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AN INQUIRY INTO THE EFFECT OF WORKING CAPITAL MANAGEMENT ON FIRM PERFORMANCE USING A COMBINED APPROACH OF BIBLIOMETRIC AND THEMATIC ANALYSIS

Keywords: working capital, firm performance, bibliometric analysis, thematic analysis, operating cycle, profitability, firm value.

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J E L Classification: G3.

Abstract: The current study evaluates the existing literature to understand the evolving nature of the relationship between a firm's short-term financial decisions and its performance. This paper aims to understand the knowledge progression and its present status, and identify future research directions. The study achieves this by looking at the existing research through an integrated lens of bibliometric analysis and thematic literature review. The findings of bibliometric analysis reveal the most influential works and authors in the domain and discuss the conceptual and intellectual structure of working capital and its impact. Through the thematic analysis, the existing literature has been analyzed by grouping them under four major themes. Based on the findings, the current research gaps have been identified and the study has suggested the future research direction.

■■■ INTRODUCTION

Corporate finance theory offers four fundamental decisions of which the working capital (WC) decision deals with the application and raising of short-term funds of a firm. Brigham and Houston (2007) said that working capital is a financial parameter that depicts the operating liquidity that is available to companies. Working capital, which was seen as the summation of CA, gradually evolved, and the concept of net working capital (NWC), which is the difference between CA and CL (Bhattacharya, 2009), came to become more popular in usage. Further, investment in working capital can be compartmentalized and studied through various ratios like liquidity and activity ratios (Tauringana & Afrifa, 2013; Deloof, 2003); as well as through operating cycle (OC) and cash conversion cycle (CCC) (Gitman, 1974; Jose, Lancaster & Stevens, 1996; Mathuva, 2010). So, also the pattern of financing working capital can be studied in detail (Nobanee, Abdullatif & Al Hajjar, 2011).

PURPOSE OF THE STUDY & RESEARCH GAP

WC is a significant factor affecting the routine operations of a business; proper management of the same helps achieve the fundamental objective of maximizing shareholders' wealth and thereby resorting to value-based management (Raza, Tursoy, Shaikh & Shaikh, 2024). Smith (1973) noted that many firms fail because financial managers are unable to plan and control WC efficiently. Examining the WC to sales ratio can predict firm bankruptcy according to a study by Foreman (2003). However, contrary to conventional wisdom which sug-

gests that a dearth of WC makes a firm financially weak, this study observed that excessive levels of WC without a proper sales or customer base can lead a firm to insolvency. This view is supported by Kouaib and Haya (2024), and Chakraborty (2008) who opine that excess WC reflects operational inefficiency. Hence, observing the levels of WC and efficient management of WC becomes critical for the performance of the firm.

The authors reviewed the present works on WC management which have used a bibliometric approach. The search was carried out in the Scopus database using the words “working capital” and “bibliometric”. The search resulted in 4 documents of which only 2 were specifically carried out on working capital (Martinho, 2021; Nobanee & Dilshad, 2021). These two papers had taken a wide view of WC for their analysis; however, the current study restricts WC research in the context of firm performance.

This study aims to understand the evolution of literature and the current status of knowledge as well as identify future research directions in the domain of the impact of WC with following research questions:

RQ1: Which are the most influential documents, authors, sources, institutions, and countries in WC and firm performance research?

RQ2: What is the conceptual structure and intellectual structure of the research involving WC and firm performance?

RQ3: Which are the dominant themes of WC and firm performance research?

RQ4: Which areas in WC and firm performance need further research?

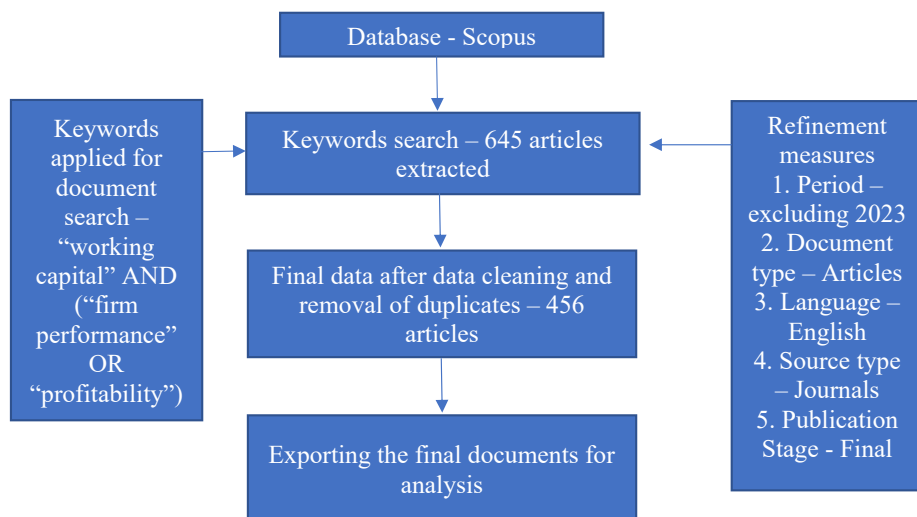
This study uses a two-step approach of presenting the bibliometric analysis and findings and supplementing the same with a thematic analysis of the literature. This approach not only validates the findings but also provides a comprehensive view of the domain of WC and firm performance. Moreover, it contributes to the field by reviewing the existing literature and eliciting novel factors for future studies.

RESEARCH METHODOLOGY & RESEARCH PROCESS

The bibliometric analysis is used to present the intellectual structure of studies in WC management. The thematic literature review classifies the existing body of literature into significant themes and presents the knowledge progression in those particular themes and also provides insights on future research directions.

To identify the documents relevant to the objectives of this research, a search was conducted on June 20, 2023, in the Scopus database. The study used strings like “working capital” AND “firm performance” and “working capital” AND “profitability”, since these were highly cited keywords (Martinho, 2021) as keywords for the search in author keywords, abstract, and title field. There was no limitation on the period of research, but documents from 2023 were not considered, as their publication stage and recency of publication may affect citation analysis. The combined searches resulted in 695 documents. The documents were checked for duplication, which resulted in the removal of 50 documents. The documents were then filtered for document type to include only Articles, language to include only English, source type to include only Journal, and publication stage to include only Final. No other refinements were made. The screening resulted in a total of 456 documents, which were finally considered for the bibliometric analysis using Biblioshiny (figure 1).

Figure 1. Flowchart of search strategy and document selection for bibliometric analysis



Source : authors' own creation.

BIBLIOMETRIC ANALYSIS AND FINDINGS

Descriptive Analysis

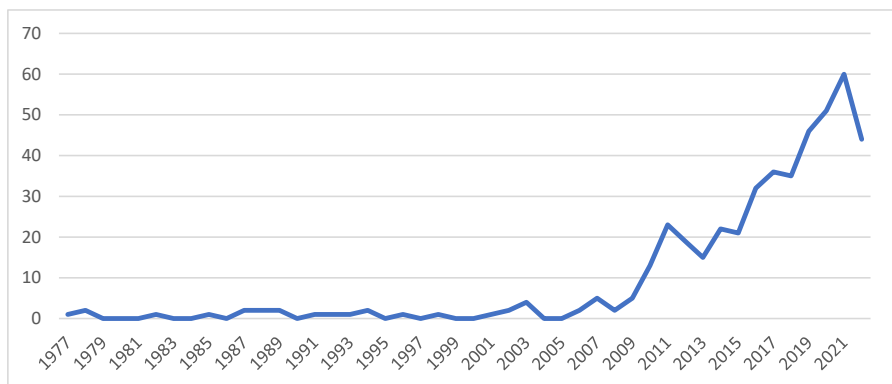
After the filtering process, 456 documents from 273 journals were elicited. About 978 authors were identified with 2.54 co-authors per document on average. The average number of citations per document came to 22.61. This shows multiple avenues of publication on the subject with a healthy number of researchers and networking as well.

This section analyzes the most influential documents, authors, sources, institutions, and countries in WC and firm performance research, primarily by looking at the number of articles published, the number of global and local citations, and normalized citations.

Annual Production

WC is one of the oldest financial decisions as elicited from the literature on corporate finance. Hence, the period of research publications was not restricted. However, beginning from 1977 till 2009, there was very sparse research on the topic (figure 2). Research on WC and firm performance or profitability picked up post-2009 and about 91% of the publications belong to these last twelve years (2010–2022).

Figure 2. Number of articles by year

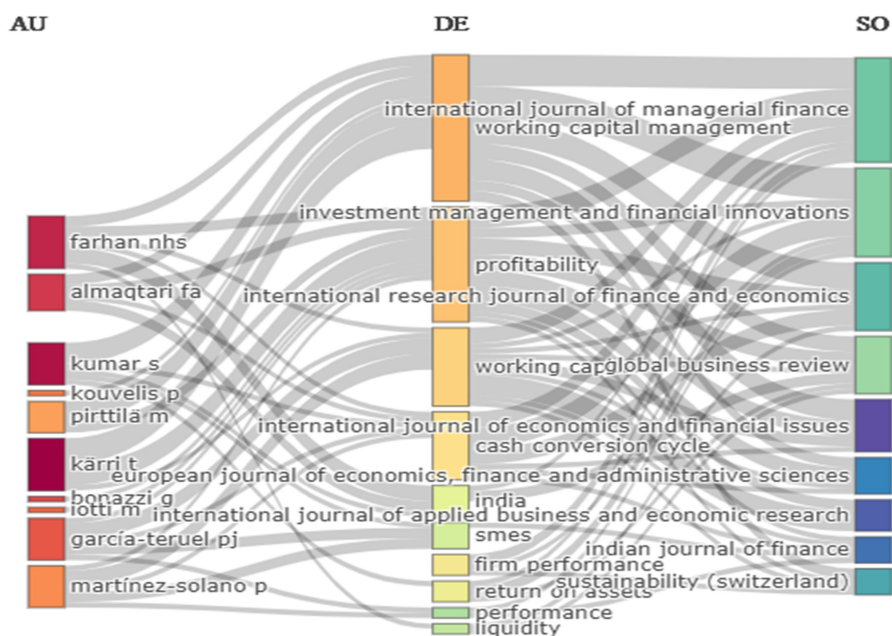


Source: authors' compilation.

Three Field Plot

The three-field plot (figure 3) depicts the relationship between three fields using Sankey Plots, where the size of the portion represents the node's value (Riehmman, Hanfler & Froehlich, 2005). The three fields were authors, keywords, and sources. As evident from figure 3, WC management/WC, profitability, and CCC are prominent keywords. Major journals to publish work on this topic are the International Journal of Managerial Finance, Investment Management and Financial Innovations, International Research Journal of Finance and Economics, and Global Business Review among others.

Figure 3. Three field plot



Source : authors' compilation.

Authors, Affiliations and Countries

The most relevant authors based on the number of publications are Karri, T., Kumar, S., and Farhan N.H.S., among others (table 1). It is worth noting that all their works were collaborative. Based on the number of citations, the most rel-

evant authors are Dechow, P. M., Garcia-Teruel, P. J., Martinez-Solano, P., Zhao, W., Kouvelis, P. (table 1). While most of the authors are common in both the lists as mentioned above, Dechow has authored only one publication which was cited 1300 times. This could be the case as the publication belongs to 1994, and this was a pioneering work on the role of accounting accruals on firm performance.

Table 1. Most relevant authors

Most relevant authors by articles published		Most relevant authors by citations	
Authors	Articles	Authors	Total citations
KÄRRI T.	6	DECHOW P.M.	1,300
KUMAR S.	6	GARCÍA-TERUEL P.J.	889
FARHAN N.H.S.	5	MARTÍNEZ-SOLANO P.	889
ALMAQTARI F.A.	4	ZHAO W.	727
BONAZZI G.	4	KOUELIS P.	720
GARCÍA-TERUEL P.J.	4	DELOOF M.	642
IOTTI M.	4	BAÑOS-CABALLERO S.	500
KOUELIS P.	4	RHEE B.-D.	309
MARTÍNEZ-SOLANO P.	4	KUMAR S.	269
PIRTILÄ M.	4	AKTAS N.	215
WANG Z.	4	CROCI E.	215
ZHAO W.	4	PETMEZAS D.	215

Source: authors' compilation.

Table 2. Most relevant affiliations and countries

Most relevant affiliations		Most relevant countries	
Affiliations	Articles	Countries	Total citations
LAPPEENRANTA UNIVERSITY OF TECHNOLOGY	18	USA	1,046
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE	11	SPAIN	928

Table 2. Most...

Most relevant affiliations		Most relevant countries	
Affiliations	Articles	Countries	Total citations
UNIVERSITI PUTRA MALAYSIA	11	INDIA	661
UNIVERSITY OF MURCIA	11	BELGIUM	642
UNIVERSITI UTARA MALAYSIA	10	CHINA	642
INDIAN INSTITUTE OF MANAGEMENT RANCHI	9	UNITED KINGDOM	507
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA	8	KOREA	310
LINCOLN UNIVERSITY	7	SWEDEN	219
OBAFEMI AWOLOWO UNIVERSITY	7	MALAYSIA	183

Source: authors' compilation.

Lappeenranta University of Technology, Birla Institute of Technology and Science, Universiti Putra Malaysia, and University of Murcia are the most prolific universities for literature based on WC management (table 2).

USA, Spain, India, Belgium, and China are the most productive countries for studies focused on WC management based on total citations (table 2). At the same time, Belgium, Spain, Sweden, Korea, and the UK are the most prominent countries based on average article citations. This reflects the dominance of the more developed countries in the domain of WC.

Document Citation Analysis

Citations become an important consideration while reviewing the quality of the work and popularity of the topic. As evident in table 3, Dechow (1994), Deloof (2003), Kouvelis and Zhao (2012), Garcia-Teruel and Martinez-Solano (2007), and Baños-Caballero, García-Teruel and Martínez-Solano (2014) were the most cited works based on global citations. Based on the normalized global citations, Kouvelis and Zhao (2012), Cui, Wang, Liao, Fang and Cheng (2021), Kouvelis and Zhao (2016), and Aktas, Croci and Petmezas (2015) are the most cited works. Seth, Chadha, Ruparel, Arora and Sharma (2020), and Farhan, Almaqtari, Al-

Matari, Senan, Alahdal and Hazaea (2021) were the most cited based on local citations. It is observed that there are very few works that have been cited on a local basis. Kouvelis and Zhao (2012) and Kouvelis and Zhao (2016) publications belong to the domain of supply chain financing and study the structuring of the trade contract between supplier and retailer, both of whom need short-term financing. The study by Seth et al. (2020) tests the relationship between the efficiency of managing WC and exogenous variables of companies operating in the manufacturing sector in India. Farhan et al. (2021) explores the relationship between the WC policies of a firm and a firm's profitability and sustainability.

Table 3. Most relevant publications by citations

Document	Global citations	Document	Normalized global citations	Document	Local citations
DECHOW P.M., 1994, J ACCOUNT ECON	1,300	KOUELIS, 2012, OPER RES	9.83	SETH H., 2020, MANAG FINANC	2
DELOOF M., 2003, J BUS FINANC ACCOUNT	642	CUI X., 2021, PAC BASIN FINANC J	9.05	FARHAN N.H.S., 2021, SUSTAINABILITY	1
KOUELIS P., 2012, OPER RES	472	KOUELIS P., 2016, MANAGE SCI	8.71	MABANDLA N.Z., 2019, ACAD ACCOUNT FINANC STUD J	1
GARCÍA-TERUEL P.J., 2007, INT J MANAGE FINAN	389	AKTAS N., 2015, J CORP FINANC	8.24	SIDDIQUI D.A., 2019, ASIAN J ECON MODEL	1
BAÑOS-CABALLERO S., 2014, J BUS RES	269	ZHANG D., 2021, J ENVIRON MANAGE	7.74	MAHMOOD F., 2019, SUSTAINABILITY	1
AKTAS N., 2015, J CORP FINANC	215	BAÑOS-CABALLERO S., 2014, J BUS RES	7.57	SETH H., 2020, BENCHMARKING	1
KOUELIS P., 2016, MANAGE SCI	214	TAURINGANA V., AFRIFA G.A., 2013, J SMALL BUS ENTERP DEV	6.42	AKGÜN A.İ., 2020, INT J MANAGE FINAN	1
LEE C.H., 2011, EUR J OPER RES	194	BOISJOLY R.P., 2020, J BUS RES	6.07	DALCI İ., 2018, HEALTH POLICY	1
BAÑOS-CABALLERO S., 2012, SMALL BUS ECON	178	ALI Z., 2020, BUS PROCESS MANAGE J	5.76	OSEIFUAH E., 2018, ACAD ENTREP J	1

Source: authors' compilation.

Conceptual Structure

This section analyzes the conceptual structure of the research involving WC and firm performance based on the most frequently occurring keywords and co-occurrence of keywords.

Most Frequent Keywords

WC/WC management, profitability, CCC, firm performance, and financial management are some of the most frequently used keywords by authors. These keywords give an idea of the popular themes on which research on WC is done. While the above-listed keywords are generic, some of the other prominent keywords are supply chain, investments, manufacture, construction, India, China, Europe, etc. These words give a fair idea of the industrial and country context in which research on WC and firm profitability has been carried out over the years. The word cloud of the 50 most relevant keywords indicates the basic and motor themes as listed above (figure 4).

Figure 4. Word cloud of 50 most frequent keywords



S o u r c e : authors' compilation.

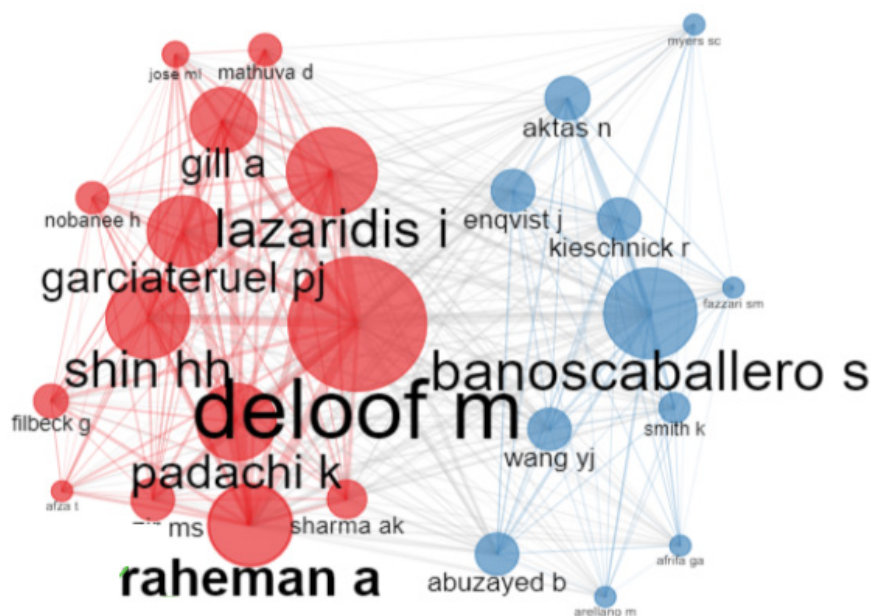
INTELLECTUAL STRUCTURE

For reviewing the intellectual structure of the research conducted on WC's impact on firm performance, the co-citation network of the most relevant documents is given below.

Co-citation Network Analysis

Based on figure 5, it is evident that there are two major clusters in the area of WC and firm performance. Cluster 1 denoted in red color consists of papers that have reviewed the WC position of a firm and analyzed its impact on the profitability of the business. Shin and Soenen (1998) have done pioneering work in this area. The other studies then have concentrated on particular geographical regions like Belgium (Deloof, 2003), Mauritius (Padachi, 2006), Turkey (Vural, Sokmen & Çetenak, 2012) and Pakistan (Raheman & Nasr, 2007). Garcia-Teruel and Martinez-Solano (2010) have mainly focused on SMEs in the European context.

The papers in Cluster 2 denoted by blue are well-connected to papers of Cluster 1 as the former has also studied WC in the context of firm profitability. However, these papers have included additional variables in their research. Baños-Caballero et al. (2014) has also studied financial restrictions faced by the firm while evaluating the effect of WC on firm performance. Aktas et al. (2015) has looked at value enhancement from WC decisions by analyzing the impact on firm performance and investments made by a firm. Kieschnick, Laplante and Moussawi (2013) has studied the impact of WC management on shareholders' wealth which is broader as compared to firm profitability. Enqvist, Graham and Nikkinen (2014) and Wang, Akbar and Akbar (2020) have differentiated their studies by observing the impact of WC on firm performance in different business life-cycle stages.

Figure 5. Co-citation network of documents and clusters

Source : authors' compilation.

Thematic Literature Review

Based on the preliminary analysis, most related research manuscripts have led to the major themes as below:

Impact of WC on firm performance through different metrics

Every business aims to increase shareholders' wealth. One way to improve shareholders' wealth is through the improvement of firm performance. The decisions taken in the business directly or indirectly affect the firm's performance/profitability (Baser Gokten, Kucukkocaoglu & Ture, 2016). The performance indicators could be related to either current level or long-term performance. They could evaluate the revenue-generating capacity or the proportion of the margins; accounting information (Khan, Alam & Syed, 2021) or market information (Ross, 2002). The most frequently used indicator to measure profitability is the return on assets (ROA) (Asaduzzaman & Chowdhury, 2014) as it

is readily available from the annual reports. Many researchers who studied the listed firms studied WC and return on equity (ROE) and/or earnings per share (EPS) (Alarussi & Alhaderi, 2018). Dechow (1994) has used cash flow to measure profitability, while Al-Najjar & Belghitar (2011) studied the WC impact using dividend policy (Chakraborty & Maruf, 2023; Islam, 2018). Some of them have used innovative measures for profitability such as economic value added (EVA) and return on capital employed (ROCE). A few researchers took multiple indicators of profitability for robustness.

Impact of WC components on firm performance

The existing literature was reviewed to analyze the indicators used to measure WC. Many researchers have studied gross WC, i.e., considering every CA, while many of them have studied net WC, i.e., difference of CA and CL (Afrifa, 2016). Some studies have focused on a niche area of WC and have analyzed one of the WC components. These components could be inventory (Peng & Zhou, 2019), cash balance (Huang, Wang & Chen, 2007), WC finance, short-term cash flows, etc. The trade credit could either be given by a firm or received by a firm, i.e., it could be a debtor or creditor study (Cao & Yu, 2018). Trade credit from suppliers has been studied as a resource of financing (Ali, Gongbing & Mehreen, 2018). The firm's OC and CCC (Jose, Lancaster & Stevens, 1996; Nobanee, Abdulatif & Al Hajjar, 2011) have been studied to analyze WC. Some research papers have also studied components of OC in the form of inventory period, debtors' period, and payable period (Mathuva, 2010). Most studies have taken annual data of the above variables as it can be easily fetched from the annual report. However, as the frequency of WC decisions is higher, quarterly data analysis could give more accurate insights.

Evaluating WC and firm performance via the firm's financing and investment policy

While corporate finance decisions are segregated based on (i) the raising of funds and application of funds and (ii) duration, it is not surprising that these decisions are interrelated and have an impact on one another. For instance, the investment decisions relating to the purchase of long-term assets also affect the investment decisions of CA. Similarly, the decision about long-term sources of finance does have an impact on the decisions of short-term financing. Kouvelis & Zhao (2012) compared credit financing and bank financing; Lee & Rhee

(2010) compared stock financing cost and supply chain synchronization and Baños-Caballero, García-Teruel & Martínez-Solano (2016) compared different sources of short term financing. Research has been conducted on the prevalence of financial constraints (Baños-Caballero et al., 2014), innovative investments (Cui, Wang, Liao, Fang & Cheng, 2021), and the association of WC and profit. Within WC financing and investment decisions, the level of financing and investment from conservative to aggressive has been studied (Aktas et al., 2015; Boisjoly, Conine & McDonald, 2020).

Impact of WC on firm performance across different clusters

Different economic factors and organizational factors have an impact on understanding the relationship between WC and firm performance. The related factors are grouped and a cluster has been formed to understand them better. First cluster is related to region of study. Accessibility of financial data could be the reason for the selection of geography which is why most studies pertain to Western countries (Al-Najjar & Belghitar, 2011; Sah, Banerjee, Malm & Rahman, 2022). However, a few researchers have studied emerging economies (Asaduzzaman & Chowdhury, 2014) while a few others have considered multiple regions and compared them (Chambers & Cifter, 2022). The second cluster differentiates the study based on firm selection or industry selection. Though many of them have taken all firms (Lee & Rhee, 2010; Nobanee et al., 2011) or all non-financial firms (Aktas et al., 2015), there are a few studies which have focused on specific industry such as textile, manufacturing, construction etc. (Yousaf & Bris, 2021). The third cluster is related to firm size in which few researchers have selected large firms (Cui et al., 2021; Deloof, 2003), while some of them have selected small and medium-scale (SME) firms (Afrika, 2016; Khan, Alam & Syed, 2021). The form of organization is the fourth cluster where most studies are concentrated on listed firms.

FUTURE RESEARCH DIRECTION AND CONCLUSION

Future Research Direction

The bibliometric and thematic analysis shows that there has been ample literature that has studied the WC and firm performance over the last decade. The analysis also highlighted that most of these studies have been confined to a few

aspects only. Therefore, there still exists a research gap and following could be the broader themes for future research:

WC and sustainable firm performance

One of the themes evaluated various performance indicators relating to accounting and the market. However, the performance indicators relating to sustainable criteria have not yet been evaluated. Some of the sustainable criteria on which WC's impact can be evaluated could be environmental indicators, social indicators and governance indicators, carbon footprint, carbon credit, sustainability indices, etc. (Mengistu & Panizzolo, 2023; Wu & Wu, 2012).

WC and firm performance for currently relevant (newer) clusters

Existing researchers have also selected few traditional clusters and analyzed WC and firm performance in those clusters. With the advent of technology and innovative business practices, there have emerged many new clusters that may affect the existing relation. The studies can be conducted considering emerging industries such as the service industry and e-commerce industry; new business models such as customer-to-customer models, direct-to-customer models, business-to-government models; different geographical regions/economies such as developing and underdeveloped countries; different organization types such as private firms, public and non-listed firms; different firm characteristics such as board diversity, ownership structure, firm size, employee size, firm age, etc. (Chakraborty, 2023; Desai & Desai, 2020).

Role of technology and innovations on WC and firm performance

The efficiency of the business cycle could be improved with the use of technology. For instance, inventory levels can be reduced with the usage of the just-in-time technique. The usage of technology will lead to a reduction in the business cycle and a sequential reduction in the WC requirements. But the cost of technology installation and maintenance will rise, which in turn may negatively affect the profit. The role of technology in distinct business operations and functions and its impact could therefore be explored. Innovations in businesses also affect the firm operations and thereby WC and firm performance. The researchers could examine the role of innovations concerning WC and firm performance.

■■■ CONCLUSION

Working capital while being a traditional corporate finance decision is also a very significant decision for a firm as it deals with day-to-day operations of the firm. As working capital is believed to have repercussions on firm performance, this is a highly explored area of study in this domain. This study has been carried out to throw light on the existing intellectual and conceptual structure of the literature in this domain. The existing literature is broadly categorized into four distinct themes so as to understand the length and depth of work carried out in this field. This analysis aptly portrays the status of literature in the current context and gives a scope to look for research gaps. These have been identified and laid out for the future researchers interested in working in this domain.

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