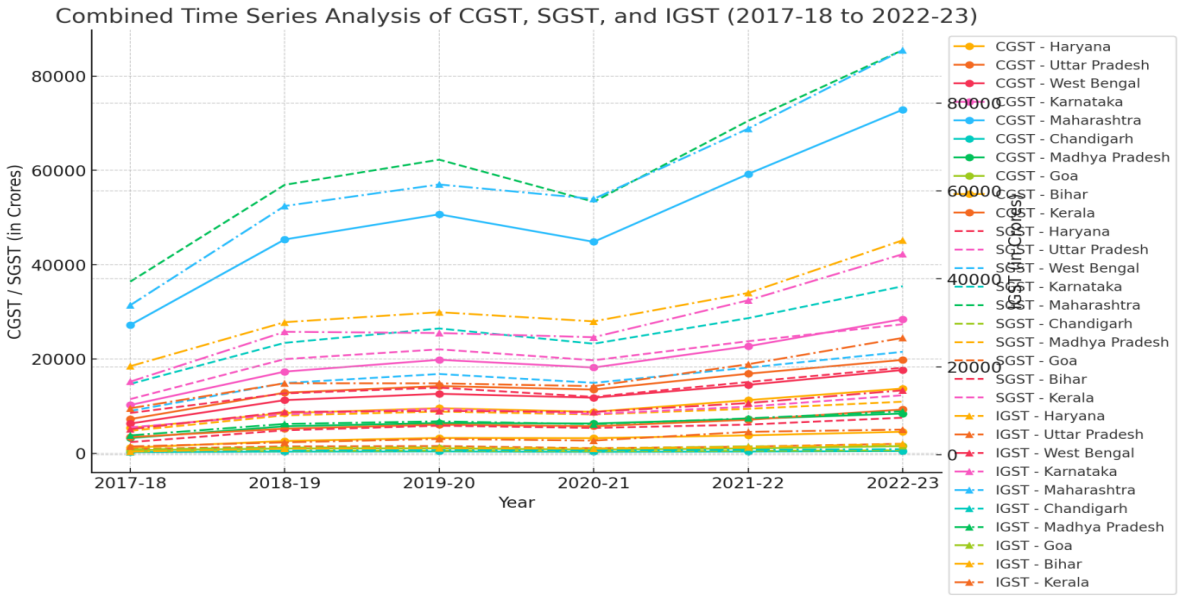
(Rs. in Crores)

States	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	CAGR (%)
Haryana	20,113	30,133	32,407	30,319	36,780	48,765	**19.379**
Uttar Pradesh	10,556	16,243	16,218	15,580	20,574	26,559	**20.266**
West Bengal	5,789	9,724	9,964	9,718	11,740	14,639	**20.388**
Karnataka	16,597	27,950	27,667	26,714	35,101	45,602	**22.403**
Maharashtra	33,980	56,557	61,447	58,164	74,141	92,027	**22.050**
Chandigarh	580	929	1,032	927	1091	1,253	**16.655**
Madhya Pradesh	4,375	6,992	7,575	6,942	8,261	9,862	**17.651**
Goa	1,189	1,617	1,667	1,389	1894	1,955	**10.457**
Bihar	691	1,365	1,480	1,382	1718	2,446	**28.764**
Kerala	1,866	2,800	3,576	3,204	5195	5,707	**25.054**

Source: Compiled from GST statistics

The CAGR results from 2017-18 to 2022-23 for IGST show steady growth across the selected states, with Karnataka (22.4%) and Maharashtra (22.1%) leading the growth. Uttar Pradesh and West Bengal also demonstrated strong growth rates, around 20.3%. Overall, this reflects an increasing trend in IGST collections, indicating healthy interstate trade and tax collection practices.

Figure-1: Combined time series of CGST, SGST and IGST



The combined dual-axis time series plot for CGST, SGST, and IGST from 2017-18 to 2022-23 shows consistent upward trends across all three types of GST for most states.

Buoyancy Ratio: This test measures how responsive GST revenue is to changes in GSDP. It shows if GST collection grows at the same rate as the economy or faster/slower. Provides a clear measure of how well tax revenues scale with economic performance.

$$\textbf{Buoyancy Ratio} = \frac{\%\ \text{Change in GST Revenue}}{\%\ \text{Change in GSDP}}$$

Table-4: 2018-19 to 2019-20 Yearly Assessment of GST Buoyancy

(Rs. in Crores)

State	GST Revenue	GSDP	Tax Buoyancy

	2018-19	2019 -20	2018-19	2019 -20	
Haryana	55233	59560	698939.76	732194.51	**1.6465**
Uttar Pradesh	61323	65281	1582180.05	1700061.8	**0.8663**
West Bengal	39780	43386	1102053.66	1179097.14	**1.2967**
Karnataka	78762	83408	1479391.43	1611133.86	**0.6624**
Maharashtra	170289	185917	2528854.3	2657370.96	**1.8058**
Chandigarh	1778	1988	40138.87	43421.43	**1.4442**
Madhya Pradesh	25683	28354	829804.73	927855	**0.8801**
Goa	4103	4280	71853.34	75032.09	**0.9751**
Bihar	10755	12640	527975.82	581855.48	**1.7175**
Kerala	16343	19234	788285.58	812934.63	**5.6572**

Source: Compiled from GST statistics and RBI Handbook of Statistics

Most states have tax buoyancy above 1, indicating that GST revenues are growing faster than GSDP. Kerala shows the highest buoyancy at 5.66, suggesting a significant increase in GST revenue relative to its economic growth. Maharashtra and Haryana also demonstrate strong tax buoyancy, while Karnataka and Uttar Pradesh show more moderate figures, indicating a slower revenue growth compared to their economic expansion.

Table-5: 2019- 20 to 2020-21 Yearly Assessment of GST Buoyancy

(Rs. in Crores)

State	GST Revenue		GSDP		Tax Buoyancy
	2019 -20	2020 -21	2019 -20	2020 -21	
Haryana	59560	54890	732194.51	741850.07	**-5.946**
Uttar Pradesh	65281	59721	1700061.8	1645316.75	**2.645**
West Bengal	43386	39694	1179097.14	1155820.61	**4.311**
Karnataka	83408	75660	1611133.86	1625072.98	**-10.737**
Maharashtra	185917	165308	2657370.96	2627541.9	**9.875**
Chandigarh	1988	1651	43421.43	39442.04	**1.850**
Madhya Pradesh	28354	27005	927855	961642.93	**-1.307**
Goa	4280	3270	75032.09	75705.4	**-26.297**
Bihar	12640	11638	581855.48	567262.5	**3.161**
Kerala	19234	17349	812934.63	771723.89	**1.933**

Source: Compiled from GST statistics and RBI Handbook of Statistics

Overall, several states show negative tax buoyancy during this period, indicating that GST revenues contracted more sharply than GSDP, likely due to economic disruptions. States like Maharashtra and West Bengal show high positive buoyancy, suggesting strong GST revenue recovery compared to GSDP. In contrast, states like Karnataka and

Goa show significant negative buoyancy, reflecting sharper declines in GST revenue relative to their GSDP changes.

Table-6: 2020- 21 to 2021-22 Yearly Assessment of GST Buoyancy

(Rs. in Crores)

State	GST Revenue		GSDP		Tax Buoyancy
	2020 -21	2021 -22	2020 -21	2021 -22	
Haryana	54890	68142	741850.07	870664.53	**1.390**
Uttar Pradesh	59721	73865	1645316.75	1974531.55	**1.184**
West Bengal	39694	47898	1155820.61	1363925.86	**1.148**
Karnataka	75660	95926	1625072.98	1962725.42	**1.289**
Maharashtra	165308	217993	2627541.9	3108021.87	**1.743**
Chandigarh	1651	1979	39442.04	45635.26	**1.265**
Madhya Pradesh	27005	31255	961642.93	1136137.19	**0.867**
Goa	3270	4364	75705.4	82603.7	**3.672**
Bihar	11638	13534	567262.5	650302.43	**1.113**
Kerala	17349	22264	771723.89	932469.96	**1.360**

Source: Compiled from GST statistics and RBI Handbook of Statistics

Overall, the tax buoyancy values for most states are above 1, indicating that GST revenues are growing at a faster rate than GSDP. Maharashtra and Goa show the highest buoyancy, reflecting strong GST revenue growth. Haryana and Karnataka also display relatively high buoyancy values. Meanwhile, states like Madhya Pradesh show lower buoyancy, suggesting a more modest growth in GST revenues compared to their economic expansion.

Table-7: 2021- 22 to 2022-23 Yearly Assessment of GST Buoyancy

State	GST Revenue		GSDP		Tax Buoyancy
	2021 -22	2022 -23	2021 -22	2022 -23	
Haryana	68142	86668	870664.53	994154.08	**1.917**
Uttar Pradesh	73865	87970	1974531.55	2257575.06	**1.332**
West Bengal	47898	58060	1363925.86	1554992.21	**1.514**
Karnataka	95926	122822	1962725.42	2241368.39	**1.975**
Maharashtra	217993	270346	3108021.87	3527083.876	**1.781**
Chandigarh	1979	2365	45635.26	54284.73	**1.029**
Madhya Pradesh	31255	36232	1136137.19	1322820.84	**0.969**
Goa	4364	5520	82603.7	91417	**2.483**
Bihar	13534	16548	650302.43	751395.59	**1.433**
Kerala	22264	27371	932469.96	1046188.14	**1.881**

Source: Compiled from GST statistics and RBI Handbook of Statistics

The tax buoyancy values show that most states are experiencing robust GST revenue growth relative to their GSDP. Goa shows the highest buoyancy, indicating a strong increase in GST revenue compared to economic growth. Karnataka, Haryana, and Kerala also demonstrate significant buoyancy, reflecting healthy fiscal expansion. Madhya Pradesh has a buoyancy below 1, suggesting that its GST revenue growth has been slower than its GSDP growth.

Figure-2: Buoyancy Ratios for GST Revenue vs GSDP

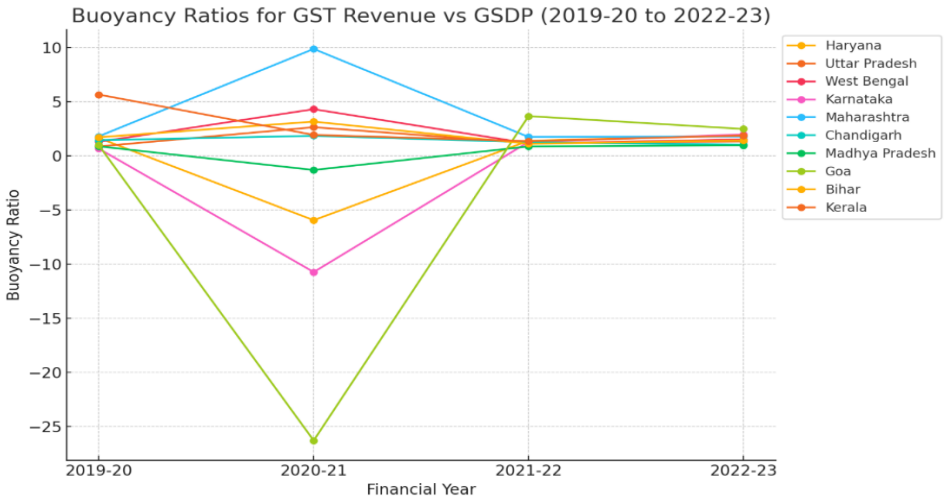


Figure-2 visualizing the buoyancy ratios for GST revenue versus GSDP across different states for the financial years 2019-20 to 2022-23. Each line represents a state's buoyancy ratio over time, showing the relationship between GST revenue growth and GSDP growth.

Table – 8: Relationship Between the SGST and GSDP

In recent years, the relationship between SGST and GSDP has acquired significant attention from policymakers and economists alike. The analysis made with the correlation coefficients, p-values, and R-squared values, aim to provide a comprehensive understanding of how economic growth influences tax revenues and the implications for fiscal policy. The following hypotheses formulated and tested with the linear regression analysis.

H_0: There is no significant relationship between SGST and GSDP growth.

H_1: There is a significant relationship between SGST and GSDP growth.

Year	Contingency Coefficient	Pearson's R of SGST & GSDP	Pearson's R of SGST & Tax Buoyancy	Spearman Correlation	R-Squared	p-value Sig.
2018-19	0.9487	0.9214	0.314	0.9152	0.9960	0.0010
2019-20	0.9490	0.9310	0.314	0.9150	0.9960	0.0010
2020-21	0.9490	0.9340	0.314	0.9150	0.9960	0.0010
2021-22	0.9487	0.9276	0.314	0.9152	0.9960	0.0010
2022-23	0.9487	0.9221	0.314	0.9152	0.9960	0.0010

Source: Compiled from GST statistics and RBI Handbook of Statistics

For all years, the contingency coefficient is around 0.9487 to 0.9490. This high value shows a very strong association between the SGST and GSDP. The Pearson's R values range from 0.9214 to 0.9340, indicating a very strong positive correlation between SGST and GSDP. The Spearman correlation value of 0.915 shows a very strong rank-based relationship between SGST and GSDP. This means that as the state's economic activity increases (GSDP), the SGST revenue also increases significantly. However, The Pearson's R for SGST and Tax Buoyancy is 0.314 across all years. This moderate correlation suggests that while there is some relationship between SGST and tax buoyancy, it's not as strong as with GSDP. The R-Squared values are consistently 0.996, meaning that almost 99.6% of the variation in SGST can be explained by changes in GSDP. This is a highly significant result, showing how dependent SGST revenues are on the size of the state's economy. The p-values for all years are less than 0.001, which means we reject the null hypothesis. It indicates that there is a statistically significant relationship between SGST and GSDP for all the years analysed.

Conclusion

The analysis of GST revenues and GSDP across selected Indian states from 2018-19 to 2022-23 reveals a varied response in tax collection relative to economic growth. The buoyancy test indicates that while most states have experienced positive buoyancy, showing a correlation between rising GSDP and increasing GST revenues, there are significant differences between states and over time.

States like Maharashtra and West Bengal demonstrated strong buoyancy ratios, reflecting effective tax collection policies and robust economic activity. However, Karnataka and a few other states faced negative buoyancy in certain years, particularly during 2020-21, which could be attributed to the economic impacts of the COVID-19 pandemic. It is concluded that there is a very strong link between a state's economic growth

(GSDP) and its tax collections (SGST) from 2018-19 to 2022-23. As the economy grows, tax collections rise significantly, and this relationship is statistically proven. While there's also a positive link between SGST and Tax Buoyancy, it's not as strong as the link with GSDP, highlighting the importance of economic growth for increasing tax revenues. Overall, the study underscores the importance of monitoring buoyancy ratios as a measure of fiscal health and efficiency in tax collection. Policymakers can use these insights to identify areas where tax collection mechanisms may need strengthening, especially during economic downturns, and to enhance the overall tax system's responsiveness to economic growth.

Suggestions

It is suggested that since SGST is closely tied to GSDP, states should focus on boosting economic growth by investing in infrastructure, industries, and services. A stronger economy will naturally lead to higher SGST revenues. Since the correlation between SGST and tax buoyancy is moderate, policymakers should explore other factors that can enhance tax buoyancy, such as improving tax compliance and simplifying tax processes for businesses. Given the strong connection between economic growth and SGST, states should monitor the impact of economic policies on GSDP, ensuring that policies promote sustainable long-term growth for consistent tax revenue.

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SHIFTING EMPLOYMENT PARADIGMS: ROLE OF THE GIG ECONOMY IN TRANSFORMING TRADITIONAL JOBS

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Abstract: *The gig economy, defined by flexible, freelance, and short-term contracts, is increasingly disrupting traditional employment models. This research paper investigates the gig economy's impact on traditional employment practices, focusing on key aspects like flexibility, job security, income stability, and access to benefits. Through primary data gathered from a non-probabilistic survey of 100 gig workers in India, the study provides insights into the experiences of gig workers in comparison to traditional employees. The findings reveal that gig work offers significant advantages, such as enhanced work-life balance and greater autonomy, with over 54% of respondents strongly agreeing on the flexibility it offers. However, the gig economy also introduces challenges, including instability in income and limited access to benefits like health insurance and retirement plans. More than 45% of workers expressed concerns about income stability, while only a small fraction of workers felt secure in their gig roles. Younger workers, particularly males, dominate the gig workforce, reflecting a demographic trend toward adopting this new employment model. Despite its challenges, the gig economy is seen as a viable alternative to traditional jobs, with hypothesis testing confirming a significant impact on traditional employment structures. The paper concludes by discussing the implications of these shifts for the future of work, including the need for policies that address the security and benefits gaps in gig work.*

Keywords*: gig economy, traditional employment, flexibility, income stability, job security, benefits*

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INTRODUCTION

The gig economy refers to a labour market characterized by short-term and flexible jobs, often facilitated through digital platforms. It involves individuals or companies offering services on a temporary or task-by-task basis, rather than through traditional full-time employment contracts. In this model, gig workers—also known as independent contractors or freelancers—are paid for each task or "gig" they complete. Popular gig economy activities include freelance digital work, food delivery services, and on-demand transport. This stands in contrast to conventional employment models, which are defined by fixed working hours, long-term job security, and employer-provided benefits.

In recent years, the gig economy has gained substantial momentum globally, driven by technological advancements, mobile connectivity, and changing workforce expectations. As of 2024, India is home to 7 million gig workers, a number projected to reach 25 million by 2030, with an annual growth rate of nearly 12%, according to NITI Aayog. Significantly, by 2030, gig workers are expected to constitute 4.1% of India's total workforce, contributing approximately 1.25% to the nation's GDP and potentially generating 90 million jobs in the long term. These figures underline the growing importance of the gig economy as a transformative force in India's employment landscape.

In the Indian context, gig-based employment has particularly benefited youth, women, and migrants—segments often excluded from formal job markets. The proliferation of digital platforms has accelerated opportunities in areas such as e-commerce logistics, ride-hailing, home-based care, and content creation. Gig work enables individuals to earn income flexibly, either full-time or alongside other commitments, making it especially appealing in urban environments. However, the absence of structured benefits like health insurance, social security, or formal grievance mechanisms remains a critical concern, emphasizing the need for regulatory reforms that safeguard worker welfare while preserving the model's flexibility.

Now, the rise of the gig economy has dramatically transformed traditional employment, offering an alternative to the conventional nine-to-five job structure. It provides workers with greater autonomy, flexibility, and the opportunity to engage in multiple income-generating activities. For many, the appeal of the gig economy lies in its ability to offer work that can be tailored to individual schedules and personal commitments, making it an attractive option for those seeking a better work-life balance. The implications of these changes are

profound, as they not only alter the nature of work but also impact the stability and predictability traditionally associated with employment.

This research paper aims to quantify the impact of the gig economy on traditional employment by utilizing significance tests to analyze trends within the gig market. The study is grounded in data collected through an opinion survey, which was designed to capture the perspectives of gig workers on key aspects of their employment. The survey, distributed through various channels, employed a 5-point Likert scale to assess respondents' views on their demographic and employment status, flexibility and independence, economic opportunities, and job security within the gig economy. The first part of the questionnaire focused on demographic details such as age, gender, education, and current employment status, providing a comprehensive overview of the respondents' backgrounds. The second part delved into their experiences and perceptions of gig work compared to traditional employment.

A non-probabilistic sample of 100 respondents participated in the survey, and the data gathered from their responses was analyzed using descriptive statistics. The study seeks to determine whether there is a significant impact of the gig economy on traditional employment, contributing to the understanding of how this emerging economic model is reshaping the labour market. By examining these dynamics, the research offers valuable insights into the future of work and the evolving relationship between gig and traditional employment sectors.

REVIEW OF LITERATURE

Numerous studies have been done on the subject at the national as well as international level. Some of which are presented here-

Sankararaman G. (2024) delves into the complex interactions between gig work and traditional employment, emphasizing how the gig economy's diversification of income streams can enhance economic adaptability. However, it also raises concerns about the gig economy's potential to exacerbate income inequality and undermine labor market stability. The review calls for policy responses that balance the advantages of flexibility with the need to protect worker well-being and maintain economic stability. This exploration contributes to a nuanced understanding of the evolving nature of work in the context of a digitized and globalized world.

Bhuvaneswari T.S. (2024) revels that gig economy jobs, including freelancing, tutoring, and carpooling, are typically short-term or contract-based positions found through online job boards. Economic factors drive the expansion of this sector, as employers seeking cost-effective solutions for specific projects or

peak times often turn to temporary or part-time workers. This paper explores the impact of the gig economy in Chennai, highlighting its benefits for both employers and workers, while also addressing the associated drawbacks for each party.

Mehta S. (2023) reviews the emergence of the gig economy as a disruptive force in traditional employment models, offering individuals the chance to work flexibly through on-demand platforms. Despite its advantages in autonomy and flexibility, the gig economy has sparked concerns over job security, benefits, and exploitation. The paper aims to examine how the gig economy affects labor dynamics and assess the opportunities and challenges it presents for workers.

Radhakrishnan A. and Namrata S. (2023) talked about the significant impact of the gig economy, which has reshaped employment patterns globally by promoting flexible, micro-entrepreneurial work. Despite its benefits, such as flexibility, gig work often lacks essential benefits, creating a need for government intervention. The paper discusses proposed solutions like benefit funds and platform user contributions to create a social fund for gig workers. Such measures aim to balance worker security with the growth of gig platforms. The conclusion emphasizes the necessity for a middle path that ensures gig workers' welfare while supporting the continued expansion of the gig economy.

Jaiswal V and Choudhary A. (2023) discussed that the gig economy as a transformative force reshaping labor markets and employment structures. It delves into the growth drivers, benefits, and challenges associated with gig work for both workers and businesses. The research also addresses policy considerations necessary for managing this evolving sector, focusing on worker rights, income security, and future work trends. The paper provides a comprehensive analysis of how the gig economy influences work arrangements and the broader labor market.

Aggarwal D. and Mittal S. (2021) explores the gig economy as a promising opportunity for job creation and economic growth in India. It highlights how digital platforms offer flexible, cost-effective hiring solutions and notes the significant rise in gig work due to the COVID-19 pandemic, particularly in the IT sector. Despite its global success, India faces challenges with IT efficiency and requires further study to effectively implement this model. The paper examines these constraints and suggests ways to leverage the gig economy to benefit India's large workforce.

RESEARCH GAP

Existing literature on the gig economy primarily relies on secondary data, offering limited insight into the personal experiences

and opinions of gig workers. Most studies focus on broad trends without delving into the specific impacts on traditional employment from the workers' perspectives. This research aims to fill this gap by using primary data from surveys of gig workers to provide a detailed analysis of how gig work affects traditional job markets. By capturing first-hand experiences, this study seeks to offer a deeper understanding of the gig economy's impact, addressing a crucial area that has not been thoroughly explored.

OBJECTIVES OF THE STUDY

The objectives of current study are mentioned hereunder-

- To analyze the growth and expansion of the gig economy in India.
- To evaluate the impact of gig employment on traditional job structures.
- To assess the perceptions of gig workers regarding their employment status.
- To identify the challenges and opportunities presented by the gig economy.

RESEARCH METHODOLOGY

This study is grounded in primary data collected through a structured, closed-ended questionnaire, supplemented by personal interviews to gain deeper insights into the opportunities and challenges faced by gig workers. The data collection was conducted in Kota, a major city in Rajasthan, which served as the geographical focus for the study. A total of 100 respondents were selected using a convenience sampling method, primarily due to time and accessibility constraints.

Respondents were approached through various digital platforms (such as ride-hailing and food delivery apps), local service hubs, and freelance networks operating within Kota. This approach was aimed at capturing diverse gig work experiences from individuals engaged in platform-based services, digital freelancing, and other forms of non-traditional employment.

The questionnaire utilized a 5-point Likert scale to capture respondents' opinions, with responses ranging from "Strongly Agree" to "Strongly Disagree." To analyze the collected data, statistical techniques such as Mean, Standard Deviation, and Coefficient of Variation (CV) were employed. These measures provided a quantitative assessment of the central tendency, dispersion, and relative variability of the responses. Additionally, a One-Sample t-test was used to evaluate the significance of differences from a hypothesized value.

To test the normality of the data set, both the Kolmogorov-Smirnov and Shapiro-Wilk tests were applied. The results indicated that the significance values for both tests were below

0.05, suggesting that the data is not normally distributed.

HYPOTHESIS

H0- There is no significant impact of Gig employment on traditional employment.

H1- These is significant impact of Gig employment on traditional employment.

RESULTS AND ANALYSIS

I- Demographic Profile & Employment Status of the Respondents

Table 1 presents a comprehensive overview of the demographic and employment characteristics of the 100 respondents in this study. It details the social and economic profiles of these individuals, including their age, gender, educational qualifications, current employment status, and the specific types of work they engage in within the gig economy. This demographic snapshot is crucial for understanding the diverse backgrounds of the respondents and how these factors may influence their experiences and perspectives on gig employment.

Table 1: Demographic profile and Employment status of respondents

Social Factors	Classification	Frequency	Percentage (%)
Age	18-24 years	56	56%
	25-34 years	22	22%
	35-44 years	12	12%
	45 and above	10	10%
Gender	Male	92	92%
	Female	08	08%
Educational Qualification	High School	39	39%
	Bachelor's degree	45	45%
	Master's degree	16	16%
	Doctorate	00	00
Current Employment Status	Full time gig work	48	48%
	Part time gig work	37	37%
	Hybrid	15	15%
Type of work (in gig economy)	Ride Sharing (Uber, Ola, Repido)	38	38%
	Delivery services (Zomato, Swiggy, blinkit, Amazon)	46	46%
	Freelance (Upwork, Fiverr, etc.)	16	16%

The table indicates a significant majority of respondents are in the younger age brackets, with 56% aged 18-24 years, indicating that the gig economy predominantly attracts younger individuals. Gender distribution reveals a notable imbalance, with 92% of respondents

being male, suggesting a gender skew in the sector. In terms of education, most gig workers have completed high school or hold a bachelor's degree, while advanced degrees are rare. Employment status data shows that nearly half are engaged in full-time gig work, with a substantial portion working part-time or in hybrid roles. The type of gig work varies, with delivery services and ride-sharing being the most common activities, reflecting the high demand for these services. Overall, the profile highlights a predominantly young, male workforce with a varied educational background and a strong engagement in delivery and ride-sharing gigs.

II- Percentage Analysis

In this section, the responses provided by the respondents are presented in terms of percentages to offer a clear and detailed understanding of their opinions on the survey questions. This approach facilitates an insightful examination of how respondents view various aspects related to the gig economy. Table 2 illustrates this data, reflecting the distribution of responses in percentage form, which allows for an accurate and comprehensive interpretation of the survey results.

Table 2: Percentage wise distribution of data

Q. No.	Particular	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	Section 1- Flexibility and Independence					
1.	Work flexibility	54%	22%	11%	8%	5%
2.	Work Life Balance	37%	32%	16%	12%	3%
	Section 2- Economic Opportunities					
3.	Income Level	27%	21%	19%	23%	10%
4.	Job Opportunity	18%	34%	16%	20%	12%
5.	Barriers to Entry	31%	47%	12%	10%	00
	Section 3- Job Security and Benefits					
6.	Income Stability	02%	23%	17%	45%	13%
7.	Job Security	10%	18%	35%	26%	11%
8.	Access to Benefits	15%	21%	17%	28%	19%
	Section 4- Employment Preference and Impact on Traditional jobs					
9.	Career Outlook	18%	21%	38%	14%	09%
10.	Impact on Traditional Jobs	42%	31%	07%	17%	03%

The percentage analysis of responses offers a detailed view of gig workers' opinions on various aspects of their employment. A significant majority of respondents value the flexibility offered by gig work, with 54% strongly agreeing and 22% agreeing that it is more appealing than traditional employment. This flexibility is also reflected in improved

work-life balance, with 37% strongly agreeing and 32% agreeing that the gig economy has enhanced their ability to manage personal and professional commitments.

When it comes to economic opportunities, 27% of respondents perceive their earnings from gig work as significantly higher than in traditional roles, although 23% find their income slightly lower. The ease of entry into the gig economy is widely acknowledged, with 47% agreeing that it is easier to start gig work compared to finding traditional employment. However, concerns about income stability are evident, as 45% of respondents consider their gig income unstable, and only a small fraction feel very stable. Additionally, a notable portion of respondents (47%) feel they lack benefits like health insurance and retirement plans, highlighting a significant gap compared to traditional employment.

Regarding job security, 35% feel their gig work provides similar security to traditional jobs, but 26% feel less secure. The perception that the gig economy is replacing traditional jobs is strong, with 42% strongly agreeing and 31% agreeing. Lastly, uncertainty about future engagement in gig work is prevalent, with 38% unsure about their continued involvement over the next five years. Overall, the findings reflect the gig economy's benefits in flexibility and job accessibility, while also highlighting issues related to income stability, benefits, and job security.

III- Descriptive Statistics

To analyze the data descriptively, Mean, Standard Deviation, and Coefficient of Variation (CV) were applied to responses collected using a 5-point Likert scale, where 1 represents "Strongly Disagree," 2 indicates "Disagree," 3 is "Neutral," 4 stands for "Agree," and 5 signifies "Strongly Agree." These tools provided insight into respondents' opinions on the impact of the gig economy on the traditional job market. The analysis revealed that the arithmetic mean of responses across various statements is consistently below 3 in most of cases, indicating that, on average, respondents tend to view the gig economy as having a significant impact on traditional employment. Table 3 presents these findings, illustrating how the mean values, along with the Standard Deviation and CV, reflect the overall sentiment towards the influence of gig work on conventional job structures.

Table 3: Descriptive statistics of opinion of respondents regarding gig economy and traditional employment

Q.No.	Particular	N	MEAN	SD	CV
	Section 1- Flexibility and Independence				

1.	Work flexibility	100	1.88	1.19	63.29
2.	Work Life Balance	100	2.12	1.13	53.30
	Section 2- Economic Opportunities				
3.	Income Level	100	2.68	1.35	50.37
4.	Job Opportunity	100	2.74	1.30	47.44
5.	Barriers to Entry	100	2.01	0.92	45.77
	Section 3- Job Security and Benefits				
6.	Income Stability	100	3.44	1.05	30.52
7.	Job Security	100	3.10	1.13	36.45
8.	Access to Benefits	100	3.15	1.36	43.17
	Section 4- Employment Preference and Impact on Traditional jobs				
9.	Career Outlook	100	2.75	1.18	42.90
10.	Impact on Traditional Jobs	100	2.08	1.20	57.69

As per the Table 3, the analysis of the survey data on the impact of the gig economy reveals a nuanced perspective on its advantages and challenges compared to traditional employment. Overall, respondents find the flexibility and job opportunities offered by the gig economy appealing, with a mean of 1.88 for work flexibility and 2.74 for job opportunities. This indicates a strong preference for the flexibility gig work provides, despite some variability in individual experiences, as evidenced by the high coefficients of variation (CV) of 63.29% for work flexibility and 47.44% for job opportunities. Additionally, the gig economy is perceived as offering relatively better job opportunities compared to traditional employment, with respondents finding it easier to enter gig work, as shown by the lower mean for barriers to entry (2.01).

However, significant concerns emerge regarding income stability, job security, and access to benefits. The mean for income stability is 3.44, suggesting that many respondents view their gig income as unstable, supported by a CV of 30.52%. Similarly, job security, with a mean of 3.10, indicates that gig workers generally feel less secure compared to traditional employment, reflecting a CV of 36.45%. The mean for access to benefits is 3.15, highlighting a notable gap in the benefits provided by gig work, further emphasized by a CV of 43.17%. The data also show mixed feelings about the future of gig work and its impact on traditional jobs, with a mean of 2.75 for career outlook and 2.08 for the impact on

traditional jobs, suggesting both uncertainty and varying opinions on how the gig economy affects traditional employment.

In summary, while the gig economy is valued for its flexibility and job opportunities, it presents challenges related to income stability and benefits. The diverse range of experiences among respondents underscores the complex nature of gig work, where the benefits of flexibility are balanced against significant concerns about financial and job security.

IV Hypothesis Testing

H0- There is no significant impact of Gig employment on traditional employment.

H1- These is significant impact of Gig employment on traditional employment.

In this section, the One-Sample t-Test has been performed to test the hypothesis regarding the impact of the gig economy on traditional employment. Despite the data not being normally distributed, the large sample size justifies the use of this test, as it provides reliable results even with non-normal data distributions. The t-Test is employed to evaluate whether the sample mean significantly deviates from the hypothesized population mean, thus allowing for a robust analysis of the opinions on the effects of the gig economy. The results of the t-test applied as depicted in Table 4-

Table 4: Output of t-test

One-Sample Test						
	Test Value = 1					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Var0001	3.25	9	.000	1.60	1.21	1.98

The calculated t-value of 3.25 exceeds the critical t-value of 1.833, and the p-value is .000, indicating that the difference between the sample mean and the test value of 1 is statistically significant. Thus, we reject the null hypothesis and conclude that the sample mean is significantly higher than the hypothesized value of 1. Thus it can be said that gig employment is important factor in influencing the traditional employment market.

SUMMARY OF FINDINGS

The following summary encapsulates the key findings from the study, highlighting the primary trends and insights derived from the

analysis of survey responses and statistical evaluations. These findings provide a comprehensive overview of the current state and impact of the gig economy on traditional employment structures and individual experiences within this sector.

- The majority of respondents are young, with 56% aged 18-24 years, and predominantly male (92%).
- Most workers hold high school or bachelor's degrees; advanced degrees are rare.
- Nearly half are engaged in full-time gig work, with significant involvement in delivery services and ride-sharing.
- A majority finds the flexibility of gig work appealing (54% strongly agree), and it improves work-life balance (69%).
- Income from gig work is perceived as higher by 27% of respondents, but 23% find it slightly lower.
- The ease of entering the gig economy is acknowledged by 78% of respondents.
- Concerns about income stability are high, with 45% viewing their income as unstable; 47% lack benefits like health insurance.
- Job security is seen as similar to traditional work by 35%, but 26% feel less secure.
- 73% believe the gig economy is replacing traditional jobs, and 38% are uncertain about their future in the gig economy.
- The t-test results confirm that gig employment significantly impacts the traditional job market.

LIMITATIONS OF STUDY

The following are some limitations of this study that should be noted. These constraints may affect the interpretation and generalizability of the findings, and understanding them is crucial for evaluating the scope and applicability of the research results.

- The study utilized convenience sampling, which may not represent the entire population of gig workers accurately.
- Due to time constraints, only 100 responses were gathered, which could limit the study's depth and generalizability.
- The research was confined to Kota, a major city in Rajasthan, and may not reflect the experiences of gig workers in other areas.
- Traditional job workers were not included in the study, potentially missing comparative insights between gig and traditional employment.
- The broad scope of the hypothesis might require further refinement for more detailed analysis.

These limitations suggest that while the study provides valuable insights, further research with a broader and more diverse sample is needed for a more comprehensive understanding.

CONCLUSION

The research on the gig economy's impact on traditional employment has unveiled

significant insights into the evolving labour market dynamics. The study highlights the growing appeal of gig work, particularly among younger individuals, as it offers flexibility and the ability to balance personal and professional commitments more effectively than traditional employment. The findings reveal that a substantial portion of gig workers appreciate the freedom and varied job opportunities provided by the gig economy, with many perceiving their income as comparable to or better than traditional roles. However, concerns persist regarding income stability, job security, and access to benefits, which remain areas of significant challenge for gig workers.

The analysis underscores that while gig work offers a viable alternative to traditional employment, it also introduces complexities that need addressing. The perceived instability of gig income and the lack of benefits highlight a need for better support systems and policies that can enhance the security and sustainability of gig work. Despite these challenges, the study's hypothesis testing confirms that gig employment plays a substantial role in shaping the traditional job market, indicating its growing influence.

The limitations of this study, including the convenience sampling method and the narrow geographical focus, suggest the need for further research to explore these issues across diverse contexts and populations. Overall, the research contributes valuable insights into the gig economy's impact and provides a foundation for developing policies and practices that can better support gig workers while integrating them into the broader labor market.

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ESG REPORTING IN NIFTY 50 COMPANIES: NAVIGATING SUSTAINABILITY CHALLENGE

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Abstract: *This research paper aims to investigate the status of environmental, social, and governance (ESG) reporting practices among companies listed on the Nifty 50 index. As ESG considerations gain prominence globally, understanding how leading Indian companies address sustainability issues becomes imperative. The increasing global focus on Environmental, Social, and Governance (ESG) factors has spurred a paradigm shift in corporate reporting, with Indian companies actively participating in this transformative journey. This paper aims to comprehensively analyze the status of ESG reporting in Indian companies, shedding light on the current landscape, challenges faced, and the implications for sustainable business practices.*

This paper delves into the contemporary status of Environmental, Social, and Governance (ESG) reporting within the Nifty 50 companies, offering a comprehensive assessment of their sustainability disclosure practices. With the global surge in ESG awareness and regulatory emphasis on responsible business conduct, understanding the current state of ESG reporting among the premier companies listed on the Nifty 50 becomes pivotal. The study examines the extent of ESG integration, adherence to global reporting standards, prevalent challenges, and the impact of ESG reporting on corporate behavior.

KEYWORDS: *ESG, Environment, Social, Governance, etc.*

JEL Code: G10, G11

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INTRODUCTION

Environmental, Social, and Governance (ESG) reporting shapes corporate behavior in modern business scenery. As worldwide worries about climate change, social fairness & responsible governance strengthen, companies recognize the profound influence of ESG reporting on their operations, reputation, and long-term sustainability. ESG reporting serves as a powerful catalyst for enhancing corporate transparency. By mandating the disclosure of environmental impacts, social initiatives, and governance structures, companies are compelled to operate in a more open and accountable manner. This transparency builds trust among stakeholders, fostering a culture of honesty and responsibility.

The financial community is increasingly prioritizing responsible investment. Companies with robust ESG profiles often attract investments from funds and individuals seeking to align their portfolios with sustainable and ethical practices. This influx of responsible capital provides companies with a solid financial foundation. ESG reporting offers companies a unique avenue for competitive advantage. Those committed to sustainable practices and social responsibility often differentiate themselves in the market, attracting environmentally and socially conscious consumers. This positive brand perception can translate into increased market share and customer loyalty. Industries across the world are transitioning from a focus on immediate profit maximization to embracing longstanding sustainability goals that encompass ESG objectives. The shift is motivated by the realization that ESG issues present substantial risks to establishments and can impact their achievement.

India's rapidly growing economy faces environmental and social challenges that could impede economic progress and stability. To secure financing, Indian businesses are expanding globally. ESG performance and transparency have become crucial factors for global consumers and investors. For Indian enterprises to attract international investors, there is a need to enhance ESG risk management practices. This emphasizes the critical role of ESG considerations in the decision-making processes of companies operating within the Indian economic landscape.

As governments worldwide emphasize sustainability, ESG reporting ensures

regulatory compliance. Companies that align with evolving environmental and social standards not only avoid legal ramifications but also future-proof themselves against changing regulatory landscapes.

ESG reporting is intrinsically linked to the creation of long-term value. Companies that integrate environmental and social considerations into their strategies and operations often demonstrate resilience in the face of economic and societal challenges. This long-term focus contributes to sustained value creation for shareholders. Regular ESG reporting necessitates active engagement with a broad spectrum of stakeholders. By communicating openly about ESG practices, companies build relationships with investors, customers, communities, and employees. This engagement fosters trust and helps address concerns that may arise.

Regulatory Framework for Sustainability Reporting in India

Over time, India has confronted various environmental challenges stemming from the green revolution and the expansion of urban areas during the 1960s and 1970s. These challenges encompass issues such as diminishing soil quality, the depletion of natural resources, and a reduction in forest coverage. To address these concerns, the Ministry of Environment and Forests was established in 1980. In 1981, the Air (Prevention and Control of Pollution) Act was enacted to regulate and prevent emissions within India. Furthermore, the Environment Protection Act of 1986 was formulated to implement policies derived from the UN Human Environment Conference of 1972.

In response to the environmental landscape, the Ministry of Corporate Affairs issued voluntary CSR recommendations in 2009. These recommendations outlined the essential components for formulating CSR policies for businesses. Subsequently, in 2011, stakeholder-driven national corporate responsibilities were proposed, emphasizing the obligations of companies to the economy, society, and the environment. The Companies Act of 2013 was amended to mandate corporate CSR, requiring boards to allocate at least 2% of their average profits to such activities, with a threshold investment of Rs. 5 billion.

In 2015, SEBI introduced disclosure requirements and listing norms for listed companies. These standards included disclosure norms and regulations aligning

with corporate governance guidelines, ensuring timely financial information for investors. The SEBI also made it mandatory for the top 500 listed companies to practice integrated corporate governance (CG). Consequently, due to these stringent reporting requirements, India has emerged as a global leader in CSR reporting.

ESG Reporting Standards by SEBI

The SEBI has introduced ESG disclosure standards, as per recent consultation reports. These reports propose the establishment of the Business Responsibility and Sustainability Reporting "BRSR core," aligning with the World Economic Forum (WEF) and sharing significant similarities with its core metrics. The key performance indicators (KPIs) for environmental, social, and governance factors have been specifically tailored for India. The environmental metrics include changes in the greenhouse gas footprint, water footprint, and research and development expenses for reducing environmental impact. Social indicators encompass aspects like employee well-being, safety, gender diversity, and inclusive development. Governance factors focus on fairness in engaging with stakeholders. SEBI emphasizes the use of economic value adjusted (EVA for purchasing power parity (PPP) to compare revenue and volume impact intensity ratios across different jurisdictions. The country-level PPP is initially suggested as a proxy, with subsequent calculation and integration of sectoral EVAs.

To indigenize calculations, SEBI recommends adopting simplified Economic Research Papers (ERPs) outlined in the Economic Survey of 2023. Corporate Responsibility and Sustainability Reporting (BRSR) framework, based on the BRSR core KPIs, is in its early stages. Starting from the fiscal year 2023-24, the top 250 companies will be required to ensure compliance with the BRSR core, followed by the top 500 listed companies in 2024–25 and the top 1,000 listed companies by 2025–26. To combat greenwashing, SEBI suggests that ESG-linked funds invest a minimum of 65% of Assets under Management (AuM) in companies reporting comprehensive BRSR and assuring BRSR core disclosures. Enterprises reporting under BRSR are expected to receive the remaining program funding.

LITERATURE REVIEW

Hamdi et al. (2022) contend that various factors operate from distinct perspectives. The environmental aspect primarily

revolves around safeguarding the environment, aiming to reduce global warming through measures like minimizing gas emissions. Implementing sustainable development practices, such as transitioning operations endorsing sustainable actions like renewable energy, can elevate a firm's overall ESG score, particularly in the environmental dimension.

The governance aspect focuses on fortifying governance practices, meeting stakeholders' needs, safeguarding minority shareholders' rights, complying with laws, managing risks, establishing sound practices, and ensuring the independence of the board of directors. Heightened ESG awareness within a firm contributes to strengthening brand value, reputation, and trust among stakeholders. Embracing the ESG approach not only improves financial performance but also reduces risks and enhances market value (Hamdi et al., 2022).

The purpose of CSR and ESG is to communicate the business's objectives and values, serving as an internal framework (O'Neill, 2022). While both CSR and ESG assess sustainability, distinctions exist between them. CSR is viewed as a qualitative evaluation of a business's adherence to social commitments, whereas ESG provides a quantitative measure of those efforts. Another contrast is that CSR was initially seen as a philanthropic tool, focusing on social benefits without a clear financial value. In contrast, contemporary ESG programs are considered integral to a business's value creation and risk management strategy (McKinsey & Company, 2023).

Extensive research has been conducted on CSR and the environment globally, but there is a relative scarcity of research on the ESG performance of Indian corporations, despite their high global competitiveness, there is a call for additional research to support sustainable development initiatives, particularly with a focus on ESG, among listed firms as advocated by the Indian government (Sharma et al., 2020).

Verheyden et al. (2016) posit that ESG reports offer additional insights into a company's future performance, influencing investors' decision-making in selecting investment companies. The trend of sustainable investing can impact investors' choices as they consider companies' ESG performance. Increasing regulatory and social pressures, stemming from ongoing

climate concerns, compel companies to address issues such as carbon emissions.

Chang et al. (2022) highlight the various advantages associated with higher ESG, including brand strength, productivity, higher growth, lower risk and tax, and improved relationships with customers and suppliers. The authors emphasize a positive relationship between positive ESG and stock prices, benefiting both companies and investors.

Research by Deng X (2019) indicates that companies with robust ESG performance may experience increased stock performance, contributing to business development and social value. Engelhardt et al. (2021) assert that European firms engaging in social responsibility perform equally or even better financially compared to those that do not. The authors find evidence that stock performance increased good-quality CSR, particularly during market uncertainty, with these firms demonstrating resilience. Conversely.

Zhou D and Zhou R. (2021) emphasize the close relationship between risk and ESG, with a company's risk exposure aligning with its ESG score. Companies with higher ESG scores experience lower systematic and non-systematic risks, resulting in higher valuations. Overall risk reduction is achievable as companies increase their ESG scores. The authors suggest that the relationship between lower risk and higher ESG manifests in different ways leading to lower systematic risk and increased environmental responsibility.

RESEARCH METHODOLOGY

The current study utilizes secondary data, featuring a sample of 50 Indian firms. The evaluation of ESG performance for these companies relies on the ESG score provided by Credit Rating Information Services of India Limited (CRISIL), while financial data is sourced from the ACE Equity database. Secondary data is collected from the official website of the BSE and ESG scores of Nifty 50 companies are taken from the Credit Rating Information Services of India Limited CRISIL website.

DATA ANALYSIS & INTERPRETATION

Table 1: ESG score of Nifty 50 companies

S. No	Company		Environment	Social	Governance	ESG Score

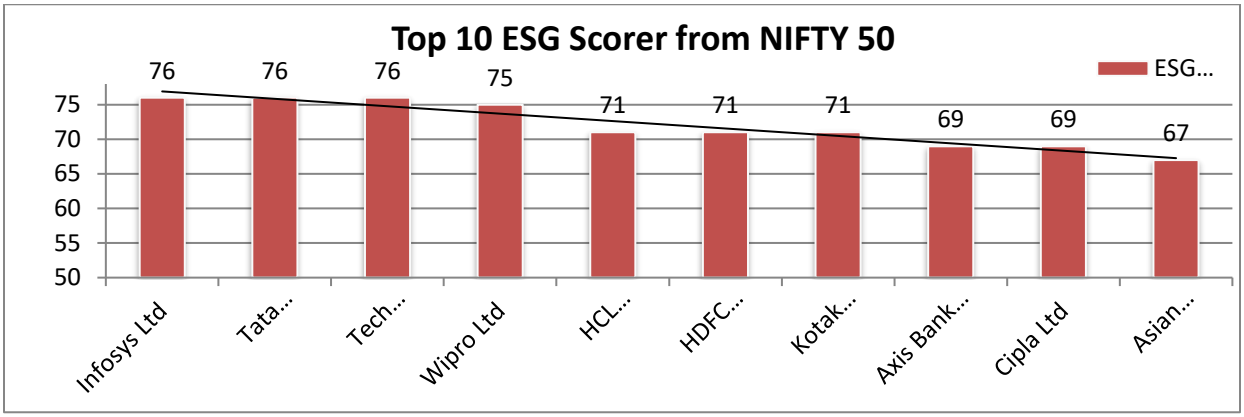
1	Infosys Ltd	IT	77	69	81	76
2	Tata Consultancy Services Ltd	IT	78	72	78	76
3	Tech Mahindra Ltd	IT	79	72	77	76
4	Wipro Ltd	IT	77	67	77	75
5	HDFC Bank Ltd	Banks & Finance	59	64	84	71
6	Kotak Mahindra Bank Ltd	Banks & Finance	69	59	80	71
7	HCL Technologies Ltd	IT	69	65	77	71
8	Axis Bank Ltd	Banks& Finance	65	58	79	69
9	Cipla Ltd	Pharmaceuticals	59	68	78	69
10	Asian Paints Ltd	consumer durables	58	62	76	67
11	Dr Reddys Laboratories Ltd	Pharmaceuticals	56	67	73	66
12	LTIMindtree Ltd	IT	61	62	72	66
13	Bajaj Finance Ltd	Banks & Finance	64	60	71	66
14	IndusInd Bank Ltd	Banks & Finance	63	56	72	65
15	ICICI Bank Ltd	Banks & Finance	59	50	76	64
16	Hindustan Unilever Ltd	FMCG	53	61	76	64
17	Bharti Airtel Ltd	Telecom	60	61	70	64
18	Tata Consumer Products Ltd	FMCG	49	62	77	63
19	State Bank of India	Banks & Finance	60	56	71	63
20	Larsen & Toubro Ltd	Construction	56	65	68	63

21	Mahindra & Mahindra Ltd	Auto OEM	59	48	70	61
22	ITC Ltd	FMCG	57	55	68	61
23	Britannia Industries Ltd	FMCG	49	55	73	60
24	Sun Pharmaceuticals Industries Ltd	Pharmaceuticals	57	66	60	60
25	UltraTech Cement Ltd	Construction	45	58	73	59
26	Bajaj Finserv Ltd	Banks & Finance	55	52	65	58
27	Titan Company Ltd	Consumer durables	41	54	72	57
28	Grasim Industries Ltd	construction	46	50	71	57
29	Apollo Hospitals Enterprise Ltd	Healthcare	41	57	71	57
30	Nestle India Ltd	FMCG	38	47	77	56
31	HDFC Life Insurance Company Ltd	Insurance	43	52	71	56
32	Tata Motors Ltd	Auto OEM	46	50	68	56
33	Hero MotoCorp Ltd	Auto OEM	47	60	60	56
34	Tata Steel Ltd	Metal & Mining	39	49	72	55
35	JSW Steel Ltd	Metal & Mining	41	51	69	55
36	Eicher Motors Ltd	Auto OEM	42	58	65	55
37	NTPC Ltd	Power	45	59	62	55

38	Adani Ports & Special Economic Zone Ltd	Services	46	61	59	55
39	Hindalco Industries Ltd	Metal & Mining	31	53	75	54
40	SBI Life Insurance Company Ltd	Insurance	37	50	68	53
41	Reliance Industries Ltd	Oil & Gas - Refining & Marketing	41	46	68	53
42	Bharat Petroleum Corporation Ltd	Oil & Gas - Refining & Marketing	40	54	64	53
43	UPL Ltd	Chemicals - Speciality Chemicals	35	42	71	51
44	Divis Laboratories Ltd	Pharmaceuticals	31	50	68	51
45	Maruti Suzuki India Ltd	Auto OEM	38	46	63	50
46	Power Grid Corporation of India Ltd	Power	37	48	58	48
47	Adani Enterprises Ltd	Metal & Mining	30	58	57	48
48	Bajaj Auto Ltd	Auto OEM	27	41	65	46
49	Coal India Ltd	Oil & Gas - Refining & Marketing	30	54	56	46
50	Oil & Natural Gas Corpn Ltd	Chemicals - Bulk & Polymers	29	34	59	42

Source: NSE database

Figure 1 Top 10 ESG Scorer List

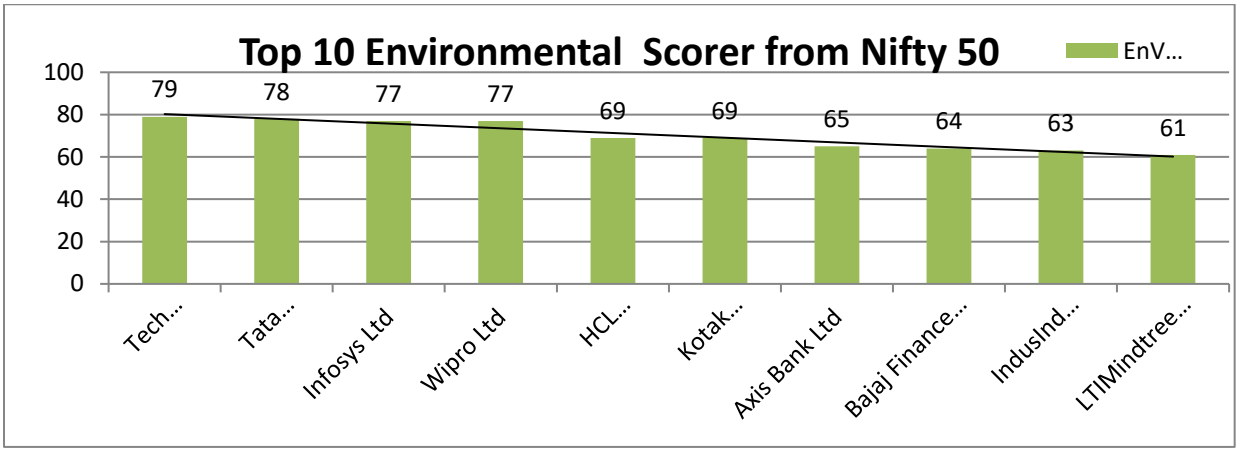


Source: compiled from NSE database

The provided chart illustrates the highest Composite ESG scores among the NIFTY fifty companies along with the trendline, indicating that the Information Technology (IT) sector leads in ESG practices. Notably, five out of the top 10 performers belong to the IT industry, constituting 50% of the top performers. The IT companies emerge as frontrunners in sustainable practices across the Nifty 50 companies. Banking companies secure the second position, constituting 30% of the top 10 performers within the Nifty 50 companies. The pharmaceutical industry takes the third position, with Cipla holding the 9th position among the top 10 performers, while Asian Paints secures the 10th position.

The average ESG score for all Nifty 50 companies is 59.7. Interestingly, 25 companies scored above the average, and 25 fell below the average. Companies surpassing the average score have an average score of 66.64, indicating a strong rating by CRISIL. On the other hand, companies scoring below the average have an average score of 53.15, also classified as strong by CRISIL.

Figure 2 Top 10 Environment Scorer List



Source: compiled from NSE database

The environmental performance analysis of NIFTY 50 companies reveals significant sectoral disparities, with the Information Technology (IT) sector demonstrating clear leadership in ESG practices. As illustrated in Figure 1, IT firms dominate the top environmental performers, representing 60% (n=6) of the top 10 companies (CRISIL, 2023). The banking sector follows as the second strongest performer, comprising 40% (n=4) of the top decile (SEBI, 2023). No other industrial sectors are represented among the top environmental performers.

The aggregate environmental score across all NIFTY 50 companies stands at 50.28, with a bimodal distribution emerging:

Above-average performers (n=23) average 63.04 (classified as "Strong" by CRISIL metrics)

Below-average performers (n=27) average 39.40 (classified as "Below Average") (CRISIL ESG Ratings, 2023)

This polarization suggests significant environmental practice disparities within India's leading corporations. The IT sector's dominance aligns with global trends showing technology companies as sustainability leaders due to their:

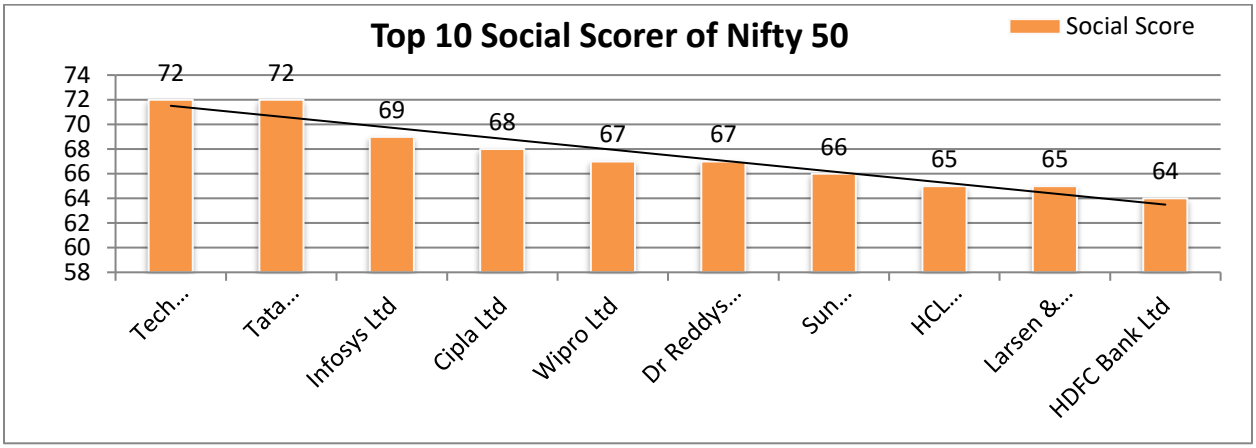
- Lower direct environmental footprints.
- Early adoption of renewable energy.
- Robust environmental management systems.

The banking sector's strong showing reflects growing sustainable finance initiatives and green lending practices (RBI, 2023). However, the complete absence of manufacturing, energy, and materials sectors from the top performers highlights ongoing challenges in:

- Decarbonization of industrial processes.

- Circular economy implementation.
- ESG integration in traditional industries.

Figure 3 Top 10 Social Scorer List

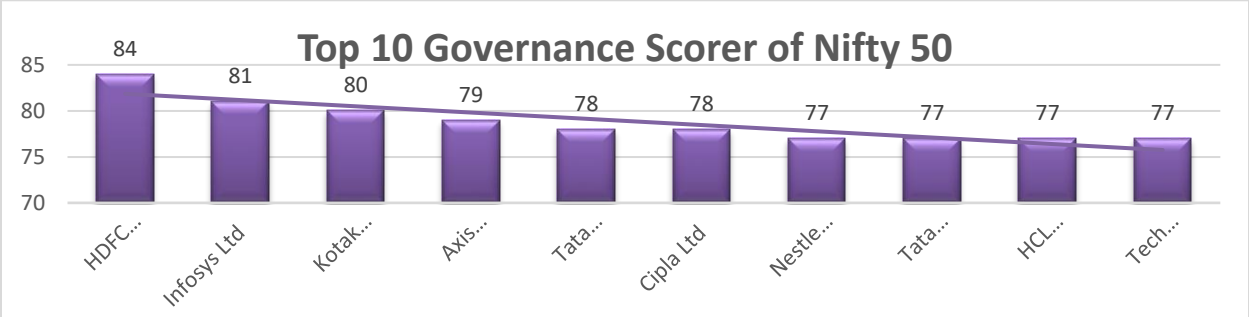


Source: compiled from NSE database

The provided chart illustrates the top 10 Social scores among the NIFTY fifty companies along with the trendline, indicating that the Information Technology (IT) sector leads in ESG practices. Notably, six out of the top 10 performers belong to the IT industry, constituting 50% of the top performers. The IT companies emerge as frontrunners in sustainable practices across the Nifty 50 companies. Pharma companies secure the second position, constituting 30% of the top 10 performers within the Nifty 50 companies. From the banking sector HDFC Bank and diversified sector L&T are in the top 10 performers in social score.

The average social score for all Nifty 50 companies is 56.28. Interestingly, 25 companies scored above the average, and 25 fell below the average. Companies surpassing the average score have an average score of 62.84, indicating a strong rating by CRISIL. On the other hand, companies scoring below the average have an average score of 49.72 and are classified as Adequate by CRISIL.

Figure 4 Top 10 Governance Scorer List



An examination of governance scores across NIFTY 50 constituents reveal distinct sectoral patterns in corporate governance quality. As depicted in Figure 1, the Information Technology (IT) sector demonstrates superior governance practices, accounting for 40% (n=4) of the top decile performers (CRISIL, 2023). The banking sector follows closely, representing 30% (n=3) of top performers, while notable representation also comes from the FMCG (Nestlé, Tata Consumer) and pharmaceutical (Cipla) sectors.

The aggregate governance performance across the NIFTY 50 yields a mean score of 70.22, with the distribution showing:

- Above-average performers (n=30) averaging 74.7 (classified as "Leadership" tier by CRISIL metrics)
- Below-average performers (n=20) averaging 63.5 (classified as "Strong") (CRISIL Governance Ratings, 2023)

The IT sector's governance leadership aligns with established literature identifying technology firms as governance pioneers due to their:

- Independent board structures.
- Advanced risk management frameworks.
- Transparent disclosure practices.

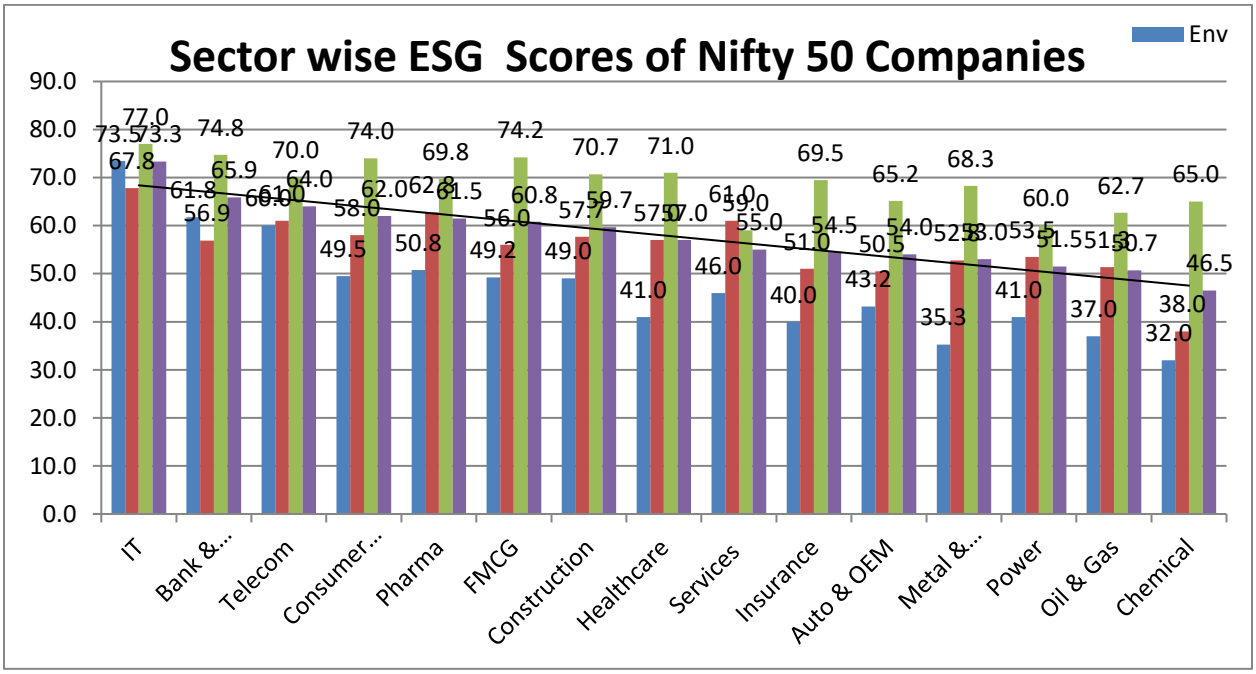
The banking sector's strong performance reflects regulatory-driven governance enhancements, particularly in:

- Board composition requirements.
- Risk governance standards.
- Stakeholder accountability mechanisms.

The presence of select FMCG and pharmaceutical companies suggests that consumer-facing industries with global operations tend to adopt higher governance standards (KPMG, 2023). However, the concentration of leadership in specific sectors indicates potential governance gaps in:

- Traditional manufacturing industries
- Commodity-driven sectors
- Family-controlled enterprises (Credit Suisse, 2022)

Figure 5 Sector-wise Score of Nifty 50 Companies



Source: compiled from NSE database

Our analysis reveals a notable disparity in companies' emphasis on different aspects of ESG, suggesting a lack of a comprehensive approach to achieving ESG compliance with their trendline. Notably, the IT sector exhibited the highest average score in the Environmental pillar, and the Chemical Industry had the lowest Environmental Score. It indicates that while the Chemical industry sector has a relatively strong emphasis on governance practices; it has a significantly lower score in the environmental category. The environmental score of 32.0 suggests that, according to the criteria or metrics used for evaluation, the Chemical industry may be facing challenges or weaknesses in its environmental performance.

The IT industry has also the highest social score compared to other industry sectors. This indicates that, according to the criteria or metrics used for evaluation, the IT industry has a strong emphasis on social factors. The social score of 67.8 suggests that the companies within the IT sector are performing well in areas related to social responsibility, community engagement, employee well-being, diversity and

inclusion, and other social impact considerations.

The analysis also reveals that the IT Industry has the highest governance score. This indicates that, according to the criteria or metrics used for evaluation, the IT industry places a strong emphasis on governance factors. The governance score of 77.0 suggests that companies within the IT sector are performing well in areas related to corporate governance, transparency, accountability, and adherence to ethical business practices.

Here are some notable case studies of successful ESG strategies implemented by organizations across various industries. These demonstrate how effective ESG initiatives can drive sustainability, improve stakeholder relationships, and enhance financial performance:

- **Unilever** launched its **Sustainable Living Plan**, focusing on reducing environmental impact, improving health and well-being, and enhancing livelihoods. The company aims to share the environmental footprint of its products, source 100% of its agricultural raw materials sustainably, and improve the health of over a billion people. Over 60% of Unilever's agricultural raw materials are now sustainably sourced. The company achieved a 32% reduction in carbon emissions per consumer unit between 2010 and 2020.
- **Tesla** focuses on accelerating the transition to sustainable energy through electric vehicles (EVs), solar power, and energy storage solutions. The company incorporates recycling systems to recover valuable materials from old batteries. Tesla became the largest EV manufacturer globally, significantly reducing emissions compared to traditional vehicles Its Gigafactories are powered by renewable energy, reducing operational emissions.
- **Microsoft** committed to becoming carbon-negative by 2030 and removing all historical emissions by 2050. The company invests in carbon removal technologies and powers operations with 100% renewable energy. Microsoft will achieve 100% renewable energy for its data centers by 2022. The company allocated $1 billion to a Climate Innovation Fund to accelerate global carbon reduction.
- **Mahindra** pledged to become carbon neutral by 2040 and actively invests in renewable energy and electric vehicle manufacturing. The company promotes

afforestation and water conservation projects through its CSR initiatives. Mahindra became the first Indian company to commit to the **Science-Based Targets Initiative (SBTi)** for emission reductions. Over 1 million trees were planted under Project Hariyali.

- **Nestlé** focuses on responsible sourcing, reducing water use, and improving nutrition. The company implemented initiatives to eliminate deforestation in its supply chain and transition to recyclable packaging. Achieved a 100% deforestation-free supply chain for its core commodities like palm oil. Committed to making all packaging recyclable or reusable by 2025.
- **Starbucks** focuses on ethical sourcing of coffee, reducing its environmental footprint, and supporting farmers. It partners with NGOs like Conservation International to ensure sustainable practices. Over 99% of Starbucks coffee is ethically sourced. Committed to achieving carbon-neutral green coffee by 2030.

These examples demonstrate that companies aligning their business models with ESG principles not only address sustainability challenges but also achieve competitive advantages in the market.

The chemical industry consistently demonstrates poor environmental performance, as reflected in low Environmental, Social, and Governance (ESG) scores. Key contributing factors include excessive resource consumption, high emissions, and substantial hazardous waste generation (Kumar & Sharma, 2022). Inadequate waste management practices and non-compliance with environmental regulations further exacerbate these challenges, often resulting in regulatory penalties and reputational damage (Singh et al., 2021). Additionally, the sector's slow transition to renewable energy sources and reluctance to adopt green chemistry principles hinder sustainability efforts (World Economic Forum, 2023). Small and medium enterprises (SMEs) in India, in particular, struggle to meet stringent global ESG and safety standards due to financial and technological constraints (IBEF, 2022). A lack of transparent ESG reporting further compounds these issues, limiting investor confidence and international competitiveness (Dutta & Bose, 2023).

Social and Governance Disparities Across Sectors

Social Performance Variations

The Utilities and Energy sectors exhibit strong social performance, attributed to ethical employment practices, community engagement, and robust corporate social responsibility (CSR) initiatives (McKinsey & Company, 2023). Conversely, the chemical industry records the lowest social score (38), indicating deficiencies in employee welfare, diversity and inclusion, and community relations (Sustainalytics, 2023). Targeted interventions, such as workforce development programs and stakeholder engagement strategies, could enhance social performance in underperforming sectors.

Governance Performance Insights

The Information Technology (IT) industry excels in governance, reflecting well-defined corporate structures, stringent risk management frameworks, and regulatory compliance (Gartner, 2023). In contrast, the Utilities and Energy sectors exhibit governance weaknesses, suggesting a need for improved board oversight and ethical business practices (Deloitte, 2022). Transparency in governance reporting and adherence to international standards could strengthen performance in these industries.

Strategies for ESG Improvement in Struggling Sectors

To enhance ESG performance, industries such as Chemicals and Energy should consider the following measures:

1. **Adoption of Cleaner Technologies** – Accelerating the shift toward renewable energy and sustainable production methods (IEA, 2023).
2. **Enhanced ESG Reporting** – Implementing standardized disclosure mechanisms to improve transparency (SEBI, 2022).
3. **Regulatory Compliance** – Strengthening adherence to environmental and safety regulations to mitigate penalties (OECD, 2023).
4. **Stakeholder Engagement** – Developing community outreach and employee welfare programs to bolster social scores (PwC, 2023).

CONCLUSION RECOMMENDATIONS AND SUGGESTIONS

Possible reasons for a low environmental score in the Chemical industry include issues such as high resource consumption, emissions, waste generation, or other

environmental impact factors. It might be valuable to conduct a more detailed analysis to understand specific areas of concern and potential areas for improvement within the environmental practices of companies in the Chemical industry. Similarly, the Utilities and Energy sectors demonstrated significant score variations across the three pillars during the study period, excelling in the social aspect but displaying weaknesses in the Governance category. On the other hand, the Consumer Discretionary and Materials sectors maintained consistently tight scores across the Environmental, Social, and Governance pillars.

The chemical industry generates significant dangerous waste, emissions, and effluents that can harm air, water, and soil quality. Poor waste management and non-compliance with environmental standards lead to penalties and lower ESG scores. Slow transition to renewable energy sources hampers sustainability efforts. Many small and medium enterprises (SMEs) in the Indian chemical sector struggle to meet stringent global ESG and safety standards. Many companies lack clear reporting mechanisms or fail to disclose critical ESG data, such as emissions and safety incidents. Indian chemical firms often face criticism for not aligning with global ESG benchmarks, making them less attractive to international investors.

Many businesses in the sector lack awareness of the growing importance of ESG, leading to insufficient prioritization of sustainability initiatives. Transitioning to cleaner technologies and renewable energy is capital-intensive, which discourages adoption, especially for smaller firms.

The slow adoption of green chemistry and sustainable production techniques limits the sector's ability to improve ESG performance.

A high social score in the IT industry may be indicative of positive practices such as ethical employment practices, community involvement, and corporate social responsibility initiatives. It reflects a focus on the well-being of employees, stakeholders, and the broader community. Understanding the specific factors contributing to the high social score within the IT industry can provide valuable insights for other sectors and contribute to the sharing of best practices in social responsibility and sustainability. Further analysis of access to detailed criteria for scoring would provide a more

comprehensive understanding of the specific strengths contributing to the IT industry's high social score. On the other hand, the Chemical Industry also lowest Social Score of 38 among the industries, a low social score may suggest challenges or areas for improvement related to social responsibility, employee well-being, community engagement, diversity and inclusion, and other social impact factors. To address this, companies in the Chemical industry could consider implementing targeted initiatives and strategies to enhance their social performance and contribute positively to society.

A high governance score in the IT industry may be indicative of robust corporate governance structures, effective risk management practices, and adherence to regulatory requirements. It reflects a commitment to maintaining high standards of ethical conduct and governance principles. Understanding the specific factors contributing to the high governance score within the IT industry can provide valuable insights for other sectors and contribute to the sharing of best practices in corporate governance and accountability. Further analysis of access to detailed criteria for scoring would provide a more comprehensive understanding of the specific strengths contributing to the IT industry's high governance score.

For struggling sectors looking to improve their Environmental, Social, and Governance (ESG) performance, practical and actionable steps are essential. Here are suggestions tailored to address the challenges faced by such industries:

RECOMMENDATIONS AND SUGGESTIONS

1. For Environmental

- Implement energy-saving technologies (e.g., waste heat recovery, LED lighting, energy audits).
- Transition to solar, wind, or biomass energy for operations. Consider renewable energy Power Purchase Agreements (PPAs).
- Introduce circular economy models by recycling waste materials and using by-products.
- Use water-efficient processes and recycling systems (e.g., Zero Liquid Discharge, rainwater harvesting).
- Set measurable carbon neutrality or net-zero targets and use carbon offsets where direct reductions are challenging.

2. For Social

- Enhance worker safety by implementing global Occupational Health and Safety (OHS) standards.
- Provide fair wages, skill training, and development opportunities for employees.
- Foster a diverse and inclusive workplace with active promotion of gender and cultural equity.
- Develop Corporate Social Responsibility (CSR) programs focusing on healthcare, education, and infrastructure in local communities.
- Involve communities in decision-making processes for projects that impact them.
- Conduct regular audits to ensure suppliers adhere to ESG standards.
- Partner with sustainable suppliers and promote fair trade practices.

3. For Governance

- Adopt globally recognized reporting frameworks like the **Global Reporting Initiative (GRI)** or **Sustainability Accounting Standards Board (SASB)** for ESG disclosures.
- Publicly disclose key ESG metrics, including emissions, diversity data, and governance practices.
- Diversify board representation to include expertise in sustainability and stakeholder engagement.
- Build partnerships with NGOs, governments, and industry peers to align with global ESG goals.
- Actively communicate with investors, employees, and consumers about ESG progress.
- Apply for green bonds, sustainability-linked loans, or grants to fund ESG initiatives.
- Obtain certifications like ISO 14001 (Environmental Management), ISO 45001 (Occupational Health & Safety), or FSC (Forest Stewardship Council).
- Use IoT devices to monitor emissions, water usage, and energy consumption in real time.
- Implement AI and data analytics to optimize supply chains and predict ESG risks.
- Conduct ESG training for employees, suppliers, and leadership teams.

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Reviewing The Landscape Of Esg Disclosures: Insights From Existing Literature

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Abstract: *In this paper, a critical review of research on the impact of ESG (Environmental, Social, and Governance) disclosures on firm performance is presented. The study is based on a comprehensive review of literature, categorized according to research objectives, which include the overview of ESG disclosures, their influence on firm performance, a review of existing literature, awareness about ESG practices, and other related studies. A total of 80 research papers and articles were reviewed. The further analysis is illustrated through graphs and tables, summarizing the review of literature based on publication year, countries where the research was conducted, research objectives, and statistical methods used. It can be concluded that significant attention has been given to ESG disclosures in recent years, reflecting its growing importance. The research spanned across 35 countries, with most studies aiming to provide a fundamental understanding of ESG disclosures and their impact on various performance metrics. Many studies focused on identifying the benefits and challenges of ESG disclosures, with a comparative analysis of these factors across different industries. The majority of the research employed descriptive statistics, indicating their prominence in data analysis, while several authors also utilized correlation and regression analysis to establish relationships and causality.*

Keywords: *ESG Disclosures, Environment Disclosures, Governance Disclosures, Social Disclosures, Review*

1. INTRODUCTION

In the realm of finance, the integration of Environmental, Social, and Governance (ESG) factors has become a pivotal consideration in investment and strategic decision-making. ESG disclosures

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provide stakeholders with critical information regarding a firm's environmental impact, social responsibilities, and governance practices. Increasingly, these disclosures are recognized as essential for assessing long-term sustainability and risk management. Several authors have attempted to define and quantify the impact of ESG on firm performance. ESG disclosures refer to the transparent communication of a company's environmental initiatives, social contributions, and governance policies. These disclosures can influence a firm's reputation, operational efficiency, and financial outcomes.

The significance of ESG disclosures has risen in parallel with heightened awareness of sustainable practices among investors, regulators, and consumers. ESG factors are used to gauge a company's commitment to sustainable and ethical operations, potentially affecting investor decisions and overall firm valuation. Companies that effectively communicate their ESG practices often see enhanced investor trust and potentially better financial performance. ESG integration can lead to improved risk management, operational efficiencies, and access to capital, as well as competitive advantages in the marketplace.

Prior research has extensively explored the relationship between ESG disclosures and firm performance, with varied results across different industries and regions. A summary of these studies and their findings is presented in this research. In the current study, we have taken a total of 80 research papers, which can be broadly divided into four categories.

The first category covers research papers encompassing environmental disclosures, the second social disclosures, the third governance disclosures, and the fourth overall ESG (Environmental, Social, and Governance) disclosures.

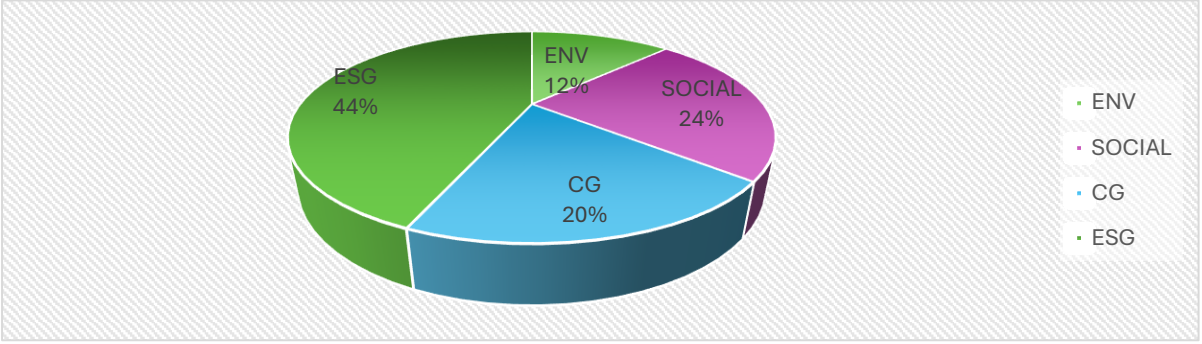

Figure 1 Categories of Research Papers

1.1 Researches on Environment Disclosures and Firm Performance:

Prasad et al. (2017) examined the extent and quality of environmental disclosures by Indian companies, employing legitimacy and agency theories. Their findings revealed that firms in environmentally sensitive industries disclose more environmental information, aligning with legitimacy theory, as these disclosures help legitimize their operations. Menike (2020) investigated the impact of environmental disclosures on the performance of food, beverage, and tobacco companies listed on the Colombo Stock Exchange. The study found that environmental disclosure and firm size positively influenced return on assets, while liquidity showed no significant relationship. Similarly, Amosh & Mansor (2020) studied the influence of ownership structure on environmental disclosure in Jordan and found that foreign ownership positively affected disclosure levels, reflecting improved corporate governance and adherence to legitimacy theory. However, government ownership did not pressure firms to enhance disclosure practices.

Kumar Swain et al. (2017) assessed environmental reporting among Indian corporations using GRI guidelines and found inconsistencies in reporting certain factors, such as energy and water, while others, like materials and biodiversity, were more consistent. Nor et al. (2016) discovered a significant relationship between total environmental disclosure and profit margins among Malaysia's top 100 companies, although other performance metrics were not significantly related. Singhania & Gandhi (2015) developed an environmental disclosure index for Indian firms and observed that factors such as location, turnover, and company age significantly determined disclosure levels.

1.2 Researches on Social Disclosures and Firm Performance:

Maqbool & Hurrah (2021)explored the reciprocal link between Corporate Social Responsibility (CSR) activities and financial performance. Their findings underscored that CSR initiatives have a constructive effect on both present and future financial performance by way of social aspects. Pareek et al. The study conducted in 2023 examined the impact of gender diversity on corporate boards,

profitability (Tobin's Q), and firm size, demonstrating a noteworthy relationship with sustainability performance. Farah et al. (2021) identified non-linear impacts of Corporate Social Responsibility (CSR) on systematic risk. The findings indicate that CSR has the potential to initially heighten risk levels, which then decrease beyond a certain threshold due to the effect of operating leverage..

Kolisch et al. (2015) found the influence of CSR on financial performance varies between industries and countries, with a specific focus on Germany and the USA. Meenu Maheshwari & Kaura (2014)observed that environmental disclosures in Indian CSR reporting are predominantly characterized by qualitative statements. Cavaco & Crifo (2014) conducted an analysis of various CSR dimensions, revealing that employee and customer responsibilities reinforce financial performance, although environmental responsibility may sometimes present conflicting demands. McWilliams & Siegel (2000) identified a range of effects of corporate social responsibility (CSR) on financial performance, including positive, negative, and neutral impacts, underscoring the multi-dimensional nature of the relationship.

1.3 Researches on Governance Disclosures and Firm Performance:

Al-Homaidi et al. (2019)examined the impact of corporate governance on the financial performance of Indian hotel companies. The findings indicated that the characteristics of the board and audit committee, as well as institutional ownership, played a significant role in influencing performance. Handa (2018) emphasized that chairman-CEO duality, director remuneration, board committees, and female directors play a crucial role in influencing bank performance. Shahwan (2015)research identified substandard corporate governance practices within Egyptian firms. The study concluded that there was no evident relationship between governance practices and financial performance, and a tenuous adverse relationship with financial distress.

Otieno et al. (2015) noted that the implementation of participative management and democratic leadership had a positive influence on the financial performance of savings and credit cooperatives. Conversely, the study found that the size of the board had a negligible impact on financial outcomes. Raithatha & Bapat (2014) discovered that board size had a notable impact on

financial disclosures within Indian companies, whereas board independence did not demonstrate a significant effect, thus aligning with resource dependency theory. In the study conducted by Gupta & Sharma (2014), an analysis was made of governance practices in India and South Korea, examining the relationship between board structures and committees and their impact on firm performance.

1.4 Researches on Overall ESG Disclosures and Firm Performance:

Sharma et al. (2020)observed that profitability metrics such as Return on Assets (ROA) and Return on Capital Employed (ROCE) significantly influenced the extent of ESG disclosures among Indian companies, with larger firms exhibiting a greater tendency to disclose. Kim & Li (2021) also found that ESG factors positively influenced profitability, especially among larger companies, where corporate governance exhibited the highest magnitude of influence. Yilmaz (2021)confirmed these results by demonstrating a substantial positive relationship between overall ESG scores and financial performance, indicating that the collective influence of all ESG elements has a greater impact than individual factors.

Buallay et al. (2022)explored the relationship between sustainability reporting and performance within the tourism industry. The findings indicated notable positive impacts on operational (ROA) and market performance (TQ), while financial performance (ROE) was not influenced. Similarly, Zhou et al. (2022)'s study identified that environmental, social, and governance (ESG) performance has a positive impact on market value, with financial performance acting as a mediating factor. Melinda & Wardhani (2020)underscored the significance of ESG disclosures in augmenting corporate value, demonstrating that ESG factors - encompassing environmental, social, and governance aspects - contribute to the enhanced valuation of companies. On the contrary, Jha& Rangarajan (2020) findings predominantly showed results that were not statistically significant, indicating the absence of a causal link between corporate sustainability performance (CSP) and corporate financial performance (CFP) in Indian companies.

Numerous studies have investigated the influence of environmental, social, and governance (ESG) disclosures on financial outcomes. Kim & Li (2021)pinpointed governance as the

predominant ESG factor in enhancing financial performance. El Khoury et al. (2023) investigated the factors influencing ESG performance in banks located in the Middle East and North Africa. The findings revealed that economic development has a negative influence on the environmental aspect, whereas corruption has a detrimental impact on the overall ESG ratings. In a related study, Izcan & Bektas (2022) identified a notable adverse relationship between ESG scores and idiosyncratic risk in Eurozone banks, attributing the findings primarily to governance and environmental factors.

Farooq reported no statistically significant relationship between ESG disclosures and firm performance or risk profiles in emerging markets, a finding that contradicts the results obtained by Atan & Razali (2016) examined variability in ESG disclosures across regions influenced by regulatory mandates, exemplified by the contrast between Malaysia and Denmark. These varied results underscore the intricate nature of how ESG factors can impact financial performance within different contexts and industries.

2. VISUAL SYNOPSIS OF LITERATURE REVIEW:

This section presents a summary of the review of literatures in the form of graphs based on the findings from 80 research papers on the relationship between Environmental, Social, and Governance (ESG) disclosures , Environment disclosures, social disclosures, governance disclosure, and Firm Performance. The graphical summary includes an analysis of the year of publication, countries where the research was conducted, research objectives, and statistical tools used. These visual representations provide a comprehensive overview of the trends and patterns in the research on ESG disclosures and Firm Performance, highlighting the diversity in methodologies, regional focus, and research objectives.

2.1 Publication Year: Distribution of studies over time

This section presents a graphical summary of the literature review on the Environmental, Social, and Governance (ESG) disclosures. Figure 2 shows the years in which the research papers were published, indicating the evolution of interest in this topic over time.

The trend depicted by the distribution of research papers on the relationship between Environmental, Social, and Governance (ESG) disclosures and Firm

Performance shows a growing academic interest over time. The earliest paper in this review was published in 2010, representing 2% of the total. There was a gradual increase in publications, with 7% of the research papers published in 2014, 9% in 2015, 5% in 2016, 4% in 2017, 6% in 2018, and a significant jump to 11% in 2019. The trend continues with 16% in 2020, 13% in 2021, 11% in 2022, and 5% in 2023.

The noticeable spike in research publications in 2020 can be partly attributed to the COVID-19 pandemic, which heightened global awareness of sustainability and corporate resilience. During the pandemic, companies' ESG practices were scrutinized more closely as stakeholders demanded greater transparency and accountability. This increased focus on ESG factors as crucial elements of risk management and long-term sustainability likely drove the surge in academic interest and research during this period.

Overall, this trend highlights the evolving and expanding body of research on ESG disclosures and their impact on financial performance, reflecting the broader movement towards integrating sustainability into business practices and strategies, especially in response to global challenges like the COVID-19 pandemic.

Table 1 : Research Papers with Publication Years

Year of Publication	No. of Research Papers	Year of Publication	No. of Research Papers
2023	**4**	**2016**	**4**
2022	**9**	**2015**	**7**
2021	**10**	**2014**	**6**
2020	**12**	**2013**	**4**
2019	**9**	**2012**	**2**
2018	**5**	**2011**	**1**
2017	**3**	**2010**	**2**

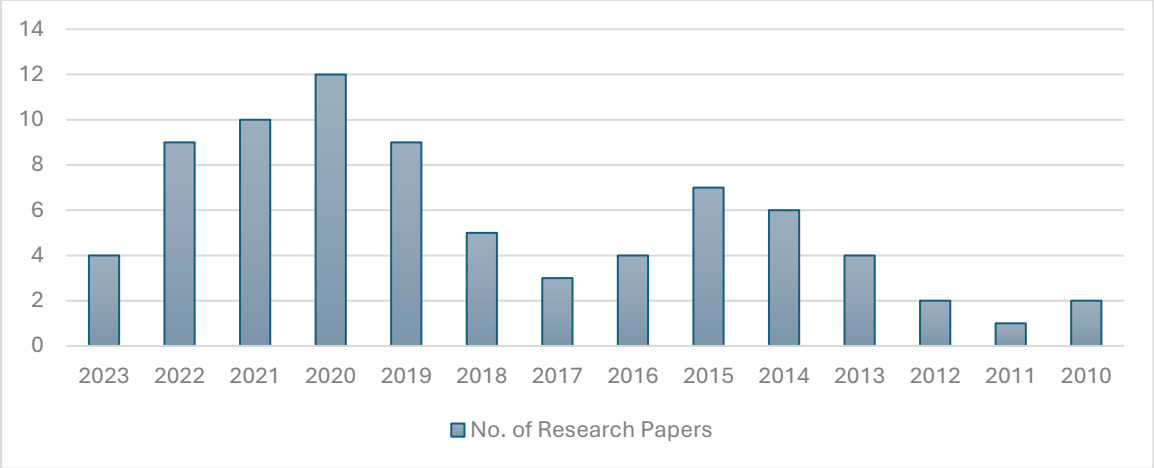

Figure 2: Research Papers with Publication Years

2.2 Countries where research was conducted: Geographic Distribution of the studies.

Figure 3 illustrates the countries where research on ESG disclosures and CFP was conducted. Research was carried out in a total of 8 countries, with the highest number of research papers from India (39), followed by Malaysia (3), Germany (2), China (2), and one paper each from Indonesia, South Korea, Denmark, and the US. This distribution indicates that while ESG research is gaining global traction, a significant portion of the studies has been conducted in India. The data reveals that although India leads in the number of studies, research in other regions continues to expand, reflecting the global importance of ESG issues.

Table 2: Geographic Distribution of the Prior Studies

Countries	**No. of Research Papers**	**Countries**	**No. of Research Papers**
India	39	Indonesia	1
Jordan	2	South Korea	2
Germany	2	US	3
Malaysia	3	Bangladesh	1
China	2	Others	21

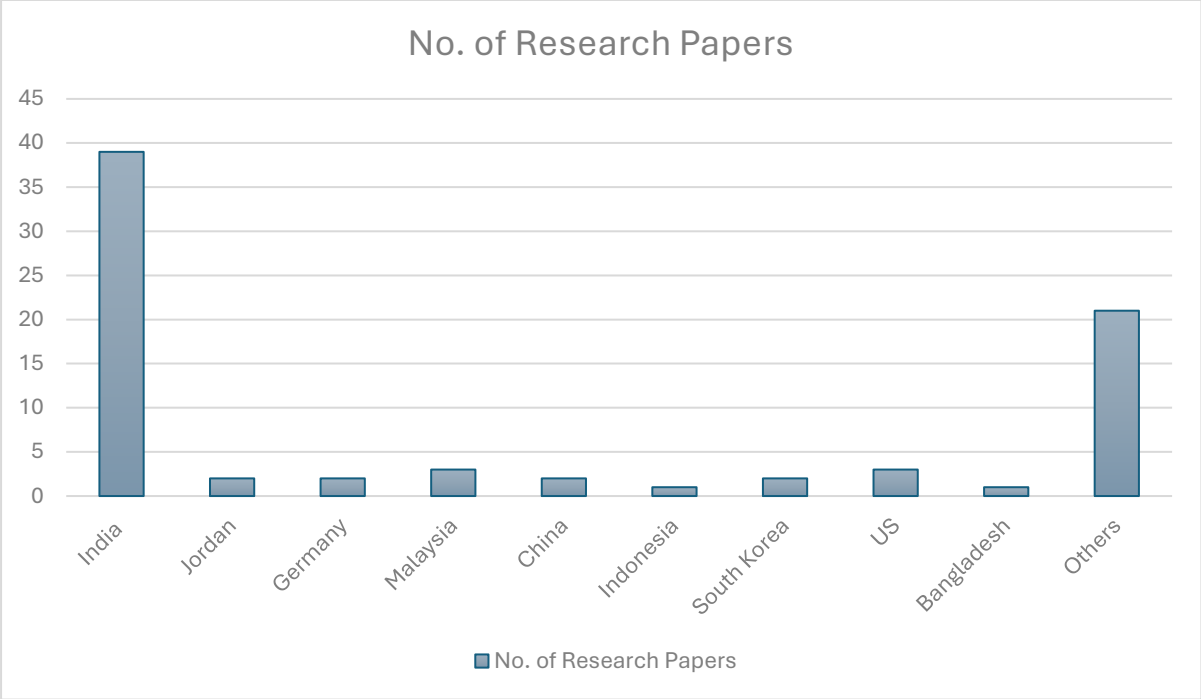

Figure 3: Geographic Distribution of the Prior studies

2.3 Objectives of the research: Key objectives and focus areas of the studies.

This distribution highlights that a significant portion of the research is dedicated to understanding the impact of ESG disclosures on financial performance, reflecting the primary interest in this area. Other categories, such as determinants, comparative studies, and regulatory frameworks, received less focus, indicating potential areas for future research to provide a more comprehensive understanding of ESG practices.

Table 3 Key Objectives of Prior Studies

Research Objectives	Number of Research Papers
Impact Analysis of Environment Disclosures	**08**
Impact Analysis of Social Disclosures	**15**
Impact Analysis of Governance Disclosures	**13**
Impact Analysis of ESG Disclosures	**24**
Comparative Studies	**02**
Conceptual Framework	**06**

Empirical Investigation on Firm	**04**
Regulatory Framework	**06**

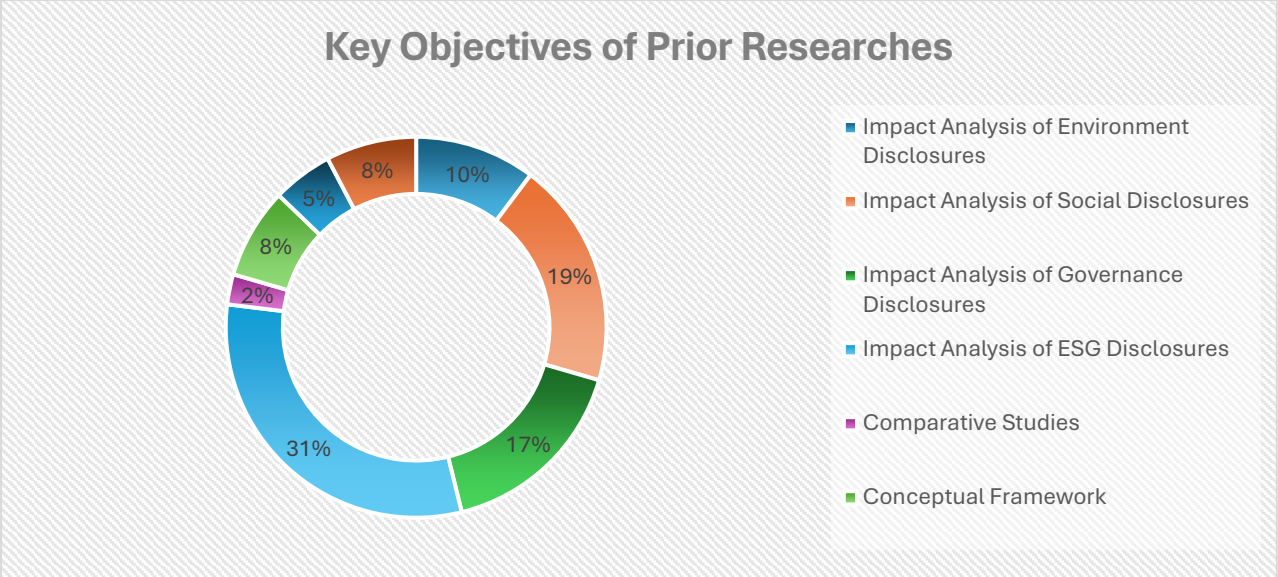

Figure 4 Key Objectives of Prior Studies

2.4 Statistical Tools Employed in Prior Researches:

Figure 4 shows statistical tools used in the prior studies. As the majority of research objectives focus on impact analysis, it is likely that descriptive statistics are predominantly utilized as a statistical tool in these studies. Descriptive statistics help in summarizing and describing the main features of a dataset, providing a simple summary about the sample and the measures.

Moreover, given the emphasis on understanding relationships and effects, many studies might also employ inferential statistical methods, such as regression analysis, to explore the associations between ESG disclosures and corporate financial performance. Regression analysis is particularly useful in determining the strength and nature of the relationship between dependent and independent variables.

In addition to descriptive and inferential statistics, other advanced statistical techniques such as structural equation modelling (SEM), factor analysis, and time-series analysis may also be used to provide deeper insights into the impact of

ESG disclosures. These methods allow researchers to account for complex interrelationships and dynamics within the data, offering a more comprehensive understanding of how governance, environmental, and social factors influence financial outcomes.

The array of statistical tests used by researchers includes the Kolmogorov-Smirnov Test, Likelihood Ratio Test, Shapiro-Wilk Test, ANOVA, Durbin-Watson Test, Kruskal-Wallis Test, Cronbach's Alpha, Mann-Whitney U-Test, and Hausman Test. These diverse statistical methods reflect the multifaceted nature of ESG research, allowing for a comprehensive exploration of the relationships and effects within the data.

Table 4: Statistical Tools employed in Prior Researches

Statistical Tools	**No. of Research Papers**	**Statistical Tools**	**No. of Research Papers**
Content Analysis	5	Regression Model	22
Descriptive Statistics	30	Likelihood Ratio Test	1
Econometric Model	6	Sharpio-Wilk Parametric Test	2
Panel Data Analysis	18	ANOVA	2
Ordinary Least Square	3	Durbin Wu Hausman Test	1
Chi Square Test	3	Kruskal -Wallis test	2
Correlation	20	Cronbach’s Alpha	1
T test	4	Mann Whitney U Test	3
F test	1	Hausman Test	5
Multiple Regression	7	Kolmogorov Test (Normality)	2

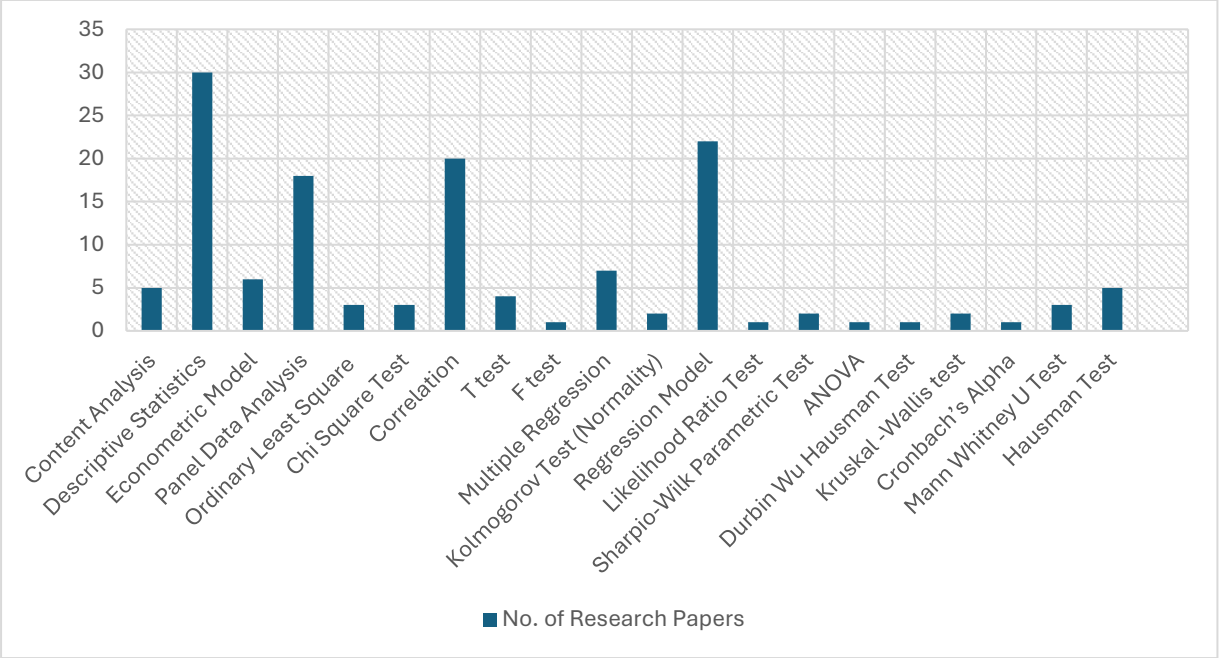

Figure 5: Statistical Tools employed in Prior Researches

3. CONCLUSION

The present paper offers a comprehensive review of research on Environmental, Social, and Governance (ESG) disclosures, analysing 78 research papers and articles. These studies are categorized into four main groups according to their research objectives, showcasing the diverse approaches and focal points within the field of ESG disclosures. Researchers found the earliest paper on ESG disclosure published in 2010. The peak of publications occurred in 2020, indicating that significant research interest in ESG disclosure is relatively recent. The study also found that research on ESG disclosure has been conducted in 13 countries, with the majority of studies originating from India.

The reviewed studies encompass a wide geographical range, including research conducted in 15 different countries. ESG disclosures have gained significant traction globally; however, there is a noticeable disparity in research volume, with fewer studies originating from certain regions, such as India, compared to others. This underscores the necessity for more region-specific research to better understand the nuances and impacts of ESG disclosures in diverse contexts.

The primary objective of most reviewed studies was to provide a foundational overview of ESG disclosures, exploring

their impact analysis, benefits, and regulatory framework. A considerable number of studies focused on identifying the factors that influence the quality and extent of ESG disclosures, as well as conducting comparative analyses across different industries and regions.

Additionally, some studies delved into the broader awareness and understanding of ESG disclosures, examining their importance and the challenges associated with their implementation. A few studies also addressed the regulatory frameworks governing ESG disclosures, case studies of specific companies, and evaluations of ESG disclosure practices.

The majority of the reviewed research utilized descriptive statistics, highlighting the prevalence of this analytical method in ESG disclosure studies. Several studies also employed correlation and regression analyses to explore relationships between variables, adding depth to the understanding of ESG disclosures and their implications.

In summary, this critical review underscores the evolving nature of ESG disclosure research, identifying key areas for future study and emphasizing the need for more comprehensive, region-specific investigations to enhance the global understanding of ESG practices and their impacts.

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The Impact Of Regulatory Changes On Retail Investor Participation In The Indian Capital Market: An Analysis

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Abstract: *This study investigates the impact of recent regulatory changes introduced by the Securities and Exchange Board of India (SEBI) on retail investor participation in the Indian capital market. Focusing on a sample of 100 retail investors, the research analyses shifts in investment behaviour, trading frequency, and investor confidence before and after the 2021 regulatory amendments. The findings reveal significant increases in average montly investment, trading frequency, and investor confidence post-regulation, highlighting the positive influence of a well-structured regulatory framework on retail investor engagement. However, the variability in responses suggests that the effects of these regulations are not uniformly experienced, indicating a need for more targeted and nuanced regulatory strategies. The study concludes with recommendations for future regulatory initiatives, emphasizing the importance of financial literacy programs, continuous monitoring of regulatory effectiveness, and tailored approaches to address the diverse profiles of retail investors.*

KEYWORDS: *Indian capital market, retail investor participation, SEBI, regulatory changes*

INTRODUCTION

The Indian capital market has undergone substantial transformation over the past few decades, propelled by technological advancements, economic growth, and regulatory reforms. Retail investors, who play a crucial role in this market, contribute significantly to market liquidity, price discovery, and overall stability. However, their participation levels are highly susceptible to regulatory changes, which can either foster or hinder their engagement. The Securities and Exchange Board of India (SEBI) has been at the forefront of implementing regulatory changes to protect retail investors and encourage their active participation. These initiatives have included stricter regulations on

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initial public offerings (IPOs), mutual funds, and trading practices, as well as measures to enhance transparency and reduce transaction costs. Despite these efforts, retail investor participation remains unpredictable, often swayed by market sentiment, economic conditions, and the perceived effectiveness of these regulatory measures.

This study explores how recent regulatory reforms have affected retail investor participation in the Indian capital market. By analysing data from a sample of 100 retail investors, the research seeks to understand how these changes have influenced investment behaviour, trading frequency, and overall market confidence. This analysis is particularly relevant amidst ongoing debates regarding the effectiveness of SEBI's regulations and the need for further reforms to boost investor participation. The significance of this research lies in its potential to provide valuable insights into the direct effects of regulatory changes on retail investor behaviour, an area that has not been extensively explored in existing literature. Moreover, the findings could offer crucial guidance to policy-makers and market regulators, helping them assess the current regulations' effectiveness and identify areas for improvement. Ultimately, this study aims to contribute to a broader understanding of how regulatory frameworks shape market participation, which is essential for developing policies that support a more inclusive and resilient capital market.

LITERATURE REVIEW

The relationship between regulatory changes and retail investor participation has been a subject of significant academic interest. The literature reveals a consensus that regulatory frameworks are crucial in shaping investor behaviour and market dynamics (Rajan & Zingales, 1998). Regulatory changes often aim to protect investors, enhance market efficiency, and promote transparency, all of which are critical for maintaining investor confidence (La Porta et al., 1998).

In the context of the Indian capital market, several studies have examined the role of SEBI in regulating and reforming market practices. For instance, Choudhary and Garg (2018) analysed the impact of SEBI's regulatory changes on IPO processes and found that stricter regulations led to increased investor confidence and participation. Similarly, Sharma (2020) explored the effect of mutual fund regulations on retail investor behaviour, concluding that improved transparency and reduced costs significantly enhanced investor engagement.

However, the literature also points out the challenges linked to regulatory changes. According to Singh and Agarwal (2019), while regulations are intended to protect investors,

they can also inadvertently increase complexity and costs, potentially deterring retail investors. This sentiment is echoed by Mehta and Patel (2021), who argued that frequent regulatory changes create uncertainty, which can lead to reduced market participation.

Moreover, empirical studies have shown that the effectiveness of regulatory changes often depends on investor perceptions and market conditions. Jain and Gupta (2017) found that positive market sentiment amplifies the impact of favourable regulations, while negative sentiment can negate their effects. This suggests that regulators need to consider market conditions and investor psychology when designing and implementing regulatory changes.

The literature also indicates a need for more targeted regulations that address the specific needs and concerns of retail investors. Gupta and Mehra (2019) emphasized the importance of tailored regulations that consider the diverse profiles of retail investors, including their risk tolerance, investment objectives, and financial literacy. This approach, they argue, would help in crafting regulations that are more effective in encouraging retail investor participation.

The literature consistently highlights that regulatory changes play a crucial role in shaping retail investor participation in the Indian capital market. However, it also points to the complexities and challenges associated with regulatory reforms, highlighting the need for a balanced approach that protects investors while promoting market participation.

STATEMENT OF THE PROBLEM

Despite extensive regulatory efforts by SEBI, the participation of retail investors in the Indian capital market remains inconsistent and sensitive to various external factors. This research seeks to investigate how recent regulatory changes have impacted retail investor behaviour, particularly in terms of investment patterns, trading frequency, and market confidence. The problem lies in understanding the effectiveness of these regulations in fostering a stable and participatory market environment for retail investors.

OBJECTIVES

- To analyse the impact of regulatory changes on retail investor participation in the Indian capital market.
- To assess the changes in investment behaviour and trading frequency among retail investors following the implementation of these regulations.
- To evaluate the overall market confidence of retail investors post-regulation.

RESEARCH METHODOLOGY

Research Design

This study employs a quantitative research design to assess the impact of regulatory changes on retail investor participation in the Indian capital market. Focusing on a sample of 100 retail investors, the research is structured as a cross-sectional analysis that examines shifts in investor behaviour before and after the implementation of key regulatory amendments introduced by the Securities and Exchange Board of India (SEBI) in 2021. These amendments, which occurred in four distinct phases throughout the year, serve as critical benchmarks for analysing changes in investment patterns, trading frequency, and overall market engagement. This approach enables a comprehensive understanding of the regulatory impact on investor behaviour within the specified timeframe.

This study is based on the regulatory framework provided by the Securities and Exchange Board of India (Delisting of Equity Shares) Regulations, 2021, incorporating the latest amendments as of August 3, 2021. These regulations oversee both voluntary and mandatory delisting of equity shares from all recognized stock exchanges in India. They stipulate the procedural requirements, rights of public shareholders, timelines, price discovery mechanisms (primarily through reverse book building), and conditions under which delisting proposals may be accepted or rejected. The regulations aim to ensure transparency, fairness, and adequate protection for investors while facilitating efficient exit opportunities for promoters or acquirers. This legal framework provides the necessary compliance structure for companies undergoing delisting and serves as the regulatory foundation for the present analysis.

Data collection

The study was based on primary data. A sample of 100 retail investors in the stock market from Kerala were selected for the study.

ANALYSIS AND DISCUSSION

Demographics of the Sample

The demographic profile of the sample establishes a foundational understanding of the investors participating in this study. The average age of the investors is 35.5 years, with a standard deviation of 10.3 years, indicating that the sample predominantly comprises relatively young investors, with some variability in age distribution. In terms of investment experience, the investors have an average of 7.2 years in the capital market, with a standard deviation of 3.8 years. This reflects a sample with a moderate level of investment experience, although there is noticeable variation within the group. See Table 1.

Table 1

Sample Demographics

Demographic Variable	Mean	Standard Deviation
Age	35.5	10.3
Years of Investment Experience	7.2	3.8

Source: Primary data

Investment Patterns Pre-and Post-Regulation

The analysis of changes in investment behaviour is a key focus of this study, with a comparison of average monthly investment amounts and trading frequency before and after the recent SEBI regulatory changes. Before these regulations, the mean monthly investment was ₹50,000, with a standard deviation of ₹15,000, indicating some variation in the amounts investors were willing to commit each month. Following the regulatory changes, the mean monthly investment rose to ₹65,000, with a standard deviation of ₹20,000. This increase suggests that, on average, investors are committing more capital to the market post-regulation, though the variability in investment amounts has also widened. The high standard deviation in the investment amount suggests severe variation in the sample values on investment amount which shows respondents scattered from the mean. More details are given in Table 2.

Table 2

Investment Patterns Pre-and Post-Regulation

Variable	Mean (Pre-Regulation)	Mean (Post-Regulation)	Standard Deviation (Pre-Regulation)	Standard Deviation (Post-Regulation)
Monthly Investment (₹)	50,000	65,000	15,000	20,000
Trading Frequency (Trades/Month)	10	15	5	6

Source: Primary data

Trading Frequency

The trading frequency represents the number of trades made by the investors each month. This metric helps gauge the level of market activity and engagement by retail investors. Before the regulatory changes, the mean trading frequency is 10 trades per month, with a standard deviation of 5 trades. This indicates moderate trading activity with some variability among investors. Post-regulation, the mean trading frequency increases to 15 trades per month, with a standard deviation of 6 trades. This increase suggests that investors are more actively trading in the market following the regulatory changes.

Investor Confidence

Investor confidence is measured on a scale of 1 to 5, with higher values indicating greater confidence in the market. The average confidence level among investors before the regulatory changes is 3.2, indicating a moderate level of confidence. After the regulatory changes, the average confidence level increases to 4.0, suggesting a significant boost in investor confidence

Table 3

Investor Confidence Levels Pre-and Post-Regulation

Variable	Mean (Pre-Regulation)	Mean (Post-Regulation)	Standard Deviation (Pre-Regulation)	Standard Deviation (Post-Regulation)
Investor Confidence (1-5)	3.2	4.0	0.8	0.9

Source: Primary data

Descriptive Statistics

The mean monthly investment increased significantly from ₹50,000 before the regulatory changes to ₹65,000 after the changes. The t-value of 4.5 indicates a strong statistical difference between the two periods, and the p-value of less than 0.01 confirms that this difference is highly significant. This suggests that the regulatory changes positively influenced investors, encouraging them to allocate more capital to the market. The increase in investment could be due to enhanced market conditions, greater investor protection, or improved confidence in the regulatory framework.

The average trading frequency rose from 10 trades per month before the regulations to 15 trades per month afterward. The t-value of 3.8 indicates a statistically significant increase in trading activity, with a p-value of less than 0.01 confirming the significance of this change. This suggests that the regulatory amendments not only encouraged higher investment amounts but also led to more active participation in the market. Increased trading frequency might reflect greater confidence in the market's stability, as well as possibly lower transaction costs or improved access to trading platforms post-regulation.

Investor confidence showed a notable increase, with the mean confidence level rising from 3.2 to 4.0 after the regulatory changes. The t-value of 2.9 indicates a statistically significant improvement in confidence, with a p-value of less than 0.05 supporting the significance of this finding. This suggests that the regulatory changes were successful in boosting investors' trust in the market. Higher confidence levels likely contributed to the observed increases in both monthly investment amounts and trading frequency, as investors felt more secure and optimistic about their investment decisions in a better-regulated environment. See Table 4 for more details.

Table 4

Descriptive Statistics of Key Variables

Variable	Mean (Pre-Regulation)	Mean (Post-Regulation)	t-value	p-value
Monthly Investment (₹)	50,000	65,000	4.5	<0.01
Trading Frequency (Trades/Month)	10	15	3.8	<0.01
Investor Confidence (Scale 1-5)	3.2	4.0	2.9	<0.05

Source: Researchers' computation

CONCLUSION AND SUGGESTIONS

The findings of this study underscore the significant impact that SEBI's 2021 regulatory changes have had on retail investor participation in the Indian capital market. Post-regulation, there was a notable increase in both the average monthly investment and trading frequency among retail investors, accompanied by a marked improvement in investor confidence. These shifts highlight the critical role that a well-designed regulatory framework plays in fostering a more active and engaged investor base. The data suggests that by enhancing market transparency and security, the SEBI amendments successfully incentivized investors to increase their market participation. However, the variability in responses among investors also indicates that the effects of these regulations may not be

uniformly experienced, emphasizing the need for a nuanced approach in regulatory design.

Looking forward, future regulatory initiatives should be more tailored to address the diverse profiles of retail investors, ensuring that all segments of the investor community are adequately supported. Enhancing financial literacy programs could further empower investors, helping them to better understand and benefit from regulatory changes. Continuous monitoring and adaptation of regulations are also essential to maintain their effectiveness in a dynamic market environment. Strengthening investor protection mechanisms remains crucial, alongside ongoing research to examine the long-term impacts of these regulatory changes. By adopting these strategies, regulators can ensure that the Indian capital market continues to evolve in a way that promotes greater inclusion, resilience, and sustained investor confidence.

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Artificial Intelligence And Accounting Research: A Bibliometric Analysis

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ABSTRACT: *Artificial Intelligence (AI) is driving a transformative change in the field of accounting and finance. This study aims to review research progress of the AI and Accounting research. This study presents a bibliometric overview using the Scopus database, identifying the most relevant research in the field classified by papers, authors, countries and journals. VOS viewer software was used to perform data visualization. The study employed key word co-occurrence analysis to identify the evolution of research themes over time in the field of AI and accounting. The results show that the most influential and cited journal is: The journal of emerging technologies in accounting with the highest number of articles published. It also shows that USA, Oman, New Zealand, UK and Indonesia are leading collaborating countries. Through visualization analysis, the study identified the main theoretical foundation, research themes, new methodologies and implications for future work in AI and accounting research. Finally, the study highlights future research agenda on AI and Accounting suggesting the least explored areas like triple-entry accounting, large language models, smart contract, technology readiness and chat boats.*

Keywords: *Artificial intelligence, accounting research, PRISMA, Bibliometric analysis, Vos Viewer*

INTRODUCTION

Digital technologies have led to tremendous and fast-paced changes in almost all areas of life. Over the last three decades, advances in nanotechnology have enabled hardware development with steadily increasing computational power (Dingli et al., 2021). As a result, digital developments like the Internet of Things or big data analytics are increasingly applied and used in many different areas. One

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of the most trending and hyped technologies of the digital age is artificial intelligence (AI) (Chollet, 2021). In recent years, Artificial Intelligence (AI) has increasingly attracted the interest of academics and practitioners, as one of the most disruptive and impactful technologies that have emerged from the Fourth Industrial Revolution (IR4.0) (Kommunuri, 2022, Kumar et al., 2022). AI involves making intelligent machines and embracing human-like machines (Kommunuri, 2022). It is a multifaceted technology applicable across many disciplines such as computer science, engineering, managerial, legal and agriculture (Lardo et al., 2022). Although AI technologies and their application in the accounting domain are still in the infant phase (Kommunuri, 2022), there is some evidence showing increased adoption (Kokina et al., 2021). The application of AI technologies in the accounting industry means that accounting functions have been further enhanced. The accounting function is no longer just financial reporting and compliance but includes detection of misstatements and irregularities using algorithms and data structures and using code languages such as Python, R, statistical analysis systems, and improving accounting estimates (Kommunuri, 2022). The accounting field underwent a significant technological revolution around the end of the 20th century. The accounting field is rapidly changing due to efficiency made possible by emerging technologies. The evolution of vibrant accounting technologies has resulted in an increase in the automation of accounting systems. General Electric is credited as being the first corporation to implement a computerized accounting system in 1954. Presently, accounting is a field where information technology (IT) has become well-known in this fourth industrial revolution (4IR) era, as businesses use cutting-edge technologies in their day-to-day operations. As a result of advances in IT, artificial intelligence (AI), blockchain, big data, cloud, enterprise resource planning (ERP) and information communication technology (ICT) have all emerged. Therefore, it is worth understanding how the evolution of technological hashtags has changed over time in the accounting profession.

The changing environment of accounting education and professional practices highlights the requirement of getting ready for a future in which technology plays a far more important role in advancing the industry (Kristandl 2022) To be competitive and relevant in the market accounting professionals must continuously adjust to new tools and processes as technology progresses. Integrating emerging technologies like block chain AI and big data into accounting curricula is crucial to equip graduates with the requisite abilities to operate

in a technology driven corporate landscape. This shift toward incorporating technology into accounting education reflects a broader trend of aligning educational programs with the demands of the evolving digital economy. Technology integration in accounting has driven significant advancements in the field leading to increased efficiency and automation of accounting systems Since the late 20th century. The introduction of numerous new technologies has severely altered the accounting environment and caused significant changes in the accounting sector (Kristandl2022).

With the increasing importance of AI in the accounting domain, a myriad of research on the application of AI in accounting has emerged in the last two decades. However, it is only in the most recent five years that there has been an astronomical rise in AI and its role in accounting Thus AI is a relatively new phenomenon, hence it is beneficial for academic scholars to regularly review prior relevant research to gain an overall view of the intellectual structure of this field and to predict how the field might move forward (Leung et al., 2017).

Previous research studies have been mainly qualitative (Kommunuri, 2022). On the other hand, those that were quantitative focused on single branches of accounting such as management accounting practices (Nain et al., 2022), auditing (Lamboglia et al., 2020), digital accounting (Ardianto & Anridho 2018), and behavioral accounting (Singh, 2021). Other studies focused on the broad topic of disruptive technologies hence they included big data, blockchain, and cloud accounting (Arora & Sharma 2022, Kumar et al., 2022, Lardo et al., 2022). Since previous studies were either qualitative or did not focus specifically on the accounting domain, the current study applies quantitative research of literature review to facilitate deeper insight into AI and accounting research area and reveal the focus of previous studies over the years and the relationships among them. Using bibliometrics, the current study aims to fulfil a research gap by carrying out a systematic and quantitative analysis of AI and accounting research in business, management and accounting; computer science; and economics, econometrics and finance journals indexed in the Scopus database.

LITERATURE REVIEW

The emergence of digital technology is driving a transformative change in accounting and finance domain. One such technology is Artificial Intelligence (AI). Thus, research on AI has grown astronomically in recent years. Kokina et al, (2021), provide an overview of the emergence of artificial intelligence in accounting and auditing. The study provides

evidence of artificial intelligence implementation by Big 4 accounting firms. A study by Sutton et al. (2018) investigates whether automation is the most effective solution in the accounting environment. Other studies investigate the impact of AI on the accounting profession. Bakarich and O'brien (2021) used a survey to investigate the extent to which AI is currently being utilized, specifically focusing on Robotic Process Automation (RPA) and Machine Learning (ML). The study also investigated the perceptions about the impact and receptiveness of this technology. Kokina et al. (2021) explore how Robotic Process Automation (RPA) is changing the work of accountants. The study identifies the roles that accountants will play in their organization's digital transformations. (Kokina et al., 2025) is of the opinion that the return on investment for AI in financial reporting is limited which explains why clients hesitate to implement it in addition to further safeguards that need to be designed in order to use AI in a regulated space.

Some researchers have focused on accounting education. Vincent et al. (2020) proposed a course in robotic process automation to add to the accounting curriculum. The authors argue that the accounting curriculum quickly needs to adapt to educate accountants of the future in this skill set. A study by Keys and Zhang (2020) presents three exercises that introduce the applications of robotic process automation (RPA) for accounting tasks. The exercises help in the introduction of RPA in an undergraduate accounting course.

Kommunuri (2022) pointed out that AI-enabled applications are already widely used in business. Thus, accounting professionals must adapt and realign with policies and the profession with digitalization. Most importantly is the suggestion that through AI, tertiary institutions and accounting graduates will have an opportunity to acquire AI knowledge which will give them a competitive advantage in future. Saleh et al. (2021) investigate the effect of AI on the quality and interpretation of financial statements. Moll and Yigitbasioglu (2019) investigate the role of internet-related technologies in shaping the work of accountants. The study establishes that scholars have not given sufficient attention to these technologies and how these technologies affect the everyday work of accountants. The authors suggest that there is an urgent need to understand the new kinds of accounting required to manage firms in the changing digital economy and to determine the new skills and competencies accountants may need to master to remain relevant and add value.

With this clear evidence that artificial intelligence and accounting research is expanding exponentially, updating prior

literature review studies and revisiting the theoretical foundation, thematic evolution, and future directions of artificial intelligence research in accounting becomes pertinent. Therefore, using bibliometric analysis, this study covers a longer publication period and targets articles in related journals in the areas of business, management and accounting; and economics, econometrics and finance.

DATA COLLECTION AND METHODOLOGY

Most of the research focuses on a accounting technology like AI, blockchain, big data, cloud, ERP or ICT. Thus, the main aim of this paper is to intuit the trending technology AI in the field of accounting research by providing a bibliometric overview of research articles published from 1984 to 2024.

OBJECTIVES OF THE STUDY

The following are the major objectives of the study:

- To provide comprehensive view of literature in the field of Artificial Intelligence and Accounting Research using Bibliometric Analysis.
- To Provide the future research hotspots in the field of artificial Intelligence and Accounting Research.

RESEARCH QUESTIONS

The study on Artificial Intelligence (AI) and Accounting Research covers various aspects through targeted research questions. It explores publication trends, leading journals, and influential articles using descriptive and citation analyses. The collaboration patterns among countries are examined through network analysis, while conceptual themes are identified using keyword co-occurrence analysis. To understand thematic similarities between countries and research fronts, bibliographic coupling is applied. Lastly, the interrelation between key authors, journals, and keywords is studied using connotation analysis. Together, these approaches provide a comprehensive overview of the structure and evolution of research in this domain.

Publication Trend:

- **Research Question:** What is the publication trend of AI and Accounting Research practices?
- **Objective:** To understand how literature in this area has evolved over the years.
- **Methodology:** Descriptive analysis using publication analysis.

Leading Journals:

- **Research Question:** Which journals are leading in AI and Accounting Research practices?

- **Objective:** To identify journals contributing the most.
- **Methodology:** Descriptive analysis using source title-wise publication and citation analysis.

Influential Articles:

- **Research Question:** Which are the most influential articles in this field?
- **Objective:** To discover the most cited or popular papers.
- **Methodology:** Citation analysis.

Country Collaboration:

- **Research Question:** How is the collaboration between countries in this field?
- **Objective:** To analyze collaboration trends.
- **Methodology:** Network analysis using co-authorship data.

Conceptual Structure:

- **Research Question:** What are the most prominent keywords used in AI and Accounting Research?
- **Objective:** To find the most researched areas.
- **Methodology:** Cluster analysis using keyword co-occurrence.

Coupling Structure Between Countries:

- **Research Question:** What is the coupling structure in research between countries?
- **Objective:** To provide information on similarity in research conducted between two countries
- **Methodology:** Intellectual structure analysis via bibliographic coupling.

Research Fronts:

- **Research Question:** What are the main thematic fronts in AI and Accounting Research?
- **Objective:** To group theme-wise similar articles.
- **Methodology:** Bibliographic coupling analysis.

Interrelation of Authors, Journals, and Keywords:

- **Research Question:** How are key authors, journals, and keywords connected?
- **Objective:** To explore their interrelationships.
- **Methodology:** Connotation analysis.

SELECTION OF DATABASE

There are various databases for published articles such as Scopus, Web of Science, Google Scholar etc and articles published have either open access or paid access. Basically, the database of Scopus and Web of Science provides superior quality articles with higher citations. So, mostly researchers, academicians, institutions prefer these databases for any sort of analysis. According to Pranckutė (2021), the database of Scopus is

more suitable for research purposes as it is interlinked and can filter the data as per our requirements.

In this study, Scopus database has been selected for bibliometric analysis. It was chosen because almost all papers of Web of Science are also indexed in Scopus. The Scopus database give comprehensive overview of research conducted in various domains across the world. It has a database of approximately 24,000 peer-reviewed journals out of which around 6,000 journals are open-access. This database is widely used in almost every domain. The database of Scopus was explored on 04 January 2025 to analyse the output of articles published from 1984 to 2024.

SELECTION OF KEYWORDS

The search criteria for Scopus database comprised of the following keywords “ai”, “artificial AND intelligence”, “data AND analytics”, “blockchain”,AND “accounting AND research” or “accounting, “accounting AND education”or ”accounting AND profession”, The papers were extracted using advanced search option and a combination of Title-Abstract-keyword was used to retrieve the data for a period from 1984 to 2024.

The query was run with the following ((TITLE-ABS-KEY : (ai) OR TITLE-ABS-KEY (artificial AND intelligence) OR TITLE-ABS-KEY (data AND analytics) OR TITLE-ABS-KEY (blockchain))) AND ((TITLE-ABS-KEY (accounting AND research) OR TITLE-ABS-KEY (accounting) OR TITLE-ABS-KEY (accounting AND education) OR TITLE-ABS-KEY (accounting AND profession))) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "ECON"))

The figure 1 shows the entire process of identification, screening and data analysis using a PRISMA flowchart.

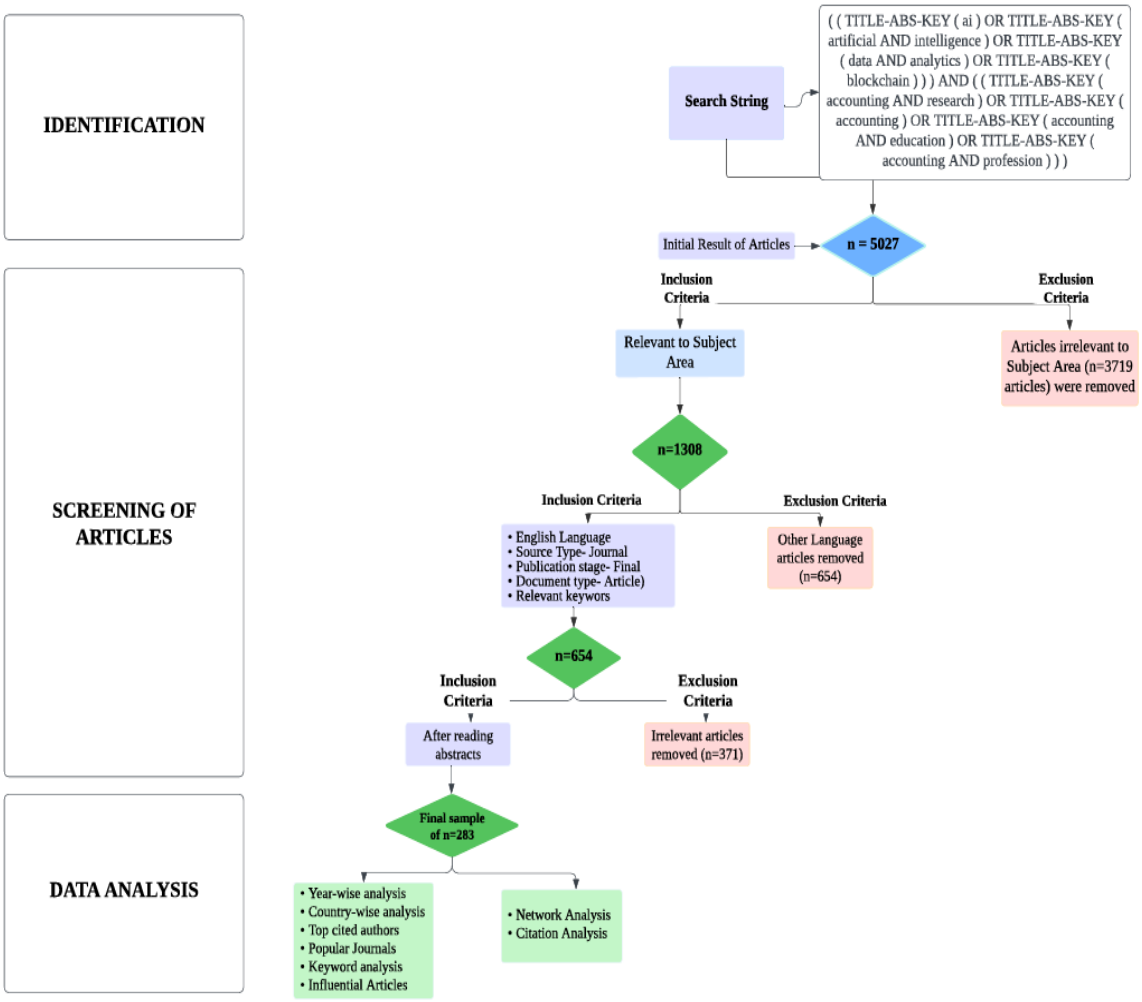


Figure 1: Flowchart of PRISMA

Note: This figure represents flowchart of PRISMA to record relevant articles from above searches. Adapted from Chauhan et.al.(2024) &Mohamad (2025).

The result of the initial search returned 5027 articles. After the initial search, the titles and abstracts of all the articles identified in the initial search were carefully reviewed for relevancy to the AI and accounting domain, resulting in the deletion of articles that were irrelevant to the study. Therefore, the study retained 283articles as articles related to AI and accounting research on which bibliometric analysis is applied to reveal the information needed to address research questions. VOS Viewer was developed by Van Eck and Waltman (2010) and is a software widely used to construct network mapping of keywords, authors, countries, and journals. VOS Viewer can build network maps to visualize the relations of selected items, making it easier for interpretation (Gu et al., 2021).

BIBLIOMETRIC ANALYSIS

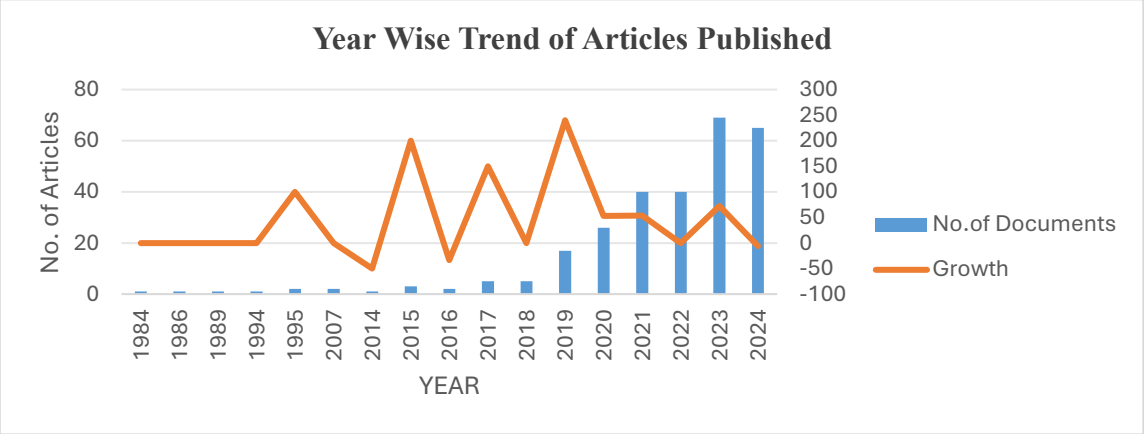
The bibliometric analysis uses immense number of studies in identifying the popular trends in literature of artificial Intelligence and Accounting Research. Hence, this section lays emphasis on results generated via bibliometric analysis tools.

1 Descriptive analysis

This sub-section focusses on a comprehensive view of trends in publication followed by most contributing countries in literature of artificial Intelligence and Accounting Research and most influential authors, journals and articles to identify the current trends in study of artificial Intelligence and Accounting Research.

1.1 Study of articles based on year of publication- The comprehensive study of articles based on year of publication is represented by a bar chart in Figure 2 for the period of 1984 to 2025. Initially in 1984 and 2018 the number of articles published were merely 1 to 5 only. In the year 2019, it increased to 17. Then, there was an increasing trend in terms of publications on literature of artificial Intelligence and Accounting Research till 2023. This scenario indicates that interest in study of Artificial Intelligence and Accounting Research among academicians and researchers in past decades has increased significantly. There is quite drop in studies on artificial Intelligence and Accounting Research in 2024 which may be due to effect of Russia Ukraine war and other international turbulences.

Figure 2: Year-wise trend of articles published between 1984 & 2024.



Source: Developed by the authors using Scopus Database

1.2 The most productive authors- The analysis of the most productive authors based on citations can provide a general idea of most contributing authors in the field of Artificial Intelligence and Accounting Research. This analysis will assist the future researchers, academicians in the related area. There are 739 authors, amongst them only 52 met the threshold limit of minimum number of documents as 2 and citation as1. Out of 52 only 28 were found to be connected. Table 2 presents the most productive authors in the field of artificial Intelligence and Accounting Research based on citations within the period. Among the studies, the studies of yigitbasioglu, ogan are highly cited with a total of 509 citations, followed by second most productive author vasarhelyi, miklos (254) and stratopoulos, theophanis c. with 208 citations.

Table-2: Top 15 most productive authors

	Authors	Citations	Total link strength
1	yigitbasioglu, ogan	509	8
2	vasarhelyi, miklos	254	3
3	stratopoulos, theophanis c.	208	19
4	qasim, amer	155	12
5	lehner, othmar m.	132	5
6	holt, matthew	129	2
7	leitner-hanetseder, susanne	102	3
8	abu afifa, malik muneer	78	2
9	appelbaum, deniz	74	2
10	mancini, Daniela	65	1
11	church, kimberly swanson	64	4
12	riley, Jennifer	55	2
13	schmidt, pamela j.	55	2
14	smith, sean stein	49	3
15	el refae, ghaleb a.	44	7

Source: Summarised by the authors using VOS viewer software

1.3 Topmost contributing journals- Generally, academic journals are the platforms used by the researchers, academicians to share their thoughts and knowledge. Hence, it is very essential to study that which journals are most contributing to the study of Artificial Intelligence and Accounting Research. The most productive journals will be publishing high quality research papers based on recent trends and developments in the said field by rigorous peer-reviews of articles. There are 109 journals, amongst them only 41 met the threshold limit of minimum number of documents published as 2 and citation as 1. Out of 41 only 35 were found to be connected documents.

In this study, Table-3 shows top 15 most contributing journals in the field of Artificial Intelligence and Accounting Research ranked according to the number of articles published. There are 144 articles published in the top 15 journals, accounting for 50.88% among all publications. *The journal of*

emerging technologies in accounting has published highest number of articles i.e., 30, followed by journal of accounting education (16), international journal of accounting information systems (12).

The number of citations for each journal have been calculated and shown in Table-3 along with the average citations. The journal of emerging technologies in accounting has been ranked first in terms of number of citations with total 844 citations, followed by international journal of accounting information systems (629) and Australian accounting review (452). Consequently, the journals are also ranked based on average citations. international journal of accounting information systems has been ranked first in terms of average citations with total 52.41, followed by accounting, auditing and accountability journal (49.16).

In the context of H-index, journal of information systems has highest H-index of 139, followed by accounting, auditing and accountability journal with H-index of 129. Apart from this, out of top 15 most contributing journals 6 of them are Q1 Journals & 7 are Q2 journals. The Quartile ranks for the most contributing journals in the field of Artificial Intelligence and Accounting Research is presented in the Table 3.

Table-3: Top 15 most contributing Journals

Sr. No.	Name of Journal	Documents	Citations	Avg. citations	H Index	SJR Quartile Rank
1	journal of emerging technologies in accounting	30	844	28.1333	31	Q2
2	journal of accounting education	16	222	13.875	47	Q2
3	international journal of accounting information systems	12	629	52.4167	70	Q1
4	journal of risk and financial management	12	55	4.5833	54	Q2

5	issues in accounting education	11	73	6.6364	34	Q2
6	financial and credit activity: problems of theory and practice	11	41	3.7273	12	Q4
7	journal of information systems	8	416	52	139	Q1
8	accounting research journal	7	68	9.7143	33	Q3
9	accounting, auditing and accountability journal	6	295	49.1667	129	Q1
10	international journal of digital accounting research	6	102	17	20	Q2
11	australian accounting review	5	452	90.4	50	Q2
12	journal of corporate accounting and finance	5	159	31.8	24	Q2
13	accounting and finance	5	122	24.4	70	Q1
14	journal of financial reporting and accounting	5	112	22.4	33	Q1
15	critical perspectives on accounting	5	27	5.4	91	Q1

Source: Summarised by the authors using VOS viewer software

1.4 Highly Influential Articles- The analysis of the most influential articles gives an idea of the recent trends and developments in the field of Artificial Intelligence and Accounting Research and helps the researchers and academicians in their investigation in related area. There are 283 articles and amongst them only 126 met the threshold limit of minimum number of citation as 10. Out of 126 only 82 were found to be connected. The table-4 indicates the top 15 highly influential articles based on the citations within the period. The total citation plays a vital role in determining the impact of an article. As the article having higher number of

citations indicates the quality of the published article.

Among the 283 articles, the article with the highest number of citations is "*The role of internet-related technologies in shaping the work of accountants: new directions for accounting research"* by *moll (2019)*, published in the *british accounting review* and had a total 299 citations. The *"The emergence of artificial intelligence: how automation is changing auditing"* by *kokina (2017)* has been ranked as the second most cited article with 286 citations, followed by *bhimani (2014)* which is *"Digitisation, big data and the transformation of accounting information"* (277).

Table-4: Details of Top 15 highly influential articles

Sr. No.	Authors and Year	Document Title	Journal Title	Citations
1	moll (2019)	The role of internet-related technologies in shaping the work of accountants: new directions for accounting research	british accounting review	299
2	kokina (2017)	The emergence of artificial intelligence: how automation is changing auditing	journal of emerging technologies in accounting	286
3	bhimani (2014)	Digitisation, big data and the transformation of accounting information	accounting and business research	277
4	schmitz (2019)	Accounting and auditing at the time of blockchain technology: a Research Agenda	australian accounting review	229
5	munoko (2020)	The ethical implications of using artificial intelligence in auditing	journal of business ethics	209
6	rikhardsson (2018)	Business intelligence & analytics in management accounting research: status and future focus	international journal of accounting information systems	205
7	richins (2017)	Big data analytics: opportunity or threat for the accounting profession?	journal of information systems	188

8	han (2023)	Accounting and auditing with blockchain technology and artificial intelligence: a literature review	international journal of accounting information systems	165
9	mosteanu (2020)	Digital systems and new challenges of financial management – fintech, xbrl, blockchain and cryptocurrencies	quality - access to success	139
10	qasim (2020b)	Blockchain technology, business data analytics, and artificial intelligence: use in the accounting profession and ideas for inclusion into the accounting curriculum	journal of emerging technologies in accounting	111
11	damerji (2021)	Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting	accounting education	110
12	yu (2018)	Blockchain: the introduction and its application in financial accounting	journal of corporate accounting and finance	109
13	huerta (2017)	An accounting information systems perspective on data analytics and big data	journal of information systems	102
14	leitner-hanetseder (2021)	A profession in transition: actors, tasks and roles in AI-based accounting	journal of applied accounting research	89
15	cai (2021)	Triple-entry accounting with block-chain: how far have we come?	accounting and finance	86

Source: Summarised by the authors using VOS viewer software

2 Network Visualization

The network analysis visualizes the co-authorship of countries, co-occurrences of keywords, bibliographic coupling of countries and articles. The network analysis portrays better graphical visualization of collaborations, co-occurrences and bibliographic coupling through nodes having different sizes, color and thickness of connecting lines (Zhang et.al., 2019).

2.1 ***Countries Co-Authorship-*** The analysis of co-authorship between countries examines the level of strength of collaboration among various countries. This also gives deeper understanding of contributions made by various countries in the related area. (Tandon et.al., 2021). In this study, the limit for

minimum number of documents was set to four documents and minimum citation was set to be 1. out of total 67 countries having co-authorship of ,26 met the thresh hold limit. This will facilitate in network analysis of most collaborative countries in research on Artificial Intelligence and Accounting Research. Hence, by this limit it implies that selected countries have at least three articles published. So, the 26 countries have been selected out of 67 countries for the analysis and countries with unconnected nodes which was 2, have been excluded.

Table-5 Co-authorship amongst countries

Sr. No.	Country	Documents	Links	Total link strength
1	United states	102	10	13
2	United kingdom	23	13	17
3	Australia	20	5	6
4	Canada	12	7	10
5	China	11	5	7
6	Malaysia	10	5	6
7	Italy	9	7	8
8	Saudi arabia	9	6	10
9	India	9	6	6
10	Jordan	9	5	8
11	Indonesia	8	1	1
12	New zealand	7	7	8
13	Egypt	7	5	8
14	Austria	7	3	7
15	Germany	7	3	4

Source: Summarised by the authors using VOS viewer software

The Table-5 shows top 15 most collaborative countries ranked according to articles published and total link strength. The term total link strength refers to the number of articles published in collaboration with authors from different countries. Hence, the country having highest total link strength is the most collaborative country. UK is the leading

country being the most collaborative country having total link strength of 17 and 13 link numbers. USA is the second most collaborative country with total link strength of 13 and 10 link numbers. It is observed that, mostly the developed countries are more interested in collaborating with developed and under-developed countries such as South Africa, Austria, Finland etc.

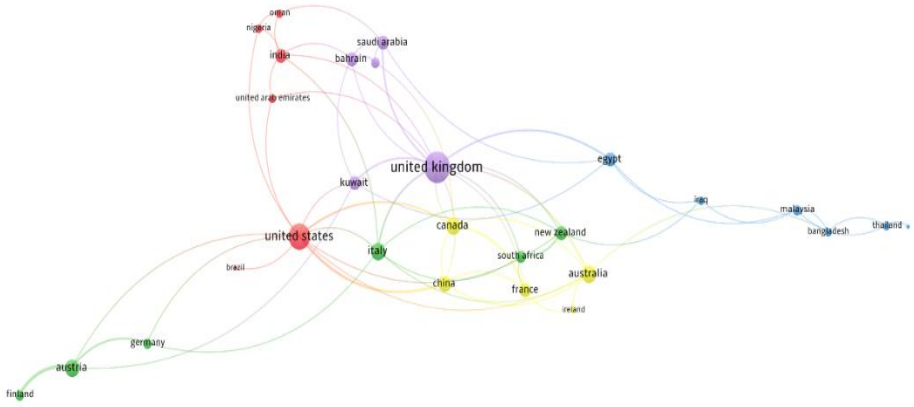


Figure-3 A network analysis of countries co-authorship

The figure 3 portrays the network analysis of co-authorship among countries in publishing articles on Artificial Intelligence and Accounting Research. The network analysis is a visualization map of collaborative countries depicted by nodes in different color and sizes connected with lines. The size of node shows number of articles published by a country. Hence, the bigger the node size, higher the articles have been published by that country. The connecting line to nodes shows those countries have published articles in collaboration. Different color of nodes depicts the various clusters formed. In this figure, countries with red, blue and purple color were found to be the most collaborative and influential country in terms of articles published on Artificial Intelligence and Accounting Research. The network analysis of countries co-authorship is based on documents weights. UK, USA, Australia, Canada & India are the most collaborative countries.

2.2 Keyword Co-occurrences- The keyword co-occurrence analysis is one of the most popular techniques used in bibliometric analysis. In this study, analysis has been conducted on 890 keywords to reveal the research hotspots and emerging areas of Artificial Intelligence and Accounting Research. The minimum keyword frequency has been limited to three to identify the essential keyword co-occurrence. So, 73 keywords met the threshold, and all the keywords were interconnected, which were

used in visualization analysis. The Table 6 highlights the top 15 keywords ranked according to the total link strength. The "blockchain" has the highest total link strength (145) followed by "artificial intelligence" (140) and "accounting" (140).

The visualization of network analysis of keywords is shown in figure 4. The nodes here represent the keywords which relate to lines representing co-occurrences. The size of the nodes reflects the frequency of keywords on Artificial Intelligence and Accounting Research and the colors of nodes shows the various clusters of keywords. In this study, through network analysis of keyword co-occurrences the keywords were divided into 6 major clusters. The details of cluster-wise keywords are shown in Table 7 below. The top 5 most co-occurring keywords are blockchain, artificial intelligence, accounting, data analytics and big data.

Basically, blockchain, artificial intelligence, data analytics and big data are the various methods and techniques used in Accounting Research.

Table-6 Keywords' Co-occurrence

Sr. No.	Key word	Occurrences	Links	Total link strength
1	blockchain	73	47	145
2	artificial intelligence	62	39	140
3	accounting	54	49	140
4	data analytics	44	39	88
5	big data	36	37	89
6	auditing	24	25	65
7	accounting education	21	28	51
8	blockchain technology	19	21	34
9	accounting curriculum	13	9	24
10	machine learning	12	18	31
11	automation	10	15	24
12	chatgpt	10	9	18
13	emerging technologies	9	14	21
14	distributed ledger technology	9	11	22

15	ai	9	7	11

Source: Summarised by the authors using VOS viewer software

Table-7 Clusters of Keywords Co-occurrence

Cluster	Colour	No. of Key words	Major Keywords
1	RED	15	Blockchain, automation, distributed ledger technology, audit, bitcoin, artificial intelligence (ai), smart contracts, triple-entry accounting, expert systems, distributed ledger, audit risk, cryptocurrency, financial accounting, smart contract, ethereum
2	GREEN	14	machine learning, big data analytics, analytics, cloud computing, curriculum, higher education, accounting curricula, risk assessment, continuous auditing, accounting analytics, stem emerging technology, audit data analytics, text mining
3	BLUE	13	Accounting, auditing, blockchain technology, audit quality, internet of things, Digitalization, technology adoption, robotic process automation, information technology, cloud technologies, technology readiness, bibliometric analysis, quality of accounting information
4	YELLOW	11	data analytics, accounting curriculum, emerging technologies, accounting profession, technology, status quo bias, digital accounting, aacsb a5, aacsb standard accounting, pedagogy, xbrl
5	PURPLE	10	artificial intelligence, accounting education, chatgpt, ai, financial reporting, critical thinking, large language models, ethics, decision-making, chatbots
6	SKY BLUE	10	big data, management accounting, accounting information systems, business analytics, cryptocurrencies, business intelligence, finance, innovation, decision making, block-chain

Source: Summarised by the authors

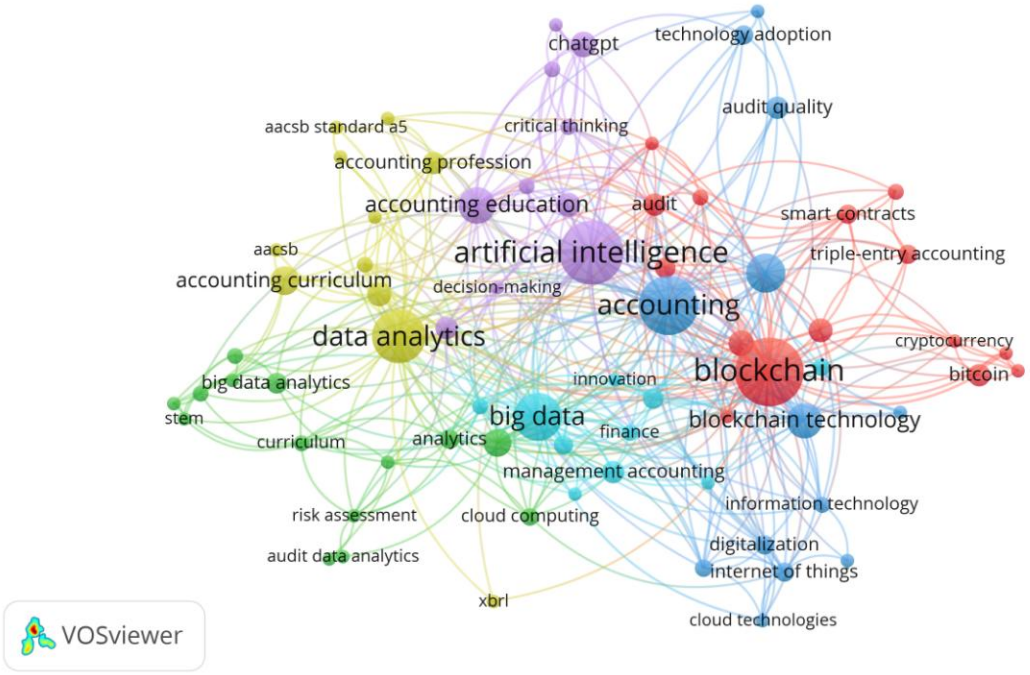


Figure-4 A network analysis of keywords co-occurrences.

Source: Developed by the authors using VOS viewer software

Cluster Analysis:

The keywords (Figures 4 & Table-7) are analyzed based on their connections. The study recognizes the existence of six clusters i.e. Red, Green, Blue, Yellow, Purple and Sky Blue. *The Red cluster* focuses on AI and its implications on financial accounting and large transactions as this cluster is more aligned to AI and its implications on accounting and specifically financial accounting and how automation can improve functions such as large transaction processing. *The green cluster* is dealing with data analytics in accounting education with the help of AI technologies. It is inevitable that accountants need new knowledge and skills which ordinarily are not available in many institutions of higher education. *The Blue cluster* talks about AI and its implications on the auditing profession with changing audit tasks. It focuses on the use of various technology for enhancement and automation audit tasks. *The yellow cluster* is all about use of emerging technologies of AI in accounting profession. Accounting education needs to be future- ready by focusing on curriculum redesigning to reflect latest technology, business data analytics, and digital accounting employment in the accounting curriculum. *The purple cluster* suggests that with increasing usage of AI, the accounting education system

needs to be technology ready. The course may include an introduction to Data analytics using AI, Chatbots, and RPA, which is very important in the era of AI. *The Sky-blue cluster* is all about decision-making in accounting using data analytics primarily focusing on the application of AI technologies in accounting functions such as cryptocurrencies, business intelligence, innovation, decision making, bankruptcy prediction and audit opinion prediction.

2.3 Bibliographic Coupling of Countries- The bibliographic coupling of countries shows how many times two or more countries cites an article is in their reference list of documents of published (Gu et al., 2021). Basically, this shows the similarity between the two publications. In this study, the bibliographic coupling of countries is presented through a visualization map of network analysis shown in figure 5. Countries are represented in each node having various colours reflecting the number of clusters formed. The size of the node shows country's contribution. Hence, bigger the node size, higher the contribution by that country. In this study, the limit of minimum number of documents of a country is set to two. So, 43 countries out of 67 countries met the threshold. The bibliographic coupling of countries involved five clusters with different colours (red, green, blue, yellow and purple,) as shown in figure 5. USA, Australia and Canada are the leading country with significant cluster (Red cluster) having 40 links. Oman being the second largest cluster (Green cluster) closely coupled with Nigeria and India. New Zealand is the third largest cluster (Blue cluster) closely related with South Africa, Italy and China. United Kingdom, Egypt, Jordan and Bahran forms the fourth cluster (Yellow cluster). Indonesia and Spain have most collaboration in fifth cluster (Purple cluster) Basically, the country, United States is located at the core of network, has a strong influence on research work of Artificial Intelligence and Accounting Research as many countries are coupled with.

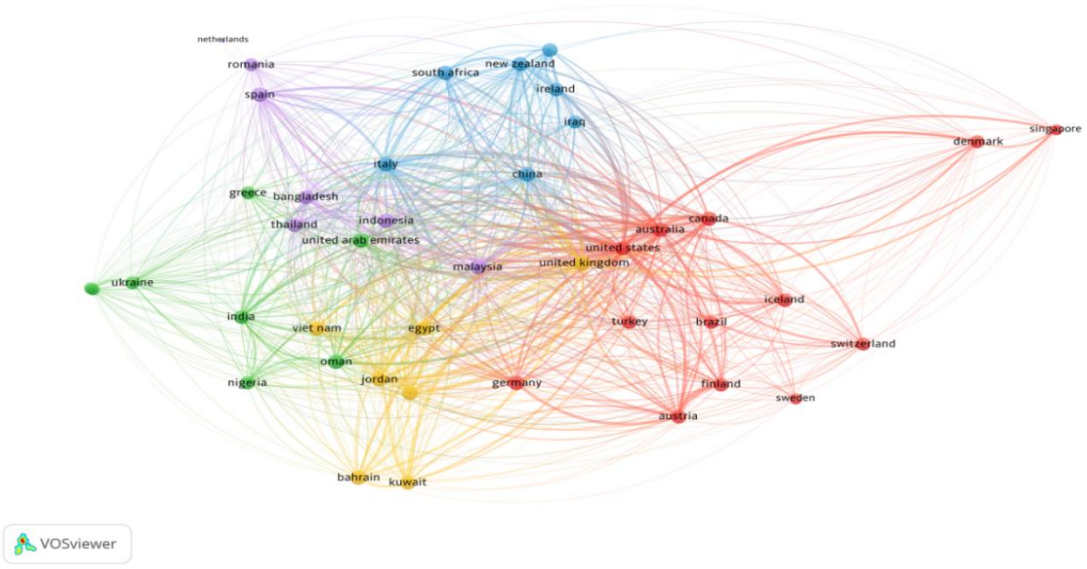


Figure-5 Bibliographic coupling of countries

2.4 Bibliographic Coupling of Articles- The bibliographic coupling of articles shows when a same article is cited as reference in two or more articles published. In other words, bibliographic coupling of articles determines articles of similar interests. This is represented by network analysis showing relatedness of articles on Artificial Intelligence and Accounting Research through nodes of different colours and sizes. The colour of nodes shows the cluster of articles related to Artificial Intelligence and Accounting Research while the node size shows the total number of citations of that article. Figure 6 shows the bibliographic coupling of articles having at least 8 citations. 145 articles met the threshold out of 283 but only 135 were linked, and the rest unconnected ones were excluded from analysis. The articles on Artificial Intelligence and Accounting Research were grouped into three clusters with different colours of nodes such as red, green and blue.

The red cluster is largest cluster comprising of 58 publications and a total of 3105 citations with an average of 53 citations per article. The majority of publications in this cluster work on Artificial Intelligence, Big data, Internet related technologies, big data analytics, data analytics, accounting Education, block chain technology, audit data analytics The highly cited article in this red cluster focuses on Big data in accounting: An overview. (vasarhelyi (2015); 321 citations).

The green cluster is the second largest cluster with 41 articles. The articles published in this cluster recorded 2077 citations, with an average citation of 50 citations per article. In this cluster, most of the articles published

focussed on block chain technology in Accounting and Auditing, Big data analytics, cloud-based block chain accounting, block chain and accounting industry, accounting for digital currencies and assets. The most cited article in this cluster focussed on Accounting and Auditing at the Time of Blockchain Technology: A Research Agenda (schmitz (2019); 229 citations).

The blue cluster is the third largest cluster, containing 36 articles published with 1277 citations, averaging 35 citations per article published. Most of the articles in this cluster studied on digitization, business intelligence, accounting profession, smart technologies etc. The most cited article in this cluster has studied "Digitisation, 'Big Data' and the transformation of accounting information" (bhimani (2014); 277 citations).

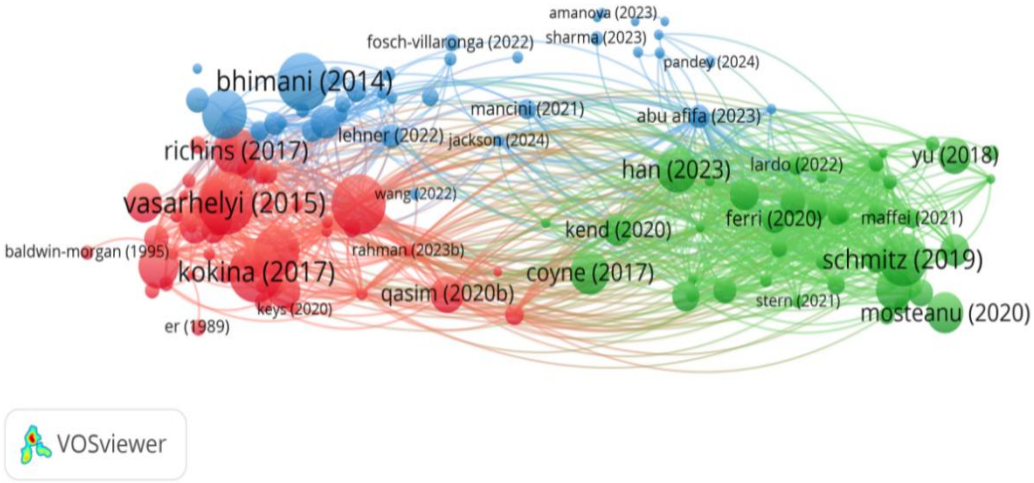


Figure-6 Bibliographic coupling of articles

ASSOCIATION BETWEEN SOURCE, AUTHORS AND KEYWORDS

The figure 7 shows the association between the journals, authors and keywords used in various articles published on Artificial Intelligence and Accounting Research. Visibility of the article is increased if it is more collaborative with the authors across the countries. The figure 7 has bars each of authors, keywords and sources. The bigger the size shows more work is done using that keyword or by that author or more articles have been published in that journal. The keywords such as Artificial Intelligence, Blockchain, Data Analytics and Accounting have bigger bar size which shows that a lot of studies have been conducted using these keywords. On the other hand, some keywords such as ai, triple entry accounting, smart contracts and business analytics have very small size of bars indicating very less studies conducted using these keywords. There is

scope for collaboration between the writers and the publications which will lead to rise in number of citations and increase articles visibility

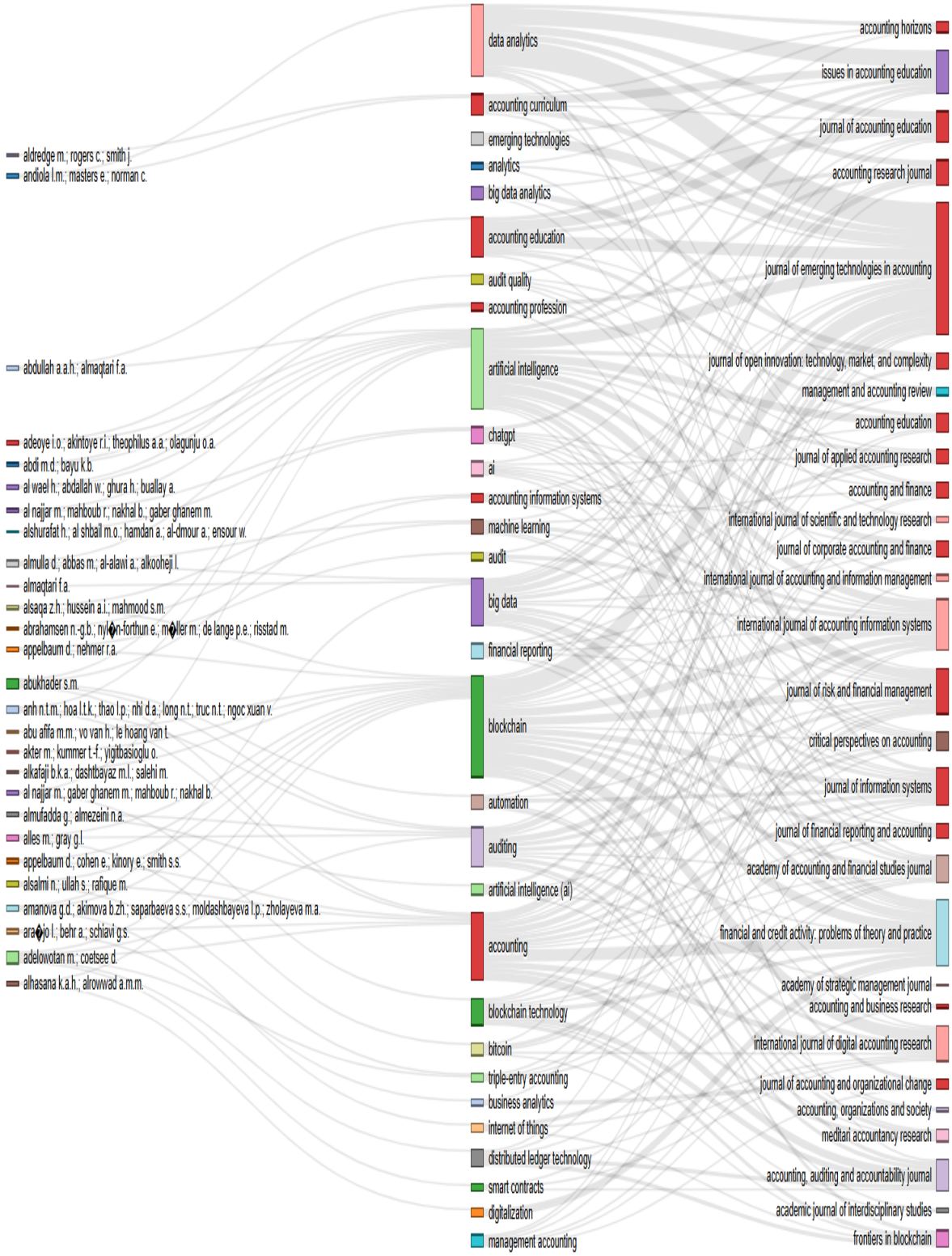


Figure 7: Connotation of Key Authors, Keywords & Key Journals.

Source: Developed by the authors using Sciencescape

FUTURE RESEARCH PROPOSITIONS

Regarding broad area of Artificial Intelligence and Accounting Research based on bibliometric analysis, this section discusses the least researched areas as the emerging hotspots in the field of Artificial Intelligence and Accounting Research. This section will be helpful to academicians, practitioners and research scholars in identifying the emerging areas and prospective studies required to be carried out in future.

The result of bibliometric analysis shows that a lot of research has been carried out on Artificial Intelligence, Blockchain and Data Analytics But from the network diagram of keyword co-occurrences as shown in Figure 4, there are many areas in which very less research has been carried out, such as triple-entry accounting, large language models, smart contract, technology readiness, chat boats, ChatGPT, audit data analytics, audit quality, higher education etc.

Based on identification of emerging hotspots, various research questions can be formed such as:

RQ-1: can triple accounting system be more reliable for various stakeholders of business organisations?

RQ-2: is it possible to use chatbots to automate tasks in accounting field?

RQ-3: Will higher level of environmental reporting enhance the market performance?

RQ-4: Is India is a technology ready country in the field of accounting?

RQ-5: does the use of artificial intelligence will lead to better audit quality leading to reduction in financial fraud?

RQ-6: is it feasible for the higher education institutions to adapt the changes in technology for better education?

RQ-7: Can audit data analytics improve the transparency in disclosed information?

RQ-8: is it possible to detect fraudulent transaction in the begging with the use of Artificial intelligence?

FINDINGS

AI is one of the most disruptive and impactful technologies that has emerged from the Fourth Industrial Revolution (IR4.0) driving a massive transformative change in the business (Kommunuri, 2022; Kumar et al., 2022). The current study investigated existing literature linking AI and the accounting domain. To achieve this

goal, a bibliometric analysis methodology was applied to a sample of 283 articles from journals indexed in the Scopus database. The descriptive statistics have shown that interest in AI and accounting domain research has risen astronomically particularly in the last five years. It is found that Yigitbasioglu, ogan is the most productive author in this field who conducted study on business intelligence & analytics in management accounting research: status and future focus in 2018 and the role of internet-related technologies in shaping the work of accountants: new directions for accounting research in 2019. *The journal of emerging technologies in accounting* has been ranked top journal in terms of number of articles published and the most cited journal with total citations of 844 and average 28 citations per article. The top three most influential articles were written by moll (2019), kokina (2017) and bhimani (2014). According to the network analysis of collaboration among countries, UK is the leading country being the most collaborative country followed by USA, Australia, Canada & India. The top 5 most co-occurring keywords are blockchain, artificial intelligence, accounting, data analytics and big data.

In bibliographic coupling of countries USA, Oman, New Zealand, UK and Indonesia are leading collaborating countries, on the other hand, coupling of articles has divided articles into three clusters as shown through network diagram. The association between authors, journals and keywords shows that there is scope for collaboration among authors and top journals in the field of emerging technologies, analytics and big data analytics collaborative research.

CONCLUSION

There are some practical and theoretical implications of the current study. Theoretically, the study contributes to existing literature since it provides some useful insights into the interaction between AI and the accounting domain. The study provided the most influential authors, sources and most cited papers. This may provide future researchers with a research map for their work. In this study, various unexplored areas have been identified such as triple-entry accounting, technology readiness, chat boats, audit data analytics, higher education etc which can be a stepping stone for future researchers who want to explore this field with deep understanding.

There are limitations to the current study. The data used was limited to the Scopus database leading to exclusion of sources

indexed in other databases such as Web of Science. There are chances that there may be different result with searching through same keywords and steps on different dates. The search query for this study was retrieved on 10 January 2024, now searching for the same after this date might have slightly different results as articles that might be published after that time. The categorization of keywords into themes as a new research method may not be exempt from bias. Future research may develop an advanced classification method to better explore the research patterns and trends.

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