AN EMPIRICAL EXAMINATION OF WORKING CAPITAL MANAGEMENT STRATEGY IN PAPER MANUFACTURING COMPANIES

Ahmed Mahdi Abdulkareem *, Nahran Qasim Krmln **, Firas Mohammed Daham ***, Suresh Vasani ****, Mustafa Abdalmunam Swadi *****, Yousif Yaqoob Faris *****

* *Corresponding author*, Industrial Bank, Basra, Iraq
Contact details: ahmed1997alabadi@gmail.com
** Department of Financial and Banking Sciences, College of Administration and Economics, University of Baghdad, Baghdad, Iraq
*** Accounting Department, College of Administration and Economics, University of Baghdad, Baghdad, Iraq
**** Department of Commerce and Management, Atmiya University, Rajkot, India
***** Industrial Bank, Basra, Iraq

How to cite this paper: Abdulkareem, A. M., Krmln, N. Q., Daham, F. M., Vasani, S., Swadi, M. A., & Faris, Y. Y. (2025). An empirical examination of working capital management strategy in paper manufacturing companies [Special issue]. *Corporate & Business Strategy Review, 6*(1), 402–411.
https://doi.org/10.22495/cbsrv6i1siart16

ISSN Online: 2708-4965
ISSN Print: 2708-9924

Received: 10.03.2024
Revised: 29.05.2024; 03.10.2024; 28.02.2025
Accepted: 10.03.2025

JEL Classification: G34, M4, M41, M42
DOI: 10.22495/cbsrv6i1siart16

Abstract

This study examines the working capital management practices of four Indian paper manufacturing companies Seshasayee Paper, South India Paper, Andhra Paper, and JK Paper focusing on financial performance metrics from 2017–2018 to 2021–2022. Using purposive sampling based on higher cash and bank balances, the study applies analytical tools such as frequency distribution, descriptive statistics, and analysis of variance (ANOVA) to evaluate data from the companies' annual reports. Key financial ratios, including the current ratio, quick ratio, inventory turnover ratio, and debtor turnover ratio, were analysed to assess liquidity and operational efficiency (Yogendrarajah & Thanabalasingam, 2011) The findings reveal significant disparities in financial management practices: Seshasayee Paper maintained a standard quick ratio, South India Paper excelled in current and quick ratios, while JK Paper faced challenges with a negative working capital cycle and lower liquidity ratios. ANOVA tests indicated significant differences in financial ratios, except for inventory turnover. These results highlight the need for companies with lower liquidity ratios to reassess their financial strategies. The study emphasizes the importance of tailored financial approaches to improve operational efficiency and sustainability in the paper industry. Future research could benefit from qualitative methods and broader sectoral comparisons.

Keywords: Working Capital, Paper Industry, Economy Development, Current Ratio

Authors' individual contribution: Conceptualization — S.V.; Methodology — S.V.; Formal Analysis — A.M.A. and S.V.; Investigation — A.M.A. and N.Q.K.; Data Curation — A.M.A. and F.M.D.; Writing — Original Draft — S.V. and M.A.S.; Writing — Review & Editing — A.M.A. and S.V.; Visualization — A.M.A., S.V., and Y.Y.F.; Supervision — A.M.A.; Project Administration — A.M.A.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

The study in the paper industry focuses on several key objectives to drive the sector forward. Sustainability is at the forefront, aiming to develop and implement practices that minimize environmental impact by reducing deforestation, conserving water, and lowering greenhouse gas (GHG) emissions. This is closely followed by efficiency, which seeks to optimize production processes to cut down on waste, energy consumption, and costs, thereby improving overall profitability. Innovation is another crucial objective, pushing for the introduction of new technologies and materials that enhance the quality and functionality of paper products, making them more competitive in the market (Yogendrarajah & Thanabalasingam, 2011). To ensure these products meet consumer needs, market analysis is conducted to understand market trends and preferences, aligning product offerings accordingly. Supply chain management is also a critical focus, aiming to streamline the procurement of raw materials and improve distribution efficiency, which helps in reducing costs and waste. Lastly, regulatory compliance ensures that all processes and products meet local and international standards, avoiding legal issues and maintaining the company's reputation (Sarma et al., 2020), These combined efforts are essential for the sustainable and profitable growth of the paper industry. Paper industries can reduce resource consumption by adopting efficient technologies, transitioning to renewable energy sources, implementing effective waste management, obtaining certifications like Forest Stewardship Council, embracing a circular economy, investing in eco-friendly materials, and collaborating with stakeholders to foster transparency and accountability in sustainability efforts. These measures can help reduce the environmental impact of paper production and promote biodiversity. Paper manufacturing companies play the most significant role in the economy. In general life paper is considered as basic needs of current life. For communication in writing, paper plays a significant role in the world (Prathap & Suhas, 2022).

This study highlights several key benefits for the paper industry's sustainability and growth. Environmental protection is prioritized, with sustainable practices reducing deforestation, conserving water, and lowering GHG emissions. Economic advantages arise from efficient production processes that cut costs, which can benefit consumers or be reinvested. Innovation provides a competitive edge by differentiating companies through unique products and processes. Improved resource management and supply chain practices optimize raw material use, reduce waste, and enhance profitability. Understanding market trends and consumer preferences boost consumer satisfaction and brand loyalty (Ajmera, 2019). Compliance and risk management are essential for ensuring adherence to local and international regulations, which helps avoid legal issues and maintain the company's reputation. Sustainable practices support long-term viability by balancing economic growth with environmental stewardship. The paper industry remains crucial globally, as the paper is integral for planning, communication, record-keeping, and news dissemination, reinforcing its significant role in modern life (Doorashamy & Garbharran, 2015). For the generation of knowledge, the book is an essential part and that is supported by only paper manufacturing companies (Srinivas, 2018). It is also noted hear that the Indian paper and paper product market reach 13.4 billion by 2024. According to the baseline scenario, domestic output would increase to 22.0 million by 2024–2025, while consumption will increase to 23.5 million. In order to fulfill the rising demand, an additional one million integrated pulp, paper, and paperboard capacity must be built in India each year (Doorashamy & Garbharran, 2015). If we describe the importance of the study then research work helped in understanding the concept of working capital management in paper companies. With the selected ratios it gave a clear idea about how selected companies manage their working capital in business and meet their day-to-day expenses. It also helps the government to frame policies and schemes for business organizations. The study in the paper industry encompasses several key benefits essential for its sustainability and growth. Environmental protection is a primary focus, as sustainable practices help reduce deforestation, conserve water, and lower GHG emissions, contributing significantly to environmental conservation (Farhan et al., 2021) This environmental responsibility is complemented by economic benefits, where efficient production processes lead to substantial cost savings that can be passed on to consumers or reinvested into the company. Competitive advantage is gained through product and process innovation, which sets a company apart from competitors. Effective resource management and improved supply chain practices reduce waste and increase profitability. Understanding market trends and consumer preferences enhances consumer satisfaction and brand loyalty. Compliance and risk management ensure adherence to regulations, avoiding legal issues and protecting the company's reputation. Sustainable practices balance economic growth with environmental stewardship, securing long-term viability and the industry's future success (Gupta et al., 2023).

The paper provides a comprehensive analysis of various studies related to financial performance, risk management, and working capital management across diverse industries and geographies. It also offers a detailed literature review, emphasizing the importance of both internal governance mechanisms, such as risk management committees (RMCs), and external economic challenges in shaping corporate performance. The literature spans regions like Iraq, the Western Balkans, India, Spain, and China, illustrating the global relevance of these topics.

Additionally, the paper integrates various methodologies from different studies, including the generalized method of moments (GMM), panel data analysis, and dynamic panel data techniques. This approach underlines the complex nature of financial performance metrics, particularly within the manufacturing, pharmaceutical, and paper industries. Future research directions could explore the integration of internal and external factors in financial analysis, aiming to develop a more holistic understanding of corporate performance. Furthermore, the paper emphasizes sustainability in industries such as paper manufacturing, where energy-efficient practices and waste management contribute to financial and environmental performance. The inclusion of studies on low-carbon operations in pulp and paper industries (Lipiäinen et al., 2022) further enriches this perspective. The study employs analytical methods to critically evaluate data from

the annual reports of four paper companies, using purposive sampling techniques, frequency distribution, descriptive statistics, and analysis of variance (ANOVA). Hypothesis testing on various financial ratios underscores significant differences in the working capital management practices among the companies. Based on the above observation researchers come to the conclusion a very few studies have taken place in the paper industry (Garg & Singh, 2024).

The authors identify the following research objectives:

- to analyse liquidity position in selected paper manufacturing companies;
- to study inventory and debtor turnover ratios in selected paper manufacturing companies;
- to identify the number of days in the working capital of selected paper manufacturing companies;
- to study working capital differences among paper companies in India.

The study highlights the positive effects of RMC size, independence, and gender diversity on company performance but does not account for external economic conditions like financial crises. Exploring these conditions could offer a more comprehensive view. Sector-specific analysis might reveal varying impacts of RMC across industries, and long-term effects could uncover trends not apparent in the short term. Additionally, the study overlooks behavioural and cultural factors, which could provide deeper insights. Investigating RMC integration with other corporate governance mechanisms and employing both quantitative and qualitative measures could enhance understanding. Comparative studies across regions could also determine if the observed relationships are consistent globally (Farhan et al., 2021).

The structure of this paper is clearly segmented as follows. Section 2 offers a literature review. Section 3 focuses on the methodology. Section 4 provides the results of the study. Section 5 analyzes the main findings. Section 6 presents the conclusion and describes limitations, recommendations, and future research directions.

2. LITERATURE REVIEW

Working capital management is crucial for maintaining financial health and optimizing firm performance across different economies. Various studies have explored the relationship between WCM and firm profitability, with mixed findings influenced by economic conditions, industry factors, and management strategies. Kiymaz et al. (2024) examine working capital management in developed and emerging economies, finding an inverse relationship between the cash conversion cycle and firm performance, with developed economies benefiting from longer inventory holding periods while emerging economies experience negative effects from extended inventory days, collection periods, and payable periods. Firm-specific factors such as size, growth, profitability, and leverage, along with macroeconomic variables like gross domestic product (GDP), interest rates, and inflation, play significant roles in working capital management efficiency. Osei et al. (2023) study the impact of working capital management on manufacturing firms in Ghana, emphasizing that ineffective working capital management leads to financial distress, whereas efficient management of cash, inventories, debtors, and creditors ensures firm sustainability. Their analysis of 55 large-scale firms (2002–2022) using fixed and random effect models reaffirmed the importance of strategic working capital management measures in developing economies. Additionally, Rahman and Wahyudi (2023) conducted a systematic literature review on working capital management strategies in the manufacturing sector, analyzing 30 articles published in 24 journals (2018–2023). Their findings reveal that European countries dominate working capital management research, with significant gaps in Southeast Asia. Most studies focus on the correlation between working capital management and firm performance using return on assets (ROA) as a measure. The literature underscores the importance of working capital management in manufacturing firms, where working capital funding is vital for operational efficiency. However, further research is needed in underrepresented regions, comparative studies across industries, and the impact of emerging economic challenges such as inflation volatility and supply chain disruptions. This review highlights the necessity of tailored working capital management strategies based on economic and firm-specific contexts, laying the foundation for future empirical investigations (Rahman & Wahyudi, 2023).

This interconnected view underscores the importance of considering both internal governance mechanisms and external economic conditions in understanding and enhancing the performance of financial institutions. Future research could benefit from integrating these aspects to provide a more comprehensive understanding of corporate performance determinants (Farhan et al., 2021). The GMM model reveals significant differences in managing working capital among small, medium, and large firms. Collection, payable, and inventory holding periods positively impact the financial performance of Indian pharmaceutical companies, while cash conversion cycles negatively affect these metrics.

The study by Panigrahi (2017) reveals that tangibility, leverage, business nature, and board size are significant factors in predicting future net and gross working capital requirements. Return on common equity and board size positively affect gross working capital, while tangibility, nature, and firm size negatively affect net working capital (NWC). The results of Sisay and Nongmaithem (2019) indicate that there is a significant negative impact of operating cash flow on the cash conversion cycle which is a comprehensive measure of working capital management. The result also shows that there is *t* significant positive impact of sales growth on the cash conversion cycle, and there is no significant effect of variables like size, ROA, current ratio and debt ratio on the cash conversion cycle. Sisay and Nongmaithem's (2019) results conclude that sales growth and operating cash flow have a significant impact on the cash conversion cycle.

The research paper by Ambati (2017) examines Sirpur Paper Mills Limited's working capital levels, composition, turnover, and liquidity position to optimize liquidity management and profitability, highlighting the importance of a systematic approach to maximizing asset utilization. Gupta et al. (2023) found no significant relationship between the creditor payment period and Tobin's Q, and firm value is positively impacted by company size, net profit ratio, sales growth, and GDP,

suggesting manufacturing firms can enhance value. Sarma et al. (2020) examine the relationship between working capital management and profitability, average receivable period, inventory conversion period, average payment period, and cash conversion cycle. Results show a negative correlation between profitability and days of accounts payables and inventory, while a positive correlation exists with working capital management. Ajmera (2019) examines the impact of capital structure on the financial performance of Indian paper manufacturing companies over a five-year period (2014–2015 to 2018–2019). Using secondary data, the research applies accounting ratios, panel data analysis, correlation matrix, and descriptive statistics. Key financial metrics evaluated include ROA, return on capital employed (ROCE), earning per share (EPS), and firm valuation, which suggest strong financial performance. The study identifies the debt-to-equity ratio, long-term debt-to-equity ratio, firm size, and interest coverage ratio as key variables. Results show that the interest coverage ratio significantly influences the return on sales (ROS) and ROA, while debt metrics notably affect ROCE.

Rey-Ares et al. (2021) investigate the effect of working capital management on the profitability of Spanish fish canning enterprises, particularly in the context of credit scarcity due to the COVID-19 crisis. The fish canning industry plays a vital role in the Spanish economy, with Spain being the European Union's largest canned seafood producer. Using a sample of 377 firms from 2010 to 2018 and a dynamic panel data technique, the research explores the relationship between working capital management and profitability. The findings suggest that optimal receivables balance sales growth and funding costs, and there is a convex relationship between inventory investment and profitability.

Suyuthi et al. (2022) focus on designing a hydrant piping system for fire safety in boiler plants of paper-producing companies. Specifically, it aims to develop a system for PT Mekabox International that meets industry standards. The design includes a mechanism where a suction pump draws water from an underground reservoir when a fire occurs. For a boiler plant area of 2016 m², the study finds that two pillar hydrants are necessary, capable of discharging 432 m³ of water per hour for two hours, with a pipe diameter of at least six inches. Lipiäinen et al. (2022) explore how the pulp and paper industries in Finland and Sweden are transitioning to energy-efficient, low-carbon operations to address global warming, ensure energy security, and maintain competitiveness. It analyses the energy transition in the 2000s, using decomposition analysis and the energy efficiency index to compare energy consumption patterns. The research highlights increased investments in energy technologies and a shift towards renewable energy. The findings suggest that kraft pulp mills have significant potential to reduce CO^2 emissions by improving efficiency, reducing fossil fuel use, and expanding biofuel and green energy adoption.

Yogendrarajah and Thanabalasingam (2011) analysed working capital management and performance based on empirical evidence from an emergent economy. This research investigates the connection between working capital and business performance in manufacturing small and medium-sized enterprises in Chile. The businesses were examined for a total of six months. From 2013 and 2018 researchers employed a stratified sample technique to distribute a questionnaire to the chosen businesses. The results of the investigation showed a negative and strong correlation between profitability, active accounts, and NWC. Alternatively, there is a positive correlation between payables and inventories. The robustness tests supported our findings. Yogendrarajah and Thanabalasingam (2011) add to the body of knowledge by supplying further empirical data on the particular context evaluation.

Zeng and Ukwuegbu (2022) examine the impact of working capital management on the business performance of 80 non-financial Mexican firms from 2015 to 2021. Motivated by the lack of empirical data for emerging economies, it uses a fixed effect panel model to analyse the relationship between working capital management and profitability. The results show that effective working capital management negatively impacts profitability, suggesting that firms should shorten their cash conversion cycles to enhance profits. These findings align with previous international studies and provide valuable insights for managers and directors of Mexican companies to improve financial performance through better working capital management.

Zalyhina and Cheprasova (2022) investigate the feasibility of using paper industry slag in the production of building ceramics as part of sustainable development efforts. Ceramic bricks were made by incorporating slag in varying percentages (5%, 10%, 15%) as a burnable ingredient, alongside quartz sand and clay. The slag underwent different pre-processing methods, including drying, grinding, and granulating. Samples were melded, dried at 100°C, and fired at temperatures ranging from 900 to 1050°C. Results show that bricks made with slag possess high physical and mechanical qualities, meeting industry standards and offering a solution for waste management in the paper industry.

Bin-Feng et al. (2022) explore the impact of family control and working capital strategy on corporate risk-taking in China, using data from A-share-listed family businesses from 2010 to 2018. Multiple regression analysis shows that a conservative working capital strategy reduces risk-taking, while increased family control in Chinese firms promotes it. Family control also moderates the effect of working capital strategy on risk-taking, weakening the inverse relationship between risk-taking and working capital conservatism. The findings provide insights for family business managers to adjust risk-taking behaviours as working capital strategies evolve.

Panigrahi et al. (2022) have worked on manufacturing businesses listed in Oman to provide proof of the relationship between working capital management and shareholder value generation. Working capital management is essential to the profitability of industrial enterprises when funding is limited, as it is right now as a result of the COVID-19 crisis. Examining the relationships between working capital management, profits quality, sales growth, and shareholder wealth of listed manufacturing businesses in Oman is the main objective of this article. Using balanced panel data, 31 manufacturing businesses that were listed on the Muscat Stock Exchange (MSE) between 2004 and 2019 were included in the research. Days in working capital are found to negatively affect

the ROA, while cash conversion cycle, payable delayed time, sales growth, and profits quality positively influence shareholder wealth as indicated by ROA. This study contributes to the literature on working capital management, profit quality, and sales growth by advancing our understanding of methodology, the impacts of working capital management components on production firms' shareholders, and socioeconomic data from Oman.

Prathap and Suhas (2022) analyse how working capital management affects the performance of Bailley Ltd. The research focuses on managing key components of working capital cash, inventories, receivables, and payables — and their influence on profitability. Analyzing data from 2016 to 2020, the study highlights the critical role of efficient working capital management in determining an organization's overall success. It compares findings from previous research with the current study to provide a comprehensive view of working capital's impact on business performance.

The research on working capital management in the paper industry identifies several gaps. It lacks exploration into how external economic conditions, such as financial crises, impact working capital practices. There's also a need for sector-specific analyses to uncover differences across various segments of the paper industry. Long-term trends and the influence of organizational behaviour and culture on working capital management are underexplored. Additionally, there is a gap in understanding how working capital management integrates with other corporate governance mechanisms, and the incorporation of qualitative methods could enrich the analysis. Finally, comparative studies across different regions are needed to determine if the observed practices and trends are consistent globally. Based on the above literature review, objectives, and Farhan et al. (2021) and Panigrahi et al. (2022), researchers have used the following hypotheses, which test the uniformity of financial performance metrics across selected paper manufacturing companies:

H_0: The performance of current ratios, quick ratios, inventory turnover ratios, debtor turnover ratios, and the number of days in working capital ratios among selected paper manufacturing companies will be the same.

Despite extensive research on working capital management and firm performance, significant gaps remain. Studies reveal mixed findings influenced by economic conditions, industry dynamics, and management strategies. While research highlights the inverse relationship between the cash conversion cycle and profitability, sector-specific analyses particularly in the paper industry are scarce. Most studies focus on developed economies, leaving emerging markets underexplored, especially in Southeast Asia. Additionally, working capital management research predominantly relies on ROA as a performance metric, overlooking other financial indicators. The role of macroeconomic conditions, corporate governance, and financial crises in shaping working capital management strategies remains under-examined. Furthermore, existing studies lack longitudinal perspectives and qualitative insights, limiting a holistic understanding of working capital management practices. Addressing these gaps, this study aims to evaluate the uniformity of financial performance metrics in selected paper manufacturing firms, integrating economic, firm-specific, and governance-related factors.

3. RESEARCH METHODOLOGY

3.1. Research design

This study is categorized as analytical or empirical, relying on pre-existing data to critically evaluate working capital management in selected paper manufacturing companies. The research uses information gathered from the annual reports of four paper companies, selected through purposive sampling techniques (Panigrahi et al., 2022). Analytical methods employed include frequency distribution (simple tabulation), descriptive statistics, and ANOVA, covering the study period from 2017–2018 to 2021–2022. The scope of the study is divided into functional and geographical dimensions. The functional scope includes key components of working capital management such as current ratios, quick ratios, inventory turnover ratios, debtor turnover ratios, and the number of days in working capital. The geographical scope is defined by the companies' operations across India. Due to constraints such as time and resources, a full population study was impractical; hence, purposive sampling was used to select companies with higher cash and bank balances, ensuring the relevance and adequacy of the sample (Farhan et al., 2021).

To supplement the current methodology, alternative approaches could be considered. Qualitative methods such as interviews with financial managers could provide deeper insights into the working capital management practices and challenges faced by these companies. Additionally, a case study approach might offer a more detailed examination of specific companies' financial strategies and outcomes. Expanding the study to include a comparative analysis of companies in different sectors could also provide broader insights into industry-specific working capital management practices. Finally, incorporating longitudinal data could help understand long-term trends and effects, enhancing the robustness of the findings (Gupta et al., 2023).

3.2. Sample selection

In this study, a purposive random sampling method was utilized to address the practical constraints of analysing an entire population. Following the guidance of Farhan et al. (2021), who emphasize the necessity of sampling when full population studies are unfeasible, and Lipiäinen et al. (2022), who highlight the value of purposive sampling in focusing on specific attributes, the sample was selected based on companies' higher cash and bank balances.

Table 1. Selected samples (name of companies)

No.	*Selected companies*	*Cash and bank (in crore)*
1	Seshasayee Paper	116.12
2	South India Paper	27.39
3	Andhra Paper	24.54
4	JK Paper	14.28

Source: Selected sample based on purposive random sampling from www.moneycontrol.com and Lipiäinen et al. (2022).

This approach ensures that the chosen firms-Seshasayee Paper, South India Paper, Andhra Paper, and JK Paper are representative of entities with

significant financial resources. Such a selection criterion is intended to provide deeper insights into financial performance metrics by focusing on firms with potentially impactful financial capabilities. This method balances practical constraints with the need for meaningful data, thereby enhancing the relevance and accuracy of the study's findings (Lipiäinen et al., 2022).

4. RESEARCH RESULTS

4.1. Descriptive statistics

Data collection is the most crucial part of any research process. For this research work, secondary data have been used from annual reports, magazines, newspapers research articles and research projects. Raw data have no meaning so it is tabulated in proper format and arranged it.

Table 2. Current ratio (in times)

Years	*Seshasayee Paper*	*South India Paper*	*Andhra Paper*	*JK Paper*
2017–2018	0.99	1.26	0.69	0.77
2018–2019	1.26	1.94	1.11	0.62
2019–2020	1.51	1.61	1.76	0.79
2020–2021	1.57	0.94	1.36	0.7
2021–2022	1.57	0.7	1.19	0.7
Average	1.38	1.29	1.222	0.716
Maximum	1.57	1.94	1.76	0.79
Minimum	0.99	0.7	0.69	0.62

Source: Authors' elaboration based on annual reports of the company.

According to Table 2, from 2017–2018 to 2021–2022, the current ratio for Seshasayee Paper showed an increasing trend from 0.99 to 1.57, averaging 1.38, which is below the standard 2:1 ratio. South India Paper exhibited a decreasing trend, starting at 1.26 in 2017–2018 and dropping to 0.7 by 2021–2022, with an average ratio of 1.29. Andhra Paper had an average ratio of 1.222, with a peak of 1.76 in 2019–2020 and a low of 0.69 in 2017–2018. JK Paper had the lowest average ratio, ranging from 0.62 to 0.79, indicating insufficient current assets to cover liabilities.

Table 3. Quick ratio (in times)

Years	*Seshasayee Paper*	*South India Paper*	*Andhra Paper*	*JK Paper*
2017–2018	0.65	1.15	0.52	0.45
2018–2019	0.99	1.23	0.73	0.35
2019–2020	1.11	1.65	1.1	0.58
2020–2021	0.96	1.43	0.98	0.62
2021–2022	1.29	1.4	1.06	0.8
Average	1	1.372	0.878	0.56
Maximum	1.29	1.65	1.1	0.8
Minimum	0.65	1.15	0.52	0.35

Source: Authors' elaboration based on annual reports of the company.

According to Table 3, the quick ratios of the selected companies vary significantly. Seshasayee Paper maintained the standard quick ratio of 1:1, with a range from 0.65 to 1.29. South India Paper performed well with an average ratio of 1.37:1, ranging from 1.15 to 1.65, showing stability over the period. Andhra Paper had an average ratio of 0.89, fluctuating between 0.77 and 1.00, indicating variability. JK Paper had the lowest average ratio of 0.56:1, with a maximum of 0.80 and a minimum of 0.35, reflecting considerable inconsistency.

Table 4. Inventory turnover ratio

Years	*Seshasayee Paper*	*South India Paper*	*Andhra Paper*	*JK Paper*
2017–2018	7.08	3.84	8.27	7.3
2018–2019	9.85	6.66	9.09	10.1
2019–2020	6.99	6.75	5.68	6.83
2020–2021	3.44	7.71	5.4	7.93
2021–2022	10.92	8.59	9.51	8.54
Average	7.656	6.71	7.59	8.14
Maximum	10.92	8.59	9.51	10.1
Minimum	3.44	3.84	5.4	6.83

Source: Authors' elaboration based on annual reports of the company.

According to Table 4, the inventory turnover ratios for the selected companies from 2017–2018 to 2021–2022 show varied trends. Seshasayee Paper had an average ratio of 7.66 times, with a high of 10.92 and a low of 3.44, reflecting fluctuations in efficiency. South India Paper's average ratio was 6.71 times, with a rising trend from 3.84 to 8.59 times. Andhra Paper exhibited a fluctuating trend with an average ratio of 7.59 times, ranging from 5.4 to 9.51 times. JK Paper had the highest average ratio of 8.41 times, peaking at 10.1 times in 2018-19 and dropping to 6.83 times in 2019–2020.

Table 5. Debtors turnover ratio

Years	*Seshasayee Paper*	*South India Paper*	*Andhra Paper*	*JK Paper*
2017–2018	10.42	3.94	18.44	25.86
2018–2019	14.27	6.22	19.94	34.95
2019–2020	14.79	6.29	22.21	40.22
2020–2021	9.63	5.97	15.24	35.64
2021–2022	14.82	6.46	15.5	26.86
Average	12.786	5.776	18.266	32.706
Maximum	14.82	6.46	22.21	40.22
Minimum	9.63	3.94	15.24	25.86

Source: Authors' elaboration based on annual reports of the company.

According to Table 5, the debtor turnover ratios for the period from 2017–2018 to 2021–2022 reveal the following trends: Seshasayee Paper had an average ratio of 12.78 times, with a high of 14.82 and a low of 9.63. South India Paper averaged 5.78 times, fluctuating between 3.94 and 6.46. Andhra Paper had an average ratio of 18.26, with a peak of 22.21 in 2019–2020 and a low of 15.5 in 2020–2021. JK Paper showed the highest average ratio of 32.71 times, ranging from a maximum of 40.22 in 2019–2020 to a minimum of 25.86 in 2017–2018.

Table 6. Number of days in working capital

Years	*Seshasayee Paper*	*South India Paper*	*Andhra Paper*	*JK Paper*
2017–2018	21.5	116.62	-3.43	-12.37
2018–2019	50.92	72.74	12.48	-37.85
2019–2020	100.96	74.72	67.23	-11.68
2020–2021	126.14	74.64	60.74	-15.37
2021–2022	75.04	75.41	35.22	13.72
Average	74.912	82.826	34.448	-12.71
Maximum	126.14	116.62	67.23	13.72
Minimum	21.5	72.74	-3.43	-37.85

Source: Authors' elaboration based on annual reports of the company.

According to Table 6, the number of days in working capital for 2017–2018 to 2021–2022 showed varying trends across companies. Seshasayee Paper had an average of 74 days, with a fluctuating trend. South India Paper averaged 82 days, ranging from a maximum of 116 days in 2017–2018 to a minimum of 72 days in 2018–2019, showing a decreasing trend. Andhra Paper averaged 34 days, with a peak of 67 days in 2019–2020 and a minimum of -3.43 days in 2017–2018. JK Paper had an average of -12.71 days, with the highest at 13.72 days in 2021–2022 and the lowest at -37.85 days in 2018–2019. Negative days for JK Paper indicate that payables were managed longer than receivables, allowing the company to use creditor funds without interest.

4.2. Hypothesis testing

The ANOVA testing results assess whether significant differences exist in working capital ratios among selected paper manufacturing companies. The ratios analysed include current ratios, quick ratios, inventory turnover ratios, debtor turnover ratios, and days in working capital. Current ratios measure liquidity, while quick ratios assess stricter liquidity by excluding inventory. Inventory turnover ratios reflect inventory management efficiency and debtor turnover ratios gauge receivables collection efficiency. The number of days in working capital indicates the speed of converting working capital into cash. ANOVA evaluates if differences in these ratios across companies are statistically significant, revealing whether variations in working capital management contribute to differing financial performances among the firms.

Table 7. ANOVA testing of the hypothesis

No.	*Ratio*	*p-value*	*Result*
1	Current ratio	0.0316	Rejected
2	Quick ratio	0.000199	Rejected
3	Inventory turnover ratio	0.7435	Accepted
4	Debtors turnover ratio	3.1E-08	Rejected
5	Number of days in working capital	0.000266	Rejected

Source: Authors' elaboration.

This study conducted hypothesis testing on various financial ratios of selected paper companies to understand their working capital management and liquidity positions. The null hypothesis (H_0) for each test was that there was no significant difference in the respective ratios among the selected companies. Table 7 above indicated hypothesis testing and it was performed at a 5% level of significance. The ANOVA test revealed significant differences in the working capital management ratios among the selected paper companies during the study period. H_0 was rejected in all ratios except inventory turnover ratios. For the most part, the hypothesis was rejected, with variations in working capital management ratios. The study also found is significant difference in how all paper companies handle their liquidity, indicating a significant difference in their financial management (Doorashamy & Garbharran, 2015).

5. DISCUSSION

The financial ratios of Seshasayee Paper, South India Paper, Andhra Paper, and JK Paper from 2017–2018 to 2021–2022 reveal insights into their operational efficiency and liquidity management. For Seshasayee Paper, the current ratio increased from 0.99 in 2017–2018 to 1.57 in the later years, averaging 1.38, which is below the standard 2:1, indicating insufficient current assets to meet liabilities. South India Paper showed a decreasing trend, with the ratio falling from 1.94 in 2018–2019 to 0.7 in 2021–2022, hinting at a possible increase in liabilities or reduction in assets. Andhra Paper's average current ratio was 1.22, with the lowest being 0.69 in 2017–2018, showing some fluctuation but generally underperforming. JK Paper consistently had the lowest ratios, peaking at 0.79 in 2019–2020, suggesting poor asset-liability management. Regarding quick ratios, Seshasayee Paper maintained an average of 1:1, meeting the standard, while South India Paper excelled with a 1.37 average, indicating strong

liquidity. Andhra Paper and JK Paper fell short, with averages of 0.89 and 0.56, respectively, indicating potential liquidity issues. Inventory turnover ratios showed mixed trends: Seshasayee Paper and Andhra Paper had average ratios of 7.66 and 7.59, respectively, reflecting decent inventory management, while South India Paper's ratio rose from 3.84 to 8.59, showing improvement. JK Paper's fluctuating ratio, averaging 8.41, suggests variability in inventory conversion. Debtor turnover ratios were highest for JK Paper, averaging 32.71, indicating efficient receivables management, while Seshasayee Paper and Andhra Paper also performed well with averages of 12.78 and 18.26, respectively. South India Paper lagged with an average of 5.78, pointing to slower receivables collection. Lastly, working capital days showed Seshasayee Paper and South India Paper requiring significant time to convert inventory to cash, with averages of 74 and 82 days, respectively. Andhra Paper had a more efficient cycle at 34 days, while JK Paper's negative average of -12.71 days suggested delayed payables, potentially beneficial for cash flow management. Overall, the analysis highlights varied performance across the companies, with areas of strength and opportunities for improvement in managing liquidity and operational efficiency (Panigrahi et al., 2022).

- *Current ratio*: With a p-value of 0.0316, H_0 was rejected, indicating a significant difference in the current ratios among the selected paper companies. This suggests variability in their ability to cover short-term liabilities.
- *Quick ratio*: The p-value of 0.000199 led to the rejection of H_0, showing significant differences in the quick ratios, reflecting diverse liquidity management practices.
- *Inventory turnover ratio*: With a p-value of 0.7435, H_0 was accepted, implying no significant difference in inventory turnover ratios, suggesting similar efficiency in inventory management among the companies.
- *Debtors turnover ratio*: The p-value of 0.0038 resulted in the rejection of H_0, indicating significant differences in how quickly companies collect receivables.
- *Number of days in working capital*: With a p-value of 0.000266, H_0 was rejected, highlighting significant differences in the number of days in working capital, which reflects varying efficiencies in managing working capital.

These results underscore the diversity in financial management practices among the selected paper companies, emphasizing the need for tailored strategies to improve liquidity, credit management, and overall financial health.

6. CONCLUSION

The following findings have been obtained from the above analysis.

The position of the current ratio in selected companies indicated that Seshasayee Paper has the highest ratio out of other companies. JK Paper indicated not a good position in the current ratio during the study period. For JK Paper it may also say negative working capital due to lower current ratios during the study period. The performance of South India Paper in quick ratio is good as compared to other selected companies based on average ratio. The average quick ratio of Seshasayee Paper is 1:1 which indicates fulfilment of standard norms. JK Paper indicated the highest average inventory turnover ratio during the study period. Seshasayee Paper has second potion in inventory turnover ratio whereas Andhra Paper indicated third position out of selected companies. The performance of JK Paper is quite good as compared to other selected companies. The debtor's turnover ratio indicated the relationship between receivables and sales. It indicated a number of times debtors have been converted into sales. A higher ratio indicated a good position for the company. JK Paper indicated a good position in the debtors turnover ratio because it was indicated 32.71 times means the company has the potential to convert their sales into debtors 32 times. South India Paper indicated lower efficiency in the debtor's turnover ratio. The number of days in the working capital ratio indicates how many days are required to convert their raw material into cash. A higher ratio indicated a less effective working capital cycle whereas a lower ratio indicated a high effectiveness of a working capital cycle. A negative working capital cycle indicates more time allowed by payable as compared to receivables or current liabilities is more as compared to current assets. Out of the selected companies, JK Paper is the only single company which indicated a negative working capital cycle. The study examines the current ratio, quick ratios, inventory turnover ratio, and debtor turnover ratios of selected paper companies from 2017–2018 to 2021–2022. Seshasayee Paper had a current ratio of 0.99, which did not meet the standard norms of 2:1. The South India Paper company had a current ratio of 1.26, which increased to 1.57 and 1.56 between 2018–2019 and 2021–2022. Andhra Paper had an average ratio of 1.22:1, while JK Paper had the lowest average current ratio. Quick ratios showed a fluctuating trend, with the highest ratios observed in 2019–2020 and 2020–2021. Seshasayee Paper maintained a standard ratio of 1:1, while South India Paper had a quick ratio of 1.37:1, and JK Paper had an average ratio of 0.56:1. Inventory turnover ratios also showed fluctuating trends, with Seshasayee Paper having the second-highest ratio at 7.66 times. Debtor turnover ratios showed fluctuating trends, with Seshasayee Paper having an average ratio of 12.78 times and South India Paper having an average ratio of 5.78 times. The ANOVA test revealed significant differences in working capital management ratios among the selected paper companies, with H_0 rejected in all ratios except inventory turnover ratios. The study also found significant differences in how all paper companies handle their liquidity, indicating a significant difference in their financial management.

These findings have practical implications for financial managers and stakeholders in the paper industry. Companies with lower current and quick ratios may need to improve their liquidity management to meet short-term obligations (Almansour & Ismail, 2024). High inventory turnover ratios suggest efficient inventory management, but fluctuating debtor turnover ratios highlight the need for consistent credit policies. The significant differences in financial management practices among the companies underscore the importance of tailored financial strategies to enhance overall performance and sustainability in the competitive paper industry.

Based on the findings from this study, future research could expand the understanding of working capital management in the paper manufacturing industry by exploring several key areas. One important direction is to investigate how industry-

specific factors, such as fluctuations in raw material costs or evolving demand for paper products, influence working capital ratios. This could provide insights into how external variables impact liquidity and operational efficiency. Additionally, examining the relationship between working capital management and other financial performance indicators, such as profitability or market share, could offer a more holistic view of how liquidity management affects overall business success (Mulyadi & Anwar, 2023). Longitudinal studies tracking these financial metrics over extended periods could reveal how companies adapt to economic shifts and market changes. Comparative research across different industries or regions might also be beneficial in determining whether the observed trends are unique to the paper industry or part of broader financial management patterns. Furthermore, incorporating qualitative methods, such as interviews with financial managers, could provide deeper insights into the practical strategies and challenges of managing working capital, complementing the quantitative findings of this study.

The study on working capital management in the paper industry has some limitations. It primarily relies on quantitative data from financial ratios without considering external economic conditions, such as financial crises, which could affect the results. The focus is limited to a few companies, which may not fully represent the industry as a whole. Additionally, the study does not explore long-term trends, organizational behaviour, or the integration of working capital management with other corporate governance mechanisms. It also lacks qualitative insights and comparative analysis across different regions, which could provide a broader perspective on the effectiveness of working capital practices.

REFERENCES

Ajmera, B. (2019). An empirical study on effect of capital structure on financial performance of paper manufacturing companies in India: Panel data analysis. *International Journal of Financial Management, 9*(3), 18–25. https://shorturl.at/0w81G

Almansour, H. M., & Ismail, M. (2024). Resolving business conflicts under arbitration procedures at the International Chamber of Commerce. *Corporate Law & Governance Review, 6*(2), 64–73. https://doi.org/10.22495/clgrv6i2p6

Ambati, Y. (2017). Working capital management in Indian paper industry — A study of Sirpur Paper Mills Limited — Kagaznagar, Telangana State. *EPRA International Journal of Economic and Business Review, 5*(10), 94–98. https://eprajournals.com/IJES/article/8244

Bin-Feng, C., Mirza, S. S., Ahsan, T., Safdar, R., Iqbal, A., & Hayat, M. (2022). Family control and corporate risk-taking in China: Does working capital strategy matter? *Economic Research-Ekonomska Istraživanja, 35*(1), 4280–4299. https://doi.org/10.1080/1331677X.2021.2013270

Doorashamy, M., & Garbharran, H. L. (2015). The effectiveness of material flow cost accounting (MFCA) in identifying non-product output costs. *Environmental Economics, 6*(2), 70–82. https://www.businessperspectives.org/images/pdf/applications/publishing/templates/article/assets/6658/ee_2015_02_Doorasamy2.pdf

Farhan, N. H. S., Belhaj, F. A., Al-Ahdal, W. M., & Almaqtari, F. A. (2021). An analysis of working capital management in India: An urgent need to refocus. *Cogent Business & Management, 8*(1), Article 1924930. https://doi.org/10.1080/23311975.2021.1924930

Garg, M. C., & Singh, M. (2024). Does working capital management affect financial performance: Empirical evidence of Indian manufacturing sector? *Journal of Operations and Strategic Planning, 7*(1), 48–64. https://doi.org/10.1177/2516600X241245808

Ghahramani, A., & Abbasi, A. (2016). Assessment of the relationship between occupational accident experience and personal and job factors in tar paper manufacturing companies. *Iran Occupational Health, 12*(6), 48–57. https://www.cabidigitallibrary.org/doi/full/10.5555/20163144056

Gupta, R., Jatav, S., & Prakash, G. (2023). Does management of working capital enhance firm value? Empirical analysis of manufacturing enterprises in India. *Investment Management and Financial Innovations, 20*(3), 224–237. https://doi.org/10.21511/imfi.20(3).2023.19

Kiymaz, H., Haque, S., & Choudhury, A. A. (2024). Working capital management and firm performance: A comparative analysis of developed and emerging economies. *Borsa Istanbul Review, 24*(3), 634–642. https://doi.org/10.1016/j.bir.2024.03.004

Lipiäinen, S., Kuparinen, K., Sermyagina, E., & Vakkilainen, E. (2022). Pulp and paper industry in energy transition: Towards energy-efficient and low carbon operation in Finland and Sweden. *Sustainable Production and Consumption, 29*, 421–431. https://doi.org/10.1016/j.spc.2021.10.029

Mulyadi, M., & Anwar, Y. (2023). Machine learning in accounting: Insight from the March 2023 bank failures. *Risk Governance and Control: Financial Markets & Institutions, 13*(2), 28–36. https://doi.org/10.22495/rgcv13i2p3

Osei, A., Osei Agyemang, A., Amoah, J. O., & Sulemana, I. (2023) Empirical study on the impact of working capital management on going concern of manufacturing firms in Ghana. *Cogent Business & Management, 10*(2), Article 2218177. https://doi.org/10.1080/23311975.2023.2218177

Panigrahi, A. K. (2017). Working capital management efficiency of the Indian cement industry. *NMIMS Journal of Economics and Public Policy, 11*, 8–28. https://ssrn.com/abstract=2914312

Panigrahi, S. K., Al Farsi, M. J., Kumaraswamy, S., Khan, M. W. A., & Rana, F. (2022). Working capital management and shareholder's wealth creation: Evidence from manufacturing companies listed in Oman. *International Journal of Financial Studies, 10*(4), Article 89. https://doi.org/10.3390/ijfs10040089

Prathap, B. N., & Suhas, K. N. (2022). A study on analysis of effect of working capital management on return on asset with speacial reference to Bailley Ltd. *International Journal of Creative Research Thoughts, 10*(9), 913–916. https://ijcrt.org/viewfull.php?&p_id=IJCRT2209246

Rahman, F. R., & Wahyudi, S. (2023). Working capital management strategies in the manufacture sector, systematic literature review. *International Conference on Digital Advanced Tourism Management and Technology, 1*(2), 377–390. https://doi.org/10.56910/ictmt.v1i2.99

Rey-Ares, L., Fernández-López, S., & Rodeiro-Pazos, D. (2021). Impact of working capital management on profitability for Spanish fish canning companies. *Marine Policy, 130*, Article 104583. https://doi.org/10.1016/j.marpol.2021.104583

Sarma, R. K., Bakshi, A., & Chhabra, S. (2020). Determinants of behaviour of working capital requirements of BSE listed companies: An empirical study using co-integration techniques and generalised method of moments. *Cogent Economics & Finance, 8*(1), Article 1720893. https://doi.org/10.1080/23322039.2020.1720893

Sisay, Y. H., & Nongmaithem, R. S. (2019). Effect of firm characteristics on working capital management of manufacturing firms in Amhara Ethiopia. *Parikalpana: KIIT Journal of Management, 15*(1–2), 9–28. https://www.proquest.com/docview/2399905149?sourcetype=Scholarly%20Journals

Srinivas, T. (2018). Financial soundness of selected Indian petroleum companies using Altman Z-score model. *Pacific International Journal, 1*(3), 129–134. https://rclss.com/pij/article/view/60/18

Suyuthi, A. I., Sufiyanto, S., & Widada, B. T. (2022). Application of hydrant piping system design in boiler in boiler plants for fire safety systems in paper producing companies. *Jurnal Penelitian, 19*(1), 45–54. https://doi.org/10.26905/jp.v19i1.7942

Xu, J., Hong, J., & Zhou, Z. (2023). Local attention to environment and green innovation: Evidence from listed manufacturing companies in 120 cities in China. *Emerging Markets Finance and Trade, 59*(4), 1062–1073. https://doi.org/10.1080/1540496X.2022.2128753

Yogendrarajah, R., & Thanabalasingam, S. (2011). *Working capital management and its impact on firms' financial performance: An analysis of trading firms* [Paper presentation]. International Conference at Rajarata University, Mihintale, Sri Lanka. https://ssrn.com/abstract=2444311

Zalyhina, V., Cheprasova, V., & Romanovski, V. (2022). Paper industry slag for the production of building ceramics. *Journal of Chemical Technology & Biotechnology*, *97*(11), 3091–3099. https://doi.org/10.1002/jctb.7174

Zeng, Y., & Ukwuegbu, N. (2022). *Effect of working capital management on firm performance*. https://ssrn.com/abstract=4088913