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Contents

Sustainability in Banking: Integrating ESG into Business Strategy

Sarath Chandran M.C.[1], B. Sathiyabama[2], N. Santhoshkumar[3], Renju Chandran[4]

[1]*Research Scholar, PG & Research Department of Commerce, Maruthupandiyar College of Arts and Science, Thanjavur, Tamil Nadu, India,Affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu, India, Email – chandranmcsarath@gmail.com,*

[2]*Research Advisor & Assistant Professor, Department of Commerce, Govt. Arts College (Autonomous), Kumbakonam, Affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu, India, Email – drbsb1982@gmail.com,*

[3]*Research Advisor & Assistant Professor, PG & Research Department of Commerce, Maruthupandiyar College of Arts and Science, Thanjavur, Tamil Nadu, India, Affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu, India, Email – cnrskumar@gmail.com*

[4]*Assistant Professor, School of Contemporary Knowledge Systems, Chinmaya Vishwa Vidyapeeth (Deemed to be University), Ernakulam, India, renju.chandran@cvv.ac.in,*

Abstract: Sustainability in banking has been one of the strategies used as the underpinning idea how the banks work and create long-run value in a unique way by integrating (Environmental, Social and Governance (ESG) Practices. We focus on six major Indian banks spread across public and private entities; among those banks, it clearly identifies a positive relationship between ESG performance and key financial indicators such as ROA, ROE, and changes in stock prices. The regression results show that there is a strong association between ESG scores and financial performance, while larger banks with high total assets are less likely to be profitable. Despite all these benefits, however, challenges persist in the form of standardizing ESG metrics, which complicate cross-bank comparisons and reporting. The results showed that, ESG integration is not just about following regulatory requirements but can also turn out to be a source of long-term profitability and investor confidence. The future research should develop standardized frameworks to quantify the financial returns of ESG practices in banking.

1. Introduction

Today, financial institutions are recognized not just as 'intermediaries of money' but also as catalysts of a sustainable world. Among the most active leaders in this transition is the integration of ESG factors within the core strategies of banks (Alkaraan *et al*., 2022). These principles will guide the assessment for sustainability and ethical impact that an organization's operations, investments, and loans have on their activities (Gasperini, 2019). Banks, formerly regarded as financial organizations that generally aim to make profits, are gradually incorporating a more varied approach toward business models and showing greater consideration for the environmental and social implications of work. This is not brought about by the internal policy change but more by regulatory pressures, stakeholder demands, and the heightened awareness of climate-related financial risks (Yip & Bocken, 2018). The new rules on sustainability have taken centre stage in most industries and, hence, banking cannot be left behind. Adopting the ESG principles is not a choice but a compulsion for banks as they are continuously held accountable for their respective contributions to the degradation of the environment

and social inequalities (Puaschunder, 2023). Transition into a more sustainable business model means embedding the ESG criteria into the core part of banking activities such as lending, investments, and managing risks (Ziolo *et al.,* 2021).

Environmental factors centre on how banking operations and portfolio companies affect nature (Thompson & Cowton, 2004). It is therefore concerned with issues of how human activities affect the climate, raw material usage, as well as post-activity waste. With the risk that environmental factors have in view, banks are now realizing the enormous loss of funds they are likely to incur if they opt to overlook these risks, especially since climate change disrupts the markets around the world, global supply chains, and economic stability (Feyen *et al.*, 2021). Social Factors discuss how the banks affect people directly or indirectly on issues related to labour, human rights, and community (Watts, 2005). Banks play an effective role in bringing about social imbalances when they provide a financial service opportunity to the underserved and contribute towards the welfare of society (Benedikter, 2010; Ji *et al.*, 2022). Responsible banking (Kandpal *et al*., 2024) includes making communities and the organization they work in diverse and inclusive. Governance incorporates the factors of corporate leadership, transparency, and accountability (Ijeoma & A, 2013). Governance can ensure the ethical operation of banks through sharp oversight with practices considering the stakeholders' interests (Rovera, 2022). Strong governance is important for making banks profitable, yet responsible stewards of resources managed in the context of ESG.

Moreover, governments and regulatory agencies across the world are increasingly step in to ensure that ESG issues form the core of business strategy for a banking sector. The regulatory forces have picked up the pace over the past few years. While the rules are strictly on environmental risk, they also assume quite a level of social governance issues forcing revaluation of positions in society by banks. For instance, at the European Union level, the Sustainable Finance Disclosure Regulation (SFDR) and the Taxonomy Regulation mandate financial institutions to report on their activities' alignment with sustainability objectives in order to clear up for stakeholders and avoid greenwashing (Och, 2020). The frameworks guide activity definitions and measures for sustaining-associated activities so banks operate and march in unison with the global set of goals, such as the Paris Agreement and the United Nations SDGs (Upadhyay, 2021). Similarly, in the United States, the Securities and Exchange Commission (SEC) has proposed rules that will require public companies, including banks, to disclose climate-related financial risks (Carattini *et al.*, 2022). So, the momentum of regulations highlights the growing importance of ESG integration as essential for compliance.

Besides regulatory pressures, there are demands from various stakeholders like investors and customers, employees, and society at large that banks should bring more transparency and accountability in ESG practices. Many institutional investors, including pension funds and asset managers, are now including ESG criteria in their investment decisions (Ji *et al.*, 2022). Instead, such investors are concerned not only with the returns available in the short term but also with the long-term sustainability of the companies into which they invest. Such investors realize that the banks that conduct good practices based on ESG criteria are well placed to control the risks and exploit new opportunities for long-term value creation. Now, increasingly, customers are banking with institutions that share their values. Conscious consumers are increasingly likely to bank with sustainability and ethics-focused banks; this has given birth to "green banking" initiatives (Chandran *et al.*, 2024). These include green loans and eco-friendly investment products up to community-based projects for society and the environment (Srivastava *et al.,* 2022). The consequence for a bank failing to meet these expectations is loss of market share and loss of reputation.

The integration of ESG into the banking operations process is a holistic approach touching every aspect of the business (Alkaraan *et al*., 2022). Gradually, it shifted from the boardroom to frontline

operations, and where today, banks increasingly come to embed ESG principles in their everyday affairs in the forms of lending practice, investment, and even the management of the bank's own environmental footprint. Perhaps the most salient area of ESG integration in lending and investment decisions (Ji *et al.*, 2022) is its advocacy of ESG criteria to integrate risk assessment to ensure that financed projects are aligned with the agenda for sustainable development. This explains why banks are more likely to support businesses and initiatives contributing to clear energy, carbon emission reduction, and common social welfare (Monasterolo *et al*., 2024). Alignment has also been achieved in banks' efforts toward a lower operational carbon footprint through sustainable practices in their offices, data centers, and supply chains. Most of the world's leading banks have pledged to become net zero by a certain date; they do this by shifting to renewable energy sources and facilitating energy efficiency as well as waste reduction (Weber & Imam, 2024).

2. Literature Review

2.1. Sustainability in Banking and ESG Integration

The integration of ESG principles into banking practices is one of the fastest-moving concepts over the past two decades. The role that the banking industry plays in the allocation of capital has positioned this industry as one of the most active players in global confrontations regarding climate change, social inequality, and problems of governance. This literature review draws upon extant knowledge bases surrounding the sustainability of banking with a focus on ESG principles and their integration-of the affiliated issues, advantages, and emerging gaps in research.

2.2. Historical Background of ESG in Banking

The discourse on ESG in banks could trace its history as far as the concept of Corporate Social Responsibility (CSR) goes, which called upon the banks to think beyond their motive of profit maximization and, at least in macro terms, of their wider societal and environmental value (Herzig & Moon, 2013). CSR forms the precursor of ESG as it involves the belief in ethical business practices, community engagement, and philanthropy. However, with the increasingly urgent environmental issues and the financial crisis in 2008, weaknesses in governance practices were brought into the limelight, and the focus turned to a more holistic framework that incorporated environmental and social factors together with governance (Weber & Imam, 2024). ESG was formalized, hence, as a structured approach to sustainability, and a lot of scholars began placing stress on their importance in banking.

As mentioned by Ye *et al*. (2021), banks can occupy a strategic position in the promotion of sustainable development in the unique financial intermediation role that they play. In giving ESG criteria an opportunity to be integrated into lending and investment decisions, banks can advance industries and projects that contribute to environmental protection, social welfare, and ethical governance (Park & Kim, 2020). This motivated further research on the practical aspects of ESG integration into banking.

Research studies have pointed out that the importance of ESG factors in determining long-term financial performance could be a means of lessening the risks associated with environmental degradation, social unrest, and governance failures (Oprean-Stan *et al*., 2020). For instance, Kalfaoglou, (2021) contend that incorporating ESG into risk evaluations enables banks to know and anticipate climate-related financial risks of extreme weather events' destruction of the global economy. Simultaneously, through the integration of ESG, banks will steer clear from risk investments in sectors with high concentration that is engaged in fossil fuels and arms manufacturing industries. Today, these factors have more stringent regulation scrutiny and by members of the public.

Further, Zumente & Bistrova, (2021) have empirical evidence that companies with a healthy ESG practice maintain better financial performance over the long term than their peers.

Governments and regulatory bodies have increasingly begun to realize the strategic importance of sustainable finance in tackling global challenges such as climate change. This is the case of the Sustainable Finance Disclosure Regulation (SFDR) within the European Union, which focuses on some aspects of a regulatory framework set forth to encourage transparency and accountability in ESG reporting. Such frameworks make banks disclose how their financial activities bear alignment with the sustainability goals while encouraging responsible investing and lending practices. However, other researchers note that inconsistent ESG metrics and reporting standards are a big problem for banks. According to Singhania and Saini, (2022), lack of world-class standard in measuring ESG performance causes banks considerable difficulties in evaluating their sustainability initiatives.

Several other researchers point out that inconsistent ESG metrics and reporting standards are a significant problem for banks. This creates inconsistency in the process of reporting and troubles investors as well as other stakeholders who depend on these data for their decisions. While most of the literature in the contemporary period is more focused on qualitative issues concerning the adoption of ESG integration in investment research, increasing attention is now being given to financial gains that would accrue through the adoption of ESG principles. Taliento *et al.* (2019) concluded that the bottom line of companies that were more sophisticated on ESG practices would likely result in positive comparisons for lower capital costs and enhanced reputational values and increased operational efficiencies. These results imply that ESG integration can result in better financial performance for the bank, especially from a long-term profitability perspective. Yet, it is very complex to quantify the financial benefit arising from the integration of ESG considerations, as highlighted by Kotsantonis *et al.* (2016).

There is ample evidence proving that good ESG practices bear positive financial performance; however, the challenge remains in developing a standardised framework for quantifying benefits arising from such practices. Much of the earlier work hinges upon case studies or datasets that are lacking in the context of understanding systematic contributions of ESG integration to financial success across different banking institutions and market contexts.

2.3. Research Gap

Even though several studies analyse the qualitative elements of ESG, that is, reputation building and compliance with regulations, there are only few empirical works that assist in quantifying the financial payback on ESG investment for banks. The standardization of ESG metrics, to date, remains a critical challenge, thus making it hard to establish economic value added by sustainable banking practices (Cort & Esty, 2020). This gap will require further study into the development of sound, widely applicable measurement frameworks of ESG. Therefore, the current literature yields rich findings on ESG in banking-especially when one considers the relationship between risk management, regulatory compliance, and long-term financial performance. However, there is a very major challenge remaining from standardizing ESG measures to the financial benefits associated with such practices. There is, therefore, a need for subsequent research into how systematic measures of financial returns on investments in ESG can be designed and developed into standard frameworks by which to assess bottom-line impact of sustainability initiatives on a bank's bottom line.

3. Research Objectives

The present study examines relatively under-researched areas as an attempt to fill the identified gaps in literature to deepen understanding of the financial and operational impacts of ESG integration within the banking sector. The focus is on the development of standardized ESG measurement frameworks and related financial outcomes from sustainable banking practices.

RQ1: How can banks systematically measure the financial performance and long-term benefits of integrating ESG factors into their business strategies and operations?

RQ2: What are the key challenges and opportunities for standardizing ESG metrics in the banking sector, and how do these impact the effectiveness of sustainability reporting and risk management?

4. Methodology

The study adopted quantitative research method to analyze the integration of Environmental, Social, and Governance factors with financial performance in the Indian banking sector. A causal-comparative research design was used to explain how ESG factors affect financial outcomes by focusing on profitability, risk management, and sustainable long-term performance. Considering the scope of this research, six top Indian banks have been selected, comprising both public and private sector organizations. The selected banks are

1. State Bank of India(SBI): It is the biggest public sector bank in India with the highest level of participation in sustainable finance initiatives.
2. Punjab National Bank (PNB): The second leading bank is a public sector bank, and it has made tremendous contributions to CSR and sustainability.
3. HDFC Bank: HDFC Bank is a private sector bank that is actively following ESG practices, primarily in the context of governance and social responsibility.
4. ICICI Bank: A private major bank has made sustainability a part of its business model through various green initiatives.
5. Axis Bank: This bank is focusing on sustainable sustainability and lending that are environment friendly.
6. Kotak Mahindra Bank: One of India's private major banks is well known for leadership in corporate governance and responsible investment approach.

The criterion for the selection is the significant market presence these banks hold as well as their commitment to ESG initiatives. Publicly available ESG reports, and sustainability disclosures of these banks indicate incorporation of these practices. They are a quintessential representation of the Indian banking sector, ensuring a balance between public and private institutions for purposeful comparison.

Data Collection for this study is based on secondary sources. For ESG scores, the selected banks' ESG scores are obtained from recognized ESG rating agencies, such as MSCI (Morgan Stanley Capital International) (Deng, 2021) and Sustainalytics (Xiong, 2021), whereas for financial data, including Return on Assets (ROA), Return on Equity, and stock performance, databases like Bloomberg and Thomson Reuters are used. Annual financial reports available on the banks' websites also serve as complementary data in terms of financial performance and ESG activities.

SPSS 29.V were used to analyze data. Multiple regression model, factor analysis, correlation, and ANOVA were applied to ascertain whether the ESG factors have significant influence on financial performance. Independent variables representing ESG scores are analyzed against dependent variables-the financial metrics-to control the effects such as size of a bank, market capitalization, and economic conditions. The three regression models will also be used to test if higher ESG scores are linked with better performance in terms of financial performance and, thereby, help understand the benefits of sustainability within the banking industry. Descriptive statistics and correlation analysis will summarize the data while finding relationships.

5. Results

The data were processed with the use of descriptive statistics and regression models to evaluate the relationship between ESG integration and financial performance of the selected Indian banks and focus on the key financial metrics on which compared: ROA, ROE, changes in stock prices, and ESG

scores, which shed light on whether sustainability practices influence bank profitability and market performance.

Table 1: Financial Performance and ESG Score of Banks

Bank	ESG Score (2022)	ROA (%)	ROE (%)	Stock Price Change (%)	Total Assets (INR Crores)
State Bank of India	75	0.7	10.5	12.5	4500000
Punjab National Bank	68	0.4	8.3	8.9	800000
HDFC Bank	80	1.8	15	18.2	1700000
ICICI Bank	78	1.5	13.5	15.6	1300000
Axis Bank	74	1.3	12.8	14.3	1000000
Kotak Mahindra Bank	82	1.9	16.2	19.4	900000

Table 1 provides the information regarding six selected Indian banks, ESG scores, scores concerning Return on Assets (ROA), Return on Equity (ROE), and change in stock price, all along with total assets. It emphasizes the ESG performance namely financials for both public sector and private sector banks. Such banks include Kotak Mahindra Bank with an ESG score of 82 and HDFC Bank with an ESG score of 80. The banks have had higher ROA at 1.9% for Kotak Mahindra Bank and 1.8% for HDFC Bank, meaning the banks are using the assets effectively for creating a profit. Punjab National Bank, or PNB, that has the lowest ESG score at 68, has a much lower ROA at 0.4%, its profitability being less efficient. Similarly, the profitability in relation to shareholders' equity is measured by ROE. Its value is highest for Kotak Mahindra Bank at 16.2%, and HDFC Bank at 15%, which reflects stronger returns for the shareholders as compared with Punjab National Bank at 8.3%.

They also perform better in the market, and this is reflected by a better change in the stock price. Kotak Mahindra Bank and HDFC Bank perform the best with a change in the stock price of 19.4% and 18.2%, respectively while Punjab National Bank changes as low as 8.9%. This will be interpreted to mean that those banks that perform better in the ESG parameters are better perceived by the investors, thus means better growth in their stock prices.

Moreover, the largest asset base is in the State Bank of India (SBI), yet it is not the most profitable. The above observation would mean that large assets are not a guarantee for better financial performance, and ROA and ROE are relatively lower for the larger public sector banks like SBI and PNB compared to their private counterparts. The findings reveal that strong ESG practices have a positive relationship with improved financial performance, and sustainability is increasingly becoming a driver of profitability and market value in the banking industry.

Table 2: Regression Results of six selected Banks

Variables	Coefficients	Standard Error	t-Statistic	P-Value
Constant	-6.9432	1.033	-6.723	0.007
ESG Score (2022)	0.111	0.013	8.226	0.004
Total Assets (INR Crores)	-1.46E-07	4.78E-08	-3.054	0.055

Source: Author Calculation

The result shows that ESG scores are positively statistically significant with the financial performance in terms of ROA of selected Indian banks. However, the total assets on ROA have a negative but not strongly significant effect. This indicates that although size plays some role, the integrative aspect as

represented by ESG scores is more crucial for the profitability. The regression model yields a high R-squared value of 96.2%, which implies that most variance in ROA can be explained by ESG scores and total assets of banks, which further proves the importance of such factors while doing financial performance analysis.

Table 3: Correlation Matrix of Financial and ESG Variables

Particulars	ESG Score (2022)	ROA (%)	ROE (%)	Stock Price Change (%)	Total Assets (INR Crores)
ESG Score (2022)	1	0.919439	0.948322	0.97248	0.005678
ROA (%)	0.919439	1	0.991572	0.978574	-0.33682
ROE (%)	0.948322	0.991572	1	0.993421	-0.26259
Stock Price Change (%)	0.97248	0.978574	0.993421	1	-0.17659
Total Assets (INR Crores)	0.005678	-0.33682	-0.26259	-0.17659	1

Source: Author Calculation

Correlation analysis (Table 3) shows that there is a significant positive correlation between ESG scores and selected key financial performance indicators like ROA, ROE, and changes in the stock price. High ESG scores are strongly correlated with ROA at 0.919 and ROE at 0.948, where banks that have higher ESG score integration tend to be the most profitable and the one that utilizes assets and equity effectively in operations. Similarly, the high correlation between ESG scores and stock price changes (0.972) indicates investors reward sustainable practices and enjoy higher market valuation. However, total assets show weak negative correlation with both ROA (-0.337) and ROE (-0.263) as if larger banks are failing in efficiency and profitability. The results highlight that asset size is not a strong determinant of performance; ESG-focused banks are better off in terms of financial performance and attract more market confidence, which further strengthens the role of sustainability in the fostering of profitability and investor attractiveness for the banking industry.

Table 4: Factor Analysis

	ESG Score (2022)	ROA (%)	ROE (%)	Stock Price Change (%)
Component 1	-0.49195	-0.49846	-0.50404	-0.50543
Component 2	0.78456	-0.55751	-0.26639	0.051839

Soure: Author Calculation

Note:

Component 1 (negative loadings for all variables (**ESG Score**, **ROA**, **ROE**, and **Stock Price Change)**

Component 2: (positive loading for ESG Score (0.785) and mixed loadings for the financial metrics)

Factor analysis shows two principal components. Component 1 displays a negative loading for all variables, meaning that, presumably an inverse relationship prevails, in which higher ESG scores are positively correlated with lower financial performance in this component. Component 2 shows a strong positive loading on ESG Score (0.785); therefore, it captures the unique influence of ESG performance of the data separated from financial metrics. This indicates that the ESG factors on their own determine a significant portion of the variance; that is, they play a distinctive role in determining the performance of banks beyond the traditional finance one.

Table 5: Result of ANOVA Test

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Statistic	p-value
Between Groups	-	2	-	6.23	0.085
Within Groups	-	3	-	-	-
Total	-	5	-	-	-

Source: Author Calculation

The ANOVA test examined whether there were differences in ROA between three categories of banks, based on their ESG scores: Low ≤ 70, Medium 71-79, High ≥ 80. The ANOVA test produced an F-statistic of 6.23, and the corresponding p-value is 0.085. Although the F-statistic indicates that the ROA data from the three groups differs at some level of significance, the p-value > 0.05 so at the 5% level, the differences are not statistically significant. Hence this would suggest although it may differ in terms of profitability based on ESG performance in the sample, the difference is not big enough to weigh much up.

6. Discussion

The findings developed from this study further strengthen the importance of ESG integration while enhancing the financial performance of Indian banks. Such an analysis, across six major banks, depicts a direct relationship existing between sustainable practices and profitability as indicated by various financial metrics such as ROA, ROE, and the changes in stock prices. It therefore falls within a growing body of literature touting the positive impact of ESG on financial outcomes both short and long term and serves as supporting evidence to the work by Ng *et al.* (2020) that found that companies with good ESG practices outperform peers over time.

Banks with good ESG scores bettered their counterparts on such criteria as profitability and market valuation: Kotak Mahindra Bank and HDFC Bank, for instance. At the top is Kotak Mahindra Bank, holding an ESG score of 82, with ROA of 1.9% and a change in stock price at 19.4%, while PNB, with the lowest ESG score at 68, trails at 0.4% ROA, and 8.9% in its stock price change (Table 1). These findings support the views of Chiaramonte *et al.* (2021), which stated that ESG integration by banks, notably in their lending and investment activities, helps in achieving long-term growth and profitability.

The regression results in Table 2 further support the positive association between the ESG scores and financial performance. These findings are aligned with earlier works, such as Ziolo *et al.* (2019), who argued that incorporating ESG factors into the analysis supports banks in staying away from environmentally and socially hazardous investments, which would eventually imply good long-term financial stability. A statistically significant positive coefficient on the ESG score is at 0.111, p-value = 0.004, which shows that higher ESG scores correspond to better ROA, thus emphasizing the profitability of sustainable business models at the banks.

Interestingly, the regression analysis also reflected that total assets have a weak negative coefficient at (-1.46e-07, p-value = 0.055), which meant that although size does not necessarily mean larger-sized banks like SBI enjoy higher profitability levels. It assures to previous studies, which has shown that size itself does not act as an effective determinant of profitability. In fact, higher inefficiencies and complexities in operational workflows happen to hound larger banks, and those would minimize the effective utilization of assets, especially in case of less robust ESG integration.

Table 3 delivers the correlation matrix between ESG scores and other financial metrics. It shows a strong positive correlation between ESG scores and most key financial metrics, like ROA (0.919), ROE (0.948), and changes in stock prices (0.972). These correlations indicate that banks with a good record of ESG practices are generally more profitable and have better repute under consideration of investors, as exhibited by more returns on equity and efficient stock market performances. This result

is not inconsistent with Taliento *et al.* (2019), who postulate that ESG integration decreased capital costs, increased reputational value, and contributes to the kind of operational efficiencies.

However, the poor negative correlation between total assets and both ROA (-0.337) and ROE (-0.263) in either case shows that a higher asset base does not necessarily reflect higher profitability. The results indicate inefficiencies that the larger banks must face and mark the growing need for ESG-driven strategies over size per se as an influential driver of financial prosperity.

Factor analysis (Table 4) yields two main components that further explain the interaction of ESG scores and financial performance. Component 1 has negative loadings across all variables, meaning there may be trade-offs or that integration is complex in terms of impacting financial performance and how at times financial performance is inversely related to ESG scores. In contrast, Component 2 has high positive loading for ESG score at 0.785, which postulates that ESG factors explain a unique and significant role in explaining overall bank performance. Indeed, Landau *et al.* (2020) argued that though ESG integration usually leads to long-term financial benefits, measuring such benefits is challenging and sometimes depends on the context and is subjective in nature.

The ANOVA test results in Table 5 aimed at determining whether there is a significant difference that exists for ROA among banks that have low, medium, and high scores on ESG. Though the F-statistic was a bit large at 6.23, showing some variability in profitability among the groups, the p-value at 0.085 still falls beyond the 5% significant level. This means that, although, in general, higher-scoring banks have better financial performance, the sample size for the purposes of this study is probably too low to pick out truly significant effects, or that variance is coming from other sources which are not explained by simple ESG scores.

These results conform to and develop previous research into ESG integration in banking. The researchers Oprean-Stan *et al.* (2020) and Sciarelli *et al.* (2021) highlighted the important role played by ESG in increasing transparency, risk reduction, and sustainable growth. Current research adds further empirical support to such assertions; stronger ESG practices would be associated with higher financial performances as well as more market confidence, as realized through a greater change in stock prices. Similar to Dipierro *et al.* (2024), however, the problem lies in standardised ESG metrics because heterogeneity in the outcome points of the various banks that will measure and report ESG factors in different ways.

7. Conclusion

In conclusion, the study showed the growing importance of ESG factors being integrated into the core strategies of Indian banks. And through the analysis of the six major banks, this clearly shows a positive relationship among ESG performance and the key financials such as ROA, ROE, and stock price changes. As Kotak Mahindra Bank and HDFC Bank, some of the highest-scoring banks on ESG, outperform their peers with consistently higher profitability and market capitalisation, yet again reminding us that sustainability pays off. Regression analysis also supports the importance of ESG integration; as aforementioned, ESG scores are a superior predictor of financial performance, but if total assets is the only factor, then the model holds little to no significance.

While such findings were made, the research also depicts challenges. The standardised ESG metrics of the banks have not been created so far; hence, the comparison and report of the cross-bank will be very difficult to handle. Although the larger banks appear to have inefficiency, the smaller ESG-focused banks are always more profitable and hold higher market confidence. The observations, therefore, remain justified for further studies and constructive development of structured frameworks towards quantifying the financial benefits of ESG integration. The study provides credibility to the statement that sustainability is not only an imposition of regulatory functions but also a factor to retain profitability and attract investors in the long run for banking institutions.

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Effect of Psychological Factors on Positive Financial Behavior

Elsa George[1]*, Sajoy P. B.[2]

[1]*Assistant Professor and Research Scholar, Department of Commerce, Sacred Heart College, Thevara Sacred Heart College, Thevara, Email: elsageorge@shcollege.ac.in
[2]Assistant Professor, Department of Commerce, Sacred Heart College, Thevara Sacred Heart College, Thevara, Email: sajoypb@shcollege.ac.in
*Corresponding Author

Abstract The overall financial behaviour of the individual is evaluated through their cash, credit, insurance, savings, and investment management. The study tries to identify the effect of three psychological factors: attitude towards money, time orientation and impulsive attitude on each component of financial behaviour. The components of financial behaviour taken for the study are cash management, credit management, savings and investment management, and insurance management behaviour of individuals. The findings of Structural Equation Modelling (SEM) revealed a significant positive effect of attitude towards money and time orientation on all the components of financial behaviour. Whereas impulsive attitude of the individual negatively influences all the components of financial behaviour. The combined effect of each psychological factors on the overall financial behaviour of individuals is also established in the study. The combined theoretical model explained 58 per cent variation in the overall financial behaviour of the individuals.

1. Introduction

The financial well-being of the individuals is influenced by their financial behaviour. A good financial behaviour leads to improved wellbeing and financial satisfaction followed by life satisfaction among people(Sehrawat et al., 2021). So, it is important to track the overall components of financial behaviour for improved financial well-being. Savings and investment management, cash management and credit indiscipline express a strong significant relation with financial wellbeing (Chavali et al., 2021).Perry & Morris (2005) defined personal financial behaviour as "an individual's self-assessed capacity to budget, save money and control expenses". Whereas Xiao (2008) broadens the definition of financial behaviour by including additional components such as credit management and cash management and thereby defined financial behaviour as "human behaviour related to money management which includes cash management, savings and credit behaviour". Further, the definition of financial behaviour is rightly modified by Dew & Jian Xiao (2011) as "the overall personal financial management behaviour of individuals are explained by their cash management, credit management, savings and investment management, and insurance management behaviour". So, it is evident that the management of cash, credit, savings and investments, and insurance management are the key components of personal financial behaviour.

Cash management refers to management of own cashflow, expenses and maintaining liquidity and includes prioritizing one's income and its management such that one is able to meet all recurring expenses and satisfy one's own need and wants(Boeschoten, 1998). Proper cash management includes budgeting for present needs along with planning for future. Credit management involves managing credit responsibly through paying off debts in time and adjusting the spendings before considering the saving (Xiao et al., 2006).Proper utilization of credit, Timely payment of credit card bills, EMIs and other financial obligations leads to healthy credit behaviour(Dew & Jian Xiao, 2011). Poor credit

management results in lowering the financial wellbeing of a person. Further poor credit behaviour also leads to increased stress and anxiety in a person (Hughes, 2021). So, healthy credit management is important component in achieving financial stability and thereby leads to positive financial behaviour. Studies have been conducted which explains that savings and investment management has a significant and positive association with financial wellbeing of individuals(Mandell & Klein, 2009). The savings and investment management can be explained as sacrificing the current consumption to accumulate funds which is further channelised into avenues that earns higher returns in future. Further savings and investment management is a crucial part of personal financial management as it has a direct impact on the economic development of the country(Owusu et al., 2022). So, the savings and investment are an important construct in effective financial behaviour. Though savings and investments are two concepts it should be studied together as the former and later go hand in hand. Insurance management of individuals involves the strategic planning and preparation to mitigate financial risks through the procurement of suitable insurance policies, ensuring coverage for potential contingencies (Vaughan & Vaughan, 2007). Taking adequate insurance frees a person from huge financial burden which may arise on the happening of the uncertain event. Therefore, there is high probability that a rational individual will always think about reducing his future contingencies by taking adequate insurance policies and thereby securing his future.

The modern behavioural finance literatures specifically explains that individuals take sub-optimal decisions due to the influence of various psychological factors on the their financial behaviour and decision making(Andreou, 2007; Bhandari G. and Deaves R., 2006; O'donoghue & Rabin, 2001; Pallier et al., 2002; Porter & Thomas Garman, 1993; Raymond S. Nickerson, 1998; Strack & Deutsch, 2004). The psychological factors like attitude towards money, future orientation and impulsive attitude plays a significant role in the decision making and financial behaviour of individuals(Percy & Elizabeth, 2011; Rabinovich et al., 2010; Rutledge & Deshpande, 2015; Reed & Naudé, 2020). Hence the study tries to establish individual as well as combined effect of the above psychological factors on the various components of financial behaviour.

Therefore, the paper tries to address the following research questions.

1. Whether the psychological factors- attitude towards money, time orientation and impulsive attitude have an impact on the cash management behaviour of individuals?
2. Whether attitude towards money, time orientation and impulsive attitude influence the credit management behaviour of individuals?
3. Does attitude towards money, time orientation and impulsive attitude have an impact on savings and investment management behaviour of individuals?
4. Does attitude towards money, time orientation and impulsive attitude have an impact on the insurance management behaviour of individuals?
5. To what extend does the three psychological factors influence the overall financial behaviour of individuals?

2. Review of Literature

Though the traditional theories of finance such as the Rational Choice Theory and Efficient Market Hypothesis (EMH) theory claims that human beings are fully rational while taking financial decisions (Scott, 2000; Uzonwanne, 2016),the modern financial theories explains that human beings are not fully rational(Kahneman, 2003). The modern theories states that financial decisions of individuals are subjected to various psychological factors and biased thoughts. The Theory of Bounded Rationality as explained by Simon (1972)states that human decisions rely on their personal experience, cognitive thoughts and personal biases. While financial behaviour requires a rational and logical thought process, numerous psychological factors significantly influence the decision-making process and behaviour of people (Dietrich, 2010)(Hashmi et al., 2021; Khresna Brahmana et al., 2012; Percy & Elizabeth, 2011;

Strömbäck et al., 2017; van Overveld et al., 2012).Therefore, understanding in detail about the complex relationship between the psychological factors and financial behaviour has become important in today's world. The psychological factors such as attitude of a person towards money, future orientation, self-control and impulsive behaviour are among those which have a significant impact of financial behaviour and wellbeing of individuals (Castro-González et al., 2020;Sehrawat et al., 2021; Gathergood, 2011; Ghazali et al., 2020; Hashmi et al., 2021; Maison, 2019; Percy & Elizabeth, 2011; Phau & Woo, 2008; Strömbäck et al., 2017; Utkarsh et al., 2020).

Extensive researches have delved into the relationships between these psychological factors and overall personal financial behaviour(Hashmi et al., 2021; Khresna Brahmana et al., 2012; Maison, 2019). Gaining a comprehensive understanding about the existing literature found to have explored only the impact of psychological factors on overall personal financial behaviour. There is no or limited studies that detailed into the individual and combined effect of psychological factors - attitude towards money, future orientation, and impulsive attitude on each individual aspect of the personal financial behaviour. Further, only limited studies have been conducted in India to understand the influence of these psychological factors on personal financial behaviour of people in India. Understanding the impact of these psychological factors is important as it empowers a person to evaluate his own financial behaviours and make necessary corrections to obtain better financial stability and hence the study.

3. Theoretical Model Development

3.1 Psychological factors

The various aspects of human psychology that shape or influence the decisions and actions of a person is referred to as the psychological factors. It includes the mindset, emotions, beliefs, attitude, or personal experience of a person.

3.2 Attitude towards Money and Financial Behaviour

The attitude towards money can be defined as a state of mind, beliefs, perception or a person's feeling and behavioural tendencies surrounding money (Sesini & Lozza, 2023)(Yogasnumurti et al., 2019) which varies from person to person. Money for saving and money for spending are the two dimensions of attitude towards money. While some individuals believe in saving money in order to improve financial security others perceive money in terms of their ability to fulfil their immediate needs and desire(Qamar & Nadeem Khemta, Muhammad Jamil, 2016). While some people feel positive about saving money for future others are likely to spend money for their immediate gratification as they focus on their short-term pleasure than their long-term financial objectives. Positive attitude towards money leads to improved financial behaviour and financial wellbeing of individuals(Castro-González et al., 2020),(Utkarsh et al., 2020),(Mariza Syafitri & Santi, 2017). A highly significant relationship also exists between money attitude and financial problem (Dowling et al., 2009).Positive money attitude helps individuals to be cautious towards spendings through proper planning and budgeting for future financial needs(Sabri et al., 2020). It also helps a person to manage his cash wisely(Sundarasen & Rahman, 2017). Since a person with positive attitude towards money plan and budget for a secure future (Sabri et al., 2020), the researcher also assumes that attitude towards money also influence the insurance management behaviour of a person. Based on the above theoretical support, the hypotheses formulated are:

H1: Attitude towards money positively influence the personal financial behaviour.

H1(a): Attitude positively influence the cash management behaviour.

H1(b): Attitude towards money positively influence the credit management behaviour.

H1(c): Attitude towards money positively influence the savings and investment management.

H1(d): Attitude towards money positively influence the insurance management.

3.3 Future Orientation and Financial Behaviour

"Future orientation refers to extend to which people focus on future rather than present or past"(Percy & Elizabeth, 2011). Future orientation of a person affects their goals, financial decisions, financial behaviour and overall financial wellbeing of individuals (Kempson & Poppe, 2018). People who are present oriented prioritize their immediate goals without considering their long-term impact. They will be interested in spending money rather than saving. While people who are long term or future oriented will prioritize savings over spendings(Rabinovich et al., 2010). Future oriented individuals considers the impact of each decision on their future which in turn motivates them to sacrifice their short-term spending and immediate enjoyment for their long-term financial security(Rabinovich et al., 2010).Low future orientation leads to increased personal debt(Rutledge & Deshpande, 2015). Further, long term oriented nature of people is also considered to be an important factor in purchase of life insurance policies (Park & Lemaire, 2011). Proper insurance management is essential for people who are long term oriented as they tend to plan for future and save for retirement(Hajam, 2020; Phau & Woo, 2008; Rutledge & Deshpande, 2015).

Hence the hypotheses formulated are:

H2: Future orientation is positively associated with financial behaviour.

H2(a): Future orientation is positively associated with positive cash management.

H2(b): Future orientation is positively associated with positive credit management.

H2(c): Future orientation is positively associated with savings and investment management.

H2(d): Future orientation positively influence the insurance management.

3.4 Impulsive Attitude and Financial Behaviour

Impulsive attitude refers to a person's sudden actions or behaviour without thinking about its potential consequences. Buying things on impulse and making financial decisions without much thinking are examples of impulsive behaviour. Impulsive financial decisions have consequences including impulsive spending, excessive borrowings, lack of savings, investing in risky ventures which further leads to poor financial behaviour, lack of financial security and increased financial anxiety. Impulsive behaviour leads to compulsive buying, excessive spendings and poor usage of credit cards (Omar et al., 2014). Non impulsive behaviour have a positive relationship with financial satisfaction and overall life satisfaction(Tahir et al., 2021). Impulsivity is also positively associated with risk behaviour of individuals (Chhabra & Assistant, 2018). Further impulsivity is negatively associated with possibility of holding health insurance because impulsive people are less concerned about the negative consequences of their choices (Brighetti et al., 2014). Therefore, there is high possibility that impulsive attitude can negatively influence the financial behaviour of an individual and hence the hypotheses formulated are:

H3: Impulsive attitude is negatively associated with financial behaviour.

H3(a): Impulsive attitude is negatively associated with positive cash management.

H3(b): Impulsive attitude is negatively associated with positive credit management.

H3(c): Impulsive attitude is negatively associated with savings and investment management.

H3(d): Impulsive attitude is negatively associated with insurance management.

4. Research Methodology

The study utilized Financial management behaviour scale drawn fromDew and Jian Xiao, (2011) to measure the financial behaviour. The scale contains 15 constructs which includes measurement of cash management using 4 constructs, credit management using 3 constructs,

savings and investment management using 5 constructs and insurance management using 3 constructs. Scales were developed by the researcher for measuring variables such as attitude towards money (4 questions), time orientation (3 questions) and impulsive behaviour (3 questions). These scales were developed based on (Kempson & Finney, 2017). The data was collected from 538 individuals from selected locations of Kerala, India using multistage non-probability sampling method. Any individual who earns and manages one's own income constituted the sample of the study.

4. Data Analysis

Table 1Construct Validity and Reliability

Variables	Constructs	Factor Loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Cash Management	FB1	0.735	0.837	0.847	0.89	0.671
	FB2	0.773				
	FB3	0.704				
	FB4	0.720				
Credit Management	FB5	0.793	0.879	0.88	0.926	0.806
	FB6	0.787				
	FB7	0.757				
Savings and Investment Management	FB8	0.766	0.882	0.886	0.914	0.68
	FB9	0.765				
	FB10	0.771				
	FB11	0.710				
	FB12	0.817				
Insurance Management	FB13	0.749	0.862	0.866	0.916	0.784
	FB14	0.721				
	FB15	0.757				
Future Orientation	FO1	0.879	0.911	0.921	0.938	0.776
	FO2	0.882				
	FO3	0.882				
Impulsive Attitude	IMP1	0.807	0.772	0.778	0.868	0.687
	IMP2	0.863				
	IMP3	0.815				
Attitude towards Money	AM1	0.781	0.794	0.805	0.866	0.618
	AM2	0.852				
	AM3	0.773				
	AM4	0.734				

Source: Author's own Calculation

The validity of the data was tested using Cronbach's alpha and Composite reliability. The obtained values are well above the threshold for Cronbach's alpha of > 0.7 (J. Hair et al., 2010) and the composite reliability > 0.7(J. F. Hair et al., 2014).The Discriminant validity of the data was tested using Fronell-Larcker Criterion(Fornell, C., & Larcker, 2016)

Table 2: Discriminant Validity - Fronell-Larcker Criterion

	Cash Management	Credit management	Impulsive Attitude	Insurance Management	Attitude towards Money	Savings and Investment Management	Time Orientation
Cash Management	0.819						
Credit management	0.719	0.898					
Impulsive Attitude	-0.593	-0.613	0.829				
Insurance Management	0.679	0.62	-0.428	0.885			
Attitude towards Money	0.603	0.582	-0.607	0.493	0.81		
Savings and Investment Management	0.766	0.721	-0.55	0.756	0.567	0.825	
Time Orientation	0.584	0.702	-0.621	0.498	0.54	0.618	0.881

Source: Author's own Calculation

Table 3 Demographic Profile of the Samples

Demographic Profile		Number	Percentage (%)
Gender	Male	318	59
	female	220	41
Age	18-30	153	28
	31-45	176	33
	46-60	182	34
	Above 60	27	5
Marital status	Single	93	17
	Married	425	79
	Widow/er	14	3
	Divorced	6	1

Education	Up to 10th Grade	89	17
	12th Grade/ Diploma	99	18
	Graduate	185	34
	Postgraduate/Professional	165	31
Annual Income of Family	Less than 1 Lakh	102	19
	1 Lakh to 2.5 Lakhs	126	23
	2.5 Lakhs to 5 Lakhs	150	28
	5Lakhs to 10Lakhs	105	20
	Above 10Lakhs	55	10

Source: Author's own Calculation

4. Results and Discussions
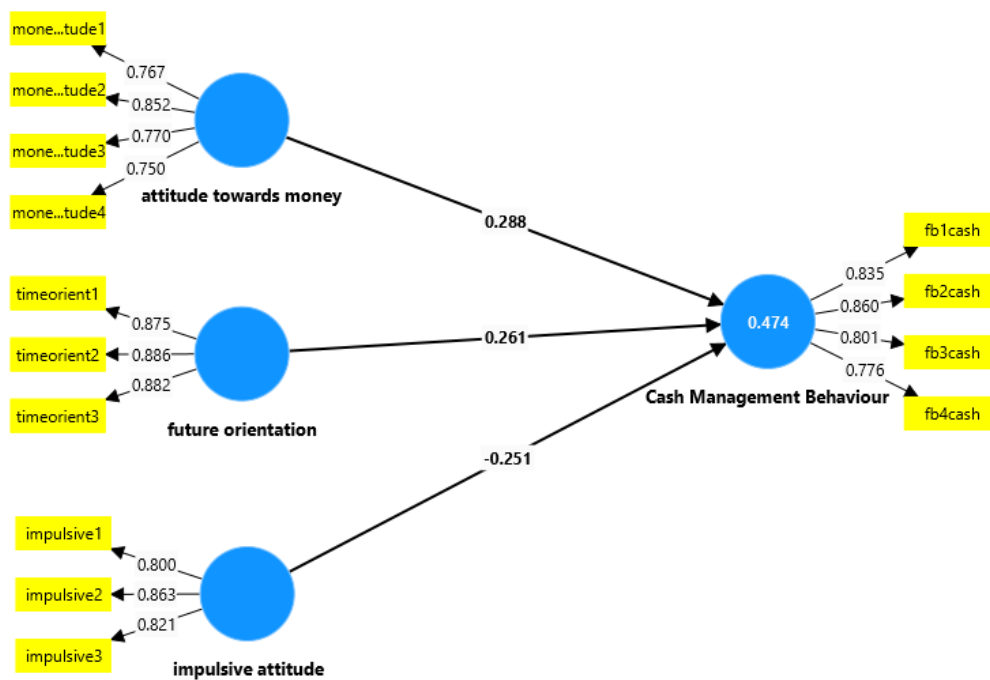
The Path coefficients explained a positive relationship between Attitude towards money, future orientation, and cash management while impulsive attitude had a negative association with Cash Management Behaviour. All relationships are significant, and we can accept the three hypotheses H1(a), H2(a), and H3(a). The three psychological factors together had an adjusted R^2 of 0.474.

Attitude towards money and time orientation had a significant positive association with credit management whereas a significant negative association was identified between impulsive attitude and credit management behaviour.We accept our hypothesis H1(b), H2(b), and H3(b). An ajusted r^2 of 0.565 of credit management was explained by the three psychological factors.
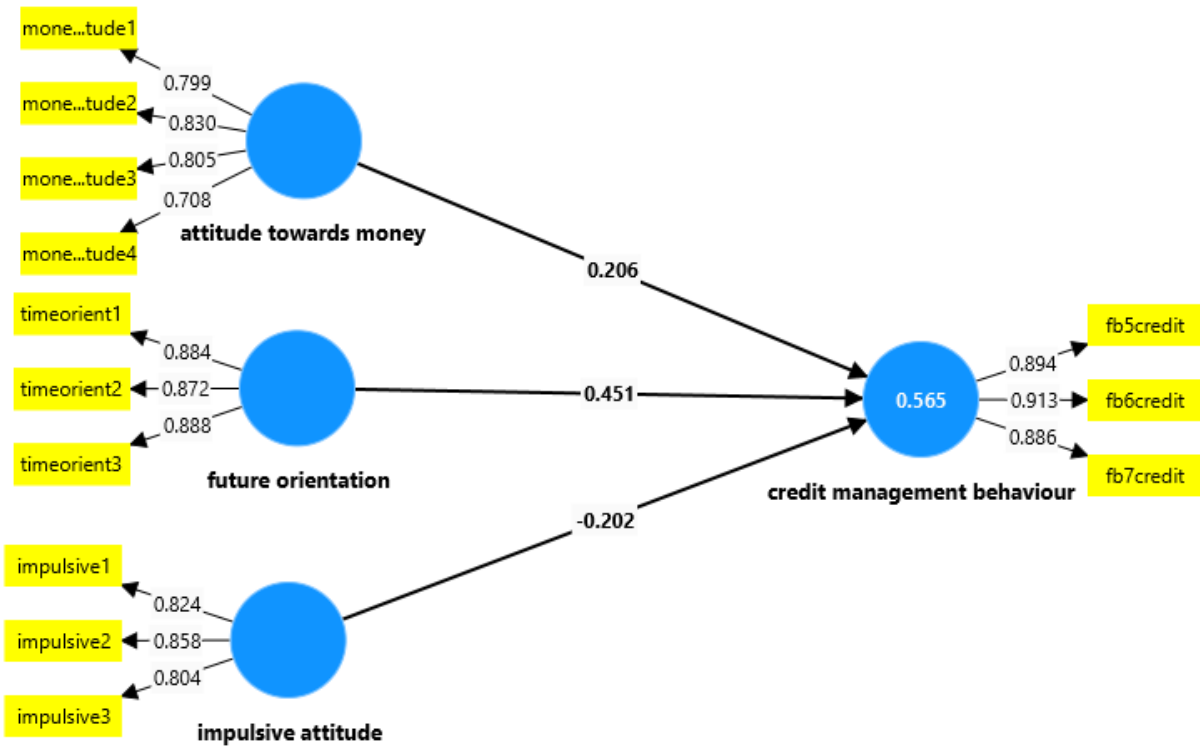
Attitude towards money and time orientation had a significant positive association with Savings and investment management whereas a significant negative association was identified between impulsive attitude and Savings and investment management behaviour. . All path coefficient were above 0.1 and we can accept the three hypotheses H1(c), H2(c), and H3(c). The adjusted r^2 obtained was 0.467.
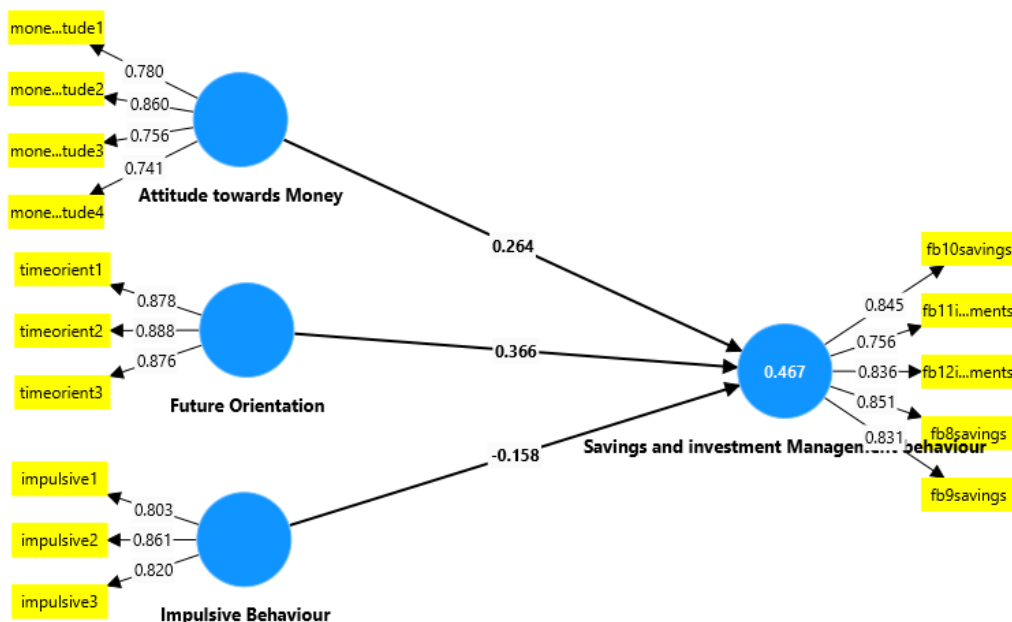
Attitude towards money and time orientation had a significant positive association with insurance management. A negative association was identified between impulsive attitude and Savings and investment management behaviour but the relationship was not significant and the path coefficient

was only -0.074. . Therefore we can accept our hypothesis and we can accept the three hypotheses H1(d) and H2(d) but we fail to accept H3(d). The adjusted r^2 obtained was 0.316.
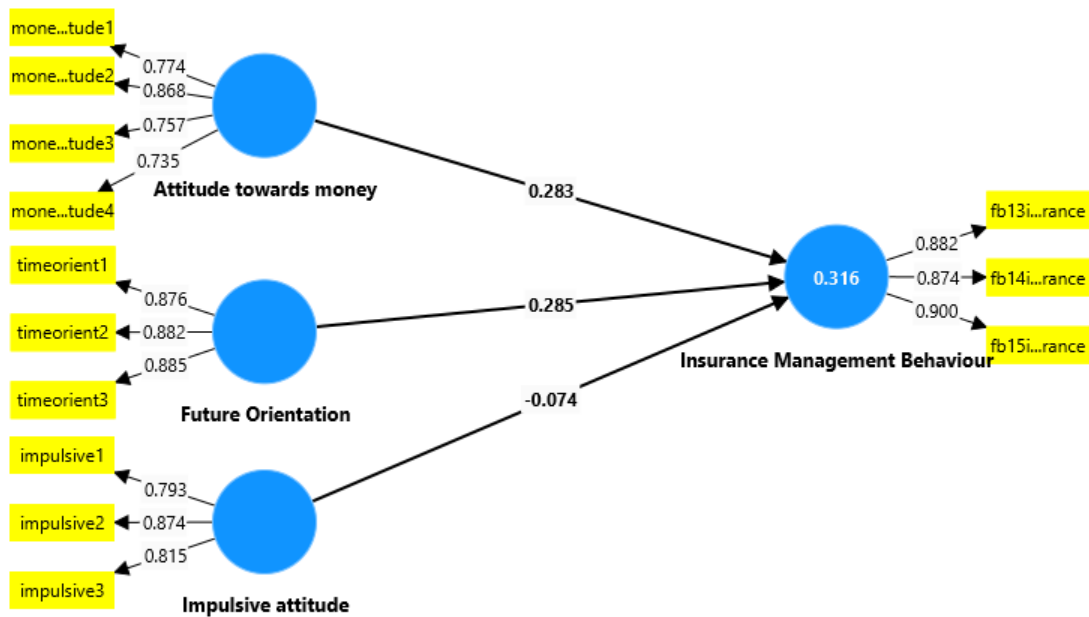
Furthermore, when considering overall financial behavior, it was observed that attitude towards money and time orientation had a significant positive association with the overall financial behaviour, while impulsive attitude displayed a significant negative association. The adjusted R-squared value for overall financial behavior was 0.576, suggesting that the combined effects of these psychological factors explained a substantial portion of the variance in individuals' financial management behavior. All the path coefficients were above 0.1 and we accept the three hypotheses H1,H2 and H3.
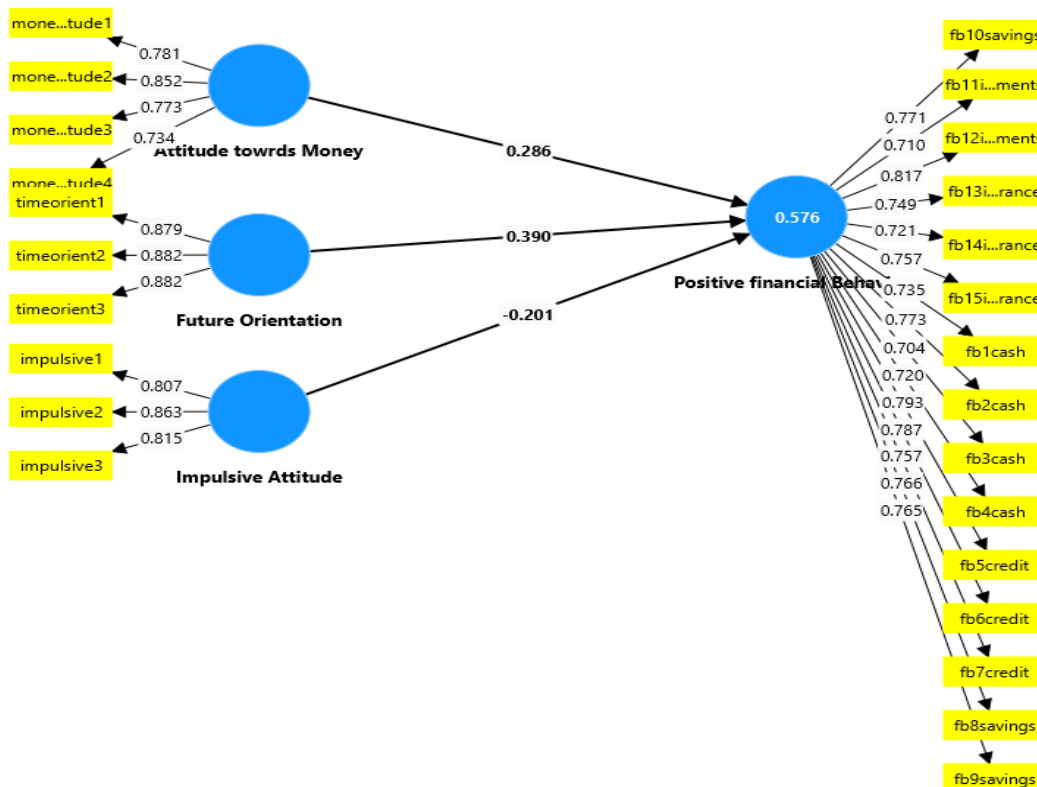
Table 4 Hypotheses test results

	HYPOTHESIS	Original sample (O)	Sample mean (M)	T statistics	P values	Decision
H1(a)	Attitude towards Money -> Cash Management Behaviour	0.284	0.284	5.867	0.000	Supported
H1(b)	Attitude towards Money -> Credit Management Behaviour	0.206	0.208	4.597	0.000	Supported
H1(c)	Attitude towards Money -> Insurance management behaviour	0.275	0.274	4.952	0.000	Supported
H1(d)	Attitude towards Money -> Savings and investment management Behaviour	0.257	0.257	5.571	0.000	Supported
H1	Attitude towards Money -> positive financial behaviour	0.286	0.286	6.496	0.000	Supported
H2(a)	Future Orientation -> Cash Management Behaviour	0.258	0.258	5.573	0.000	Supported
H2(b)	Future Orientation -> Credit Management Behaviour	0.454	0.455	9.528	0.000	Supported
H2(c)	Future Orientation -> Insurance management behaviour	0.288	0.289	5.216	0.000	Supported
H2(d)	Future Orientation -> Savings and investment management Behaviour	0.365	0.366	7.543	0.000	Supported
H2	Future Orientation -> positive financial behaviour	0.390	0.390	8.655	0.000	Supported
H3(a)	Impulsive Attitude -> Cash Management Behaviour	-0.254	-0.254	5.082	0.000	Supported
H3(b)	Impulsive Attitude -> Credit Management Behaviour	-0.200	-0.200	4.028	0.000	Supported
H3(c)	Impulsive Attitude -> Insurance management behaviour	-0.075	-0.076	1.341	0.180	Not Supported
H3(d)	Impulsive Attitude -> Savings and investment management Behaviour	-0.162	-0.161	3.327	0.001	Supported
H3	Impulsive Attitude -> positive financial behaviour	-0.201	-0.201	4.263	0.000	Supported

Source: Author's own Calculation

5. Discussions and managerial implications

The study underscores the crucial significance of three key psychological factors, namely attitude towards money, future orientation, and impulsive attitude, in shaping various financial management behaviors. These psychological aspects influence how individuals approach and handle their finances, impacting cash management, credit management, savings and investment management, insurance management, and overall financial behavior. By analyzing the data, the researchers were able to quantify the impact of these psychological variables on the variability observed in each financial behavior, as indicated by the adjusted R-squared values.

The findings revealed that attitude towards money, future orientation, and impulsive attitude collectively accounted for a substantial 57.6% of the variation in individuals' financial behavior. This

highlights the pivotal role these psychological factors play in understanding and predicting how people manage their finances.

In the realm of cash management, the study indicated that individuals' attitudes toward money and future orientation had positive correlations with responsible cash management practices. Conversely, those displaying an impulsive attitude tended to exhibit less disciplined cash management behavior, potentially leading to financial challenges.

Likewise, in the context of credit management, the study observed positive associations between attitude towards money and future orientation, suggesting that individuals with a positive outlook and forward-thinking approach are more likely to handle credit responsibly. On the other hand, a negative relationship was found between credit management behavior and impulsive attitude, indicating that impulsive individuals may engage in riskier credit behaviors.

Moreover, the study highlighted the significance of attitude towards money and future orientation in influencing prudent savings and investment management practices. Those with positive attitudes towards money and future-oriented mindsets were more inclined to adopt sound savings and investment strategies. Conversely, an impulsive attitude showed a significant negative association with savings and investment management behavior.

Further, the study reveals that attitude towards money and time orientation influence insurance management behavior. Individuals with positive attitudes towards money and future-oriented mindsets tend to exhibit more responsible and thoughtful insurance management practices. On the other hand, the study did not find a statistically significant relationship between impulsive attitude and insurance management behavior. However, it is important to note that the combined effects of attitude towards money, time orientation, and impulsive attitude still accounted for a moderate level of explanatory power, as indicated by the adjusted R-squared value of 0.316. While further research may be needed to understand the influence of impulsive tendencies on insurance management fully, the findings highlight the meaningful impact of attitude and future orientation in shaping individuals' decisions and behaviors related to insurance.

Overall, the study's comprehensive examination of these psychological factors provides financial professionals, policymakers, and educators with valuable knowledge. By recognizing the impact of attitude towards money, future orientation, and impulsive tendencies on financial behaviors, targeted interventions can promote better financial decision-making and empower individuals to achieve their long-term financial objectives.

6. Conclusion

The research underscores the significant influence of psychological factors, namely attitude towards money, future orientation, and impulsive attitude, on financial management behaviour. The study reveals that these factors collectively account for a substantial 57.6% of the variation in individuals' financial behaviour. This highlights the pivotal role played by these psychological aspects in understanding and predicting financial management practices.

The study further elucidates the impact of these factors on specific financial behaviours such as cash management, credit management, savings and investment management, and insurance management. Positive attitudes towards money and future orientation were found to correlate with responsible financial practices, while impulsiveness was associated with less disciplined financial behaviour.

These findings provide valuable insights for financial professionals, policymakers, and educators. By understanding the profound influence of psychological factors on financial behaviors, targeted interventions can be developed to promote better financial decision-making and empower individuals to achieve their long-term financial objectives. This research, therefore, contributes significantly to the existing body of knowledge on financial self-efficacy and its role in shaping financial behaviors

and well-being. Future research could further explore these relationships across different demographic groups and economic conditions.

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Choice of Payment Pattern by the Households: A Survey-Based Approach

Niharika Mohapatra[1], Alok Ranjan Behera[2*]

[1] ICSSR Research Fellow, Department of A & A Economics, Utkal University, niharikamohapatra@utkaluniversity.ac.in,

[2] Assistant Professor, Department of A & A Economics, Utkal University, arbehera@utkaluniversity.ac.in,

*Corresponding Author

Abstract: The heterogeneous choice pattern of consumption is influenced by the nature of the payment system, including liquidity, availability, acceptance, and usage costs. Consumers' payment patterns shift from traditional forms to advanced payment methods. The study wants to examine the choice of payment modes for purchasing different products and services and also to find out which factors are influencing the use of UPI mode. A multistage stratified simple random sampling method was applied to select households. It is found that cash is the most preferable mode of payment followed by UPI. However, in the case of durable items, net banking is the preferred mode of payment. From the corelation analysis it is found that, the use of UPI mode is statistically corelated with the level of income, age and use of smart phone and computer. Further, the regression result reveals that the income level, use of both smart phone and computer are the factors that influencing the use of UPI.

1. Introduction

Consumers' payment patterns have changed over the years, both in the world and in India. In the 1900s, people used cash and cheques (Evans & Schmalensee, 2005), and before the evolution of money and cheques, people used the barter system for their transactions. Now, the payment mode has shifted from cash-based and paper-based to cashless. The payment system is rapidly changing (Simatele& Mbedzi, 2021) in an evolutionary process with the changing behaviour of consumers. It is predicted that the economy is going to be cashless and that cash will die (Arvidsson &Markendahl, 2014; Carton & Hedman, 2013; Hedman, 2012) in future.

In our regular transactions, we need different modes of payment for various purposes. After various digital payment modes were introduced, the use of cash payment relatively declined. But cash still plays the primary role (Simatele& Mbedzi, 2021) in the demand and supply side of the transaction process (Arango-Arango & Suarez-Ariza, 2020; Flannigan &Satib, 2017; Bech et al., 2018; Arango et al., 2015). Here, we might wonder whether there are any unique attributes for which it has yet to be enhanced by other forms of payment, where other payment instruments have many incentives like discounts, rewards, cashback offers, etc. or any other reasons for more use of cash. The foremost reason is that cash transaction is the preferred payment system due to its ease of use, universal acceptance, and user behaviours (Aurazo& Vega, 2021; Rybina, 2021).

The digital modes of payment are the best alternative payment system (Schmiedel et al., 2012; Arango & Taylor, 2008); that create more significant opportunities, such as speedier, easier, lower cost of their functioning, security, saves time and manpower, etc. (Swiecka et al., 2021; Shree et al., 2021; Rybina, 2021; Aurazo& Vega, 2021). Use of digital payment modes may bring transparency in government system, reduces corruption. Financial inclusion is an indicator of economic development through increase in monetisation, decrease in volume of hoarding and flow of fund into the banking system. Digitisation may help the public to access more volume of credit. Use of digital modes not only helps

for easy transaction but also help to increase in efficiency and productivity of both financial system and real sector.

2. Literature Review

Cash is a preferable payment instrument (Simatele & Mbedzi, 2021) for consumers due to its wide acceptance nature and ease of use. But now, consumers substitute debit cards and cash for credit cards because of the incentive programmes. Males prefer credit cards over debit cards in consumption, but females do not. It is not only males but also educated people who choose to use credit cards in time of consumption (Arango et al., 2015). People also want to pay for identical products with debit cards rather than cash. For beer and coffee, bids were substantially higher for cards than for cash (Runnemark et al., 2015).Compared to debit cards, consumers with formal jobs are more likely to pay in m-payment because most of them are receiving their salaries and pay through bank transfers. Informal sector workers purchase their goods by using cash (Simatele & Mbedzi, 2021).

Further, consumers prefer to use cash in low-value transactions such as paying for tickets, hiring domestic help, hiring contractors, and receiving healthcare services. For the purchase of food, apparel, shoes, movies, theatres, fitness centres, leisure activities, and cultural events, cards are used more frequently. Payment cards or stick cards are used to make high-value purchases like televisions, radios, and household goods (Swiecka et al., 2021). The choice of payment systems differs in various places. Consumers most often pay cash in small markets and saloons or parlours. Consumers prefer to pay with cards while shopping in malls, gas stations, and stores, which have discount opportunities for using cards. In online shopping, consumers prefer fast transfer instruments or cash on delivery (Swiecka et al., 2021). The number of cash transactions made by respondents has noticeably decreased, and digital payments are widely used. Respondents oppose making cash mode and suggest that others use only digital forms of payment. Even though digital payments are widely used, they believe that in the future, technologies guaranteeing anonymity in digital payments will proliferate (Szumski, 2022).

The development of an internal electronic payment system, both in banking and postal services, allowed customers to use such a facility at an affordable price. Therefore, customers mostly use electronic modes of payment, such as bill payment and employee payroll payment, due to convenience (Humphrey et al., 1996). Previous studies have focused on factors determining digital payment and the consumption patterns of consumers in digital payment. The novelty of this study is that it relates to various modes of payment for different goods and services and which factors are influencing the mode of UPI in particular.

3. Objectives of the study

- To examine the choice of payment modes for purchasing different products and services.
- To find out the factors that are influencing the use of UPI.

4. Research Methodology

The study is based on only primary data sources. A multi-stage stratified simple random sampling method has been applied to select the 440 households from two districts of Odisha. These 440 households represent geographical locations, such as rural and urban, across different social groups and literacy rates.

The variables are different modes of payment, such as cash and digital payments like debit cards, credit cards, UPI, and net banking's, etc. The goods and services taken for the study are divided into three broad categories, namely, (a) Food items, (b) Consumables and Services items, and (c) Durable Goods (NSS, 2022-23).

Food items like vegetables and non-vegetable articles, dairy products, snacks and tiffin, beverages, and grocery items are used daily. Under consumable and service items viz petrol, saloon and parlour, fees of school and tuition, stationery items of office, books, footwear, cosmetics, dress materials, mobile and television recharge, newspaper, bills and premiums, house service payment, liquified petroleum gas, repairing services, child product, medical services, diagnostic and medicines, house construction materials, restaurant, travel, payment to friends and relatives, gift and donation and rent. Under durable assets, we have taken only vehicles and electronic products. Other products have been ignored due to the very low response from the surveyed households. To analyse the data, we have applied descriptive statistics such as percentages, mean and standard deviation, etc., and we have also applied correlation and regression to find the relationship between the value of UPI with income level, education, age of the respondent, average distance, members of the family, marital status, and users of mobile and computers. Here we have taken only UPI mode of digital payment because most of households are using this mode compare to other modes of payment in our study areas.

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A multiple regression model is used to evaluate the influence of socioeconomic factors on UPI payments. The multiple regression model is a type of model that has one dependent variable and multiple independent variables. This model is formulated as

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \epsilon_i$$

Where Y_i = Value of UPI

X_{1i} = No. of Members

X_{2i} = Marital Status

X_{3i} = Mobile and computer Users

X_{4i} = Average Distance from ATM and Banks

X_{5i} = Income

X_{6i} = Age

X_{7i} = Education

α, β's are the intercept and regression coefficients

ε is the error term

To normalise the data, we have taken the log form in value of UPI payment, income, age, and education.

5. Data analysis

The study has tried to measure the use of different modes of payment, including cash, by the surveyed households when purchasing goods and services in rural and urban areas.

Table 1: Households Using Different Modes of Payment

Modes of Payment	Frequency	Per centage
Cash	440	100
Debit Card	77	17.5
Credit Card	20	4.5
UPI	218	49.5
Net Banking	23	5.2
Source: Authors' Compilation		

Table 1 reveals that all surveyed households use cash to purchase different goods and services; cash is the most popular payment method in the study area. Nearly half of the households, 49.5 per cent, use UPI, the second most preferable payment mode. Nowadays, all individuals are willing and able to purchase a mobile phone, which may be used for multiple purposes, such as social connection through social media and economic connection, like using different payment modes. The debit cards stand in third place with 17.5 per cent of HHs choices. All account holders own this card and can use it anywhere; the point-of-sale device is available at a supermarket, shopping mall, etc. Credit cards (4.5%) and net banking (5.2%) are the preferred payment options.

Figure 1: Households Using Different Modes of Payment in Rural and Urban Areas

Source: Authors' Compilation
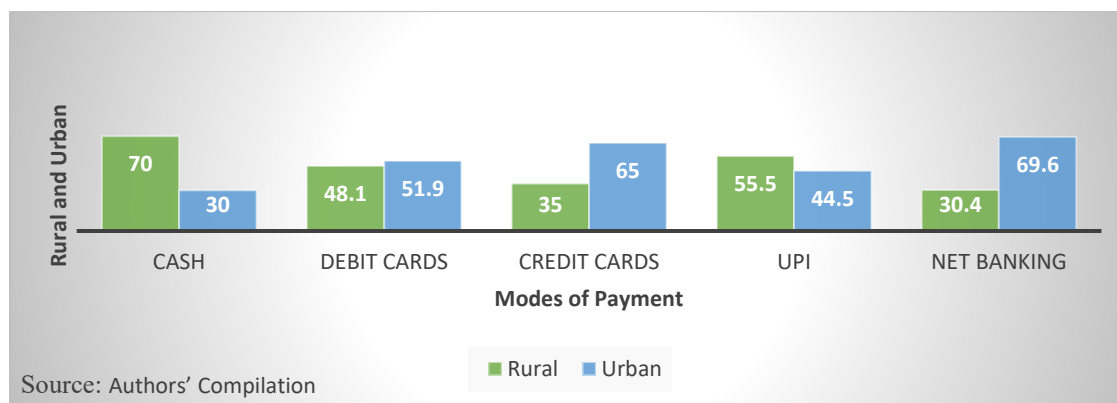
Further, figure 1 shows how different payment methods are used in various areas, especially in rural and urban. The study found that 30 per cent of households in urban and 70 per cent of households in rural areas use cash. There is a vast difference between rural and urban households in terms of using cash. Like cash, the difference is also in using net banking and credit cards in urban and rural areas. 48.1 per cent of rural households and 51.9 per cent of urban households use debit cards. However, in the case of UPI, rural people use more than urban people. So, the area plays a significant role in determining all payment options. Education and experience give urban people more choices in the card payment system than in rural.

Table 2: Percentage of Total Expenditure on Different Products

Products	Cash	Debit	Credit	UPI	Net Banking	Total
Veg and non-veg	87.62	0.00	0.00	12.38	0.00	100.00
Dairy Products	83.14	0.00	0.00	16.86	0.00	100.00
Snacks/ Tiffin	66.12	0.00	0.00	33.88	0.00	100.00
Beverages	72.26	0.00	0.00	27.74	0.00	100.00
Grocery Items	79.99	2.09	0.00	17.92	0.00	100.00
Total Food Item	81.70	0.85	0.00	17.44	0.00	100.00
Petrol	57.31	13.87	3.79	25.03	0.00	100.00
Saloon/Parlor	77.71	0.00	0.00	22.29	0.00	100.00
Mob & TV Recharge	40.26	1.18	1.69	56.87	0.00	100.00
News Paper	90.18	0.00	0.00	9.82	0.00	100.00
Bills & Premium	65.36	0.53	1.34	31.36	1.41	100.00
House Service Payment	79.28	0.00	0.00	20.72	0.00	100.00
LPG	89.98	0.00	0.00	7.45	2.57	100.00
Rent	51.37	0.00	0.00	48.63	0.00	100.00
School & Tuition Fees	69.31	0.00	0.00	30.69	0.00	100.00
Books & Office Stationery	63.22	2.78	0.00	34.01	0.00	100.00
Foot Ware	69.72	3.39	1.25	25.49	0.14	100.00
Cosmetics	56.20	0.00	2.60	40.60	0.61	100.00
Dress Materials	63.35	10.47	4.05	21.59	0.53	100.00
Repairing Service	75.35	0.00	0.00	24.65	0.00	100.00
Children Product	75.84	5.58	0.93	17.65	0.00	100.00
Med Service	65.64	21.33	3.03	10.00	0.00	100.00
Diagnostic Center	64.40	10.37	4.15	21.09	0.00	100.00

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Medicine	75.76	3.79	1.93	18.52	0.00	100.00
House Construction Material	82.42	10.12	0.00	7.46	0.00	100.00
Restaurant	40.19	7.14	4.88	47.79	0.00	100.00
Travel	66.89	5.57	2.49	25.05	0.00	100.00
Payment to friends and relatives	47.93	0.00	0.00	50.93	1.14	100.00
Gift & Donation	91.11	0.52	0.00	8.37	0.00	100.00
Consumables and services	70.04	5.11	1.47	23.10	0.27	100.00
Electronic Products	34.12	13.21	6.36	42.63	3.68	100.00
Purchase of Vehicles	30.68	23.95	3.61	13.55	28.21	100.00
Durable Assets	31.37	21.81	4.16	19.34	23.32	100.00
Source: Authors' Compilation						

Table 2 shows the distribution of the percentage of the total expenditure by the surveyed households among the different modes of payment during the purchase of different goods and services.

It is found that households use cash as a medium of payment to purchase different food items, which is 81.7 per cent. Among the different modes of digital payments, UPI is the most preferred mode at 17.44 per cent, second to cash. Some households use debit cards to buy different grocery items on the market. In the second category of the product, that is, consumables and services, the preferable modes of payment are the same. Cash is the most preferred mode, followed by UPI, debit card, credit card, and net banking. But in the case of durable assets, the first preference is cash, and the second preference is net banking, followed by debit cards, UPI, and credit cards 31.37, 23.32, 21.81, 19.34 and 4.16, per cent respectively. Data shows that cash is dominated in unorganised transactions like vegetables, snacks, dairy products, etc., but the use of cash is decreasing for consumables and durable transactions.

In the case of purchase of food items, cash and UPI are the common modes used by all households. A debit card is also used to get grocery products, which is 2.09 per cent. Among the consumable items, cash is mostly used for newspapers (90.18%) and LPG (89.98%). The most common uses of net banking are for LPG purchases (2.57%), followed by payments for bills and premiums (1.41%), money transfers to friends and relatives (1.14%), and other expenses. UPI mode is preferable to avail services like television and mobile recharge (56.87%) and fund transfer to friends and relatives (50.93%), followed by rent payment (48.63%), payment in restaurants (47.79%), etc. The use of debit cards is more than that of credit cards. Households prefer credit cards to pay for restaurant services (4.88%), diagnostic centre services (4.15%), etc. Debit cards are used for medical services (21.33%) the most, followed by filling petrol (13.87%), purchase of dress materials (10.47%), house construction materials (10.12%), etc. Durable products like televisions, refrigerators, washing machines, etc., are consumed preferably by using the UPI mode of payment, and cash is still dominant for purchasing vehicles. But in the case of aggregate durable items, cash (31.37%) followed by net banking is the second preferable mode (23.32%), debit cards (21.81%), UPI (19.34%) and credit cards (4.16%) respectively.

Figure 2: Different Mode-wise Percentage of Total Expenditure

Source: Authors' Compilation
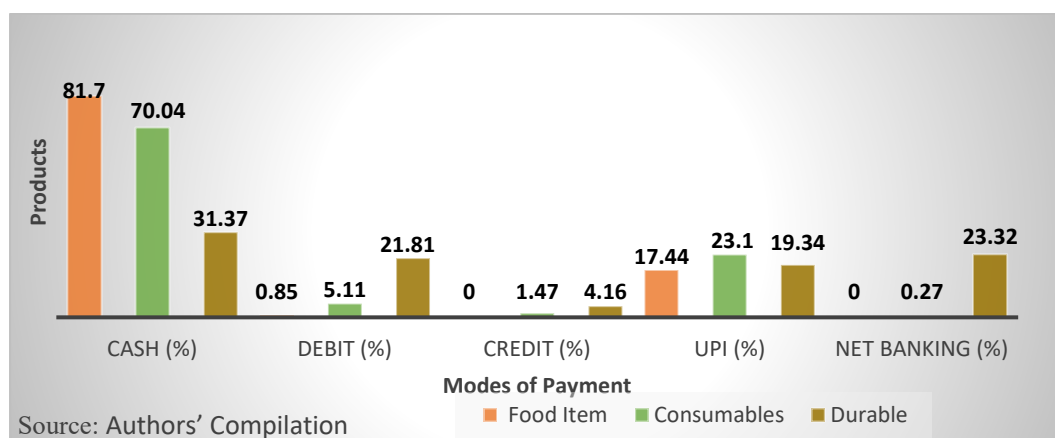
Figure 2 shows that cash dominates over other modes of payment in all three categories of commodities and services, followed by UPI. Consumers use all modes of payment to purchase durable assets.

Table 3: Percentage of the households using different modes to buy various Products

Products	Cash (%)	Debit (%)	Credit (%)	UPI (%)	Net Banking (%)
Veg and non-veg	98.2	0.0	0.0	18.4	0.0
Dairy Products	53.4	0.0	0.0	8.9	0.0
Snacks/ Tiffin	60.9	0.0	0.0	21.8	0.0
Beverages	40.7	0.0	0.0	10.0	0.0
Grocery Items	91.4	1.4	0.0	22.7	0.0
Food Item	68.90	1.4	0.0	16.36	0.0
Petrol	55.9	10.9	2.3	22.5	0.0
Saloon/Parlor	69.5	0.0	0.0	15.2	0.0
Mob & TV Recharge	55.7	0.7	0.7	41.4	0.0
News Paper	12.5	0.0	0.0	1.1	0.0
Bills & Premium	71.8	0.9	1.4	19.8	1.1
House Service Payment	5.2	0.0	0.0	0.7	0.0
LPG	65.0	0.0	0.0	5.7	1.8
Rent	3.0	0.0	0.0	2.3	0.0
School & Tuition Fees	45.2	0.0	0.0	9.3	0.0
Books & Office Stationery	43.9	0.9	0.0	11.8	0.0
Foot Ware	85.7	2.3	0.9	29.3	0.5
Cosmetics	57.7	0.0	0.7	22.3	0.7
Dress Materials	86.1	7.5	2.5	32.5	0.9
Repairing Service	30.9	0.0	0.0	7.3	0.0
Children Product	25.0	4	0.5	5.2	0.0
Med Service	23.2	9	0.7	4.3	0.0
Diagnostic Center	20.9	7	0.5	3.4	0.0
Medicine	64.1	5	0.5	15.2	0.0
House Construction Material	10.5	4	0.0	1.1	0.0
Restaurant	17.7	9	0.7	15.45	0.0
Travel	37.7	11	0.0	13.4	0.0
Payment to friends & Relatives	18.4	0 0.0	0.0	18.4	0.5
Gift & Donation	47.0	0.5	0.0	3.9	0.0
Consumables	41.42	2.48	1.01	13.11	0.91
Electronic Products	22.7	2.0	1.1	11.4	0.4
Purchase of Vehicles	3.2	2.0	0.5	0.7	0.9
Durables	12.95	2.05	0.80	6.02	0.68
Source: Authors' Compilation					

In Table 3, it is shown that households in Odisha make use of a variety of payment modes to meet their day-to-day transactions. These modes are cash, debit and credit cards, UPI, and net banking for purchasing various goods and services. The percentage of expenditure in cash mode on items like vegetables and non-vegetable items, groceries, and tiffin items are 98.2 per cent, 91.4 per cent and 60.9 per cent, respectively. Households also use UPI to purchase food items, i.e., 16.36 per cent less than the cash users (68.90 per cent). Only 1.4 per cent of households use debit cards to purchase grocery items, and in the case of buying dairy products, snacks, parlours, house services, and rent, no households use debit cards, credit cards or net banking.

Cash is not only the most preferable mode of payment for food items but also for consumable items (41.42%) and durable items (12.95%). The percentage of households that use cash for purchasing dress materials (86.1%), footwear (85.7%), and bills and premiums (71.8%). This result implies that HHs are from rural or underdeveloped regions. The next preferable mode is UPI, which is used for recharge of mobile and television (41.4%), purchase of dresses (32.5%), footwear (29.3%), cosmetics items (22.3%) and many more items in e-commerce. This mode is easier compared to other modes of payment. More than 20 per cent of households are

using UPI to fill petrol. However, a very small percentage of households use this mode for house service payments (0.7%) and newspaper payments (1.1%).

The use of debit cards, credit cards, and net banking is very low. A small percentage of households use debit cards to fill petrol (10.9%), dress materials (7.5%), and ticket booking for travel purposes (2.5%). Net banking is used to purchase LPG (1.8%) and bills and premium pay (1.1%). Credit cards are used for purchasing dresses (2.5%), filling petrol (2.3%), and paying bills and premiums (1.4%).

Regarding durable products, 12.95 per cent of households use cash, followed by UPI, debit cards, credit cards, and net banking, with a percentage of 6.02, 2.05, 0.8, and 0.68, respectively.

Table 4: Percentage of Households Using Different Modes in Rural and Urban

Products	Cash (%)		Debit (%)		Credit (%)		UPI (%)		Net Banking (%)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Food items	68.83	69.09	0.0	4.5	0.0	0.0	11.75	27.12	0.0	0.0
Consumable Items	21.72	43.31	0.5	2.9	0.2	0.8	5.2	20.9	0.05	0.6
Durable Assets	14.61	9.09	1.14	4.16	0.3	2.27	5.03	16.7	0.0	2.27
Source: Authors' Compilation										

Table 4 depicts the rural and urban comparison of using different modes of payment to purchase different items like food items, consumables and services, and durable assets. In the food items category, households use cash as an important component of payment mode more than any other mode, both in rural and urban areas. Between the regions, 69.09 per cent of households in urban areas use cash, which is greater than that of rural areas (68.83%). No users in rural areas use debit cards, credit cards, and net banking to purchase food items. Only 4.5 per cent of HHs use debit cards to buy food items in urban areas. In urban areas, households use a higher percentage of UPI to buy food items compared to other categories of items. To purchase consumable items, households use all the modes of payment, both in rural and urban regions. Cash and UPI dominate over other modes to purchase consumable items; cash users are 21.72 per cent and 43.31 per cent in rural and urban areas, respectively, and UPI users are 5.2 per cent and 20.9 per cent in rural and urban areas. But in the case of durable assets, UPI users are more in urban areas, and cash users are more in rural. Other modes of payment are used, but they are negligible in both regions.

Table 5: Mean & S.D. Value of Total Expenditure on Different Products

Item Group	Cash		Debit Card		Credit Card		UPI		Net Banking	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Vegetable/ non-Veg	26352	17987	0.00	0.00	0.00	0.00	19852	14560	0.00	0.00
Dairy Products	10539	12413	0.00	0.00	0.00	0.00	12200	10811	0.00	0.00
Snacks/ Tiffin	7317	6790	0.00	0.00	0.00	0.00	10466	8314	0.00	0.00
Beverages	4784	5380	0.00	0.00	0.00	0.00	7500	9113	0.00	0.00
Grocery Items	27403	21125	48000	25171	0.00	0.00	24672	28904	0.00	0.00
Foods	63518	40043	48000	25171	0.00	0.00	38978	40364	0.00	0.00
Petrol	18060	18557	22150	21120	29400	16840	19600	18020	0.00	0.00
Saloon/ Parlor	3702	692	0.00	0.00	0.00	0.00	4868	5828	0.00	0.00
Mobile & T.V. recharge	7337	7467	17600	17027	25200	20187	14139	13162	0.00	0.00
News Paper	4008	2051	0.00	0.00	0.00	0.00	4800	3146	0.00	0.00
Bills & Premiums	13382	19525	8700	3304	14566	4717	23534	21870	18360	11937
House Service Payment	14973	11611	0.00	0.00	0.00	0.00	30000	6000	0.00	0.00
LPG	15658	5242	0.00	0.00	0.00	0.00	14837	3625	15975	5200
Rent	53815	32834	0.00	0.00	0.00	0.00	66240	28464	0.00	0.00

Fees	7701	15516	0.00	0.00	0.00	0.00	15891	31922	0.00	0.00
Books & office stationery	1529	2505	3250	3329	0.00	0.00	3063	4279	0.00	0.00
Foot Ware	1991	1561	3550	2753	3375	4423	2135	1962	750	353
Cosmetics	552	1032	0.00	0.00	2833	2255	1357	1481	667	289
Dress Materials	5455	5527	10412	8515	13000	10208	4952	5199	4375	2056
Repairing Service	2031	3051	0.00	0.00	0.00	0.00	3103	3789	0.00	0.00
Children Product	1111	1154	2250	2255	750	354	1237	1154	0.00	0.00
Medical Service	1689	2639	6311	8306	2667	2082	1389	2203	0.00	0.00
Diagnostic Centre	3545	5195	7500	7397	10500	6364	7120	6571	0.00	0.00
Medicine	1729	2292	4900	4219	6250	8132	1786	1548	0.00	0.00
Construction Materials	43363	59830	61250	37053	0.00	0.00	36100	40725	0.00	0.00
Restaurant	1835	2364	2767	1640	5667	8083	2529	3078	0.00	0.00
Travel	4850	5799	6091	6457	0.00	0.00	5110	5147	0.00	0.00
Payment to friends& relatives	6747	8613	0.00	0.00	0.00	0.00	7169	8577	6500	4950
Gift & Donation	10954	13331	6500	4950	0.00	0.00	12253	15511	0.00	0.00
Consumables & Services	66703	55701	27878	29821	41294	46144	54310	58325	13347	11420
Electronic Product	5099	9208	21943	16692	19000	13856	12741	15399	27500	3536
Purchase of Vehicle	131785	140090	85000	22688	108500	26162	271667	287504	374000	333623
Durable	22215	67625	60155	42993	44571	46360	27924	84711	258500	314327
Non-Food: Total	72054	69259	39441	43810	50699	53765	60722	75964	78460	190378
Source: Authors' Compilation										

Table 5 reveals that households choose to spend more by using cash mode, followed by debit cards and UPI, for food items. However, no households use credit cards or net banking for the same purpose. Some households reveal that they started using these two modes for food items during COVID-19, particularly in urban areas. The standard deviation value shows a high variation in the use of UPI followed by cash.

In the second category, consumables and services, the mean value reveals that households also prefer to use cash. They prefer UPI, credit cards, debit cards, and net banking, among the different digital modes. There is a high standard deviation value in the case of UPI, followed by cash, credit card, debit card and net banking. In the case of the durable category, households spend money using net banking; the mean value is very high, Rs. 258500.00, which is higher than any other value. The second choice of the household is a debit card, followed by a credit card, UPI, and cash. Households have the least preference for using cash to buy durable assets. The standard deviation value shows a high variation in net banking followed by UPI, cash, credit, and debit cards.

Table 6: Mean & Standard Deviation Value of Total Expenditure in Rural and Urban

Item Group		Cash		Debit Card		Credit Card		UPI		Net Banking	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Rural	Foods	57938	36803	0.00	0.00	0.00	0.00	32498	41367	0.00	0.00
	Consumable& Services	6621	39399	11071	31789	3143	8315	9319	56622	10429	9844
	Durable: Total	24571	73247	64643	44951	22000	0.00	39457	109784	0.00	0.00
	Non-Food: Total	6621	39399	12230	31553	3143	8315	9783	56617	10429	9844
Urban	Foods	76945	44281	48000	25171	0.00	0.00	46281	38183	0.00	0.00

	Consumable & Services	85360	61896	26753	26445	33310	46914	62008	70659	15050	12327
	Durable: Total	13717	41633	56666	43807	48333	49601	12198	18284	258500	314327
	Non-Food: Total	2390	17843	39143	43581	47930	57050	64775	74518	108225	223639
Source: Authors' Compilation										

Table 6 shows the mean and standard deviation values of different items used by survey households by using different modes of payment in different regions. It reveals that households in rural areas usually prefer cash, followed by UPI. The mean value of cash use is Rs. 57938, and UPI is Rs. 32498 for food. The standard deviation value shows there is high variation in the case of UPI followed by cash for food items. Households in rural areas are using these two modes only to buy food items like vegetables, non-vegetables, dairy products, beverages, etc.

The mean expenditure of debit cards is Rs. 11071, which is preferred the most, and Rs. 3143.00, the mean value of expenditure using credit cards, which is the least preferred. In the case of durable assets, the households prefer debit cards (Rs. 64643) the most to buy durable goods like home appliances, vehicles etc. followed by UPI (Rs. 39457), cash (Rs. 24571), and credit card (Rs. 22000). The standard deviation value reveals that the variation is very high in case of UPI (109784) followed by cash (73247) and debit card (44951). The variation is zero in the case of credit cards, which means almost all households are spending the same amount by using a credit card. In rural areas, households are not using net banking to make payments to purchase durable assets due to a lack of internet facilities.

Further, the table reveals the mean and standard deviation values of different items used by survey households using different modes of payment in urban areas. It reveals that households in urban areas also prefer cash, followed by debit cards and UPI, to buy food items. The average amount of spending in cash is Rs. 76945, followed by debit cards Rs. 48000 and Rs. 46248 in UPI. No households use credit cards and net banking for the same purpose, but from the discussion, it is found that during COVID-19, they used these two modes to buy food items. The variation is very high in the case of cash use, followed by UPI and debit cards. The consumables and services are purchased using cash the most, followed by UPI, credit cards, debit cards, and net banking. In the case of durable assets, the preferable mode is net banking (Rs. 258500), followed by debit card (Rs. 56666), credit card (Rs. 48333), cash (Rs. 13717), and UPI (Rs. 12198). The variability of data from standard deviation shows that there is high variation in the case of net banking (314327) followed by UPI (18284), credit card (49601), debit card (43807) and cash (41633).

From the above analysis, we found that, the UPI is the most preferable mode of payment among different alternatives by the households in Odisha. Therefore, study tried to find out the factors that influencing the use of UPI.

Table 7: Descriptive Statistics

	N	Minimum	Maximum	Mean	S.D.	Skewness	Kurtosis
UPI Amount	218	250	606200	29152.50	54560.27	6.71	61.18
No. of Members	218	2	17	4.97	1.91	2.01	7.95
Education Level	218	2	96	14.55	14.21	5.21	27.66
Income	218	1500	200000	25789.91	26180.11	2.71	11.41
Age	218	21	77	43.24	11.54	0.15	-0.69
Marital Status	218	1	4	1.42	1.03	2.08	2.38
Users of Mobile & Computers	218	0	2	1.32	0.49	0.53	-1.12
Average Distance	218	0.15	250.5	4.279	17.26	13.52	193.25
Source: The Authors' Calculation							

In our data set, 218 individuals are using the UPI mode of payment for their transactions, corresponding to all variables. In Table 7, marital status and mobile and computer users are denoted as categorical variables, while others are nominal. In a household, the minimum member is two, and the maximum is 17, so the average number of members in a family is 4.97, which is equal to 5. The average income of households is 25789.91 rupees. The average distance from residence to banks and ATMs is 4.28 Kilometers. The standard deviation is high in value of UPI amount and income level. The skewness results show that all variables are positively skewed.

Table 8: Correlation Result

Variables	LUPI	Mbrs	LEDU	LIncome	LAge	Marital	MobCom User	AvgDistance
LUPI	1							
Mbrs	-0.009	1						
LEDU	0.056	-0.010	1					
LIncome	0.272*	-0.037	0.202*	1				
LAge	0.145**	0.012	-0.006	0.125	1			
Marital	-0.034	-0.113	0.110	-0.022	-0.463*	1		
MobCom User	0.275*	-0.060	0.221*	0.345*	0.123	0.032	1	
Avg_Distance	0.089	-0.067	0.070	0.042	-0.094	-0.024	0.076	1
Source: Authors' Calculation								
Note: * & ** denote 1% and 5% level of significance								

The table 8 depicts the correlation among the variables. The level of log income is statistically correlated with log UPI and log education at a 1% level respectively. The log age is statistically associated with log UPI at 5%. Marital status is statistically and negatively correlated with age. The users of mobile and computer is statistically associated with log UPI, education and log income. The association between education and age are very least (-0.006) followed by the correlation between members of family and log UPI (-0.009).The highest correlation exists between marital status and age (-0.463).

Table 9: Analysis of Variance (ANOVA)

Model	Sum of Squares	DF	Mean Square	F	Sig.
Regression	9.072	7	1.296	4.380	0.000
Residual	62.134	210	0.296		
Total	71.206	217			
Source: Authors' Calculation					

Table 9 shows the independent variables significantly predict the value of UPI Payment, $F(7,210)=4.380$, $p<.001$, which indicates that the factors under study significantly impact the value of UPI payment.

Table 10: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.357	0.127	0.098	0.544
Source: Authors' Calculation			

The table 10 displays the model summary, representing the adjusted R^2 of 0.098 with a standard error estimate of 0.544. The independent variables, number of members, marital status, mobile and computer users, average distance, income level, and education level, account for an estimated 12.7% of the value of UPI(R square= 0.127). The very low adjusted R-square shows that socioeconomic factors do not significantly impact the value of UPI payments.

Table 11: Regression Result

Model	Coefficient	Std. Error	t-statistics
Constant	1.768**	0.705	2.506
No. of Members	0.005	0.020	0.253
Marital Status	0.014	0.041	0.340
MobCom_Dummy	0.230*	0.083	2.776
Avg_Distance	0.003	0.002	1.224

LIncome	0.286*	0.102	2.793
LAGE	0.543	0.352	1.541
LEDU	-0.090	0.176	-0.508
Source: Authors' Calculation			
Note: * & ** denote 1% and 5% level of significance			

Table 11 shows that the two variables, income and use of mobile and computer, significantly affect the value of UPI payment (p-value < 0.01). These variables have a positive impact. Of the two significant factors, income strongly influences the dependent variable more than using computers and mobile phones. An individual with higher incomes has a higher tendency to deposit money and receive their salary in the bank. At the same time, using mobile and computers provides access to UPI payment. The other factors are not statistically significant and have a very low impact, except age. Unlike other variables, education is negatively related. The number of members and average distance from banks and ATMs have an eligible impact on the dependent variable. Hence, income and the use of mobile phones and computers are the main socioeconomic factors that affect the value of UPI payments.

6. Result and Discussion

From the surveyed households, it is found that, despite the development of payment systems, i.e., digital modes of payment, traditional payment plays a vital role in payment methods (Swiecka et al.,2021). Cash has its unique features for which, after many technological payment evolutions, it is still an important mode of payment not only in rural areas but also in urban areas for buying different articles. It is convenient for individuals to use, as it is high liquidity, and is widely acceptable (Aurazo& Vega, 2021; Shree et al., 2021). It is also accepted by everyone in each transaction. It is also revealed from the analysis that, every household prefers to use cash to purchase goods and services.

Further, in an underdeveloped economy like India, informal sectors prefer to pay wages and salaries in cash. Therefore, cash is dominated in both geographical areas for payment against buying different goods and services because of its acceptance nature and ease of use, which is supported by Simatele& Mbedzi (2021) in their study. Particularly in the case of beverages, both soft and hard drinks bids are substantially higher for the cards than for cash (Runnemark et al., 2015), but in our study, for the beverages, households are using both cash and UPI, not any card. These two modes are used for beverages or food items due to their ease-of-use nature. A study by Swiecka et al. (2021)reveals that households use cash for low-value products and cards for high-value products.

7. Conclusion

Cash is preferable for food items, and digital modes are preferable for durable assets. The association between education and age are very least followed by members of family and log UPI. The highest correlation exists between marital status and age. Among the variables, only two factors are statistically influencing the value of UPI, namely use of smartphones and computers and income of the respondents. Study may educate people from different sectors to access and use digital payment modes to enhance the payment efficiency that ultimately influencing the growth of the economy. In estimation of regression model the only digital mode of payment that is UPI taken for the study. Study would have considered other modes of digital payment like debit cards, credit cards, NEFT, RTGS, net banking etc. Study would have taken other socio-economic factors like savings, access of credit, occupation, experience on use of digital payments etc. Policy makers need to initiate the infrastructural development and awareness on confidence of the public to use more to more of digital modes of payment to accelerate the pace of economic growth.

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Balancing the Books and the Planet: Leveraging Cloud-Based Accounting for Sustainable Business Practices

Sweeta Agrawal[1], Jayashree Jethy[2]

[1] Research Scholar, P.G. Department of Commerce, Rama Devi Women's University, Bhubaneswar, Odisha. E-mail: swetaagrawal1845@gmail.com

[2] Assistant Professor, P.G. Department of Commerce, Rama Devi Women's University, Bhubaneswar, Odisha. E-mail: Jayashreejethy@rdwu.ac.in

*Corresponding Author

Abstract: Cloud based accounting have revolutionized conventional corporate practices leading to improved decision-making capabilities and optimising accounting process. In addition to operational enhancements, the use of cloud-based accounting has considerable implications for sustainable growth. This paper examines the relation between cloud-based accounting and sustainability by analysing its capacity to mitigate environment damage, enhance economic resilience and foster social inclusion. Data were gathered using a standardised questionnaire created using Google form. A total of 217 responses very included in the study and the final data analysis was conducted using smart PLS software which demonstrated significant connections between environmental, economic and social factors highlighting the transformative potential of cloud-based accounting. The measurement model was evaluated using convergent validity and divergent validity, both of which exceed the necessary requirement to further proceed for hypothesis testing. The findings of the hypothesis testing indicated that the adoption of cloud-based accounting software enhances the economic, environmental and social performance of the company which ultimately enhances the overall sustainability confirming H1 to H6. This study adds to the existing Corpus of knowledge by offering a deeper understanding of the relationship between sustainability and cloud-based accounting systems. It also offers valuable insights to accountants, government and other stakeholders, seeking to implement cloud-based accounting solutions for sustainable development.

1. Introduction

The use of cloud technology in diverse areas have revolutionized traditional business method across several sectors. Cloud-based accounting solutions have rapidly become essential components of contemporary financial management techniques. Consequently, organisations can enhance decision making capabilities and optimise accounting procedures. CBA can swiftly adjust to the fast-evolving digital landscape. In addition to the basic cost reduction and operational improvements, the adoption of CBA has significant implications for sustainable developments (Awewommomom et al.,2024; xu,2012). These Repercussions addresses significant social, economic and environmental issues that impact enterprises worldwide. Adoption of sustainable business practices is becoming imperative as we live in a time where concerns about resource depletion, inequalities in society and climate change are becoming more severe. Given this, cloud-based accounting system demonstrates the ability to serve as a vital tool for enacting positive change (Chang et al.,2010). It integrates financial aim with overreaching sustainability goals in order to benefit both corporations and the wider society (Deb et al.,2021). In the context of sustainable development, cloud-based accounting is crucial as it has the ability to minimise negative effects on environment along with boosting economic resilience and

social inclusion (Hackett and Dissanayake2014; Choy et al.,2021). Businesses can optimise their resource consumption and enhance data transparency as adopting cloud-based accounting systems will help them implement sustainable practices and contributes to the global efforts to combat climate change. This availability and accessibility of CBA technology enhances the capacity of to navigate economic volatility more effectively (Parmentoal et al.,2022). It also preserves stability which aids resilience in the face of change (Kara et at,2022; Maksimovic,2018). Adoption of Cloud-based accounting has significant consequences for advancing equity and inclusivity. It enables variety of stakeholders regardless of location or socioeconomic barriers.

By enhancing collaboration communication and knowledge exchange, Cloud-based accounting overcomes conventional challenges which further encourages transparent, accountable and reliable culture among firms (Balogun et al., 2020). The sustainability of traditional accounting techniques is hindered by their reliance on manual processes and on-premise technology. Traditional accounting depends on on-premise technology which sometimes make them less sustainable (Alsharari,2020) and results in the overuse of resources. This in turn limit accessibility. This issues of using traditional accounting makes it more challenging for businesses to implement environmentally, Socially and economically responsible practices. Consequently, the advent of cloud-based accounting solutions offers an affordable way to address these challenges, enabling companies to leverage technology effectively.

2. Literature of Review

2.1 Cloud-based accounting

The evolution of CBA can be traced back to the advent of cloud computing technology. Cloud computing as described by Dimitriu and Matei (2014), refers to delivery of computing services over the internet enabling customers to access resources like storage and processing power. conventional accounting software's providers began to move their services over the cloud as cloud computing gained popularity worldwide. These software applications allowed users to complete accounting task remotely using mobile apps or web browsers (Miller ,2008; Ali,2020).

In the field of accounting, cloud-based accounting has become a game-changer. This is owing to its advantages including affordability, scalability, accessibility and flexibility (Agrawal and Jethy,2023). Because they offer instruments for tracking and reporting environmental, social and governance (ESG) information, cloud-based accounting systems constitute essential tools for promoting sustainable accounting practices (Petcu et al.,2024; Wang et al., 2017). Utilizing cloud technology, organizations can gather and examine data while sharing sustainability data with stakeholders in a transparent manner. This improves accountability and builds confidence.

2.2 Sustainability and its parameters

As sustainability is a comprehensive term with social, economic and environmental components, it has attracted considerable interest in academic literature. Additionally, it has gained attention in policymaking forums. Sustainability is a multidimensional term that demands integrated approaches and cooperative efforts from various stakeholders (Al-Okaily et al.,2023; Edwards and Lawrence,2021; Binder, 2010). Sustainable development involves addressing environmental deterioration while promoting economic prosperity and cultivating social inclusiveness. For enterprises to balance profitability and social responsibility, sustainability is not merely theoretical. It necessitates aligning economic activity with social and ecological well-being. This requires a shift to comprehensive decision-making procedures and value generation (Ismail, 200; Barron et al.2023). Firms can protect the environment for future generations while enhancing their competitiveness.

Adopting sustainable practices also offers benefits such as risk reduction and the creation of societal value.

2.3 Linking sustainability with Cloud-based accounting technologies

The integration of sustainability concepts with CBA technologies presents substantial opportunity for the advancement of socially and ecologically responsible business practices. Organizations can advance their sustainability agendas by enhancing transparency, while economic viability and stakeholder engagement. This can be achieved by utilizing cloud-based accounting solutions which is also known for their scalability, accessibility and operational efficiency (Kumar and Buyya,2012; Balogun et al.,2020). However, the potential of sustainable Cloud-based accounting cannot be fully realized unless issues such as Data security, regulatory compliance, digital inclusiveness are addressed. Firms can preserve their financial resilience and competitive edge in the digital age by utilizing the synergies between sustainability and cloud technology which would result in beneficial environmental and social outcomes (Alshirahet al.,2023). Businesses are increasingly integrating sustainability as they recognize the interconnectedness of social equality, economic resilience and environmental stewardship. The growing recognition of companies regarding interdependence of social equality, economic resilience and environmental stewardship makes incorporation of sustainability into Cloud-based accounting systems essential for ensuring long-term sustainability (Melnyk etal.,2019). Organizations can improve their environmental performance and can enhance their social authorization to operate by integrating sustainability concerns into cloud-based accounting methods. This will result in a collaborative gain for all stakeholders. Table 1 presents the proposed items used for measuring the impact of CBA technologies on sustainability across three key dimensions: environmental, economic and social (Deegan et al.,2018). Each dimensions include several measurable items to access specific aspects of organisational sustainability performance. These items are developed on the basis of existing literature and are designed to give a comprehensive overview of how CBA adoption influences sustainability outcomes of organization.

Although the potential of Cloud-based accounting software to support sustainable development goals is becoming increasingly evident, little is known about the attitudes of professionals toward its use. Their perceptions of the benefits regarding the use of cloud-based accounting in terms of social, economic, and environmental impacts remain under-researched. Despite abundant literature on how cloud-based accounting enhances organizational efficiency, studies exploring its role in sustainable development and users' perceptions are relatively scarce.

Table 1: Proposed items for measurement of the impact of CBA technologies on sustainability

Environmental Sustainability	(1) Reduction In Paper Usage. (2) Energy Efficiency. (3) Carbon Footprint Reduction. (4) Resource Conservation. (5) E-Waste Management. (6) Lifecycle Assessment.
Economic Sustainability	(1) Cost Savings. (2) Return on Investment. (3) Business Performance. (4) Revenue Growth. (5) Productivity. (6) Infrastructure Cost. (7) Market Competitiveness. (8) Long Term Savings. (9) Smart Growth
Social Sustainability	(1) Improved Satisfaction. (2) Accessibility. (3) Remote Work. (4) Collaboration. (5) Transparency. Accountability. (6) Inclusivity. (7) Security and Privacy. (8) Stakeholder Engagement

Source: Author's own calculation

3. Hypothesis of the Study

3.1 Environmental Sustainability:

Environmental sustainability refers to the management and preservation of natural resources and ecosystem for future generations. According to Kidd (1992), environmental sustainability means preservation of ecological integrity. It involves strengthening ecosystems and ensuring responsible use of renewable resources. Achieving sustainability goals requires incorporating environmental issues into decision making processes (Mensah,2019). Evaluating the environmental impact of various activities and commodities require comprehensive methodologies such as ecological footprint analysis and life cycle assessment (Alshirah et al.,2023; Chapin et al.,2009). Researches emphasizes on how important it is to encourage companies and individuals to adopt environmentally friendly procedures and innovations (Kuhlman et al,2010;Agrawal, and Jethy, 2023).Reducing pollution, mitigating the effects of climate change and encouraging sustainable resource management techniques are some of the common goals of interventions that foster environmental sustainability (Lara and Doyer,2008).Numerous studies indicate that the environmental benefits of cloud computing meet several important criteria for determining environmental sustainability such as reductions in consumption of energy, carbon footprint, consumption of paper and electronic thrash generation. Cloud-based accounting helps to preserve the environment by lowering the requirement of paper-based financial documentation, reducing energy used by traditional IT infrastructure, promoting sustainable practices and lowering the production of electronic waste.

H1 =Cloud-based account significantly enhances the environmental performance of the organisation
H2 = Improved environmental performance contributes positively to the overall sustainability

3.2 Economic Sustainability:

Economic sustainability means encouraging economic growth and progress while maintaining long - stability and equality. According to Schneider et al. (2010), economic sustainability is developing systems that provide wealth without consuming too many natural resources. Researchers believe that encouraging inclusive growth and lowering wealth disparity are essential to ensure economic sustainability (Lieder and Rashid,2016; Edwards and Lawrence ,2021). Improving human capital requires investment in social security system, health care and education in order to ensure fair access to opportunities, promoting entrepreneurship and innovation, which can further drive economic sustainability (Velenturf et al.,2021; Ghisellini et al.,2016).

Cloud-based accounting offers substantial financial benefits that aligns with key criteria for accessing economics sustainability, financial transparency, scalability and cost reductions. It contributes to the accomplishment of economic sustainability objective by lowering the expenses of IT infrastructure and maintenance. Additionally, it makes it easier to allocate resource efficiently, improve financial transparency and boost competitiveness (Kara et al.,2022; Ashford and Hall,2011). These benefits demonstrate how cloud-based accounting promote creativity, optimises resources, supports stability and prosperity in the economy.
H3= Cloud-based accounting adoption significantly enhances the economic performance of the organisation.
H4 = Improved economic performance contributes positively to the overall sustainability.

3.3 Social Sustainability:

The basis of social sustainability is establishing inclusive community, that advance equity, well-being and social cohesion. Social sustainability includes elements like social justice, human right, cultural diversity and community resilience policies that guarantee access to fundamental services while advancing social inclusion to achieve social sustainability (Barron et al.,2023; Dempsey et al.,2011). The advantages of social aspect of sustainability includes transparency, accountability, satisfaction among workers, improved employee engagement and improved financial data accessibility (Jewett et al.,2021). The social benefits highlight how cloud-based accounting can promote social inclusion,

cohesiveness and employee well-being with in enterprises and contribute to the goals of social sustainability.

H4 =Cloud based accounting adoption significantly enhances the social performance of organisation.

H5 =Improved social performance contributes positively to the overall sustainability.

Figure-1 illustrates the conceptual framework developed for this study

Figure-1: Conceptual framework
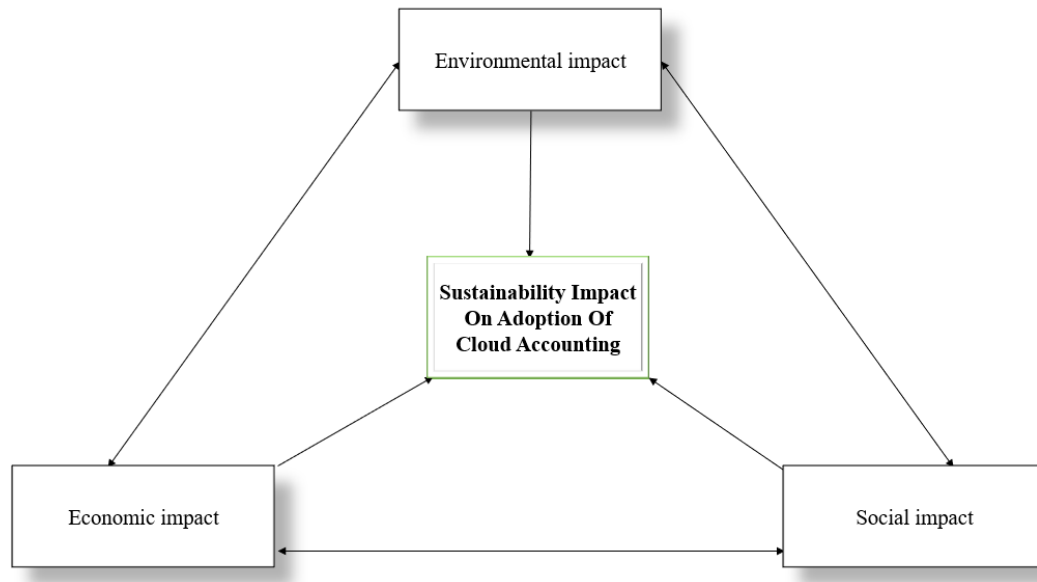
Source: Author's own

4. Methodology
4.1 Research Design

This study adopts a quantitative research approach, to investigate the influence of cloud-based accounting systems on organisational sustainability. This framework is designed to gather data via a structured questionnaire and examine the correlation between key variables using statistical tools.

4.2 Target Audience

The target audience included a diverse array of professionals such as accountants, auditors, chief financial officers, finance controllers and academicians with expertise in accounting and finance in Odisha. To ensure the ethical standards, this research guaranteed the respondents that, their participation would be completely voluntary and their responses would be kept anonymous and confidential.

4.3 Questionnaire Design

A customised questionnaire was developed by a group of accounting specialist using Google form. All the questions were constructed using a 5-point Likert scale. To guarantee the relevance and comprehensiveness of the questionnaire, validation techniques were implemented.

4.4 Tools Used

The questionnaire was validated for relevance and comprehensiveness, and the data was analysed using smart PLS and SPSS software. Smart PLS and SPSS software's were chosen for their complementary strengths. SPSS excels in descriptive and preliminary data analysis,

providing a clear understanding of the data set while smart PLS is ideal for advanced structural equational modelling (SEM) and robust evaluation of complex relationship between constructs. Therefore, SPSS was used for descriptive analysis whereas smart-PLS was employed for testing structural relationship between CBA adoption and sustainability outcomes. The measurement model was evaluated for validity testing and the structural model was tested with path coefficients to access the significance of relationships.

4.5 Survey Process

Initially, 300 questionnaires were circulated among professionals working in different sectors in Odisha. Out of those questioners circulated, a total of 253 responses were received. To ensure the representativeness and quality of the data, these answers were closely examined. Further examination revealed that 36 of these responses were either contradictory or incomplete. In addition, concerns about bias related to respondent demographics or answer patterns led to the exclusion of 20 responses. A total of 217 responses were deemed appropriate, which were then included in the final analysis. Table 2 provides an overview of survey response process including the distribution and final analysis of the questionnaire.

Table 2: Response summary

Category	Number of Respondents
Questionnaires distributed	300
Questionnaires returned	253
Incomplete or contradictory responses	36
Excluded due to bias	20
Included in final analysis	217

Source**:** Author's own calculation

5. Data Analysis
5.1 Demographic Profile

The demographic data analysis indicates a balanced representation of male and female respondents of this study. 51.8% of the total represent male while 48.2% are female. The age distribution indicates that majority of respondents fall within the age range of 25–34 (34.2%) following the age group of 34–44 (33.8%) The 18–24 (17.6%) and 45 above (14.4%) age groups have fewer respondents. In terms of educational background, 45.5% of the respondents hold a bachelor's degree. The responses are fairly distributed across industry sectors, with the government sector having a slight advantage (28.5%) over the private (27.6%), non-profit (27.1%), and self-employed (16.7%) sectors. Regarding working experience, a significant number of respondents have between five and ten years of experience (42.2%), followed by those who have between one and five years (28.9%) and over ten years (28.9%). Lastly, in terms of annual income, the majority (43.6%) falls within ₹1,00,000 - ₹5,00,000 slab. Table 3 presents the demographic characteristics of the respondents, highlighting the key factors that may influence their views on Cloud-based accounting and sustainability.

Table 3: Demographic Profile

Respondents' characteristics		Frequency	Percentage (%)
Gender	Male	112	51.8
	Female	105	48.2
Age	18-24	38	17.6
	25-34	74	34.2

	34-44	73	33.8
	45 and above	31	14.4
Academic Qualification	Bachelor's Degree	99	45.5
	Master's Degree	90	41.4
	Professional Certification	28	13.1
Industry Sector	Government	62	28.5
	Private	60	27.6
	Non-profit	59	27.1
	Self-employed	36	16.7
Experience	1 - 5 years	63	28.9
	5 - 10 years	92	42.2
	More than 10 years	62	28.9
Annual Income	Less than ₹1,00,000	10	4.6
	₹1,00,000- ₹5,00,000	95	43.6
	₹5,00,001 ₹10,00,000	86	39.4
	More than ₹10,00,000	27	12.4

Source: Author's own calculation

5.2 Measurement Model Evaluation

5.2.1 Convergent Validity

Convergent validity accesses the degree to which items within a single construct are correlated and measure the same underlying concept. it is considered satisfied when the item loadings exceed a threshold of 0.70, indicating that the items strongly represent their construct and explain at least 50% of the variance (AVE greater than 50) (Blunch,2012). Table 4 presents the factor loadings for various constructs within the study. Factor loadings refer to the correlation coefficient between observed variable and their underlying construct. A high factor loading generally greater than 0.70 indicates that the observed variable is strongly related to the constructs in the measure. As shown Table 4constructs ECO1, SOC5 and SUS4 exhibit notably low factor loadings of 0.069, 0.022 and 0.085, respectively. Therefore, theses constructs have been eliminated from the research model.

In accordance with the accepted standards as supported by Lee (2009), an additional validation measure was carried out to confirm the convergent validity of the constructs. According to Hu and Bentler (1999), this validation criterion requires an Average Variance Extracted (AVE) value of 0.50 or above, which means that the latent variables have to explain at least 50% of the variance in the indicator variables they are correlated with. Table 4, clearly indicates that every construct (other than ECO1, SOC5 and SUS4) has item loadings that are higher than the specified threshold, highlighting their strong convergent validity. Furthermore, Table 5showsthe reliability of the model constructs, measured by Cronbach's alpha, composite reliability, and average variance extracted (AVE). All the construct meets or surpasses the pre-established threshold point of 0.50 for AVE values, which adds even more evidence to support the validity of the constructs being examined (Venkatesh,2009).

Using Cronbach's alpha and composite reliability measures, the reliability of the scale was carefully evaluated for each of the five major components in the study. These included adaptation (ADPT), economic impact (ECO), environmental impact (ENV), social impact (SOC) and sustainability (SUST). Each component of the model demonstrated adequate convergent validity. All factor loadings were above 0.63 (Table 4). Furthermore, reliability was confirmed. Composite reliability scores exceeded the acceptable threshold of 0.60. All AVEs surpassed 0.50 (Yu,2011). The assertion that the items meet the required criterion is further supported by the composite reliability scores. Additionally,

Cronbach's alpha scores were greater than 0.50 (Table 5) (Sarstedt,2015).

Table 4: Factor loadings

Model Constructs	Items	Factor Loadings
Adaption Of CBA (Four Items)	ADP1	0.736
	ADP2	0.787
	ADP3	0.839
	ADP4	0.902
Environmental Impact (Five Items)	ENV1	0.882
	ENV2	0.909
	ENV3	0.819
	ENV4	0.694
	ENV5	0.913
Economic Impact (Six Items)	ECO1	0.069
	ECO2	0.865
	ECO3	0.732
	ECO4	0.884
	ECO5	0.854
	ECO6	0.853
Social Impact (Six Items)	SOC1	0.835
	SOC2	0.794
	SOC3	0.639
	SOC4	0.71
	SOC5	0.022
	SOC6	0.782
Sustainability (Four Items)	SUS1	0.777
	SUS2	0.759
	SUS3	0.798
	SUS4	0.085

Source: Author's calculation

Table 5: Reliability of constructs

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
ADPT	0.675	0.822	0.606
ECO	0.894	0.922	0.705
ENV	0.899	0.927	0.718
SOC	0.809	0.868	0.570
SUST	0.834	0.890	0.670

Source: Author's calculation

5.2.2 Discriminant Validity

Discriminant validity was assessed by comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlation scores between that construct and other constructs in the

model, as described by Henseler et. al (2015). This approach ensures that the model achieves a favourable discriminant score. Table 6, demonstrates the discriminant validity of the constructs, calculated using the Fornell-Larcker criterion. This helps assess whether the constructs in the model are distinct and measure different concepts. Every item met this criterion, as seen in Table 6, demonstrating strong discriminant validity. Discriminant validity was analysed using both the Fornell-Larcker and cross-loadings criteria. The evaluation additionally confirmed that every item demonstrated a higher loading on its targeted construct in relation to all other constructs within the model (Fornell and Larcker,1981). In Table 6 diagonal elements represents the square roots of the AVE while Off-diagonal components were correlations between other constructs. Each parameter exceeded the off-diagonal elements in corresponding rows and columns (Yuliana,2022).

Table 6: Discriminant validity using Fornell-Larcker criterion

	ADPT	ECO	ENV	SOC	SUST
ADPT	0.778				
ECO	0.740	0.839			
ENV	0.769	0.807	0.847		
SOC	0.701	0.834	0.839	0.755	
SUST	0.737	0.714	0.828	0.645	0.818

Source: Author's calculation

5.3 Structural Model Evaluation

After specifying the measurement model, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed to evaluate the structural model (Wold et al.,1984). This assessment involved examining the statistical significance of structural path model. Each hypothesis was found to be significant. This conclusion is based on the analysis of p-values and t-statistic results. To be more specific, all the six hypotheses were determined to have the anticipated direction of influence and were statistically significant at a p-value < 0.05 as shown in Figure-2. Table 7 gives an overview of the results, summarizing these findings. The hypothesis testing results, which are shown in Table 7, explain the relationships between the variables.

The results indicate that Cloud-based accounting adoption significantly enhances the environmental performance of the organization which in turn positively influences to the overall sustainability, which supports hypotheses H1and H2, respectively. Additionally, the adoption of Cloud-based accounting also boosts the organization's economic performance which contributes positively to the overall sustainability, thereby supporting hypotheses H3 and H4. Furthermore, Cloud-based accounting adoption enhances the social performance of the organization which also positively impacts to the overall sustainability aligning with hypotheses H5 and H6. Figure-2 shows the structural model of this research.

Table 7: Hypothesis testing

Hypothesis	Casual Path	Adjusted R square	t- value	p- value	Hypothesis supported
H1	ENV -> ADPT	.776	27.394	0.00	Yes
H2	SUST -> ENV	.568	16.888	0.00	Yes
H3	ECO -> ADPT	.603	18.059	0.00	Yes

H4	SUST -> ECO	.529	15.603	0.00	Yes
H5	SOC -> ADPT	.691	22.007	0.00	Yes
H6	SUST -> SOC	.488	14.315	0.00	Yes

Source: Author's calculation

Figure-2: Structural research model
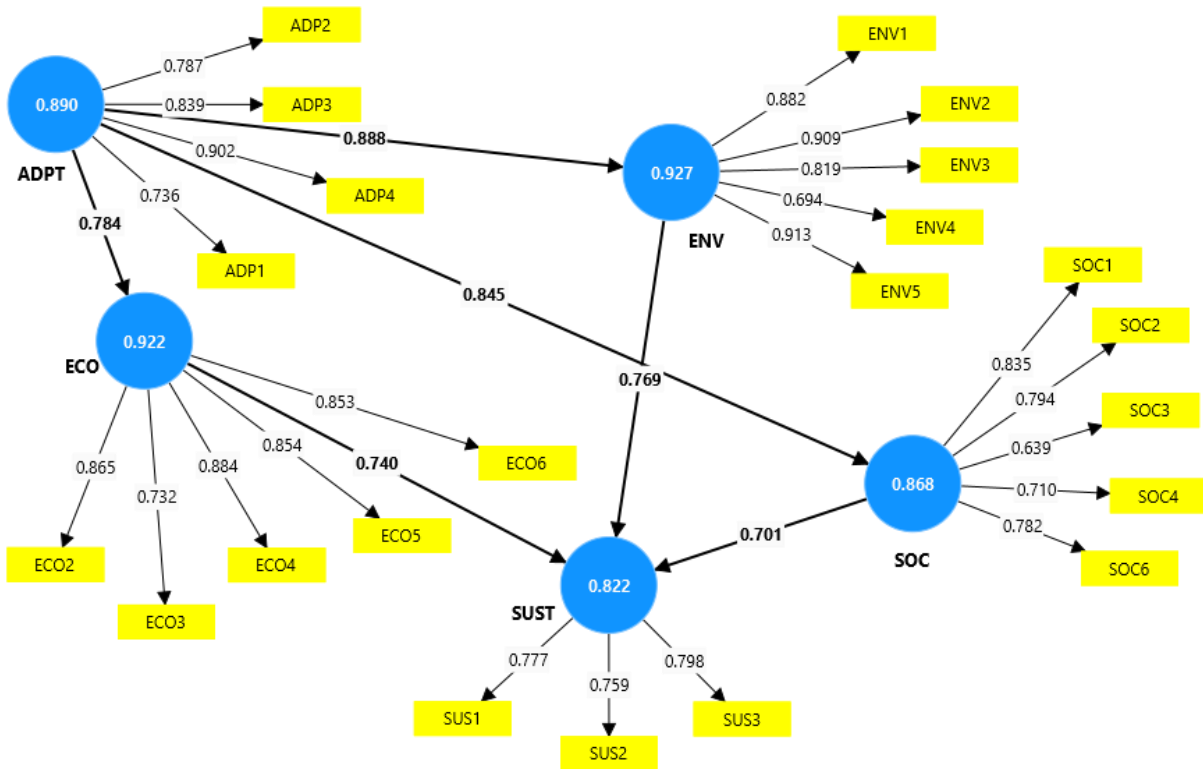
6. Results and Discussion

The study examines the association between sustainability indicators and cloud-based accounting (CBA) system adoption with an emphasis on economic, environmental and social aspects of sustainability. The structural equation modelling (SEM) analysis evaluated six distinct hypotheses.

The hypothesis showed the interrelations among several constructs, investigating the associations between environmental issues, economic considerations, social aspects and sustainability outcomes within the framework of cloud-based accounting systems. Each hypothesis examined the association between two major constructs.

According to the adjusted R-square values, t-values and p-values, the findings exhibited a strong correlation between these constructs. This results also aligns with previous studies which highlighted the importance of interconnected environmental, economic and social factors in the adoption of cloud-based accounting system (Kamble et al.,2018; Li and Cui,2020v). Previous researchers have highlighted the critical role of these sustainability dimensions in promoting widespread adoption of CBA solutions (AI-Sharafi et al.,2023).

Merrill et al (2019) discovered that firms are emphasizing environmental sustainability, are likely to accelerate digital transformation initiatives including the adoption of CBA to minimise their ecological footprints. Moreover, recent studies have also highlighted the social impact of CBA like research by Olawale et al. (2024) have demonstrated that CBA system enhances workplace corporation and inclusion by facilitating remote access to financial information, which is crucial in the contemporary and hybrid work settings. The findings of this study align with the broader sustainability framework reinforcing the interconnectedness between different aspects of sustainability. This research is in line with previous results, illustrating the interdependence of these sustainability characteristics and their combined impact on the integration of cloud-based accounting.

7. Conclusion

The integration of cloud technology in accounting practices significantly impacts sustainable business practices. This research analysed the integration of sustainability and cloud-based accounting systems for environmental, social and economic perspectives. The empirical investigation using smart PLS validated a robust correlation between the adoption of cloud-based accounting and enhanced sustainable outcomes, encompassing reduced environment impacts, strengthened economic resilience and improved social inclusion. Cloud-based accounting has significant benefits from environment, economic and social viewpoints signifying pathway towards more sustainable corporate practices. Businesses can address the limitations of conventional accounting practices and achieve sustainable objectives by adopting cloud-based solutions. This study underscores the need of incorporating sustainability considerations into accounting practices while laying down a foundation for future studies as organisations are increasingly embracing technology-driven solutions. The strategic implementation of CBA solutions has potential to enhance sustainability across several sectors.

The findings of this research have significant implications for both practitioners and scholars. Organisations may use the findings from the research to include cloud-based accounting technology in their sustainability initiative. Managers must prioritize the implementation of CBA solutions that enhances economic, environmental and social sustainability while focusing the enhancement of data security, regulatory complaints and digital inclusiveness. Moreover, training and development programs for employees to professionally use cloud-based accounting systems will optimise the sustainability outcome of these technology. This research offers valuable insights for accountants, governments and other stakeholders seeking to use cloud-based accounting systems for sustainable development. The findings of this research have the potential to influence policy-making investment decisions and strategic planning in order to promote socially responsible, economically feasible and environmentally sound accounting practices. Theoretically, this study also adds to the existing corpus of knowledge by offering deeper understanding of the relationships between sustainability and cloud-based accounting. It highlights the interconnections among various sustainability factor including social, environmental and economic aspects. The development of conceptual framework model and theories emerging from this research can guide future studies and promote academic engagement in the field of technology, sustainability and accounting.

While the study provides valuable insights into how CBA influences sustainability, there are significant drawbacks to consider. A primary limitation is that, this research concentrates on a single location, Odisha which make constrained the generalizability of its implications. The accuracy of the findings

may also be affected due to the response bias from self-reported data. Future researches could address these limitations by including a wider range of geographical locations. Looking ahead, several opportunities exist for advancing cloud-based accounting and sustainability accounting practices. Standardised framework for accessing and reporting ESG performance can be developed by practitioners and scholars. Future researchers may also investigate the effects of CBA implementation on sustainability across various sectors and nations. Additionally, future researches could also examine the role of organisational culture and leadership on the implementation of CBA solutions together with the effect of digital transformation on sustainability at macroeconomics scale.

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Factors Influencing the Capital Structure of Pharmaceutical Companies in India – An Empirical Study

Shekhar V. Sawant

Assistant Professor in Commerce Swami Vivekanand College of Commerce Borim Ponda Goa. Email: sawant.shekhar@gmail.com

Abstract: Several theories attempt to explain the capital structure's shortcomings, such as bankruptcy, taxes, costs, information asymmetry, and agency costs. In practice, capital market imperfection is necessary because empirical Evidence consistently shows a pattern of leverage ratios. Many researchers have documented the use of leverage ratios in various industries. The debate about capital structure's determinants has been in the corporate finance literature for a long time. Due to the issue's complexity, the multiple theories about its structure have been continuously debated. This paper aims to analyse the range of factors that influence the capital structure of pharmaceutical companies. The research uses a multiple regression model to analyse the data collected from the Indian pharmaceutical industry. It also considers the various characteristics of the debt-equity ratio. The data collected from the pharmaceutical industry was analysed fourteen years. The study's results suggest that the multiple regression model fits the analysis well. It also shows that a range of factors that affect a company's capital structure, such as profitability, growth, and size, do not have significant explanatory coefficients. The factors that affect a company's capital structure, such as debt service capacity, liquidity, and business risk, are substantial. They are, therefore, the most crucial factors that influence the capital structure of Indian pharmaceutical firms.

1. Introduction

When a growing company needs capital, it can come from either Equity or debt. Many questions arise when it comes to this matter. Is it better to have all debt or all Equity? Should the company be financed with both Equity and debt? Its debt and Equity composition typically determine the optimal capital structure for a company. Although the exact structure of a company's capital structure is not known, it can be determined by several factors. These include its business risk, financial flexibility, and shareholder wealth. In addition, other factors, such as its growth rate and profitability, are also considered to determine the optimal capital structure. These factors are vital as they help companies find the optimal capital structure to enhance their firm value and minimize costs. Although the availability of capital is often limited, companies can still generate money from various sources. A debate has been raised over the several factors influencing a company's capital structure decisions.

The question of how capital structure affects a company's cost of capital has been a central issue in financial theory for a long time. Two main theories have been presented regarding the subject. One of the main theories that are given is the Net Income approach, which states that the decisions made by a company regarding its capital structure can affect a company's financial performance. On the other hand, the NOD approach says that the decisions made by a company relating to its capital structure do not affect a company's value. The debate about capital structure started to gain momentum following the publication of a theoretical work by Miller and Modigliani in 1958. They claimed that the decisions made by a company regarding its capital structure do not affect a company's wealth creation capacity.

Although Miller and Modigliani supported the NOI approach, Ezra Solomon argued in 1963 that there is an optimal capital structure that can affect a company's financial performance. His analysis also states that the decisions made by a company regarding its capital structure can affect a company's value. The debate about the ratio of Equity and debt in a company's capital structure has been continuously raised.

Numerous authors have since contributed to the development of capital structure theories based on the work of Modigliani and Miller. These include Weston, Wippem, Davenport, Sarma, and Rao. During the years following the publication of Modigliani and Miller's seminal work, multiple theories have been presented that attempt to analyse the various aspects of the capital market. Various researchers acknowledge the importance of capital structure as empirical Evidence shows that companies' leverage ratios across different industries have a consistent pattern over time. Some prominent researchers contributing to the study of capital structure include Bowen, Bradley, Malitz, Kester, Wessels, and Rajan.

The role of capital structure in a company's financial performance has been a central issue in corporate Finance for a long time. Due to the continuously raised debate about the subject, different theories have been presented. Some of the prominent researchers who have contributed to the development of capital structure theories include Barton and Gordon (1988), Demirguc-Kunt (1992), Wald (1999), Pandey (2000), and Gonenc (2003).

2. Review of the literature

This review aims to determine how far Indian firms have substantiated the theoretical and practical theories of capital structure decisions. It also seeks to examine the effects of these decisions on a company's cost of capital.

According to various researchers, Indian firms are more likely to rely on external debt as their primary source of Finance than those in advanced countries. This finding contradicts the "pecking order theory" of Myers and Majluf (1984), which suggests that firms prefer to use internal funds as their primary source of Finance. This paper reviews a couple of studies that have shown this. In 1997, Sahu and colleagues studied debt financing in Indian companies for 11 years. They found that the total debt funds outstanding of the 170 companies exceeded their net worth. During the study period, the average debt fund size of the sample companies was 71.5%. This indicates that the companies are more likely to rely on debt funds as their primary source of Finance. In 1992, Singh and colleagues also found that Indian firms are more likely to rely on external equity finance as their primary source of Finance.

In a study conducted during the 1980s, the researchers analysed the financing patterns of the 50 largest manufacturing companies in nine developing countries. These countries are India, Pakistan, Thailand, Malaysia, Mexico, Zimbabwe, and the Republic of Korea. In 2001, Pal also analysed the corporate financing patterns of Indian firms from 1989 to 1998. According to him, Indian companies have relied on various forms of debt, such as bonds, corporate loans, and fixed deposits, for their financial needs. These are the funds that are required to meet their business requirements.

Deb and colleagues analysed the capital structure decisions of over 200 Indian companies from 1981 to 1990. They found that the funding pattern of the sample firms was in line with the pecking order theory. However, they did not find strong Evidence supporting the agency-theological explanation.

In 1999, Jain and Babu noted that historically, Indian companies have been leaning toward debt. This was due to the lack of capital. However, with the liberalization of capital markets, the underlying factors that led to this trend have changed. As a result, the debt-equity ratio of financial institutions has started to decrease.

3. Need for and Objectives of the Study

The main objective of this study is to analyse the numerous factors that influence the design and structure of a capital structure. The study also draws upon the findings of financial literature to identify the factors that influence the choice of a particular loan. Despite a vigorous theoretical debate about the subject, empirical Evidence is still lagging.

Over the past two decades, various theories have been presented to explain the variations between the debt-to-equity ratios of various firms. Some prominent Indian studies tackling this subject include Venkatesan, Shekhar, Pandey Mohanty, Singla, and Patel. These studies support that debt ratios are influenced by industry growth, business risk, government policy, and capital market developments.

Despite the various theories about the link between capital structure and varied factors, researchers have not produced a definitive conclusion. Therefore, further studies are needed to analyse the factors that can influence the structure of a firm's capital. The changes brought about by the liberalization of the financial markets over the past decade have affected the operations of corporate units. This study aims to provide a comprehensive analysis of the several factors that influence the structure of a capital structure.

3.1 Objectives of the study:

1) To study the nature of corporate structures in India during the post-liberalization decade.
2) To analyse the effects of various tax, agency, and information theories on Indian corporate organizations.
3) To analyse the relationship between the various factors that affect the profitability and growth of a business, such as financial leverage, asset value, and business risk.

3.2 Scope of the study

This study covers the pharmaceutical companies in India that were listed from 2003 to 2022. It also excludes the companies that are not available with the data. The total number of companies studied in this industry is 71.

3.3 Variables, Theory, and Hypotheses

3.3.1 Dependent Variable:

Financial Leverage

Different authors have different definitions of financial leverage. For instance, 1995, Rajan and Zingales defined leverage according to its objective. There are various definitions of leverage, such as debt-equity ratio and debt-to-capitalization.

The debt-equity ratio, a measure of financial leverage, is computed by considering an organization's total equity and debt. It is used in this study to compare the performance of different financial institutions. Similarly, in 1997, Chatrath and colleagues used book values to calculate equity and debt.

The debt-equity ratio is used because it shows the firm's overall dependence on debt and equity. It also includes long- and short-term liabilities since banks convert short-term loans into long-term ones due to renewal in India. According to Barges (1963), using market value measures of leverage could have a serious bias in the analysis. Hence, book values are utilized to calculate debt and equity.

3.3.2 Independent Variables

Profitability (PROF)

The finance concept is divided into the trade-off theory and the Myer (1984) theory. The former suggests that profitability can help boost the debt capacity of a company. On the other, Myer claims that managers follow a hierarchy of earnings, with retained earnings at the top and debt and equity at the bottom.

The relationship between the debt ratio and the PROF is negative, as higher profitability implies that a company will rely more on its internal funds and reduce its debt. A measure of the firm's internal capital generation is a variable that is used by Kester (1986), Titman (1988), Waid (1999), and Pandey (2000). The link between profitability and leverage is negative. It supports the belief that firms with internal accruals and liquid assets can use less debt. Accordingly, the study hypothesizes that:

Hypothesis 1: There is no significant negative relationship between profitability to debt ratios.

Collateral Value of Assets (COVA)

The various capital structure theories claim that the type of assets a firm has affects its capital structure choice. For instance, the trade-off theory states that firms with assets that can be used as collateral are more likely to issue debt. This has implications for the agency costs of the firm.

Agency costs are the expenses a firm must pay for the excess cash its managers spend on perquisites. This is usually done at the expense of the shareholders. Debt can help curb this tendency by reducing the free cash managers can use for wasteful expenditures.

The composition of a company's assets can also affect its ability to behave opportunistically. For instance, if a firm has a lot of tangible assets, it is more likely that it will be able to issue debt. Firms with many fixed assets are also expected to have more debt than those with less. A study by Pandey and colleagues, 2000 revealed that the relationship between a company's debt and its tangible assets is positive.

Hypothesis 2: There is no significant positive relationship between the collateral Value of Assets (COVA) to debt ratios.

Growth (GROW)

The option model of Myers, Majluf, and Titman (1977) indicates that firms with high growth rates should reduce their debt levels. In 1988, Wessels and Titman noted that in growing industries, firms have more opportunities to acquire wealth from their debtholders, which can result in higher agency costs.

According to Myers, the amount of debt a firm has is inversely related to its future growth potential. He noted that companies with high debt levels could pass up the value of their assets when they make investments. He also noted that the amount of debt firms have is inversely related to their future growth potential. According to Titman and Wesselson (1988), growth opportunities are not capital assets that can be easily converted into cash and are unsuitable for collateralization.

These assets are considered intangible and have value if a company exists. If it were to fail, the anticipated bankruptcy costs for companies with better growth opportunities would be higher.

The more significant the bankruptcy costs, the lower the financial leverage that a company can have. This is according to the growth rate that is measured by taking a yearly growth rate. A measure of this is the growth rate of total assets. Therefore, as per the pecking order theory, the study hypothesizes

that:
Hypothesis 3: Firm growth to debt ratios will have a significant negative relationship.

Size (SIZ)
According to Wessels and Titman, large companies are less prone to bankruptcy and more diversified. In addition, they argue that large firms should be heavily leveraged. In 1982, however, a study by Marsh revealed that small firms prefer short-term debt over long-term loans.

Information asymmetry can be observed in the debt ratio of a firm. Large companies may have information asymmetry that allows outside investors to prefer to hold equity rather than debt. This could be a proxy for the likelihood of bankruptcy, as large firms tend to be more diversified.

The natural logarithm of sales is a measure of the size used by Pandey (2000) to determine if a firm's sales are more lucrative than its assets. Titman and Wessel's (1988) use of this parameter have also been noted. In addition, other researchers, such as Kim and Sorenson (1986) and Sinha (1992), have found a negative relationship between the leverage and size ratios. However, in 2003, Halit Gonenc and Pandey noted that the relationship between these two factors is positive.In support of the trade-off theory, the study hypothesizes that:

Hypothesis 4: Firm size will have a significant positive relationship to debt ratios.

Debt Service Capacity (DSC)
A high debt service capacity can help a company meet its financial obligations, even if EBIT decreases. This means that a firm with a high debt service capacity is likelier to have a higher debt component within its financial structure (Mittal and Singla,1992).

An organization's capacity to borrow is proportional to how well it can service its obligations (Venkatesan 1983). Higher debt service capacity can result in a higher debt ratio as it implies that the business can pay more interest than depreciation and taxes and hypothesize that:

Hypothesis 5: Firm debt service capacity will have a significant positive relationship to debt ratios.

Tax Rate (TAXR)
A positive relationship exists between the amount of money corporations spend on debt and the tax rate they pay. In 1986, Senbet and Haugen noted that firms with high tax liabilities tend to use more debt to get the most out of the deduction for interest expenses. According to their study, the tax rate that a company pays is computed by considering the profit before taxes.

Hypothesis 6: Firm effective tax rate will have a significant positive relationship to debt ratios.

Non-Debt Tax Shields (NDTS)
Masulis and DeAngelo argued in 1980 that the tax benefits of debt are not as substantial as those of non-debt deductions. In 1984, Bradley et al. found a positive coefficient, while Mackie-Mason did the opposite. The study also proxies NDTS with the amortization and depreciation ratios. and hypothesizes that:
Hypothesis 7: Firm non-debt tax shield will significantly negatively affect debt ratios.

Liquidity (LIQ)

Having greater liquid assets allows firms to fund their investments. However, their liquidity position can negatively affect the leverage ratio. According to the study, this issue can be explained by the body's negative impact on borrowing decisions due to the scaling of current liabilities. Thus, the study hypothesizes that:

Hypothesis 8: Farm liquidity will significantly negatively impact debt ratios.

Uniqueness (UNIQ)

It is expected that a company that invests heavily in research and development will have a higher portion of its value attributed to intangible assets than one that focuses on tangible assets. This means that it will incur higher agency costs when it issues debt.

In 1988, Wessels and Titman noted that a company with unique products is expected to spend more on marketing and selling its products. This is because the demand for such products exceeds the supply of these goods and services. To capitalize on this opportunity, a company can create unique assets through its R&D efforts and specialization.

According to Pandey and colleagues, a range of factors, such as the company's advertising expenditure, R&D budget, and the rate at which its employees leave their positions, can be used to measure the uniqueness of a company. An organization with many intangible assets may have a low collateral value.

The debt ratio is also negatively affected by uniqueness. R&D expenditures can be used to measure a company's uniqueness. However, for Indian companies, these values are not available easily. Therefore, the study proxies for uniqueness with the ratio of selling and distribution expenses to total assets and hypothesizes that:

Hypothesis 9: Firm uniqueness will have a significant negative relationship to debt ratios.

Business Risk (BRISK)

According to Bradley et al. in 1984 and Smith and Barclay in 1995, the optimal debt level of a firm is related to its earnings volatility. The risk coefficient is a measure of this. Thus, the higher the risk, the lower will be the debt level leading to the hypothesis:

Hypothesis 10: Firm Business Risk (BRISK) will have a significant negative relationship with debt ratios.

3.3 Methodology

The selected companies are evaluated according to the classification criteria of the Indian economy's official directory, CMIE. The final list includes firms from the pharmaceutical industry.

This industry group is categorized according to the above criteria. The data for this study was gathered from various sources, such as the CMIE's official directory, the stock exchange platforms of the country's major stock exchanges, and the corporate database of the Center for Monitoring the Indian Economy.

The data collected from these sources was then analysed and interpreted using various statistical techniques. These included multiple regressions, hypothesis testing, and statistical methods. The study

also utilized stock exchange platforms' websites to gather information. The study's findings were then analysed using these tools.

The study employs a multiple regression model to analyse the relationship between various independent variables (e.g., profitability, growth, liquidity) and the dependent variable of debt-equity ratio (DER). Data collected from 71 pharmaceutical companies over ten years are subjected to rigorous statistical analysis, including hypothesis testing and regression diagnostics. The results are interpreted to identify significant factors influencing capital structure decisions in the pharmaceutical industry.

The Empirical Model: The following regression model is used for testing the hypothesis:
$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X3 + \ldots\ldots + \beta n X n + E i$
Where, Y is the dependent variable; X_1, X_1, X_2, ..., and X are the independent variables; a is the constant term in the equation; B_1, B_2, B ..., and are the coefficients of the Independent variables and Ei is the error term with mean zero and constant variance.

4. Results and Discussion

The regression analysis reveals significant relationships between certain independent variables and the debt-equity ratio of pharmaceutical companies. Factors such as debt service capacity, liquidity, and business risk emerge as influential determinants of capital structure, while variables like profitability and growth show less significant impacts. The study highlights the nuanced interplay of factors shaping capital structure decisions and underscores the need for further research in this area.

A range of factors affect a company's capital structure. This study identifies the key factors influencing a company's capital structure. It was conducted by selecting ten independent and one dependent variable.

The variables can be studied in many ways to determine the impact of capital structure on a company's operations. A multiple regression model is then used to analyse the data and identify which has the most significant influence on a company's financial position. The study's results are presented below. The study was conducted on the data of various pharmaceutical companies from 2003 to 2022.

The data collected from the companies were then analysed and grouped to form a large data set. The study's results reveal the relationship between several factors such as financial leverage, profitability, and debt-equity ratio. The study also highlighted the independent variables influencing a company's capital structure: growth, size, liquidity, and tax rate. During the analysis, the significance of the various statistical tests was analysed.

The procedure for calculating the multiple regression coefficients is known as the T-test. It involves comparing the values and coefficients from zero to the ones from varying periods. The study's objective is to find out which factors influence a company's capital structure after considering the various companies' data for a decade. Unfortunately, the study's results did not meet the researchers' expectations.

An independent variable's value may not change over time. For instance, the tax rate may not change.

Some of the variables collected during the period are no longer available. The data on these independent and dependent variables were gathered during this period. The total sum of squares is then calculated using the ten-time series observations. Thus, the degrees of freedom for the Total Sum of Squares become n-1 = 9.

Due to numerous independent variables, the total sum of squares is calculated as k = 9. However, due to the existence of a regression function, the mean sum of squares for the residual component of variation is not found. This means that the P-value and F statistic cannot be found.

The computation of the standard error of regression coefficients is also affected by the existence of different independent variables. For instance, the degree of freedom of "t" is n-K-1-0, which limits the scope of the test to determine the significance of regression coefficients. Furthermore, some independent variables do not meet the tolerance limits specified for different variance inflation factors.

This issue is also apparent in the collinearity diagnostics generated by the software. The study has since pooled the various variables' values from all the years, resulting in the fit of multiple regressions. The total number of participating companies is seventy-one.

The data collected from the seventy-one companies during the ten years were then analyzed and grouped to form a set of multiple regressions. Table 1 shows the results of these studies. The data of the dependent variables are also included in the analysis.

Table 1 The results of the pharmaceutical sector's pooled analysis with the debt-equity ratio as a dependent variable.

R	R Square	Adjusted R Square	Std. Error
0.64	0.41	0.31	0.25

	Sum of Square	D.F.	Mean Square	F	Sig. P-Value
Regression	2.46	11	0.25	4.0	0.0002
Residual	3.64	58	0.06	-	-
Total	6.10	69	-	-	-

Variable	B	St. Error	T	Sig.	Lower Bound	Upper Bound
Constant	0.4311	0.1827	2.2501	**0.0272**	0.0467	0.8240
PROFIT	(0.0951)	0.1231	(0.7768)	0.4546	(0.3428)	0.1521
COVA	(0.1531)	0.2747	(0.5747)	0.5720	(0.6928)	0.3755
GROWTH	(0.0314)	0.1242	(0.2525)	0.8025	(0.2550)	0.2022)
SIZE	(0.0035)	0.0230	(0.1423)	0.9013	(0.0640)	(0.0501)
DSC	(0.0052)	0.0021	(2.8959)	**0.0054**	(0.0081)	(0.0016)
TAXR	(0.0202)	0.0290	(0.7112)	0.4801	(0.0780)	0.0370
NDTS	7.0025	2.9891	2.3430	**0.0231**	1.0213	12.9753

LIQ	(0.0301)	0.0133	(2.0880)	**0.0410**	(0.0551)	(0.0011)
UNIQUE	(0.1900)	0.6401	(0.2968)	0.7675	(1.4710)	1.0891
BRISK	0.1401	0.0465	2.9368	**0.0047**	0.0427	0.2309
Note: Figures in bracket indicates a negative figure						

Source: Authors SPSS Output

Independent variables of the regression model with DER as the dependent variable have a coefficient of determination of 0.41 with a standard error of the estimate of 0.25. The regression was significant with ANOVA (F= 4.0, P= 0.0002). It shows that the influence of the other independent variables on the leverage measure is significant.

The results of the study revealed that the adverse effects of the multiple regression coefficients, such as the ones related to the size, growth, and distribution of PROF, COVA, and UNIQ, were more apparent than the positive effects of the other variables, such as the ones related to the NDTS and BRISK. The study also revealed that the average values of the remaining coefficients were not significant at 5%.

The null hypotheses presented in the study, such as those related to the size, distribution, and growth of PROF, CAVA, and UNIQ, did not have significant p-values. The study also rejected the null hypotheses related to the NDTS, BRISK, and DSC as they were statistically significant. The p-values of the other hypotheses were accepted in these cases as they were statistically not significant.

The study rejected the null hypothesis about LIQ due to its expected sign. It also found that the several factors that affect the capital structure of Indian pharmaceutical companies, such as the size, growth, distribution, and revenue of COVA, PROF, and UNIQ, do not significantly impact the country's pharmaceutical industry.

The significant value DSC signs, such as BRISK and NDTS, are expected to significantly affect the industry's capital structure. But their signs are in a different direction. This study analyses the factors that influence the industry's capital structure. In 1992, Venkatesan and Mittal noted a positive correlation between DSC and debt levels.

The study revealed that high DSC is linked to low debt levels. The Indian pharmaceutical industry has resorted to the equity financing mode whenever the market has been strong. This is because a highly profitable company can have a high debt service capacity, and since it is profitable, it can raise equity through initial public offerings.

Highly profitable Indian companies have also resorted to paying off their costly debts. This is because, during the 1990s, they raised their finance at high-interest rates. They then realized that the interest rates would gradually decrease in the country. As a result, they preferred to use internal accruals to settle their debts.

The debtholders of profitable companies have also preferred to reduce their debts by converting some of them into equity. This has led to a positive relationship between the DSC and the DER. According to MacKie-Mason (1990), the negative correlation between NDTS and debt ratios might be due to the existence of a negative coefficient.

The study found that the higher the tax benefits an organization receives due to the NDTS, the higher its DER will be. This is in line with the tax theory, which states that companies tend to increase their debt levels if they can benefit from tax savings.

The negative correlation between debt ratios and BRISK has been reported by Bradley and Smith (1995), Masulis and DeAngelo (1980), and other researchers. However, the findings of this study do not support the claims made by these studies. Therefore, the researchers conducted a separate analysis to examine the reasons for the opposite sign.

The theory about minimizing debt holds true for companies with high business risk. However, whenever a firm is in difficulty, it might be unable to raise the necessary capital to meet its financial obligations. This is because they fear the equity market may not meet their requirements.

Because of this, many companies in India are now resorting to debt financing instead of an equity-based capital raise. This is because debt financing can provide them with incredible tax benefits. It can also help them meet their cash flow needs.

The optimal debt level of a company is also increased rather than decreased depending on its earnings volatility. The liquidity position of a company can influences its leverage ratio. This is because having a prominent level of liquid assets helps it manage its investments.

The results of the study are consistent with the expectations of the researchers. The several factors influencing a company's capital structure in India are the DSC, LIQ, NDTS, and BRISK. Despite the different signs the first three variables presented, the last one has the exact positive correlation.

5. Conclusion:

This study aims to analyse the competing arguments regarding the optimal capital structure. The Net Income theory states that there is an optimal structure, while the Net Operating Income theory claims no such thing exists. Miller and Modigliani have argued about the irrelevance of the structure.

Since the inception of the competing theories, various research works have been conducted on the subject of optimal capital structure. These studies have provided empirical proof for both the Net Income and the Net Operating Income theories. The Miller and Modigliani model's assumptions about optimal capital markets have also been modified.

Due to the numerous factors that affect the structure's relevance, many theories have been presented regarding the determinants and relevance of the capital market. This paper aims to analyse the competing arguments' relative importance.

The study utilized the Evidence and the Theory available to identify ten independent variables that influence pharmaceutical firms' capital structure in India. These variables were calculated over ten years, from 2023 to 2022. The companies included in the study trade on the National Stock Exchange (NSE) or the Bombay Stock Exchange (BSE).

The data collected during the study were used to calculate a range of factors that influence the capital structure of pharmaceutical firms. These include the debt-equity ratio, collateral value, growth, size,

debt service capacity, tax rate, liquidity, and uniqueness. Multiple regressions were then utilized to analyse the data.

The study results revealed that the independent variables, business risk, DSC, NDTS, and LIQ, have significant coefficients. These factors, therefore, emerged as the key factors that influence the capital structures of pharmaceutical firms in the country.

The results revealed that the previous studies' four independent variables, BRISK, DSC, LIQ, and NDTS, have different signs than expected. The difference between these variables and the DER is that the former has a direct relationship with the latter, while the latter has a negative relationship. Based on this, the study states that the higher the LIQ and DSC, the lower the level of debt that a company has in its capital structure. On the other hand, the higher the BRISK, NDTS, AND DSC, the more debt a company has in its capital structure.

Although the study identified four independent factors that play a significant role in the capital structure of pharmaceutical companies, further research is needed to analyse the other factors that can affect the structure's effectiveness. For instance, the definition of leverage used in the study could lead to different outcomes.

In addition, the study also analysed the relationship between the cost of capital and the capital structure of pharmaceutical firms. After the data set has been analysed, the factors that can influence a company's capital structure will be unveiled. This study contributes to understanding the complex factors influencing capital structure decisions among pharmaceutical companies in India. While certain variables exert significant influence, others exhibit less pronounced effects, highlighting the multifaceted nature of capital structure determinants. Future research should continue to explore additional factors and refine methodologies to enhance our understanding of capital structure dynamics in the pharmaceutical sector and beyond.

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Investment-Cash Flow Sensitivity amidst Geopolitical Risk and Group Affiliation: Insights from Metal Industry

Sakti Ranjan Dash[1], Maheswar Sethi[2*]

[1] Ph.D. Research Scholar, and Assistant Professor, P.G. Department of Commerce, Berhampur University, Bhanja Bihar-760007, Odisha,India
email: shaktiranjan.srd@gmail.com, ORCID ID: https://orcid.org/0000-0002-6423-2906

[2]Assistant Professor, P.G. Department of Commerce, Berhampur University, Bhanja Bihar-760007, Odisha, India
email:maheswar.sethi1989@gmail.com, ORCID ID: https://orcid.org/0000-0002-7456-9203

*Corresponding Author

Abstract: This study explores the Investment-Cash Flow Sensitivity (ICFS) in the metal industry and explores how geopolitical risk (GPR) and group affiliation influence this relationship. The analysis is based on a sample of 244 metal firms from 2012 to 2022. Using a panel fixed-effect regression, the study reveals that Indian metal firms exhibit low ICFS, while this sensitivity intensifies during periods of geopolitical risk. Additionally, the group affiliation of a firm significantly moderates this effect and helps to mitigate ICFS in times of geopolitical uncertainty. This research offers valuable contributions to the existing literature, with implications for economies, firms, managers, and investors. To the best of the authors' knowledge, this study is the first to explore investment-cash flow sensitivity (ICFS) in relation to both geopolitical risk and group affiliation within the metal industry.

1. Introduction

The dependency of firms on internal funds (cash flow) while making investment decisions is referred to as investment-cash flow sensitivity (ICFS). ICFS has been a burning issue in the corporate finance literature since the pioneering work of Fazzari et al., (1998). While scholars' working on ICFS, strongly oppose Modigliani & Miller's, (1958) proposition which delineates investment decisions as independent of financing choices (Sinha & Sawaliya, 2021). In their framework of a perfect capital market, Modigliani & Miller (1958) portrayed internal and external finance as substitutes due to the absence of market friction. However, such an ideal capital market does not exist in the real world as there is a lot of friction in the market (Dash & Sethi, 2024; Kuo & Hung, 2011; Myers & Majluf, 1984a). This friction can result from information asymmetry, as proposed by the pecking order theory (Myers & Majluf, 1984b), agency problems outlined in agency theory (Jensen, 1986), taxes, and various transaction costs emphasised in the static trade-off theory (Myers, 1977). The difference in cost of internal and external funds motivates a manager to choose wisely between these two alternatives, and imperfectness in the capital market makes the external sources of funds even more costlier than internal sources (Gupta, 2022a). Hence, a firm prefers internal funds (cash flow) over external sources in the investment decision when facing financial constraints (Dash *et al.*, 2023a).

Consequently, realising the implication of operating cash flow in the investment decision, researchers across the world have paid substantial attention to investigating the dependency of investment on firms' cash flow.

So far the metals and mining industry is concerned; it has traditionally been capital-intensive, involving long-term projects that demand a well-organised approach. This is largely due to the complex infrastructure, combined with the uncertainties. An often overlooked aspect of this industry is that investments are mostly sunk costs (Rumokoy et al., 2023). Consequently, firms follow a strict capital allocation system, where investment decisions are subject to more thorough evaluation and risk analysis. Another key feature of this industry is its openness to international trade, making it highly integrated into the global economy. As a result, companies are more exposed to macroeconomic fluctuations (Jefferis, 2014). In an already challenging investment landscape, firms must be particularly careful when making decisions in the context of geopolitical risk (GPR).

Geopolitical risk (GPR) is a macroeconomic risk in which the potential hazards stemming from conflicts, terrorist activities, and tensions between countries disrupt the normal course of peaceful international relations (Caldara & Iacoviello, 2022). This GPR also triggers disputes that disturb business cycles and financial markets, resulting in financial difficulties for businesses.So far, in an emerging economy like India, GPR has a potential impact on several grounds, such as India's economy faces challenges due to geopolitical risks, including a slow economic recovery, vulnerability to rising tensions in Asia, and worsening indicators such as inflation, tighter banking conditions, and trade shocks (Gupta, 2023). Key geopolitical concerns for India involve China's interference, the Russia-Ukraine conflict, regional instability, and the ongoing border dispute with China. Additionally, India is exposed to significant risks, such as increasing crude prices and tightening financial conditions. The evidence suggests urgent attention is needed to explore the impact of geopolitical risks on the Indian economy and ICFS. Through this paper, we have made a novel attempt to address some pertinent questions, such as whether Indian metal industry firms depend on their cash flow for investment?. Does geopolitical risk have any impact on investment-cash flow sensitivity? Does group affiliation moderate the GPR-ICFS nexus?

This paper uniquely contributes to the body of knowledge by offering new insights that align theoretical frameworks with empirical evidence in several ways, including adding to the limited literature on "corporate investment, ownership structure and macroeconomic risk" in emerging economies, particularly India. To the best of the authors' knowledge, this study is the first empirical work to explore investment-cash flow sensitivity (ICFS) in relation to both geopolitical risk and group affiliation within the metal industry. The remaining sections include a literature review, research methodology, empirical results, discussion, conclusion and scope for future work.

2. Literature Review and Hypothesis Development

2.1 Investment-Cash Flow Sensitivity

The crucial role of cash flow in guiding investment decisions, referred to as investment-cash flow sensitivity, was first highlighted by Fazzari et al. (1988). This discovery has sparked considerable interest among scholars seeking to understand the factors contributing to this phenomenon. Investment is a key indicator of a firm's growth (Dash and Swain, 2020). Yet, the current VUCA (volatile, uncertain, complex, and ambiguous) environment poses significant challenges to maintaining a steady investment strategy. Therefore, it is essential to examine each factor to make informed investment choices thoroughly. Some firms have positive cash flow sensitivity, while others may have negative ICFS. According to the Fazzari et al. (1988), firms with positive ICFS are more likely to encounter high external capital costs than low ICFS firms. These firms are typically smaller and younger, distribute lower dividends and are remotely expected to possess a bond rating, especially an investment-grade rating. They also exhibit lower asset tangibility (Hovakimian, 2009). They maintain considerably higher financial slack to preempt potential liquidity issues. They demonstrate lower asset tangibility (Hovakimian, 2009) and maintain significantly higher financial slack to mitigate potential liquidity risks. At the same time, some firms also show negative sensitivity towards cash flow when making their investment agenda. To a large extent, the adverse correlation appears to stem from the divergence in trajectories of cash flows and capital expenditures among companies designated as negatively responsive to cash flow changes throughout their existence. Initially, these entities emerge into the public domain endowed with promising investment prospects but meagre earnings. Their capacity to secure substantial debt and equity suggests that market sentiment regards their investment ventures as highly profitable despite their minimal present cash flows. Moreover, their initial cash flow deficiencies render synchronising investments impractical for periods of ample cash. Initially, the cash flow shortage necessitates a prolonged period for it to become a significant financing source. Additionally, abstaining from current investments may impede the realisation of future cash flow increments. Consequently, these companies allocate most of their investments during periods of minimal cash flow, predominantly relying on external funding. As per the corporate life cycle hypothesis, their previous investments yield higher cash flows as they mature, coinciding with a deceleration in investment rates due to diminishing lucrative opportunities. These synchronous shifts in cash flows and investment rates give rise to an adverse empirical correlation between investment and cash flow. So, as far as Indian manufacturing firms are concerned, they are financially constrained due to high market imperfection and lack of a robust financial system (Dash *et al.*, 2023a; Dash & Sethi, 2024; Dash & Swain, 2020). Hence, the following hypothesis may be developed for ICFS in the Indian context.

H1: Indian metal industry firms have positive ICFS.

2.2 GPR and ICFS Relationship

In the past two decades, there has been a remarkable shift in corporate investment policy decisions due to unpredictable changes in cash flow around the globe (Khaib et al., 2021). One prominent factor persuading to change the investment policy is macro-economic risks like GPR (Díez-esteban & García-g, 2020). However, little evidence exists on how GPR affects investment (Comerio & Strozzi, 2019). Geopolitics involves the political dynamics between states in cross-border interactions, focusing on the strategic significance of these relationships for economic dominance, geographical location, and access to vital resources (Fiorillo et al., 2024). Geopolitical risk emerges from the evolving nature of these relations and international affairs. In recent years, escalating tensions between nations and adverse events have threatened global economic stability, leading to a heightened geopolitical risk (Overland, 2019). Consequently, the 'DTCC Systemic Risk Barometer Survey[1]' has recognised GPR as one of the top five systematic risks since 2013. Hence, the GPR has become a hurdle for the development of the economy and business as it reduces policy flexibility and increases the cost of production. Taking this argument further, Jackson & Orr, (2019) opine that investors and business groups are concerned about the shifting economic landscape, especially if some policy changes are viewed as unstable or temporary. This situation inherently encourages a firm to postpone the investment and expansion plan and resume such decisions when the probabilities of uncertainty become low. The study of Dejuán & Ghirelli, (2019) also agrees with a similar statement in the context of Spain. They suggest that macroeconomic risk decreases business investment by increasing precautionary reserves or deteriorating lending conditions. Rodrik, (1991) documents that such risks not only affect firm-level investment behaviour but also the country's macroeconomic fundamentals such as foreign trade, exchange rate, national savings and socio-political stability which in turn create more chaotic situation. For emerging economy like Indiamost of the businesses houses are with limited financial resources (financially constrained firms), Gupta & Mahakud, (2020) exhibit that the macroeconomic environment is very important for business's smooth investment agenda.

Hence, recognising geopolitical risk's potential to considerably affect the global financial system's safety, resilience, and stability, it is essential to conduct empirical investigations into this matter. However, inadequate measures for geopolitical risk have been a significant hurdle in empirical research. However, Caldara & Iacoviello, (2022) have addressed this gap by creating a GPR index. This index uses text searches to assess the proportion of articles in major English-language newspapers that discuss unfavorable geopolitical events. Geopolitical risk, as defined in this context, includes 'the threat, occurrence, and escalation of adverse events related to wars, terrorism, inter-state tensions, and political factors that disrupt the peaceful conduct of international relations.'Researchers have increasingly used the GPR index to investigate its economic impacts, beginning with its

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[1] https://www.dtcc.com/dtcc-connection/articles/2021/december/13/systemic-risk-barometer-2022-forecast'

influence on business. However, there is very little evidence of GPR-ICFS relationship. Gupta, (2023) demonstrated that unfavourable geopolitical events prompt banks to shrink loan sizes and raise interest rates, driving up debt costs for firms. This makes it harder for firms to obtain external financing from banks and financial institutions, forcing them to depend primarily on internal cash flows for investments. Consequently, the study argues that geopolitical risk (GPR) negatively affects lending institutions, reduces market liquidity, and increases the cost of external financing for firms. The substantial cost differential between internal and external financing, aggravated by GPR, impedes firms' borrowing capacity from external markets. Consequently, the firm turns to investing with available internal funds, and GPR intensifies the sensitivity of investments to cash flow fluctuations. Given this, the paper proposes the following hypothesis:

H$_2$: GPR increases investment-cash flow sensitivity.

2.3 GPR and ICFS Nexus amidst Group Affiliation

Next, this paper debates that ownership structure has a potential impact on a firm's ICFS amidst Business groups, formed through formal and informal ties, operate as unified entities that can pool resources internally and access external market resources (Huang et al., 2021; Sethi, et al., 2021). This internal capital market within business groups helps affiliates overcome financial constraints by providing internal funding, enabling them to invest more in long-run projects without resource allocation issues (Gupta &Mahakud, 2022; Hai et al., 2022; Huang et al., 2021).

Business groups are especially significant in emerging markets, where they help mitigate external capital market imperfections (Almeida &Wolfenzon, 2006; Khanna&Rivkin, 2001). The internal capital market within these groups offers advantages like economies of scope and scale, improved resource allocation, and risk-sharing, enhancing their market value(Hai et al., 2022; Sethi, et al., 2021). Additionally, business groups have a separate management and control system at the group level. However, research has revealed that these internal capital markets can be inefficient. According to agency theory, agents in these relationships might pursue low-profit, high-risk projects for personal gain, leading to issues like tunnelling behaviour and conflicts between large and small shareholders (Hai*et al.*, 2022). The widespread use of pyramid structures in business groups exacerbates these agency problems by increasing the separation between management control and cash flow rights(Hai*et al.*, 2022; Huang *et al.*, 2021). This asymmetry can lead to financial malpractices, such as hollowing out companies, affecting dividend policies, and increasing financial costs, ultimately reducing the market value of holding companies.

In India, most firms are affiliated with business groups(Gupta &Mahakud, 2022). Studying the impact of GPRon internal capital flows for group-affiliated firms is crucial. Research indicates that business group firms face fewer financial constraints than standalone firms(Dash et al., 2023a; Dash and Swain, 2020), which are highly constrained. This is because group firms benefit from internal capital

markets and can easily raise funds due to their reputation and political connections (Hai*et al.*, 2022; Huang *et al.*, 2021). Cash-rich firms, however, may over-invest due to managers' empire-building motivations(Biddle *et al.*, 2009). Thus, group-affiliated firms can have more ICFS than standalone firms and avoid GPR compared to standalone firms. Given this, the paper proposes the following hypothesis:

H₃: The impact of GPRon ICFS is less in group affiliated firms.

3. Research Methodology

3.1. Data and Sample

The data are collected from the "prowess" database of the 'Centre for Monitoring Indian Economy' (CMIE) and 'https://www.matteoiacoviello.com/gpr.htm' for a period of 11 years from 2012-2022. This study is confined to listed manufacturing firms as such firms remain under obligation to pursue the regulatory prescriptions of the SEBI for recording and reporting of financial information. Firms involved in banking and financial services are excluded from the sample as they follow a different set of regulatory and financial reporting practices. Besides, firms having missing data are also not considered. So, a data set of 2,449 firm-year observations is assembled for 244 metal industry firms. Following the methodology of Díez-esteban & García-g, (2020), the study uses the monthly GPR index developed by Caldara & Iacoviello (2022) to measure GPR. After that, the monthly GPR index is converted into an annual average of the index to align that frequency with the sample's firm-level yearly data. Further, firms associated with any group are classified as group-affiliated firms, while those not associated with any group are treated as standalone firms. It was found in this study that 70 firms belong to business groups, whereas 174 firms are standalone. Data has also been winsorised at 99th and 1st percentile levels to remove outliers.

3.2. Variables

In line with the literature, investment has been taken as the dependent variable, and cash flow has been taken as the independent variable representing internal funds. Here, investment is the function of cash flow, which measures investment-cash flow sensitivity. Further, investment is calculated as the change in the fixed asset from the previous year to the current year, and after that, investment is scaled by the previous year's total asset. So, the beginning year of the sample period is not considered for estimation. This study uses GPR as a first-level moderating variable and group affiliation as a second-level moderating variable. Further, Tobin's Q, sales growth, firm size, firm age, liquidity, and ROA have been used as control variables to address the influence of possible omitted variables. The description of variables is provided in Table 1.

Table 1: Variables used in the study

Variable	Abbreviation	Description	Data Source	Reference
Investment	I/K	Net investment in fixed asset (I) (It - It-1), divided by total assets at the beginning of the period (K)	Prowess Database	(Arslan et al., 2006; Brown & Petersen, 2009)
Cash Flow	CF/K	Profit after tax (PAT) adjusted for the effect of non-cash items divided by total assets at the beginning of the period (K)	Prowess Database	(Arslan et al., 2006; Brown & Petersen, 2009)
Geopolitical Risk	GPR	Average of GPR value	https://www.matteoiacoviello.com/gpr.htm	(Fiorillo et al., 2024; Gupta, 2023)
Group Affiliation	GAF	A dummy variable '1' if the firm is a group affliated otherwise '0'.	Prowess Database	(Sethi & Swain, 2019)
Tobin's Q	Q	Market capitalisation plus total assets minus book value of equity whole divided by total assets	Prowess Database	(Attig et al., 2014)
Sales Growth	SG	(Current Year Sales / Previous Sales) – 1	Prowess Database	(Dash & Swain, 2020; Dash et al., 2023)
Liquidity	LIQ	Liquid Asset/ Total Asset	Prowess Database	(Gupta, 2022; Dash & Swain, 2020)
Leverage	LEV	Total debt/Total asset	Prowess Database	(Dash et al., 2023; Gupta, 2022; Sethi & Swain, 2019)
Firm Size	FS	Natural logarithm of Total assets	Prowess Database	(Dash et al., 2023; Gupta, 2022; Sethi & Swain, 2019)
Firm Age	FA	Number of years since incorporation	Prowess Database	(Dash et al., 2023; Gupta, 2022; Sethi & Swain, 2019)
Profitability	ROA	(Profit after Tax/ Total asset) ×100	Prowess Database	(Dash et al., 2023; Sethi & Swain, 2019)

Source: Authors' compilation

3.3. Estimation Approach

The study uses a panel data set due to its distinct benefits like controlling unobservable heterogeneity ((Fazzari and Petersen, 1993; Hsiao, 2003; Moulton, 1986), gathering extensive observations, minimising collinearity, and providing technical efficiency(Das et al., 2023; Koop, G., & Steel, 2001; Sethi & Swain, 2019b) Further, the study applies panel fixed effect regression as suggested by Hausman test to generate robust results. This study has estimated the following model for the analysis.

$$(I/K)_{it} = \beta_0 + \beta_1 (CF/K)_{it} + \beta_2 (CF/K)_{it} * GPR + \beta_3 (CF/K)_{it} * GPR*GAF + \beta_4 Q_{it} + \beta_5 SG_{it} + \beta_6 LIQ_{it} + \beta_7 LEV_{it} + \beta_8 FS_{it} + \beta_9 FA_{it} + \beta_{10} ROA_{it} + \Theta_i + \gamma_t + \varepsilon_{it}$$

The descriptions of the variables taken in the models are depicted in Table 1. Additionally, a firm-specific effect Θ_i, and time dummy γ_t, have been considered in the model. The subscript "i" represents firms, and "t" represents years.

3.4 Conceptual model

The study has the following conceptual model for better understanding.
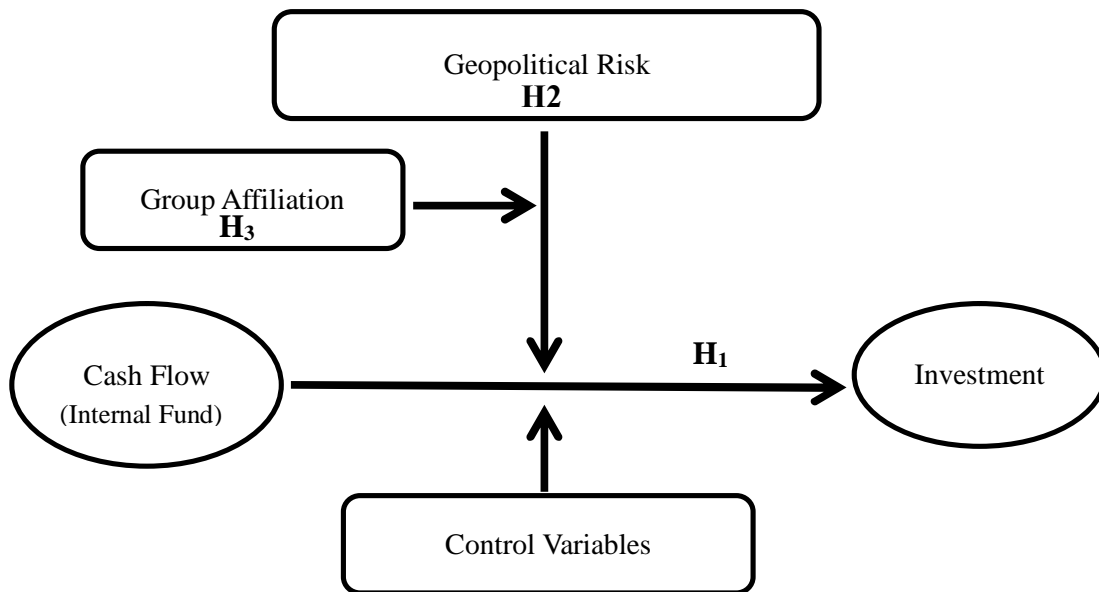
Fig. 1: Conceptual Model

Source: Authors' creation

4. Results and Discussion
4.1. Summary Statistics
Table 2: Summary Statistics

Variable	Mean	Median	S.D.	Min	Max
I/K	11.1	0.0	51.0	-0.5	258.0
CF/K	15.2	0.1	62.4	-10.2	312.0
GPR	0.2	0.2	0.0	0.1	0.2
Tobin's Q	1.2	1.1	7.9	-399.0	13.0
Sales Growth	0.9	0.1	20.2	-1.0	879.5
Liquidity	0.5	0.5	0.2	0.0	1.0
Leverage	1.6	0.6	45.5	0.0	23.0
Firm Size	7.7	7.6	2.3	-2.3	14.7
Firm Age	31.3	30.0	17.0	1.0	133.0
ROA	-0.1	1.8	41.6	-19.0	113.6

Source: Authors' calculation.

Table 2 illustrates the summary statistics of the variables. The mean of I/K is 0.11.1, which indicates that Indian metal manufacturing firms spend around 11% of their total assets towards capital expenditure every year. The mean of CF/K is 15.2, which suggests that an average Indian firm has a cash flow of around 15% of its total assets. The mean of GPR, Tobin's Q, sales growth, liquidity, leverage, firm size, firm age, and ROA, are 0.2, 1.2, 0.9, 0.5, 1.6, 7.7, 31.3, and -0.1 correspondingly. The values are consistent with the prior work of Dash & Sethi, (2024).

4.2 Correlation Matrix and Multi-collinearity Test

Before applying the multiple regression, it is necessary to check whether there is any strong association among independent variables. If it is so, it leads to a multicollinearity issue. Hence, we tested the multicollinearity highlighted in Table 3 through the correlation matrix and variance inflation factor. Though the correlation coefficient values between 0.001 to 0.994, the highest VIFs of 3.010 (<10) show the absence of a multicollinearity problem, as recommended by (Chatterjee & Hadi, 1977; O'Brien, 2007).

Table 3: Correlation Matrix and Variation Inflation Factor (VIF)

	I/K	CF/K	GPR	Tobin's Q	Sales Growth	Liquidity	Leverage	Firm Size	Firm Age	ROA	VIF
I/K	1										
CF/K	0.994	1									1.139
GPR	-0.014	-0.013	1								3.010
Tobin's Q	-0.001	0.000	0.010	1							1.179
Sales Growth	0.112	0.145	0.034	-0.016	1						1.025
Liquidity	-0.008	-0.008	-0.030	-0.055	0.008	1					1.357
Leverage	-0.0004	-0.001	-0.013	-0.994	-0.002	0.046	1				1.428
Firm Size	0.030	0.032	0.015	0.115	-0.041	-0.433	-0.091	1			1.410
Firm Age	-0.038	-0.040	0.022	0.016	-0.028	-0.218	-0.004	0.330	1		1.111
ROA	0.001	0.002	-0.005	0.964	0.038	-0.021	-0.962	0.117	0.005	1	1.605

Source: Authors' calculation.

4.3 Regression Results

Table 4: Impact of GPR & Group Affiliation on ICFS: Fixed Effect Regression Analysis

Variables	Coefficient (β)	p-value
$(^{CF}/_K)_{it}$	-1.201***	0.000
$(^{CF}/_K)_{it}$ x GPR	5.758***	0.000
$(^{CF}/_K)_{it}$ x GPR x GAF	2.091**	0.008
'Tobin's Q'	-0.002	0.766
'Sales Growth'	0.001 **	0.007
'Liquidity'	-0.265 ***	0.000
'Leverage'	-0.028 ***	0.250
'Firm Size'	0.025*	0.055
'Firm Age'	-0.007**	0.001
'ROA'	0.001	0.176
'Constant'	0.175	0.103
'Time Effect'	Yes	

Within R Square	0.126	**p-value (F)**	0.000
Overall R Square	0.064	**No. of Observation**	2,449

Source: Author's calculation.

'Note: ***,**, and *** indicate significant level at 1%, 5%, and 10% respectively'

Table 4 presents the fixed effect regression results of the study. The findings suggest that firms in the Indian metal industry rely less on internal cash flows for their investment decisions, indicating that they are financially unconstrained and have easy access to external funds. However, this situation changes during geopolitical risk (GPR) periods, when the internal cash flow sensitivity (ICFS) increases significantly. During such times, GPR negatively impacts the economy and financial institutions, increasing the cost of external funds and compelling firms to rely more on internal resources for investment decisions. Additionally, as most Indian firms are group affiliates (Gupta & Mahakud, 2022), there are differing views on the role of ownership structure (group affiliates vs standalone firms) in the ICFS relationship nexus (Almeida & Wolfenzon, 2006; Hai*et al.*, 2022; Huang *et al.*, 2021; Khanna&Rivkin, 2001; Sethi*et al.*, 2021). This disparity in evidence motivates an examination of the association between group affiliation, GPR, and ICFS in the Indian context. The results show that group affiliation moderates the GPR-ICFS relationship by reducing the sensitivity induced by GPR. This indicates that group firms provide a form of co-insurance for their sister firms,

enhancing confidence in utilising internal cash flows. Group firms can also engage in intercorporate borrowing, which helps mitigate the negative effects of GPR.

5. Conclusion and Implications

This study explores firms' internal cash flow sensitivity (ICFS) in the Indian metal industry, focusing on the influence of geopolitical risk (GPR) and the moderating role of group affiliation. The results indicate that, under normal conditions, Indian metal firms show low ICFS. However, during periods of heightened geopolitical risk, this sensitivity increases. Furthermore, the findings highlight that group affiliation plays a crucial role in moderating the impact of GPR, helping to reduce ICFS during times of geopolitical uncertainty.

The findings of this research offer valuable insights for project managers, investors, regulators, lenders, financial institutions, and academics. First, the study enhances the understanding of corporate investment behaviour and ICFS, benefiting businesses, scholars, and policymakers. Second, it raises awareness among companies about the negative impact of geopolitical risk (GPR) and encourages the development of policy initiatives that can support economic growth and help firms navigate such risks. Third, loan agencies, investors, and stakeholders should closely consider a firm's ownership structure (group-affiliated vs. standalone) when making investment or lending decisions. Lastly, regulators should implement appropriate policy measures, such as maintaining low interest rates, simplifying investment procedures, and ensuring easy access to external funds to support firms in mitigating the challenges posed by GPR.

5.1 Limitations of the Study and Scope for Future Research

This study focuses exclusively on firms in the metal industry, but future research could extend the analysis to include other manufacturing firms for broader insights. Additionally, cross-country comparisons could provide a more comprehensive understanding of the topic. The current research relies on quantitative financial data from financial statements. Still, future studies could incorporate qualitative factors—such as the personal attributes of project managers and CEOs and the type of investment projects—which may significantly influence a firm's investment decisions. While this study considers group affiliation, future research could explore other components of ownership structures, such as varying holding patterns, to further enrich the literature. Further, Small and Medium Enterprises (SMEs) play a vital role in the economic development of the country (Dash, et al., 2023). Future research can explore the ICFS in the SME context.

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Appendix

Table A1:Hausmantest Results

Hausman test statistic:	Selection of Model (Fixed Effect / Random Effect
H = 39.0275 with p-value = prob.(chi-square(13) > 39.0275) = 0.00019	Fixed Effect

Source: Author's own calculation
Note- A low p-value counts against the null hypothesis that the random effects model is consistent, in favour of the fixed effects model

Capital Structure, Firms' Growth and Shareholders' Value: A System GMM Approach

Chandrika Prasad Das[1], Suman Bindu[2*]

[1]Assistant Professor, P.G. Department of Commerce, Berhampur University, Berhampur, Email: chandrika.das9@gmail.com, Mob: 7978410849

ORCID iD – 0000-0002-3077-3747

[2]Assistant Professor, Department of Commerce, S.B.R. Govt. Women's College, Berhampur, Email: sumanbindu43@gmail.com , Mob: 9489245532

ORCID iD – 0000-0003-0763-1190

*Corresponding Author

Abstract: This study explores the impact of capital structure on firms' growth and shareholders' value for NSE-200 listed manufacturing firms over 20 years, from 2001-02 to 2019-20. It also highlighted how firms' growth and shareholders' value were influenced by capital structure decisions, with the moderating effect of intangible assets. The data has been collected from the PROWESS database of CMIE (Centre for Monitoring Indian Economy). Using the two-step system GMM method, the study found that capital structure significantly influenced firms' growth and shareholders' value in Indian manufacturing firms.

1. Introduction

Capital structure research has been ongoing since the foundational work of Modigliani and Miller" *3; 78)"which remained central to corporate finance research, capturing the interest of academics, researchers, and practitioners alike. Decisions related to a company's capital structure are among the major analysed subjects in this field; however, a unified perspective still needs to be discovered, even after years of exploration. Modigliani and Miller originally posited that, under ideal conditions, capital structure of a firm don't affect its value. Since then, two prominent theories, the trade-off theory and the pecking order theory, have been conceptualised as pillars of contemporary capital structure theory. The trade-off theory posits that firms aim to achieve optimal capital structure by balancing the debt tax-shield with the likely costs of bankruptcy (Baxter, 1967; Leland, 1994; Leland & Toft, 1996). This theory later expanded to include agency costs, encompassing issues such as free cash flow dilemmas, asset substitution, and under-investment (Jensen & Meckling, 1976; Myers, 1977; Jensen, 1986). In contrary, the pecking order theory argues that asymmetric information influences capital structure decisions, creating a financing hierarchy within firms (Myers & Majluf, 1984).

With the advent of globalisation and industrialisation, many large companies, particularly joint-stock corporations, require capital to sustain and grow in competitive markets. Investors rely on a firm's market value and relevant influencing factors to purchase. They forecast value and price changes based on understanding these factors, informing their decision to buy or sell shares (Neveu, 1981). Capital structure denotes to the combination of debt and equity finance to increase the long-term market value of a firm. An optimal capital structure minimises the weighted average cost of capital, which maximises market value (Vatavu, 2015). Minimised cost of capital ultimately boosts return, maximising shareholder wealth (Tak, 2016). Financing decisions, among the most challenging for

financial managers, significantly influence a firm's performance (Atiyet, 2012). Various determinants, such as company size, growth potential, asset tangibility, liquidity, and profitability, have been identified by scholars as factors influencing capital structure (Serghiescu & Vaidean, 2014).

Financial managers frequently use metrics like return on assets (ROA), earnings per share (EPS) and return on equity (ROE), to measure firm's performance. However, investors and finance experts increasingly question these traditional metrics, arguing they fall short of capturing economic value (Eljelly & Alghurair, 2001). In response, newer metrics, such as "created shareholder value (CSV)", "shareholder value added (SVA)", "economic value added (EVA)", and "market value added (MVA)" have emerged. These metrics align with value-based management frameworks to offer a more comprehensive measure of shareholder wealth (Bhasin & Shaikh, 2013; Chen & Dodd, 1997; Nel, 2010).

The linkage of capital structure with firm value has been amply explored across various regions and sectors. Nonetheless, consensus still needs to be improved on the applicability of capital structure theories, particularly in manufacturing industries. This study aims to add to the literature in two main ways. First, it examines how capital structure influences firms' growth and shareholder value in the Indian manufacturing firms. Second, it employs a two-step System GMM approach, allowing for a rigorous investigation of the relationships among these variables. The study seeks to examine the effect of capital structure on the firm's growth and shareholders' value taking 75 manufacturing firms listed on the National Stock Exchange (NSE) in India, spanning 20 years from 2000-01 to 2019-20. The remainder of this paper is depicted as follows: The section "Review of Literature" highlights relevant empirical research, the Section "Research Methodology" outlines the data and econometric model, the Section "Results and Discussion" interprets the results, and the Section "Conclusion" offers closing remarks.

2. Literature review

The link between capital structure, firm's growth and shareholders' value has become a significant focal point of researchers in financial economics, particularly in emerging markets like India. Modigliani and Miller (1958) pioneered the theory that capital structure is immaterial in a frictionless market. However, subsequent research has indicated that market distortions, such as taxes, liquidation costs, and managerial conflict, influence capital structure decisions and their impact on firms' growth and shareholders' value (Myers, 1984). Irawan et al. (2022) found an inverse relationship between capital structure and profitability while highlighting a modest positive influence of firm size and growth on profitability and firm value. Similarly, Linawati (2022) demonstrated that profitability and bank size significantly enhance the firm value, with capital structure as a mediating factor in the context of Indonesian banks. Mills and Mwasambili (2022) extended this discourse by establishing bidirectional causality between different types of debt and firm growth in Ghana.

In Vietnam, Dang and Do (2021) investigated the effect of capital structure on firm value across various industries, concluding that while capital structure negatively affects specific sectors like construction and real estate, it positively influences the food and beverage industry. This complexity is further supported by Khanh et al. (2020), who found that good corporate governance significantly affects firm value, mediated by capital structure, thereby underscoring the importance of governance mechanisms in shaping financial outcomes. Hirdinis (2019) explored the mining sector, revealing that while capital structure positively influences firm value, larger firm size negatively impacts value, contradicting Irawan et al.'s findings. Mandala et al. (2019) focused on firm age, concluding that it influences the link between capital structure and firm value. Rachmat et al. (2019) reinforced the significant roles of capital structure and profitability in determining firm value, particularly in Indonesia.

Faccio and Xu (2018) broadened the scope by examining the effects of tax reforms on equity value in OECD countries, indicating that higher tax evasion rates diminish the impact of tax changes on firm value. In contrast, Jiraporn and Liu (2008) focused on the effect of staggered boards on capital structure choices and subsequent firm value, concluding that while staggered boards lead to lower debt levels, they do not affect firm value post-Sarbens-Oxley Act. Bereznicka (2017) and Doorasamy (2021) further illustrate the regional and sectoral nuances affecting the capital structure-firm value relationship, with Bereznicka emphasising the dominance of country-specific factors over industry characteristics, particularly in medium-sized firms. Meanwhile, Nursetya and Hidayati (2021) affirmed that while capital structure affects performance, it does not influence firm value, aligning with Al-Slehat (2020), who found in significant relationship of financial leverage with firm value in Jordan's industrial sector.

The findings of Cheng et al. (2020) introduced the concept of an inverted U-shaped relationship between ideal capital structure and firm value, suggesting that optimal levels of capital structure exist where firm value peaks. Conversely, Nguyen et al. (2020) demonstrated a favourable link between capital structure and firm value in Vietnam's food and beverages sector, adding a nuanced understanding of the prevailing narratives. Rahman et al. (2019) and Rosario and Chavali (2019) explored profitability's mediating role, with the former indicating that equity and debt ratios significantly impact ROA, while the latter confirmed a positive association between capital structure and profitability in India's hotel industry. Gunawan et al. (2018) and Ngatemin et al. (2018) also highlighted the positive influence of capital structure on firm value, although the latter indicated firm size negatively affects firm value.

Alfi and Safarzadeh (2016) and Gharaibeh and Sarea (2015) showed a multifaceted influence of capital structure and other firm-specific factors on firm value, emphasising the importance of financial leverage and liquidity. Mule et al. (2015) and Priya et al. (2015) corroborated the positive impact of capital structure on financial performance and firm value, while Chowdhury and Chowdhury (2010) underscored capital structure's significant influence on firm value. Mujahid and Akhtar (2014) and Atiyet (2012) further explored the intersection of capital structure, shareholder value, and financial performance, revealing that capital structure positively affects shareholder wealth. Sudheer and Vishnu (2022) and Aggarwal and Padhan (2017) reiterated the favourable effect of equity on firm value, while Sinha (2017) and other studies added to the growing body of evidence on capital structure's role in determining corporate value.

Existing work depicting the influence of capital structure on firm growth and shareholder value highlights significant relationships but reveals notable gaps that necessitate further exploration. Studies like Irawan et al. (2022) and Linawati (2022) indicated mixed impacts of capital structure on firm value and profitability, suggesting a need for contextual understanding specific to the Indian market. Moreover, while Mills and Mwasambili (2022) and Dang and Do (2021) explored the dynamics in different countries, their findings may not be directly applicable to Indian firms due to their unique economic and regulatory environments. Additionally, studies like Perwito and Disman (2021) emphasised the role of intangible assets, an area less examined in Indian contexts. Furthermore, while many studies focus on specific industries, the multidimensional effects of capital structure across diverse sectors in India remain underexplored. This research aims to bridge these gaps by comprehensively analysing capital structure's impact on firms' growth and shareholders' value among selected NSE-listed companies in India, considering industry variations.

3. Research methodology

3.1. Data and Sample

The data are gathered from the CMIE PROWESS database and firms' annual reports, covering 20 years from 2001 to 2020. Data from 2021 and 2022 are omitted due to aberrant industry performance following the Covid-19 epidemic. Annual reports, audited and distributed to shareholders, are used as they are reliable sources of information (Maama & Appiah, 2019). Based on data consistency, 2,140 firm-year observations are gathered for 107 sample companies, excluding companies with incomplete data. Figure 1 depicts the conceptual research model.
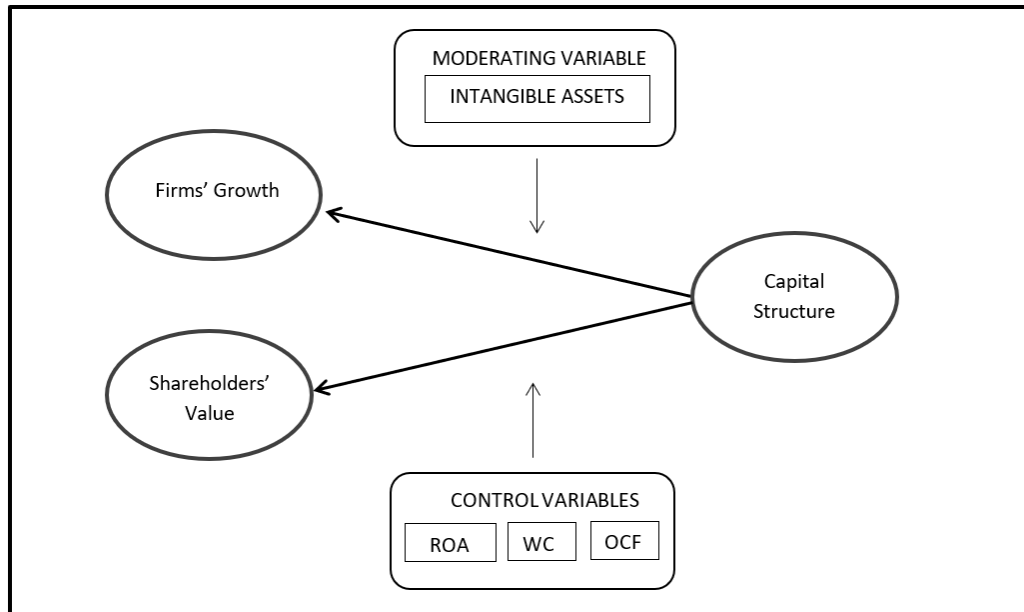
Figure 1: Conceptual Research Model

3.2. Variables

Consistent with the literature, firms' growth (Total Sales, Total Assets) and shareholders' value (Earnings Per Share, Market Value Added) have been considered as the dependent variable, and debt-equity ratio, interest coverage ratio, total equity to total assets have been used as the explanatory variables to assess the capital structure. This study uses ROA, operating cash flows, and working capital as control variables to mitigate omitted variable bias. Table 1 reports the definition of the viable.

Table 1: Variable Description

Variable	Symbol	Description
Total sales	$TOTALSALES_{it}$	Total Sales generated by the firm in a financial year
Total assets	$TOTALASSETS_{it}$	Total assets reported in the Balance Sheet
Earnings per share	EPS_{it}	(Net income-preferred dividends) ÷ Average outstanding common shares
Market value added	MVA_{it}	Market value of the firm – Capital contributed by shareholders
Debt-equity ratio	D/E_{it}	Total debt ÷ Total equity
Interest coverage ratio	ICR_{it}	Earnings before interest and tax ÷ Interest expense
Total equity to total assets	$TETA_{it}$	Total equity ÷ Total assets
Return of total assets	ROA_{it}	Profit after tax ÷ Total assets

Working capital	WC_{it}	Total Current Assets – Total Current Liabilities
Operating cash flows	OCF_{it}	Operating Income + Depreciation + change in working capital - Taxes
Intangible assets	IA_{it}	Total intangible assets reported in the Balance Sheet

Source: Authors' Compilation

3.2. Estimation method and econometric model

This study applies a Generalized Method of Moments (GMM) regression model within a panel data framework to estimate model parameters. The dynamic panel approach through GMM effectively addresses heterogeneity from unobserved firm and time-invariant effects and issues such as measurement error, missing variable bias, persistence, and endogeneity (Caselli et al., 1996). Specifically, the system GMM estimator is well-suited for datasets with modest periods, especially when variables are endogenous and interdependent relationships exist (Sheikh et al., 2018). Given the structure of the data, covering 107 firms across 20 years (i.e., N>T), system GMM is appropriate for this analysis.

The study considers TOTAL SALES, TOTAL ASSETS, EPS, and MVA as dynamic variables, as they exhibit persistence influenced by prior values. This persistence reflects a firm's competitive standing within its industry (Mueller, 1977; Mueller, 1986), particularly prominent in emerging and developed markets where firms leverage innovation to build competitive advantages. Past research, including work by Goddard et al. (2005), Isik and Soykan (2013), Pattitoni et al. (2014), Nunes and Serrasqueiro (2015), Vatavu (2014), Challe et al. (2016), and Isik and Tasgin (2017), supports this view. Consequently, this study captures this persistence effect using the GMM model.

We assume all explanatory variables as endogenous, following the assumptions of Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998), which state that present observations are likely influenced by prior values, resulting in correlations between explanatory factors and errors. Lags of these variables are used as instruments to manage endogeneity concerns. Lag lengths are specified using lag (0 1 2) in all cases. A two-step system GMM approach is used to estimate dynamic panel data (using the Stata command xtdpdgmm).

The dynamic panel model is estimated as follows:

$$\text{TOTAL SALES}_{it} = \alpha_i + \beta_1 \text{TOTAL SALES}_{it-1} + \beta_2 \text{TOTAL SALES}_{it-2} + \beta_3 \text{D/E}_{it} + \beta_4 \text{ICR}_{it} + \beta_5 \text{TETA}_{it} + \beta_6 \text{ROA}_{it} + \beta_7 \text{WC}_{it} + \beta_8 \text{OCF}_{it} + \beta_9 \text{IA}_{it} + \beta_{10} \text{IAXD/E}_{it} + \varepsilon_{it} \text{ ---- (1)}$$

$$\text{TOTAL ASSETS}_{it} = \alpha_i + \beta_1 \text{TOTAL ASSETS}_{it-1} + \beta_2 \text{TOTAL ASSETS}_{it-2} + \beta_3 \text{D/E}_{it} + \beta_4 \text{ICR}_{it} + \beta_5 \text{TETA}_{it} + \beta_6 \text{ROA}_{it} + \beta_7 \text{WC}_{it} + \beta_8 \text{OCF}_{it} + \beta_9 \text{IA}_{it} + \beta_{10} \text{IAXD/E}_{it} + \varepsilon_{it} \text{ ---- (2)}$$

$$\text{EPS}_{it} = \alpha_i + \beta_1 \text{EPS}_{it-1} + \beta_2 \text{EPS}_{it-2} + \beta_3 \text{D/E}_{it} + \beta_4 \text{ICR}_{it} + \beta_5 \text{TETA}_{it} + \beta_6 \text{ROA}_{it} + \beta_7 \text{WC}_{it} + \beta_8 \text{OCF}_{it} + \beta_9 \text{IA}_{it} + \beta_{10} \text{IAXD/E}_{it} + \varepsilon_{it} \text{ ---- (3)}$$

$$\text{MVA}_{it} = \alpha_i + \beta_1 \text{MVA}_{it-1} + \beta_2 \text{MVA}_{it-2} + \beta_3 \text{D/E}_{it} + \beta_4 \text{ICR}_{it} + \beta_5 \text{TETA}_{it} + \beta_6 \text{ROA}_{it} + \beta_7 \text{WC}_{it} + \beta_8 \text{OCF}_{it} + \beta_9 \text{IA}_{it} + \beta_{10} \text{IAXD/E}_{it} + \varepsilon_{it} \text{---- (4)}$$

4. Results and Discussion

4.1. Descriptive statistics

Table 2 shows the features of the variables. The mean of total sales is 1.1010, which lies between two extreme values, i.e., minimum 0.0050 and maximum 2.2039. It indicates that the mean is well representative of the total sales, which is further substantiated by less standard deviation, i.e., 0.6769 or cv of 0.6148. The mean of total assets, EPS, MVA, debt-equity ratio, interest coverage ratio, total

equity to total assets, ROA, working capital, operating cash flows and intangible assets are 10.940, 0.001, 1.580, 0.640, 0.801, 0.467, 9.609, 0.111, 1.079 and 0.001, respectively. The median value of all the variables lies between the minimum and maximum values. It is almost in the middle of the series.

Table 2: Descriptive Statistics

Variables	Mean	Median	S. D.	Minimum	Maximum	C.V.
TOTAL SALES	1.1010	1.1004	0.6769	0.0050	2.2039	0.6148
TOTAL	10.9400	10.8700	1.6290	6.9230	16.0900	0.1489
ASSETS EPS	0.0013	0.0012	0.0031	-0.0035	0.0071	2.3846
MVA	1.5800	1.5700	2.5610	-0.8558	4.0298	1.6208
D/E	0.6403	0.6341	1.1680	0.0000	1.3500	1.8241
ICR	0.8010	0.7913	2.0250	-0.1084	1.7206	2.5280
TETA	0.4675	0.4555	0.1665	0.0350	0.8921	0.3561
ROA	9.6090	9.5650	8.3180	-31.7900	51.0040	0.8656
WC	0.1117	0.1083	0.1637	-0.4697	0.6955	1.4655
OCF	1.0791	1.0702	3.9970	-115.3000	117.4582	3.7040
IA	0.0012	0.0010	0.0040	0.0000	0.0030	3.3333

Source: Author's calculation

4.2. Correlation matrix

Table 3 shows the correlation coefficients and VIFs of the variables. The correlation coefficients between the variables range from 0.000 to 0.603, which is less than the 0.80 cutoff limit. It suggests that there is no collinearity, as Gujarati (2004) stated. Furthermore, the maximum VIF value is 1.528, which is less than the threshold limit of 10, as mentioned by Chatterjee and Hadi (1977) and O'brien (2007). So, there is the absence of multicollinearity issues among the independent variables.

Table 3: Correlation Matrix and Variance Inflation Factor

	TOTAL SALES	TOTAL ASSETS	EPS	MVA	D/E	ICR	TETA	ROA	WC	OCF	IA	VIFs
TOTAL SALES	1.000	-0.011	0.103	-0.303	-0.037	0.040	0.073	0.203	0.175	-0.024	0.017	
TOTAL ASSETS		1.000	0.231	-0.087	-0.250	0.051	0.242	0.603	-0.034	-0.009	0.019	
EPS			1.000	-0.134	-0.080	-0.004	-0.212	0.306	-0.058	-0.036	-0.036	
MVA				1.000	-0.044	-0.053	0.013	-0.171	-0.395	0.046	-0.040	
D/E					1.000	-0.046	-0.514	-0.352	-0.107	-0.001	-0.035	1.413
ICR						1.000	0.026	0.091	0.057	0.000	-0.012	1.011
TETA							1.000	0.389	0.242	-0.016	0.093	1.528
ROA								1.000	0.160	-0.011	-0.014	1.242
WC									1.000	-0.050	0.017	1.074
OCF										1.000	0.014	1.003
IA											1.000	1.012

Source: Author's calculation

4.3. Regression Analysis

Table 4 shows the regression results of Model 1, which evaluates the relationship between capital structure and total sales using the GMM regression model. The GMM diagnostic test is performed using the Sargan-Hansen test, which determines the overall validity of the instruments with a null hypothesis indicating that "instruments as a group is exogenous."

Table 4: Regression showing the effect of capital structure on total sales

Dependent Variable			TOTAL SALES
Independent Variables	**Coefficient**	**Std. Err.**	**P-value**
Intercept	0.508***	0.051	0.000
TOTAL SALES L1	0.754***	0.023	0.000
TOTAL SALES L2	-0.183***	0.021	0.000
D/E	-0.228***	0.010	0.004
ICR	-0.220***	0.000	0.000
TETA	-0.412***	0.065	0.000
ROA	0.015***	0.000	0.000
WC	0.344***	0.057	0.000
OCF	-0.295***	0.026	0.000
IA	-2.353	1.605	0.143
IA x D/E	-13.332***	2.140	0.000
Firm-year observations	1500		
No. of firms	75		
No. of Instruments	43		
AR (1) test p-value	0.000		
AR (2) test p-value	0.188		
AR (3) test p-value	0.237		
Sargan-Hansen test p-value	0.107		

Source: Author's calculation

Note: ***, **, and * represents statistical significance at 1%, 5%, and 10%, respectively.

Since the p-value of the Sargan-Hansen test accepts the null hypothesis in all cases (p>0.10), the instruments are valid. Another requirement for the model is that the number of instruments should be equal to or less than the group in order to prevent over-identification in the model. This requirement is also satisfied. Other diagnostic procedures include checking for autocorrelation or serial correlation with AR (1), AR (2), and AR (3) statistics. AR (1) demonstrates first-order serial autocorrelation (i.e., the differenced error term is serially correlated at AR (1)), while AR (2) is regarded as a required test for detecting autocorrelation at levels. The null hypothesis of AR (2) statistics states, "there exists no autocorrelation in the error term," which is accepted in all situations, demonstrating no autocorrelation in the model. The AR (3) test is used to determine the presence of autocorrelation at subsequent lag. AR (3) results also reveal that there is absence of autocorrelation in the model.

The result reveals that the total sales are positively impacted by their first lag and negatively impacted by their second lag, confirming their dynamic nature. The coefficient of the debt-equity ratio stands negative with a p-value of 0.004, which means that capital structure has a significantly negative

impact on firms' growth. Lenders and investors consider a substantial debt-equity ratio to be risky, as a substantial amount of debt carries high interest, which leads to insufficient working capital. The shortage of working capital will affect the production process, and consequently, sales are also affected. The manufacturing sector's overall sales are significantly and negatively impacted by the interest coverage ratio. This indicates that an increase in the interest coverage ratio reduces total sales, and the manufacturing sector's revenues are less reliable and inconsistent with the higher interest coverage ratio. Total sales are significantly negatively correlated with total equity to total assets. The less leveraged a corporation is, the greater the equity-to-asset ratio, which shows that a company's assets were created through issuing equity shares rather than by taking on debt. When the financing of assets is done mostly through equity, and no or less amount of debt leads to an imbalance in capital structure, which increases the weighted average cost of capital. Costs that are too high have an adverse effect on revenue, output, and sales. ROA and working capital positively influence the firm's growth, while operating cash flows negatively affect the firm's growth. The interaction effect of intangible assets with the debt-equity ratio as a combined factor negatively affects total sales. The link between a firm's growth and capital structure is negatively moderated by intangible assets. The firm managers should consider investing less in intangible assets and more in tangible assets to increase their production ability and sales.

Table 5: Regression results showing the effect of capital structure on total assets

Dependent Variable			TOTAL ASSETS
Independent Variables	**Coefficient**	**Std. Err.**	**P-value**
Intercept	0.943***	0.095	0.000
TOTAL ASSETS L1	0.960***	0.012	0.000
TOTAL ASSETS L2	0.019*	0.010	0.069
D/E	-0.038***	0.004	0.000
ICR	0.101***	0.000	0.000
TETA	-1.171***	0.071	0.000
ROA	0.050***	0.001	0.710
WC	-0.324***	0.057	0.000
OCF	0.228***	0.025	0.000
IA	14.328***	1.758	0.000
IA x D/E	-3.878**	2.410	0.100
Firm-year observations	1500		
No. of firms	75		
No. of Instruments	43		
AR (1) test p-value	0.003		
AR (2) test p-value	0.254		
AR (3) test p-value	0.360		
Sargan-Hansen test p-value	0.118		

Source: Author's calculation

Note: ***, **, and * stand for statistical significance at 1%, 5%, and 10%, respectively.

Table 5 shows the impact of capital structure on the total assets of sample companies. The result shows a negative effect of debt-equity ratio on total assets, which means that in the manufacturing sector, total assets decline in response to an increase in the debt-equity ratio. Lenders and investors consider substantial debt-equity ratio to be risky, as a substantial amount of debt carries high interest,

leading to insufficient capital for asset financing. The interest coverage ratio positively and significantly influences total assets in the manufacturing sector. The fewer debt expenses the corporation needs to pay, the more cash it has available for other uses, such as investment in assets. Total equity to total assets has a significant negative association with total assets. A corporation is less indebted if it has a larger shareholder-equity ratio, which shows that its assets were created through the issuance of equity shares rather than by taking on debt. So, the manufacturing sector firms must include debt to finance assets and maintain long-term financial stability. ROA and operating cash flows positively influence the firm's growth, while working capital negatively affects the firm's growth. The interaction effect of intangible assets with the debt-equity ratio as a combined factor negatively and significantly affects total assets. The firm managers should consider investing less in intangible assets and more in tangible assets to increase their total assets.

Table 6: Regression results showing the effect of capital structure on EPS

	Dependent Variable		EPS
Independent Variables	**Coefficient**	**Std. Err.**	**P-value**
Intercept	-0.000*	0.000	0.098
EPS L1	0.369***	0.002	0.000
EPS L2	0.058***	0.001	0.000
D/E	-0.167**	0.000	0.050
ICR	-0.205***	0.000	0.000
TETA	-0.119***	0.000	0.000
ROA	0.230***	0.000	0.000
WC	0.221***	0.000	0.000
OCF	-0.040***	0.000	0.000
IA	0.030**	0.007	0.000
IA x D/E	0.031***	0.010	0.002
Firm-year observations	1500		
No. of firms	75		
No. of Instruments	43		
AR (1) test p-value	0.105		
AR (2) test p-value	0.947		
AR (3) test p-value	0.998		
Sargan-Hansen test p-value	0.277		

Source: Author's calculation
Note: ***, **, and * represents statistical significance at 1%, 5%, and 10%, respectively.

Table 6 reports the impact of capital structure on earnings per share in the manufacturing sector. The debt-equity ratio's detrimental effect on earnings per share means that in the manufacturing sector, earnings per share decline in response to rise in the debt-equity ratio. A high debt-equity ratio can lead to a decrease in profits. For shareholders, this might indicate a reduction in earnings as the profits can be used to pay interest or payments on debt. The manufacturing sector's earnings per share are

significantly and negatively impacted by the interest coverage ratio. A corporation is more capable of repaying its debt if it has a higher interest coverage ratio. However, if the debt component is more in its capital structure, then more interest will be diverted for payment. So, earnings may not be sufficient to magnify the shareholder earnings.

Earnings per share is significantly and negatively correlated with the total equity to total assets ratio. This depicts that the more the assets are financed with equity, the lower the earnings per share will be. A corporation is less indebted if it has a larger shareholder-equity ratio, which shows that its assets were created through the issuance of equity shares rather than by taking on debt. So, the manufacturing sector must include debt to finance assets to maintain financial stability and magnify the earnings per share in the long run. ROA and working capital positively influence the shareholders' value, while operating cash flows negatively affect the shareholders' value. The debt-equity ratio, paired with the interaction effect of intangible assets, has a positive and considerable impact on earnings per share. The opportunities to boost firm value are provided by sustained investment in intangible assets. The company's ability to make money will be higher if a company owns more intangible assets, and investors will value the company more, raising its worth.

Table 7: Regression results showing the effect of capital structure on MVA

Independent Variables	Dependent Variable	MVA	
	Coefficient	Std. Err.	P-value
Intercept	0.932***	0.244	0.000
MVA L1	0.536***	0.011	0.000
MVA L2	0.032***	0.009	0.001
D/E	0.195*	0.050	0.057
ICR	0.044***	0.000	0.000
TETA	-0.489	0.431	0.257
ROA	0.023***	0.003	0.000
WC	-2.019***	0.349	0.000
OCF	0.462***	0.167	0.006
IA	-29.588**	12.703	0.020
IA x D/E	12.256	15.796	0.438
Firm-year observations	1500		
No. of firms	75		
No. of Instruments	43		
AR (1) test p-value	0.000		
AR (2) test p-value	0.546		
AR (3) test p-value	0.752		
Sargan-Hansen test p-value	0.297		

Source: Author's calculation

Note: ***, **, and * stand for statistical significance at 1%, 5%, and 10%, respectively.

Table 7 reports the impact of capital structure on market value added in the manufacturing sector. The debt-equity ratio depicts a positive and significant association with the market value added. Debt is usually cheaper than equity, and interest payments are tax deductible. Therefore, the higher the debt, the higher the return to shareholders, and therefore, the greater the value of the company. The interest

rate positively affects the market value added in the manufacturing sector. The increase in interest coverage ratio determines the company's capacity to repay debt, and the company is not vulnerable to volatile interest rates, consequently increasing market value. Total equity to total assets negatively affects market value added but is insignificant. ROA and operating cash flows positively influence the shareholders' value, while working capital negatively affects the shareholders' value.

The interaction effect of intangible assets with the debt-equity ratio as a combined factor positively affects market value added but is insignificant. Sustainable intangible asset investment offers chances to boost market value. The more intangible assets a company owns, the greater its perceived value and profitability potential, enhancing its overall attractiveness to investors.

5. Conclusion

The study attempted to examine the effect of capital structure on firms' growth and shareholders' value of the manufacturing sector listed on the National Stock Exchange for twenty years as a whole and the moderating effect of intangible assets on the relation between capital structure, firms' growth and shareholders' value. Total sales, Total assets, Earnings per share, and Market value added were considered as the dependent variables. In contrast, the Debt-Equity ratio, Interest coverage ratio, and Total equity to Total assets were considered as independent variables for the study. Return on total assets, working capital, and Operating cash flows were considered as control variables, while intangible assets were considered as moderating variable. It was found that the selected independent variables significantly affected firms' growth and shareholders' value for manufacturing sector.

This study provides critical insights for policymakers in formulating capital structure policies that foster sustainable firm growth and maximise shareholder value. For academicians and researchers, it enriches the existing literature on corporate finance with empirical findings using the System GMM approach, supporting robust data analysis. The government can use these findings to frame regulations promoting optimal capital structures and driving economic growth.

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Mapping the Scholarly Landscape of Firm Ownership and Performance: A Bibliometric Exploration

Jasmeet Kaur[1]*, Sheeba Kapil[2]

[1]**Research Scholar, Indian Institute of Foreign Trade and Assistant Professor, University of Delhi, jasmeetkaur@ms.du.ac.in*

[2]*Professor (Finance), Indian Institute of Foreign Trade*

*Corresponding Author

Abstract: Corporate governance through the ownership lens and its impact on firm performance has been explored under various contexts by numerous researchers. The agency theory rightly illustrates the problem of "separation of ownership and control" which leads to agency conflicts. Thus, ownership structure plays a pivotal role in the effective governance of an enterprise. Using the bibliometric analysis and Vosviewer's network visualization techniques, this study aims to map past research and literature on ownership structure and firm performance. The extant literature is retrieved from Scopus database (2001-2023). We employ citation, co-citation, and cluster analysis to reveal a multi-thematic view of our research objective. Furthermore, we identify annual production, associated keywords, impactful studies, leading journals, prominent authors, and noteworthy citations. Our study paves out a clear pathway for future investigation of the key concerns in this research field which can assist academics, industry practitioners and policymakers.

1. Introduction

Ownership is a key component of the internal corporate governance mechanism since owners have a direct influence on board constitution which is an indispensable governance aspect. The agency literature asserts that ownership structure provides incentives to keep an eye on managers by ensuring that management makes investments in projects which bear positive net present value (Jensen & Meckling, 1976). Ownership structure and its association with firm performance was first studied by Berle and Means (1932) through their classic research "The Modern Corporation and Private Property". Since then, several researchers have found a significant role of ownership type on the firm's success.

The ownership structure of a company impacts its performance in several ways. Firstly, differences in owners' identity, concentration and capital endowment determine their comparative power, motivations and the capacity to oversee managers. Shareholdings by banks, government, institutions, mutual funds, corporations, and individuals are ideal examples here. Secondly, since owners generally have divergent objectives, they have varied impacts on how well a company performs. We find corporate investors focusing more on building long-term relationships while financial investors are inclined towards short-term profits and goals.

Through this article, we attempt to synthesise the findings of numerous significant studies that have been published about the impact of ownership structure on firm performance. We undertake a two-tier evaluation by employing two techniques of bibliometric analysis. Bibliometric analysis uses

quantitative techniques which enable a systematic, illustrative, and thorough review of the research trends and provides a comprehensive knowledge map of the study topic (Kraus et al., 2020).

The review attempts to address the following research questions:

i. What is the publication trend in firm ownership structure research over the years in terms of overall volume and distribution of studies?

ii. What are the hotspot keywords, impactful studies, leading journals, prominent authors, and noteworthy citations in this field?

iii. What research topics in the context of OSFP have gained attention among scholars and what are their significant contributions?

iv. What is the summary of research outcomes and the underlying streams for future scope of study?

2. Review of literature

The agency theory rightly illustrates the problem of "separation of ownership and control" which gives rise to agency conflicts. The theory believes that managers start shirking and further build up and expand their own empires at the cost of shareholders wealth (Jensen & Meckling, 1976).

Numerous forms of ownership have been described by Ezeoha and Okafor (2010), which generally includes Managerial (Insider) Ownership, State (Governmental) Ownership, Institutional (Mostly Block holders) Ownership, Foreign Ownership, Ownership Concentration, Family Ownership, and Individual Ownership.

In an effort to account for the perhaps conflicting interests of various owner types, some research on the link between corporate ownership and business performance has recently begun to recognise the multidimensionality of ownership. According to Berger and Patti (2000), while investigating empirical finance concerns, a firm's ownership structure should be taken into account. This is due to the fact that disparities in ownership arrangements affect how well insiders' (managers') goals are aligned with those of investors, who supply funding.

Claessens et al. (1999) propound, that there are four main groups of people that hold a majority of firms: families, the state, widely held financial institutions including banks and insurance companies, and widely held corporations. As a result, every company with a diverse ownership structure used its own operating structure and tactics to manage their business, which had a varied impact on the success of the company.

Tam and Tam (2007) discovered that ownership structure has a positive association with business performance and that ownership concentration is significant, contrary to Kumar's 2003 examination which revealed no link at all between ownership structure and firm performance. According to Vo and Nguyen's (2014) research, a CEO is not incentivized to enhance work performance by a low degree of ownership.

A review paper aims to describe the current state of knowledge, explain apparent discrepancies, highlight areas that still require investigation, and establish a consensus on a particular area of study when none previously existed. Therefore, an evaluation of the current body of literature that considers the findings of earlier research, offer valuable insights to academics, policymakers, and practitioners (Gurzki &Woisetschläger, 2017

3. Reasearch Methodology

Bibliometric reviews have gained attention of research scholars recently. Bibliometric reviews use statistical methods to analyse a sizable body of published research to identify trends, patterns, and relevance of a certain subject as by source, citation, author, year, nation, method, theory, and research challenge. With the use of a network visualization or viewer software, such as VoS (Visualization of Similarities), which is primarily used to
conduct this kind of bibliometric review across a range of topic areas, a graphical bibliometric review may be created (Rialp et al., 2019).

Furthermore, we have relied on Scopus database as several authors have written review articles based on findings from the Scopus-indexed journals, which have a greater number of publications than Web of Science.

This review work follows three major stages which involves "assembling," "arranging," and "assessing" of articles (Paul et al., 2021). The following table displays the three stages and criteria encompassing this review.

Table 1: Scientific Procedures and Rationales (SPAR) for Bibliometric Review

ASSEMBLING	Search Database	SCOPUS
	Time Period	2001-2023
	Search Fields	Title, Author, and Keywords
	Search Keywords	"Ownership Structure" OR "Firm Ownership" OR "Managerial Ownership" OR "State Ownership" OR "Institutional Ownership" OR "Foreign Ownership" OR "Ownership Concentration" OR "Promoter Ownership" OR "Family Ownership" AND "Firm Performance" OR "Financial Performance" OR "Company Performance" OR "Corporate Performance" OR "Organizational Performance" OR "Firm Profitability"
ARRANGING	Research Domain	Business, Management & Accounting, Economics, Econometrics & Finance, Social Sciences
	Document Type	Journal Article or Review
	Language	English
	Publication Stage	Final
	Source Type	Journal
	Total Papers Extracted	1369
ASSESSING	Analysis Method	Bibliometric Analysis through: ▪ Performance Analysis- Publication Volume & Trend, Prominent Authors, Papers & Journals ▪ Science Mapping- Network & Thematic Analysis based on keyword co-occurrence
	Reporting Convention	Words, Network Diagrams, Tables & Figures
	Limitation	Authenticity, Accuracy & Extensiveness of data fetched from Scopus database

Source: Author's own tabulation

In the first stage i.e. **Assembling**, we started by identifying source databases which offer an extensive coverage of bibliometric information on Ownership Structure and Firm Performance. We then, establish our dataset by using a logical and sequential protocol for searching, identifying, and selecting a broad range of bibliographic references. This step-by-step process would enable other researchers to repeat and replicate the investigation (with or without modifications) in the context of their research and update the existing pool of knowledge. The available literature served as the resource base for identifying search keywords associated with Ownership and Performance (Campopiano et al.,2017).

The second stage of **Arranging** incorporates various filter criteria for research domain, document type, language, publication stage, and source type. The search culminated in December 2023 which resulted in a dataset of total 1403 papers. The dataset was further refined and articles that did not relevantly match our central theme and subject area were excluded. For instance, studies which used "ownership" and "firm performance" with certain business terms but without any connection to our OSFP research domain were eliminated. Consequently, after rigorous filtering, a final dataset of 1369 papers were generated.

Assessing, i.e. the third stage includes performance analysis and science mapping. A Bibliometric software like Vosviewer works on the science mapping techniques where relational aspects are explored to identify association and similarities between two documents. The two most useful and popular citation-based techniques are bibliographic coupling and co-citation analyses (Belussi et al., 2019). A thematic analysis was carried out based on clusters in the network diagram. The reporting was supplemented using network diagrams, figures, and tables.

4. Data analysis and findings

We applied Vosviewer's citation and co-citation analysis to spot the most influential and frequently cited articles, journals, and authors. Citation analysis is employed to find out the number of times a certain article has been cited in other Scopus articles. Citation analysis quantified the citations of authors, documents, and journals in our review database. Since citations are an accepted measure to verify and validate academic relevance, it is used to identify well-known authors, articles, and journals for our OSFP research. By highlighting the connections between authors, articles, and journals within a study field, co-citation analysis offers an alternative view on academic relevance. Co-citation is the term used to describe how frequently two articles are cited jointly by other studies on the same topic. For instance (as shown in Figure 1), here we take two studies by Jensen & Meckling (1976) and Fama (1980) both of which are cited in the reference lists of four publications of Demsetz & Lehn (1985), Shleifer &Vishny (1986), Eisenhardt (1989) and Claessens et. al. (2000). So, we may conclude that these two publications are intellectually linked and related to the same research sub-field. Hence, the two studies by Jensen & Meckling (1976) and Fama (1980) receive four co-citations each.

Figure 1: Understanding Co-Citation Analysis
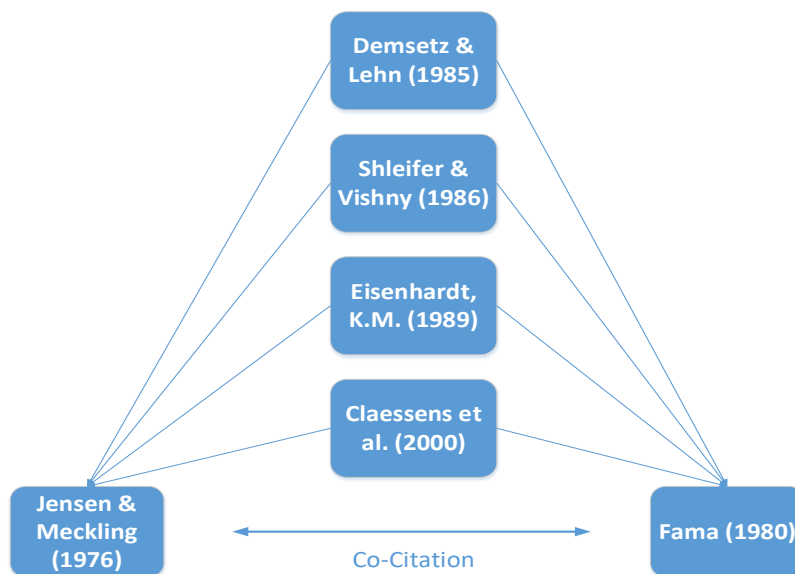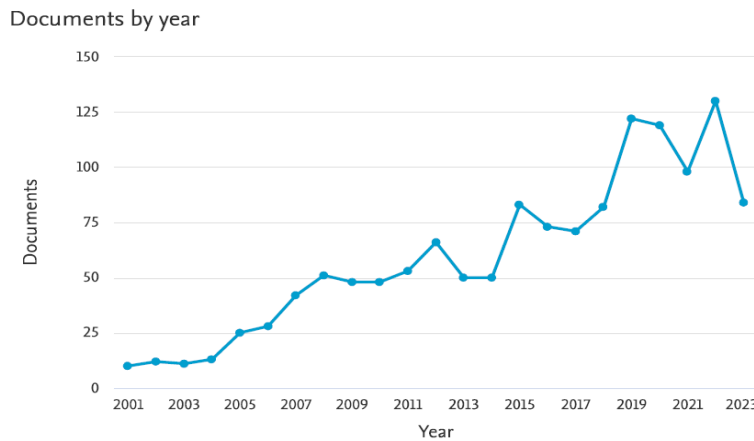

Source: Author's own creation

3.1 Performance Analysis

Performance analysis reveals the performance of a research field based on available literature (Donthu et al., 2021) Measures based on publication and citation numbers are the main elements of this analysis.

3.1.1 Publication Volume & Trend

The first segment of our performance analysis focusses on the volume of OSFP publications. A total of 1369 relevant, peer-reviewed research papers from high-ranked sources, represent a notable portion of literature. Figure 2 shows the annual scientific production of OSFP research articles. We find scanty literature in the initial years; nevertheless, ownership structure as a dimension of corporate governance has gained greater attention of researchers since 2004. We find a surge in the number of published works thereafter which indicates an upward publication trend. The average annual growth rate since 2014 is approximately 15.49%. The year 2022 is known for its highest number of research production with a total of 130 publications.

Figure 2: Publication Volume over the years

Source: Author's Own Creation

3.1.2 Leading Journals

According to Table 2's statistics, Virtus Interprets' *Corporate Ownership and Control* journal is the one that generates the most papers in this category. In fact, majority of the research published in this source is about ownership. The other journals at the top of the list (as determined by the quantity of documents) are *Sustainability (Switzerland)* and Wiley-Blackwell's *Corporate Governance: An International Review* (at number 3). The list of leading journals in Table 1 is ranked as per the total number of Scopus citations that they have received. The journal citation count only considers and counts citations of articles appearing in our OSFP Scopus database, and not all papers published in those journals.

With 5127 total citations, Elsevier's *Journal of Corporate Finance* is undeniably the source where we can locate the highest impact factor papers in this field. The *Journal of Financial Economics* is the second most cited source for studies focused on ownership forms and performance, with 2666 citations overall and the highest CPD. Next on the list is the specialised journal known for corporate governance literature, i.e. *Corporate Governance: An International Review*, which has 2435 citations and 33 published publications. With 2184 citations, the *Journal of Banking and Finance* is ranked among the most contributing journals based on total citations.

The other notable thing is that every journal on our list of the top 20 most referred journals is a well-known publication in the governance, finance, management, accounting, and strategy fields, demonstrating the cross-disciplinary and multidisciplinary character of the OSFP knowledge base. Remarkably, while publishing the highest number of papers in this area, the *Journal of Corporate Ownership and Control* was unable to establish any traction in the CPD space. After this journal was reported as possibly predatory, Scopus ceased to publish articles in it in 2017. The *Asia Pacific Journal of Management,* the *Journal of Family Business Strategy*, and the *Strategic Management Journal* are some of the other active journals publishing in this topic.

It is evident that a greater number of publications on OSFP with a higher citation impact (Total Citations and CPD basis) are produced by broad-based finance, accounting, and management journals.

Table 2- Leading Journals

S. No.	Source	Publisher	Documents	Citations	CPD
1	Journal Of Corporate Finance	Elsevier	24	5127	213.63
2	Journal Of Financial Economics	Elsevier	8	2666	333.25
3	Corporate Governance: An International Review	Wiley-Blackwell	33	2435	73.79
4	Journal Of Banking and Finance	Elsevier	14	2184	156
5	Strategic Management Journal	Wiley-Blackwell	10	1356	135.6
6	Asia Pacific Journal of Management	Springer International	13	1321	101.62
7	Corporate Governance (Bingley)	Emerald	28	936	33.43
8	Journal Of Family Business Strategy	Elsevier	16	929	58.06
9	Journal Of Comparative Economics	Elsevier	8	785	98.13
10	Family Business Review	Sage	8	670	83.75
11	Pacific Basin Finance Journal	Elsevier	14	661	47.21
12	Sustainability (Switzerland)	CSU Research Output.	36	623	17.31
13	Journal Of Business Research	Elsevier	9	534	59.33
14	Journal Of Business Finance and Accounting	Wiley-Blackwell	8	452	56.5
15	Economics Of Transition	Wiley-Blackwell	8	450	56.25
16	Corporate Ownership and Control	Virtus Interpress	92	430	4.67
17	Journal Of Management	Sage	5	363	72.6
18	Journal Of Business Ethics	Springer International	6	362	60.33
19	Research In International Business and Finance	Elsevier	9	337	37.44
20	Managerial Finance	Emerald	13	269	20.69

Source: Author's own tabulation   CPD-Citation Per Document (Citations/Documents)

3.1.3 Prominent Authors

One of the intrinsic qualities of bibliometric evaluations is their capacity to pinpoint authors and works that have influenced discussions within a subject or academic area.

The most well-known writers are shown in Table 2 according to the number of Scopus citations. Our ranking also shows the academic dominance of American academics, which is in line with previously released data on the regional distribution of OSFP studies. Thirteen out of the top twenty writers are Americans, it turns out. The top three authors ranked by total citations are Belen Villalonga, Harold Demsetz and David F. Larcker. The most influential researchers based on CPD are David H. Erkens, Brian Bolton, and Belen Villalonga.

Table 3: The Most Prominent Authors

S. No.	Author	Documents	Nation	Total Publications	H Index	Citations	CPD
1	Villalonga B.	2	USA	24	19	1076	44.83
2	Demsetz H.	1	USA	33	13	1068	32.36
3	Larcker D.F.	2	USA	74	47	959	12.96
4	Bhagat S.	1	USA	41	25	835	20.37
5	Bolton B.	2	USA	18	9	835	46.39
6	Mitton T.	1	USA	25	17	791	31.64
7	Richardson S.A.	1	UK	37	23	762	20.59
8	Tuna I.	1	UK	18	14	762	42.33
9	Tehranian H.	2	USA	58	29	730	12.59
10	Marcus A.J.	2	USA	39	18	730	18.72
11	Cornett M.M.	2	USA	38	24	730	19.21
12	Maury B.	3	Finland	14	10	597	42.64
13	Xie F.	2	USA	18	12	540	30.00
14	Hung M.	1	Hong Kong	28	18	539	19.25
15	Matos P.	1	USA	21	18	539	25.67
16	Erkens D.H.	1	China	9	7	539	59.89
17	Liu Y.	4	USA	18	9	522	29.00
18	Wei Z.	1	USA	20	12	505	25.25
19	Joh S.W.	1	South Korea	19	6	475	25.00
20	George R.	2	India	24	13	457	19.04

Source: Author's own tabulation

3.1.4 Most Influential Articles

The most important research in the subject were identified by document citation analysis, which helped us narrow down our search for eminent writers and documents. The papers with the most Scopus citations are shown in Table 4. The research "Ownership Structure and corporate performance (2001)" by Belen Villalonga and Harold Demsetz is the most referenced work, confirming their leadership in academia. They are credited as being the pioneers to investigate the relationship between company performance and business ownership. The authors' findings did not reveal a statistically significant correlation between ownership structure and business performance, but they did provide guidance for future investigations. In a novel study, Erkens et al. (2012) examines how corporate governance factors affected organisations' performance in the wake of the 2006–2007 recession crisis. Furthermore, we validate the Journal of Corporate Finance's leading position because a substantial portion of its highly referenced papers were published in this publication.

Table 4: Most Influential Articles

S. No.	Authors	Article Title	Source	Paper Type	Citations
1	Demsetz, H.; Villalonga,B. (2001)	Ownership structure and corporate performance	Journal of Corporate Finance	Empirical	1134
2	Bhagat,S.; Bolton,B. (2008)	Corporate governance and firm performance	Journal of Corporate Finance	Conceptual Review	909
3	Mitton,T. (2002)	A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis	Journal of Financial Economics	Empirical	828
4	Larcker et al. (2007)	Corporate governance, accounting outcomes, and organizational performance	Accounting Review	Empirical	819
5	Maury,B. (2006)	Family ownership and firm performance: Empirical evidence from Western European corporations	Journal of Corporate Finance	Empirical	580
6	Erkens et al. (2012)	Corporate governance in the 2007-2008 financial crisis: Evidence from financial institutions worldwide	Journal of Corporate Finance	Empirical	591
7	Joh, S.W. (2003)	Corporate governance and firm profitability: Evidence from Korea before the economic crisis	Journal of Financial Economics	Empirical	499
8	Andres, C. (2008)	Large shareholders and firm performance-An empirical examination of founding-family ownership	Journal of Corporate Finance	Empirical	443
9	Douma et al. (2006)	Foreign and domestic ownership, business groups, and firm performance: Evidence from a large emerging market	Strategic Management Journal	Empirical	436
10	Cornett et al. (2008)	Corporate governance and pay-for-performance: The impact of earnings management	Journal of Financial Economics	Empirical	417
11	Cornett et al. (2007)	The impact of institutional ownership on corporate operating performance	Journal of Banking and Finance	Empirical	386
12	Margaritis, D.; Psillaki,M. (2010)	Capital structure, equity ownership and firm performance	Journal of Banking and Finance	Empirical	370
13	Mersland R.; Øystein Strøm, R. (2009)	Performance and governance in microfinance institutions	Journal of Banking and Finance	Empirical	351
14	Zhou, X. (2001)	Understanding the determinants of managerial ownership and the link between ownership and performance: Comment	Journal of Financial Economics	Empirical	329
15	Kor, Y.Y.; Mahoney, J.T. (2005)	How dynamics, management, and governance of resource deployments influence firm-level performance	Strategic Management Journal	Empirical	315
16	Zhang et al. (2019)	Green innovation and firm performance: Evidence from listed companies in China	Resources, Conservation and Recycling	Empirical	300
17	King M.R.;Santor, E. (2008)	Family values: Ownership structure, performance and capital structure of Canadian firms	Journal of Banking and Finance	Empirical	276
18	Li et al. (2009)	Ownership, institutions, and capital structure: Evidence from China	Journal of Comparative Economics	Empirical	235
19	Randøy,T.;Goel,S (2003)	Ownership structure, founder leadership, and performance in Norwegian SMEs: Implications for financing entrepreneurial opportunities	Journal of Business Venturing	Empirical	230
20	Klein et al. (2005)	Corporate governance, family ownership and firm value: The Canadian evidence	Corporate Governance: An International Review	Empirical	225

Source: Author's own tabulation

Subsequently, a document co-citation analysis (DCA) was performed to provide a more comprehensive understanding of the dynamics and structure of the knowledge base. With a total of 4685 articles in the document co-citation network, DCA was carried out on a far bigger body of literature, based on reference lists of 1369 papers in our review database. The most often referenced work in the OSFP literature is "Theory of the firm: managerial behaviour, agency costs and ownership structure (1976)" by Jensen and Meckling. This "canonical study" and the 1983 publication "Separation of ownership and control" by Fama and Jensen laid the theoretical groundwork for the corporate governance literature.

Andrei Shleifer and Robert W. Vishny's other well-known study, "A survey of corporate governance (1997)," is a ground-breaking study that examines corporate governance systems worldwide with a focus on ownership concentration and investor legal protection. It is remarkable to know that these publications were excluded from our OSFP database, which is indexed by Scopus, even yet, they

frequently appeared together in the reference lists of articles included in our review database, acting as important conceptual frameworks for ownership structure, agency conflicts, and company performance.

Several empirical studies are included in the list of the most co-cited publications in addition to theoretical ones. More precisely, Belen Villalonga and Harold Demsetz continue to dominate in academia with the largest number of co-citations for their publications.

There are two other studies that are frequently cited and are worth mentioning: the first is titled "Management ownership and market valuation: An empirical analysis" and was conducted by Morck, Shleifer, and Vishny in 1988. It examines the relationship between management ownership and the market value of the firm, as determined by Tobin's Q. The second study is titled "Additional evidence on equity ownership and corporate value" and was conducted by John J. McConell & Henry Servaes in 1990 in an effort to determine the relationship between equity ownership and Tobin's Q. According to the two papers, there is a curvilinear relationship between the variables and a nonmonotonic one. Ultimately, the highly regarded studies of corporate governance and OSFP literature place the *Journal of Financial Economics* at the top, with this journal publishing six of the top twenty co-cited papers.

3.2 Science Mapping

Science Mapping approach investigates the relationship among constituents of a research domain. It analyses the intellectual interactions and inherent associations among research constituents (Baker et al., 2021; Donthu et al., 2021). We combine it with network analysis to put forward a credible bibliometric-intellectual structure.

3.2.1 Keyword Analysis and Emerging Research Areas

We performed keyword co-occurrence analysis to identify the most often researched themes and subjects in the OSFP research base, together with the underlying associations, to answer our research question on the discovery of hotspot keywords. The following is the justification provided by Zupic and Cater (2015) for keyword co-occurrence (co-word analysis): Words that appear together often in documents indicating a tight relationship between their underlying meanings. Through co-word analysis, a network of interrelationships is represented by themes that further depict the conceptual space, of a field (p.435). By displaying the terms that writers commonly use together, or jointly mention, a keyword co-occurrence analysis helps academics to uncover underlying patterns and trail surrounding a research domain. A total of 35 hotspot keywords were found when we set the keyword co-occurrence analysis to "Author Keywords" and a minimum of 20 keyword occurrences. "Corporate governance" (492 instances), "firm performance" (428 instances), "ownership structure" (330 instances), "financial performance" (155 instances), and "ownership concentration" (102 instances) were the top five co-occurring terms. These findings show that agency theory is the most often used theoretical framework in the body of knowledge pertaining to OSFP research, and studies on the topic frequently consider closely linked topics of corporate governance and performance.

The capacity to recognise "emerging research topics" in closely adjacent domains as well as inside the subject area is another essential benefit of keyword co-occurrence analysis. For the OSFP literature database, we utilised VoSviewer and the display threshold was set at least 20 occurrences of co-occurring terms which generated a keyword co-occurrence network map. The co-occurrence map of keywords brings out two important things: (i) often occurring terms/keywords based on their frequency, and (ii) whether and how the popularity of a keyword varies over a period of time. The terms that have appeared together the most frequently in the OSFP research during the previous 20 years are shown in Figure 7.
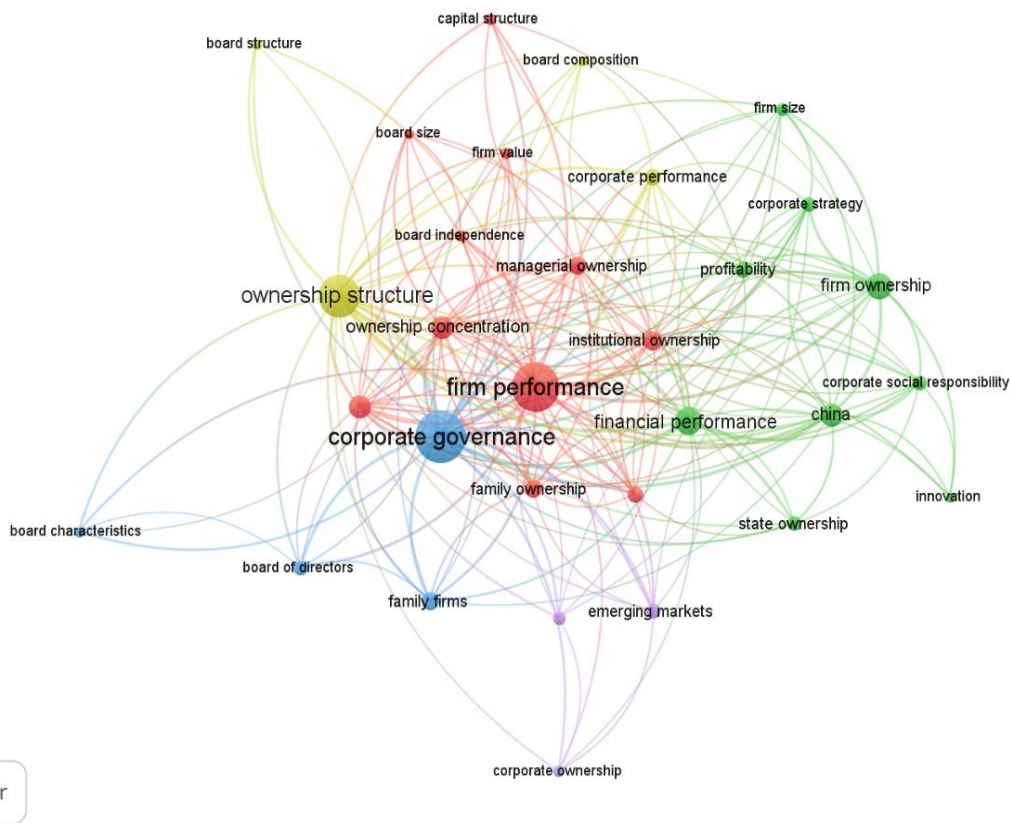
Source: Author's Own Creation

The emerging research streams of the OSFP knowledge trajectory of the past few years have been set out in light green and yellow colours.

Ranking based on recency and frequency reveals that research areas such as firm ownership (130 cases), corporate strategy (43 cases), corporate social responsibility (42 cases), and Innovation (24 cases) have attracted significant attention in the past few years. Moreover, Board of Directors (42 cases) has also been a popular research subject where we found studies on board independence, structure, composition, diversity, and size. These observations suggest the current and future research path and areas of interest among global researchers and academics investigating OSFP.

A dominant evolving research topic is how ownership structure affects corporate social responsibility, which is further linked to firm performance (Dakhli, 2021; Sahasranamam et al., 2019; Yong Oh et al., 2011). Additionally, the effects of current trend of ownership have been linked to executive compensation (Jatana, C., 2023; Al-Al-Msiedeen & Sawalqa, 2021; Luo & Jackson, 2012). Furthermore, the association between ownership and sustainability has attracted relatively less attention so far, but it is undoubtedly a developing area of research. A recent paper in this vein studies the association of ownership structure with sustainability performance (Kapil & Kumar, 2023), while emphasising on sustainable development along with strengthening of governance aspects.

Recent studies have also evaluated whether and how firm ownership affects innovation, both empirically and theoretically, and results suggest a significant influence of ownership structures on innovation proxies such as innovation performance and innovation output (Duong et al., 2022; Minetti et al., 2015; Chen et al., 2012). With this view, we recommend that possible reverse causality effects and endogeneity issues should be taken into consideration in any new empirical research that links firm ownership to pertinent outcome variables such as sustainability, innovation, or performance. We note that the keyword "China" has also made it to the list of top hotspot keywords which suggests

extensive Chinese research evidence in our Scopus listed studies (Duppati et al., 2023; Iwasaki et al., 2022; Lin Shao, 2019; Wang et al.,2019).

3.2.2 Schools of thought in OSFP Research

Next, we use network analysis to perform author co-citation analysis (ACA), which helps to uncover the OSFP knowledge base's structure. On a network diagram, authors are grouped by the ACA according to how similar their co-citations are. On the other hand, the OSFP domain has several theoretical stances or sub-themes that may be clarified using the ACA network diagram. 430 writers satisfied the first criteria of minimum 50 author co-citations out of a total of 9,539 authors in our author co-citation network map (comprising authors identified in the references section of documents in our Scopus-indexed OSFP database).

The network map of the writers who are co-cited the most often is shown in Figure 6. The OSFP knowledge base is represented by the four clusters (Red, Green, Yellow, and Blue) that show several sub-themes or schools of thought. These lines of reasoning appear to us as logical clusters with intricate relationships between them. The ACA network map, which prominently displays Michael Jensen, William Meckling, Andrei Shleifer, Robert W. Vishny, and Eugene Fama as major nodes in the centre, suggests that the OSFP knowledge base has evolved and progressed into a distinct field of study. These five have created the theoretical underpinnings of corporate governance research trajectory, through their contributions to agency theory and the separation of ownership and control in business enterprises.
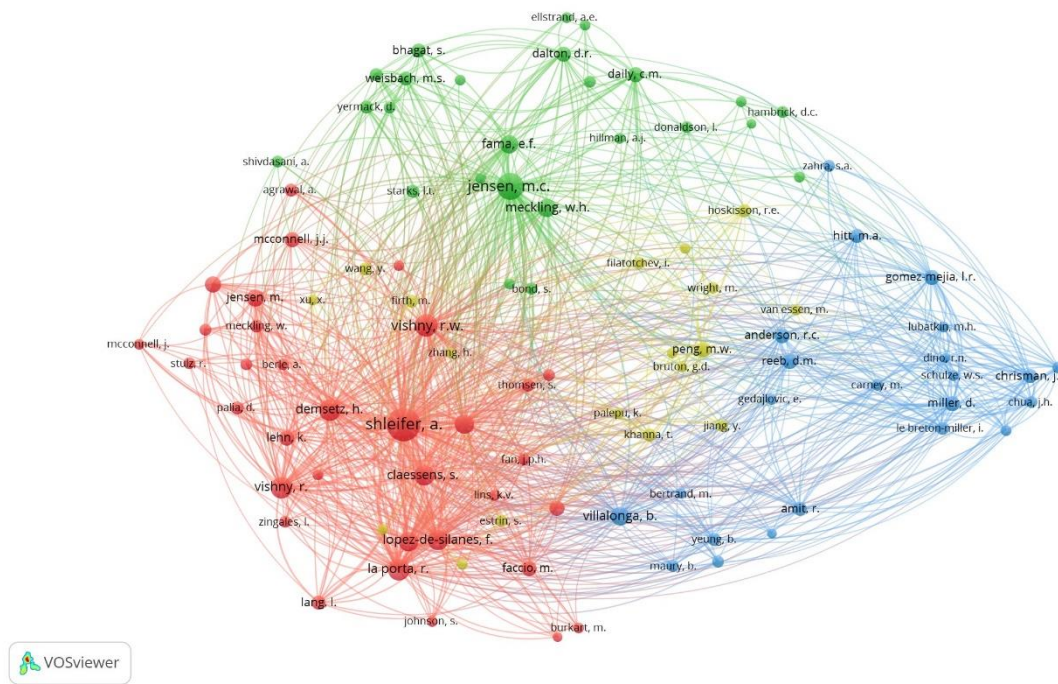
Source: Author's Own Creation

Cluster 1: Agency Theory & Board of Directors

The green cluster, lays spotlight on the connections between corporate governance, agency conflicts, board of directors, and business performance, is headed by Michael Jensen, William Meckling, Eugene Fama, Michael Weisbach, David Yermack, and Amy Hillman. We note that finance and economics are these experts' areas of interest. It is clear from the comparatively large node sizes that the researchers in this cluster have significantly contributed andestablished a substantial influence on the literature.

From the agency point of view, independent directors are intended to function as a strong oversight and monitoring tool over the board of directors and senior management and the employment of non-executive directors is autonomous from the management which boosts monitoring, effective

management and thus, firm performance (Jensen & Meckling, 1976; Fama & Jensen, 1983a, Dalton et al.,1999). Numerous studies contend that big boards require even more coordination and interaction among the members, which slows down decision-making process and raises chances of the free-riding issue (Jensen, 1993; Yermack, 1996). This cluster encompasses studies which have successfully investigated a wide array of governance issues using a multi-theoretic approach (Hillman & Dalziel, 2003; Lynall et al., 2003).

Cluster 2: Ownership & Performance

Andrei Shleifer, Robert Vishny, Rafael La Porta,Florencio Lopez-de-Silanes, and Randall Morck are kingpins of the red cluster. Co-authors of widely referenced papers in "Law and Finance" are these writers. Significant academic studies on ownership concentration and corporate governance have been produced internationally by authors in this cluster. The theories advanced by Jensen and Meckling (1976) and Shleifer and Vishny (1986) regarding the relationship between a firm's ownership structure and firm performance in developed capital markets were empirically tested by Morck, Shleifer, &Vishny (1988), McConnell & Servaes (1990), Thomsen &Pedersen (2000), and Gedajlovic&Shapiro (1998, 2002), to mention a few.

These investigations discovered critical managerial, institutional, and blockholder effects on company performance (Miao et al., 2023; Nashier & Gupta, 2023). We observe that the size of network nodes for Andrei Shleifer and Robert Vishny is relatively larger as compared to other researchers in this cluster due to the fact that they co-authored "Large shareholders and corporate control (1986)" and "A survey of corporate governance (1997)", which are among the most widely referenced papers on ownership and governance.

Cluster 3: Family Control & Performance

In the blue cluster, we find dominance of Benjamin Maury, Belen Villalonga, Ronald C. Anderson, and David M. Reeb. This cluster focuses on family control or family-owned firms and its impact on firm performance. Worldwide, publicly traded businesses frequently have family authority. Regarding family ownership and firm success, the empirical research in this cluster yielded contradictory results. Research by Villalonga & Amit (2006a), Sraer &Thesmar (2007), Anderson & Reeb (2003), and other researchers revealed a relationship between family control and business success, concluding that family firms outperform non-family enterprises (Kao et al., 2018; Al Farooque et al., 2020). Others (Gomez-Meja et al., 2007; Maury, 2006) have conclude that family controls may raise alarms for minority investors since there is a risk of expropriation when there is minimal openness. The reasons for the disparities in the results might include variations in family enterprises (Villalonga &Amit, 2006a), shareholder security levels (Maury, 2006), family engagement in administration, and sample techniques or methodology (Miller et al., 2007).

Cluster 4: OSFP in Emerging Economies

Finally, we observe a few dispersed yellow nodes which apparently do not form a cluster, but are present in the list of top 100 co-cited authors. Here we find authors like Kun Wang, Zhang Dayong, Tarun Khanna, Krishna Palepu, and Ruth V. Aguilera. These authors seem to focus on emerging economies like China and consequently report that ownership's impact on company performance in emerging market economies is bound to be different. The prevalence of block holdings(in general) and familial interests (in particular), among non-Anglo-Saxon countries has been highlighted by La Porta et al. (1999). We discover a sizeable amount of research being done on ownership structure problems in emerging countries (Jain et al., 2023). A few sample works covering the literature in the area of strategy and finance include Qi, Wu, & Zhang (2000), Claessens, Djankov, & Lang (2000), Khanna & Palepu (2000a), Khanna &Rivkin (2001), Chang & Hong (2002), Joh (2003), and Lemmon & Lins (2003).According to Aguilera et al.'s (2020) assessment of the effect of state ownership on performance globally, state ownership has a marginally detrimental effect on a company's financial performance, with significant national variations in both the impact's magnitude and direction. Furthermore, if the goals of the state conflict with those of the other shareholders, state ownership may have a negative impact on a company's performance (Mishra & Phung, 2016).

5. Future research, issues and conclusion

The OSFP knowledge base's multidisciplinary character is clearly demonstrated by the results of our journal citation analysis as well as document co-citation analysis. Our database contained renowned periodicals from the fields of accounting and law, management and strategy, and finance and economics. Two important publications that focus on issues linked to corporate governance and business ownership were identified during the review: *Journal of Corporate Finance* and *Corporate Governance: An International Review*. It is notable that these publications occupied positions of leadership in this multidisciplinary field.

Interestingly, the number of significant publications and co-cited documents in the *Journal of Financial Economics* demonstrate its dominance in this field. Scholars in this discipline now have publication choices thanks to these results.

With our literature mapping, we have been able to identify "canonical documents" that have made critical and deep-rooted impact on the literature. Analysis of these studies can uncover the theoretical underpinnings of the subject and its origin. Our co-citation analysis unveils the key texts on agency theory and firm ownership identities (Ownership Concentration, Management Ownership, Government Ownership, and the like) by Jensen & Meckling,
Jensen & Fama, Shleifer &Vishny which serve as the theoretical and conceptual cornerstones of OSFP research area. Notably, co-citation analysis found these earlier papers because they were frequently cited by other documents in our review database's reference lists. Our analysis highlighted the contributions of Demsetz&Villalonga, Anderson & Reeb, Khanna & Palepu, Bhagat & Bolton, among others.

The primary constraint on this analysis is that, while the Scopus database encompasses most peer-reviewed economics, finance and social science papers released since 1996, it may not cover all significant research related to the topic. Our results demonstrates that our use of co-citation analysis, which surpasses the scope of the literature available in Scopus database, somewhat overcame this restriction.

Another limitation is that the primary findings of the studies are not assessed by our bibliometric approach. Given this, the purpose of our study is to aid future investigations that synthesise the findings from significant OSFP studies that were sourced for this bibliometric evaluation. Our study paves out a clear pathway for future research on the interactions between ownership and innovation, sustainability, social responsibility, and strategy, which can assist academics, industry practitioners and policymakers.

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Do SMEs and Main Board IPO Firms Behave Differently on Listing?

Anil Kumar[1], Madhu Totla[2]*

[1] Professor, Department of Commerce, University of Delhi, Delhi-110007, India, Email- profanilkumar@commerce.du.ac.in, Mobile no. 9810857745

[2] Assistant Professor, Shaheed Sukhdev College of Business Studies, University of Delhi, Delhi -110089, India Email- madhumaheshwari@sscbsdu.ac.in, Mobile No. 9555759554

*Corresponding Author

Abstract:

The study investigates the factors driving listing returns and simultaneously compares the performance in both the short and the long-term of India's SME IPO firms with main board IPO firms. The study primarily employs multivariate regression on a sample of 216 main board and 602 SME segment IPO firms listed on the respective segments of both the major stock exchanges of India between January 2012andDecember 2021to assess whether the short-run and long-run performance of these segments vary. Further, it employs the listing segment as an independent variable along with size and subscription levels (overall, institutional and retail) as control variables to determine the impact of the listing segment on performance. The study suggests that main board IPO firms outperform the SME segment in the short term whereas both segments perform similarly in the long run. It also demonstrates that both size and subscription (both retail and institutional) are significant factors determining short-run performance. The study has implications for the investor community by showing that on the listing day, the main board IPOs outperform SME IPOs, which will help build their perception.

1. Introduction

Small and medium businesses play a crucial part in fostering the nation's, all-inclusive economic growth. However, operating and financial conditions pose a challenging environment to these enterprises, making it arduous to access the multiple financing options available thereby impeding their growth. Therefore, in an additional effort to make capital more accessible to these enterprises, the government modified the prerequisites of issuance and listing and established a separate platform for the SME segment. SEBI devised a separate set of eligibility requirements for the firms to get listed under these segments. With the establishment of the dedicated listing segment for small and medium enterprises on both NSE and BSE in 2012, the entire scenario in the IPO market appears to have changed.

The SME segment helps visionary leaders and innovators transform their entrepreneurial aspirations into tangible achievements simultaneously providing investors seeking untapped potential and diverse portfolios with a unique avenue. The segment has however seen extremely low volume and occasional trading, which raises the likelihood that some shady investors and promoters might manipulate prices to further their agendas, eventually leading to the underperformance of IPOs listed in the SME segment, in the long run. Thus, the investors in these SME IPO firms are at higher risk than they would be in main board IPOs.

Majority companies, when issuing new shares, intentionally underprice them to gain humongous profits. This strategy ensures the subscription of a large portion of the issue and subsequent making of profits.

IPO underpricing is an act of issuing shares at a price lower than their listing price. While the long-term benefits of IPO underpricing may not be immediately apparent, it is widely accepted and established that IPOs resulting in favourable returns on the day of listing, help issuers generate wealth. Multiple theories have been laid out to explain this anomaly of the equity market- information asymmetry theory by Rock, (1986),(Beatty & Ritter, (1986), Signalling theory by Allen&Franklin (1989), Grinblatt & Hwang (1989), Marshall (1998), and Agency theory to name a few. There is no single explanation describing the difference in short-run performance of both the main board and SME segment. In light of these contradictions, a comparison of the performance of IPOs of both segments will help in comprehending and managing the related risk. The study also seeks to understand how the sentiment of knowledgeable and ignorant investors determines performance of IPO since the long and short run.

Succeeding paragraphs of this research article have been organised in this manner: Section two discusses the existing studies related to IPOs of small and medium enterprises, with international studies first and then Indian studies. Section three identifies the research gap, lays objectives and establishes hypotheses. Sample, data and research methodology employed herein are comprehensively presented in section four. The fifth section presents the data analysis while section six discusses the results and section seven presents the outcome and the last section summarizes and concludes the study with implications, limitations along with the potential for additional study in this field.

2. Review of Literature

Researchers worldwide have examined IPO underpricing; several hypotheses and determinants have been established to determine the causes and characteristics of underpricing. Also, various studies focused on the IPOs listed on the AIM or SME segment: meant for small-size companies with less stringent eligibility requirements. Brau & Osteryoung (2001) discuss the issue of micro-IPOs to determine the factors impacting the likelihood of success or failure by assessing and analysing documents of small corporate offering registration known as SCOR documents in the US market. On empirical investigation using logistic regression: ownership and governance aspects, marketing mechanism and expenses, business cycle stages and signalling factors were found to be crucial factors impacting the likelihood of success or failure of micro-IPO.

Gao et al (2015)suggested that high levels of discretionary accruals immediately before the IPO transforms into high levels of underpricing on listing and poor long-run performance in SME IPO firms of China, listed between 2006 and 2010 on the SME board of Shenzhen Stock Exchange. Similarly, Goergen et al (2003)also conclude that the underpricing of IPOs listed on Euro NM is 2-3 times more on average than in major markets and the fraction of IPOs with negative initial returns is substantially larger. The study further concludes that both the types of long run returns- the Cumulative abnormal returns and the Buy and Hold abnormal returns are highly negative and significantly different from that of IPO firms of the main segment.

Bradley et al (2006) also suggest in a similar way about the small or penny stock IPOs having higher levels of underpricing than regular main board IPOs in the US from 1990 to 1998 and significantly inferior long-run performance. Additionally, the study suggests that these IPO stocks have a prolonged lock-up period and higher margins.

Jiming & Xing (2012)looked at the causal connection and the resulting impact among the shift in operating performance and ownership concentration after IPO of the SME firms which got listed on the China's Shanghai Stock Exchange. The results indicate towards a strong positive association among ownership concentration and operating performance of the firms post the IPO.

However, Burrowes & Jones (2004) report a low level of underpricing in IPOs which got listed on the newly introduced AIM segment of the London Stock Exchange contrary to what is normally associated with small, young, and expanding firms. Furthermore, in comparison with the IPOs which were listed on the main segment over major stock exchanges of US, UK, and other developed nations, the initial returns (measured as raw and adjusted with market return) demonstrate that IPOs registered on the AIM segment of the London Stock Exchange exhibit to be cautiously and prudently ill-priced. The study further reports that these IPOs underperformance in the long-run is similar to firms listed on the main

segment**.** On similar lines as this, Chorruk & Worthington (2013)also suggested that underpricing is significantly lower in IPOs listed on the Market for Alternative Investments (MAI) in Thailand than that for IPOs of companies listed on the main Stock Exchange. This study suggests that small firms perform good post listing, with market-adjusted positive returns until second-year of listing.

Similarly, Gao et al (2015)while studying the performance of SME IPO firms in China in long run, suggested that Chinese SME IPOs outperform the market and behave differently than the main board IPOs in China. However, SME firms with earnings manipulation in the pre-IPO period continued showing underperformance in the long run post-listing. Yang et al. (2020)concluded that family firms listed on SME platforms in China exhibit lower underpricing levels than non-family firms and further reports more pronounced inverse relation of family involvement with underpricing where the family members have political ties and this gets moderated with the presence of state ownership.

Among studies in India, Dhamija & Arora (2017) suggested a lower level of underpricing in SME IPOs than what is exhibited and reported by other studies of main board IPOs. The reason listed by the study emphasises that being a new segment, it has not caught the eye of the investors and, that investors might be a bit sceptical about investing in these young firms. Furthermore, underpricing seems to be intentional, as both- the issuers and the underwriters are unsure of the market response. This is further supported by the low oversubscription rate of these IPOs. On analysing the factors by employing regression analysis, it finds that the offer type, stock exchange, size of the issue, the reputation of the lead managers, promoter shareholding, and the oversubscription rate appear to be the significant factors impacting underpricing. The performance of SME IPO firms in the long run was computed using holding period return (HPR) for one year holding after the listing and the study shows 123.67 % raw holding period return and 99.7% excess holding period return, which is in contradiction with other international and Indian studies.

The average age of the board members, relationship between board members and their directorships, size of the board, proportion of board directors and board committees are the significant governance factors impacting underpricing in SME IPOs in India, according to Arora & Singh (2020). Further referencing the entrenchment hypothesis, it reports a quadratic linkof underpricing with promoter ownership, where underpricing first rises with an increase in promoter ownership before beginning to decrease with an increase in promoter ownership.

Arora & Singh (2021)also examined the pattern of performance in the long-runof SME Initial Public Offerings (IPOs) in India along with determining and analysing issues and firm-related characteristics, impacting this performance. Their research reveals a long-run overperformance of IPOs in this segment which contradicts with existing international studies on SME IPOs but is similar with the findings of Dhamija & Arora (2017) in India and studies of some Asian markets – China, Malaysia and Korea. The findings further include that subscription rate and size of the issue are negatively impacting the buy and hold abnormal return, while reputation of the underwriter, market conditions (hot or cold), first day returns, auditors' reputation, profits prior to issue and inverse of issue price have a significant and substantive positive impact on BHAR. However, firms' age and size, volatility and leverage have no significant relationship with BHAR.

Dhamija & Arora (2017) also concluded that in comparison to main board IPOs, SME IPOs gave a very high holding period abnormal return. Arora & Singh (2021) too concluded on the same lines that in India, SME IPOs outperform the market index over a one-year time period.

The studies on first day returns and the long-term performance of Small and Medium Enterprise IPOs document mixed results. In some markets (UK, China, Thailand, India) they exhibit lower underpricing than mainstream IPOs, whereas in some markets (USA, EuroNM) they exhibit a higher level of underpricing and different reasons have been attributed to these mixed sets of results.

3 Research Gap:

The extensive review of international and Indian literature in this area, confirms that underpricing exists both in the main board IPOs as well as the SME IPOs. However, to solve investor's dilemma of whether

to invest in main board IPOs or SME segment IPOs for better returns, a comparison of the returns of IPOs of the main segment with that of SME segment in India needs to be examined in depth. There is a dearth of studies comparing the performance of these two segments.

4. Objective and Hypotheses

To address the research gap, the broad objective crystallized is:Is there any difference in the short- and long-term performance between the main board and the SME segment IPO firms listed in India. The short run performance has been measured as - raw returns and returns adjusted with market returns between the day of issue closing and the day of listing on the respective segment of the stock exchange whereas long run performance has been measured using Buy and Hold Return (BHR) and Buy and Hold Abnormal Return (BHAR i.e. BHR adjusted with market returns during the contemporaneous period). The long-term performance has been measured for six holding period ranging from 1 week to 3 years from the day of listing. The study further aims at determining whether the first day returns and the long-term performance of these IPO firms are impacted by listing segment, size of the firm and the subscription levels (overall as well as bifurcated into retail and institutional subscription levels).

Hypothesis 1

H_o: *The listing day returns of IPOs on the main board and those of the IPOs in the SME segment do not significantly differ with each other.*

H_a: *The listing day returns of IPOs on the main board and those of the IPOs in the SME segment significantly differ with each other.*

Hypothesis 2

H_o: The BHARsof six holding periods spanning from one week tothree years, of IPOs of the Main Board and SME segment show no significant difference.

H_a: The BHARs of six holding periods spanning from one week tothree years, of IPOs of the Main Board and SME segment show significant difference.

5. Research Methodology

The current study unties the performance of 216 main board IPOs and 602 SME segment IPOs issued between January 2012 to December 2021 at the Small and Medium Enterprises segment and the main board segment of NSE and BSE- the major stock exchanges of India. As the SME segment was launched in 2012 in India and had its first listing in February 2012 only, therefore, for comparison and analysis the sample period begins from January 2012 to provide the widest coverage to the activities of the Indian IPO market, and includes all equity issues till December 2021.

To test hypothesis 1 and hypothesis 2, regarding significant differences in listing day gains (both measures- raw returns as well as returns adjusted with market returns between the day of issue closing and the day of listing) and the BHARs (of six holding periods) of the firms registered for stock trading on the main and the SME segments of the Indian stock exchanges, students t-test has been used. (Kumar & Totla, 2023b)**.**

To determine the impact of the listing segment on underpricing, first day returns and returns adjusted with market return were taken as the dependent variable in a multiple regression analysis(Maheshwari & Kumar, 2022). The listing segment, a dummy variable of the Main board/ SME segment, is the independent variable that we are interested in. Total Assets were taken to be the proxy for size and overall subscription level was taken as the control variables. Another regression model using retail subscription level and institutional subscription level instead of overall subscription level was also analyzed to determine the impact of informed and uninformed investor sentiment separately on the IPO underpricing of these two segments(Kumar & Totla, 2023a)

$$LDR_i = \alpha + \beta_1 mainboard + \beta_2 \ln(sub_i) + \beta_3 lnTA + \varepsilon_i \qquad \text{(Eq. no.1)}$$

$$LDR_i = \alpha + \beta_1 mainboard + \beta_2 ln(Rsub_i) + \beta_3 ln(Isub_i) + \beta_4 lnTA + \varepsilon_i \qquad \text{(Eq. no.2)}$$

$$MAER_i = \alpha + \beta_1 mainboard + \beta_2 \ln(sub_i) + \beta_3 lnTA + \varepsilon_i \qquad \text{(Eq. no.3)}$$

$$MAER_i = \alpha + \beta_1 mainboard + \beta_2 ln(Rsub_i) + \beta_3 ln(Isub_i) + \beta_4 lnTA + \varepsilon_i \qquad \text{(Eq. no.4)}$$

$$BHAR_{iT} = \alpha + \beta_1(dinitialreturns_i) + \beta_2 \ln(assetsize_i) + \beta_3(dmainboard_i) + \varepsilon_i$$
(Eq. no.5)

6. Data Analysis

The descriptive statistics (Table 1) suggest that the average listing day return for IPO firms which got listed on the main board is 19.75% whereas it is 6.15% for IPO firms listed in SME Segment. The average return in excess of the market return for the contemporaneous time for main board and SME segment IPOs is 19.69% and 5.94% respectively. This shows that both segments yield positive returns on the when they get listed as compared to the returns the market index yields during contemporaneous period. However, the first day returns of IPO firms on the Main Board are higher than that of the IPO firms on SME segment.

Table 1: Descriptive Statistics of Main Board and SME IPOs

Variable	Main Board IPOs	SME Segment IPOs
Average Listing Day Return	19.75%	6.15%
Average Market adjusted Excess Return	19.69%	5.94%
Average Overall Subscription Level (in times)	37.21	8.63
Average Retail Subscription Level (in times)	9.55	7.25
Average Institutional Subscription Level (in times)	18.14	10.07
Average Total Assets (in crores)	6484.09	91.62
Average Age (in years)	22	12
Average Issue Size (in millions)	12110.34	115.18
N	216	602

Source: Constructed by authors

The average issue size is approximately Rupees 1200 crores and 12 crores for the main board and SME segments respectively. Similarly, the average subscription level of the main board IPOs is almost 4 times the subscription level of SME segment IPOs. The difference in average age and asset size of IPO firms of the two segments is because of the different listing requirements of the two segments. Young and small companies get listed in the SME segment and old and big companies get listed in the main board segment. The difference in all the variables between the main board and the SME segment IPOs is extremely high.

Table 2: Year-wise Average Listing Day Returns Main Board and SME IPOs

Year	Main Board IPOs	SME IPOs
2012	4.23%	3.14%
2013	2.21%	14.60%
2014	26.08%	7.22%
2015	8.78%	5.46%
2016	14.08%	5.36%
2017	16.70%	6.85%
2018	7.53%	4.64%
2019	19.59%	2.28%
2020	44.86%	0.97%
2021	29.63%	10.94%

Source: Constructed by authors

The year-wise first day returns of IPOs on the main board and the SME segment (Table 2 and Figure 1) show that in all years except the year 2013, listing day returns on Main Board IPOs are far higher than that of SME IPOs. The two series move in the same direction except in the year 2020 where the first day returns of the IPOs on SME segment plunged whereas that of the main board IPOs have increased. This change in direction may be due to the breaking of the COVID-19 Pandemic which adversely hit small and medium enterprises more.

Figure 1:Average Listing Day Returns of Main Board and SME IPOs
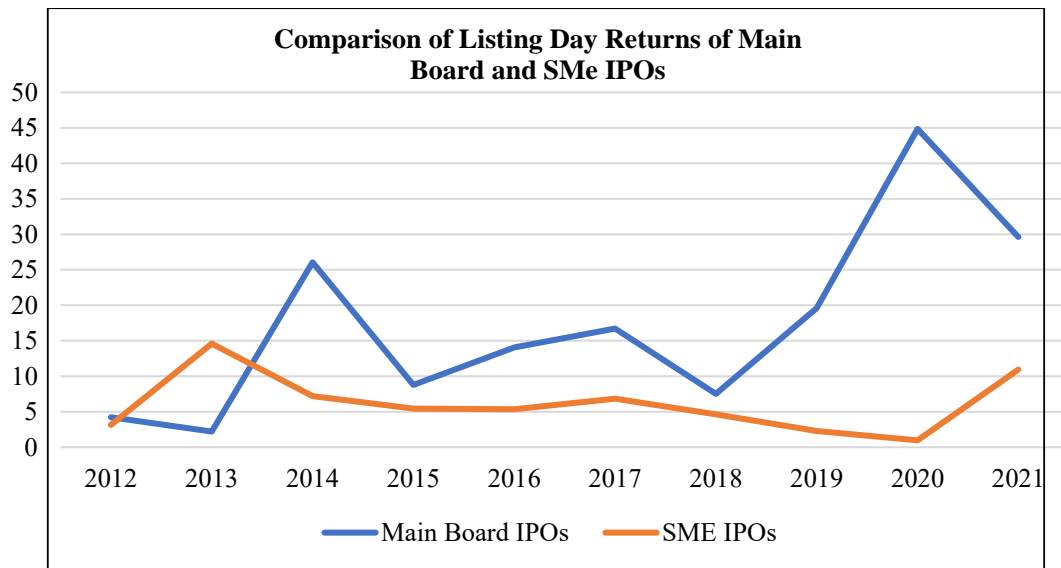
7. Result and Discussion
7.1 Main Board and SME IPOs performance

The sample was split into two groups in order to investigate the differences in the underpricing and long-term performance of initial public offerings listed on the Main and the SME segment. The first

group is of the IPO firms which got listed on the main board segment and the second group consists of firms which got listed on the SME segment of the stock exchanges in India.

The student t-test results (Table 3) for the difference in first day raw returns and the returns in excess of market returns between the Main Board and the SME segment IPOs are significant at 1%. This indicates a discernible difference in the first day returns of the IPOs of the two segments. The first hypothesis (hypothesis 1) assuming that there is no significant difference in the first day returns of main board IPOs and SME segment IPOs stands rejected.

The Initial Public Offerings on the Main Board Segment of the major Indian stock exchanges generate significant returns for investors who purchased at the offer price and sold on listing and these returns are significantly greater than what an investor could earn by investing in the IPOs listed on the SME segment.

Table 3: Difference in Listing Day Returns of Main Board and SME IPOs

		Mean	N	t statistics	Significance
Listing Day Raw Returns	Main Board IPOs	19.75%	216	5.369	.000 ***
	SME IPOs	6.14%	602		
Market-Adjusted Excess Returns	Main Board IPOs	19.69%	216	5.483	.000 ***
	SME IPOs	5.94%	602		

Source: Constructed by authors

The table reports the student t-test for the difference in average listing day returns of Main Board IPOs and SME IPOs Significant at ***1%

The BHR of the IPOs of these two segments are statistically different only in a holding period of 1 week while in a holding period of more than one week, the two segments generate similar buy and hold returns (Table 4).

Table 4: Difference in Average BHRs of IPOs of Main Board and SME Segment

Holding Period Average BHR	Segment	Mean BHRs	N	Standard Error	t statistics	Significance
1week BHR	Main Board	1.2333	216	.0318	3.959	.000***
	SME Segment	1.0972	602	.0128		
1-month BHR	Main Board	1.2338	216	.0318	1.374	.170
	SME Segment	1.1768	602	.0221		
3 months BHR	Main Board	1.3184	198	.04267	.941	.347
	SME Segment	1.2588	595	.03363		
6 months BHR	Main Board	1.4662	183	.05763	.605	.545
	SME Segment	1.3867	582	.0713		

1-year BHR	Main Board	1.5077	158	.0823	-.135	.893
	SME Segment	1.5270	557	.0722		
3 years BHR	Main Board	1.3957	126	.1119	-.712	.477
	SME Segment	1.5585	265	.1484		

Source: Constructed by authors

The table reports the output of the t-test determining difference of average BHRs of IPOs of the main board and SME Segment for all six holding periods. Significant at 1% ***

The independent sample t-test results (Table 4) suggest that the long-term abnormal returns (BHAR) of IPOs of the two segments do not significantly differ with each other for a holding period of more than a week. Thus, we fail to reject the second hypothesis (Hypothesis2) of no significant difference in long-term abnormal returns of IPOs of the main board and SME segment for 1-, 3- and 6-month period along with 1 and 3-year holding period. The mean BHAR levels for IPOs of the main board segment are significantly more than the IPOs listed on the SME segment only for 1 week of the holding period. However, for a holding period greater than one week, the difference between both the segments is of no statistical significance and the null hypothesis cannot be rejected.

Table 5: Difference in Average BHARs of IPOs between Main Board and SME Segment

Holding Period Average BHAR	Segment	Mean BHARs	N	Standard Error	t statistics	Significance
1week BHAR	Main Board	.2315	216	.03187	3.959	.000***
	SME Segment	.0938	602	.01289		
1month BHAR	Main Board	.2205	216	.03189	1.312	.190
	SME Segment	.1662	602	.02214		
3 months BHAR	Main Board	.2811	198	.04267	1.362	.174
	SME Segment	.1862	595	.03363		
6 months BHAR	Main Board	.4004	183	.05763	.397	.691
	SME Segment	.3479	582	.07138		
1year BHAR	Main Board	.3916	158	.07806	-.237	.813
	SME Segment	.4251	557	.07186		
3 years BHAR	Main Board	.0670	126	.11110	-.574	.566
	SME Segment	.1976	265	.14761		

Source: Constructed by authors

The table reports the output of the t-test determining difference of average BHARs between IPOs of the main board and SME Segment for all six holding periods.

Significant at ***1% .

7.2 Impact of Main Board/ SME Segment on first day returns

To assess the effect of the listing segment on IPO Underpricing variables, regression specifications given in equation no.1 to equation no.4 were tested. Table 6 reports the results for the given regression specifications. All the given regression specifications have been tested for the assumptions of

multicollinearity, heteroskedasticity and autocorrelation problems amongst the residuals. Cross section data so no issue of auto correlation and for multicollinearity -VIF values are less than 3 (in tolerance limit). For heteroskedasticity white consistent errors have been reported.

The regression analysis findings indicate that the magnitude of first day returns depends on the segment on which the IPO is listed. The coefficient (beta) for the ***mainboard*** is significantly positive (models i, ii, and iv) which means that the firms which got listed on the main board segment of the stock exchanges exhibit significantly higher listing day returns in comparison to those which got listed on the SME segment. Further ***lnTA*** is also significant but with the negative sign which means that listing day returns will be lower for firms with higher total assets. Overall subscription level(***lnsubscription***) is also a significant factor determining listing day returns. The higher the subscription level higher is the listing day return. Similar is the relationship between retail subscription and institutional subscription levels.

Table 6: Multiple Regression Results for Impact of Main Board/ SME Segment Listing on IPO
Underpricing (Listing Day returns)

Independent Variable \ Dependent Variable	Model (i) First Day Raw Returns	Model (ii) First Day Raw Returns	Model (iii) Returns in Excess of Market Returns	Model (iv) Returns in Excess of Market Returns
Mainboard	4.785 (1.695) (.090)*	10.581 (3.798) (.000)***	4.358 (1.550) (.122)	10.146 (3.659) (.000)***
lnSubscription	8.796 (15.504) (.000)***	-	8.735 (15.457) (.000)***	-
lnTA	-1.063 (-2.071) (.039)**	-1.726 (-3.201) (.001)**	-.901 (-1.762) (0.078)*	-1.583 (-2.951) (.003)***
lnretailsubscription	-	1.882 (2.635) (.009)**	-	1.780 (2.504) (.012)**
lninstitutionalsubscription	-	7.376 (9.410) (.000)***	-	7.428 (9.519) (.000)***
C	1.591	4.031**	.947	3.424*
R^2	27.2%	26.2%	27.2%	26.3%
Adjusted R^2	27%	25.9%	26.9%	25.9%
F-statistic	101.407	71.926	101.219	72.207
Probability (F stat)	.000***	.000***	.000***	.000***
Sample	818	818	818	818

Source: Constructed by authors

The table summarizes the results of regression equations 7-10. Values in the first brackets are t values followed by p values.

Significant at *** 1%, **5%, *10%

Table 7: Multiple Regression Results for Long Run Abnormal Returns of IPOs

Independent Variable \ Dependent Variable	BHAR1W	BHAR1M	BHAR3M	BHAR6M	BHAR1Y	BHAR3Y

dinitialreturns	.319 (.000)***	.425 (.000)***	.495 (.000)***	.688 (.000)***	.752 (.000)***	.174 (.485)
lnassetsize	-.012 (.145)	-.007 (.529)	-.005(.811)	-.039 (.306)	-.120 (.002)***	.009 (.985)
dmainboard	.207 (.000)***	.113 (.066)*	.150 (.161)	.254 (.210)	.521 (.014)**	-.130 (.738)
C	-.108 (.002)***	-.128 (.012)**	-.166 (.053)*	-.042 (.798)	.233 (.164)	.021 (.954)
R^2	.175	.130	.069	.039	.056	.002
Adjusted R^2	.172	.127	.065	.035	.052	-.006
F-statistic	57.550	40.676	19.204	10.297	13.831	.263
Probability (F stat)	.000***	.000***	.000***	.000***	.000***	.852
Sample	818	818	787	759	709	390

Source: Constructed by authors

The table summarizes the results of the OLS estimation of the regression specifications 3-5. Figures in the first brackets are p values.

Significant ***1%, **5%, *10%

7.3 Outcome

The results indicate a considerable disparity in underpricing levels between main board and SME category IPOs. Firms listed on the SME segment have significant lower first day returns. This finding is similar to the findings of Dhamija & Arora (2017), Burrowes & Jones (2004), Gao et al. (2015). However, the outcome of the study, run counter to the idea that listing segment influences the performance of the IPOs in the long term. It implies that the IPO firms which got listed on these two segments produce comparable long-term returns. This is in contradiction with the findings of Arora & Singh (2021).

While analysing the IPO underpricing levels of firms listed on these two different segments, it is clear that old and large companies listed on the main board segment have higher subscription levels, resulting in significantly higher levels of underpricing than young and small companies tapping the market on SME segment.

8. Conclusion

The study empirically investigates if there is a significant difference in the short and long run performance of IPOs listed on the main board and SME segment in Indian stock exchanges by using data of 818 IPO firms listed on main board and SME segments of both BSE and NSE between January 2012 and December 2021. The results suggest a significant difference in underpricing levels of the main

board and SME segment IPOs. Firms listed in the SME segment exhibit lower levels of first-day returns.

However, the findings of the study suggest otherwise for the effect of listing segments over the long-term abnormal returns of these IPOs. It suggests that IPO firms listed on the SME and the Main Board segment generate matching returns over the long term.

All existing previous studies have studied only a single segment- SME at a time and have not compared the performance over long-term of these two segments. Our study observed a positive BHAR of the SME segment IPOs. However, no statistically significant difference was observed in the performance over long-run of IPOs listed on the SME Platform and the main board segment of the Indian stock exchanges could be observed.

For investors: The study's findings indicate that the probability of generating profit in the short term is high in main board IPOs as compared to SME segment IPOs and therefore short-term investors should invest in main board IPOs. However, as IPOs which got listed on the main board and the SME platform yield similar long-run returns, from an investment point of view, investors should be indifferent about listing segments for long-run investment.

For policy making: With the IPO market still being dominated by large-sized companies, SEBI should strengthen the SME segment more and incentivize investors to participate in small IPOs thereby increasing efficiency in this segment.

For corporates: Smaller companies need to improve subscription levels, for which they need to incentivize investors to participate in their IPOs.

The major limitation of the study is concerning the measurement of Buy and Hold Abnormal Returns (BHAR). The implicit assumption of measuring BHAR is that the IPO's systematic risk is the same as that of the market index used, in this case, it is NIFTY i.e., the average betas of the IPOs is equal to 1. However, the betas are suggested to be higher than 1 and therefore the BHAR has an upward bias. Also, the calculation of BHAR uses the index as a benchmark which suffers from new listing bias and rebalancing bias. Also, BHAR suffers from skewness bias as long-term abnormal returns suffer from positive skewness. Also, the study is limited to IPOs in India only and therefore the findings cannot be generalized to other economies.

The growing role of the IPO market in driving economic growth in the country suggests many new areas of research. Cross-country comparison between main board and SME IPO performance across emerging economies or Asian countries seems to be an intriguing area for further study. Further studies could also focus on comparing IPO performance of main board and SME segment of sectoral firms.

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Do Microfinance Institutions Contribute to Sustainable Entrepreneurship from the Borrower's Perspective?

K. R. Malarchitra¹*   and   P. Sasirekha²

¹*Assistant Professor, Department of Commerce, RGM Govt Arts & Science College, Attappady, Palakkad, Kerala, India and Ph.D. Research Scholar, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamilnadu, India. email: malarchitra2015@gmail.com*

²*Assistant Professor, Department of Commerce, Avinashi lingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamilnadu, India*
Corresponding Author
Corresponding Author

Abstract: Microfinance is a livelihood source of income for most of the poor community. Microfinance in the form of microcredit supports numerous people by way of promoting entrepreneurial culture. Starting an enterprise is not an easy task due to capital formation. In India, microfinance institutions (MFIs) have been instrumental in providing small loans, particularly to underprivileged groups who lack collateral. They are making a significant impact on the country's efforts to foster financial inclusion. The microfinance sector is very diverse comprising various players of different types and legal forms. It includes Banks, SFBs, NBFCs, Non-Profit MFIs, and NBFC-MFIs. Proper business ideas, advisory and guidance services from the proper source are a way for good and successful entrepreneurship. Microfinance has mainly targeted women entrepreneurs with cost-effective funding assistance from microfinance institutions. The success of entrepreneurship depends upon the entrepreneurship's sustainability by achieving their common goals through empowerment. Sustainability is measured in the form of business growth, development and longstanding nature and outreach aspects. The success of any business aims at proper fund management and effective results through the operation. Microfinance is targeted especially at weaker sections community which find it difficult to raise funds for starting a business. Empowerment and growth of the business are reflected in the economic status and soundness of the micro entrepreneurship.

1.   Introduction

A microfinance tool helps to alleviate financial hardship among underprivileged rural sections of the population through financial inclusion. The idea over the past 20 years, microfinance has grown to be a vital instrument for reducing poverty; Dr. Yunus of Grameen Bank first advocated it in 1970. (Karanshawy,2007). The microfinance sector has empowered rural communities and served as a banking solution for those who are unbanked. Women entrepreneurs have the opportunity and the ability to grow their businesses through microcredit institutions. As microloans, small amounts of money are loaned to businesses for income generation (Okiocredit, 2005). Microcredit supports entrepreneurship for beginning new microenterprises and for growing existing microenterprises (Anglin et al., 2020). Microfinance provides working capital as well as asset creation for people in rural and urban areas. Microfinance is a service that provides financial services to people, such as loans, savings and insurance (Ledgerwood, 1999). A microloan is a flexible and cost-effective financial solution for entrepreneurs who otherwise do not have access to bank credit. There are a

variety of microfinance institutions dedicated to providing small loans to the poor, specifically microcredit (O'Donohoe et.al, 2009). It has been observed that microcredit institutions are increasingly becoming microfinance institutions (MFIs) that offer innovative, customized services to entrepreneurs (Chowdry, 2011). As a result of access to microcredit, self-employment assets are invested significantly more profits are increased for households with higher borrowing ability and female borrowers are better equipped to make financial decisions (Weber and Ahmad, 2014).

1.1 Women empowerment

Microfinance is a means of providing low-income people with capital for their businesses, helping them out of poverty, empowering them, and delivering long-term social advantages. (Agion & Morduch 2005). The MFI industry is viewed as an efficient and creative way to alleviate financial hardship because it offers a variety of financial assistance for borrowers in need of a modest sum of money for founding startup businesses (Kneiding, 2009). As part of the microfinance program, multidimensional outcomes are produced, like nutrition, health, education, and autonomy (Khavul et al., 2013). In India a group lending initiative promotes the use of microcredit, leading to improvements in small business profitability and expenditure on long-lasting objects, but only partially timeframe. Additionally, group microcredit lending had no significant effects on women's empowerment, health, or education with an emphasis on social capital, group financing, and how they connect to loan repayment and credit availability. (Banerjee et al.,2015). A group lending arrangement can create social networking platforms used other than the family (Attanasio et al., 2015 When microloans are used appropriately, they can improve decision-making within the household and women's welfare, reliant on initial conditions (Ngo and Wahhaj, 2012). Women earn from microcredit only when they can utilize it to participate in mutually beneficial activities and when the majority of their household budget is allocated to public goods. There is a probability that microcredit programs will have different impacts on households, and the use of credit may not improve women's decision-making authority in the household. Small loans are an effective way of promoting the empowerment of women, but MFIs must also be able to understand the characteristics of female debtors to accomplish their mission (Hunt and Kasynatha, 2001). MFIs must follow the rules and fulfil their goals for them to serve the intended purpose for which they were founded. Reviewing the MFIs' operational procedures is therefore strongly advised because their primary goal is to empower and facilitate the impoverished (Shivi & Prabhat, 2014).

2. Literature of Review

Microfinance institutions (MFIs) provide various financial services to millions of microentrepreneurs across the globe, spanning from reputable commercial institutions to self-help organizations (Dokulilova, 2009). The microfinance sector has also adopted Updates on banking technology like ATMs, internet, and online banking access, as well as credit cards to assist investors and to enhance banking services (Havemann,2009). A flourishing global microfinance industry is backed not just by donors not to mention lenders, network organizations, philanthropists, investors, management consulting firms, and several more specialized companies. Together, these institutions make up a thriving global microfinance market. (Gonzalez 2011). The microfinance industry is an emerging tool for economic development, reduction of poverty and empowerment of low-income communities. Microfinance also plays a new role in micro-entrepreneurship (Mondal,2007). Women who are empowered develop resilience and strength, which equips them to make decisions about their lives. This strengthens their control over resources, counters subordination, and represents their social role and empowerment as the people's power and means of self-governance. (Misra,2018) Numerous opportunities, such as expanding markets, lowering poverty rates, and promoting social change, have arisen as a result of microfinance. However, there is a common misconception that microfinance consists solely of providing loans to the poor. But microfinance now addresses concerns of poverty reduction, social impact on the poor, and encouraging the poor how to manage their finances (Agion & Morduch,2005 Although microfinance institutions aim to uplift their customers and give them the

money they need to escape poverty, it is critical for both human and corporate well-being to comprehend MFI sustainability(Muwamba,2012). By rural development program of Islamic financial institutions, offers, interest-free loans to organizations comprising men and women and Islamic microfinance specifically targets women. This article has two main objectives. The first is to investigate the relationship between women's socioeconomic welfare and Islamic microfinance (Hassan and Mollah, 2018). MFIs should concentrate on providing appropriate assistance and training to conduct entrepreneurship in addition to lending operations (Valente, 2011). To support customers with extended loans turning to business, the microfinance institution ought to think about extending the grace period and reducing the repayment schedule. They should also reorganize their training materials to emphasize enhancing clients' business acumen and infrastructure improvements (Chirkos, 2014). Microfinance institutions that finance MSEs must be forced to do so and must be adaptable enough to accommodate MSEs not just through financial institutions but also by offering technical assistance to the MSEs (Waithaka et al.,2014). Small and medium-sized businesses' ability to develop their revenue and profits depends heavily on microfinance, and those that take part in it will experience a notable boost in both their net profits and revenue (Wang, 2013).

3. Sustainable Entrepreneurship

The need for long-term growth and the adoption of sustainable organization practices to safeguard people have been the main forces behind sustainable entrepreneurship. Sustainable entrepreneurship is mostly motivated by positive attitudes about sustainability and entrepreneurship. A significant shift brought about by sustainable entrepreneurship has been the move to service-oriented business models, which comprise generating value for society in addition to economic benefit. Governments may significantly increase the reach and savings of magnitude by creating effective rules and by offering MFIs and their clients a stable financial environment ((Mustafa et al., 2018). The allocation of credit is a vital component in reducing poverty through creative methods of extending credit to the underprivileged as a possible remedy. Encouraging women to participate in longer loan terms decision-making processes, for instance, will boost the empowerment of women (Swain and Wallentin, 2009). Besides having positive effects on individuals and groups, entrepreneurial activity stimulates macroeconomic growth and job creation as well (Sheikh, 2021)The term "sustainable entrepreneurship" refers to a business-driven definition of sustainability that emphasizes boosting both social and commercial value. The term "corporate social innovation," which was coined with the idea that social challenges should serve as a basis for corporations to develop solutions as goods and services, thereby opening up new markets, has been used to describe the social component of sustainable entrepreneurship (Olsson et al., 2014). Sustainable Entrepreneurship is achieved through the empowerment consisting of social as well as business empowerment. Increased sustainability lowers borrowers' levels of poverty (Nanayakkara, 2012).

4. Statement of the problem

The microfinance industry provides a source of livelihood for many people, providing them with what they need to meet their daily needs, as well, as health care, housing, marriage, and other personal necessities. Women constitute the majority of borrowers, and ensuring that they are empowered in business and in terms of their social status can be accomplished by utilizing microloans effectively. Before extending a loan, MFIs ought to educate qualified clients in business skills. Many times, the purpose and objective of microloans are not attained due to various reasons like family issues, natural disasters, failure in business, migration of places etc. Social status empowerment is achieved as a result of their business's sustainable entrepreneurship and the entrepreneur's success is measured through the performance outreach of the enterprises. Continuous monitoring is necessary for the success of the enterprise if the performance does not result in outreach, which leads to the failure of the business. The business is going to dissolve as a result of poor planning and execution, misusing money for personal expenses, and spouse dominance over money usage. Although real empowerment leads to both societal and personal success, microfinance is a useful instrument for assisting low-income women in eliminating poverty and enabling them to work for themselves.

5. Objectives of the study

1. To analyse the socio-economic and business profile details of the micro-entrepreneurs

2. To analyse how microfinance is contributing to social and business empowerment for sustainable entrepreneurship for women borrowers.

6. Research Methodology

The primary data were collected from the borrowers of NBFC-MFIs through a structured interview schedule. Totally 150 borrowers were interviewed for the study. Stratified random sampling is used for the study. Three NBFC-MFIs functioning in the Coimbatore district of Tamilnadu are taken for the study under registered members of the Microfinance Institution Network (MFIN).

The tools employed in the research study are Simple percentage analysis, analysis of variances and regression. The socio-economic variables and business-related variables were considered for inclusion in the regression model. The overall score for empowerment is found by adding the ratings of the empowerment items on the scale, to be included as the dependent variable in the regression analysis. The fundamental goal of multiple regressions is to construct an equation that yields the predictor variables' coefficients. The general equation for multiple regressions is,

$$Y = a_0 + a_1 X_1 + a_2 X_2 + \ldots\ldots a_n X_n$$

Where Y, the dependent variable

$a_1, a_2, \ldots a_n$ are the regression coefficients for the

Independent variables $X_1, X_2, \ldots X_n$ respectively.

7. Result and discussion

Table 1 Socio economic profile of the Micro Entrepreneurs and Empowerment Score

Variables		No of respondents (No = 150)	Percentage (%)	Mean	SD
Age (in years)	28 - 35	23	15.3	62.04	3.55
	36 - 43	77	51.3	62.19	3.76
	44 - 51	37	24.7	60.78	3.27
	52 - 60	13	8.7	58.23	3.11
Educational Qualification	Illiterate	28	18.7	58.75	2.65
	Up to school level	67	44.7	61.19	3.40
	UG Degree	38	25.3	63.32	3.81
	Diploma	6	4.0	61.67	1.97
	PG Degree	2	1.3	68.50	2.12
	Professional Degree	9	6.0	62.67	3.32
Social Category	Backward	54	36.0	61.33	3.61
	Most backward	86	57.3	61.90	3.60

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	SC/ST	10	6.7	58.70	4.30
Type of Family	Nuclear	87	58.0	61.70	3.62
	Joint Family	63	42.0	61.17	3.85
Number of members in the family	1-2	6	4.0	60.50	2.81
	3-4	71	47.3	61.80	3.62
	5-6	51	34.0	61.55	3.47
	7-8	22	14.7	60.55	4.70
Earning members in the family	One	3	2.0	59.00	1.00
	Two	85	56.7	61.94	3.63
	Three	38	25.3	62.00	2.87
	More than three	24	16.0	59.33	4.59
Area of Residence	Urban	43	28.7	61.98	4.45
	Semi urban	54	36.0	62.43	3.59
	Rural	53	35.3	60.11	2.72

Source: Computed from primary data

The socioeconomic profile of the Micro entrepreneurs is observed in Table 1. It's seen based on the data table above that most among the responders were within the age range of 36-43 years (51.3%). Educational qualification of the Micro-entrepreneurs revealed that the majority of them have education at the school level (44.7%), The Social category of the respondents' states, that the majority of them (57.3%) are from the most backward class. According to family status, the majority of respondents (58.0%) were living in a nuclear family and 42.0 percent of respondents living in a joint family. The majority of the respondents (47.3 %,) have three to four members in the family, and 56.7 percent of respondents have two earning members in the family. Area of residence of respondent's 36.0 percent belong to semiurban area.

Table 2 Business Profile & Relationship of respondents with NBFC-MFIs and Empowerment Score

Variables		No of respondents (No=150)	Percentage (%)	Mean	SD
Years of Experience in business	1-5 yrs	29	19.3	62.07	2.85
	6-10 yrs	81	54.0	62.27	3.85
	11-15 yrs	31	20.7	59.19	3.48
	Above 15 yrs	9	6.0	60.33	2.40
Nature of Business	Vegetable vendor	13	8.7	59.08	4.66
	Fast food Stall	15	10.0	62.07	3.47
	Flower shop	11	7.3	59.55	3.62
	Tailoring shop	16	10.7	62.56	2.78
	Petty shop	16	10.7	61.94	3.80
	Garments	15	10.0	62.93	3.77
	Small Scale Farming	22	14.7	59.23	2.39
	Others	42	28.0	62.60	3.51

Source of initial fund invested	NBFCs-MFI	13	8.7	62.30	3.54
	Own fund	15	10.0	59.27	3.13
	Borrowed from friends and relatives	11	7.3	61.16	3.74
	Borrowed from private money lenders	16	10.7	62.11	4.00
Monthly income from the business (in Rupees)	10000 - 20000	33	22.0	60.61	3.16
	20001 - 30000	38	25.3	60.55	3.26
	30001 - 40000	43	28.7	61.98	4.26
	40001 - 50000	30	20.0	62.43	3.65
	Above 50000	6	4.0	63.83	3.66
Monthly business expenditure (in Rupees)	Up to 5000	5	3.3	61.80	2.68
	5001 - 10000	42	28.0	60.12	3.40
	10001 - 15000	30	20.0	61.40	3.18
	15001 - 20000	44	29.3	61.77	3.82
	20001 - 25000	7	4.7	63.71	3.45
	25001 - 30000	22	14.7	62.82	4.38
Monthly saving out of the business activity (in Rupees)	Up to 5000	5	3.3	60.60	1.34
	5001 - 10000	40	26.7	61.23	3.61
	10001 - 15000	45	30.0	60.78	3.52
	15001 - 20000	42	28.0	62.40	4.27
	20001 - 25000	13	8.7	61.46	3.41
	Above 25001	5	3.3	63.00	2.92
Years of association with NBFC-MFIs	2 - 3 yrs	5	3.3	63.00	3.94
	4 - 5 yrs	30	20.0	62.10	3.27
	6 - 7 yrs	57	38.0	61.44	4.35
	8 - 9 yrs	38	25.3	60.87	3.31
	10 yrs & above	20	13.3	61.45	3.07
Amount of loan taken in a year (In Rupees)	35001 - 45000	31	20.7	60.87	3.84
	45001 - 55000	22	14.7	61.55	2.61
	55001 - 65000	46	30.7	60.57	3.48
	Above 65000	51	34.0	62.65	4.01

Source: Computed from primary data

Table 2 exhibits the majority of the respondents (54.0%) have experience of 6-10 years in doing various business activities. The majority of them, 28.0 percent are doing other businesses like tea stalls, milk businesses, beauty parlors, fancy stores, bakery etc. It is understood that Micro Entrepreneurs are doing various diversified activities, different categories of people doing business based on their skills and knowledge. More number of respondents (28.7%) have an income of 30001-40000. Micro entrepreneurs are earning a sizeable amount of income from their business activity.15001-20000 monthly expenditure incurred for most of the respondents.30.0 percent of the

respondent's monthly savings from the business is 10001-15000. The majority of the respondents (38.0 %) of them 6-7 years of association in the NBFC-MFIs. The majority of them (34.0 %) availed a loan of above 65000 for business.

Association between Socio-economic factors and Empowerment on NBFC-MFIs

The following null hypothesis was framed and tested to find whether scores differed significantly affected by socioeconomic factors.

H0: The Empowerment score on NBFC-MFIs do not differ significantly among the socioeconomic factors of the respondents.

Ha: The Empowerment score on NBFC-MFIs differs significantly among the socioeconomic

factors of the respondents.

Table 3 Association between Socio-economic factors and Empowerment on NBFC-MFIs

Variables		Sum of Squares	df	Mean Square	F	P	Result
Age (in years)	Between Groups	201.828	3	67.276	5.299	.002	Significant
	Within Groups	1853.612	146	12.696			
Educational qualification	Between Groups	453.669	5	90.734	8.157	.000	Significant
	Within Groups	1601.771	144	11.123			
social category	Between Groups	93.282	2	46.641	3.494	.033	Significant
	Within Groups	1962.158	147	13.348			
Type of family			148		.856 (t value)	.393	Not Significant
Earning members in the family	Between Groups	157.401	3	52.467	4.036	.009	Significant
	Within Groups	1898.039	146	13.000			
Area of Residence	Between Groups	157.939	2	78.969	6.118	.003	Significant
	Within Groups	1897.501	147	12.908			

Source: Computed from primary data

The socioeconomic variable of the respondents like Age (0.02), Educational qualification (0.00), social category (0.033), Earning members in the Family (0.009), and Area of Residence (0.03) have a considerable variation in the average mean of empowerment score on the above variables, As a result, the null hypothesis (Ho) has been rejected about these variables alone.

Concerning the variable like type of family (0.856) there is no significant difference found It is inferred that empowerment on socio socio-economic profile of the respondents like age, educational qualification, social category, earning members in the family, and area of residence is highly significant. There is a correlation between entrepreneurs' socioeconomic status and empowerment in connection with social standards.

Association between Business Profile & Relationship of Respondents and Empowerment on NBFC-MFIs

The following   null hypothesis was framed and tested to find whether scores differed significantly based on Business profile & Relationship of Respondents

H0: The Empowerment score on NBFC-MFIs do not differ significantly among the Business profile & Relationship of Respondents

Ha: The Empowerment score on NBFC-MFIs   differ significantly among the Business profile & Relationship of Respondents

Table 4 Association between Business profile and Relationship of Respondents   and Empowerment on NBFC-MFIs

Variables		Sum of Squares	df	Mean Square	F	P	Result
Years of Experience in business	Between Groups	234.715	3	78.238	6.274	.000	Significant
	Within Groups	1820.725	146	12.471			
Nature of Business	Between Groups	339.065	7	48.438	4.007	.000	Significant
	Within Groups	1716.375	142	12.087			
Source of initial fund invested	Between Groups	208.384	3	69.461	5.491	.001	Significant
	Within Groups	1847.056	146	12.651			
Monthly income from the business	Between Groups	128.990	4	32.247	2.427	.051	Not significant
	Within Groups	1926.450	145	13.286			
Monthly business expenditure	Between Groups	156.607	5	31.321	2.375	.042	Significant
	Within Groups	1898.833	144	13.186			

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monthly saving out of the business	Between Groups	76.137	5	15.227	1.108	.359	Not significant
	Within Groups	1979.303	144	13.745			
Years of association with NBFC-MFIs	Between Groups	37.413	4	9.353	.672	.612	Not significant
	Within Groups	2018.027	145	13.917			
Amount of loan taken in a year	Between Groups	119.550	3	39.850	3.005	.032	Significant
	Within Groups	1935.890	146	13.260			

Source: Computed from primary data

Variables like years of experience in business (0.000), Nature of Business (0.000), Source of initial fund invested (.001), Monthly business expenditure (.042) Amount of loan taken in a year (0.32) have a significant difference in the business empowerment on business profile and relationship of the respondents with NBFC-MFIs. Based on the above variables, the null hypothesis (Ho) is rejected.

Concerning variables like association (0.612), Monthly income from business (0.051), and monthly savings out of the business (.359) there is no significant difference is found, it is inferred that empowerment on Business profile and relationship of the respondents with NBFCMFIs like Years of experience, Nature of business, and amount of loan taken in a year have highly significant in empowerment. The above result states that a strong business profile and positive relationship between MFIs and borrowers have an impact on empowerment and provide sole economic support for running the business.

Table 5 Regression Analysis of empowerment score by micro-entrepreneurs

Dependent Variable: Empowerment of micro-entrepreneurs

Particulars	B	Std. Error	Beta	t	Prob.
(Constant)	58.270	3.005			
AGE	-.006	.065	-.011	-.099	Ns
EDUCATIONAL QUALIFICATION	.665	.264	.220	2.517	**
SCIAL CATOGORY	.197	.501	.031	.394	Ns
Type of Family	.606	.977	.081	.620	Ns
Number of members in the family	-.018	.324	-.007	-.055	Ns
Earning members in the family	-1.474	.564	-.310	-2.613	**
Area of Residence	.172	.441	.037	.391	Ns
Years of Experience in business	-.282	.122	-.310	-2.303	*
Monthly income from the business(Rs.000s)	.074	.080	.250	.930	Ns

Monthly business expenditure (Rs.000s)	.053	.091	.113	.584	Ns
Monthly saving out of the business activity (Rs.000s)	-.106	.094	-.172	-1.128	Ns
Years of association	.245	.227	.130	1.081	Ns
Amount of loan taken in a year (Rs.000s)	.056	.033	.181	1.689	Ns

Source: Computed from primary data

Model summary

R	R Square	F	Prob.
.537	.288	4.229	**

*** - Significant at 1% level (P<0.01)

The regression analysis findings are displayed above, along with information about Multiple R and the variables used in the regression equation. The R-value shows that there is a moderate correlation (0.537) among the dependent variable (Overall empowerment score) as well as the collection of independent variables. The value of R square (0.288) is the squared multiple correlation value, which explains that 28.8 % of the difference in the overall empowerment score is because of the thirteen independent variables finally included within the formula. The value of F-statistic (F=4.229), and the similar level of significance (P<0.01) show that the correlation between the total empowerment and the set of independent variables and the dependent variable (score) is significant at the 1% level.

According to the regression table, factors like age, number of members in the family, earning members in the family, year of experience in business and monthly savings out of business have negative effects on the overall empowerment score as the respective regression coefficients are negative. Coefficients of standardized regression (Beta) were found regarding the regression coefficients incorporated into the model. As these variables are independent of portions of measurements and hence, they are comparable. The relative contribution of each variable to the dependent variable, the Overall empowerment score can be found from these standardized regression coefficient values. It is seen from the regression table that monthly income from Business has the highest beta value of 0.250, which contributes more towards the overall empowerment score.

8. Conclusion

As stated earlier, one of the most important roles microfinances may play in development is giving the underprivileged, which are largely ignored by the traditional banking industry, for getting financial services. People who successfully combine people and resources are considered good entrepreneurs. While entrepreneurship can have positive effects on individuals or groups moreover, it promotes and sustains macroeconomic expansion and employment prospects for small and medium-sized businesses are widely recognized due to their significant roles in wealth creation, job creation, and economic expansion. The reality that women run or supervise a sizable percentage of small and medium-sized companies worldwide is another important point to emphasize. Empowerment is the social mission to the poor, for social and business status by wealth creation. Here social and business empowerment contributes towards sustainable business ownership. The study also confirmed the positive and significant relationship between wealth accumulation and social integration through empowerment. Higher social status, wealth creation, independent decision, satisfaction of all family needs, business growth, diversification of business, strong business support and convenience and comfort in doing

business leads to achievement in empowerment status. Sustainable entrepreneurship aims to develop individual entrepreneurship and achievement in the economic development of the country.

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Rural Tribal Health in Rajasthan: Assessing Determinants and Enhancing Well-being

Renu Jatana

ICSSR Senior Research Fellow, Ex Dean and Faculty Chairman, UCCMS, MLS University, Udaipur (Raj)
renujatana30.mlsu@gmail.com

Abstract: The study includes the identification of different determinants which are related to the health status and well-being of the tribal population. This research work also measures the impact of demographic, social and economic factors on the health status and well-being of the tribal population. Accordingly, the survey method was being used for primary data collection. A well-structured questionnaire being designed having questions related to demographic, socio-economic aspects and also questions related to availability of health care services. Approximately 35% of respondents found the healthcare facilities acceptable, 30% rated them as good, 15% as excellent, while 15% considered them poor; additionally, 5% emphasized the urgent need for improved services in tribal areas. Nearly 30% of the respondents were dissatisfied with healthcare services in Rajasthan's tribal regions, while 17.5% were somewhat dissatisfied, 15% remained neutral, and nearly 30% were somewhat satisfied; additionally, about 7.5% were fully satisfied with the current tribal healthcare services.

1. Introduction

The overall development and progress of the nation depends on the health and wellbeing of the tribal population. Rajasthan is a state which consist of various tribal communities which have different historical contexts, cultural identities, social and economic conditions and so the health development related practices become critical aspect. The tribal population have various health related problems with limited resources and infrastructure. Lack of awareness, quality of health services and modern medical practices are also the challenges being faced by the tribal population. The study focuses on the multifaceted aspects that affect the health and wellbeing of the tribal population in Rajasthan. Through the evaluation of the various aspects and determinants associated with health status of the tribal population the research work tries to find valuable insights so the effective policies and strategies can be formulated for betterment of the tribal population.

Rural tribal communities in Rajasthan have long experienced disparities in health outcomes as a result of a combination of historical, geographical, social, and economic factors. Their limited access to basic amenities such as clean water, sanitation facilities, and healthcare infrastructure has led to a higher prevalence of communicable diseases, malnutrition, and maternal and child health issues. The interplay between these factors underscores the need for a comprehensive analysis that considers not only the immediate health concerns but also the broader determinants that shape the health landscape of these communities.

In order to understand the tribal health in Rajasthan different factors are being considered which includes income, education, occupation, sector (public/private), traditions, culture and beliefs. Challenges such as low literacy rates, limited healthcare access, lack of awareness about modern medicine, and gender fairness issues can affect how these communities take care of their health. This study aims to identify these factors to understand health differences and find ways to help.Improving tribal health means going beyond regular healthcare. One should respect their culture and how they live. Providing healthcare that blends with their traditions and modern medicine can build trust and cooperation. Also, improving healthcare, educating about health, offering job opportunities, and ensuring clean water can enhance their overall well-being.

2. Literature Review

Bhasin (2007) study delves into the health, settlements, and amenities of six tribal groups in Rajasthan, highlighting cultural influences. Factors affecting health encompass housing, services, and traditional medical practices deeply embedded in tribal life. Limited healthcare access results in a mix of therapies. Overcoming cultural barriers is essential for effective public health interventions. Tackling social attitudes, economic constraints, and healthcare access are pivotal in enhancing tribal well-being. The study underscores the need to bridge the gap between traditional and modern healthcare while considering the cultural context of these communities.

According to author Negi et al. (2019) health plays an important role in community well-being as it is critical for the human progress and development. India is being the second largest tribal population in the world with different socio-economic marginalities. The major challenges in the tribal region are to make aware people about the various health care practices being there in the region. Author tries to identify different socio-economic factors related to tribal health. Additionally, it underscores the necessity for a comprehensive national health policy tailored to address the distinct health needs of the indigenous population, acknowledging the urgent requirement for holistic intervention.

Kapoor & Dhall (2016) there are some common challenges which can be easily identified among the tribal population. Although identification of factors influences the health of tribal population is challenging as the tribal population in closely connected with nature and environment. According to this research work malnutrition is one of the most predominant reasons for diseases among the tribal population. It was also identified that the main reason behind the malnutrition is very low literacy rate and conventional socio-cultural practices.

According to author Debroy et al. (2023) the present tribal health system in the country faces different and unique challenges as compared to the non-tribal health system. Globally also the nations are facing different challenges related to health care in tribal regions. Main reasons behind distinct health issues are rituals, different languages, socio-cultural practices, customs etc. of the tribal population. Different organizations are giving the efforts towards providing better health care services but still there are many obstacles which are hindering the successful implementation of the health care services. The author further emphasized on the issues like availability of limited resources, infrastructure, languages, cultural barriers, geographical remoteness, scarcity of health care professionals, socio-economic differences, integration of traditional and modern health care practices etc. (Das et al., 2016). In order to overcome these barriers collective approach is required under which government, NGO's, medical specialist, and the tribal population should participate for better health services to the community. By overcoming these challenges, it is possible to increase the quality and accessibility of the health care services.

Thomas et. al. (2021) discussed that geographical distance and limitation in infrastructure have presented significant obstacles to delivery of better health care services in the tribal area of India. Majority of tribal population is residing in far remote areas which are not accessible easily like mountain terrains, forests, and areas with no or limited transportation facilities. The geographical area having different characteristics makes it very difficult to establish and maintain the health care practices and facilities and also confirm timely delivery of medical services and supplies. Kumar et.

al. (2020), the insufficient access to nearby healthcare facilities necessitates individuals to undertake extensive journeys for medical care, a predicament compounded during medical emergencies. Moreover, the remote locations hinder healthcare providers from offering on-site care, particularly for non-emergency procedures. Consequently, delivering timely and comprehensive healthcare services becomes arduous due to the scarcity of adequately equipped hospitals, clinics, and healthcare centres.

Jacob (2014) discussed about the tribal communities in India grapple with socioeconomic hardships like poverty and limited education access, obstructing healthcare utilization and fostering health inequalities. These challenges often lead to neglect of medical needs due to struggling to meet necessities, causing delays in seeking care. Lack of preventive healthcare awareness further amplifies health disparities within tribal groups. Overcoming these intricate issues demands a comprehensive strategy, tackling poverty, education, and promoting preventive health measures. Eswarappa (2022) suggested that embracing both traditional and modern approaches ensure comprehensive and culturally sensitive care, bridging the gap for holistic healthcare in tribal communities.

3. Objectives:

The objectives of the research work are as follows:

1.) To identify various determinants related to health and well-being of Tribal population.

2.) Measure the impact of demographic, socio-economic factors on the health and well-being of Tribal population.

3.1 Hypotheses:

$H1_0$: There is no significant relationship between demographic, socio-economic factors and the health status & well-being of Tribal population in Rajasthan.

$H1_a$: There is significant relationship between demographic, socio-economic factors and the health status & well-being of Tribal population in Rajasthan.

$H2_0$: There is no significant relationship between health care facilities and the satisfaction level of Tribal population in Rajasthan.

$H2_a$: There is significant relationship between health care facilities and the satisfaction level of Tribal population in Rajasthan.

4. Research Methodology

The research methodology employed in the study involves a systematic approach to gather, analyse, and interpret data related to the health and well-being of rural tribal communities in Rajasthan. The methodology encompasses various stages, including research design, data collection, data analysis, and interpretation.

Research Design: Quantitative Research.

Sampling Technique: Stratified Random Sampling Technique.

Sample Size: 400 respondents form different districts of Rajasthan.

The study was adopted quantitative research design being focused to identify the determinants impacting the health status and well-being of Rajasthan's tribal population. Through a structured survey which included demographic, socio-economic, and healthcare availability aspects, a comprehensive understanding of these factors emerged.

4.1 Tools and Techniques:

A well-structured questionnaire was being designed in order to collect primary data. The questionnaire consists of two sections. Section A included questions related to demographic aspects and section B includes questions related to socio-economic aspects, satisfaction level, availability of health care facilities etc. The instrument was being tested using Cronbach's alpha technique. The Cronbach's alpha value was found to be 0.8321 which interprets that there is high internal consistency between the items. In order to find the association between socio-economic factors and health status Chi-Square test was being used. Similarly, to find the relationship between health care facilities and satisfaction level Chi-Square test was applied.

5. Data Analysis

5.1 Demographic and Socio-Economic Aspects:

5.1.1 Income Wise Classification:

Table5.1: Income wise classification

Monthly Income Range	Number of Respondents	Percentage (%)
<1000	100	25%
1000-2000	140	35%
2000-3000	80	20%
>3000	80	20%

The income wise classification suggests that about 25% respondents were having monthly income less than 1000 rupees, about 35% respondents were having monthly income in the range 1000 to 2000 rupees,20% respondents confirm that they were having the income between 2000 to 3000 whereas about 20% were having income greater than 3000.

5.1.2 Age Wise Classification:

Table 5.2: Age wise classification

Age Group	Number of Respondents	Percentage (%)
20-30	160	40%
31-40	100	25%
41-50	80	20%
51-60	60	15%

Based on age wise classification the respondents were being categorized into four groups. It was found that about 40% respondents were from the age group 20-30 years, about 25% belongs to age group 31-40 years, about 20% were from the age group 41-50 years whereas about 15% were between the age group 51-60 years.

5.1.3 Gender Wise Classification:

Table 5.3: Gender wise classification

Gender	Number of Respondents	Percentage (%)
Male	240	60%
Female	160	40%

About 60% respondents were male and 40% respondents were female. It was found that majority of respondents were male.

5.1.4 Caste Wise Classification:

Table 5.4: Caste wise classification

Caste Category	Number of Respondents	Percentage (%)
General	180	45%
Scheduled Caste (SC)	80	20%
Scheduled Tribe (ST)	100	25%
Other Backward Classes (OBC)	40	10%

Based on the caste wise classification the respondents were being categorised into four groups such as general, schedule cast, schedule tribe and other backward classes. Majority of respondents were from general category which accounts for about 45% whereas 20% respondents were from SC category, 25% respondents were from scheduled tribe category and remaining respondents were from other backward classes category which accounts for only 10%.

5.1.5 Highest Education Level:

Table 5.5: Education status

Education Level	Number of Respondents	Percentage (%)
Illiterate	120	30%
Up to 10th Std.	80	20%
Up to 12th Std.	140	35%
Graduation	60	15%

Education wise classification suggest that about 30% respondents were illiterate 20% respondents were educated up to 10th standard and 35% respondents were educated up to 12th standard. It was found that majority of the respondents were educated up to 12th standard which accounts for about 140 respondents in number.

5.1.6 Occupation or Primary Source of Income:

Table 5.6: Occupation wise classification

Occupation / Source of Income	Number of Respondents	Percentage (%)
No Occupation	60	15%
Govt. Schemes	100	25%
Day Labour	160	40%
Other Craft Works	80	20%

The primary source of income of about 40% respondent in majority is day labour similarly 25% respondents are being engaged in government schemes work whereas about 20% respondents are earning their income through craft work and about 15% respondents are having no occupation presently.

5.1.7 Frequency of Illness and Disease Infections:

Illness and Disease Infections	Number of Respondents	Percentage (%)

Table 5.7: Occurrence of illness and disease

Always	268	67%
Sometimes	40	10%
Never	92	23%

Majority of respondents about 67% were getting regularly infected by the diseases whereas 10% were being have illness and diseases infection sometimes and 23% said they were never being affected by the infectious diseases.

5.1.8 Distance to Nearest Health Centre:

Table 5.8: Distance to nearest health centre

Distance to Nearest Health Centre	Number of Respondents	Percentage (%)
Less than 5 km	120	30%
5-10 km	150	37.5%
10-20 km	80	20%
More than 20 km	50	12.5%

Majority of respondents about 37.5% confirmed that distance to the nearest health center is about 5-10 kms whereas about 30% confirmed that it is less than 5 kms, 20% were with the opinion that the health centre is about 10-20 kms and 12.5% confirmed that it is more than 20 kms.

5.1.9 Availability of Healthcare Facilities:

Table 5.9: Availability of healthcare facilities

Availability of Healthcare Facilities	Number of Respondents	Percentage (%)
Excellent	60	15%
Good	120	30%
Fair	140	35%
Poor	60	15%
Very Poor	20	5%

About 35% respondents confirmed that the available health care facilities are fair enough whereas 30% confirmed that the health services are good and 15% confirmed that the health care services are excellent while 15% were with the opinion that the services or facilities are poor, 5% were with the view point that the services are very poor and are required to be improved in the tribal areas.

5.1.10 Preferred Healthcare Service Provider:

Table 5.10: Preferred healthcare service provider

Preferred Healthcare Service Provider	Number of Respondents	Percentage (%)
Primary Health Centre	130	32.5%
Government Hospital	120	30%
Private Hospital	100	25%
Others	50	12.5%

The majority of respondents about 32.5% confirmed that their preferred health care service provider are primary health centres whereas 30% confirm that their preferred healthcare service provider are government hospitals, 25% preferred private hospitals while 12.5% depend on others.

5.1.11 Community Health Worker (CHW) Home Visits:

Table 5.11: Community Health Worker (CHW) home visits

CHW Home Visits	Number of Respondents	Percentage (%)
Yes	150	37.5%
No	250	62.5%

37.5% confirmed that community health workers visit their homes while 62.5% were against the above view point.

5.1.12 Familiarity with Accredited Social Health Activist (ASHA) Worker:

Table 5.12: Familiarity with ASHA worker

Familiarity with ASHA Worker	Number of Respondents	Percentage (%)
Yes	80	20%
No	320	80%

A substantial majority (80%) of respondents are unfamiliar with Accredited Social Health Activist (ASHA) Workers, while only 20% report familiarity. This highlights a significant awareness gap about the pivotal role ASHA Workers play in community healthcare. Addressing this gap through focused awareness campaigns can optimize their contributions for better health outcomes.

5.1.13 Challenges in Accessing Medical Services:

Table 5.13: Challenges in accessing medical services

Challenges in Accessing Medical Services	Number of Respondents	Percentage (%)
No	180	45%
Yes	220	55%

Majority of respondents about 55% were with the view point that there are various obstacles while accessing the medical services whereas about 45% were against the above-mentioned opinion. The findings suggest that heath care services should be enhanced in the tribal areas so that access is easy for the individuals of the region.

5.1.14 Access to Clean Drinking Water:

Table 5.14: Access to clean drinking water

Access to Clean Drinking Water	Number of Respondents	Percentage (%)
Always	120	30%
Often	100	25%
Sometimes	90	22.5%
Rarely	60	15%
Never	30	7.5%

30% respondents confirmed that they always have access to clean drinking water which accounts for about 120 respondents, 25% said that they often have access to the clean drinking water whereas 7.5% confirmed that they do not the access to clean drinking water. Overall, the data showcases varying levels of access to clean drinking water, with a notable majority having reliable access, while a smaller but still significant portion faces challenges in securing this basic necessity. The findings highlight the importance of addressing water access disparities and ensuring that clean drinking water is accessible to all members of the population.

5.1.15 Access to Proper Sanitation Facilities:

Table 5.15: Access to proper sanitation facilities

Access to Proper Sanitation Facilities	Number of Respondents	Percentage (%)
No	280	70%
Yes	120	30%

Majority of respondents about 70% were with the opinion that they were not having the access to proper sanitation facilities whereas only 30% confirmed that they are having proper sanitation facilities. There is need to increase the sanitation facilities in order to have better hygiene environment.

5.1.16 Satisfaction Level:

Table 5.16: Satisfaction with present healthcare services

Satisfaction with Present Healthcare Services	Number of Respondents	Percentage (%)
Dissatisfied	120	30%
Somewhat dissatisfied	70	17.5%
Neutral	60	15%
Somewhat satisfied	120	30%
Satisfied	30	7.5%

About 30% respondents in all were dissatisfied with the present healthcare services in the different tribal regions of Rajasthan, 17.5% were somewhat dissatisfied, 15% were neutral about the health care services whereas nearly 30% respondents were being somewhat satisfied and about 7.5% were fully satisfied with the present health care services in the tribal region of Rajasthan. These findings emphasize the need for healthcare providers and policymakers to address areas of concern and work towards enhancing the quality and accessibility of healthcare services to meet the diverse needs and expectations of the tribal population.

5.2 Hypotheses Testing Results:

$H1_0$: There is no significant relationship between demographic, socio-economic factors, and the health status & well-being of Tribal population in Rajasthan.

To find the association between socio-economic factors and the health status above mentioned hypothesis was being framed and it was further divided various sub-hypotheses which association between various aspects related to socio-economic environment. These sub-hypotheses were being further analysed and tested using the statistical technique Chi-Square test. The corresponding results are as follows:

5.2.1 Income and Health Status & Well Being:

$H1.1_0$: There is no significant relationship between socio-economic factor: income and the health status & well-being of Tribal population in Rajasthan.

Table 5.17: Income and health status& well being

Chi-Square Tests			
	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	528.488[a]	6	.000
Likelihood Ratio	509.510	6	.000
Linear-by-Linear Association	292.410	1	.000
N of Valid Cases	400		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.00.			

Test Applied: Chi-Square test.

Result: Null hypothesis being rejected.

The outcomes confirm that as the p-value is found be 0.00 which lesser than the standard alpha value of 0.05, so the null hypothesis is being rejected further it can be interpreted that there is significant relationship between socio-economic aspect income and the health status and well-being of the tribal population of Rajasthan.

5.2.2 Age and Health Status:

H1.2$_0$: There is no significant relationship between demographic factor: age and the health status & well-being of Tribal population in Rajasthan.

Table 5.18: Ageand health status& well being

Chi-Square Tests			
	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	505.775[a]	6	.000
Likelihood Ratio	518.347	6	.000
Linear-by-Linear Association	306.823	1	.000
N of Valid Cases	400		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.00.			

Test Applied: Chi-Square test.

Result: Null hypothesis being rejected.

The findings confirm that as the p-value is found be 0.00 which lesser than the standard alpha value of 0.05, so the null hypothesis is being rejected further it can be interpreted that there is significant relationship between demographic aspect age and the health status and well-being of the tribal population of Rajasthan.

5.2.3 Gender and Health Status:

H1.3$_0$: There is no significant relationship between demographic factor: gender and the health status & well-being of Tribal population in Rajasthan.

Table 5.19: Gender and health status& well being

Chi-Square Tests			
	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	295.522[a]	2	.000
Likelihood Ratio	358.950	2	.000
N of Valid Cases	400		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.00.			

Test Applied: Chi-Square test.

Result: Null hypothesis being rejected.

The Chi-Square value is found to be 295.522 and the corresponding p-value is found to be 0.00 which interprets that as the p-value (0.00) < 0.05 (standard alpha value), so it can be concluded that the null hypothesis is being rejected and it can be concluded that there is association between the demographic factor gender and health status based on the type of health care services being provided by the institutions in the tribal region.

5.2.4 Education and Health Status:

H1.4$_0$: There is no significant relationship between socio-economic factor: education and the health status & well-being of Tribal population in Rajasthan.

Table 5.20: Education and health status& well being

Chi-Square Tests			
	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	354.760[a]	6	.000
Likelihood Ratio	376.394	6	.000
Linear-by-Linear Association	220.873	1	.000
N of Valid Cases	400		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.00.			

Test Applied: Chi-Square test.

Result: Null hypothesis being rejected.

The Chi-Square value is found to be 295.522 and the corresponding p-value is found to be 0.00 which interprets that as the p-value (0.00) < 0.05 (standard alpha value), so it can be concluded that the null hypothesis is being rejected and it can be concluded that there is association between the socio-economic factor education and health status.

5.2.5 Occupation and Health Status:

H1.5$_0$: There is no significant relationship between socio-economic factor: occupation and the health status & well-being of Tribal population in Rajasthan.

Table 5.21: Occupation and health status& well being

Chi-Square Tests			
	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	399.351^a	6	.000
Likelihood Ratio	411.316	6	.000
Linear-by-Linear Association	216.322	1	.000
N of Valid Cases	400		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.00.			

Test Applied: Chi-Square test.

Result: Null hypothesis being rejected.

The Chi-Square value is found to be 295.522 and the corresponding p-value is found to be 0.00 which interprets that as the p-value (0.00) < 0.05 (standard alpha value), so it can be concluded that the null hypothesis is being rejected and it can be concluded that there is association between the socio-economic factor: occupation and the health status & well-being of Tribal population in Rajasthan.

Finally, it can be concluded from the above individual sub-hypothesis testing results that the null hypothesis H1$_0$ is being rejected and it can be interpreted that there is significant relationship between demographic, socio-economic factors, and the health status & well-being of Tribal population in Rajasthan.

5.2.6 Health Care Facilities and Satisfaction Level:

H2$_0$: There is no significant relationship between health care facilities and the satisfaction level of Tribal population in Rajasthan.

Table 5.22: Satisfaction level and availability of healthcare facilities

Satisfaction Level and Availability of Healthcare Facilities:Crosstabulation						
Count						
	Availability of Healthcare Facilities					Total
	Very	Poor	Fair	Good	Excel	

		Poor				lent	
Satisfaction Level	Dissatisfied	0	0	0	60	60	120
	Somewhat dissatisfied	0	0	10	60	0	70
	Neutral	0	0	60	0	0	60
	Somewhat satisfied	0	50	70	0	0	120
	Satisfied	20	10	0	0	0	30
Total		20	60	140	120	60	400

Table 5.23:Satisfaction and availability of healthcare facilities: Chi-Square results

Chi-Square Tests			
	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	791.383[a]	16	.000
Likelihood Ratio	733.073	16	.000
Linear-by-Linear Association	325.485	1	.000
N of Valid Cases	400		
a. 5 cells (20.0%) have expected count less than 5. The minimum expected count is 1.50.			

Test Applied: Chi-Square test.

Result: Null hypothesis being rejected.

The findings confirm that as the p-value is found be 0.00 which lesser than the standard alpha value of 0.05, so the null hypothesis is being rejected further it can be interpreted that there is significant relationship between health care facilities and the satisfaction level of Tribal population in Rajasthan.

6. Conclusion

Mainly the research work was focused on identification of factors or determinants affecting the health status and well-being of the tribal population in various districts of Rajasthan. In order to collect data a well-structured questionnaire was being designed and being tested using the Cronbach's Alpha method. The results of Cronbach's Alpha method have shown good internal consistency. The majority of respondents about 32.5% confirmed that their preferred health care service provider are primary health centres. About 35% respondents confirmed that the available health care facilities are fair enough whereas 30% confirmed that the health services are good and 15% confirmed that the health care services are excellent. Hypothesis testing results confirm that the null hypothesis $H2_0$ was being rejected as the p-value (0.000) is found to be lesser that the standard alpha value of 0.05, so it can be interpreted that there is significant relationship between the availability of healthcare facilities and the satisfaction level among the tribal population in Rajasthan. The outcomes underscore the importance of enhancing healthcare services in tribal areas to address dissatisfaction and improve overall well-being. The study provides valuable insights for policymakers and stakeholders to focus on targeted interventions to bridge the gaps in healthcare provision and enhance the satisfaction of the tribal population in Rajasthan.

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