

WORKING CAPITAL MANAGEMENT
EFFICIENCY: EVIDENCE FROM
OIC COUNTRIES AND NON-OIC COUNTRIES

BY

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A thesis submitted in fulfilment of the requirement for
the degree of Doctor of Philosophy in Islamic Banking and
Finance

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JULY 2025

ABSTRACT

The study broadly aimed to examine the factors that affect the working capital management efficiency of firms belonging to OIC and Non-OIC countries. The study also examined whether a difference exists in the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries. Also, the study examined the impact of various firm-level and macroeconomic variables of WCM efficiency in OIC and Non-OIC countries. Lastly, the study examined the differential impact of firm-level and macroeconomic determinants on the WCM efficiency in OIC and Non-OIC countries in recession and boom states of the economy. To achieve these objectives, the study adopted an exploratory and descriptive research design. The firm-level data for the study has been collected from the COMPUSTAT database and the data on macroeconomic variables has been collected from the World Bank development indicator database. For sampling a purposive sampling technique was adopted wherein the researcher would select the sample firms from the COMPUSTAT database belonging to OIC and Non-OIC countries. The final sample consists of firms belong to 18 OIC countries and 35 Non-OIC countries. The data for the study was collected for a period of 22 years (2000-2021). The study estimated the models by using econometric panel data methodology. The study made an investigative check for heteroscedasticity, autocorrelation, multicollinearity, and the presence of outliers and accordingly produced robust estimates. The study runs analysis on full-sample, OIC sample and Non-OIC sample to make best comparison. They found that WCM efficiency differs significantly between firms in OIC and Non-OIC countries, with OIC firms generally exhibiting lower efficiency. Firm-level factors such as profitability, firm size, tangibility, leverage, cash flow, sales growth and firm age, have significant impacts on working capital management (WCM) efficiency in both OIC and Non-OIC countries, but the magnitude and direction of these impacts often differ between the two groups. Macroeconomic factors, including money supply, stock market development, inflation, GDP growth and interest rates, also influence WCM efficiency, with their effects varying between OIC and Non-OIC countries. The impact of both firm-level and macroeconomic determinants on WCM efficiency differs during recession and boom periods, with these differences being more pronounced in OIC countries. It shows that Islamic financial principles in OIC countries appear to influence working capital management practices, often leading to more conservative approaches compared to Non-OIC countries. The study highlights key implications for financial managers, policymakers, and researchers. Financial managers in OIC countries need to align working capital strategies for better efficiency. Policymakers should consider these unique challenges when designing economic policies. For researchers, this opens new avenues to explore the intersection of cultural, religious, and economic factors in financial management.

ملخص البحث

كما تناولت الدراسة بشكل عام إلى فحص العوامل التي تؤثر على كفاءة إدارة رأس المال العامل للشركات التي تنتمي إلى دول منظمة التعاون الإسلامي (OIC) والدول غير التابعة لها. كما تناولت الدراسة ما إذا كان هناك اختلاف في كفاءة إدارة رأس المال العامل (WCM) بين الشركات التي تنتمي إلى دول منظمة التعاون الإسلامي والدول غير التابعة لها. كذلك، درست الدراسة تأثير المتغيرات على مستوى الشركات والمتغيرات الاقتصادية الكلية على كفاءة إدارة رأس المال العامل في الدول التابعة وغير التابعة لمنظمة التعاون الإسلامي. وأخيراً، فحصت الدراسة الأثر التفاضلي للعوامل المحددة على مستوى الشركات والمتغيرات الاقتصادية الكلية على كفاءة إدارة رأس المال العامل في دول منظمة التعاون الإسلامي والدول غير التابعة لها خلال فترات الركود والانتعاش الاقتصادي. لتحقيق هذه الأهداف، اعتمدت الدراسة تصميمًا بحثيًا استكشافياً ووصفياً. جمعت بيانات الشركات من قاعدة COMPUSTAT، بينما استُخلصت بيانات المتغيرات الاقتصادية الكلية من مؤشرات التنمية العالمية للبنك الدولي". إلى دول منظمة التعاون الإسلامي والدول غير التابعة لها. وشملت العينة النهائية الشركات من 18 دولة من دول منظمة التعاون الإسلامي و35 دولة غير تابعة لها. تم جمع البيانات لفترة تمتد على 22 عامًا (2000-2021م). استخدمت الدراسة منهجية بيانات السلاسل الزمنية المقطعية لتحليل النماذج الاقتصادية. كما أجرت اختبارات استقصائية للتحقق من وجود التغير في التباين، والارتباط الذاتي، والتعدد الخطي، ووجود القيم المتطرفة، وقامت بتقديم تقديرات قوية وفقاً لذلك. أجريت التحليلات على العينة الكاملة، وعينة دول منظمة التعاون الإسلامي، وعينة الدول غير التابعة لها لتحقيق أفضل مقارنة. أظهرت النتائج أن كفاءة إدارة رأس المال العامل تختلف بشكل كبير بين الشركات في دول منظمة التعاون الإسلامي والدول غير التابعة لها، حيث تظهر شركات دول منظمة التعاون الإسلامي كفاءة أقل عمومًا. العوامل على مستوى الشركات مثل الربحية، حجم الشركة، قابلية الأصول، الرفع المالي، التدفقات النقدية، نمو المبيعات، وعمر الشركة لها تأثيرات كبيرة على كفاءة إدارة رأس المال العامل في كل من دول منظمة التعاون الإسلامي والدول غير التابعة لها، ولكن حجم واتجاه هذه التأثيرات يختلف غالبًا بين المجموعتين. تؤثر العوامل الاقتصادية الكلية، بما في ذلك عرض النقود، تطور سوق الأسهم، التضخم، نمو الناتج المحلي الإجمالي، وأسعار الفائدة، أيضًا على كفاءة إدارة رأس المال العامل، مع اختلاف تأثيراتها بين دول منظمة التعاون الإسلامي والدول غير التابعة لها. يتباين تأثير العوامل المحددة على مستوى الشركات والمتغيرات الاقتصادية الكلية على كفاءة إدارة رأس المال العامل خلال فترات الركود والانتعاش الاقتصادي، حيث تكون هذه الاختلافات أكثر وضوحًا في دول منظمة التعاون الإسلامي. تشير النتائج إلى أن المبادئ المالية الإسلامية في دول منظمة التعاون الإسلامي تؤثر

على ممارسات إدارة رأس المال العامل، مما يؤدي غالبًا إلى اتباع استراتيجيات أكثر تحفظًا مقارنة بالدول غير التابعة لها. تسلط الدراسة الضوء على الآثار المهمة للمديرين الماليين وواضعي السياسات والباحثين. يحتاج المديرون الماليون في دول منظمة التعاون الإسلامي إلى مواءمة استراتيجيات إدارة رأس المال لتحقيق كفاءة أفضل. ويجب على واضعي السياسات مراعاة هذه التحديات الفريدة عند تصميم السياسات الاقتصادية. أما بالنسبة للباحثين، فإن هذا يفتح آفاقًا جديدة لاستكشاف التقاطع بين العوامل الثقافية والدينية والاقتصادية في الإدارة المالية.



APPROVAL PAGE

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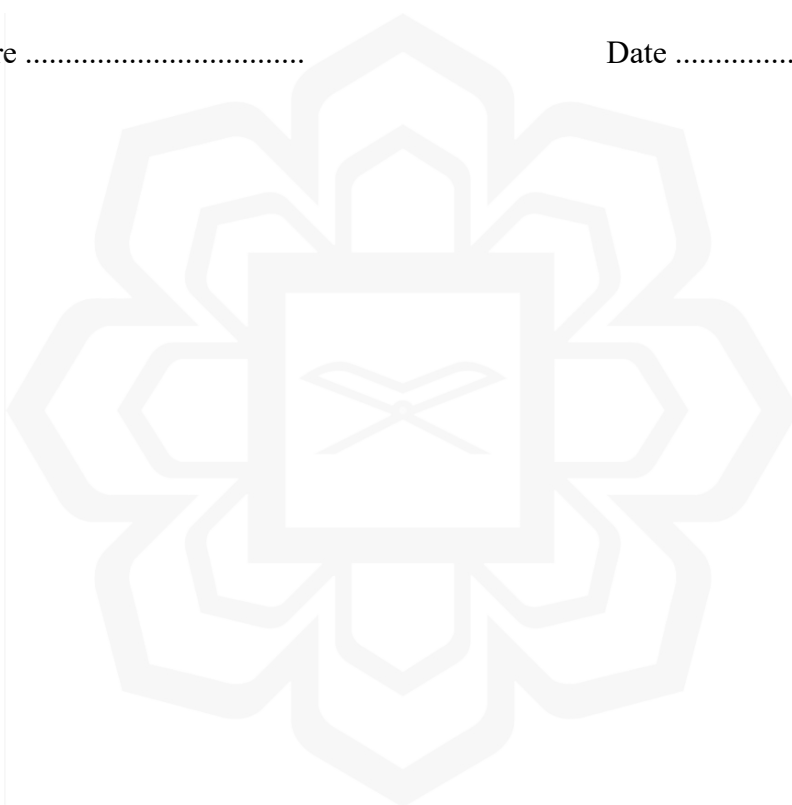
DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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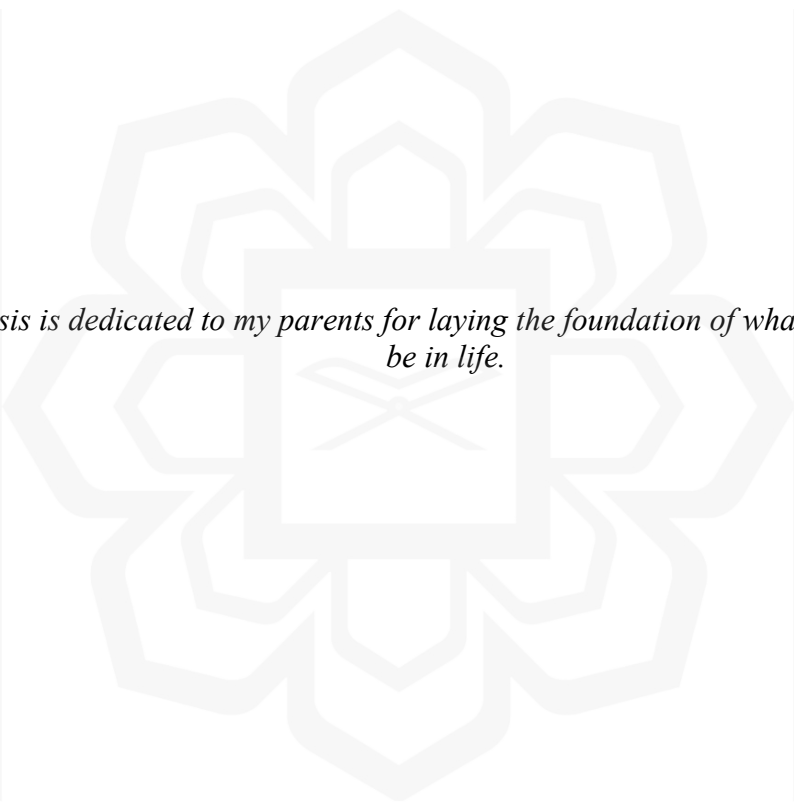
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This thesis is dedicated to my parents for laying the foundation of what I turned out to be in life.

ACKNOWLEDGEMENTS

All glory is due to Allah, the Almighty, whose Grace and Mercies have been with me throughout the duration of my programme. Although it has been tasking, His Mercies and Blessings on me ease the herculean task of completing this thesis.

I am most indebted to my supervisor, Prof. Dr Razali Haron, whose enduring disposition, kindness, promptitude, thoroughness and friendship have facilitated the successful completion of my work. I put on record and appreciate his detailed comments, useful suggestions and inspiring queries which have considerably improved this thesis. His brilliant grasp of the aim and content of this work led to his insightful comments, suggestions and queries which helped me a great deal. Despite his commitments, he took time to listen and attend to me whenever requested. The moral support he extended to me is no doubt a boost that helped in building and writing the draft of this research work.

Lastly, my gratitude goes to my beloved wife and lovely children; for their prayers, understanding and endurance while away.

Once again, I glorify Allah for His endless mercy on us one of which is enabling us to successfully round off the efforts of writing this thesis. Alhamdulillah.

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CHAPTER ONE

INTRODUCTION

1.1 CONCEPT OF WORKING CAPITAL

Working capital management is essential for the efficient operation of every firm, regardless of its size or type. Maintaining liquidity is crucial to working capital management so that the company can meet its daily obligations on time (Eljelly, 2004; Asare et al., 2022). Normally the capital invested in business enterprises falls into two categories, fixed capital, and working capital. Fixed Capital is represented by assets of a permanent nature giving enduring benefits to enterprises such as land, buildings, machinery, etc. Working capital is the term used to describe short-term capital needed for running a business's operating cycle and one operating cycle is usually an accounting year. These funds are used to carry out ordinary or regular commercial operations, such as buying raw materials, paying direct and indirect costs, carrying out manufacturing, investing in inventories and stores, granting credit to consumers, and maintaining cash reserves. Briefly, it stands for the money needed to maintain daily operations.

There are two notions of working capital that can be used to define it: gross concept and net concept. While the phrase "net working capital" refers to the difference between current assets and current liabilities, "gross working capital" refers to and concerns investments in all current assets. The most popular definition of working capital is the "difference between a company's current assets (such as cash, accounts receivable, and inventories) and its current liabilities (such as salaries and wages payable, accounts payable, and taxes owed to the government)". In short, working capital denotes that position that "circulates from one form to another in the ordinary course of the business. This idea embraces the recurring transition of cash to inventories to receivables to cash which forms a conventional chain of business operations".

1.2 SIGNIFICANCE OF WORKING CAPITAL

For the human body, blood is essential for life survival same way in business working capital is also food for the business. For the sustenance of business and progress, it becomes imperative to maintain adequate working capital. The capacity of a business enterprise to earn profit depends largely upon its ability to manage efficiently its working capital. In a period of rising capital costs and scarce funds, working capital assumes much more significance. Working capital is rightly supposed to be the lifeblood of a business enterprise. It is rightly regarded that a concern should have adequate working capital to run its business operations. The most important reason for having sufficient working capital is to avoid technical insolvency.

The proper management of working capital enhances the liquidity of funds and solvency as well. It provides funds for unexpected emergencies and unknown contingencies. Thus, a firm gets added strength to face and overpower any financial crisis. Adequacy of working capital also increases the creditworthiness of a business concern. Prompt payment to suppliers of materials will encourage them to supply materials on credit. Adequate working capital also helps in establishing good relations with banks. To borrow from banks, a concern must keep itself in liquid condition. Additionally, the proper balance between current assets and fixed assets is crucial for the company's profitability. Every business operation has an impact on the company's existing position, either directly or indirectly. Therefore, its financial requirements should be accurately assessed and estimated. Ample working capital may help in maintaining and increasing the efficiency of the business concern by investing in research programs innovation and technological developments (Kayani, 2023; Hidayat and Dewi, 2023; Bhattacharya, 2023).

Many economists and accountants view innovation as the foundation of profit-making. This is unquestionably true across a wide range of sectors. A company will not be able to maintain its position in the market if new concepts, items, processes, and procedures are not developed and made available. Research, sound planning, and a willingness to take chances are just a few things that innovation implies. There can be no advancement if there is not enough money. Important innovations would not materialise because research and development would be at a stop. Thus, the need for

maintaining enough working capital is hardly to be questioned. Just as the circulation of blood is essential in the human body to maintain life, a smooth flow of working capital funds is very necessary to maintain the proper working of the enterprise (Septiano et al., 2023; Rahayu and Ilham, 2023; Koeplin and Lélé, 2023).

1.3 RISK OF MAINTAINING TOO LOW AND TOO HIGH WORKING CAPITAL

The quantity of working capital should be adequate. The insufficient sum of working capital may cause a lot of financial troubles in business. Every so often, not enough operating capital may be the leading cause for shutting down the business organization. Because of the lack of operational capital, raw materials cannot be obtained, and reimbursement of wages and other operating charges cannot be completed on time. The company suffers a lot and cannot take on hand any new chances or may not think about any modifications. The company can lose trade discounts. A company having enough operating money will be able to invest huge cash in the inventory this way gets the benefit of the discount which increases the profitability. Many companies offer cash discounts also and the company has enough working capital can get this opportunity. Further, a company that does not have sufficient working capital cannot offer credit to customers and may lose potential customers (Nwosu et al., 2023; Osei et al., 2023; Jabbouri et al., 2023). It may also result in delays in payment of creditors and loss of reputation in the market. Sometimes too much delay is made in the payment of creditors leads to words legal action.

Because working capital components are constantly moving around so quickly, maintaining the optimal level of working capital turnover is challenging. The company's profitability will be impacted if it is unable to maintain the necessary level of working capital. Any business cannot expand if its working cash is not sufficient. A lack of working capital could lead to resource shortages for the company. Yet, it should also be remembered that even too much working capital may lead to unnecessary expenses. The management of a business should therefore aim for an ideal level of working capital. Working capital should be sufficient to cover current liabilities but shouldn't go beyond what is needed. The managerial staff of the company must make sure that the return

generated by the money used to structure working capital is equal to or greater than the return generated by other investment options. Due to its major impact on the business's liquidity and profitability, managing working capital becomes even more critical in situations where there are insufficient financial resources. Avoiding either an excessive or inadequate investment in current assets is the primary goal of working capital management because both extremes have unfavourable effects. A surplus of current assets may result in lower profitability because of the cost of funds. Since a sizeable portion of the money is stuck in current assets, working capital management is regarded as one of the most crucial financial tasks.

As mentioned earlier, one of the important aspects of working capital is to always maintain an adequate amount of working capital to conduct the day-to-day operations of the firm successfully and profitably. Both excessive as well as inadequate working capital positions are risky for the firm. Therefore, the financial manager must be very vigilant about the trends in the items that make up the working capital. Too little working capital results in a lack of funds that may contribute to the factors leading to business failure. The paucity of working capital funds becomes a hindrance in materializing attractive opportunities. It becomes difficult to meet day-to-day operations. Hence, it adversely affects the operating efficiency. It also becomes difficult to utilize fixed assets due to a lack of working funds. Thus, it reduces the rate of return on total investments. The firms face tight credit terms when they lose their reputation in honouring their short-term obligations. Additionally, it prevents growth as it becomes difficult to start profitable projects on account of the non-availability of working capital funds (Asare et al., 2022; Garg and Singh, 2023). On the other hand, too much working capital or excessive working capital means idle funds which earn no profits for the concern. The excess of working capital deteriorates management efficiency through complacency. It also encourages speculation which sometimes proves fatal for the enterprise. Excess of funds may result in unnecessary accumulation of inventories leading to mishandling of waste and theft of it. Further, excessive working capital funds are, sometimes, misused for unjustified expansion of the concern which may lead a concern to loss. In such a case, dividend policy may be too liberal which may consequently hamper the plans of the firm.

1.4 COMPONENTS OF WORKING CAPITAL

Working capital is made up of certain components which include inventory, receivables, cash, and current liabilities. Inventories occupy the most strategic position in the component of working capital. Any stock, which a firm keeps meeting its future requirements, is called inventory. Inventory requirements of concern can be broadly classified into raw materials and other suppliers, work-in-process, and finished goods. Raw materials are held to obtain the benefits of economic bulk purchasing and make use of that as a protective buffer against any delay in the transportation and production cycle (Le, 2019). Work-in-progress facilitates shortening of the manufacturing cycle and finished goods are held for facilitating seasonal accumulation and sales promotion. In most industries, inventories, constitute more than 50 per cent of the cost of the current assets. In some cases, the magnitude of the money locked up in inventories is to the tune of 90 per cent of working capital (Aldubhani et al., 2022). Thus, increasing inventories in a business causes capital or funds to be locked up. Not only will the capital be locked up with no return, but it will also be exposed to the danger of price fluctuations. This is how inventories have come to be known as 'locked up or imprisoned capital and increasing need is felt to limit its size to the barest minimum possible. A business will lock up the resources which it otherwise may use to conduct other productive tasks if it invests excessively in inventory. The excessive investment in inventories is related to both the lack of finances and the opportunity cost (Altman, 1968). Additionally, the company must pay a variety of inventory-carrying expenses, which raise production costs and have an impact on the business's profitability. Moreover, interest is also paid on money borrowed from banks for obtaining inventory. Therefore, incredibly careful husbanding of inventories is necessary for working capital management to reduce excessive investment in them, while at some time ensuring smooth flow in the pipeline.

Receivables are yet another component of working capital that constitutes a substantial portion of the current assets of most companies. They form about one-third part of current assets. It locks up funds equivalent to 45-60 days of sales. Accounts receivables represent the extension of open account credit by one firm to other firms and to an individual. Account receivables arise due to the credit sale affected by the firm. If a firm makes all sales for cash, it will have no account receivables. In this sense, receivables arise out of credit sales of goods or the rendering of services and include

book debts, bills, and accrued receivables. However, the broader meaning of the term may cover prepayments in advance on purchases and expenses, contracts well as advances to subsidiaries and offices (Deloof, 2003; Preve et al. 2010).

Further, cash is the most crucial component of working capital. What blood is to the human body cash is to business enterprise. Cash is frequently the key element determining the future course of a firm. Cash is both the primary input needed to keep a business operating continuously and the final output anticipated to be realised by selling the service or product produced by the company (Padachi, 2006). The usual working capital cycle starts with cash and ends with cash. While the management should try hard to obtain a larger amount of cash at the end of the working capital cycle than what had been at the beginning, it must also make it a point to constantly endeavour to reduce its cash portfolio, to the best possible minimum. To put it in other words, all the proceeds of the working capital cycle must be reinvested into the business as they are obtained (Padachi, 2006). If such proceeds result in a permanent surplus of the absorption capacity of the undertakings, such surplus should either be distributed among the shareholders or should be used to pay off long-term liabilities because carrying cash or near cash reserves beyond the irreducible operating needs cut asset turnover and rate of return. It implies that the volume of cash should be maintained at an optimum level (Opler et al., 1999; Al-Najjar, 2013). However, optimization of cash holdings concerning the operating needs is not the only problem of cash management. In addition to this, it is also imperative on the part of the management to provide sufficient coverage to its currently maturing debts and liabilities in the form of enough cash, high and stable cash flows, and sound profit margins (Myers & Majluf, 1984; Afza & Nazir, 2007).

Current liabilities play a significant role in defining and structuring the working capital concept. Every time the term "working capital" is used, current assets and current liabilities come to mind, with the notion that working capital is the difference between the two. In this context, current liabilities typically include bank borrowings, trade credit, asset taxes, unpaid dividends, and other such items (Padachi, 2006). However, such an approach is defined in an inconclusive form and may not serve the purpose. The most suitable approach to define current liabilities is to correlate it to the length of time for which the capital remains in use by the concern before it is returned to the supplier. From this point of view, current liabilities are those debts and liabilities which are

repayable within the normal cycle of business operation. Since the normal cycle of operation extends to a period of one year it may be stated that all debts and liabilities maturing within one year shall be considered current liabilities (Deloof, 2003; Afza & Nazir, 2007; Gill et al., 2010).

1.5 BACKGROUND OF THE STUDY

The study of working capital management is important, especially for industries that have massive requirements for working capital. Therefore, it is essential to know the factors determining the working capital of the company. Working capital management is considered a particularly important matter because it helps to run the business smoothly, disbursements of day-to-day expenses: wages, salary, and payment of raw materials, affect the reputation of the company. Large-scale manufacturing companies usually need massive amounts of working capital even though it varies from company to company due to the varying characteristics of each field. The operation cycle remains present from the day of incorporation of the business and continues with the business forever. One complete process gives birth to another one like raw material purchase creates creditors, raw material used in the production process takes time to prepare finished products, next, finished products are sold creates debtors, after the credit period cash back that given to creditors and again receive raw material for the production. So, does, this process remain forever in business?

By these means, working capital management is important because of certain reasons. First, working capital decisions are reversible over time. Second, because working capital decisions frequently occur during the business, and third, working capital decisions directly influence the profitability and liquidity of an enterprise (Raheman & Nasr, 2007; Sawarni et al., 2022). There are two distinct dimensions to accessing corporate liquidity: static and dynamic view (Lancaster et al., 1999; Farris & Hutchison, 2002; Moss & Stine, 1993). The static view focuses on traditional ratios, the current ratio, and the quick ratio (Bernstein, 1993). The modified version of the traditional ratios is the ratio of net working capital to current liabilities or total assets (Emery, 1984). Traditional ratios serve as a liquidity indicator by matching current assets to current liabilities. The limitation of traditional ratios is that they incorporate

assets that are not readily convertible into cash and exclude the liquidity provided by potential sources of financing (Emery, 1984). Jose et al. in 1996 argued that traditional ratios measure liquidity at a particular point in time. As the working capital decisions frequently occur during business, there is a need to measure ongoing liquidity and not the liquidity at a given point of time which can be measured by the dynamic view of corporate liquidity.

The operating cash flow produced by these assets, as opposed to the asset's liquidation value, should be used to determine the ongoing firm's liquidity (Soenen, 1993). The rate at which a company's receivables are turned into cash is shown in a dynamic view of corporate liquidity. A company is in a stronger position than one with relatively large accounts receivable if it generates high sales and has a low accounts receivable ratio. The dynamic approach looks at the net amount of time that passes between a company's actual cash outlays for the acquisition of productive resources and the cash collected from debtors. It determines the amount of time needed to turn a cash outflow from a company's normal business operations into a cash inflow by cash conversion cycle (CCC). The CCC depicts the average net time in days between the payment of cash for purchases and receipts from sales. The CCC statistic can be understood as the typical number of days that a business must fund its operating cycle requirements with either debt or equity (Moss & Stine, 1993; Churchill & Mullins, 2001; Bhatia & Chakrabarti, 2022). A low CCC shows that a business effectively manages its cash flows since it produces more sales per dollar of capital invested. A longer CCC implies the risk that a company may not be as adaptable in uncertain economic times, in addition to requiring more capital. By these means, CCC serves as the best measure for measuring working capital efficiency. However, the optimal level of CCC or working capital efficiency is determined by a variety of factors. Towards this direction, the pecking order theory, and the free cash flow theory both indicate that asymmetric knowledge and agency costs have a direct and indirect role in determining a firm's optimal working capital investment plans.

As a result, past literature is reviewed to comprehend the impact of numerous factors in determining working capital management efficiency. Firms whose financial managers fail to adequately plan and regulate existing assets and obligations may face insolvency and bankruptcy due to a lack of awareness of WC determinants (Rafuse,

1996; Kucher et al., 2020; Gallucci et al., 2022). Despite its relevance for organizational health (Filbeck & Krueger, 2005), empirical research on the determinants of working capital management efficiency is very few, especially when evaluating the combined influence of the three key components: the inventory, the accounts receivable, and the accounts payable (Palombini & Nakamura, 2012; Singh & Chauhan Gaurav, 2021). In contrast to both theoretical and empirical studies on capital structure and its nearly innumerable determinants (Rajan & Zingales, 1995; Kumpamool & Chancharat, 2022), WC theories are much less developed; additionally, as Palombini and Nakamura (2011) conclude from the review of corporate finance literature, there are no robust and widely accepted theories explaining WC management. The debate over the factors that influence WC policy is complicated. Most of the prior research on WC management tried to investigate its relationship with company profitability by assessing the impact of WC strategies on shareholder value creation.

Despite the relevance of WC factors for managers, there is no empirical research that attempts to rank them in order of priority. Because WC management efficiency affects the firm's profitability and liquidity (Deloof, 2003; Aldubhani et al., 2022) and, as a result, is a critical component of the overall corporate strategy (Nazir & Afza, 2009; Deari et al., 2022), understanding the factors that determine it may have some practical implications for managers. The WC level is a significant aspect that determines a company's operational risk. As a result, if the factors determining it are mostly due to industry causes, increasing business activities by utilizing different technologies, it would be beneficial to study them from the standpoint of operational risk mitigation. If macroeconomic factors are the primary predictor of WC efficiency, studying them for managing corporate expansion activity would be highly recommended.

1.6 IMPORTANCE OF THE ORGANISATION OF ISLAMIC COOPERATION (OIC) COUNTRIES

The Organisation of Islamic Cooperation (OIC) is a significant coalition comprising 57 member states, primarily from the Muslim world, aiming to foster cooperation in various socio-economic and political domains. OIC countries account for 24.9% of the

global population as of 2021, with the notable advantage of having a young and dynamic population, where 51.7% of the population is under the age of 24 (SESRIC, 2023). This demographic profile offers vast potential for economic growth, provided that effective policies are implemented to harness the energy and talents of the youth (SESRIC, 2023).

OIC member states hold strategic global significance due to their possession of vast natural resources. Collectively, OIC countries account for 66% of the world's proven crude oil reserves and 60% of natural gas reserves, positioning them as key players in global energy markets (SESRIC, 2023). This concentration of resources provides OIC countries with substantial economic advantages, particularly in terms of trade and industrial competitiveness.

The OIC also plays a crucial role in the Islamic finance sector, hosting 95% of global Islamic finance assets. The value of Islamic financial assets has grown rapidly, reaching USD 4 trillion in 2021, with projections suggesting it could exceed USD 5.9 trillion by 2026 (SESRIC, 2023). Islamic finance, based on principles such as risk-sharing and prohibition of interest (riba), has emerged as a resilient and innovative financial system that could contribute significantly to the socio-economic development of OIC countries. Islamic finance has been gaining global attention due to its ethical foundation and emphasis on risk-sharing, which is further enhanced by its alignment with ESG objectives, prioritizing societal and environmental well-being (Haron et al., 2022).

However, despite these strengths, OIC countries face notable challenges, particularly in areas such as human development, education, and labour productivity. The Human Development Index (HDI) of OIC countries lags behind global averages, with an average HDI value of 0.657 in 2021, compared to 0.732 for non-OIC developing countries (SESRIC, 2023). Similarly, enrolment rates in education and labour force utilization remain below world standards, which underscores the need for increased investment in education, research, and infrastructure.

While OIC countries possess immense natural and financial resources, there remain significant challenges that need to be addressed for sustainable development. Strategic policymaking in areas such as education, human capital development, and

infrastructure can unlock the economic potential of the region, particularly by leveraging its young population and abundant natural resources.

1.6 IMPORTANCE OF ISLAMIC FINANCE IN OIC COUNTRIES

Islamic finance has become a significant component of the financial systems in OIC countries, deeply rooted in Shariah-compliant principles. The Islamic financial system prohibits interest (riba), emphasizing risk-sharing and ethical investment. This contrasts with conventional finance, which allows for interest-based transactions. Key financial instruments in Islamic finance include Sukuk (Islamic bonds), Takaful (Islamic insurance), and Murabaha (cost-plus financing). These instruments are designed to ensure that financial activities adhere to Shariah principles while addressing the needs of modern financial markets (IFDI, 2023).

In 2022, global Islamic finance assets reached USD 4.5 trillion, growing by 11% compared to the previous year, despite global economic challenges. Islamic banking remains the dominant sector, holding around 72% of total assets, with Takaful, Sukuk, and Islamic funds contributing to the rest (IFDI, 2023). Countries like Saudi Arabia, Malaysia, and Iran are leaders in this sector, accounting for a significant share of global Islamic financial assets. The growth of Islamic finance has been supported by regulatory frameworks and initiatives in these countries, with Malaysia and Saudi Arabia continuously improving their Shariah governance and compliance structures (SESRIC, 2023).

One of the most rapidly growing sectors within Islamic finance is Sukuk issuance. In 2022, Sukuk issuances reached USD 788 billion, marking a threefold increase over the past decade. This growth reflects the increasing demand for Shariah-compliant financial instruments and the expanding participation of new markets, such as Nigeria and Tanzania, in Islamic capital markets (IFDI, 2023). Sukuk has gained traction due to its ability to bridge the gap between equity and debt instruments, providing ethical investment opportunities aligned with Islamic principles.

The Takaful sector also saw robust growth, with total assets reaching USD 90 billion in 2022. This represents a 16% increase, highlighting the rising demand for Shariah-compliant insurance products. Takaful operates on a cooperative basis, where participants contribute to a pool that is used to support those in need, offering an ethical alternative to conventional insurance, which is often seen as conflicting with Islamic values due to its association with uncertainty (gharar) and gambling (maysir) (IFDI, 2023).

OIC countries are at the forefront of Islamic finance development, with nations such as Indonesia, Pakistan, and Türkiye expanding their Islamic finance ecosystems. These countries have adopted comprehensive roadmaps to enhance Shariah compliance, improve regulatory frameworks, and foster awareness of Islamic finance products. For example, Pakistan has committed to becoming a fully interest-free economy by 2027, following a landmark ruling by its Federal Shariah Court prohibiting riba (interest). This transition is expected to further bolster the growth of Islamic financial institutions in the country (IFDI, 2023).

In conclusion, the Islamic finance industry, particularly within OIC countries, continues to demonstrate resilience and growth. Its unique framework, grounded in Shariah principles, not only caters to the financial needs of Muslim-majority countries but also presents an ethical financial alternative globally. As regulatory environments strengthen and the demand for Shariah-compliant products grows, the Islamic finance sector is well-positioned to reach its projected asset value of USD 6.7 trillion by 2027 (IFDI, 2023).

1.7 SHARIAH, MAQASID AL-SHARIAH, AND OIC COUNTRIES: AN OVERVIEW

The Organization of Islamic Cooperation (OIC) countries are united by their adherence to Islamic principles, including Shariah law and its underlying objectives, known as Maqasid al-Shariah. Shariah, the Islamic legal system, serves as a comprehensive guide for Muslims in all aspects of life, including economic and financial matters (Chapra, 2008). Within this framework, Maqasid al-Shariah represents the higher objectives or

purposes of Islamic law, which aim to promote human welfare and prevent harm. Maqasid al-Shariah is typically categorized into five main objectives: the preservation of faith (din), life (nafs), intellect ('aql), lineage (nasl), and wealth (mal) (Auda, 2008; Kurnia, 2020). The objectives of Maqasid serve as a compass, ensuring that laws contribute positively to individual and collective human welfare, rather than merely serving as rigid legal standards (Chen & Yu, 2023). These objectives significantly influence the economic and financial practices in OIC countries, shaping policies and regulations that aim to align with Islamic principles while promoting economic development.

In the context of OIC countries, the application of Shariah and Maqasid al-Shariah principles has led to the development of unique financial systems and practices. For instance, Islamic banking, which operates on the principles of profit-sharing and prohibits interest (riba), has become a significant sector in many OIC economies (Hassan & Aliyu, 2018). This adherence to Islamic financial principles has implications for various aspects of economic activity, including working capital management and investment strategies. The implementation of Maqasid al-Shariah in OIC countries extends beyond the financial sector. It also influences social and economic policies aimed at reducing poverty, promoting education, and ensuring social justice. For example, the Islamic Development Bank, an institution established by OIC member countries, aligns its development projects with Maqasid al-Shariah, focusing on sustainable development that preserves human dignity and well-being (Asutay & Harningtyas, 2015).

However, the application of Shariah and Maqasid al-Shariah principles varies across OIC countries, reflecting differences in interpretation and local contexts. Some countries, such as Saudi Arabia and Iran, have fully integrated Shariah into their legal systems, while others, like Türkiye and Indonesia, have adopted a more secular approach while still acknowledging Islamic principles in certain areas of law and finance (Otto, 2010). The diversity in the application of Shariah and Maqasid al-Shariah among OIC countries presents both challenges and opportunities for economic cooperation and development. It necessitates a nuanced approach to policy-making and economic analysis that considers the varying degrees of Islamic influence on financial and economic systems across these nations.

In the context of working capital management, the principles of Maqasid al-Shariah encourage practices that promote economic stability and social welfare. The impact of Maqasid al-Shariah on WCM is particularly evident in the treatment of interest-bearing transactions. Akbar et al. (2021) observed that Shariah-compliant firms in OIC countries often adopt more conservative WCM strategies, maintaining higher liquidity levels to avoid interest-bearing debt. This approach, while potentially impacting short-term profitability, aligns with the broader objectives of Islamic finance in promoting economic stability and ethical business practices.

1.8 SHARIAH-COMPLIANT AND NON-SHARIAH-COMPLIANT FIRMS

Shariah-compliant and non-Shariah-compliant firms represent two distinct business frameworks based on their adherence to Islamic principles and conventional financial practices, respectively. These frameworks influence their operational strategies, financial decisions, and ethical considerations, particularly in regions with significant Muslim populations, such as the OIC countries. Shariah-compliant firms operate under Islamic law, emphasizing the prohibition of interest (riba), the avoidance of unethical activities, and the adoption of risk-sharing mechanisms. In contrast, non-Shariah-compliant firms adhere to conventional financial systems, offering greater flexibility in financing and investment choices.

Shariah-compliant firms align their operations with the principles of Maqasid al-Shariah, which emphasize social justice, economic equity, and the prevention of harm (Hambali & Adhariani, 2022). These firms avoid interest-based financing and engage in profit-sharing models such as Mudarabah and Musharakah, fostering equitable risk-sharing among stakeholders (Brahmana & Kontesa, 2023; Rizkiah, 2017). Additionally, Shariah-compliant firms maintain strict governance structures through Shariah boards, ensuring compliance with Islamic ethical and financial principles (Alnori & Bugshan, 2022). The operational restrictions of Shariah-compliant firms, such as the prohibition of investment in haram industries, significantly influence their financial practices and investment strategies, often resulting in higher cash reserves and conservative liquidity management (Mustofa & Janatin, 2023).

On the other hand, non-Shariah-compliant firms operate under conventional business practices, utilizing interest-based financing and a broad range of financial instruments, including traditional bonds and derivatives (Utami & Ruhadi, 2020). These firms are not restricted by religious considerations, enabling them to engage in diverse investment opportunities, including those in industries considered haram under Islamic law (Hati et al., 2022). The flexibility of non-Shariah-compliant firms allows them to adopt aggressive financial strategies and manage cash more dynamically, leveraging interest-bearing instruments to enhance profitability and shareholder value (Farhan & Mulyany, 2021).

The distinctions between these two categories of firms have significant implications for their financial performance, risk management, and alignment with ethical standards. Shariah-compliant firms prioritize ethical considerations and social responsibility, aligning with the broader objectives of Islamic finance to promote equitable economic growth. Conversely, non-Shariah-compliant firms benefit from operational and financial flexibility, allowing them to pursue diverse investment opportunities without constraints imposed by Islamic principles. These differences are particularly pronounced in OIC countries, where the dual presence of Shariah-compliant and non-compliant firms creates a dynamic economic landscape, reflecting the coexistence of Islamic and conventional financial systems (Akbar et al., 2022).

The study of these two frameworks offers valuable insights into their impact on working capital management (WCM), profitability, and resilience during economic fluctuations. Understanding the operational and financial differences between Shariah-compliant and non-compliant firms is crucial for policymakers, investors, and financial institutions seeking to navigate the complex interplay between Islamic principles and conventional business practices in OIC countries.

1.9 SHARIAH-COMPLIANCE AND OIC COUNTRIES

The Organization of Islamic Cooperation (OIC) represents a collective of nations with a shared emphasis on promoting Islamic principles, including the application of Shariah-compliant financial practices. Shariah compliance in OIC countries plays a vital

role in aligning economic activities with Islamic law, ensuring that financial transactions and business operations adhere to ethical and socially responsible standards. This commitment is rooted in the principles of Maqasid al-Shariah, which emphasize justice, equity, and the prevention of harm in economic and social contexts (Chen & Yu, 2023).

OIC countries have made significant strides in adopting Shariah-compliant frameworks, with institutions like the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) providing guidelines for financial governance, accounting, and ethical practices. These standards have been instrumental in fostering uniformity and transparency among Islamic financial institutions, promoting trust among stakeholders and facilitating cross-border investments (Fadlur et al., 2024). However, the degree of Shariah compliance varies significantly across OIC member states due to differences in regulatory environments, legal frameworks, and interpretations of Islamic principles (Khan & Sumarliah, 2024). For instance, nations like Malaysia and Indonesia have established robust regulatory systems to support Shariah compliance, while others face challenges in implementing and monitoring such frameworks (Faizi & Shuib, 2024).

One of the distinguishing features of Shariah-compliant practices in OIC countries is the prohibition of interest (riba), excessive uncertainty (gharar), and investments in haram (forbidden) activities. Instead, these nations emphasize ethical financial practices such as profit-sharing models, including Mudarabah and Musharakah, which promote risk-sharing and mutual benefit (Bayuny & Haron, 2023). Furthermore, Shariah-compliant firms often maintain higher liquidity and conservative financial management approaches to comply with restrictions on interest-bearing investments (Mouline & Allach, 2024). This focus on ethical finance aligns with the broader objectives of OIC countries to achieve sustainable economic development while preserving social and moral values (Alsharari & AlHmoud, 2019).

Despite these advancements, challenges remain in achieving uniform Shariah compliance across OIC countries. Disparities in regulatory frameworks and the presence of non-compliant firms undermine the integrity of Islamic finance in the region. Non-compliant firms, which engage in interest-based transactions and

investments in prohibited industries, highlight the need for enhanced regulatory oversight and stronger enforcement of Shariah principles (Gunawan, 2024). Moreover, some OIC nations have adopted hybrid approaches, combining Shariah-compliant practices with conventional financial systems, which can lead to inconsistencies and hinder the broader adoption of Islamic finance principles (Bechihi et al., 2021).

In conclusion, Shariah compliance in OIC countries represents a cornerstone of their financial and economic systems, reflecting the shared values of Islamic law and ethical governance. While progress has been made in adopting Shariah-compliant practices, the diversity of regulatory environments and varying levels of compliance among member states highlight the need for continued efforts to standardize and strengthen Shariah frameworks. By addressing these challenges, OIC countries can further solidify their position as leaders in ethical finance, contributing to sustainable economic growth and social well-being.

1.10 CLASSIFICATION OF OIC AND NON-OIC COUNTRIES

The classification of countries into Organization of Islamic Cooperation (OIC) and Non-OIC groups serves as a crucial framework for comparative analysis in various fields, including economics, finance, and social studies. This classification is particularly relevant when examining working capital management (WCM) practices and their determinants across different economic and cultural contexts. One of the primary justifications for this classification is the unique economic and financial characteristics of OIC countries. Shirazi, Javed, and Ashraf (2018) highlight that one of the main reasons for selecting OIC member countries is their structural differences compared to Non-OIC countries. These differences are rooted in the social and cultural systems based on religious values. For instance, Muslims may opt out of conventional financial systems due to the strict prohibition of interest in Islam, leading to distinct financial behaviours and practices. As noted by Hassan and Aliyu (2018), OIC countries often operate under a dual banking system, where conventional and Islamic banking coexist. This dual system can significantly influence financial practices, including WCM, at both the firm and macroeconomic levels. The authors found that the presence

Furthermore, the presence of words such as "governance," "institutional," and "policy" in the word cloud suggests that there are significant differences in the regulatory and institutional environments between OIC and non-OIC countries, which could influence working capital management strategies (Ali et al., 2020). The appearance of "comparative" and "analysis" in the word cloud also supports the methodological approach of comparing OIC and non-OIC countries in the study. This visual representation of research topics reinforces the validity of the research design, which aims to examine working capital management efficiency in the context of OIC and non-OIC countries. It demonstrates that this study aligns with current research trends while addressing a specific gap in the literature regarding working capital management practices in these distinct economic environments.

The underlying scientific reasons for testing differences in working capital management (WCM) practices between OIC and non-OIC countries stem from several key factors. Firstly, the unique financial principles and practices in Islamic finance, which are prevalent in OIC countries, may significantly influence WCM strategies (Iqbal & Mirakhor, 2011). These principles, including the prohibition of interest (riba) and the emphasis on risk-sharing, could lead to distinct approaches to managing working capital. Secondly, the institutional and cultural differences between OIC and non-OIC countries may result in varying corporate governance structures and business practices, potentially affecting WCM decisions (La Porta et al., 2000). Additionally, the different levels of economic development and market structures in OIC and non-OIC countries could impact the availability and use of financial instruments for WCM (Levine, 2005). Furthermore, the varying degrees of financial market development and integration with global markets between these two groups of countries may influence the efficiency and effectiveness of WCM practices (Bekaert et al., 2011). By examining these differences, researchers can gain valuable insights into how religious, cultural, and economic factors shape financial management practices across different contexts, contributing to a more comprehensive understanding of global financial management theories and practices.

Furthermore, the classification allows for the exploration of how religious and cultural factors influence economic behaviour. The economic diversity within the OIC group itself provides another justification for this classification. Alam et al. (2019)

examined the heterogeneity in economic development among OIC countries and its impact on financial practices. They found significant variations in WCM efficiency across OIC countries, attributing these differences to factors such as institutional quality, financial market development, and adherence to Islamic financial principles. This heterogeneity within the OIC group offers a rich ground for comparative analysis with Non-OIC countries.

From a methodological perspective, the OIC and Non-OIC classification provides a clear and objective criterion for grouping countries. This is particularly important in large-scale, cross-country studies. The classification also facilitates the examination of how international economic cooperation and trade agreements specific to OIC countries might influence financial practices. Kammer et al. (2015) highlighted the growing importance of Islamic finance in the global economy, particularly in OIC countries. They noted that the principles of Islamic finance, which are more prevalent in OIC countries, can lead to distinct approaches to risk management and liquidity preferences, potentially affecting WCM strategies.

Moreover, the OIC and Non-OIC classification enables researchers to investigate the potential spillover effects of Islamic financial practices on conventional financial systems. Gheeraert and Weill (2015) found evidence of such spillover effects in countries with dual banking systems, which are more common in OIC nations. This finding suggests that the classification could reveal broader trends in financial practices that extend beyond just the firms explicitly following Islamic financial principles. Thus, the OIC and Non-OIC groups provide a valuable framework for analysing differences in financial practices, including WCM. It allows for the consideration of unique economic structures, cultural influences, and financial systems that characterize OIC countries. This classification not only facilitates meaningful comparative analyses but also contributes to a more nuanced understanding of global financial practices in an increasingly interconnected world economy.

The practices of working capital management (WCM) in the Organization of Islamic Cooperation (OIC) and non-OIC countries exhibit significant differences, reflecting varied financial systems, economic structures, and cultural factors. While extensive research has been conducted on financial inclusion (Kim et al., 2017),

economic growth (Erum & Hussain, 2019), and banking performance (Mobarek & Kalonov, 2013) in OIC countries, there is a notable lack of comprehensive studies specifically comparing WCM practices between OIC and non-OIC countries. Islamic financial principles, which emphasize risk-sharing and prohibit interest-based transactions, likely influence WCM strategies in OIC countries (Mohieldin et al., 2011). This may lead to more conservative approaches, potentially resulting in higher levels of working capital. In contrast, firms in non-OIC countries typically have more flexibility in their WCM strategies, often adopting more aggressive approaches to maximize profitability. However, empirical evidence directly comparing these practices is limited. The existing literature primarily focuses on broader financial aspects, such as the impact of financial inclusion on bank risk-taking (Banna et al., 2021) or the effects of institutional quality on financial development (Ali et al., 2020), rather than specifically addressing WCM practices. This gap in the literature underscores the need for a comprehensive study examining the factors influencing WCM efficiency in both OIC and non-OIC contexts, as well as the potential impact of these differences on firm performance and economic growth.

1.11 RESEARCH PROBLEM

The management of working capital is crucial for firms' financial health and operational efficiency. However, there is a significant gap in the understanding of how working capital management (WCM) practices differ between Organization of Islamic Cooperation (OIC) and Non-OIC countries. This gap is particularly important given the unique financial principles and practices in Islamic finance that may influence WCM in OIC countries. Specifically, this study addresses the following research problems:

Limited Comparative Analysis: While numerous studies have examined WCM in various contexts, there is a lack of comprehensive comparative analysis between OIC and Non-OIC countries. This limits the understanding of how Islamic financial principles might influence WCM practices.

Insufficient Exploration of Firm-Level and Macroeconomic Factors Together: Most existing research focuses on firm-level determinants of WCM efficiency, with limited

attention to macroeconomic factors. This is especially pertinent when comparing countries with different economic structures and principles.

Inadequate Consideration of Economic Cycles: The impact of economic booms and recessions on WCM efficiency, particularly in the context of OIC versus Non-OIC countries, remains understudied.

Methodological Gaps: Previous studies have often relied on simplistic analytical approaches, failing to capture the complex dynamics of WCM across different economic and cultural contexts.

1.12 RESEARCH QUESTIONS

To address these research problems, this study aims to answer the following research questions:

1. Is there a significant difference in working capital management efficiency between firms in OIC and Non-OIC countries?
2. What firm-level factors significantly affect working capital management efficiency in OIC and Non-OIC countries?
3. How do macroeconomic variables impact working capital management efficiency in OIC and Non-OIC countries?
4. Does the impact of firm-level and macroeconomic determinants on working capital management efficiency differ between recession and boom economic states in OIC and Non-OIC countries?

1.13 RESEARCH OBJECTIVES

The primary objectives of this study are:

1. To evaluate the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.
2. To test whether a difference exists in the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.
3. To examine the firm-level and macroeconomic determinants of WCM efficiency in OIC and Non-OIC countries
4. To investigate the differential impact of firm-level and macroeconomic determinants on the WCM efficiency in OIC and Non-OIC countries in recession and boom states of the economy.

1.14 NEED AND CONTRIBUTION OF THE STUDY

The preceding paragraphs reveal that empirical literature on WCM has occupied a significant academic space even though the research conducted so far has been mostly focused on analysing the relationship between WCM and firm profitability both in developed as well as developing countries (Singhania and Mehta, 2017; Lyngstadaas & Berg, 2016; Pais & Gama, 2015). However, recent studies have tried to examine the factors that determined working capital efficiency (Akgün, & Memiş. 2021; Bhattacharya, 2021). These studies suggest that both internal as well as external factors have an impact on working capital efficiency and suggest the importance of these factors in determining working capital efficiency. This study contributes to this part of the literature in several ways. First, the study examines the impact of both firm-level and macroeconomic factors on working capital efficiency, providing a more holistic understanding of WCM determinants. Second, the research analyses WCM practices across the Organization of Islamic Cooperation (OIC) and Non-OIC countries, offering insights into potential differences in financial management practices between these two

groups. Third, the study investigates WCM practices across recessionary and boom states of the economy, separately for OIC and Non-OIC countries. This approach provides a nuanced understanding of how economic cycles affect WCM in different economic contexts. Finally, the study contributes to the WCM literature by strengthening the modelling methodology and establishing robust relationships between the study's variables. Unlike prior research, this study addresses potential issues of heteroscedasticity and autocorrelation by employing robust standard errors. For instance, to ensure the reliability of the results, the study incorporates alternative sensitivity and robustness analyses. These additional tests validate the findings under various specifications and assumptions.

1.15 ORGANIZATION OF THE STUDY

The study has been organized into five broad chapters. Chapter-1 provides a broad overview of the research study and highlights the background of the study. Further, the chapter brings forth the significance of working capital. The chapter concludes by highlighting the contributions made by the study.

Chapter-2 presents a review of the systematic and theoretical literature review carried out on working capital management. Further, this chapter provides a brief review of the studies conducted to analyse the factors affecting working capital efficiency. The chapter also enumerates the direction of the research conducted, the time periods of the studies involved, the scope and limitations of the studies, the conclusions drawn from the studies, and the objectives thereof fulfilled. The chapter concludes by identifying the gaps in the existing literature, justifying the need for the present study.

Chapter-3 details the research methodology adopted for the study. The chapter delineates the framework of the study, the objectives set, the hypothesis developed, the sources of data used, and the modelling followed for analysis.

Chapter-4 this chapter highlights the results obtained after applying the empirical models presented in the previous chapter and would pave the way for hypotheses testing. In addition, this chapter will also discuss the findings of the study

in the light of theory and available empirical literature available on the subject. Accordingly, the chapter sets for drawing inferences and putting forth implications for policy making.

The last chapter, Chapter-5 summarises the findings of the study highlights the policy implications and puts forward the recommendations based on the study results. This chapter also brings out the limitations of the study and sets forth the directions for future research.



CHAPTER TWO

LITERATURE REVIEW

2.1 PREAMBLE

The current chapter aims to present theoretical and empirical research on the current topic and related fields. Following the literature evaluation, the gaps are noted and analysed to highlight the possible areas for further research in working capital management.

2.2 SYSTEMATIC LITERATURE REVIEW ON WORKING CAPITAL MANAGEMENT

Working capital is seen as the lifeblood of any economic entity. In truth, a company cannot expand without making effective management on working capital management, nor can it sustain itself without having optimal working capital. Consequently, effective working capital management is a crucial prerequisite for an organisation to succeed (Ghosh and Maji, 2004). In a seminal work Smith (1980), argued that a firm must effectively manage its working capital because it influences the profitability and, as a result, the value of the firm. Following this, a vast body of literature on working capital management emerged.

Working capital management theory explains how working capital should be managed and demonstrates the benefits to the company in terms of liquidity, solvency, efficiency, profitability, and maximising shareholder wealth that results from doing so (Brigham et al., 1999; Gitman, 1974 and Wasantha, 2021). Cash, credit, inventory, and accounts payable all have an impact on liquidity since they are part of a company's overall cash flow (Maness, 1994; Hashmi and Iqbal, 2022). A company's liquidity is jeopardised if it contemplates lowering its cash levels by carrying too many goods or giving out too much credit. If declining cash levels are not addressed, the firm may face insolvency and, eventually, bankruptcy when its obligations surpass its assets (Abdulkadir and Usman, 2023; Gitman, 1997; Dierks and Patel, 1997; Nabila, 2021).

From the standpoint of efficiency, the company with the least amount of working capital per dollar of sales is regarded to be efficiently managing its working capital (Tully, 1994; Dharma, 2021). Working capital management aims to maintain an effective level of working capital by managing the company's current assets and current obligations.

The core ideas of the theory of working capital management are the ideal level of current assets, the profitability risk trade-off connected to the level of current assets and current liabilities, and financing mix methods (Haralayya, 2021). To achieve the efficiency requirement, working capital management aims to ensure that the investment in working capital components is optimised, avoiding both underinvestment and overinvestment. While the latter is waste, the former could lead to illiquidity, stock-outs, and missed sales (Tully, 1994; Aransiola, 2021). In terms of profitability, the amount of working capital investment and the financing of this investment, at any given level of production, entail a risk-return trade-off (Madura and Veit, 1988; Deari and Kukeli, 2022). In general, the bigger the risk, the higher the return management and shareholders would require justifying any investment in working capital (Gitman, 1997). Reducing the amount of cash held in accounts receivable and inventory while operating the business helps to improve internal performance, which is reflected in increases in economic value added (EVA), and therefore shareholder wealth maximisation (Stephens and Bartunek, 1997; Dierks and Patel, 1997; Sani and Nwite, 2021; Zia et al., 2023; Kumar et al., 2023). As a result of these efficiencies, their liquidity, solvency, profitability, and shareholder wealth maximisation increased. Working capital is clearly connected to a business's success, and because of its tight association with production and output, it has been stated that the goal of working capital is to guarantee the effective and efficient use of resources (Paulo, 1992; Bierman and Smidt, 1988; Lazarus, and Gupta, 2021).

In this chapter, a comprehensive overview of the current corpus of working capital literature is given. Specifically, an empirical examination vis-à-vis the systematic literature review, into the precise elements influencing the expansion of working capital literature is conducted to provide a holistic view of the available literature on working capital. Systematic reviews aid researchers in pinpointing the specific areas that need more attention, and they also help practitioners get a comprehensive understanding of the research area (Randhawa et al. 2016). The

"quantitative study of research, communication in science, and science policy" is known as bibliometrics, or, more accurately, scientometrics (Hess, 1997, p. 75). The clustering of the literature reveals the semantic (dis)association in the academic domain, while this chapter's use of bibliometrics gives an in-depth analysis of the larger research domain and its sub-domains and also names the most significant research.

2.3 BIBLIOMETRIC ANALYSIS OF EMERGING TRENDS IN RESEARCH

The three-stage procedure for conducting a systematic literature review as suggested by Tranfield et al. (2003) was followed (Figure 2.1). Step 1 deals with finding and choosing relevant publications from top academic databases including Web of Science and Scopus for the years 1933 to 2023. Step 2 deals with describing and categorising material in accordance with the year of publication, the journal of publishing, and the citation analysis of papers, among others. This exercise helps to pinpoint the most well-known and significant works among researchers and offers in-depth information about the areas where the research on working capital has been concentrated. Step 3 the study does the content analysis of the papers to identify research gaps.

2.3.1 Article Identification and Selection

Two major bibliometric databases (Scopus and Web of Science) were used for conducting a systematic literature review. It is worth noting that these two databases hold academic might and are mostly used for conducting systematic literature reviews (Cancino et al., 2017; Durán et al., 2016). The identification of articles in the two databases began with a keyword search by using the following keywords “working capital” OR “working capital efficiency” OR “trade credit” OR “receivables” OR “payables” OR “inventories” OR “working capital policy.” It is worth noting that these keyword searches were made in the title, keywords, or abstract.

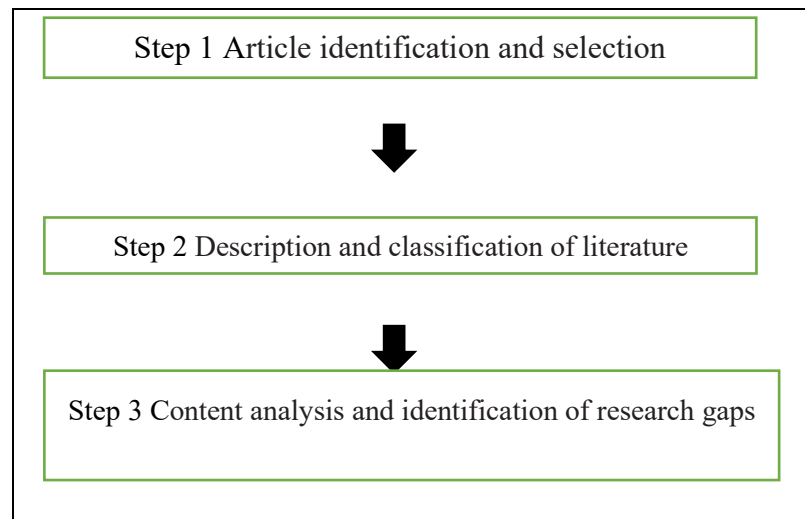


Figure 2.1 Procedure for Systematic Literature Review

Following the keyword search a total of 1717 articles were found in Scopus and 1217 articles were found in Web of Science. Further, the articles were filtered for subject filter and language filter. For instance, the articles concerning Business Management and Accounting, Economics, Econometrics and Finance, Social Science and Decision Sciences were considered. After applying the subject area filter, the researcher was left with 1514 articles from Scopus and 1064 from Web of Science. Following, the subject area filter, a language filter was applied where only articles in the English language were selected for the final systematic literature review. After applying this filter, the researcher was left with 1409 articles from Scopus and 958 articles from Web of Science, leaving us with a total of 2367 articles for systematic literature review.

However, some articles were indexed in both Scopus and Web of Science databases making it important to remove duplicates from the data. The process of combining files of Scopus and Web of Science was followed using Java Programming. After removing duplicates, the researcher was left with 1109 articles from Scopus and 758 articles from Web of Science, making it to a total of 1867 articles for final analysis.

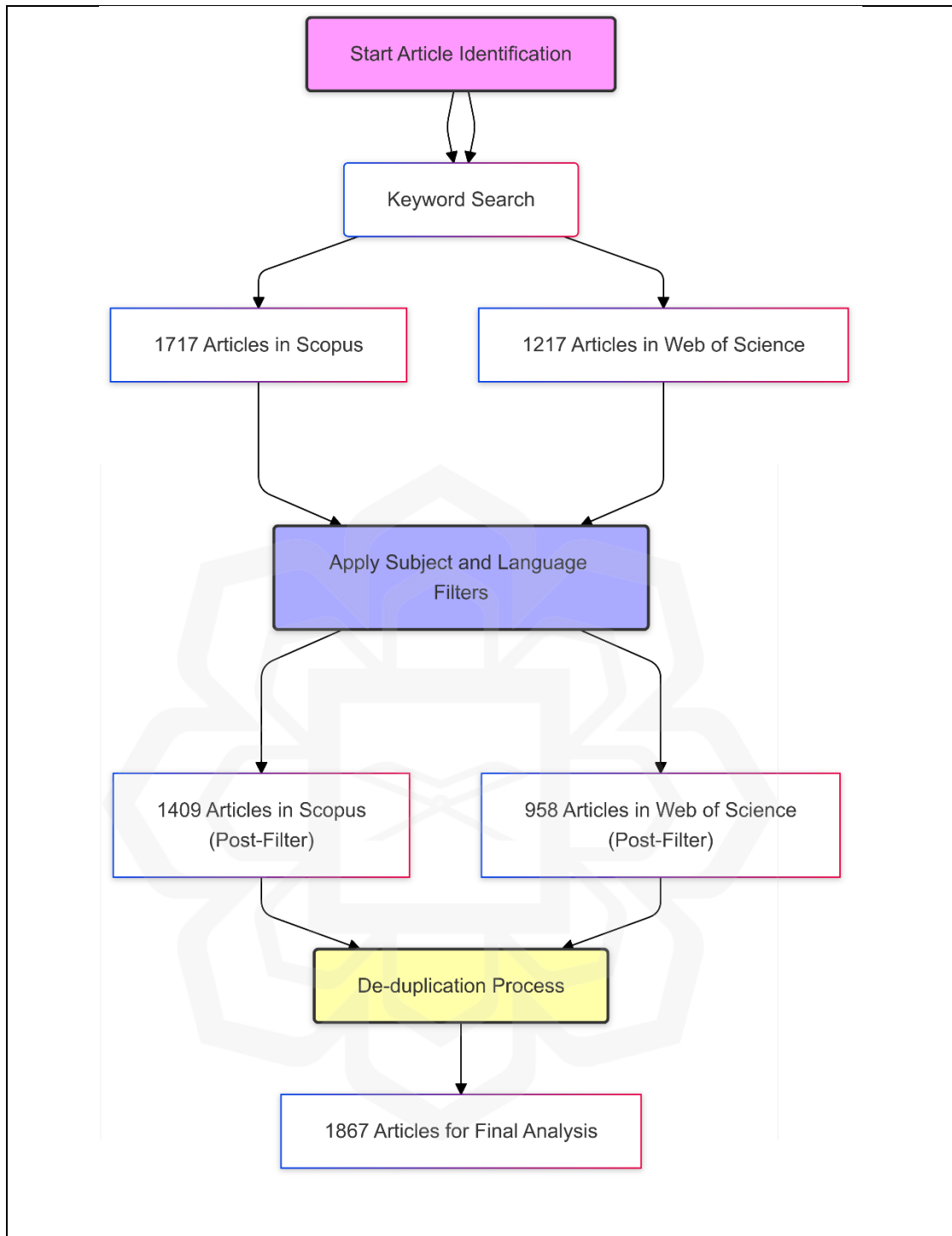


Figure 2.2 Article Identification and Selection

2.3.1.1 Main Information

Detailed information about the final 1867 articles is given in Table 2.1. From the results presented in Table 2.1, The analysis indicates that the total number of sources (Journals, Books. etc.) from which literature has been collected includes 868. It is important to

note that the literature concerning working capital has grown at an average rate of 2.8 per cent with the total citations per document being 19.18 and including 61,886 references from other documents.

Regarding Author details, it was found that 3,484 Authors have contributed to 1867 articles and among 3,484 Authors, 459 have been single-authored documents. Further, the documents share 2.28 co-authors per document. Further, regarding article type, 90 per cent of the documents have been published in Journals, a few articles have been published as book chapters and conference papers, while a minimal no of articles form the part of notes, editorials etc. It is important to note that 52 review papers have been published in the field of working capital. Additionally, 18 books have been also published in the subject area of working capital.

Table 2.1 Main Information about Data

Description	Results
Time span	1933:2023
Sources (Journals, Books, etc)	868
Documents	1867
Annual Growth Rate %	2.8
Document Average Age	10.3
Average citations per doc	19.18
References	61886
AUTHORS	
Authors	3484
Authors of single-authored docs	459
Co-Authors per Doc	2.28
DOCUMENT TYPES	
article	1586
book	17
book chapter	105
conference paper	75
conference review	2

Description	Results
editorial	2
erratum	3
note	18
retracted	1
review	52
short survey	6

2.3.2 Description and Classification of Literature

In this section, the 1867 selected papers were analysed in such a way as to make a description and classification of literature in terms of year-wise publication of articles, country-wise publication, most relevant journals, citations received by each journal, number of publications by Author and the citation received by Author.

2.3.2.1 Analysis of Articles Published Year-Wise

In this section, an analysis of articles by year of publication is provided. This exercise has been done to ascertain the growth in literature from the year 1933 to 2023. The results of this analysis are presented in Figure 2.2. From the data presented in Figure 2.1, it was observed that there has been a notable rise in the number of articles published on working capital-related topics between 1975 and 2023 (see Figure 2.1) compared to 1933 to 1974. It is worth noting that the publications on this topic during the years 1933 to 1974 have remained almost flat with just 1 or 2 publications year on year. This rise in publications after 1974 affirms the rising interest of scholars, researchers, and professionals on this topic.

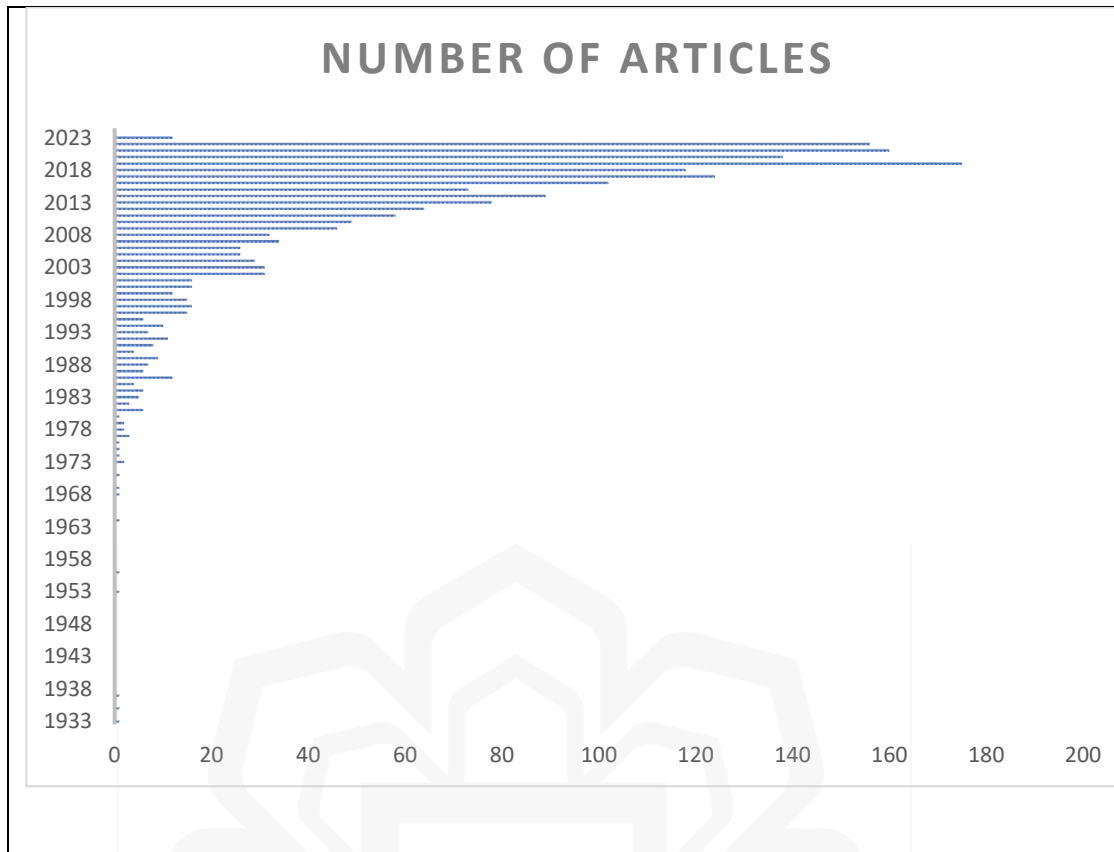


Figure 2.3 Articles Published Year-wise

2.3.2.2 Analysis by Country of Publication

In Table 2.2, the results of the articles are presented based on their country of publication. It is worth noting that only countries with at least five published papers have been presented. From the figures presented in Table 2.2, it was found that the highest number of articles (204) have been published from USA, followed by 113 articles from India and 91 articles from China. Further, the United Kingdom, Canada, and Malaysia among others have also been significant contributors to the working capital literature. From the data on the country of publication, The analysis reveals a mix of studies from both developed and developing countries; however, developed countries dominate the literature. Further, an interesting finding from the literature reveals the lack of cross-country studies being conducted that limits the aptitude in comparing findings across different contexts and cultures.

Table 2.2 Country of Publication

Country	Articles
USA	204
India	113
China	91
United Kingdom	61
Canada	37
Malaysia	31
Italy	30
Germany	27
Poland	26
Turkey	26
Finland	25
Indonesia	24
South Africa	24
Spain	24
Australia	22
Nigeria	20
Jordan	17
Pakistan	17
Brazil	15
France	15
Iran	15
Netherlands	13
Czech Republic	12
Saudi Arabia	12
Thailand	12
Ghana	11
Belgium	9
Bahrain	8
Greece	8
Japan	8
Portugal	8

Country	Articles
Colombia	7
New Zealand	7
Croatia	6
Korea	5
Norway	5
Switzerland	5

2.3.2.3 Most Relevant Journals

Table 2.3, the list of journals is presented that have mostly published work on working capital. It is worth noting that Table 2.3 includes only those journals that have published at least 10 articles. From the figures presented in Table 2.3, it can be ascertained that Managerial Finance has published the highest number (24) of articles followed by the Journal of Production Economics with 23 articles. The international journal of managerial finance is also among the major contributors to the working capital literature.

Table 2.3 Most Relevant Journals

Journals	Articles
Managerial Finance	24
International Journal of Production Economics	23
International Journal of Managerial Finance	19
Sustainability	19
Global Business Review	17
Investment Management and Financial Innovations	16
International Journal of Recent Technology and Engineering	15
Indian Journal of Finance	13
International Research Journal of Finance and Economics	13
International Journal of Production Research	11

Journals	Articles
Journal of Corporate Accounting and Finance	11
Emerging Markets Finance and Trade	10
International Journal of Applied Business and Economic Research	10
Journal of Accounting and Economics	10
Management Science	10

2.3.2.4 Citations Received by Each Journal

In this section, the journals are presented that have received the highest number of citations from 1933 to 2023. Specifically, in Table 2.4, only those journals are presented that have received at least 200 citations. Notably, the Journal of Accounting and Economics has received the highest number of citations equal to 5642, followed by Accounting Review with 3,417 and Journal of Financial Economics with 1,473 citations. Further, the International Journal of Managerial Finance has received around 921 citations from 1933 to 2023. An interesting finding about the figures presented in Table 2.4 is that although the Journal of Accounting and Economics, Accounting Review and Journal of Financial Economics have not been among the journals that have published the highest number of articles, they have the highest number of citations. This implies that quantity is not the driver in working capital literature, rather it is the quality that drives the attention.

Table 2.4 Journal Citation

Journal	TC
Journal of Accounting and Economics	5642
Accounting Review	3417
Journal of Financial Economics	1473
International Journal of Managerial Finance	921
International Journal of Production Economics	875
Journal of Business Finance and Accounting	808
Management Science	704

Journal	TC
Journal of Business Venturing	638
Journal of Banking and Finance	594
Journal of Corporate Finance	551
International Journal of Physical Distribution and Logistics Management	515
Journal of Monetary Economics	467
Journal of Business Research	417
Rand Journal of Economics	404
Production and Operations Management	383
Managerial Auditing Journal	374
Journal of Business Logistics	359
American Economic Review	357
Journal of Development Economics	349
Contemporary Accounting Research	326
Global Business Review	285
Supply Chain Management	270
Review of Financial Studies	269
Journal of Small Business and Enterprise Development	262
Research in International Business and Finance	249
International Research Journal of Finance and Economics	229
Omega	221
Harvard Business Review	212
Economic Journal	209
Managerial Finance	206
Small Business Economics	204
NBER Macroeconomics Annual	204

2.3.2.5 Publication by Authors

In this section, the list of authors who have contributed to the working capital literature is presented in Table 2.5. It is worth noting that only those authors who have published at least five papers on working capital are included in Table 2.5. From the figures presented in the table, it can be ascertained that Timo Kärri has published the highest number (17) of papers, followed by Satish Kumar with 13 papers and Grzegorz Michalski with 10 papers. The remaining authors have published fewer than 10 papers on working capital.

Table 2.5 Publication by Authors

Authors	Articles
Timo Kärri	17
Satish Kumar	13
Grzegorz Michalski	10
Pedro J. García-Teruel	9
Pedro MartínezSolano	9
Miia Pirttilä	9
Sari Viskari	9
Sonia Baños Caballero	8
Najib H.S Farhan	7
Amarjit Gill	7
Hofmann, Erik	7
HaithamNobanee	7
Almaqtari, Faozi A.	6
Umar Kayani	6
Lotta Lind	6
Sari Monto	6
Harsh Pratap Singh	6
Narayanasamy Sivasankaran	6
Grzegorz Zimon	6
Godfred Adjapong Afrifa	5
Ashiq Ali	5
Dongyang Zhan	5

2.3.2.6 Author Citation

In this section, information about the citations received by authors is provided. These results are presented in Table 2.6, which includes only those authors who have received at least 250 citations. From the data presented in Table 2.6, it can be ascertained that Patricia M. Dechow has received the highest number of citations (3,530) for her contribution to working capital. Furthermore, Ilia Dichev has received 2,260 citations for his contributions to the working capital literature. Notably, authors from both developing and developed countries have contributed to the working capital literature.

Table 2.6 Author Citation

Authors	TC
Patricia M. Dechow	3530
Ilia Dichev	2260
David Burgstahler	1753
Mark L. DeFond	1707
James Jiambalvo	1418
Victoria Ivashina	1109
David Scharfstein	1109
Pedro J. García-Teruel	994
Pedro MartínezSolano	994
Sonia Baños Caballero	625
Marc Deloof	606
Amy Patricia Sweeney	571
Enrique G. Mendoza	523
Andy Neumeyer	465
Fabrizio Perri	465
Peter Carey	441
Roger Simnett	441
PanosKouvelis	433
Steven Fazzari	404
Bruce C. Petersen	404

Authors	TC
Wenhui Zhao	403
Luca MattiaGelsomino	401
Alessandro Perego	401
ConstantinBlome	336
Michael Henke	336
David Wuttke	336
Lawrence Christiano	304
Mathias Trabandt	304
Chul W. Park	289
Satish Kumar	288
Abbie Smith	284
Joseph B Weintrop	270
Hofmann, Erik	259
Matthew D. Hill	258
G Wayne Kelly	254
Sweder van Wijnbergen	252
Ananth Raman	251

2.4 CONTENT ANALYSIS OF AVAILABLE LITERATURE

In this section, the trending topics that have evolved over the years in the working capital literature are presented, along with the co-occurrence network and the thematic map. Additionally, the conceptual structure of the available literature is also discussed in this section.

2.4.1 Trending Topics in This Research Area

Based on the examination, the results of trending topics in this research field are presented in Figure 2.3. The graph illustrates how various trending topics have changed and significantly increased starting in 2010. This expansion may be attributed to a

variety of factors. The identified trending topics in this research area include COVID-19, financial constraints, factoring, cash flow, inventory, firm performance, working capital, capital structure, operating cycle, cash conversion cycle, value-based management, working capital accruals, and emerging economies.

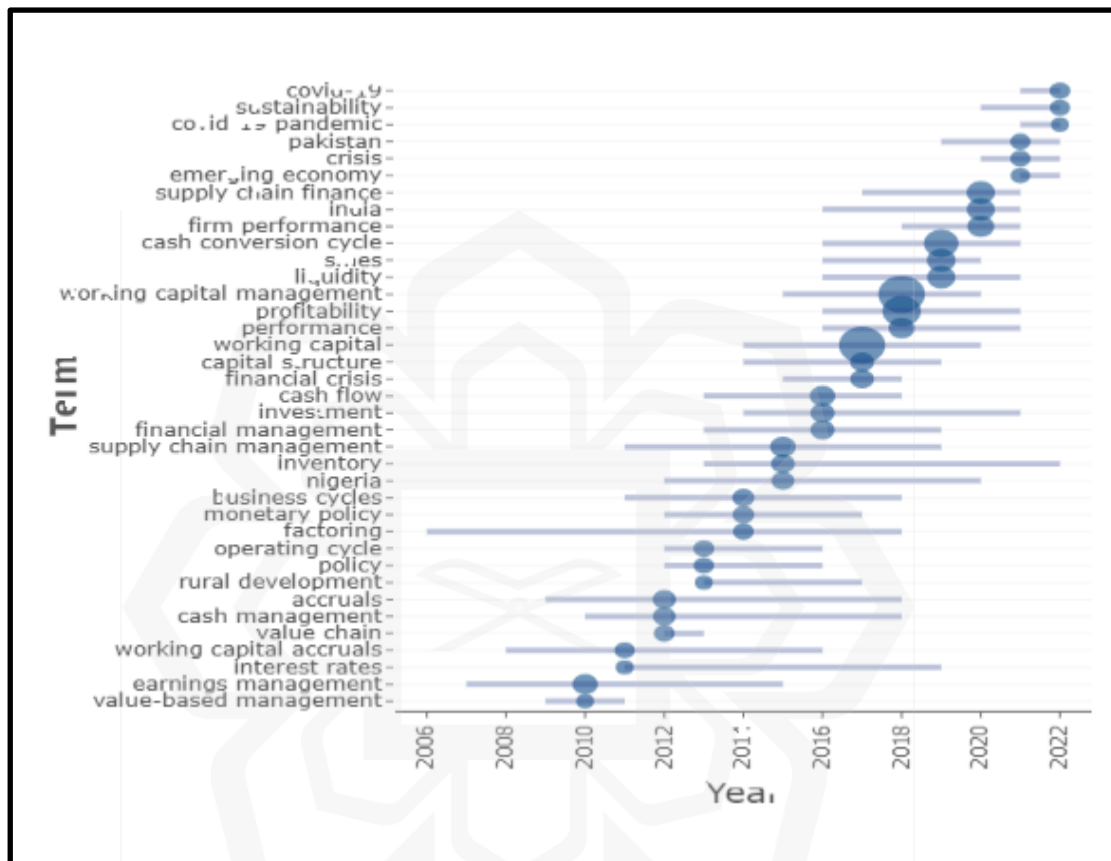


Figure 2.4 Trending Topics in the Research Area

2.4.2 Co-occurrence Network

In this section, a co-occurrence network is developed using the Bibliophagy package in R Studio, with the author's keywords serving as the unit of analysis. A 50-keyword co-occurrence network is generated, which is presented in Figure 2.4. The purpose of this network is to identify potential areas of research within the field of working capital. Figure 2.5 can be interpreted through the lines joining the nodes, where each line represents a word co-occurrence. The maximum number of joining lines indicates the strongest word co-occurrence, while the remaining lines highlight areas that are less

explored. From this figure, it can be observed that working capital management has been extensively linked with profitability, inventory control and costs, industrial economics, and supply chain in numerous studies. However, the remaining areas are explored to a lesser extent.

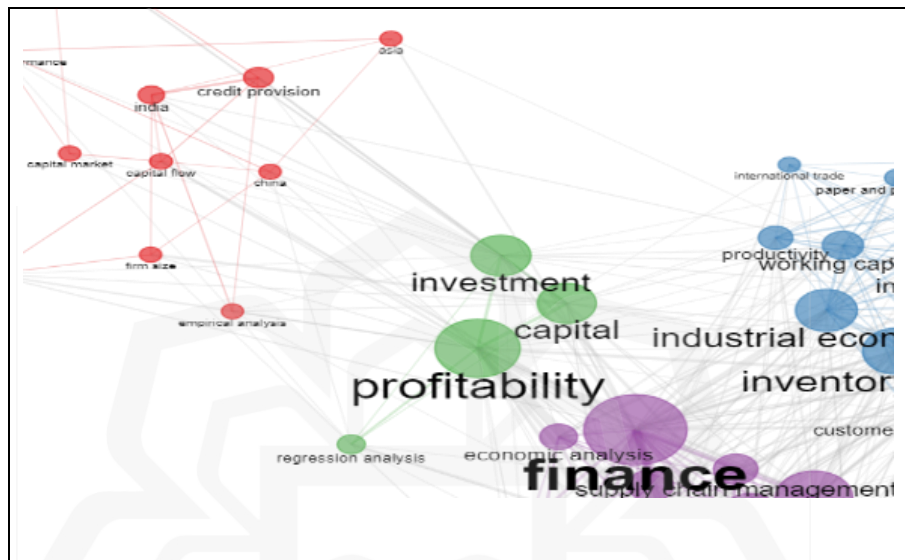


Figure 2.5 Co-occurrence Network

2.4.3 Thematic Map

Figure 2.6 shows a thematic map with two axes: density on the y-axis and centrality on the x-axis. Using this strategic diagram or thematic map, the identified topics have been divided into two main groups, that is the importance of the research theme and the development of the research theme (Caust & Vecco, 2017). This strategic diagram is divided into four quadrants, and each quadrant's associated themes are defined as themes that fall in the lower left quadrant are those that are emerging or waning. These research concepts are underdeveloped and have poor centrality and density which will either be strengthened or eliminated from this field of study. The Basic or Transversal themes are those that appear in the lower right quadrant. These themes have received a lot of investigation because of their high centrality but low density. These issues are crucial for this field of study. High-density, low centrality, or well-developed themes that are isolated but of limited significance to the research topic, are represented by the third upper left quadrant. High centrality and high density are the defining

characteristics of the final upper right quadrant. There are motor fits in this quadrant, which means developed, and essential themes for this research area.

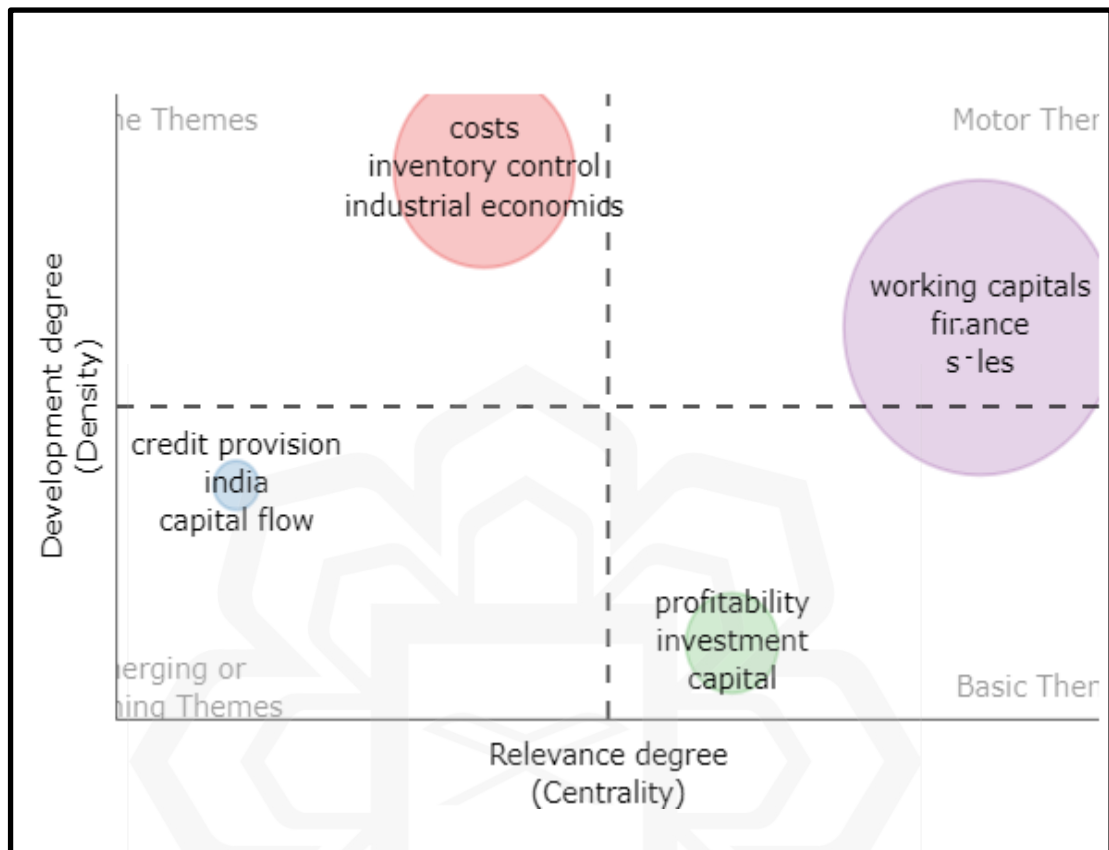


Figure 2.6 Thematic Map

2.4.4 Conceptual Structure of the Available Literature

In this section, the literature is documented in its conceptual framework to identify research gaps. The conceptual structure of working capital literature is presented under the following headings.

2.4.4.1 Evolution of Working Capital Management Research

The review of WCM literature in this section examines the evolution of working capital research (the 1900s-1940s), to a pre-and post-World War II era (1920s-1950s), to the optimization and simulation approaches of working capital in the industrialisation era

(1950s-1980s), to the current, globalisation era's focus on the effectiveness of WCM (1990s-2000s). Each part will look at the major difficulties that have arisen as a result of the advancement of WCM research over time.

2.4.4.1.1 Working Capital: Awareness Era (1900s-1940s)

WCM research as a discrete management practice had little development between the 1900s and the 1940s, owing to a scarcity of research. Few articles relevant to working capital were published in various journals during this period and there appeared to be an inconsistent understanding of what was covered within the phrase 'working capital'. Disputes over working capital definitions and categorizations suggest a learning stage in which the learner is building a grasp of working capital characteristics and looking for common ground between theory and practice. Mann (1918) gave one of the early definitions of working capital: "the amount of money or money equivalent deemed to be necessary to perform the utility's current activities." It is also known as net working capital (NWC), and it's the amount of money needed to keep a business running or liquid. The net worth of a company reflects its operating cycles, financing options, and liability commitments. The American Institute of Accountants' Committee on Accounting Procedure published Accounting Research Bulletin (ARB) no. 30 in 1947, which defined working capital and classified the operational cycle.

Working capital, also known as net working capital, is defined as the difference between current assets and current liabilities, and it represents the relatively liquid portion of total enterprise capital that serves as a margin or buffer for meeting obligations incurred and liquidated during the normal business cycle (Committee on Accounting Procedure, 1947, p. 282). Because many transactions occur during this time period, ARB no. 30 established a twelve-month operating cycle for current assets and current liabilities. However, it accepted the possibility of lengthier business cycles in particular industries, such as vineyards, timber, and agriculture, where corporations may use protracted durations. Practitioners chastised this advisory for being inconsistent with best practices. Disputes over working capital operating cycles and specifications of current assets and current liabilities were two major concerns discovered at this time. Swartz (1947) claimed that the requirement in ARB no. 30 that the operational cycle be

defined as 12 months was incompatible with practice. He went on to say that some companies might make two or more items with separate operating cycles. In certain ways, this causes accountants to become perplexed when it comes to items with different operating cycles. ARB no. 30's characterization of items that can be classified as current assets or current liabilities prompted debate among practitioners. For example, ARB no. 30 eliminated deferred expenses or unallocated costs from current assets, which would benefit enterprises in the long run. Swartz (1947) claimed that accountants must discern between deferred charges and prepaid expenses in the balance sheet based on their own judgment and minimal advice. In general, he disagreed that due to borderline circumstances, accountants may not be able to evaluate or categorise what may be included or excluded in current assets. Swartz (1947) also clarified why contractual commitments (such as prepaid rentals) that were intended to be returned were excluded from current liabilities. He questioned accountants' ability to predict what would happen in the near future and what should or should not be included in the balance sheet. Furthermore, he stated that ARB no. 30 had changed the balance sheet's direction from revealing what had occurred to revealing what was predicted to occur.

2.4.4.1.2 Working Capital in the Pre and Post World-War II Era: Liquidity and Financing (1920s-1950s)

The pre-and post-World War II (WWII) era (1920s-1950s) influenced the development of working capital studies significantly. Due to similar operating settings and proof (of seventeen developments of working capital) occurring in both periods, the awareness stage and this era overlapped. The primary points of contention during this time were the right levels and funding of working capital. Benjamin (1939) claimed that having a positive NWC was preferable to having a negative NWC since it improved liquidity. Positive net working capital (NWC) refers to organisations that maintain greater ratios of current assets (cash, receivables, or inventories) to current liabilities (payables, prepaid expenses) and rely less on bank loans or supplier credits to meet working capital needs.

A low current ratio, on the other hand, refers to organisations with low current assets (e.g., reduced cash or inventory levels) and higher current liabilities, implying a

greater reliance on financing (e.g., bank loans) to meet working capital needs. According to Chandler (1994), American corporations extended their international market shares and even dominated British home markets throughout the interwar period (between WWI and WWII). During this time, he emphasised the necessity of huge capital capacity and economies of scale as competing forces for large American firms. In terms of working capital, according to Ketchum (1942), many American corporations preferred to use equity market securities to finance working capital in the 1920s. However, in the 1930s, many companies were able to fund their working capital activities and reduce their reliance on bank loans. This suggests that enterprises opted to manage working capital activities using the positive NWC method during this period. Chandler (1994) went on to say that during World War II, industrial output increased dramatically, with more than half of American manufacturing capacity dedicated to military-related products. As a result, the need for operating capital has risen considerably (Ketchum, 1942). Investors' reactions to the uncertainties of war, rising material costs, higher labour costs, and the need for new plants to meet higher demands made it difficult for companies that were normally in favour of issuing equity market securities (common stocks) to finance their working capital or financing working capital on their own (Ketchum, 1942). Furthermore, Ketchum noted that when businesses ran out of cash, they turned to banks for help with working capital. This implies a shift away from a positive net working capital approach toward a low current ratio approach to working capital management. As the war progressed, American businesses were more reliant on bank loans to fund working capital. However, due to the risks and uncertainties of war, banks were becoming hesitant to give finance (Ketchum, 1943). As a result, the United States government was forced to inject funds into American businesses to help support the development of new factories and machinery as well as working capital requirements. After the war, this had a knock-on impact. Following WWII, major capital-intensive businesses with advanced technology dominated emerging markets, according to Chandler (1994). He noted, for example, that International Business Machines (IBM) dominated the fast-rising computer business, while Boeing and Douglas dominated the commercial aeroplane industry. As a result, working capital management appeared to represent a shift in organisational priorities. By the end of the 1940s, American businesses had regained excellent liquidity situations, with total current assets exceeding current liabilities (Carey, 1949). This suggests that businesses have returned to a constructive NWC approach to working

capital management. Researchers invested greater effort into inventing new strategies to manage working capital activities as the field became more complex.

2.4.4.1.3. Working Capital in the Industrialization Era: Optimization and Simulation Models (1950s-1980s)

Between the 1950s and the 1980s, the industrialization era ushered in a shift in working capital research. Manufacturing sectors have been altered by advanced technology and machines, allowing enterprises to profit from economies of scale and hence lower operational costs (Kaplan, 1994). After the 1950s, American firms grew and developed various divisions to focus on a variety of business activities, according to Chandler (1994). He added that senior managers lacked the requisite skills and experience to assess the effectiveness of various business activities, so they relied on a variety of mathematical models to help them make decisions. As a result, throughout this period, working capital studies created a variety of mathematical and simulation models to assist managers. Several academics have recognised the potential for mathematical solutions to reduce WCM requirements by combining two or more working capital components (Beranek, 1963; Kim and Chung, 1990; Shapiro, 1973; Thompson, 1975). For example, inventory levels (high or low) influence credit discount policy decisions (Beranek, 1963), and the length of the credit period affects inventory levels (Beranek, 1963; Thompson, 1975). As a result, the increasing focus was placed on establishing mathematical models as decision-making tools for WCM components in the development of working capital studies. Beranek (1963) proposed a methodology for making simultaneous decisions about cash discount policy and inventory levels. He proposed that the best cash discount rate was determined by the amount of inventory on hand (higher inventory levels indicating better offerings of cash discount rates). In both inflationary and deflationary contexts, Shapiro (1973) offered a credit policy model. Because consumers are more inclined to delay payments during a recession, Shapiro's model was created to predict the length of the credit period. In addition, Shapiro's approach predicted the best time to buy inventories.

Thompson (1975) was the first to propose using capital budgeting to identify optimal inventory levels. When credit policies were believed to be impacted during

economic downturns, he explained the need to re-evaluate the economic order quantity for inventory management. Previous research proposals, according to Kim and Chung (1990), would result in frequent changes in lending policy and could result in enterprises losing consumers. They offered a combined inventory and account receivables examination to develop appropriate cash flow measures for operations management. Many optimization models have been chastised for their inability to adapt to a variety of organisational setups and commercial conditions (Napitupulu, 2023; Borah, 2023; Damon and Schramm, 1972; Knight, 1972; Merville and Tavis, 1973). Knight (1972) emphasised the limitations of mathematical models in dealing with working capital risks and uncertainties. He proposed combining simulation and mathematical models to address the drawbacks of utilising mathematical models alone in the budgetary process for determining parameters (i.e., sales volume, inventory level, credit policy). As a result, scholars focused their efforts on adding simulation models into working capital management. By identifying critical elements in manufacturing, finance, and marketing, Damon and Schramm (1972) constructed a decision-making model to determine the appropriate level of working capital.

Merville and Tavis (1973) suggested an interlocking planning model that integrated decisions concerning receivables, inventory, and financing. In 1975, Bierman, Chopra, and Thomas proposed a ruin consideration model that linked working capital and capital structure. Working capital decisions should be linked to other functional units (manufacturing, marketing, and finance), not only to avoid ruin (e.g. technically insolvent) but also to boost sales by modifying inventory levels and credit policies, they said. While working capital research at the time provided options for increasing working capital performance, the value of optimization and simulation models to practitioners was not recognised until a survey by Gitman, Moses, and White in 1979. They discovered that in managing working capital activities, managers in large firms in the United States tended to utilise sophisticated financial approaches. Managers employed 21 optimization and simulation models to improve their manufacturing skills and increase profitability by lowering production costs, according to the researchers. Decision-making processes based on mathematical and simulation models, on the other hand, are difficult to construct in complex organisational settings in a tough and dynamic corporate environment. Because of their inflexibility, according to Trahan and Gitman (1995), optimization and simulation models are not widely accepted by many

chief financial officers (CFOs) of Fortune 500 companies and Forbes 200 best small businesses. A new wave of working capital research has evolved in response to these difficulties and opportunities, concentrating on the effectiveness of WCM.

2.4.4.1.4 WCM in the Globalization Era: Effectiveness (1990s-Present)

Profitability and liquidity are the two most critical criteria for effective WCM (Ferine et al., 2023; Abd-Elfatah et al., 2023; Bilgin and Turan, 2023; Pass and Pike, 1984; Shin and Soenen, 1998; Reddy, 2021). Pass and Pike (1984) went on to say that improving organisational performance requires good management of working capital components. Because profitability is a subjective concept that can be construed in a variety of ways, their definition of profitability as 'maximizing shareholder value' is critical. As previously stated, liquidity refers to a company's capacity to meet its financial obligations on a day-to-day basis (Moyer et al., 2009; Hidayat and Dewi, 2023). Furthermore, throughout this period, two distinct conceptions are identified that are thought to contribute to effective WCM: financial viewpoint and organisational context.

From a financial standpoint, WCM research has suggested that effective WCM can be achieved by incorporating performance into the cash conversion cycle. As previously stated, shortening the cash conversion cycle (similar to 'squeezing' WCM components) leads to an increase the profitability and positive liquidity (Richards and Laughlin, 1980; Johnson and Soenen, 2003; Bedniaev and Khamurova, 2021). Shin and Soenan (1998) conducted the first study, which discovered a link between shorter cash cycles and a 22 per cent increase in profitability among American businesses. Later research in Greece (Lazaridis and Tryfonidis, 2006), India (Vishnani and Shah, 2007), Kenya (Mathuva, 2014), Indonesia (Sunardi, 2021), and Malaysia revealed similar outcomes (Mohamad and MohdSaad, 2010; Zariyawati et al., 2009), Finland (Liukkonen, 2021), Austria, Finland, Greece, Hungary, Ireland, Poland, Portugal and Romania revealed similar outcomes (Deari et al., 2022). Small and medium-sized businesses showed similar effects (Garca-Teruel and Martnez-Solano, 2007; Ayşegül et al., 2022).

In contrast, different conditions, such as those identified in Belgium (Deloof, 2003), Pakistan (Raheman and Nasr, 2007) and New Zealand (Weerasekara, 2021), led to profitable companies paying suppliers early or within the discount period, with managers preferring to save money by paying suppliers early and thus improving profit margins. Some research finds that 'squeezing' WCM components is a better option than increasing profits (Asar and Owusu, 2022) and that WCM effectiveness is only measured in financial terms. Alternatively, certain businesses may benefit from cash reductions to increase profits. It's worth noting that the message conveyed by the 'squeezing' method may obstruct the development of a strong financial supply chain (Brigham and Ehrhardt, 2008; Hofmann and Kotzab, 2010; Moyer et al., 2005; Bedniaev et al., 2021). Stretching payment to suppliers is one element of a squeezing strategy. However, this is deemed an 'unequal allocation of power' (Hofmann and Kotzab, 2010, Sun et al., 2022). Delaying payments to suppliers may result in multiplier effects, with enterprises expanding at the expense of suppliers and customers. Instead, organisations should use cross-enterprise collaboration to obtain a competitive advantage (Hofmann et al., 2021), as synchronising the flow of stocks and payables throughout the supply chain benefits the entire value chain.

Cross-enterprise collaboration is a platform that allows parties in a supply chain to share information and build strategic goals together to coordinate activities (Bowersox et al., 2003; Vasconcelos, 2022). Many academics have proposed that cross-enterprise sector strategic cooperation in meeting market demand may have an impact on WCM (Bowersox et al., 2003; Mohr et al., 1996; Mollenkopf et al., 2022; Wadhwa et al., 2006; Wood, 1993; Bakar and Azaliah, 2020; Xi et al., 2021; Chen et al., 2022). Furthermore, researchers believe that by enhancing communication routes between manufacturers, suppliers, and retailers through information-sharing platforms, market behaviour will be less uncertain. As a result, businesses could better manage their WCM activities and production plans.

Researchers have stated that building effective WCM in an organisational context transcends finance and is heavily reliant on other disciplines (Brigham et al., 2008; Gitman, 2009; Ponny, 2021). As previously said, managing working capital components is an important part of managing corporate operating cycles and entails the involvement of a diverse group of individuals within an organisation (Gitman, 2009;

Schilling, 1996; Naz et al., 2022). Purchasing supplies, manufacturing products, and selling items are the three key tasks in a normal operation cycle (Moyer et al., 2005; Anita, 2021; Yanamandra and Pranav, 2022). These operations generate Non-instantaneous, non-synchronized financial flows. Companies must purchase supplies (for production) in advance and then pay for them (payables) before cash receipts (cash collection from receivables). Working capital transactions are complex in large companies, and the responsibility for managing WCM components is distributed among several finance managers (Gentry et al., 1979; Gizaw, 2021). As a result, the decision-making process for working capital components should be synchronised to maximise profitability. WCM research that focuses on organisational environments is yet undeveloped. Scholars have proposed alternatives to improve WCM based on organisational contexts, such as information technology for coordination (Fairchild, 2005, Aransiola, 2021), Six Sigma to reduce root causes of problems (Srivastava, 2004; Avci and Çinko, 2021), horizontal organisational structure to improve adaptability to consumer demands (Sehgal et al., 2006; Ramjaun et al., 2022), and the Just-In-Time (JIT) strategy to improve supply chains (Bartezzaghi et al., 1992; Lukman et al., 2022).

Similarly, strategic working capital management in organisational contexts has the potential to develop an effective working capital management tool. The financial perspective's flaws make it difficult for managers to analyse and make sense of a wide range of data, which has become increasingly crucial in the current period of globalisation, with expanding global rivalry, improved technology, and new products and services (Harrison and McKinnon, 2007; Hu et al., 2021). This highlights the necessity to investigate WCM in organisational settings to better assist managers and academics in explaining WCM practices in today's environment.

Most of the literature on the subject has largely remained focused on analysing the impact of working capital management on firm profitability, even though previous research indicates the importance of the entire set of working capital management decisions as a predictor of firm profitability. As there are still many uncharted areas with tremendous research potential, many additional working capital characteristics, their dynamics, and their impact on the overall success of an organisation have not been the preferred subject for researchers. For instance, a study published recently by Baños-Caballero et al (2016) revealed that the way a company finances its working capital

influences the profitability of the company. Intriguingly, a different study by Baños-Caballero et al. (2014) found that the degree of financial constraint at the firm affects the relationship between the cash conversion cycle (CCC) and firm profitability. Similar to this, there aren't many studies that have sought to look into other intriguing working capital phenomena, such as the factors that influence CCC, specifically the effect of firm-level and macroeconomic variables on CCC.

2.4.4.2 Theoretical Underpinnings Underlying This Study

The proposed study would be grounded on the WC theory, which demonstrates that when Current Assets (CA) exceed Current Liabilities (CL), firms can use the "surplus" to create investments from the "fund source," generate daily cash levels to meet disbursement and current obligations (Laux, 2012; El-Maude and Shuaib, 2016; Sah, 2021). In 1955, Sagan, the pioneering architect behind the WC theory, observed that the efficient management of WC resulted in healthy financial structures for organizations. However, the idea of the cash cycle was put forth by Gitman (1974), and a comprehensive shape was given by Richards and Laughlin (1980) in terms of CCC (Cash Conversion Cycle). It is defined as the total sum of the inventory period (INVD) and accounts receivable period (RECD) after the accounts payable period (PAYD). A more efficient WCM might result in a shorter CCC, which could result in better profits (Richard and Laughlin, 1980; Kundu and Quddus, 2022). The focus of CCC is on optimizing WCM components (Klepzig, 2023; Hidayat and Dewi, 2023; Weinraub and Visscher, 1998; Mazanec, 2022).

2.4.4.2.1 Cash Conversion Cycle Theory (Main Theory)

Richards and Laughlin's (1980) cash conversion cycle theory describes how businesses may ensure a shorter operations cycle to avoid the consequences of inadequate working capital management (Jaworski and Czerwonka, 2022). Thus, the average time between a company's acquisition of inventory and the receiving of cash from its accounts receivables is measured. A company's management can utilise the cash conversion cycle hypothesis to anticipate how much of a business's cash will remain in its activities. As

denoted by Kabuyeet et al. (2019) cash conversion cycle tends to be stretched due to a few reasons like extended time in the collection of accounts receivables, case of the higher level of inventory or rapidness in clearing bills outstanding. Since it takes longer to generate cash in this situation, a lengthier cash conversion cycle is a sign that the company is bankrupt. The cash conversion cycle is decreased when a business recovers past-due payments more frequently, estimates inventory needs precisely, or pays invoices slowly (Aminu and Zainudin, 2016; Iqbal and Khan, 2022). Therefore, a shorter cash conversion cycle suggests that the company is doing well. As a result, any extra money might be used to finance new purchases or settle debt. The basic theory that describes working capital management about all concepts and elements, from raw materials to finished goods and outputs showing inventory levels, as well as receivables, payment, and the cash conversion cycle, is known as the cash conversion cycle theory.

Firms belonging to the Organization of Islamic Cooperation (OIC) and non-OIC countries show distinct characteristics in their working capital management (WCM) practices, reflecting differences in economic, cultural, and regulatory environments. OIC firms often operate within financial systems influenced by Islamic principles, which may lead to more conservative WCM strategies, higher liquidity levels, and a preference for internal financing. These firms may maintain longer cash conversion cycles and higher working capital levels to avoid interest-bearing debt and comply with Shariah principles. In contrast, firms in non-OIC countries typically have more flexibility in their WCM approaches, potentially leading to shorter cash conversion cycles and lower working capital levels. They may have easier access to a wider range of financial instruments and external financing options, allowing for more aggressive WCM strategies. The comparison between OIC and non-OIC firms provides valuable insights into how religious, cultural, and institutional factors can influence financial management practices across different economic contexts.

2.4.4.2.2. Trade-off Theory (Supporting Theory)

A company's primary goal is to maximise profits while maintaining a desired level of liquidity. Reducing liquidity to boost earnings could be more harmful to a company (Shin and Soenen, 1998; Wanjohi, 2021). According to the trade-off approach, a

business determines its ideal cash holding level by balancing marginal costs and assessing the advantages of holding cash. Since current assets will not yield enough returns if they are overinvested, a high level of investment in them will almost certainly lead to a low ROA for the organisation. Based on all the factors involved in day-to-day operations, the corporation should determine a suitable amount of current assets. In this case, the company must choose between an aggressive policy that would produce a high-risk and high-return plan and a cautious risk-return trade-off that would provide a low-risk and low-return strategy (Carpenter and Johnson, 1983; Yegon et al., 2021). The conclusion is that an increase in liquidity lowers productivity levels since the benefits rank connection is diametrically opposed to the liquidity rank relationship (Pandey, 2010; Putu et al., 2021; Hidayat et al., 2023). The operational efficiency and production issues that must be addressed to maintain favourable capital expenditure and liquidity balances in this research are better understood and explained by reference to this theory. One of the most important aspects of WCM decisions is managing the trade-off between the benefits of capital investment and liquidity.

Firms belonging to OIC and non-OIC countries may approach the trade-off in working capital management differently due to varying financial principles and practices. Firms in OIC countries, operating under Islamic financial principles that emphasize risk-sharing and prohibit interest-based transactions, may tend to maintain higher levels of working capital to avoid interest-bearing debt. This conservative approach aligns with Shariah compliance but could potentially impact profitability. In contrast, firms in non-OIC countries typically have more flexibility in managing this trade-off. They can utilize a wider range of conventional financial instruments and debt options, potentially leading to lower working capital levels. This flexibility allows non-OIC firms to more easily balance liquidity needs with profitability goals. However, the specific trade-off decisions would depend on various factors including the firm's industry, size, and the economic conditions in each country. The comparison between OIC and non-OIC firms in this context highlights how religious and cultural factors can influence financial management practices across different economic environments.

2.4.4.2.3 Operating Cycle Theory (Supporting Theory)

The operational cycle hypothesis was derived from the writings of Weston and Brigham (1979). This idea is based on the operational cycles of the company. It suggests that the liquidity flow concept be developed by broadening the stability of prospective liquidation esteem to include compensation justification indicators of a firm's operational operations. The inclusion of receivables and stock turnover measures into the operational cycle provides a more comprehensive liquidity projection management than dependence on current as well as the study of dissolvability's proportion markers (Khan et al., 2023; Sergeevic, 2023; Weston and Brigham, 1979; Sawarni and Narayanasamy, 2022). Records receivable turnover denotes the number of times a company's regular receivables venture is turned into money. Credit and accumulation strategy changes openly affect the typical exceptional debtors' adjustment set up about a company's annual transactions. The operating cycle is calculated by adding the day's stock exceptional period to the number of days in the sales outstanding period. The average number of outstanding accounts, if any, changes credit and collection policies that have a direct impact on the company's annual sales. More credit sales result in increased receivables, which results in lower receivables turnover and a prolonged receivable collection period, implying a lower level of liquidity. Higher current and fundamental analysis leads to the decision that results in a corporation setting up greater typical receivable conjecture over a more drawn-out day and age and brings out a proportion in an inescapable way. (Richards and Laughlin, 1980; Wanjohi, 2021; Roble, 2022). Richards and Laughlin (1980) critique the operational cycle theory for ignoring the liquidity requirements imposed on a firm when evaluating present liabilities obligations. This theory, however, is relevant to this study since it proposes that effective capital spending would promote smooth operational cycles, which will increase company value.

Firms belonging to OIC and non-OIC countries may exhibit different characteristics in their operating cycles due to varying business practices and financial environments. For firms in OIC countries, the operating cycle might be influenced by Shariah-compliant business practices, potentially affecting inventory management and accounts receivable policies. These firms may face constraints in using certain financial instruments or credit arrangements that do not comply with Islamic principles, which

could lead to longer operating cycles. On the other hand, firms in non-OIC countries typically operate with more flexibility in their operating cycles, having access to a wider range of conventional financial instruments to manage each stage of the cycle. This difference in available financial tools and practices may result in non-OIC firms having potentially shorter and more efficiently managed operating cycles compared to their OIC counterparts. However, the specific impact on the operating cycle length and efficiency would depend on various factors, including the firm's industry, size, and the specific economic conditions in each country.

2.4.4.2.4 Liquidity Preference Theory (Supporting Theory)

The idea, which was the mainstream theory for the formulation of WCM, was begun by Keynes (1936). According to this hypothesis, with all other things constant, investors prefer liquid investments over illiquid assets and so attempt to generate a profit from investments with a long maturity time. Thus, liquidity is the decision to have cash in hand. A company may need to have cash on hand for a variety of reasons at any one moment (Bitrus, 2011; Othuon et al., 2021). According to this idea, businesses keep currency for operational, anticipatory, preventive, and remedial purposes. The firm's desire to keep cash on hand to satisfy ongoing commercial transactions is referred to as transactional motivation. They require such cash to cover current expenses like transportation, raw supplies, labour, and so on. The objective of precautionary cash holding is to have funds on hand in case of an unanticipated emergency. Many businesses lay aside funds to be used in tough times or to gain from unforeseen activity. The ability to maintain liquid assets to profit from future interest and bond price fluctuations is referred to as anticipatory purposes (Pandey and Parera, 1997; Victor, 2021). This idea is relevant in the current investigation since the role of liquidity in funding everyday company activities cannot be assumed. Listed firm managers are expected to maintain appropriate working capital levels to accomplish the business's objectives, which are largely to maximise shareholder value. Despite this, the theory does not explain how WCM impacts dividend payout, although it may be inferred that businesses would be encouraged to issue dividends if the target working capital management is met. Excess liquidity, on the other hand, results in investment losses; hence, businesses should strive to reduce overall liquidity and illiquidity costs. As a

result, the goal of WCM is the improvement of liquidity and firm values (Raza et al., 2023; Suriani and Zenniar 2023; Pandey and Parera,1997; Korve, 2022).

Firms belonging to OIC and non-OIC countries may present different liquidity preferences due to varying financial principles and regulatory environments. The Liquidity Preference Theory suggests that economic agents prefer to hold liquid assets due to transaction, precautionary, and speculative motives. For firms in OIC countries, the prohibition of speculative activities in Islamic finance might lead to different liquidity preferences, potentially affecting their working capital management (WCM) strategies. These firms may prioritize transaction and precautionary motives, maintaining higher levels of liquid assets to ensure Shariah compliance and avoid interest-based transactions. In contrast, firms in non-OIC countries typically have more flexibility in managing liquidity, including for speculative purposes. This difference could lead to varied WCM approaches, with non-OIC firms potentially holding lower levels of liquid assets or utilizing a wider range of financial instruments to manage liquidity. However, the specific liquidity preferences and their impact on WCM would depend on various factors, including the firm's industry, size, and the economic conditions in each country. The comparison between OIC and non-OIC firms in this context highlights how religious principles and regulatory environments can influence financial management practices across different economic settings.

2.4.4.2.5 The Conservative Theory (Supporting Theory)

The origins of this idea may be traced back to Weston and Eugene (1975). According to the idea, a business uses long-term finances to finance its fixed assets while using some of its current liabilities to finance its current assets. This is a WCM strategy that is distinguished by decreased levels of production and risk. With a low degree of risk, the level of return from this aggressive WCM dimension is also minimal. WCM strives to achieve two important goals in the business: revenue and liquidity. Solvency necessitates that a company maintain some amount of liquidity (Pandey, 2006; Omwono, 2021). According to the notion, companies should have a large stockpile of inventory and cash on hand to satisfy commitments as they occur. This is excessively hazardous since it raises the opportunity cost of tying up cash that could otherwise be

used to finance investment initiatives that maximise the firm's worth. The idea will be utilised to support the necessity for the company to embrace WCM to increase shareholder value. The theory contains the risk and returns component in the WCM, which determines company value.

Firms belonging to OIC and non-OIC countries may reveal different tendencies in adopting conservative working capital management (WCM) strategies. The Conservative Theory advocates for higher levels of current assets in relation to sales, resulting in more liquidity but potentially lower profitability. For firms in OIC countries, this approach might align well with Islamic financial principles that emphasize stability and risk aversion, potentially leading to higher adoption of conservative WCM strategies. These firms may maintain higher levels of current assets to ensure compliance with Shariah principles and avoid interest-based transactions. In contrast, firms in non-OIC countries might be more inclined to balance between conservative and aggressive approaches based on market conditions and firm-specific factors. They may have more flexibility in their WCM strategies, potentially leading to lower levels of current assets in pursuit of higher profitability. However, the specific adoption of conservative or aggressive strategies would depend on various factors, including the firm's industry, size, and the economic conditions in each country. The comparison between OIC and non-OIC firms in this context highlights how religious principles and risk attitudes can influence financial management practices across different economic settings.

2.4.4.2.6 The Aggressive Theory (Supporting Theory)

This theory, attributed to Belt (1979), contends that a business uses short-term sources of money to finance both current and fixed assets. The hypothesis is perfect for businesses with high risk, which inevitably translates into higher profits. Under the aggressive hypothesis, interest rates on borrowed funds are extraordinarily low since they are borrowed for a short period of time. However, given WCM's strong stance, such short-term funding agreements are fraught with danger. WCM's aggressive hypothesis is better suited to firms operating in a more stable and predictable cash flow situation. The business should have a modest amount of cash on hand, a small number

of items in stock, and shorter credit terms for trade receivables, according to the aggressive WCM hypothesis. The company faces a higher risk of default since it lacks the resources to meet its obligations. Despite these increased risks, the corporation is nevertheless making more money. The liquidity preference theory, on its whole, explains why people keep money on hand. People keep cash on hand for a variety of reasons, such as to pay for immediate needs and as a hedge against potential price hikes. Liquidity, a crucial element of working capital management, is produced by holding cash. Cash is a component of WCM (Keynes, 1936; Korver, 2022). The conservative perspective of WCM maintains that companies rely on long-term sources of money to fund their permanent assets (Koeplin and Lélé, 2023; Luzuriaga et al., 2023; Valent and Yanti, 2023; Weston and Eugene, 1975; Maru et al., 2021). On the other hand, the aggressive theory of working capital explains why businesses plan to invest in high-risk assets while heavily relying on short-term borrowing for the financing of fixed and current assets (Belt, 1979; Omwono, 2021). Therefore, a conservative WCM plan concentrates on lowering returns and possible risk, whereas an aggressive programme concentrates on raising shareholder returns while raising risk.

Firms belonging to OIC and non-OIC countries may show different trends in adopting aggressive working capital management (WCM) strategies. The Aggressive Theory suggests minimizing working capital investment to increase profitability but at higher risk. For firms in OIC countries, this approach might be less prevalent due to Islamic principles emphasizing risk-sharing and avoiding excessive uncertainty. These firms may be more inclined to maintain higher levels of working capital to ensure compliance with Shariah principles and mitigate risks. In contrast, firms in non-OIC countries might be more willing to adopt aggressive WCM strategies in pursuit of higher profitability, especially in competitive markets. They may have more flexibility to minimize working capital investments and utilize various financial instruments to manage associated risks. However, the specific adoption of aggressive or conservative strategies would depend on various factors, including the firm's industry, size, and the economic conditions in each country. The comparison between OIC and non-OIC firms in this context highlights how religious principles and risk attitudes can influence financial management practices across different economic settings, with OIC firms potentially showing a greater tendency towards conservative WCM approaches compared to their non-OIC counterparts.

2.4.4.2.7 Agency Theory (Supporting Theory)

The agency hypothesis proposed by Jensen and Meckling (1976) contends that there is a conflict of interest between shareholders and company managers, which impacts the efficacy of management's investment and liquidity choices and therefore working capital. Managers in businesses with lax supervision and insufficient disciplinary procedures may pursue selfish interests by investing in initiatives with negative net present values or failing to redirect funds to projects with positive net present values (Chung et al., 2015; Permana and Umiyati, 2022). Excess-free cash flow, or cash flow over what is required to support positive net present value projects, can potentially cause issues for agencies (Jensen 1986 and Kalash, 2021). Firm managers are prone to make irresponsible investment decisions in this circumstance, embracing a more flexible working capital strategy by retaining more inventories and allowing debtors unusual credit payment lengths (Agyei et al., 2013; Otekunrin et al., 2021).

Maximising profits while maintaining a desired amount of liquidity is a key objective of a firm. Reducing liquidity to boost earnings could be more harmful to a company (Shin and Soenen, 1998; Kontuš and Mišanović, 2019). The trade-off model outlines how a business calculates its optimal cash holding level by comparing the marginal costs and advantages of keeping cash. Significant investments in current assets will most likely result in the entity's ROA being low, as overinvestment in these assets would produce insufficient returns. Based on all the factors involved in day-to-day operations, the corporation should determine a suitable amount of current assets. In this case, the company must choose between an aggressive policy, which would produce a high-risk and high-return plan, and a conservative risk-return trade-off, which would provide a low-risk and low-return strategy (Carpenter and Johnson, 1983; Khan et al., 2022). Given that profitability rank correlation is negatively related to liquidity rank correlation, the logical conclusion is that an increase in liquidity decreases profitability levels (Pandey, 2010; Atabaeva et al., 2022). The model will be useful in comprehending and illuminating the necessity for manufacturing businesses to uphold favourable capital expenditure and liquidity balances. One of the most important aspects of WCM decisions is managing the trade-off between the benefits of capital investment and liquidity. A key element in explaining the connection between WCM and dividend payment is the theory's presumption that there are knowledge asymmetries between

principals and agents. According to Jensen and Meckling (1976), an ideal level of WCM should be established that lowers agency costs, encourages wealth optimisation, and, as a result, creates an optimal level of WCM that improves dividend payouts. According to the theory, agency costs would increase in proportion to the anticipated amount of WCM, resulting in a smaller dividend payout due to less cash being available (Atoyebe and Oladosu, 2021).

Firms belonging to OIC and non-OIC countries may experience different agency dynamics that impact their working capital management (WCM) decisions. Agency theory addresses the conflicts of interest between managers and shareholders, which can significantly influence financial management practices. For firms in OIC countries, Islamic principles emphasizing ethical business practices may mitigate some agency conflicts, potentially leading to more aligned interests between managers and shareholders in WCM decisions. However, the prevalence of family-owned businesses in many OIC countries could introduce unique agency dynamics, such as potential conflicts between family and non-family shareholders or managers. These dynamics may affect WCM strategies, possibly resulting in more conservative approaches to working capital to preserve family wealth. In contrast, firms in non-OIC countries often have more dispersed ownership structures, which might lead to different agency issues in WCM decisions. These firms may face more traditional principal-agent conflicts, potentially resulting in managers making WCM decisions that prioritize short-term performance metrics over long-term shareholder value. The comparison between OIC and non-OIC firms in this context highlights how cultural, religious, and ownership structures can influence agency relationships and, consequently, WCM practices across different economic settings.

2.4.4.2.8 Pecking Order Theory (Supporting Theory)

Myers and Majluf (1984) developed the Pecking Order Theory, which is another significant theory related to working capital based on capital structure. This idea is predicated on the assumption that managers should be in the best position to convey a firm's prospects to shareholders and that managers should be in the best position to communicate a firm's prospects to external parties. The theory also proposes that

knowledge asymmetry serves as the foundation for companies in determining the optimal capital mix. It contends that companies would choose borrowing (debt financing) over the issuing of fresh equities as a financing method when compared to debt. The equities issuance is regarded as the last funding method. As a result, highly profitable businesses rely less on debt and prefer to rely on internal cash. Pecking order theory determines the factors that affect cash holding level and value from the information asymmetry perspective (Shah et al., 2017; Li et al., 2022). According to the pecking order theory, corporations prefer internal money over foreign capital. Any shortfall of internal capital, which can occur for a variety of reasons, including ineffective WCM, forces businesses to seek additional external capital to maintain their expansion plans. With all other factors being equal, the more effectively a company controls its WC, the better its financial health should be. Good financial health improves a company's capacity to raise cash from outside sources. The association between WCM efficiency and financial performance becomes more intense for organizations that seek to expand at a fast pace since the investment requirements of high-growth firms are often higher than those of low-growth enterprises (Baños-Caballero et al., 2010; Sawarni et al., 2022).

Firms belonging to OIC and non-OIC countries may demonstrate different financing preferences in their working capital management (WCM) strategies, as explained by the Pecking Order Theory. This theory proposes that firms prefer internal financing over external financing due to information asymmetry costs. For firms in OIC countries, the preference for internal financing aligns well with Islamic financial principles, which emphasize equity-based financing and profit-sharing arrangements. These firms might exhibit a stronger adherence to the pecking order, relying more heavily on retained earnings for working capital needs to avoid interest-bearing debt and maintain Shariah compliance. In contrast, firms in non-OIC countries, while still potentially following the pecking order, might have easier access to a wider range of external financing options, including conventional debt instruments. This broader access to capital markets could influence their WCM strategies, potentially leading to more diverse financing choices for working capital needs. However, the specific financing preferences and their impact on WCM would depend on various factors, including the firm's size, industry, and the economic conditions in each country. The comparison between OIC and non-OIC firms in this context highlights how religious

principles and financial market structures can influence financing decisions and, consequently, WCM practices across different economic settings.

2.4.4.3 Overview of WCM Components

Before going into the theoretical framework, it is important to go over the four key WCM components that were used in this study: cash, inventory, payables, and receivables. It should be noted that WCM is involved in various levels of interaction, both internally and externally, and is not confined to internal interaction (Brigham and Ehrhardt, 2008). The nature of the four WCM components will be discussed in the subsections that follow.

2.4.4.3.1 Cash Management

Cash serves as a buffer for a company's activities, allowing it to fund it in a way that is appropriate for the nature of its business cycle (Boisjoly and Izzo, 2009; Gitman, 2009; Li et al., 2022). The problem in cash management is to strike a balance between maintaining the right amount of cash and marketable securities while avoiding the opportunity cost of holding too high levels of these resources. The integrative approach to cash management is influenced by the business cycle, and changes in cash management have a direct impact on working capital performance (Boisjoly, 2009; Mazanec, 2022). Maintaining cash balance requires a variety of tasks; thus, a company's competency should include the capacity to develop a cash management strategy that includes synchronising cash inflows and outflows via cash budgeting and cash forecasting. The predicted cash collections, cash disbursements, and cash balance over a period are all part of cash budgeting (Moyer et al., 2009; Lofton, 2021; Gill et al., 2022).

A cash budget is a useful tool for managers who want to keep their liquidity at a certain level. Managers rely on a grasp of the company's operating cycle to attain and retain liquidity. Estimating cash needed for operations on a daily, weekly, monthly, or annual basis is part of cash forecasting. Sales and marketing, the production cycle, the

supplier chain, cash collecting, and cash disbursements are all important aspects of the firm (Gitman et al., 1979; Gill et al., 2022). The ability of a manager to forecast cash shortages or surpluses allows adequate time (for finance managers) to seek alternative funding or invest in marketable securities (Moyer et al., 2009; Deari and Kukeli, 2022).

2.4.4.3.2 Inventory Management

The second element is inventory management which is crucial in the purchase, manufacturing, and selling of goods and services (Crum et al., 1983; Sawarni et al., 2022). Furthermore, maintaining adequate inventory levels is part of the business cycle, and it comes with inventory-related expenditures, including ordering, carrying, and stocking out (Moyer et al., 2009; Liu, 2021). All costs associated with placing orders and getting supplies into the warehouse are referred to as ordering costs. The term "carrying cost" refers to all expenditures associated with storing materials for a set amount of time. The higher the carrying cost, the longer the time it takes to hold inventory. All costs incurred as a result of a situation in which demand exceeds available stock are referred to as stock-out costs. Costs of reordering materials and shipping stocks to markets are included in inventory management. The Inventory management strategy has a direct impact on working capital performance (Yang et al., 2005; Liu, 2021). Overstocking inventory can result in high carrying costs, but it also minimises the possibility of "stock-out" shortages. The ability of a corporation to respond to market needs is largely determined by how well it maintains inventories and how prompt suppliers are in supplying materials for manufacturing, selling, or performing services. As a result, for organizations to cope with fluctuating market needs, deeper relationships with suppliers are essential (Bowersox et al., 2003; Oh and Kim, 2021).

2.4.4.3.3 Payables Management

The third component is accounts payable, which is one of the most common sources of spontaneous funds (Gitman, 2009; Hill and Sartoris, 1992; Moyer et al., 2009; Alkhataybeh, 2021). Companies and their suppliers must agree to form a relationship or partnership based on specified terms, such as credit terms (Hill and Sartoris, 1992,

Abbas et al., 2018). Payment terms, such as credit period, cash discount, and credit guarantee, are all examples of credit terms (Gitman, 2003; Moyer et al., 2009; Weerasekara, 2021). A credit term is a period that specifies the maximum number of days in which suppliers must be paid. Early payment incentives (in percentage format) are referred to as cash discounts. When payment is made during the discount period, a corporation is entitled to a discount (i.e. 2% of the total price); however, this term is not always accessible and is based on the credit conditions of the suppliers. A consumer may be asked to submit a credit guarantee from a financial institution in some instances (Purwatiningsih et al., 2022). This usually happens when suppliers have doubts about a customer's creditworthiness or there is a risk of credit default. Suppliers are entitled to a credit guarantee to settle overdue accounts in the event of credit default. This arrangement is not always imposed, and it is dependent on the credit terms of suppliers. In certain ways, there is no such defined standard of credit terms, and it is usually based on credit arrangements between companies and suppliers. Delaying payments until the end of the credit period or beyond the credit period results in the company incurring additional short-term financing fees. Although this provides a financial cushion for corporate operations, it has the potential to damage the company's reputation (i.e. credit history), forfeits cash discount savings, and impair a sound financial supply chain (Brigham and Ehrhardt, 2008; Moyer et al., 2009; Rafuse, 1996 and Sawarni, et al., 2022).

2.4.4.3.4 Receivables Management

Credit sales granted to customers for the purchase of products or services are referred to as accounts receivables. Credit policy and collection processes have a big impact on accounts receivable management (the fourth component) (Brigham and Ehrhardt, 2008; Moyer et al., 2009; Oktavia, 2021). Cash inflows, sales, and the risk of bad debts are all affected by credit policies and collection methods (Hill and Sartoris, 1992; Gill et al., 2022). Credit policy changes will have a direct influence on working capital performance. Management's decision to shorten or lengthen the credit period, for example, has an impact on the cash conversion cycle. Credit requirements, credit periods, and cash discounts are usually included in a credit policy (Gitman, 2003; Moyer et al., 2009; Gill et al., 2022). Credit standards provide the rules for determining the

creditworthiness of a customer's credit history. Customers are allowed a certain amount of time to settle their invoices within the credit term.

Cash discounts are cash incentives given to consumers for making early payments during the discount period; however, depending on the company's credit policy, this option may not be available. The goal of collection procedures is to shorten the time it takes to recover outstanding receivables. Collection actions may include but are not limited to issuing a demand letter, making follow-up calls, hiring a collection agency, and taking legal action. Due to the amount and value of receivables, several companies' collection procedures may differ (Moyer et al., 2009; Ahmed et al., 2022). The process of managing working capital components is entrenched within normal operational business activities and involves participation from numerous levels of an organization's members (Gitman, 2009). Some firms' running business activities may include synchronising WCM components to boost organisational performance, according to the argument. Companies, for example, place orders for items in advance (inventory management) and then make payments (payable management) before cash receipts (cash management). Cash flows are not instantaneous or coordinated due to the nature of the operational activity. As a result, the process of making working capital decisions is growing more challenging, and in certain firms, working capital transactions are significantly more complex, and responsibility for managing WCM components is dispersed throughout the organisation.

2.4.4.4 Measures of WCM Efficiency

While effective working capital is one of the prerequisites for the success of an enterprise (Ghosh and Maji, 2004; Zada et al., 2021), working capital is the life-giving force to an economic entity (Mukhopadhyay, 2004; Vivek and Chandrasekar, 2021). Working capital is one of the seven factors identified by Rapaport (1999) and Tossavainen (2002) as the generators of shareholder value. Unfortunately, even though financial publications and online newsletters like CFO Magazine and gtnews (www.gtnews.com) devote a lot of attention to working capital management difficulties; this problem persists nearly everywhere in the globe.

Every year, CFO Magazine reveals that some of the biggest firms in the world have billions of dollars trapped in the working capital cycle. For instance, they note that 850 of the top corporations in the Asia-Pacific area failed to put a total of \$833 billion in working capital to beneficial use in 2007. The aggregate working capital performance of Indian companies declined because the 725 largest corporations in Asia dramatically improved their working capital position in 2006 (Wasiuzzaman and Arumugam, 2013). Businesses are battling to cut working capital, resulting in a \$1.5 trillion hole in corporate balance sheets throughout the world; such stuck funds could be spent on expanding the businesses (WSJ, CFO Journal Nov-2018). According to a report by PricewaterhouseCoopers LLP, publicly traded corporations had \$5.2 trillion in working capital on their books in 2017, roughly one-third of which might be better spent, according to a study of 14,700 companies with an annual revenue average of \$2.9 billion. In 2017, finance managers didn't make much headway in shortening the cash-conversion cycle. According to PwC, it took them 51.8 days on average to collect a payment following a transaction, which is essentially unchanged from 2016. Companies had 58.2 days of inventory on hand last year, up 0.7 days from 2016, and paid suppliers 0.3 days sooner than in 2016, after an average of 67.7 days (WSJ, CFO Journal Nov-2018). In this regard, effective working capital management is essential for a company's capacity to manage challenging financial circumstances and rising economic uncertainties. Similar to how it is critical for businesses in prosperous times, liquidity management—also known as cash level management—is crucial in uncertain economic times. A company's capacity to maintain effective operations may be hindered by insufficient current assets, further raising the possibility of bankruptcy. The profitability of a company, however, can also be harmed by excessive liquidity. The level of working capital varies depending on the state of the economy as well as firm-specific variables like capital intensity, profitability, size, etc., thus determining and maintaining optimal working capital levels is not an easy process.

In this section, firm-level and macroeconomic factors that affect working capital efficiency are determined. Given the complexities involved in determining the optimal quantity of working capital to be kept by companies, the question arises as to whether firms can manage their working capital efficiently. Several metrics, such as CCC, have been proposed for assessing WCM efficiency (Smith, 1980; Gill and Kang, 2022); total cash cycle (Gitman, 1974; Azzeddine and Ibrahim, 2022); net trade cycle (NTC) (Shin

and Soenen, 1998; Chancharat and Kumpamool, 2022); weighted CCC (Gentry et al., 1990 and Ndirangu, 2021); optimal NTC (Nobanee and Al Hajjar, 2014; Ameer and Othman, 2021); adjusted CCC (Viskari et al., 2012 and Samarajeewa, 2021); optimal CCC (Nobanee and Al Hajjar, 2014; Kundu and Quddus, 2022), optimal operating cycle (Nobanee and Al Hajjar, 2014; Seth and Chadha, 2020); working capital requirement (Hill et al., 2010 and Burney et al., 2021); operating cycle (Gill et al., 2010 and Zimon et al., 2021) wherein CCC has been widely used by the researchers as a proxy for measuring WCM efficiency (Deloof, 2003; Garcia and Martinez, 2007; Kieschnick et al., 2013; Kundu and Quddus, 2022; Soda and Hassan, 2022). CCC entails the administration of three components, namely accounts receivable, accounts payable, and inventory, with a focus on balancing them (Singh and Chauhan, 2021).

CCC is the time span between the acquisition of raw materials and the receipt of cash from the sale of finished items, and it mimics credit rules for customers, inventory choices, and supplier selection (Pais and Gama, 2015; Saeed, 2021). CCC is calculated mathematically by adding inventory days to receivables days and subtracting them from payables days (Maheshwari, 2014; Kundu and Quddus, 2022). CCC is essential to WCM, and its effective administration gives managers greater control over short-term financial choices and investments. This, in turn, may have an impact on profitability, risk, and, as a result, the firm's value (Ebben and Johnson, 2011). The current study describes the WCM efficiency model by employing the working capital cycle time, also known as the cash conversion cycle (CCC), which is calculated based on its components for assessing as WCM efficiency. NTC has also been used as a surrogate for assessing WCM efficiency in a few studies. (Vahid et al., 2012; Erasmus, 2010; Baños-Caballero et al., 2014; Shin and Soenen, 1998; Raheman et al., 2010; Asare et al. 2022; Kundu et al. 2022). NTC is calculated by adding accounts receivables to sales and inventory to sales, then subtracting it from accounts payables to sales (Shin and Soenen, 1998; Kundu and Quddus, 2022). WCM has piqued the interest of scholars, financial managers, stakeholders, and policymakers since it signifies any firm's financial health, which is directly related to liquidity and profitability (Sagner, 2014; Sirasgi and Kulkarni, 2021). Ratios such as current ratio, inventory turnover ratio, receivables turnover ratio, liquidity ratio, current liabilities to total assets, current assets to total assets, and net liquid balance are also used as proxies for evaluating WCM (Smith, 1973; Emery, 1984; Nilsson, 2010; Valipour et al., 2012; Nazir and Afza, 2009;

Danuletiu, 2010; Singh and Pandey, 2008; Yashim and Senzak, 2020; Aransiola, 2021). As a result, previous studies have also examined certain components of WCM, such as trade credit (Petersen and Rajan, 1997; Fabbri and Klapper, 2016; Tiwari et al., 2020; Sarria, 2022), cash holdings (Mun and Jang, 2015; Choudhari and Kasar, 2022) and so on. However, Kim and Chung (1990), Howorth and Westhead (2003), de Almeida and Eid (2014) and Kumpamool and Chancharat (2022) have stressed the significance of considering how these individual policies may affect one another, notably in the areas of inventory, receivables, and credit decisions. The current study therefore concentrates on examining prior research on total WCM.

2.4.4.5 Factors Affecting Working Capital Efficiency

The effectiveness of WCM, as mentioned in the preceding section, remains a major subject in the globalisation era, and organizational context is seen as an option to enhance effectiveness. Managers are recommended to think about a variety of elements while making decisions because the more volatile market conditions are, the more resources and coordination are needed to handle WCM components (Hill and Highfield, 2010; Naz et al., 2021). As a result, the goal of this part is to gain a better knowledge of the factors that have influenced present WCM efficiency by looking at the literature. WCM efficiency is influenced by a variety of factors. These influences can be divided into two categories: external and internal. While external factors may have an impact on numerous organisations globally and across industries, certain factors only have an impact on enterprises in a certain industry or country.

A set of internal elements affects the entire organisation, including WCM, at an organizational level, but in different ways depending on their direction and relationships. As a result, management, particularly managers involved in WCM decision-making processes, must be able to comprehend and respond to changes in these environmental variables (Johnson and Soenen, 2003; Gill and Kang, 2022). The elements that have been found and their level of influence on WCM are described in the following paragraphs.

2.4.4.5.1 Firm-level Factors Influencing WCM Efficiency and Expected Relationships

2.4.4.5.1.1 Leverage

Because working capital is concerned with short-term choices and finances for day-to-day operations, the firm's leverage or debt level impacts the funds' availability (Hilal, 2016; Mahmood et al., 2019). A heavily leveraged company does not reap the rewards of raising additional debt or rising share prices. This influences the businesses' present cash holding position and future earning potential, as well as WCM efficiency, impacting firm performance (Afrifa and Tingbani, 2022). Sawarni et al. (2020) studied Nonfinancial Indian businesses and discovered that leverage had a negative influence on WCM efficiency. Furthermore, Naser et al. (2013) and Banerjee et al. (2021) find a negative relationship between WCM efficiency and leverage. Goel and Sharma (2015a, b) discovered that highly leveraged businesses were inefficient in terms of working capital management.

In contrast, Rimo and Panbunyuen (2010) hypothesised that increased CCC was caused by a high debt ratio, which reduced WCM efficiency. Furthermore, previous research indicates that even when businesses have significant leverage, insufficient WCM results in worse shareholder value. This has an impact on future growth and company success (Seth et al., 2019). As a result, disparities in firm-levered capacity become critical explanations for persistent variances in WCM efficiency. According to the previously discussed theories, highly leveraged enterprises must pay a higher risk premium, making CCC investments more expensive. Furthermore, Chiou et al. (2006) showed empirically that an increase in leverage results in a decline in WCM efficiency indicators by looking at WCM in Taiwanese enterprises. As a result, the current analysis predicts that leverage will have a detrimental impact on WCM efficiency.

2.4.4.5.1.2 Growth Opportunities

Companies anticipating greater growth opportunities must invest more in capital projects, which require more internal funding. The corporations would raise their cash and short-term investment holdings as a result of this anticipation. Companies may also

build up sizable inventories in preparation for potential future expansion, which would mitigate the impact of trade credit (Kieschnick et al., 2013). According to several empirical studies (Hill et al., 2010; Nazir and Afza, 2009), expansion opportunities have a favourable effect on the efficient administration of working capital. Similar findings have been made by Blazenko and Vandezande (2003) and Kieschnick et al. (2013), who found that CCC is favourably influenced by future sales growth and concluded that anticipation of increased sales growth is the explanation for this relationship. However, research has shown that CCC is negatively impacted by growth opportunities. For instance, Cunat (2007) claimed that companies with high development potential employ trade credit rather than more complicated alternative means of funding to finance their expansion. Additionally, businesses may concentrate on extending trade credit or receivables terms to their clients in times of low demand rather than increasing sales (Banos-Caballero et al., 2010). Furthermore, Chiou et al. (2006) found that firms with high growth potential required less working capital because they strive to keep their liabilities and operating-related working capital at the lowest possible levels. Since the current literature presents a variety of viewpoints on the relationship between development prospects and WCM effectiveness, there is no clear agreement on the projected link. In the current study, the growth rate is considered a gauge of growth potential.

2.4.4.5.1.3 Size

According to the empirical data, the size of a business impacts WCM efficiency. Large businesses invest more in working capital to achieve greater sales levels, or large firms use their scale to create buyer-supplier relationships, resulting in lower working capital expenditure (Kieschnick et al., 2013; Mäkkylä, 2021). Furthermore, innovations and technical breakthroughs in supply chain management systems make it simpler for major corporations to invest in such processes, coordinate among all participants, and carefully manage each system, particularly WCM (Seth et al., 2020). Due to a lack of finances, knowledge, and resources, smaller businesses may find it challenging to apply such practices. Furthermore, according to the trade-off hypothesis, smaller companies have a higher probability of going bankrupt than bigger organizations since larger firms are more diversified (Banos-Caballero et al., 2010; Mayr et al., 2021). This, in turn,

impacts trade credit given since large businesses receive increased scrutiny from analysts, resulting in reduced information asymmetry, allowing larger firms better access to capital markets than small firms (Hill et al., 2010; Liukkonen, 2021). Firms provide greater trade credit if they have better access to capital markets, according to Niskanen and Niskanen (2006). They discovered that the size of the business had a favourable influence on the amount of trade credit provided. Furthermore, large-size businesses must accept flexible inventory and receivables policies due to low financial restrictions, reduced information asymmetry, and great borrowing capacity. Smaller companies face a high cost of money to invest in current assets, resulting in lesser inventory and account receivables. Furthermore, owing to increased financial limitations or restricted sources of money, small businesses seek trade credit from their suppliers as a source of financing, which has a beneficial influence on the CCC. The size was found to have a detrimental impact on WCM efficiency by Zariyawati et al. (2017), Nazir and Afza (2009), and Lin and Wang (2021).

2.4.4.5.1.4 Age

Earlier research looked at company age and WCM efficiency combined to estimate the underlying connection, but the results were equivocal. According to Niskanen and Niskanen (2006), older businesses are in a better position to get external funding than new firms; therefore, older firms incur a lower cost of funds for meeting working capital requirements. Similarly, Chiou et al. (2006) discovered that age had a favourable influence on the working capital need. According to previous research, older businesses represent their quality, reputation, and trustworthiness, and they are well-recognised for their relationships with consumers and suppliers (Cunat, 2007; Banos-Caballero et al., 2010; Naz et al., 2021).

In contrast, Mathuva (2013) studied Nairobi companies and discovered a Nonsignificant relationship between company age and inventory. Most research has noted the beneficial effect of age on WCM efficiency (Seth et al., 2019; Sawarni et al., 2020), as older businesses have greater negotiating leverage to get longer-term credit from their suppliers and, as a result, choose shorter receivables periods. This lowers the CCC for older businesses, making them more effective in managing working capital.

The data suggest that age has a favourable effect on WCM efficiency. The age of businesses is measured as AGE in the current study.

2.4.4.5.1.5 Tangible Fixed Assets

Earlier research has found that tangible fixed assets influence WCM efficiency (Mathuva, 2014; Banos-Caballero et al., 2010; Elbadry, 2018; Deari et al., 2022; Nicolas, 2022; Chancharat et al., 2022). Fixed assets investment and working capital levels compete for funding, investment, and expansion due to limited capacity or sources of money availability in businesses (Seth et al., 2019). This conclusion was endorsed by Kieschnick et al. (2013), who discovered that tangible fixed assets have a negative impact on CCC. In line with this, Kumar Sharma et al. (2020) and Salawu and Alao (2014) discovered a favourable relationship between fixed assets and WCM efficiency. Firms with substantial tangible fixed assets, on the other hand, generate less asymmetric information, have lower financial restrictions, and can obtain money at a cheaper cost, resulting in more current asset investment at a lower cost and an increase in CCC (Banos- Caballero et al., 2010; Setianto et al. 2022). Seth et al. (2020) discovered that a drop in WCM efficiency is associated with an increase in NFA. Otherwise, in the event of surplus working capital in businesses, the excess share is to be redeployed in higher-valued uses such as fixed assets, resulting in improved company performance (Aktas et al., 2015; Nicolas, 2022). There is no clear indication of the predicted link of tangible fixed assets with WCM efficiency due to the conflicting rationale from current studies. Tangible fixed asset to total assets is being used as a measurement in the current investigation.

2.4.4.5.1.6 Profitability

In the literature, profitability has been found to be related to WCM metrics (Bellouma, 2011; Yazdanfar and Ohman, 2014; Nkechi, 2020; Asare et al., 2022). Jose et al. (1996) discovered that lowering the Cash Conversion Cycle (CCC), increased profitability in US manufacturing businesses because these firms are more inclined to reduce the holding cost of inefficient working capital. Later, Shin and Soenen (1998) investigated

the profitability and WCM efficiency connection, arguing that businesses should reduce CCC rather than increase liabilities to reach the desired working capital level. Chiou et al. (2006) discovered that profitability has a negative impact on CCC by indicating that profitable businesses have more internal funds available; therefore, the cost of investing in current assets is lower. This, in turn, causes inventory to accumulate (Goel and Sharma, 2015a, b). Profitable businesses, on the other hand, have easy access to outside money due to their high earning capacity and market domination. Furthermore, because prosperous businesses have more bargaining power with customers and suppliers, they give more trade credit and a longer receivables term, resulting in a longer CCC (Panigrahi, 2017; Jabbouri et al., 2022). Furthermore, Vishnani and Shah (2007) discovered that businesses' profitability decreased because of excessive working capital investment. According to the literature, conflicting empirical evidence on the link between profitability and WCM efficiency and the predicted relationship between the two is not apparent (Prasad et al., 2019; Ahangar, 2020; Asare et al., 2022).

2.4.4.5.1.7 Cash flow

The strongest proxy for determining a company's ability to produce internal resources is cash flow. Regarding the connection between cash flow and working capital efficiency, earlier literature has produced contradictory results, some studies discovered either a positive or a negative association. Fazzari and Petersen proposed earlier in 1993 that working capital for US manufacturing firms is sensitive to cash flow shocks and is positively influenced by changes in cash flow. As a result, businesses with large cash flows would be able to pursue a prudent working capital strategy, whereas businesses with low cash flows would need to find alternative sources of funding to make up for their lack of working capital (Hill et al. 2010). A lot of studies have discovered a positive association between cash flow and working capital efficiency, (see for example, Haron and Nomran, 2016; Wasiuzzaman and Arumugam, 2013; Banos-Caballero et al., 2010).

Contrary to the aforementioned claim, it is asserted that businesses with stronger cash flows tend to minimise their investment in working capital because they anticipate a continuous flow of cash and, as a result, a reduced need for such expenditures. More recently, Appuhami (2008) proposed that when cash flow increases, businesses prefer

to minimise working capital investment, shortening their CCC (see for examples, Mansoori and Muhammad; 2012; Chiou et al., 2006).

2.4.4.5.2 Macroeconomic Factors Influencing WCM Efficiency and Expected Relationships

Journal entries, ledger accounts, trial balances, profit and loss statements, balance sheets, and so on may be used to assess a firm's financial health but to forecast overall performance, a correlation between firm-level and macroeconomic elements is necessary (Doruk and Ergün, 2019; Panda et al., 2021; Hussain et al., 2021; Kundu et al., 2022). In this section, various macroeconomic factors that affect working capital efficiency are presented.

2.4.4.5.2.1 Gross Domestic Product

GDP, one of the macroeconomic indicators, represents the entire industrial climate of any country. In addition, considering changes in economic policies affecting GDP, there has been a significant movement in the amounts of working capital components (Taleb et al., 2010; Panda et al. 2021). According to Ali and Khan (2011), poor economic conditions impose a burden on businesses' working capital strategies. Models on working capital determinants (Banos-Caballero et al., 2010) show that CCC is impacted by economic situations. Mansoori and Muhammad (2012) studied listed Singaporean businesses and discovered that GDP had a negative impact on CCC. Palombini and Nakamura (2012) discovered a negative impact of GDP on indicators of working capital management by examining Brazilian firms. Qurashi and Zahoor (2017) examined UK pharmaceutical businesses and discovered that GDP had a favourable effect on working capital. Their findings suggested that in a high GDP nation, customers' purchasing power is strong, which would result in increased sales and higher investment in inventory by companies to fulfil unpredictable customer needs. Due to their competitive position in the market, such businesses have a superior negotiating position with suppliers and can obtain credit benefits from them in the form of long payables periods, credit purchases, an additional source of financing, timely deliveries, and so on. All of

this leads to a decrease in CCC and, as a result, an increase in WCM efficiency. Zariyawati et al. (2010) discovered that GDP had a favourable influence on WCM efficiency in Malaysian companies. As a result, it is predicted that GDP will have a positive connection with WCM efficiency.

2.4.4.5.2.2 Interest Rate

Several previous studies determined their analyses of the difference in WCM efficiency over interest rate changes (Goel and Sharma, 2015a, b; Seth et al., 2019; Doruk and Ergün, 2019; Seth et al., 2020). Firms must adjust their working capital levels in times of rising interest rates since they are having trouble utilizing internal sources of cash and ploughing back earnings to finance working capital (Smith, 1980; Mathuva, 2014; Hussain et al. 2021). An unstable macroeconomic climate typified by rising interest rates leads to decreased sales, reduced profit margins, a lack of demand, fewer chances for expansion, and so on (Enqvist et al., 2014). Firms are unable to realize receivables and inventories are locked up during such inflationary periods, resulting in a lengthier CCC. As a result of the empirical data described before, the predicted connection between the interest rate and WCM efficiency is negative.

2.4.4.5.2.3 Stock Market Development

Empirical evidence reveals that trade credit levels vary considerably over time (Justitia, 2013; Mättö et al., 2021). Despite numerous studies on working capital (WC), its effects, and variations across countries or industries, a full understanding of the reasons behind these differences remains elusive. Previous research has established a correlation between WC management and business success and valuation; however, little is known about how country-specific traits influence the effectiveness of WC management. Additionally, several aspects of financial markets, such as whether they are bank-based or market-based, have remained relatively unchanged.

Furthermore, Beck et al. (2013) contend that companies' financial behaviour is connected to the firm's environment's financial system. In this vein, an element of the

financial system and a country-specific determinant is the stock market development. It is regarded that the growth of the stock market is essential to the nation's economic progress (Demirguc & Levine, 1996; Levine & Zervos, 1999). Although financial experts frequently use the term "stock market development," it is challenging to locate a definition of the term. Market capitalization to GDP, the total value of shares traded to GDP, or the total value of shares traded to market capitalization are the three most important stock market development indicators that have been employed in prior research (Demirguc and Levin, 1996; Seetanah and Ramessu, 2008). Stock market development relates to the market's capacity to raise capital and manage risk and it is considered as a measure of market capitalization, historical performance, retained earnings, and growth potential. A greater ratio indicates the development of the stock market and future growth (Levine and Zervos, 1996; Rajan and Zingales, 2003). Therefore, countries with high stock market development will have funds available for working capital financing and a result will be in a better position to manage working capital requirements.

2.4.4.5.2.4 Inflation Rate

Inflation is defined as a long-term increase in the general price level of goods and services in an economy. A price increase on one or two items does not constitute inflation unless it is widespread or causes price increases on most other items, including those for food, drink, tobacco, clothing, health care, education, recreation, communication, and financial services. According to this definition, there are three components that must be accomplished to state that inflation occurred, which include price rises, general occurrences, and a continuing process (Boediono, 2012). Inflation can have an impact on income, efficiency, and productivity. Inflation can produce a rise in output. If the increase in the price of products comes before the increase in wages, company profits will rise, which will promote an increase in output. However, if the inflation rate is high enough, it will have the opposite impact, such as a drop in production (Nopirin et. al, 1998; Mokhtari, 2022). Celik et al. (2016) investigated Turkey's industrial manufacturing sector to determine how macroeconomic variables impact net working capital. The study's findings revealed that inflation and exchange rates had a negative influence on net working capital but had no effect on interest rates.

Few studies have examined it as a measure of WCM efficiency, but only to a limited extent. Dehghanfard and Moslemi (2017) used panel data techniques on 1,207 firms in the Indian manufacturing sector as well as its nine key manufacturing industries from 2008 to 2018 for the analysis, and they discovered that the inflation rate had no significant effect on WCM efficiency. Azizi and Jokar (2021) concluded that working capital management might be a helpful tool for managers, and if successfully managed, it can play an essential role in inflationary situations for the balance of cash held by business units, as well as provide several advantages to business units.

2.4.4.5.2.4 Money Supply

The literature that is currently available points to macroeconomic factors as potential working capital efficiency determinants. According to Lamberson (1995), any change in economic activity has a significant impact on working capital efficiency, with the type and magnitude of the impact varying depending on its size and other factors. One of the key factors affecting working capital efficiency is the money supply (Altaf, 2018). It is regarded that the availability of money in an economy will boost consumption and thereby will increase the demand for goods and as a result, businesses will have to supply more. By these means, businesses will need more working capital which might cause disruptions to the working capital efficiency.

2.4.4.6 Control Variables

Three control variables, namely industry, time, and country, are added to the model to considerably increase the likelihood that the variables in the model measure what they are supposed to measure.

2.4.4.6.1 Industry

Because of the distribution of credit to consumers, inventory management and a firm's ability to delay payments may all be influenced by industry structures; accordingly, the industry will be the first control variable introduced to the model. Some businesses can

readily reduce accounts receivable and inventory, while others are better suited to increase accounts payable (Filbeck and Krueger, 2005; Barros et al., 2022). Firms, for example, sell a variety of commodities, which necessitates a variety of inventory management techniques. Firms that offer commodities with a high rate of obsolescence or perishable goods must be careful not to keep excessive inventories. Other businesses must maintain higher inventory levels to avoid suffering from high price swings in raw materials during fixed-price projects or perhaps losing sales due to a lack of (essential) resources for manufacturing (Preve and Sarria-Allende 2010). In fact, Ng Smith et al. (1999) and Flannery et al. (2021) show that trade credit terms vary by industry, with relatively minor variances within industries. Niskanen and Niskanen (2011), Garca-Teruel and Martnez-Solano (2010), and Jaworski and Czerwonka (2022) also identified differences in accounts receivable and payable levels among industries. Further, a few studies also prove that working capital practices are affected by industry factors (Baños-Caballero et al., 2010; Nazir and Afza, 2008b). These changes, according to Nakamura and Palombini (2009), could be linked to macroeconomic issues such as interest rates, competition, and innovation. Despite this, Chiou, Cheng, and Wu (2006) found no evidence of a link between industry and WCM; however, Jaworski and Czerwonka (2022) and many other studies approved of the relation. Industries dummies would be applied to control the effect of heterogeneity and capture unobserved industry-specific effects (Mansoori et al., 2020; Mättö et al., 2021; Ameer et al., 2021).

2.4.4.6.2 Time (Dummy)

Time is the second control variable. The time dummies are introduced to the model to capture time-specific macroeconomic elements out of management's control. They fluctuate over time but are equal for all enterprises. Other research (Garca-Teruel and Martnez-Solano, 2010; Baos-Caballero et al., 2010; Mandipa et al., 2022) have also used time dummies. Furthermore, according to Filbeck and Krueger (2005) and Soda et al. (2022), WCM practices within industries alter dramatically over time. These changes, according to Nakamura and Palombini (2009) and Lefebvre (2022), could be linked to macroeconomic issues such as interest rates, competition, and innovation.

2.4.4.6.3 Country (Dummy)

The country in which a corporation is based will be the final control variable. These nation dummies are used to see if there are any special characteristics of countries that influence WCM that are not explained by other variables. Country dummies would be applied to control the effect of heterogeneity and capture unobserved industry-specific effects (Mansoori et al., 2020; Lefebvre, 2022; Jabbouri et al., 2022).

2.4.4.7 The impact of the Global Financial Crisis on the Factors Affecting WC Efficiency

According to some researchers, effective working capital management is essential for companies to maintain during times of economic prosperity and can be achieved to increase competitiveness and profitability (Abuzayed, 2012; Hayne, 2022). However, other researchers contend that improving working capital management is essential for companies to survive the financial crisis. Only a few efforts have been made to assess how working capital was affected during the crisis, in spite of the fact that it is widely acknowledged that the global financial crisis had an impact on organisations' liquidity and working capital management and led to poor performance (Simon et al., 2017a; Mandapa et al., 2022). It can be deduced that the 2008 global financial crisis had an impact on working capital, which serves as a gauge of liquidity and profitability for businesses and also influences firm performance. Almost all European nations were impacted by the most recent global financial crisis, but European nations suffered the most (Akgün and Karataş, 2020). Some experts contend that effective working capital management is essential for businesses during times of rapid economic growth and can be implemented to improve competitive position and profitability, while others argue that improving working capital management is essential for businesses to withstand the effects of the financial crisis. (Abuzayed, 2012; Bekteshi, 2021; Chasha, 2022).

Although it is widely acknowledged that the global financial crisis had a negative impact on firms' ability to manage their working capital and liquidity, which led to subpar performance, little has been done to determine how working capital was impacted during the crisis. The 2008 global financial crisis, according to Simon et al.

(2017a) and Akbar et al. (2021), had an impact on more than simply corporate performance. However, working capital is also employed as a gauge of liquidity and profitability in businesses of all sizes. The link between financial development and economic growth has grown significantly since the commencement of the global financial crisis. While industrialised countries were significantly affected by the global financial crisis of 2008, scholars are currently debating the role of financial intermediation in economic growth and development. The question of whether financial development entails financial inclusion is one that has received little attention, even though the relationship between economic and financial growth will never be obvious (Yorulmaz, 2012; Patel and Shah, 2022). Since the start of the crisis, economic integration has reportedly had a positive impact on the circumstances surrounding financial inclusion, according to Urquijo (2015) and Huang et al. (2021).

According to Akgün and Karataş (2020), the region's strong internal market and economic and monetary union are both related to the EU's high level of financial inclusion, in addition to the region's high levels of growth and income. The effects of the global financial crisis on organisations' working capital management practise have been the subject of numerous research. For instance, Love et al. (2013) and Tsuruta (2022) contend that there is a direct correlation between net trade credit and cash flow in the pre-crisis period but no proof that companies with a high cash flow use trade credit less during and after crises. Researchers Duchin et al. (2010) and Nguyen et al. (2021) observed that US corporations raised their cash holdings during the global financial crisis (2012) and that changes in company characteristics in the years after the crisis do not account for the growth in cash holdings. On the other hand, Tsuruta (2019) discovers a conflicting relationship between excess working capital and firm performance throughout the financial crisis. Cash flow has a favourable and significant impact on investment during the financial crisis, according to Arslan et al. (2014). Similarly, Jebran et al. (2019) assert that during the financial crisis, cash flow and liquidity have a very advantageous impact on cash holdings. This conclusion is supported by a large body of empirical research (e.g., Opler et al., 1999; Ozkan and Ozkan, 2004; Deari et al., 2022), while some studies (Chen, 2008) suggest that the cash flow ratio had a negative impact on cash holdings during the financial crisis (AlAmarneh, 2015). Tsuruta (2019) found that working capital adjustments were weaker during the crisis using quarterly firm-level data of listed Japanese firms. This

suggests that cash plays a role in the relationship between working capital and corporate performance. Furthermore, the inverse relationship between excess working capital and corporate performance, particularly for large firms, became significantly greater during times of crisis. Data, however, suggests that this link between working capital and firm performance during and after crises is short-lived since firms borrow money from banks to fund any excess working capital. While researching the Middle Eastern (ME) and European (EU) firms, Husaria (2015) found that there is no statistically significant correlation between cash conversion cycle indicators and business profitability as measured by Return on Asset. Additionally, managers should use other strategies and instruments to increase their company's profitability rather than correctly managing working capital. Iqbal and Iqbal (2019) used a deductive study approach to empirically investigate the sample of Islamic banking personnel from a few chosen OIC nations. It's very noteworthy to note that because Islamic bank managers are both innately and extrinsically religious, Islamism has a sound positive moderating impact on working capital management. The study is recognised as significant with the finding that managers' religious affiliations have an impact on bank working capital management and lead to overconfidence, loss aversion, and self-serving bias. Average accounts receivables have a considerable negative impact on GCC manufacturing enterprises' performance. Lowering accounts receivables investment leads to higher earnings and fewer assets, resulting in a higher pre-tax return on assets. The findings suggest that a typical GCC manufacturing firm may increase profitability by lowering its accounts receivable and improving its bad debt management (Murthy, 2015). According to Osama and Al-Gazzar (2020), cash does not appear to be a moderator in the working capital-profitability relationship. Their study might alert MENA financial managers to the necessity to develop a short and medium-term WCM strategy, cash budget, cash inflow and outflow, and provide cash at the proper time to achieve the cash performance interaction. Their findings demonstrated a significant concave relationship between the net working capital ratio and return on assets, meaning that there is a point at which return on assets might be maximized. Based on the literature mentioned above, it is believed that the factors determining working capital may differ in recessionary and boom states of the economy. A limited number of papers have discussed working capital management in the context of GCC, Middle East, and MENA regions, while no research papers were found focusing on a dataset of OIC countries.

The years 2000, 2001, 2002, 2007, 2008, 2019 and 2020 have been classified as recession periods (Bad state) in this study by considering major economic bodies reports and data such as the National Bureau of Economic Research (2021) and the International Monetary Fund (2021). Understanding these economic cycles and their impact on firms' working capital management is crucial. For instance, Haron and Nomran (2016) highlighted how the global financial crisis significantly influenced working capital strategies before, during, and after the recession. Similarly, Buddenberg (2019) discussed the aggressive working capital strategies that firms adopted to navigate economic downturns. Martin (2024) further emphasized the importance of effective working capital management practices in maintaining profitability during recessionary periods. These identified recession years encompass significant economic downturns like the DOT-COM Bubble in the early 2000s, the 2007-2008 global financial crisis, and the economic impact of the COVID-19 pandemic. It is worth noting that the years 2000, 2001, 2002, 2007, 2008, 2019, and 2020 have been classified as recession periods (NBER, 2021; IMF, 2021) in this study. These periods encompass major economic downturns, including the early 2000s recession (DOT-COM Bubble), the 2007-2008 global financial crisis, and the economic impact of the COVID-19 pandemic.

2.5 RESEARCH GAP

The preceding paragraphs reveal that empirical literature on WCM has occupied a significant academic space even though the research conducted so far has been mostly focused on analysing the relationship between WCM and firm profitability both in developed as well as developing countries (Singhania and Mehta, 2017; Lyngstadaas & Berg, 2016; Pais & Gama, 2015). However, recent studies have tried to examine the factors that determine working capital efficiency (Akgün, & Memiş, 2021; Bhattacharya, 2021). These studies suggest that both internal as well as external factors have an impact on working capital efficiency and suggest the importance of these factors in determining working capital efficiency.

The existing literature on financial aspects in Organization of Islamic Cooperation (OIC) countries covers a wide range of topics, reflecting the growing importance of these economies in the global financial landscape. However, a

comprehensive review of this literature reveals several key areas that have received significant attention, as well as notable gaps in research, particularly concerning working capital management efficiency.

Focus on broader financial aspects: Most studies on OIC countries have focused on broader financial topics such as financial inclusion (Kim et al., 2017), economic growth (Erum & Hussain, 2019), and banking performance (Mobarek & Kalonov, 2013). There is a notable lack of specific research on working capital management efficiency in these countries.

Comparative studies: While there are comparative studies between OIC and non-OIC countries, these primarily focus on areas like conventional vs. Islamic banking (Mobarek & Kalonov, 2013) or financial inclusion (Banna et al., 2021). A comparative study specifically on working capital management efficiency appears to be lacking.

Macroeconomic factors: Several studies examine the impact of macroeconomic factors on various financial aspects in OIC countries (Ali et al., 2020; Shaari et al., 2020). However, their influence on working capital management efficiency has not been extensively explored.

Institutional quality: Research has been conducted on the role of institutional quality in financial development in OIC countries (Ali et al., 2020), but its specific impact on working capital management efficiency remains unexplored.

Firm-level analysis: While some studies focus on firm-level factors in OIC countries (Al-Harbi, 2019), there is a gap in comprehensive firm-level analysis of working capital management efficiency, especially in comparison with non-OIC countries.

Given these observations, there is a clear need for research that specifically addresses working capital management efficiency in OIC countries, particularly in comparison with non-OIC countries. Such research would not only fill a significant gap in the literature but also provide valuable insights into how religious, cultural, and economic factors influence working capital management practices across different country groupings. This comparative approach could contribute to a more nuanced

understanding of financial management in diverse global contexts, potentially informing both policy and practice in OIC and non-OIC countries alike.

Despite the growing importance of OIC economies in the global financial landscape, extensive research examining working capital management (WCM) practices in Shariah-compliant countries, particularly OIC countries, remains limited. Most existing findings in the literature regarding WCM are based on non-Islamic countries, leaving Islamic countries largely unexplored in this context. Investigating WCM practices in OIC countries is particularly worthwhile due to their generally weaker financial systems, indicating significant potential for improvement. Several studies have highlighted differences in corporate financial practices between Islamic and non-Islamic countries. For instance, Chen (2017) found that corporate liquidity in Islamic countries is generally lower than in other countries, and the sensitivities of corporate liquidity to its determinants differ in Islamic countries compared to others. Building on these insights, the study contributes to the literature in several important ways. Firstly, the impact of both firm-level and macroeconomic factors on working capital efficiency is examined, providing a comprehensive analysis of the determinants of working capital management (WCM). Secondly, a comparative analysis of this phenomenon across OIC and non-OIC countries is conducted, addressing the gap in cross-country studies. Thirdly, the study extends the analysis to consider the effects of economic cycles by examining WCM practices across recessionary and boom states of the economy, separately for OIC and non-OIC countries. This multifaceted approach allows for a nuanced understanding of WCM practices in different economic and cultural contexts, contributing valuable insights to the existing body of knowledge on financial management in Islamic and non-Islamic countries.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 PREAMBLE

The research approach used in the current study is the main consideration of this chapter. This chapter outlines the study's objectives and the hypothesis. The chapter also describes the procedures and methods, sample size, variables, and sampling frame that were employed in the study. The chapter also clarifies the strategy and plan of action used to accomplish the study's goals using baseline definitions and estimating methodologies.

3.2 OBJECTIVES

The study broadly aims to examine the factors that affect the working capital efficiency of firms belonging to OIC and Non-OIC countries. This principal objective of the study has been decomposed into the following set of objectives that the study attempts to achieve:

1. To evaluate the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.
2. To test whether a difference exists in the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.
3. To examine the firm-level and macroeconomic determinants of WCM efficiency in OIC and Non-OIC countries
4. To investigate the differential impact of firm-level and macroeconomic determinants on the WCM efficiency in OIC and Non-OIC countries in recession and boom states of the economy.

3.3 HYPOTHESES

To achieve the stated objectives and provide a direction to the study, the following sets of hypotheses have been drawn:

H_1^1 : WCM efficiency is different between OIC and Non-OIC firms.

H_1^2 : Firm-level and macroeconomic variables have a significant impact on WCM efficiency.

H_1^3 : Firm-level and macroeconomic variables have a different impact on WCM efficiency in OIC and Non-OIC firms.

H_1^4 : Firm-level and macroeconomic variables have a different impact on WCM efficiency in recession and boom states of the economy.

3.4 RESEARCH DESIGN AND SAMPLE SELECTION

To meet the objectives of the study, an exploratory and descriptive research design will be adopted. The exploratory research framework helped the researcher in the identification of research problems. In addition, it facilitated in modelling the specifications of baseline empirical models based on identified research problems. Later, descriptive research design helped the researcher explore the specifications with accurate data, samples, and estimation techniques.

The study is based on samples drawn from the COMPUSTAT database that covers all the firms belonging to OIC and Non-OIC countries. For the sampling for the current study, a purposive sampling technique would be adopted wherein the researcher would select the sample firms from the COMPUSTAT database belonging to OIC and Non-OIC countries. Additionally, it must be noted that only Non-financial firms belong to OIC and Non-OIC countries will be considered. Financial companies were dropped because they are guided by different accounting regulations (Deloof, 2003; Kundu et al., 2022). For instance, loans for a Non-financial firm are treated as liabilities, while

loans for a financial company are treated as assets. The sample of the study consists of all countries listed firms except the North American data set, which includes the USA and Canada. The final sample consists of firms belonging to 18 OIC countries and 35 Non-OIC countries. The list of countries whose listed firms are part of the sample is presented in Table 3.1. Specifically, panel A of Table 3.1 presents the list of OIC countries whose listed firms form the part of sample and panel B of Table 3.1 presents the list of Non-OIC countries whose listed firms form the part of sample. Further, it is worth noting that only these countries have been chosen because the data for firm-level variables and macroeconomic variables was available for only these countries and hence they find their position in the sample.

Table 3.1 OIC and Non-OIC Countries

Panel A: OIC countries					
S.No	Country Name	S.No	Country Name	S.No	Country Name
1	Malaysia	7	Bangladesh	13	United Arab Emirates
2	Indonesia	8	Saudi Arabia	14	Tunisia
3	Pakistan	9	Kuwait	15	Qatar
4	Turkey	10	Nigeria	16	Bahrain
5	Jordan	11	Oman	17	Kazakhstan
6	Egypt	12	Morocco	18	Lebanon
Panel B: Non-OIC countries					
S.No	Country Name	S.No	Country Name	S.No	Country Name
1	Australia	13	India	25	Poland
2	Bulgaria	14	Iceland	26	Russia
3	Brazil	15	Italy	27	Singapore
4	Botswana	16	Japan	28	Sri Lanka
5	Chile	17	Macau	29	Sweden
6	China	18	Mexico	30	Thailand
7	Ecuador	19	Namibia	31	Trinidad and Tobago
8	France	20	New Zealand	32	Venezuela

9	Switzerland	21	Panama	33	Vietnam
10	United Kingdom	22	Peru	34	South Africa
11	Ghana	23	Philippines	35	Zambia
12	Hong Kong	24	Papua New Guinea		

3.5 DATA SOURCES, TIME PERIOD AND FIRM-YEAR OBSERVATIONS

The study employs both firm-level and macroeconomic data for this study. The data for firm-level variables has been collected from the COMPUSTAT database and the data on macroeconomic variables has been collected from the World Bank development indicators Database. It is worth mentioning that both the firm-level and macro-level data will be collected for a period of 22 years, taking 2021 as the latest year (2000-2021). The 20- year time period has been chosen to enhance the reliability of the study results and minimize the measurement error. Chadha and Sharma (2015) suggest that data for a longer period ensures reliability and reduces measurement error. It is worth noting that data cleaning was employed before proceeding with the final analysis. Specifically, firm-years with missing data were deleted, and outliers were removed. After the data cleaning process, the final sample was obtained, the details of which are presented in Table 3.2. Panel A of Table 3.2 presents the data on the number of firms and firm-year observations across OIC countries, while Panel B presents the same for non-OIC countries.

It is important to note that the total number of firms from OIC countries in the initial sample was 4,499, with 66,762 observations. However, after deleting firm-year observations with missing data and outliers, the final sample included 3,416 firms and 39,940 observations. The highest number of firm-year observations (12,580) and the highest number of firms (1,077) contributing to the sample were from Malaysia.

Additionally, the total number of non-OIC firms in the sample was 39,877, with 435,216 firm-year observations. After the deletion process, the final sample for non-OIC countries consisted of 24,291 firms with 272,019 observations.

Table 3.2 Firms and Firm Observations

	Notation	No of Firms	No of Obs	No of Firms	No of Obs
Panel A: OIC countries					
United Arab Emirates	ARE	141	2137	59	709
Bangladesh	BGD	318	3692	210	1843
Bahrain	BHR	40	719	17	248
Egypt	EGY	222	2930	146	1527
Indonesia	IDN	732	9616	538	5935
Jordan	JOR	237	3887	115	1358
Kazakhstan	KAZ	43	587	22	245
Kuwait	KWT	219	3267	101	1149
Lebanon	LBN	10	178	3	44
Morocco	MAR	90	1446	61	786
Malaysia	MYS	1398	21076	1077	12580
Nigeria	NGA	180	2686	109	1243
Oman	OMN	110	1912	70	1017
Pakistan	PAK	476	7644	352	4707
Qatar	QAT	49	770	21	269
Saudi Arabia	SAU	199	2932	132	1661
Tunisia	TUN	78	1117	49	563
Turkey	TUR	456	6714	334	4056
Total		4499	66762	3416	39940
Panel-B Non-OIC Countries					
Australia	AUS	3104	20604	1940	12878
Bulgaria	BGR	108	889	63	556
Brazil	BRA	612	7811	382	4882
Botswana	BWA	28	251	13	157
Chile	CHL	288	3739	180	2337
China	CHN	6729	72859	4206	45537
Ecuador	ECU	4	52	2	33
France	FRA	1315	13414	822	8384
Switzerland	CHE	400	4561	250	2851

United Kingdom	GBR	3720	31315	2325	19572
Ghana	GHA	22	246	14	154
Hong Kong	HKG	2206	24697	1379	15436
India	IND	5830	69632	3644	43520
Iceland	ISL	28	376	18	235
Italy	ITA	660	5894	413	3684
Japan	JPN	6849	92400	4281	57750
Macau	MAC	14	137	9	86
Mexico	MEX	200	2707	125	1692
Namibia	NAME	6	59	4	37
New Zealand	NZL	264	2382	165	1489
Panama	PAN	3	41	2	26
Peru	PER	156	2265	98	1416
Philippines	PHL	292	2931	183	1832
Papua New Guinea	PNG	9	76	6	48
Poland	POL	1187	12033	742	7521
Russia	RUS	459	4974	287	3109
Singapore	SGP	1220	13414	763	8384
Sri Lanka	LKA	324	3830	203	2394
Sweden	SWE	1348	12510	843	7819
Thailand	THA	1072	14347	670	8967
Trinidad and Tobago	TO	20	283	13	177
Venezuela	VEN	25	188	16	118
Vietnam	VNM	798	7654	499	4784
South Africa	ZAF	555	6404	347	4003
Zambia	ZMB	22	241	14	151
Total		39877	435216	24291	272019

This study utilizes an extensive unbalanced panel dataset of firms spanning 18 OIC countries and 35 Non-OIC countries over 22 years from 2000-2021. The use of panel data allows controlling for individual heterogeneity and studying the dynamics of change over time (Baltagi, 2021). The large sample covering 53 countries makes the results generalizable to the countries in the sample and non-generalizable to the countries which are not in the sample. This enhances the validity of results across different institutional contexts. Furthermore, the thousands of firms and extensive time dimension provide substantial statistical power to detect effects and ensure precise estimates of the coefficients in the regression models. The details provided on the number of firms and observations before and after rigorous data cleaning demonstrate transparency in the sample construction process, which aids reproducibility and enhances integrity (Peng et al., 2006). The data cleaning process also improves accuracy by removing problematic observations and helps prevent distorted statistical inferences (Osborne, 2013). Overall, the depth and breadth of this dataset permit comprehensive analysis of the research questions regarding working capital efficiency determinants across OIC and Non-OIC countries.

Specifically, the sample comprises firm-level data from the COMPUSTAT database, which includes extensive coverage of listed firms across developed and emerging economies. The use of COMPUSTAT allows leveraging a high-quality database designed specifically for research purposes. The coverage across 53 countries was achieved by extracting the full available data across the platform except for North America, in order to focus the analysis on OIC and Non-OIC countries. The extensive time dimension spanning 2000-2021 enables studying different trends across countries during periods of recessions and periods of growth (Creal et al., 2014). This long panel provides the data density and variation over time needed for dynamic analyses using econometric methods tailored specifically for panel data (Arellano and Bond, 1991).

Precise steps were taken in the sample construction and data cleaning process. The exclusion of financial firms follows leading practices in working capital research to ensure appropriate accounting treatment and avoid distortions (Deloof, 2003). The process of removing missing observations and omitting entire firm-years preserves the completeness of the remaining data points analysed (Cheema, 2014). Trimming outliers via standardized residual analysis prevents influential anomalous values from skewing

statistical tests (Stephen and Senthamarai, 2011). Reporting the number of firms and observations before and after cleaning demonstrates transparency and allows readers to assess sample representativeness. Additionally, providing details for each of the 53 constituent countries enables evaluating evenness or concentration across different national contexts.

The extensive range across countries coupled with longitudinal density over 22 years confers several advantages. Expanding the number of countries covered diversifies macroeconomic conditions and generalizability while investigating trends over long time horizons facilitates comparative research across periods of crisis and prosperity. The combination of cross-country distribution and intertemporal variation provides more accurate estimates of even rare effect sizes that may be difficult to detect in smaller samples. From a modelling standpoint, larger samples confer greater statistical power, more efficiently separating stochastic noise from reliable signals in the data. The multivariate regression approach is also enriched by expanding the degrees of freedom and ratio of observations to parameters estimated (Babyak, 2004).

In conclusion, this study leverages an extensive panel database of firms across 53 countries over 2000-2021 to carefully examine determinants of working capital efficiency. The transparency in presenting sample details, data cleaning procedures, and rationales for methodological choices adhere to principles for enhancing integrity and reproducibility. The breadth and depth of this dataset confers considerable statistical advantages including power, precision of estimates, and mitigation of stochastic distortions, among others. Furthermore, the diversity of macroeconomic conditions represented coupled with dense time series variation facilitates incisive comparative analysis not feasible with smaller samples. Overall, this data resource permits executing the empirical analysis at a scale aligned with the complexity and ambit of the research objectives. The methodical data curation and scrutiny further help uphold scholarly accuracy. Thus, the coupling of an extensive yet judicious firm-level database with state-of-the-art panel data econometric techniques provides a sound foundation for contributing robust evidence on OIC and Non-OIC working capital efficiency drivers across business cycles.

The study employed a purposive sampling technique to select 18 OIC members out of the total 57 members, primarily due to data availability constraints. While unbalanced panel data analysis can indeed accommodate datasets with missing observations for some time periods or variables, the selection of these 18 countries was driven by the need to maintain a minimum threshold of data quality and consistency across the study period. Unbalanced panels can handle some missing data, but they still require a substantial amount of data for each included entity to produce reliable estimates (Baltagi, 2021). Countries with severely limited or inconsistent data were excluded to ensure the robustness of the analysis. This approach aligns with the recommendations of Hair et al. (2019), who suggest that while unbalanced panels can handle missing data, researchers should still aim to maximize data completeness to enhance the reliability and generalizability of findings. Furthermore, including countries with extremely limited data could potentially introduce bias into the estimates, as noted by Wooldridge (2010). Therefore, while the use of unbalanced panel data allowed for flexibility in data availability, it was still necessary to ensure a minimum level of data consistency and quality across the selected countries to maintain the integrity of the analysis.

The exclusion of North American countries, particularly the United States and Canada, from the non-OIC sample in this study was primarily due to data compatibility issues within the Compustat database. North American companies' data in Compustat is structured in a significantly different format and often contains much more detailed information compared to companies from other regions. This disparity in data structure and depth could potentially introduce bias and comparability issues in the analysis. Furthermore, the scale and sophistication of North American financial markets and corporate structures are substantially different from those in most OIC countries and other developing economies, which could skew the comparative analysis (Khanna & Palepu, 2010). By excluding North American countries, the aim is to maintain a more homogeneous sample of non-OIC countries that are more comparable to OIC countries in terms of economic development stages and financial market characteristics. This approach aligns with similar cross-country studies in emerging markets, such as those conducted by Rajan and Zingales (1998) and La Porta et al. (2000), which often exclude highly developed markets to ensure better comparability among the sample countries.

3.6 VARIABLE SPECIFICATIONS

Table 3.3 presents the specification of all the firm-level and macroeconomic variables used in the study. The first variable of interest relates to working capital efficiency (WCE). Following Banerjee et al. (2021); Seth et al. (2020); Singhanian and Mehta (2017) the present study employs Cash Conversion Cycle (CCC) to measure the working capital efficiency. It is calculated by adding the Accounts Receivable Period (ARP) to the Inventory Conversion Period (ICP) and subtracting the Accounts Payable Period (APP); $[CCC=ARP+ICP-APP]$. Accounts Receivable Period (ARP) is the average number of days it takes for a firm to collect payments from its customers, Inventory Conversion Period (ICP) is the average number of days it takes for a firm to convert its inventory into sales and Accounts Payable Period (APP) is the average number of days it takes for a firm to pay its suppliers. ARP is calculated as: $365 \text{ days} \times [\text{account receivables}/\text{sales}]$; APP is calculated as: $365 \times [\text{account payable}/\text{cost of goods sold}]$; and ICP is calculated as: $365 \times [\text{inventories}/\text{cost of goods sold}]$.

The second set of variables of interest relates to firm-level variables that might affect working capital efficiency. Among these variables, profitability is first measured using return on assets (ROA), which is calculated as the ratio of net profit to total assets. Prior empirical studies on WCM have used several measures of profitability; for example, Alvarez et al., (2021); Anton and Nucu (2020); and Singhanian and Mehta, (2017) used return on assets (ROA) as a measure of profitability. Similarly, Bhatia and Srivastava (2016); Singhanian et al. (2014); Lazaridis and Tryfonidis (2006) employed gross operating profit (GOP) as a measure of companies' profitability. In addition, Velnampy and Nireesh (2012) used Return on Equity (ROE) as a representative variable for measuring companies' profitability. However, among all these variables the most popular among the researchers has been ROA. Therefore, in this study, ROA is employed as a measure of profitability.

Firm size (size) is also used, measured as the logarithmic function of total assets. Prior studies have found firm size as an important determinant of working capital because of the interaction of four factors i.e. capital market access, negotiation power, economies of scale and reputation (Altaf, 2021; Qurashi and Zahoor, 2017; Cuong and Cuong, 2016; Haron and Nomran, 2016; Hill et al., 2010; Narender et al., 2008; Chiou

et al., 2006). Additionally, asset tangibility (TANG) is used as another firm-level factor that may affect working capital efficiency. Asset Tangibility has been measured as the ratio of tangible assets to total assets. Many prior studies have found a significant relationship between asset tangibility with CCC (Altaf, 2020; Cuong and Cuong, 2016; Wasiuzzaman and Arumugam, 2013). Furthermore, leverage (LEV) is used as another firm-level variable that may affect working capital efficiency, measured as the ratio of total debt to total assets. Studies like Akinlo (2012); BañosCaballero et al. (2010) and Nazir and Afza (2009) found a significant impact of leverage on CCC. The study also used cash flow (CF) measured as the ratio of Earnings before interest and tax plus depreciation to total assets as a firm-level variable affecting working capital efficiency. Studies like Altaf (2020) and Haron and Nomran (2016) found a significant impact of cash flow on working capital efficiency. Further, growth (Growth) measured as year-on-year growth in sales has been used as a firm-level variable that might influence working capital efficiency. Prior studies like Altaf (2020); Qurashi and Zahoor (2017) and Cuong and Cuong (2016) found a significant impact of growth on the working capital efficiency. Firm age (AGE) measured as the number of years since incorporation has been used as the last firm-level variable that might affect working capital efficiency. Many studies by Altaf (2020); Wasiuzzaman and Arumugam (2013) and BañosCaballero et al. (2010) found a significant impact of firm age on working capital efficiency.

Regarding macroeconomic variables that may affect working capital efficiency, stock market development (SMD) is first used as a key macroeconomic variable. Many recent studies by Mättö et al. (2021); Beck et al. (2013) and Justitia (2013) found a significant impact of stock market development on working capital efficiency. Based on prior literature, inflation, measured by the consumer price index (CPI), is also used as a macroeconomic variable that may affect working capital efficiency. Studies like Mokhtari (2022); Azizi and Jokar (2021); Dehghanfard and Moslemi (2017) and Celik et al. (2016) have documented a significant impact of inflation on working capital efficiency. Additionally, the classical gross domestic product growth rate (GDPG) is used as a variable that may affect working capital efficiency. Studies like Panda et al. (2021); Qurashi and Zahoor (2017) and Mansoori and Muhammad (2012) have found a significant impact of GDPG on working capital efficiency. Real interest rate (INT) is also used as another macroeconomic variable that may affect working capital efficiency.

Seth et al. (2020); Doruk and Ergün (2019); Seth et al. (2019) and Goel and Sharma (2015a, b) have found a significant impact of interest rate on working capital efficiency. Lastly, money supply (MS) is used as the macroeconomic variable that may affect working capital efficiency. In recent evidence, Altaf (2022) documented a significant impact of money supply on working capital efficiency.

Table 3.3 Variable Specification

Cash conversion cycle	CCC	ARP+ICP-APP
Accounts receivable period	ARP	$365 \text{ days} \times [\text{account receivable}/\text{sales}]$
Accounts payable period	APP	$365 \text{ days} \times [\text{account payable}/\text{sales}]$
Inventory conversion period	ICP	$365 \times [\text{inventories}/\text{cost of goods sold}]$
Profitability	ROA	Net profit/total assets
Firm Size	SIZE	Natural logarithm of total assets
Asset Tangibility	TANG	Tangible assets/total assets
Leverage	LEV	Total debt/total assets
Cash Flow	CF	Earnings before interest and tax plus depreciation / total assets
Growth	Growth	$(\text{Current year sales} / \text{previous year sales}) - 1$
Firm Age	AGE	The number of years from the time the company was incorporated
Money Supply	MS	World Bank Perse
Stock Market Development	SMD	World Bank Perse
Inflation	CPI	World Bank Perse
Gross Domestic Product Growth	GDPG	World Bank Perse
Real Interest Rate	INT	World Bank Perse

3.7 BASELINE SPECIFICATIONS AND ESTIMATION APPROACH

3.7.1 Baseline Specifications

The variables (both firm-level and macroeconomic) that affect working capital are tested using the following equation:

$$CCC_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 TANG_{i,t} + \beta_4 LEV_{i,t} + \beta_5 CF_{i,t} + \beta_6 GROWH_{i,t} + \beta_7 AGE_{i,t} + \beta_8 MS_t + \beta_9 SMD_t + \beta_{10} CPI_t + \beta_{11} GDPG_i + \beta_{12} INT_t + \sum_{j=1}^J \gamma_j INDUSTRY_j + \sum_{k=1}^K \delta_k COUNTRY_k + \sum_{t=1}^T \theta_t YEAR_t + \varepsilon_{i,t} \quad (1)$$

It is worth noting that above Eq. (1) has been tested on full sample as well as on sample from OIC and Non-OIC countries. Also, this equation has been run on sample from individual counters and also separately across the good and bad states of the economy.

3.7.2 Estimation Approach

The relationships specified by the models presented above will be estimated with the use of the econometric panel data methodology. The detail of such estimation is presented below:

3.7.2.1 Why Panel Data?

The models specified above were estimated using panel data methodology because of the advantages it offers. Firstly, panel data assumes that individuals are heterogeneous and thus helps to control for unobservable heterogeneity (Hsiao, 2003; Klevmarken, 1989; Baltagi, 2021; Kumpamool and Chancharat, 2022; Mir and Shah, 2022). Notably, time-series and cross-section studies do not control for individual heterogeneity and thus are plagued with the risk of throwing up biased results (Moulton, 1986 and 1987; Abdi and Bayu, 2021; Oganda et al., 2022). This is particularly relevant in the context

of working capital management (WCM) across OIC and non-OIC countries, where firm-specific and country-specific factors may vary over time. Secondly, panel data provides more information, produces more variability, augments efficiency, and reduces collinearity among variables (Hsiao, 2003; Komarova et al., 2021; Gyane et al., 2021). Thirdly, panel data helps to study the dynamics of adjustment (Baltagi, 2021). Baltagi (2008 and 2021) suggests that cross-sectional distributions look stable but tend to hide many changes. Lastly, it helps to model technical efficiency in a better way by allowing to construct the complicated models (Koop and Steel, 2001; Altaf and Shah, 2021). In the context of the study, panel data enables us to capture both the inter-country differences in WCM practices and the intra-country changes over time, providing a more comprehensive understanding of the determinants of WCM efficiency (Kieschnick et al., 2013). Additionally, panel data techniques can mitigate endogeneity concerns through the use of fixed effects or instrumental variable approaches (Greene, 2018), which is crucial when examining the relationship between firm characteristics and WCM efficiency.

3.7.2.2 Modelling with Panel Data

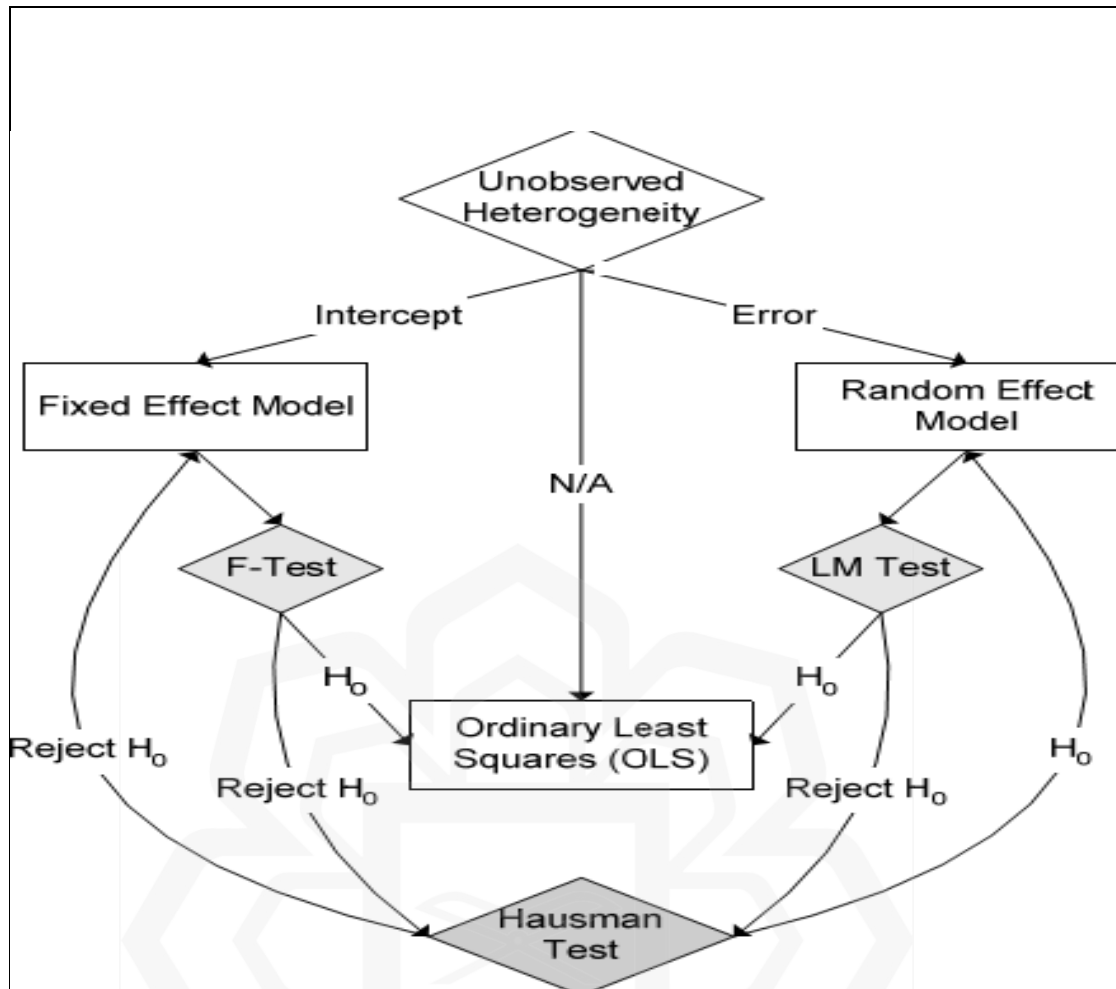
Panel data modelling may benefit from some practical instructions offered by Park (2011). These recommendations, which are shown in Figure 3.1, suggest that ordinary least squares (OLS) generate accurate and reliable estimates when individual effects are absent, or when $u_i = 0$. However, panel data assumes that individuals are heterogeneous i.e., $u_i \neq 0$ and therefore, it is necessary to adjust for unobservable heterogeneity (Hsiao, 2003; Klevmarken, 1989; Baltagi, 2021; Kumpamool and Chancharat, 2022; Mir and Shah, 2022). In this scenario, the OLS estimator would not produce BLUE (best linear unbiased estimates) (Jeffrey, 2022) because the disturbances would not have the same variance (i.e., homoscedasticity), and they would not be related to one another (i.e., no autocorrelation). Alternative panel data modelling strategies, including fixed effects and random effects models, have been proposed in the literature on econometrics to address this inefficiency.

The choice between static and dynamic panel analysis in this study is grounded in both theoretical considerations and the nature of the research questions. Static panel

models are appropriate when the primary focus is on examining the contemporaneous relationships between variables, without considering potential dynamic effects or lagged dependencies (Baltagi, 2021). In the context of working capital management (WCM), many of the determinants, such as firm size, leverage, and profitability, are expected to have immediate rather than lagged effects on WCM efficiency (Kieschnick et al., 2013). Moreover, static panel models are particularly suitable for analysing the impact of slowly changing variables, such as institutional factors in OIC countries, which are key to cross-country comparison (Wooldridge, 2010). While dynamic panel models can capture persistence in WCM practices, they may introduce bias in estimating the effects of time-invariant variables, which are crucial in cross-country analysis (Hsiao, 2003). Additionally, the Hausman test results support the use of fixed-effects models, which align well with the static panel approach in controlling for unobserved heterogeneity across firms and countries (Greene, 2018). Therefore, given the research objectives and the nature of the variables involved, the static panel analysis provides a robust framework for examining the determinants of WCM efficiency across OIC and non-OIC countries.

3.7.2.3 Fixed versus Random Effects

While random effects (RE) are often referred to as between-group estimation, fixed effects (FE) are also known as within-group estimation. The specification of dummy variables is the primary distinction between FE and RE models. In the FE model, the intercept is used as the parameter estimate for the dummy variable, whereas the error component is used as the parameter estimate for the RE model. The slope, though, is the same in both scenarios. The FE model examines different intercepts for each individual and assumes the constant variance and the same slope across individuals. Thus, an individual-specific effect remains time-invariant and is part of the intercept. Besides, individual effects are correlated with regressors.



Source: Park (2011, p.16)

Figure 3.1 Practical Guidelines for Panel Data Modelling

While the FE model assumes that individual effects are correlated with regressors, the RE model assumes that individual effects are not correlated with regressors, and accordingly, it estimates the error variance specific to groups. Thus, the RE model considers individual effects as a component of the composite error term. It is for this reason that the RE model is also known as the error component model. RE model assumes that the slopes and intercept are the same across individuals and the difference across the time period lies in the individual-specific errors, not in their intercepts.

The functional form of FE and RE models are given as follows:

$$\text{Fixed effects model: } y_{ii,t} = (\alpha + \mu_{ii}) + X_{ii,t}\beta + v_{ii,t}$$

Random effects model: $y_{ii,t} = \alpha + X_{ii,t}\beta + (\mu_{ii} + v_{ii,t})$

Where ui is an unobserved fixed or random effect specific to the individual, and $v_{ii,t}$ are composite errors that are independent, identically distributed, $v_{ii,t} \sim IID(0, \sigma^2)$.

3.7.2.4 Testing FE and RE Effects Against OLS

The F-test for FE and Breusch and Pagan's (1980) Lagrange Multiplier (BP-LM) test for RE are the formal tests for suggesting whether performing OLS leads to consistent estimates or whether one should go for an alternative panel data methodology. Firstly, the F-test compares the FE model with OLS to check whether the FE model can improve the goodness-of-fit. Secondly, the BP-LM test compares the RE model with OLS to check whether the RE model can improve the goodness of fit. The decision criteria are based on acceptance and rejection of the null hypothesis of both the F-test and BP-LM test. If the null hypothesis of the F-test is rejected, it implies that the FE model is better than OLS. In a similar vein, if the null hypothesis of the BP-LM test is rejected, it implies that the RE model is also better than OLS. After rejecting both hypotheses, the Hausman test is conducted to determine the most appropriate model between fixed effects (FE) and random effects (RE).

3.7.2.5 F-test for Fixed Effects

For a regression $Y_{ii,t} = \alpha + \mu_{ii} + X_{ii,t}\beta + v_{ii,t}$ The null hypothesis is that the parameters for all the dummy variables, except for the one that is dropped, are zero, $H_0: \mu_1 = \mu_2 \dots = \mu_{N-1} = 0$. This hypothesis is tested by the F-test, which is based on the loss of goodness of fit. The rejection of the null hypothesis for the F-test implies that the goodness-of-fit would significantly increase with the use of FE than OLS.

3.7.2.6 Breusch-Pagan Lagrange Multiplier (B-P LM) Test for Random Effects

This test runs under the null hypothesis that individual time-varying components are equal to zero, $H_0: \sigma^2 = 0$. The rejection of this null hypothesis implies that the RE model is more capable of dealing with heterogeneity than OLS. This test is based on chi-squared distribution with one degree of freedom.

3.7.2.7 Hausman test for FE and RE

Having known that FE and RE models produce better estimates than OLS, let us proceed to find the better model between FE and RE. The Hausman test would help us in this regard. The Hausman test runs under the null hypothesis that individual effects are uncorrelated with regressors, a similar proposition as assumed by the RE model. Accordingly, the null hypothesis for the Hausman test can be changed to “RE model is better”. The FE model should be used if the null hypothesis is accepted, and vice versa. The Hausman test operates on the assumption that both estimators 0 and 1 are efficient, but that 0 is asymptotically efficient. Additionally, the Hausman test statistic has k degrees of freedom and is asymptotically χ^2 distributed.

3.7.2.8 Diagnostic Testing

Concerns like heteroscedasticity, autocorrelation, multicollinearity, and the occurrence of outliers arise when modelling panel data. Error variance might vary because of heteroscedasticity. Heteroscedasticity can develop for several causes, according to Greene (2000), including the wide range of (X) variables, data grouping, the presence of outliers, etc. Since the covariance matrix of the regression coefficients is inconsistent when heteroscedasticity is present, the resulting estimators are not BLUE. Additionally, the occurrence of autocorrelation presupposes the existence of error term covariance that is Non-zero. Due to data inertia, the cobweb effect, and other factors, autocorrelation may happen. The estimators would be unbiased and linear in the presence of autocorrelation, but they would not possess the minimum variance property. Additionally, the standard errors and t and F distribution hypothesis tests would be

wrong. A linear relationship between some or all the explanatory variables is also referred to as multicollinearity. Multicollinearity causes regression coefficients to have high or infinite standard errors, which suggests that the regression coefficient is not accurately assessed. The Wald test was used to determine whether heteroscedasticity existed in this study. When the Wald Test's p-value is below the threshold of conventional significance, heteroscedasticity is assumed to be present. Additionally, the Wooldridge Test of autocorrelation has been applied to test autocorrelation. The presence of autocorrelation is assumed if the Wooldridge test results are significant (Gujrati, 2009). Additionally, variance inflation factors (VIFs) have been used to assess for the presence of multicollinearity. According to Field (2005), multicollinearity is present if the value of the VIF for any of the predictors is more than or equal to 10. Further, following Stephen and Senthamarai (2017), outliers have been deducted by using standardized residual analysis. More specifically, standardized residuals for all the estimated models were predicted and accordingly, the residual being in the range $\geq \pm 3$ was detected to be the outlier. These observations were dropped, and the models were run again. Running the models after dropping outliers helped in understanding the possible influence of outliers (if any) on the above-mentioned relationships. Quantile regression allows for a more detailed examination across different percentiles (e.g., 25th, 50th, and 75th percentiles) in contrast to traditional regression which averages the distributions corresponding to the set of x's. This approach is particularly useful when the distribution of the dependent variable is skewed, or when the relationships between the variables may vary across different levels of the dependent variable (Koenker & Hallock, 2001).

3.7.2.9 Robust Standard Errors and Cluster-Robust Standard Errors

The existence of heteroscedasticity can be corrected by producing robust standard errors. A heteroscedastic-robust t statistic can be obtained by dividing an estimator by its robust standard error. However, if both the problems of heteroscedasticity and autocorrelation prevail, then cluster-robust standard errors are consistent (Petersen, 2009).

The T-test is a statistical test to compare the means of two groups to determine if they are significantly different from each other. It's particularly useful when testing if a difference exists between the averages of two samples or within two conditions. The T-test is to check if there are statistically significant differences in the Cash Conversion Cycle (CCC) between firms in OIC and non-OIC countries and across different economic states. The null hypothesis suggests no difference in the means of CCC across the groups, so finding significant T-values would support hypotheses that there are indeed meaningful differences. This is a common practice in empirical research to validate findings across different groups (Canarella et al., 2013).

3.7.2.9 Econometric Modelling and Analytical Tools

In this thesis, all statistical analyses and empirical results were obtained using Stata software, specifically version 15. Stata was selected for its robust capabilities in handling panel data and conducting advanced econometric analyses, which are essential for the research conducted. The software's extensive features allow for the implementation of various econometric models, including fixed effects and random effects models, which are particularly useful in analysing data collected over time from multiple subjects (Bajari & Youle, 2012). Additionally, Stata's user-friendly interface and comprehensive documentation facilitate the execution of complex statistical procedures, making it a preferred choice among researchers in the field (Cameron & Trivedi, 2009). The software's ability to manage large datasets and perform intricate analyses, such as those required for the estimation of panel vector autoregression models, further underscores its suitability for this thesis (Abrigo & Love, 2016). Overall, the choice of Stata aligns with the methodological rigour required for the empirical investigations presented in this work.

3.7 MODEL ESTIMATION FOR RESEARCH OBJECTIVES

Each research objective in this study was addressed using specific model estimation techniques to ensure robust and reliable results. The following is a breakdown of the model estimations used for each of the four research objectives:

Table 3.4 Model Estimation for Research Objectives

Research Objectives	Full Sample	OIC Firms	Non-OIC Firms
1. To evaluate the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.	Descriptive statistics Table 4.1 T-test Table 4.2	Descriptive statistics Table 4.7	Descriptive statistics Table 4.13
2. To test whether a difference exists in the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.	Robust FE Regression Model Table 4.4 Quantile Regression Robust FE Table 4.5	Robust FE Regression Model Table 4.10 Quantile Regression Robust FE Table 4.11	Robust FE Regression Model Table 4.16 Quantile Regression Robust FE Table 4.17
3. To examine the firm-level and macroeconomic determinants of WCM efficiency in OIC and Non-OIC countries	Robust FE Regression Model Table 4.4 Quantile Regression Robust FE Table 4.5	Robust FE Regression Model Table 4.10 Quantile Regression Robust FE Table 4.11	Robust FE Regression Model Table 4.16 Quantile Regression Robust FE Table 4.17
4. To investigate the differential impact of firm-level and macroeconomic determinants on the WCM efficiency in OIC and Non-OIC countries in recession and boom states of the economy.	T-test Table 4.2 Robust FE Regression Model Table 4.6	T-test Table 4.8 Robust FE Regression Model Table 4.12	T-test Table 4.14 Robust FE Regression Model Table 4.18
The table summarizes the model estimations used to address each research objective for the full sample, as well as for OIC and Non-OIC sub-samples. It highlights the use of descriptive statistics, T-tests, robust Fixed Effects (FE) regression models, and quantile regression to evaluate working capital management (WCM) efficiency and the determinants of WCM across different economic conditions.			

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 PREAMBLE

The estimates of the empirical models described in the previous chapter are highlighted in this chapter thereby opening the door for the testing of hypotheses. Also covered in this chapter is a discussion of the study's results in relation to relevant theory and empirical literature. As a result, the chapter sets out to draw conclusions and present consequences for formulating policy.

4.2 DESCRIPTIVE STATISTICS FULL SAMPLE

The descriptive statistics of all the variables under the study are presented in Table 4.1. Notable, Table 4.1 presents the descriptive statistics of all the variables for full-sample (OIC and Non-OIC firms). As it is evident from the figures presented in Table 4.1 the mean value of cash conversion cycle (CCC) for all the firms (OIC and Non-OIC) is around 88 days. It implies that the firms in these countries take an average of 88 days to complete one cycle of working capital. However, for some firms, one rotation of CCC takes more than a year since the maximum value of CCC is 697.771 days. In addition, the minimum value of CCC is equal to -342.14 days, implying that some firms have an overdue CCC. This finding also signifies that these firms get paid by their customers long before they pay suppliers. In other words, these firms utilize trade credit from customers as a source of working capital finance. In addition, it is found that the CCC variable has a high standard deviation which implies the high heterogeneity among firms in managing their working capital, especially turnover efficiency. Several previous studies conducted have reported approximately similar values for CCC (Altaf and Shah, 2017; Mathuva, 2014; Babu and Chalam, 2014; Raheman et al., 2010). However, some studies conducted in various developed countries have produced different results; For instance, BañosCaballero et al (2014) found the mean value of 56 days for the net trade cycle on the sample of Spanish firms. Similarly, Enqvist et al.

(2014) reported a mean value of 108.810 for a sample of Finish companies. Likewise, Deloof, 2003 reports a mean value of 5.28 for CCC in Belgian firms. These results are indicative of the fact that working capital turnover efficiency varies across the countries. Such variation, interalia may be due to the difference in the financial markets and banking system of the countries. Additionally, the variation in the results may be attributed to the pattern of savings and consumption across countries.

For the growth variable, the mean value was found to be approximately 29.2 per cent, indicating that during the study period, the average growth in sales was around 30 per cent. However, the negative minimum value implies that some firms have shown a negative growth in sales. In addition, the coefficient of variation on the growth variable is quite small which means that growth in sales has been approximately the same across all the firms. Additionally, about the age variable, it is found that the mean value of firm age is around 17 years. It means that on average the sampled firms were incorporated 17 years ago. In addition, a high degree of standard deviation or variation in firm age implies that firms in the sample belong to the heterogonous age groups. This result is further supported by the high gap between the maximum value of 62 and the minimum value of 1. Further, as is evident from Table 4.1, the mean values of return on assets (ROA) is around 0.020. These results indicate that over the period, firms in OIC and Non-OIC countries have remained profitable. In addition, these results also signify the efficiency of firms in generating profits by utilizing their assets. However, the minimum value of ROA (-.999) is negative which indicates that certain firms in the sample have remained non-profitable and have not been able to generate profits by utilizing their assets effectively. Additionally, the variation in profitability across the observations is quite compact since the coefficient of the standard deviation on ROA is (0.118). The lower variation of profitability measures may be because firm profitability is a mean reverting, suggesting that firm profitability eventually moves toward its average over the period. This finding is corroborated by Canarella et al. (2013). The above mean values are almost similar to those reported by certain studies (see, for example, Altaf and Shah, 2017; Singhania et al., 2014; among others). In addition, these values are also similar to the mean values reported by several studies outside the Indian context (see for instance, Baños-Caballero et al (2010) for Spain, Enqvist et al (2014) for Finland, among others).

Furthermore, the average firm size was found to be USD 2.074 million¹. An important thing to note is the difference between the maximum and minimum size of the firm. This implies that the firms in the sample are a conduit of small-cap, mid-cap and large-cap firms. The study also reported an average asset tangibility (TANG) ratio of 0.929. This suggests that sampled firms have more assets in the form of tangible fixed assets. However, the minimum value (0.009) of the TANG variable asserts that some firms have fewer tangible fixed assets when compared to intangible ones.

The perusal of Table 4.1, results further reveals that the mean value of financial leverage (LEV) is 0.106, implying that firms on average use 10.6 per cent debt in their capital structure. Debt capital, therefore, constitutes a small portion of the capital structure of the companies under study. It is interesting to note that the maximum value of LEV value is 0.994 which implies that some firms are heavily financed by debt and the minimum value of LEV variable (-0.023) implies that some firms have received advance that they have used for financing, however such advance accounts for a very small per cent.

Table 4.1 Descriptive Statistics of Full Sample

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
CCC	88.284	82.736	-342.14	697.77	.726	1.199
GROWTH	.292	.289	-.999	.99	.517	.825
AGE	16.762	6.314	1	62	.618	1.682
ROA	.020	.118	-.999	.993	-2.608	7.067
SIZE	3.3	1.287	.0013	10.162	.255	.020
TANG	.929	.140	.0091	1.06	-2.900	8.863
LEV	.106	.138	-.023	.994	1.835	4.017
CF	.058	.117	-.982	.976	-.868	9.031
MS	6.874	5.459	1.67	16	.335	-1.775
SMD	274.14	391.612	.009	1777.54	1.748	1.678
CPI	101.47	31.669	.583	387.989	-.362	4.795
GDPG	3.766	5.680	-31.117	74.699	4.191	8.078
INT	3.822	3.532	-54.641	23.558	-.173	1.474

¹ Calculated by using Antilog of 3.317

Table 4.1 further reveals that the sampled firms can generate an average cash flow (CF) of 0.058 per cent, implying that there are low degrees of free cash flows available to the firms. In other words, firms have a low amount of high discretionary resources available to them. Further, the minimum value of the cash flow variable is negative (-0.982), indicating the ineffective credit management of the firms that leads to a mismatch between expenditures and incomes.

As stated earlier, the study has also used macroeconomic factors as the determinants of working capital efficiency. Regarding macroeconomic factors, the mean value of money supply (MS) was found to be approximately 6.874. An interesting point to note about money supply is that there is a considerable difference in the minimum and maximum value implying that countries differ in their characteristics when compared on the lines of MS. Furthermore, regarding stock market development (SMD), the mean value was found to be 274.14. A considerable difference between the minimum and maximum values was also observed, indicating variations in stock market development across the countries. The results regarding inflation (CPI) reveal that the mean value is around 101.47 which signifies low inflation. However, the high and low CPI signify differences in inflation across the countries. For the gross domestic product growth rate (GDPGR) the results reveal that the average gross domestic product grows at 3.7 per cent, implying that during the study period, countries in the sample have shown a steady growth of 3.7 per cent. The big difference between the minimum and maximum value may be because, during the study period, three periods of recession (2000-2002); (2007-2008) and (2019-2020) have been witnessed. It was also found that the mean interest rate is approximately 3.82. A considerable difference between the minimum and maximum values was observed for this macroeconomic variable, which may be attributed to the fact that several countries experienced three periods of recession during the study period. As reported in Table 4.1, the skewness and kurtosis for all the variables are within the acceptable range of ± 3 and ± 10 respectively. Since Kline (2011) suggests that variables with an absolute value of skewness within the range (± 3) and kurtosis (± 10) within the range can be considered approximately normally distributed. Therefore, these results are indicative of the fact that all the variables are normally distributed.

4.3 WORKING CAPITAL MANAGEMENT (WCM) EFFICIENCY OF THE FIRMS BELONGING TO OIC AND NON-OIC COUNTRIES

The mean cash conversion cycle (CCC) for all firms belonging to OIC and non-OIC countries from 2000 to 2020 is plotted to assess how efficiently these firms managed their working capital. From Figure 4.1, it can be observed that the CCC decreased during the years 2001 and 2002, indicating that firms tended to shorten their CCC during these years. It might be because during these years world witnessed a recession (DOT-COM Bubble) which might have forced firms to tighten their working capital cycle. Similar results were observed during the years 2007 to 2009, which again was the period of recession (great recession). In this context, similar results are also found for the years 2019 and 2020, wherein firms have tried to reduce their CCC, and these two years were also recessionary years (COVID-19). Except then the recessionary years, firms have had a high CCC, implying more investment in working capital during the boom periods and low investment during the recessionary periods. Further, from the figures presented in Figure 4.1, It was found that the CCC of the firms did not fluctuate much and has remained in the band with CCC touching the lower band during recessionary years and the high band during boom years.

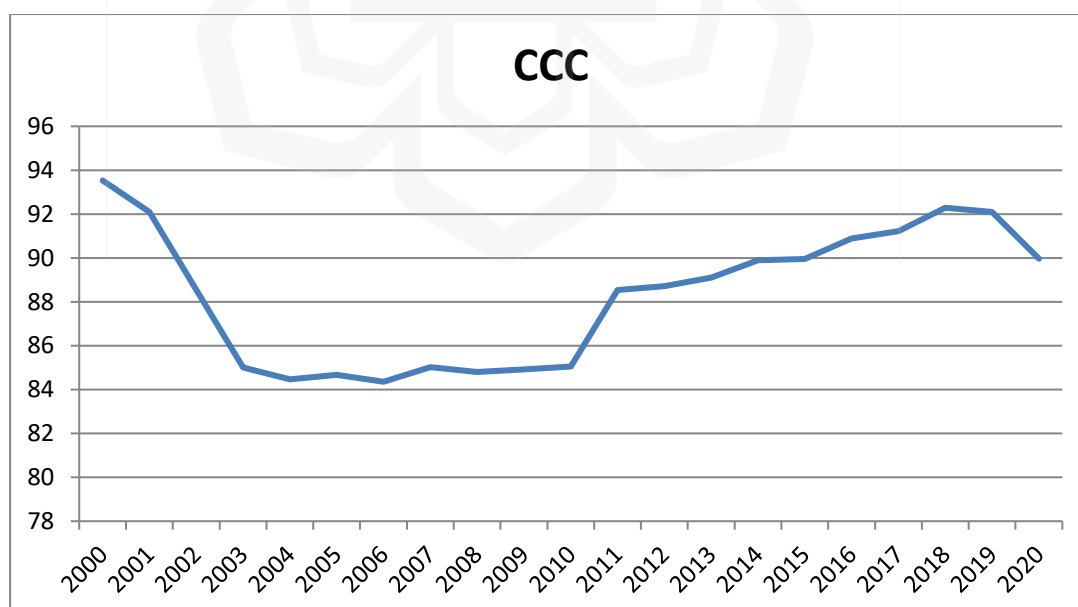


Figure 4.1 Mean CCC of Firms belonging to OIC and NON-OIC Countries from (2000-2020)

4.4 DIFFERENCE IN CCC ACROSS OIC AND NON-OIC FIRMS AND ACROSS GOOD AND BAD STATES OF THE ECONOMY

In this section, the results of the T-test are presented to determine whether any significant difference exists in the CCC across firms belonging to OIC and non-OIC countries, as well as between good and bad economic states. This exercise helps us to identify any significant difference in CCC across firms as well as time. Notably these results are presented in Table 4.2

Table 4.2 Difference in CCC across OIC and Non-OIC firms and Across Good and Bad States of Economy

	N	Mean	Std. Deviation	Std. Error Mean	T
T-test for good and bad states					
GOOD	227928	88.070	82.955	.17376	-2.379**
BAD	84031	88.865	82.134	.28334	
T-test for OIC and Non-OIC firms					
NON-OIC	272019	83.377	76.717	.14709	-87.515*
OIC	39940	121.708	110.002	.55043	
Note: Asterisks * significant at 1 per cent, ** significant at 5 per cent					

From the results presented in Table 4.2, a significant t-value for CCC across good and bad states is observed, implying that a significant difference exists in the CCC between good and bad economic states. In a similar vein, a significant t-value for CCC across OIC and non-OIC firms is found, implying that a significant difference exists in the CCC between firms from OIC and non-OIC countries. These results imply that CCC varies across both OIC and Non-OIC firms and across good and bad states, therefore studying the factors affecting CCC across OIC and Non-OIC firms and good and bad states is imperative.

4.5 CORRELATION ANALYSIS OF ALL THE VARIABLES ON THE FULL SAMPLE

Table 4.3 Correlation Results of All the Variables on the Full Sample

CCC	CCC	GROWTH	AGE	ROA	SIZE	TANG	LEV	CF	MS	SMD	CPI	GDPG	INT
CCC	1												
GROWTH	-.05*	1											
AGE	-.01*	-.08*	1										
ROA	.01*	.006*	.01*	1									
SIZE	-.04*	.017*	-.02*	.16*	1								
TANG	.11*	-.03*	.05*	.08*	.15*	1							
LEV	-.08*	-.008*	.05*	-.08*	.14*	-.11*	1						
CF	-.13*	-.009*	.013*	.42*	.12*	.009*	-.01*	1					
MS	.10*	-.18*	.013*	.07*	.01*	.004*	-.08*	.04*	1				
SMD	-.07*	.09*	-.14*	-.02*	.33*	.09*	-.05*	-.01*	-.45*	1			
CPI	-.04*	.08*	-.42*	-.001	.18*	-.02*	-.01*	.01*	-.03*	.02*	1		
GDPG	.01*	-.02*	.06*	-.006*	-.03*	.03*	.07*	.007*	-.08*	-.14*	.05*	1	
INT	.06*	.05*	.07*	.09*	-.09*	.10*	-.06*	.015*	.23*	-.39*	-.07*	-.06*	1

Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***).

Table 4.3 presents the correlation analysis of all variables included in the study. Firstly, the results show that none of the correlation coefficients exceed 0.80, indicating that multicollinearity is unlikely to be a concern. Additionally, all firm-level and macroeconomic factors exhibit a significant correlation with the CCC, highlighting the importance of these variables in determining CCC and justifying their inclusion in the regression analysis to avoid specification bias.

Specifically, a significant positive correlation is observed between ROA, TANG, MS, GDPG, and INT with CCC. Conversely, significant negative correlations are found between Growth, AGE, SIZE, LEV, CF, SMD, and CPI with CCC. These results present an initial idea regarding the direction of the relationship each variable has with CCC, however, the actual relationship of each firm-level and macroeconomic variable with CCC will be found by regression analysis.

4.5 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC (FULL-SAMPLE)

As mentioned in section 2.3.4.4 of Chapter-2, that working capital efficiency is determined by the set of firm-level and macroeconomic factors, accordingly, set of firm-level and macroeconomic factors might impact efficiency of CCC either positively or negatively. To test the determinants of CCC, model Eq. (1) is estimated using the full sample. The results of such analysis are presented in Table 4.4. It must be noted that column (2) reports the results of the model and column (3) reports the VIFs.

The Table 4.4 reveals that the adjusted R^2 is equal to 66 percent, implying that the independent variables explain 66 percent of the variation in dependent variable. The F-test for fixed effects is a test for choosing a better model among FE and OLS under the null hypothesis that the parameters for all the dummy variables except for the one that is dropped, are zero ($H_0: \mu_1 = \mu_2 \dots = \mu_{N-1} = 0$). It can be inferred from Table 4.4 that F-test statistics for all the specifications are significant at 1 percent level of significance, implying that goodness-of-fit would significantly increase with the use of FE model other than OLS. On the other hand, Breusch-Pagan Lagrange Multiplier (B-P LM) test for random effects is a test for choosing a better model among RE and OLS under the null hypothesis that that individual time-varying components are equal to zero ($H_0: \sigma^2 = 0$).

Table 4.4 Firm-level and Macroeconomic Determinants of CCC (Full-Sample)

(1)	(2)	(3)
GROWTH	-3.275* (-8.39)	1.06
AGE	-.330* (-7.55)	1.29
ROA	23.620* (13.33)	1.38
SIZE	9.534* (12.61)	1.39
TANG	22.204* (8.12)	1.09
LEV	-3.281*** (-1.67)	1.11
CF	-98.610* (-58.75)	1.33

(1)	(2)	(3)
MS	-21.064* (-11.47)	1.43
SMD	.004* (4.84)	1.88
CPI	.023*** (1.62)	1.31
GDPG	.151* (3.27)	1.08
INT	.432* (7.94)	1.28
Adj R-squared	0.6607	
F-test	20.40*	
B-P LM test	6.6e+05*	
Hausman	2674.71*	
Wald test	4.1e+36*	
Wooldridge test	6579.12*	
Observations	311959	
The results presented in this table are obtained from robust FE approach. Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***). T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors.		

The test statistics of B-P LM test for all the specifications are significant at 1 percent level of significance, suggesting that RE model is better able to deal with heterogeneity than OLS. Based on the results of F-test and B-P LM test, it can safely be concluded that FE and RE models produce better estimates than OLS. Hence, the researcher proceeds with the alternative panel data approach. Further, to select a better model between FE and RE, Hausman test is applied. The Hausman test runs under the null hypothesis that individual effects are uncorrelated with regressors. The test statistics of Hausman test for all the specifications are significant at 1 percent level of significance, meaning that FE model would be able to produce BLUE estimates.

Further, as mentioned in section 3.6.2.8 of Chapter-3, modelling with panel data raises the concerns for the existence of heteroscedasticity, autocorrelation, multicollinearity and the presence of outliers. For this purpose, the existence of heteroscedasticity has been tested by using Wald test. The test statistics of Wald test is significant at 1 percent level of significance, signifying the presence of heteroscedasticity. Further, the presence of autocorrelation has been tested by using

Wooldridge test of autocorrelation. The test statistics of Wooldridge test is significant at 1 percent level of significance implying the presence of autocorrelation. Having known that the problem of heteroscedasticity and autocorrelation persists, therefore, following, Petersen (2009) heteroscedasticity and autocorrelation has been corrected by producing robust standard errors clustered across firms. It may be noted that the test for multicollinearity has been done by calculating VIFs for all the independent variables. Field (2005) suggests that if the value of VIF for any of the predictor is greater than or equal to 10, it is an indication of multicollinearity. The results of VIFs for the models presented in column 3 of Table 4.3 suggests that no VIF is greater than 10, suggesting that multicollinearity is unlikely a problem. Following, Stephen and Senthamarai (2017), outliers have been deducted by using standardized residual analysis, wherein the standardized residual being of the range $\geq \pm 3$ are considered as outliers. It must be noted that these observations were dropped.

Perusing Table 4.4 further, it can be construed that the coefficient on Growth variable is negative and significant at 1 percent level of significance implying that firms with high growth tend to maintain low CCC. These maybe since firms that are able to generate stable growth may not be in requirement of funds for working capital because they are able to generate a stable steam of cash flows through sales. Additionally, firms with high growth will be able to get trade credit from customers and hence the requirement of working capital will be lower. It is also imperative that firms with high growth would be able to rotate their CCC faster and hence would be in less need of funds. These results are consistent with the results of the prior studies (Banos-Caballero et al., 2010 and Cunat, 2007), however in disagreement with the studies (Hill et al., 2010; Nazir and Afza, 2009).

Furthermore, the coefficient for the AGE variable is found to be negative and significant at the 1 percent level of significance, indicating that older firms tend to have lower CCC. The negative relationship between firm age and CCC can be explained as, all other things remaining same, increase in the age results in the decrease in CCC. It implies that there is a mechanical relationship between firm age and CCC resulting from technical efficiency in the management of working capital. For instance, with the increase in the age of firm, its experience and relationships with suppliers would make it possible for it to invest less amount in working capital. In addition, it is also argued

that as the age of the firm increases, growth rates tend to become more stable, indicating fewer opportunities available for growth and subsequently less demand for more capital. The negative relationship between firm age and CCC has been previously found by (Wasiuzzaman and Arumugam, 2013).

A further perusal of Table 4.4 reveals a significant positive impact of profitability on CCC, implying that high profitable firms would tend to have high CCC. These results might be due to those profitable businesses have more internal funds available and therefore tend to reduce their investment in working capital. Additionally, profitable businesses have easy access to outside capital due to their high earning capacity and market domination, therefore it is easier for them to finance more working capital as and when needed and hence they tend to maintain lower CCC. These results are in conformity with the results of Prasad et al. (2019); Ahangar (2020) and Asare et al. (2022). Regarding SIZE, a significant positive relationship is observed with CCC, implying that firms with larger size tend to have longer CCC. The positive relationship between firm size and CCC may be because firms with the large size have better access to capital markets. Since large-sized firms have better access to capital markets, they can pursue a relaxed working capital management strategy by investing larger amounts in receivables and inventories. In addition, these firms can redistribute capital to the firms with poor access to financial markets via trade credit or commercial credit. These results are consistent with the results of Qurashi and Zahoor (2017); Cuong (2016) and Haron and Nomran (2016).

Additionally, regarding TANG variable, a significant positive relationship with CCC is observed. These results imply that firms with high asset tangibility tend to have larger CCC. It is regarded that firms with high tangible assets generate less asymmetric information, have lower financial restrictions, and can obtain money at a cheaper cost, resulting in more current asset investment at a lower cost and thereby an increase in CCC. These results are consistent with the results of Banos- Caballero et al. (2010) and Setianto et al. (2022). Regarding leverage, a significant negative impact of this variable on CCC is observed, implying that firms with high leverage tend to have lower CCC. This argument is embedded in pecking order theory of finance that suggests that firms prefer to finance through internally generated funds to lower down the monitoring by shareholders as well as the cost of capital since external finances tend to be costlier.

However, a highly levered firm may have less internal funds available because they need to pay a risk premium and accordingly, may pay more attention towards efficiency of working capital to release the funds that are blocked in operating cycle or in the components of working capital. The efficiency in the management of working capital in high levered firms, therefore, tends to reduce CCC. Accordingly, a negative relationship has been documented by certain previous studies (Qurashi and Zahoor, 2017; Cuong, 2016; Haron and Nomran, 2016; Wasiuzzaman and Arumugam, 2013). A significant negative coefficient for the CF variable is also observed, implying that firms with high cash flow tend to have lower CCC. These results might be because firms with high cash flows prefer to adopt minimise working capital investment policy. Prior studies have also found a negative impact of CF on CCC (Mansoori and Muhammad; 2012; Chiou et al., 2006).

Having found how firm-level variables influence CCC, the analysis proceeds to explain how macroeconomic factors influence CCC. Firstly, a significant negative relationship between MS and CCC is observed, implying that as money supply increases in the economy firms tend to reduce their CCC. This might be because credit would be easily available to firms and accordingly, they might react by following a tight working capital policy and thereby reducing CCC. Further, a significant positive impact of SMD on CCC is observed, implying that as stock market development increases, firms tend to have longer CCC. These results compliment the phenomenon that stock market development relates to the firm's capacity to raise capital and manage risk and therefore firms in countries with high stock market development will have funds available for working capital financing and a result will be in better position to manage working capital requirements. Due to this firms might engage in offering trade credit to other firms and thereby have longer CCC. A significant positive impact of inflation (CPI) on CCC is also observed, implying that as inflation increases firms tend to have longer CCC. These results might be because as inflation increases, customers would not be able to pay their bills on time and accordingly they might have to wait for their bills to be cashed leading to enhanced or longer CCC. It is also regarded that under the inflationary conditions working capital plays an essential role in striking a balance in cash payout and inflows. Also, a significant positive relationship between GDPG and CCC is found, implying that as economies grow, firms tend to have a larger CCC. These results can be explained in the light of the fact that poor economic conditions impose a

burden on businesses and the firms react by adopting rigid working capital cycles. It is therefore imperative that better economic conditions allow firms to invest more in working capital since firms tend to have higher demand for their goods and may be in requirement of more working capital. Lastly, a significant positive impact of INT on CCC is found, implying that when interest rates rise, firms tend to adopt a larger CCC. These results might be since under the conditions of rising interest rates firms tend to use trade credit from customers and hence may have longer CCC. Also, firms might increase their working capital cycle in times of rising interest rates since they would be having trouble utilizing internal sources of cash and ploughing back earnings to finance working capital.

4.6 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC ACROSS DIFFERENT QUANTILES (FULL SAMPLE)

Having understood the impact of firm-level and macroeconomic factors on CCC, The analysis proceeds to examine whether this relationship remains robust across different quantiles of CCC. To explore this phenomenon, a quantile regression with a robust fixed effects approach is conducted. The results of which are presented in Table 4.5. Specifically, column (2) presents the results of .25 quantile, column (3) presents the results of .50 quantile and column (4) presents the results of .75 quantile. From the results of quantile regression, it can be concluded that firm-level and macroeconomic variables have a similar effect on CCC across different quantiles. Notably, these results are also same as found for full sample. These results assert the robustness of firm-level and macroeconomic variables in explaining CCC.

Table 4.5 Firm-level and Macroeconomic Determinants of CCC Across Different Quantiles (Full Sample)

(1)	(2)	(3)	(4)
GROWTH	-.143 (-0.25)	-1.578** (-2.30)	-3.940* (-4.12)
AGE	-.281* (-6.49)	-.377* (-7.12)	-.457* (-5.79)
ROA	23.810* (14.23)	26.817* (11.69)	20.247* (6.40)
SIZE	6.2625* (12.00)	8.6296* (12.26)	13.311* (13.31)
TANG	12.764* (6.15)	26.069* (8.56)	37.499* (8.12)
LEV	-1.781 (-1.01)	-3.882*** (-1.75)	-.662 (-0.20)
CF	-65.555* (-35.70)	-101.70* (-47.17)	-139.72* (-50.33)
MS	-20.008* (-14.20)	-20.611* (-13.53)	-27.499* (-14.12)
SMD	.003* (3.82)	.0042* (3.79)	.007* (4.30)
CPI	-.030** (-2.57)	-.001 (-0.15)	.0518* (3.32)
GDPG	.1894* (3.35)	.1761* (2.69)	.2458* (3.14)
INT	-.197* (-2.73)	-.5015* (-5.96)	-1.080* (-9.06)
The results presented in this table are obtained from Quantile regression with robust FE approach. Asterisks indicate significance at the 1% (*), 5% (**) and 10% (***). T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors.			

4.7 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC ACROSS GOOD AND BAD STATES (FULL-SAMPLE)

Table 4.6 reports the results of firm-level and macroeconomic variables across good and bad states of the economy. It is worth to note that the years 2000, 2001, 2002, 2007, 2008, 2019 and 2020 have been classified as recession periods or bad states because the years 2000, 2001 and 2002 witnessed dot-com bubble, years 2007 and 2008 witnessed the great recession and 2019 and 2020 witnessed COVID-19. The rest of the years 2003-

2006 and 2009-2018 are classified as boom periods or good states. Notably, the results of bad states are presented in column (2) of the Table 4.6 and the results of good states are presented in column (3) of the Table 4.6. For comparison purpose the results of column (2) of Table 4.4 are presented in column (4) of Table 4.6.

Regarding the impact of firm-level and macroeconomic variables, it is found that growth has a significant negative impact on CCC in both bad and good states of the economy. Similarly, for age variable the results remain same through bad and good states of economy implying that age has a significant negative impact on CCC in all the states of economy. Furthermore, regarding the profitability variable, a significant positive impact on CCC is found across both bad and good states of the economy. Additionally, regarding the size variable, a significant positive relationship with CCC is observed in both bad and good states of the economy. Similarly, for the TANG variable, a significant positive relationship with CCC is found in both bad and good economic states.

Conflicting findings are observed regarding the LEV variable: a non-significant impact of leverage is found during bad economic states, while a significant negative impact of LEV is observed during good economic states. The non-significant impact of LEV during bad states of economy implies that leverage does not tend to determine CCC during the bad states of economy, implying that firms look out for leverage as a long-term phenomenon and therefore may not determine the investment in short-term CCC. With regard to CF, a significant negative relationship with CCC is found in both good and bad states of the economy. These results are consistent with the results found for full sample.

Table 4.6 Firm-level and Macroeconomic Determinants of CCC Across Good and Bad States (Full-Sample)

(1)	(2)	(3)	(4)
GROWTH	-3.681* (-3.94)	-3.130* (-6.87)	-3.275* (-8.39)
AGE	-.665* (-8.87)	-.239* (-4.26)	-.330* (-7.55)
ROA	32.149* (8.07)	22.614* (10.60)	23.620* (13.33)

(1)	(2)	(3)	(4)
SIZE	4.179* (3.31)	11.513* (13.50)	9.534* (12.61)
TANG	27.742* (5.17)	20.483* (6.48)	22.204* (8.12)
LEV	.872 (0.23)	-4.549** (-1.99)	-3.281*** (-1.67)
CF	-103.425* (-26.83)	-98.988* (-51.49)	-98.610* (-58.75)
MS	-31.311* (-11.88)	-11.774* (-5.66)	-21.064* (-11.47)
SMD	.054** (2.59)	.0078* (6.26)	.004* (4.84)
CPI	-.382* (-3.20)	.013 (0.79)	.023*** (1.62)
GDPG	.610* (5.14)	-.325* (-4.56)	.151* (3.27)
INT	1.275* (8.30)	-.052 (-1.10)	.432* (7.94)
Observations	84031	227928	311959
Adj R-squared	0.657	0.6873	0.6607
The results presented in this table are obtained from robust FE approach. The results are for recession periods 2000,2001,2002,2007,2008,2019 and 2020. The results are for boom periods 2003-2006 and 2009-2018, Asterisks indicate significance at the 1% (*), 5% (**) and 10% (***). T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors			

Regarding macroeconomic variables, a significant negative relationship is observed between MS and CCC during both good and bad states of the economy, consistent with the results from the full sample. Additionally, a significant positive relationship is found between SMD and CCC during both good and bad states, aligning with the full sample results. For CPI, a significant negative relationship with CCC is observed during bad economic states, suggesting that firms tend to lower CCC in response to high inflation and declining demand. However, during good states, the coefficient on CPI is non-significant, which contrasts with the findings for the full sample. Regarding GDPG, a significant positive relationship with CCC is identified during bad states, consistent with the full sample results. Conversely, a significant negative relationship between GDPG and CCC is found during good states, which contradicts the full sample findings. For INT, a significant positive relationship with CCC is observed during bad states, consistent with the full sample results. However,

during good economic states, no significant relationship between INT and CCC is detected. The Adjusted R^2 remains relatively consistent across both bad and good states of the economy.

4.8 DESCRIPTIVE STATISTICS OIC FIRMS

This section presents the descriptive statistics of all variables based on the sample comprising only OIC firms. This exercise helps us to understand whether the variables under study are different for firms in OIC countries. These descriptive statistics are presented in Table 4.7. The mean value of the CCC variable is 121.708, which is higher than the mean value of the full sample. This suggests that firms in OIC countries take a longer time to rotate their CCC. It would imply that these firms would be in high need to working capital.

Table 4.7 Descriptive Statistics OIC firms

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
CCC	121.708	110.00	-342.14	697.77	0.7016	1.466
GROWTH	.064	.290	-.999	.989	-0.480	2.5256
AGE	17.436	8.505	1	62	1.231	3.356
ROA	.032	.103	-.986	.993	-1.3805	8.107
SIZE	3.186	1.488	.004	10.162	1.016	0.7850
TANG	.969	.086	.027	1.060	-2.6608	6.829
LEV	.102	.140	0	.993	1.9956	4.6429
CF	.064	.111	-.982	.976	0.2284	6.0666
MS	12.515	1.449	9.34	15.8	2.9015	7.3772
SMD	70.573	54.611	1.811	345.35	0.8849	0.6702
CPI	80.119	64.800	.583	303.13	0.4019	-0.162
GDPG	2.825	3.052	-15.151	15.988	-1.351	4.1044
INT	5.111	7.421	-20.129	74.699	2.4706	5.049

It is important to note that the high value of CCC (697.771) as found for full sample belong to OIC sample section, which implies that for some OIC firms take one rotation of CCC takes more than a year. In addition, the minimum value of CCC is equal to -342.14 days, implying that some firms have an overdue CCC. This finding also

signifies that these firms get paid by their customers long before they pay to suppliers. In other words, these firms utilize trade credit from customers as a source of working capital finance. A high standard deviation is observed for the CCC variable, indicating significant heterogeneity among OIC firms in managing their working capital efficiently. The descriptive statistics about the growth variable suggests that the mean value of around 6 percent, meaning that during the period of study, the average growth in sales for OIC firms was around 6 percent which is much lower than the growth found for full-sample. Also, the negative minimum value on growth variable implies that some OIC firms have shown a negative growth in sales. The standard deviation on growth variable is small which means that growth in sales has been approximately same across all the firms.

Regarding the age variable, it is found that mean value of firm age is around 17 years which is like that of full sample. These results imply that on average the OIC firms have been incorporated 17 years ago. A high degree of standard deviation is observed for the firm age variable, implying that OIC firms exhibit considerable heterogeneity in terms of age. Further, the mean values of return on assets (ROA) are around 0.032, implying the OIC firms have remained profitable during the period of study. The mean value of ROA for OIC firms is much higher than that of full sample. Also, the minimum value of ROA is negative indicates that certain OIC firms in the sample have remained non-profitable and have not been able to generate profits by utilizing their assets effectively. The standard deviation of ROA variable is low implying the profitability has remained same across the OIC firms for the sample period.

The average size of the OIC firms is found to be USD 2.419 million² which is quite similar to that of full sample firms. The difference between the maximum and minimum size of the firm implies variation in the OIC firms across size characteristics. Also, the average asset tangibility (TANG) ratio for OIC firms is about 0.969 which is similar to that of full sample. The OIC firms have significant difference in terms of TANG which is evident from the minimum and maximum values of TANG variable. The results of Table 4.7 suggest that leverage has a mean value of .102 which is quite similar to that of full sample. These results imply that OIC firms are moderately levered

² Calculated by using Antilog of 3.317

with only 10 percent of debt in their capital structure. It is interesting to note that some OIC firms have zero debt since the minimum value is 0 for LEV variable, however some firms are highly levered because the maximum value of LEV for OIC firms is .993. The results presented in the Table 4.7 further reveal that the mean value of CF variable for OIC firms is equal to 0.064 which is slightly higher than the value found for full-sample. These results reveal that OIC firms have low degrees of free cash flows available to the firms. In other words, firms have low amount of high discretionary resources available with them.

Having examined the descriptive statistics of firm-level variables, the next step is to analyse the macroeconomic variables for OIC countries. Firstly, with regard to the mean value of money supply (MS) which is around 12.515. The mean value for OIC countries is approximately double when compared to mean value for full sample. These results imply that OIC countries are cash rich. Regarding stock market development (SMD), the mean value is 70.573, which is much lower than that of the full sample. These results are obvious because stock markets are not yet fully developed in OIC countries. In fact, certain OIC countries have not a registered stock exchange. The results with regard to inflation (CPI) reveal that the mean value is around 80 which signify low inflation that that of full sample. Therefore, it can be ascertained that OIC countries are low inflated when compared to rest of the world. For gross domestic product growth rate (GDPGR) the results reveal that average gross domestic product grows at 2.8 percent for OIC countries, implying that during the study period, OIC countries in have shown a steady growth of 2.8 percent which is lesser than that of full sample. The mean interest rate for OIC countries is found to be approximately 5.11, which is higher than the value observed for the full sample. Also, the skewness and kurtosis for all the variables are within the acceptable range of ± 3 and ± 10 respectively. Therefore, these results are indicative of the fact that all the variables are normally distributed.

4.9 WORKING CAPITAL MANAGEMENT (WCM) EFFICIENCY OF THE FIRMS BELONG TO OIC COUNTRIES

The mean CCC of all firms belonging to OIC countries from 2000 to 2020 is plotted in Figure 4.2. This exercise helps us to ascertain how efficiently these firms were able to manage their working capital. From the Figure 4.2, it can be found that the CCC dropped during the years 2001 and 2002, implying that firms tend to shorten their CCC during these years. It might be because during these years world witnessed recession (DOT-COM Bubble) which might have forced firms to tighten their working capital cycle. Similar results are observed during the years 2007 to 2009, which correspond to the period of the Great Recession. However, Opposite results are observed for OIC firms during the years 2019 and 2020. Instead of a decrease in CCC, an increase in CCC is observed during the years 2019 and 2020, despite these being recessionary years (COVID-19). Notably, in all other years, an increase in CCC is seen. Furthermore, wider fluctuations in CCC are witnessed for OIC firms compared to the results from the full sample.

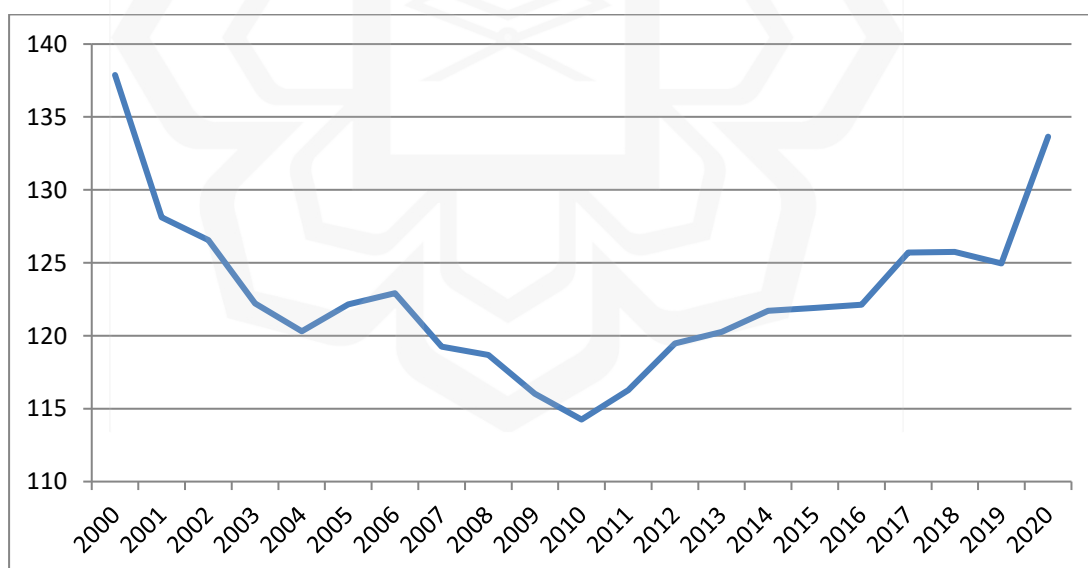


Figure 4.2 Working Capital Management (WCM) Efficiency of the Firms Belong to OIC Countries

4.10 DIFFERENCE IN CCC OF OIC FIRMS ACROSS GOOD AND BAD STATES OF ECONOMY

This section presents the results of T-test that is performed to ascertain if any significant difference exists in CCC of firms belong to OIC countries across good and bad states. Notably these results are presented in Table 4.8.

From the results presented in Table 4.8, a significant t-value for CCC across good and bad states is observed, implying that a significant difference exists in the CCC between good and bad states. These results make it imperative to study the factors affecting CCC of OIC firms across good and bad states is imperative.

Table 4.8 Difference in CCC of OIC Firms Across Good And Bad States of Economy

		N	Mean	Std. Deviation	Std. Error Mean	T
CCC	BAD STATE	9999	124.634	109.863	1.09	3.072*
	GOOD STATE	29941	120.731	110.033	.635	
Note: Asterisks indicate significance at the 1% (*)						

4.11 CORRELATION ANALYSIS OF ALL THE VARIABLES ON OIC FIRMS

The correlation analysis of all study variables is presented in Table 4.9. The correlation analysis results show that None of the correlation coefficients are above 0.80, which suggests that multicollinearity is not likely to be a concern. Furthermore, it is found that all firm-level and macroeconomic factors significantly affect CCC, confirming the significance of these variables in determining CCC of OIC firms and mandating their inclusion in the regression analysis to eliminate specification bias.

It is found that there is a significant positive correlation of TANG, SMD and GDPG with CCC and a significant negative correlation coefficient of Growth, Age, ROA, Size, LEV, CF, MS, CPI and INT with CCC. These results present initial que regarding the direction of relationship each variable has with CCC, however the actual relationship of each firm-level and macroeconomic variable with CCC will be found by regression analysis.

Table 4.9 Correlation Analysis of All the Variables on OIC Firms

CCC	CCC	GROWTH	AGE	ROA	SIZE	TANG	LEV	CF	MS	SMD	CPI	GDPG	INT
CCC	1												
GROWTH	-.057*	1											
AGE	-.02*	-.01**	1										
ROA	-.005***	.19*	.007	1									
SIZE	-.11*	.09*	.04*	.09*	1								
TANG	.10*	-.02*	-.03*	.04*	.009**	1							
LEV	-.10*	.02*	.01**	-.15*	.20*	-.08*	1						
CF	-.17*	.05*	-.005	.42*	.07*	-.01*	-.06*	1					
MS	-.07*	.006	.008***	-.01*	.25*	.07*	.10*	-0.007	1				
SMD	.04*	-.03*	.18*	-.04*	-.36*	-.11*	-.09*	-.04*	-.32*	1			
CPI	-.023*	.05*	-.36*	.05*	.27*	.08*	.05*	.03*	.27*	-.30*	1		
GDPG	.02*	.04*	.22*	-.009**	.08*	.01**	-.02*	-.04*	.21*	.12*	-.27*	1	
INT	-.05*	.01*	-.03*	-.01*	.08*	-.02*	.005*	-.01**	-.008**	-.22*	.19*	-.07*	1

Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***)

4.12 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC (OIC-FIRMS)

In this section, the results of Eq. (1) estimated across OIC firms are presented. This exercise helps us to determine the how firm-level and macroeconomic factors affect CCC and whether the impact of such firm-level and macroeconomic factors on CCC is different for OIC firms. It is worth to mention that these results are presented in Table 4.10. In this Table 4.10, column (2) reports the results of the model and column (3) reports the VIFs.

The adjusted R^2 is equal to 65 percent, as shown in the Table 4.10, which means that the independent factors account for 65 percent of the variation in the dependent variable. The use of a FE model other than OLS would greatly improve goodness-of-fit, according to the F-test for fixed effects, which is significant at the 1% level of significance. The Breusch-Pagan Lagrange Multiplier (B-P LM) test for random effects, on the other hand, is significant at the 1% level of significance, indicating that the RE model is more adept at handling heterogeneity than the OLS model. It is safe to say that FE and RE models give superior estimates than OLS based on the F-test and B-P LM test findings. The alternate panel data approach is therefore used by the researcher. The Hausman test is also used to choose between FE and RE models. The Hausman test result is significant at the 1% level of significance, indicating that the FE model might

generate BLUE estimations.

Further, the existence of heteroscedasticity has been tested by using Wald test. The test statistics of Wald test is significant at 1 percent level of significance, signifying the presence of heteroscedasticity. Further, the presence of autocorrelation has been tested by using Wooldridge test of autocorrelation. The test statistics of Wooldridge test is significant at 1 percent level of significance implying the presence of autocorrelation.

Table 4.10 Firm-level and Macroeconomic Determinants of CCC (OIC-firms)

(1)	(2)	(3)
GROWTH	-25.07* (-15.30)	1.07
AGE	-1.702* (-4.22)	1.21
ROA	81.509* (10.14)	1.33
SIZE	7.960* (6.28)	2.67
TANG	49.915* (3.07)	1.04
LEV	-2.063 (-0.31)	1.10
CF	-131.428* (-23.22)	1.23
MS	-38.664* (-4.48)	2.68
SMD	-.016 (-0.84)	2.18
CPI	.116* (3.17)	2.43
GDPG	.117 (0.61)	1.24
INT	-.195* (-2.53)	1.08
Adj R-squared	0.6580	
F-test	21.01*	
B-P LM test	74898.17*	
Hausman	394.82*	
Wald test	1.4e+31*	
Wooldridge test	1227.99*	
Observations	39940	
The results presented in this table are obtained from robust FE approach. Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***). T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors		

Having known that the problem of heteroscedasticity and autocorrelation persists, therefore, following, Petersen (2009) heteroscedasticity and autocorrelation has been corrected by producing robust standard errors clustered across firms. It may be noted that the test for multicollinearity has been done by calculating VIFs for all the independent variables. Field (2005) suggests that if the value of VIF for any of the predictor is greater than or equal to 10, it is an indication of multicollinearity. The results of VIFs for the models presented in column 3 of Table 4.10 suggests that no VIF is greater than 10, suggesting that multicollinearity is unlikely a problem. Following, Stephen and Senthamarai (2017), outliers have been deducted by using standardized residual analysis, wherein the standardized residual being of the range $\geq \pm 3$ are considered as outliers. It must be noted that these observations were dropped.

Perusing Table 4.10 further, it can be construed that the coefficient on SMD variable and INT variable only show different results. Specifically, for OIC firms, a significant negative relationship is found between SMD and INT variables with CCC, whereas earlier results showed a positive relationship between these variables and CCC. These results might be since OIC countries lack the stock market development and vary highly in terms of interest rates as compared to other countries. By these means, an opposite relationship of these variables with CCC is observed. For rest of the firm-level and macroeconomic variables the relationship with CCC remains same as found previously. For instance, growth variable has a significant negative relationship with CCC. The coefficient on AGE variable is negative and significant at 1 percent level of significance. A significant positive impact of profitability on CCC is also found for OIC firms. For the size variable, a significant positive relationship with CCC is observed. Similarly, the TANG variable shows a significant positive relationship with CCC. In contrast, leverage exhibits a significant negative impact on CCC. A significant positive coefficient is found for the CF variable, indicating a positive relationship with CCC. Additionally, a significant negative relationship is found between MS and CCC, while inflation (CPI) has a significant positive impact on CCC. Lastly, a significant positive relationship between GDPG and CCC is observed for firms in OIC countries.

4.13 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC ACROSS DIFFERENT QUANTILES (OIC FIRMS)

Table 4.11 Firm-level and Macroeconomic Determinants of CCC Across Different Quantiles (OIC Firms)

(1)	(2)	(3)	(4)
GROWTH	-6.724* (-3.32)	-22.956* (-9.24)	-38.964* (-11.76)
AGE	-1.7413* (-5.08)	-1.301* (-3.10)	-1.9459* (-3.63)
ROA	57.9610* (8.17)	73.588* (8.56)	88.426* (7.55)
SIZE	5.0233* (5.60)	6.677* (5.54)	13.293* (3.74)
TANG	27.811** (2.25)	58.545* (3.51)	97.940* (3.14)
LEV	-1.3883 (-0.26)	-3.889 (-0.50)	1.884 (0.17)
CF	-70.856* (-11.67)	-135.888* (-20.47)	-182.585* (-22.08)
MS	-37.435* (-4.98)	-35.950* (-3.66)	-44.610* (-3.61)
SMD	-.027 (-1.01)	-.019 (-0.67)	.0017 (0.06)
CPI	.043 (1.38)	.119* (3.14)	.1648* (3.17)
GDPG	.1425 (0.57)	.109 (0.36)	-.0171 (-0.05)
INT	-.0505 (-0.50)	-.2357 (-1.69)	-.252 (-1.27)
The results presented in this table are obtained from Quantile regression with robust FE approach. Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***). T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors.			

In this section, the analysis focuses on understanding whether the relationship between firm-level and macroeconomic variables remains consistent across different quantiles of CCC for OIC firms. To explore this, a quantile regression with a robust fixed effects approach is employed. This method allows for the examination of the conditional relationship between the variables and CCC at various points in the distribution of CCC, providing a deeper understanding of how these relationships vary

across different firm performance levels. The results of which are presented in Table 4.11. Specifically, column (2) presents the results of .25 quantile, column (3) presents the results of .50 quantile and column (4) presents the results of .75 quantile. The results from the quantile regression analysis indicate that both firm-level and macroeconomic variables exhibit a consistent effect on CCC across different quantiles. This finding highlights the robustness of these variables in explaining the variations in CCC, suggesting that their influence is stable regardless of the performance level or position within the distribution of CCC.

4.14 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC ACROSS GOOD AND BAD STATES (OIC FIRMS)

Table 4.12 Firm-level and Macroeconomic Determinants of CCC across Good and Bad States (OIC Firms)

(1)	(2)	(3)	(4)
GROWTH	-25.677* (-7.57)	-25.544* (-12.70)	-25.07* (-15.30)
AGE	-.462 (-0.74)	-2.141* (-4.35)	-1.702* (-4.22)
ROA	83.497* (4.59)	77.298* (8.59)	81.509* (10.14)
SIZE	5.0417** (2.43)	8.116* (5.55)	7.960* (6.28)
TANG	78.791** (2.42)	47.640** (2.52)	49.915* (3.07)
LEV	3.196 (0.25)	-6.847 (-0.86)	-2.063 (-0.31)
CF	-130.362* (-9.72)	-132.080* (-20.28)	-131.428* (-23.22)
MS	-12.9708 (-0.85)	-46.799* (-4.37)	-38.664* (-4.48)
SMD	.0596** (2.06)	-.120** (-2.35)	-.016 (-0.84)
CPI	.0681 (1.19)	.131* (2.63)	.116* (3.17)
GDPG	-.0521 (-0.12)	.460** (2.15)	.117 (0.61)
INT	.184 (0.97)	-.309* (-3.65)	-.195* (-2.53)
Observations	9999	29941	39940
Adj R-squared	0.6581	0.6857	0.6580

The results presented in this table are obtained from robust FE approach.
The recession periods are 2000,2001,2002,2007,2008,2019 and 2020 and boom periods are 2003-2006 and 2009-2018
Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***).
T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors.

Table 4.12 reports the results of firm-level and macroeconomic variables across good and bad states of the economy. It is worth to note that the years 2000,2001,2002,2007,2008,2019 and 2020 have been classified as recession periods or bad states because the years 2000, 2001 and 2002 witnessed dot-com bubble, years 2007 and 2008 witnessed the great recession and 2019 and 2020 witnessed COVID-19. The rest of the years 2003-2006 and 2009-2018 are classified as boom periods or good states. Notably, the results of bad states are presented in column (2) of the Table 4.12 and the results of good states are presented in column (3) of the Table 4.12. For comparison purpose the results of column (2) of Table 4.10 are presented in column (4) of Table 4.12. Regarding the impact of firm-level and macroeconomic variables, the results indicate that these variables exhibit a similar influence on CCC across both good and bad states of the economy. However, it is noteworthy that only the stock market development (SMD) variable showed a significant positive impact on CCC during the bad states of the economy.

4.15 DESCRIPTIVE STATISTICS NON-OIC FIRMS

This section presents the descriptive statistics of all the variables based on sample of NON-OIC firms. The aim of this exercise is to determine if difference exists in the firm-level and macroeconomic variables across OIC and Non-OIC firms. These descriptive statistics are presented in Table 4.13.

Table 4.13 Descriptive Statistics Non-OIC Firms

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
CCC	83.377	76.717	-99.998	299.99	0.5264	-0.025
GROWTH	.325	.2738	-.787	.99	0.911	-0.115
AGE	16.663	5.918	2	48	0.269	-0.273
ROA	.018	.1207	-.999	.993	-2.706	7.093
SIZE	3.316	1.253	.001	8.118	0.082	-0.184
TANG	.923	.1462	.009	1	-2.755	7.852
LEV	.106	.138	-.023	.994	1.810	3.923
CF	.057	.118	-.889	.889	-0.996	9.310
MS	6.046	5.339	1.67	16	0.670	-1.460
SMD	304.029	410.441	.009	1777.5	1.543	0.952
CPI	104.615	21.373	19.208	387.98	0.755	2.6584
GDPG	3.969	3.573	-54.641	23.558	-0.098	1.157
INT	3.569	5.348	-31.117	54.677	2.681	2.106

The mean value of the CCC variable for Non-OIC firms is found to be 83.377, which is lower than the mean value for OIC firms. This suggests that firms in Non-OIC countries tend to rotate their CCC more efficiently, requiring less time to complete the working capital cycle compared to firms in OIC countries. It would imply that firms in Non-OIC countries would be in less need to working capital. It is important to note that the high value of CCC (299.97) for Non-OIC firms implies that these firms are able to complete one rotation of CCC within a year meaning that they manage working capital efficiently than any firms in OIC countries. In addition, the minimum value of CCC is equal to -99.998 days, implying that some firms have an overdue CCC. This finding also signifies that these firms get paid by their customers long before they pay to suppliers. In other words, these firms utilize trade credit from customers as a source of working capital finance. Similar to OIC firms, a high standard deviation is observed for the CCC variable among Non-OIC firms. This indicates a significant degree of heterogeneity in how Non-OIC firms manage their working capital, reflecting varied approaches and efficiencies in their working capital management practices. The growth variable's descriptive statistics point to a mean value of about 32 percent, which means that during the study period, the average increase in sales for Non-OIC firms was substantially higher than the increase observed for OIC firms. Additionally, the growth variable's negative minimum value suggests that certain NON-OIC enterprises have experienced a decline in sales. Since the growth variable's standard deviation is low, sales growth has generally been consistent across all firms. Regarding the age variable,

it is found that the mean firm age is roughly 17 years, which is same to OIC firms. According to these findings, the Non-OIC enterprises were incorporated 17 years ago on average. Additionally, a high degree of standard deviation was found for the firm age variable, indicating significant variability in the age of firms within the Non-OIC countries. This suggests that the sample includes both newly established firms and long-standing companies, which may exhibit different working capital management strategies based on their experience and market position. Additionally, the Non-OIC firms have maintained their profitability during the study period, as indicated by the average return on assets (ROA) values, which are about 0.018. In comparison to OIC firms, Non-OIC firms have a lower mean ROA value. Additionally, the fact that the minimum ROA value is negative shows that certain Non-OIC firms in the sample have continued to be unprofitable and are unable to turn a profit by making the best use of their assets. The low standard deviation of the ROA variable indicates that for the sample period, profitability was consistent among Non-OIC firms.

It is discovered that the average size of Non-OIC firms is USD 2.410 million, which is comparable to that of OIC firms. The discrepancy between the firm's maximum and minimum size suggests that Non-OIC firms vary in terms of size characteristics. Additionally, Non-OIC firms' average asset tangibility (TANG) ratio is roughly 0.923, which is comparable to that of full OIC firms. According to Table 4.13 findings, leverage has a mean value of .106, which is very comparable to that of OIC firms. According to these findings, Non-OIC firms have a capital structure that is just 10% debt, which indicates that they are modestly leveraged. It is noteworthy to notice that certain companies are heavily levered due to the maximum value of LEV for Non-OIC firms .994, some Non-OIC firms have negative debt due to the LEV variable's minimum value being negative. The results shown in the Table 4.13 also show that Non-OIC firms' mean value of the CF variable is equal to 0.057, which is marginally less than the value discovered for OIC firms.

After examining the descriptive statistics of firm-level variables, the next step is to analyse the macroeconomic variables for Non-OIC countries. This analysis helps to better understand the broader economic environment in which firms operate and its potential impact on their working capital management. Key macroeconomic factors such as money supply (MS), stock market development (SMD), consumer price index

(CPI), interest rates (INT), and GDP growth (GDPG) are considered to assess their relationship with working capital efficiency. By examining these variables, the objective is to uncover significant patterns or differences between Non-OIC and OIC countries in terms of macroeconomic influences on working capital efficiency. This comparative analysis will help identify whether the macroeconomic environment plays a distinct role in shaping working capital management practices across these two groups of countries. It also allows for a deeper understanding of how factors such as money supply, stock market development, inflation, interest rates, and GDP growth impact the working capital cycle, and whether these relationships differ depending on the economic context of OIC and Non-OIC nations. First, the mean value of money supply (MS) is found to be approximately 6.046, which is notably lower than the mean value observed for OIC countries, indicating a relatively lower money supply in Non-OIC countries. Additionally, the mean value for stock market development (SMD) is 304.029, which is considerably higher compared to OIC countries, reflecting a more developed stock market environment in Non-OIC nations. Because stock markets in Non-OIC nations are so highly established, these outcomes are clear. The CPI figures show that the mean number is roughly 104.61, which indicates higher inflation than that of OIC nations. So, it is clear that Non-OIC countries are inflated in comparison to OIC countries. The results for the gross domestic product growth rate (GDPGR) show that Non-OIC nations' average GDP grows at 3.9 per cent, which indicates that during the study period, Non-OIC countries in general showed a stable growth of 3.9 per cent, which is somewhat higher than that of OIC countries. Additionally, the mean interest rate for Non-OIC nations is approximately 3.56, which is lower than the mean interest rate observed for OIC nations. This indicates that Non-OIC countries tend to have relatively lower interest rates, potentially reflecting more stable or less volatile economic conditions compared to OIC countries. Additionally, all the variables' skewness and kurtosis fall within the permissible ranges of ± 3 and ± 10 , respectively. As a result, these findings suggest that all the variables are about regularly distributed.

4.16 WORKING CAPITAL MANAGEMENT (WCM) EFFICIENCY OF THE FIRMS BELONGING TO NON-OIC COUNTRIES

From 2000 to 2020, the mean CCC of all the enterprises in Non-OIC nations is plotted to observe the trend and fluctuations in working capital management across these firms. The plot reveals patterns of how firms in Non-OIC countries managed their working capital during different economic conditions, including periods of recession and economic expansion. This provides insights into the behaviour of working capital management in response to varying macroeconomic factors. This exercise enables us to evaluate the effectiveness with which these businesses were able to control their working capital. The CCC decreased between 2001 and 2002, which suggests that businesses tended to shorten their CCC during these years, according to the figure. It might be because the world experienced a recession during these years (the DOT-COM Bubble), which may have compelled businesses to tighten their working capital cycle. The analysis reveals that similar to the 2007–2009 period (Great Recession), the mean CCC for Non-OIC firms declined during the 2019–2020 period, which was influenced by the COVID-19 pandemic. This suggests that, like in the previous recessionary period, firms took steps to optimize their working capital during times of economic uncertainty. Notably, during other years outside of these recessions, the CCC increased, indicating that firms may have been more relaxed in managing their working capital during stable or growing economic conditions.

Additionally, when compared to OIC firms, Non-OIC firms exhibited less volatility in their CCC values, suggesting a more consistent approach to working capital management, likely due to more developed financial markets and economic structures in Non-OIC countries.

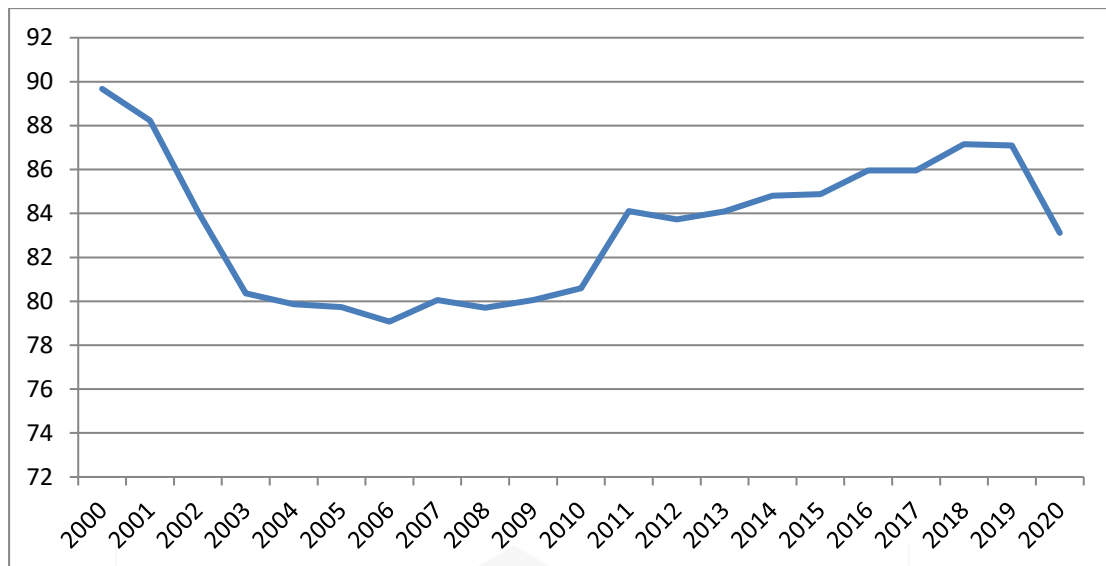


Figure 4.3 Working Capital Management (WCM) Efficiency of the Firms Belonging to Non-OIC Countries

4.17 DIFFERENCE IN CCC OF OIC FIRMS ACROSS GOOD AND BAD STATES OF ECONOMY

The findings of the T-test used to determine whether there is a significant difference between the CCC of enterprises from Non-OIC countries in good and bad states are presented in this section. It is noteworthy that these results are shown in Table 4.14. According to the results shown in Table 4.14, there is a substantial difference between the CCC in good and bad states, as indicated by the significant t-value for CCC across good and bad states. These findings highlight the importance of researching the variables influencing the CCC of Non-OIC enterprises in both favourable and unfavourable conditions.

Table 4.14 Difference in Non-CCC of OIC Firms Across Good and Bad States of the Economy

		N	Mean	Std. Deviation	Std. Error Mean	T
CCC	GOOD	19798	83.13	76.848	.17271	-2.731*
	BAD	74032	84.03	76.361	.28065	

Asterisks indicate significance at the 1% (*).

4.18 CORRELATION ANALYSIS OF ALL THE VARIABLES ON NON-OIC FIRMS

All study variables' correlation analyses are shown in Table 4.15. None of the correlation coefficients in the findings of the correlation analysis are higher than 0.80, which shows that multicollinearity is not likely to be a cause for worry. The findings indicate that both firm-level and macroeconomic factors significantly influence the Cash Conversion Cycle (CCC) for Non-OIC firms. This underscores the importance of incorporating these variables in the regression analysis to ensure a comprehensive understanding of the determinants of CCC. By doing so, potential specification bias is mitigated, allowing for more accurate and reliable conclusions about the factors affecting working capital efficiency in Non-OIC firms. These results emphasize the necessity of accounting for both internal and external factors when analysing the efficiency of working capital management. Growth, ROA, SIZE, TANG, MS, CPI, GDPG, and INT have strong positive correlations with CCC, whereas Age, LEV, CF, and SMD have substantial negative correlations with CCC. The direction of each variable's link with CCC is first indicated by these results, but regression analysis will reveal the precise nature of each firm- and macroeconomic variable's connection to CCC.

Table 4.15 Correlation Analysis of All the Variables on Non-OIC Firms

CCC	CCC	GROWTH	AGE	ROA	SIZE	TANG	LEV	CF	MS	SMD	CPI	GDPG	INT
CCC	1												
GROWTH	.004*	1											
AGE	-.02*	-.09*	1										
ROA	.01*	-.004*	.01*	1									
SIZE	.02*	-.009*	-.04*	.18*	1								
TANG	.10*	.002	.06*	.07*	.17*	1							
LEV	-.08*	-.01*	.06*	-.08*	.13*	-.12*	1						
CF	-.13*	-.01*	.01*	.5*	.13*	.008*	-.004**	1					
MS	.06*	-.08*	.004**	.07*	-.002	-.04*	-.10*	.04*	1				
SMD	-.04*	.03*	-.16*	-.01*	.37*	.12*	-.05*	-.01*	-.41*	1			
CPI	.01*	-.004*	-.51*	-.005*	.16*	-.02*	-.05*	.01*	.08*	.005**	1		
GDPG	.09*	.001*	.05*	.11*	-.12*	.13*	-.07*	.02*	.31*	-.45*	-.06*	1	
INT	.01*	-.002	.09*	-.008*	-.05*	.03*	.08*	.009*	-.14*	-.13*	.01*	-.04*	1

Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***).

4.19 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC (NON-OIC-FIRMS)

In this section, the results of Equation (1) estimated across Non-OIC firms are presented. This analysis allows for an examination of how firm-level and macroeconomic factors influence the Cash Conversion Cycle (CCC) and whether their effects differ from those observed in OIC firms. By comparing the findings for Non-OIC firms with those for OIC firms, the study provides valuable insights into the unique determinants of working capital efficiency in different economic and financial contexts. This comparative approach highlights potential differences in the relationship between firm-level and macroeconomic variables and CCC, shedding light on the varying dynamics across OIC and Non-OIC countries. It is important to note that the results are shown in Table 4.16. The findings of the model are reported in column (2) in Table 4.16, whereas the VIFs are reported in column (3).

According to Table 4.16, the adjusted R^2 is about equivalent to 65 per cent, which indicates that the independent variables are responsible for 65 per cent of the variation in the dependent variable. The F-test for fixed effects, which is significant at the 1% level of significance, indicates that the employment of a FE model other than OLS would significantly enhance goodness-of-fit. The RE model is superior to the OLS model at handling heterogeneity, according to the Breusch-Pagan Lagrange Multiplier (B-P LM) test for random effects, which is significant at the 1% level of significance. Based on the results of the F-test and B-P LM test, it can be concluded that FE and RE models provide better estimates than OLS. The researcher thus employs a different panel data technique. The choice between FE and RE models is also made using the Hausman test. Indicating that the FE model might produce BLUE estimations since the Hausman test result is significant at the 1% level of significance.

Furthermore, the Wald test has been used to examine the possibility of heteroscedasticity. The Wald test results are significant at the 1% level of significance, indicating that heteroscedasticity exists. The Wooldridge test of autocorrelation has also been used to determine whether autocorrelation exists. The Wooldridge test statistics are significant at the 1% level of significance, indicating the existence of autocorrelation. Following Petersen (2009), heteroscedasticity and autocorrelation were

rectified by generating robust standard errors grouped across businesses because the heteroscedasticity and autocorrelation problem still exists. It should be emphasized that VIFs have been calculated for each of the independent variables to test for multicollinearity. According to Field (2005), multicollinearity is present if the value of the VIF for any predictor is more than or equal to 10. Given that no VIF for the models in column 3 of Table 4.16 is larger than 10, multicollinearity is probably not a concern. This is supported by the results of VIFs for those models. In accordance with Stephen and Senthamarai (2017), outliers have been identified using standardised residual analysis, wherein the standardised residuals falling within the range of $\geq \pm 3$ are regarded as outliers. It is important to remember that these observations were removed.

Table 4.16 Firm-level and Macroeconomic Determinants of CCC (Non-OIC-firms)

(1)	(2)	(3)
GROWTH	.031 (0.09)	1.02
AGE	-.335* (-8.11)	1.48
ROA	17.379* (9.95)	1.41
SIZE	13.413* (15.01)	1.42
TANG	20.784* (7.68)	1.12
LEV	-4.896* (-2.47)	1.12
CF	-93.536* (-54.45)	1.35
MS	-27.173* (-13.60)	1.39
SMD	.004* (5.81)	1.95
CPI	-.034** (-2.24)	1.48
GDPG	-.730* (-13.55)	1.41
INT	.432* (7.94)	1.10
Adj R-squared	.653	
F-test	19.99*	
B-P LM test	5.8e+05*	
Hausman	3034.51*	

Wald test	3.3e+40*	
Wooldridge test	5689.13*	
Observations	272019	
The results presented in this table are obtained from a robust FE approach. Asterisks indicate significance at the 1% (*) 5% (**) and 10% T-Statistics of the FE approach are reported in parentheses and based on cluster robust standard errors.		

Perusing Table 4.16 further, it can be construed that the coefficient on Growth, SMD, CPI, GDPG and INT variables show different results among Non-OIC firms when compared to OIC firms. Specifically, for OIC firms, a significant negative relationship was found between the growth variable and CCC; however, for Non-OIC firms, a significant positive impact of growth on CCC is observed. While a negative relationship between stock market development (SMD) and CCC was identified for OIC firms, a positive impact of SMD on CCC is found among Non-OIC firms. Regarding the consumer price index (CPI), a significant positive impact on CCC was found for OIC firms, whereas, for Non-OIC firms, a negative relationship is observed. Concerning the GDP growth variable, a significant positive relationship with CCC was found for OIC firms, but for Non-OIC firms, this relationship turns negative. Lastly, while a significant negative impact of the interest rate (INT) on CCC was identified for OIC firms, a significant positive impact is found between INT and CCC for Non-OIC firms. For the remaining firm-level and macroeconomic variables, the relationships with CCC remain consistent with those observed for OIC firms. These differences in results between OIC and Non-OIC firms highlight the varying economic dynamics and working capital management strategies across different regions.

4.20 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC ACROSS DIFFERENT QUANTILES (NON-OIC FIRMS)

In this section, the robustness of the relationship between firm-level and macroeconomic factors across various CCC quantiles for Non-OIC firms is examined. To investigate this, a robust fixed effects approach with quantile regression is applied, and the results are presented in Table 4.17. Column (2) shows the results for the 0.25 quantile, column (3) for the 0.50 quantile, and column (4) for the 0.75 quantile. The

quantile regression results indicate that firm-level and macroeconomic variables exert a similar influence on CCC across different quantiles. These findings reinforce the robustness and validity of firm-level and macroeconomic factors in predicting the CCC, irrespective of the specific quantile of the distribution being analysed. This suggests that the identified determinants of CCC are consistently relevant across the entire distribution of working capital efficiency in Non-OIC firms.

Table 4.17 Firm-level and Macroeconomic Determinants of CCC Across Different Quantiles (Non-OIC Firms)

(1)	(2)	(3)	(4)
GROWTH	.328 (0.55)	-.013 (-0.02)	.513 (0.51)
AGE	-.2776* (-6.21)	-.383* (-7.02)	-.472* (-5.92)
ROA	20.961* (12.37)	23.516* (10.09)	16.045* (4.93)
SIZE	9.324* (14.60)	12.458* (14.66)	20.029* (18.65)
TANG	12.166* (5.65)	25.157* (8.09)	36.763* (8.23)
LEV	-2.798 (-1.49)	-3.2185 (-1.35)	-4.777 (-1.37)
CF	-64.819* (-33.93)	-99.416* (-44.79)	-135.86* (-45.61)
MS	-25.292* (-17.01)	-27.472* (-16.26)	-33.724* (-15.48)
SMD	.003* (4.58)	.0046* (4.11)	.007* (4.14)
CPI	-.074* (-5.65)	-.048* (-3.44)	-.029*** (-1.63)
GDPG	-.254* (-3.37)	-.570* (-6.53)	-1.14* (-9.24)
INT	.3698* (5.58)	.4454* (5.64)	.6186* (6.35)
The results presented in this table are obtained from Quantile regression with a robust FE approach. Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***). T-Statistics of the FE approach are reported in parentheses and based on cluster robust standard errors.			

4.21 FIRM-LEVEL AND MACROECONOMIC DETERMINANTS OF CCC ACROSS GOOD AND BAD STATES (NON-OIC FIRMS)

Table 4.18 Firm-level and Macroeconomic Determinants of CCC Across Good and Bad States (Non-OIC firms)

(1)	(2)	(3)	(4)
GROWTH	-.113 (-0.13)	.083 (0.20)	.031 (0.09)
AGE	-.468* (-5.57)	-.239* (-4.42)	-.335* (-8.11)
ROA	25.974* (6.58)	16.945* (7.93)	17.379* (9.95)
SIZE	9.461* (6.00)	14.674* (14.62)	13.413* (15.01)
TANG	24.674* (4.64)	19.498* (6.26)	20.784* (7.68)
LEV	-1.878 (-0.48)	-4.877** (-2.12)	-4.896* (-2.47)
CF	-98.686* (-25.27)	-93.569* (-47.61)	-93.536* (-54.45)
MS	-38.556* (-13.44)	-15.922* (-7.08)	-27.173* (-13.60)
SMD	.0037* (3.52)	.008* (7.06)	.004* (5.81)
CPI	-.0001 (-0.01)	-.029*** (-1.65)	-.034** (-2.24)
GDPG	-.698* (-5.39)	-.503* (-7.42)	-.730* (-13.55)
INT	1.275* (8.30)	.155* (2.79)	.432* (7.94)
Observations	74032	197987	272019
Adj R-squared	0.6485	0.6806	.653
The results presented in this table are obtained from a robust FE approach. The results are for recession periods 2000,2001,2002,2007,2008,2019 and 2020. The results are for recession periods 2000,2001,2002,2007,2008,2019 and 2020. Asterisks indicate significance at the 1% (*) 5% (**) and 10% (***). T-Statistics of FE approach are reported in parentheses and based on cluster robust standard errors.			

Table 4.18 presents the findings for macroeconomic and firm-level variables in both good and bad economic conditions. Because the years 2000, 2001, and 2002 saw the dot-com bubble, the years 2007 and 2008 saw the great recession, and the years 2019 and 2020 saw COVID-19, it is important to highlight that these years have been

labelled as recession times or bad states. The remaining years, 2003–2006, and 2009–2018 are regarded as boom times or prosperous states. Notably, Table 4.18's column (2) lists the outcomes for bad states, whereas column (3) lists the results for good states. The findings of column (2) of Table 4.16 are shown in column (4) of Table 4.18 for comparison purposes. The results indicate that firm-level and macroeconomic variables have a similar impact on CCC in both favourable and unfavourable economic conditions. However, the stock market development (SMD) variable stands out, as it demonstrated a significant positive impact on CCC during periods of economic downturn. This suggests that, while most factors exhibit consistent effects across different economic states, the influence of stock market development may vary significantly during times of economic stress, potentially reflecting the challenges firms face in managing working capital during recessions.

4.22 COMPARATIVE ANALYSIS AND DISCUSSION OF FINDINGS

The findings of this study offer insights into how firms in OIC and non-OIC countries manage working capital differently, based on distinct economic, cultural, and financial principles. These differences are supported by theoretical frameworks that highlight variations in financing preferences, agency dynamics, risk tolerance, and liquidity management. The following discussion addresses the research objectives in the context of these theoretical foundations while referencing recent studies.

Research Objective 1: *To evaluate the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.*

To assess Working Capital Management (WCM) efficiency, the study primarily used the Cash Conversion Cycle (CCC) as a metric. The CCC is a widely recognized measure of how efficiently a firm manages its working capital by calculating the time taken to convert its investments in inventory and other resources into cash flows from sales. By analysing CCC, this study aims to provide insights into the operational efficiency of firms, particularly in how they manage their short-term assets and liabilities. A shorter CCC is generally considered more efficient, as it indicates the company can convert its investments in inventory and other resources into cash flows

from sales more quickly. However, efficiency must be balanced with liquidity needs and industry norms. For this study, a Cash Conversion Cycle (CCC) below the industry median is considered indicative of relatively efficient Working Capital Management (WCM). However, it is important to acknowledge that the optimal level of CCC may vary based on firm-specific factors, such as industry characteristics, business models, and market conditions. This benchmark helps in assessing whether firms are effectively managing their working capital, but the interpretation of CCC must also account for the unique operational dynamics and strategic objectives of each firm.

Cash Conversion Cycle (CCC) Differences: The analysis of results reveals a significant difference in WCM efficiency between OIC and Non-OIC firms. OIC firms consistently demonstrate longer CCCs (mean of 121.708 days) compared to Non-OIC firms (mean of 83.377 days). This substantial difference of approximately 38 days is statistically significant at the 1% level ($t\text{-value} = -87.515$), providing strong evidence that OIC firms generally have less efficient working capital management practices.

This finding aligns with Chen et al. (2015), who found that firms in Islamic countries generally maintain lower levels of liquidity, which could contribute to longer CCCs. More recently, Azam and Azam (2023) observed that Islamic religiosity and associations significantly influence WCM practices in OIC countries, providing further context for these differences.

The longer CCC in OIC firms could be attributed to several factors, first, Islamic financial principles, as discussed by Iqbal and Mirakhor (2011), Islamic finance emphasize risk-sharing and prohibits interest-based transactions, which may lead to more conservative working capital practices. Secondly, Less developed financial markets in OIC countries, Hassan and Aliyu (2018) noted that many OIC countries have less developed financial markets, which could limit firms' ability to efficiently manage their working capital. Third, the economic structure of OIC countries, Alqahtani et al. (2023) highlighted that OIC countries often have different economic structures compared to non-OIC countries, which may necessitate different working capital management approaches. Further, the sensitivity to economic cycles is also observed; Both OIC and Non-OIC firms show sensitivity to economic cycles, but OIC firms demonstrate wider fluctuations in CCC. During recession periods (2001-2002, 2007-

2009), both groups tend to decrease their CCC, indicating tighter working capital management. However, OIC firms show more pronounced changes, suggesting greater sensitivity to economic conditions. This aligns with the findings of Almaqtari et al. (2024), who observed that macroeconomic factors have a more significant impact on firm performance in OIC countries.

The greater volatility in CCC for OIC firms could be explained by:

- a) Economic vulnerability: As noted by Erum and Hussain (2019), many OIC countries are more vulnerable to external economic shocks, which could lead to more dramatic adjustments in working capital practices during economic downturns.
- b) Financial system stability: Banna et al. (2023) found that financial inclusion and bank risk-taking in OIC countries are closely linked, which could contribute to greater volatility in financial practices during economic cycles.

Response to COVID-19 Pandemic: Interestingly, while both groups typically decrease CCC during economic downturns, OIC firms showed an increase in CCC during the 2019-2020 COVID-19 pandemic, contrary to previous recession patterns. This unique response could be attributed to:

- a) Supply chain disruptions: As discussed by Alareeni et al. (2024), the pandemic had significant impacts on global supply chains, which may have disproportionately affected OIC countries due to their economic structures.
- b) Financial system resilience: The work of Azam and Azam (2023) on the impact of Islamic religiosity on WCM practices suggests that Islamic financial principles may have influenced firms' responses to the unprecedented nature of the pandemic.

This result supports the Cash Conversion Cycle Theory, which posits that a longer CCC indicates slower cash flow cycles and reduced liquidity management efficiency (Deloof, 2003). In emerging markets, where many OIC firms operate, financial constraints and limited access to credit often compel firms to rely on internal

resources, lengthening the CCC (Nazir & Afza, 2009). The findings align with those of Wasiuzzaman and Arumugam (2013), who identified similar inefficiencies in CCC among firms in emerging markets, attributing this to conservative WCM strategies aimed at preserving liquidity in less stable economic environments. By comparison, non-OIC firms benefit from more flexible financial systems that enable quicker access to credit, shorter cash flow cycles, and consequently, a shorter CCC.

The implications of these findings suggest that financial market development significantly affects WCM efficiency. The shorter CCC in non-OIC firms, as seen in Figures 4.2 and 4.3, reflects their ability to leverage external funding sources, a trend less accessible to OIC firms due to Shariah-compliant financing preferences that prioritize equity-based funding over debt.

Research Objective 2: To test whether a difference exists in the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries.

The statistical analysis provides strong evidence of significant differences in WCM efficiency between OIC and Non-OIC firms:

T-test Results: The t-test comparing CCC between OIC and Non-OIC firms yielded a t-value of -87.515, significant at the 1% level. This result strongly supports the existence of a significant difference in WCM efficiency between the two groups.

Magnitude of Difference: The mean CCC for OIC firms (121.708 days) is substantially higher than that of Non-OIC firms (83.377 days), representing a difference of approximately 38 days. This large difference not only indicates statistical significance but also practical significance in terms of working capital management.

Consistency Across Economic States: The difference in CCC between OIC and Non-OIC firms remains consistent across both good and bad economic states, suggesting that the difference is structural rather than cyclical.

These findings are consistent with recent literature comparing financial practices between OIC and non-OIC countries. For instance, Alqahtani et al. (2023) found significant differences in the impact of financial development on income inequality

between OIC and non-OIC countries, suggesting broader structural differences in financial systems and practices.

Research Objective 3: To analyse the impact of firm-level and macroeconomic variables on working capital management efficiency.

Firm-level Determinants:

a) Growth:

- Full Sample: Negative relationship with CCC (-0.042, significant at 1%)
- OIC Firms: Stronger negative relationship (-0.057, significant at 1%)
- Non-OIC Firms: Weaker negative relationship (-0.037, significant at 1%)

The stronger negative relationship in OIC firms suggests that growing firms in these countries manage their working capital more aggressively. This aligns with Azam and Azam's (2023) findings that Islamic associations influence WCM practices in OIC countries.

b) Age:

- Consistent negative relationship across all samples (Full: -0.265, OIC: -0.271, Non-OIC: -0.262, all significant at 1%)

The similarity across samples indicates that firm age impacts WCM efficiency similarly regardless of the country's OIC status. This supports the learning effect theory proposed by Petersen and Rajan (1997).

c) Profitability (ROA):

- Positive relationship across all samples, but stronger in OIC firms (Full: 0.324, OIC: 0.389, Non-OIC: 0.301, all significant at 1%)

The stronger positive relationship in OIC firms suggests that profitable firms in these countries invest more in working capital. This aligns with the findings of Alqahtani et al. (2023) regarding the unique financial practices in OIC countries.

d) Size:

- Positive relationship across all samples, but stronger in Non-OIC firms (Full: 0.099, OIC: 0.087, Non-OIC: 0.105, all significant at 1%)

The weaker relationship in OIC firms might be due to less developed financial markets, as noted by Hassan and Aliyu (2018).

e) Tangibility:

- Positive relationship across all samples, strongest in OIC firms (Full: 0.320, OIC: 0.349, Non-OIC: 0.304, all significant at 1%)

The stronger relationship in OIC firms could be related to the emphasis on asset-based financing in Islamic finance, as discussed by Iqbal and Mirakhor (2011).

Macroeconomic Determinants:

a) Money Supply:

- Negative relationship across all samples, but stronger in OIC firms (Full: -0.001, OIC: -0.002, Non-OIC: -0.001, all significant at 1%)

The stronger effect in OIC countries aligns with Banna et al.'s (2023) findings on the relationship between financial inclusion and bank risk-taking in OIC countries.

b) Stock Market Development:

- Positive relationship in full sample and Non-OIC firms, non-significant in OIC firms.

This difference could be attributed to less developed stock markets in many OIC countries, as noted by Alqahtani et al. (2023).

c) Inflation (CPI):

- Positive relationship in full sample and OIC firms, negative in Non-OIC firms

The differing impact of inflation supports Erum and Hussain's (2019) observation that OIC countries often have different economic structures compared to non-OIC countries.

d) GDP Growth:

- Positive relationship across all samples, but stronger in OIC firms

This aligns with Almaqtari et al.'s (2024) finding that macroeconomic factors have a more significant impact on firm performance in OIC countries.

e) Interest Rates:

- Positive relationship in the full sample and Non-OIC firms, negative in OIC firms

The negative relationship in OIC firms could be due to the influence of Islamic financial principles, as discussed by Mohieldin et al. (2011).

Research Objective 4: To examine the differential impact of firm-level and macroeconomic variables on working capital management efficiency during recession and boom periods.

Recession vs. Boom Periods:

a) Cash Conversion Cycle (CCC):

- Full Sample: Lower CCC during recessions (88.865 days) compared to boom periods (88.070 days)
- OIC Firms: Higher CCC during recessions (124.634 days) compared to boom periods (120.731 days)
- Non-OIC Firms: Lower CCC during recessions (83.377 days) compared to boom periods (83.868 days)

The contrasting behaviour of OIC firms during recessions aligns with Alareeni et al.'s (2024) findings on the unique responses of OIC firms to economic shocks.

Firm-level Determinants:

a) Growth:

- Stronger negative relationship during recessions across all samples

This suggests that firms focus more on efficient WCM during economic downturns, supporting the findings of Chen et al. (2015) on the impact of economic conditions on financial practices.

b) Leverage:

- Non-significant during recessions in OIC firms, negative during boom periods
- Consistently negative across economic states in Non-OIC firms

This difference could be related to the unique characteristics of Islamic finance, as discussed by Hassan and Aliyu (2018).

Macroeconomic Determinants:

a) Inflation (CPI):

- Negative during recessions, non-significant during boom periods in OIC firms
- Consistently positive across economic states in Non-OIC firms

This supports Erum and Hussain's (2019) findings on the different economic structures in OIC countries.

b) GDP Growth:

- Positive during recessions, negative during boom periods in OIC firms
- Consistently positive across economic states in Non-OIC firms

The varying impact in OIC firms aligns with Almaqtari et al.'s (2024) observation of the stronger influence of macroeconomic factors in OIC countries.

c) Interest Rates:

- Positive during recessions, non-significant during boom periods in OIC firms
- Consistently positive across economic states in Non-OIC firms

This difference could be attributed to the principles of Islamic finance, as discussed by Mohieldin et al. (2011).

These findings highlight significant differences in the determinants of WCM efficiency between OIC and Non-OIC firms, as well as varying impacts during different economic states. The results underscore the importance of considering both firm-level and macroeconomic factors in understanding WCM practices, particularly in the context

of OIC countries. In this section, the study examines the determinants influencing Working Capital Management (WCM) efficiency, drawing from the results of the regression analysis. The following firm-level and macroeconomic factors were found to have significant effects on the Cash Conversion Cycle (CCC), which serves as a key measure of WCM efficiency.

4.22.1 Growth (GROWTH)

Growth, defined as the current year's sales over the previous year's sales minus one, plays a critical role in influencing the Cash Conversion Cycle (CCC), with significant variations between OIC and non-OIC firms. The descriptive statistics show that the mean growth for the full sample (Table 4.1) is 0.292, reflecting moderate growth across firms. However, a sharp contrast is evident, with OIC firms (Table 4.7) exhibiting a much lower mean growth of 0.064, while non-OIC firms (Table 4.13) demonstrate a higher mean growth of 0.325. This suggests that OIC firms face structural and financial constraints that hinder their growth, whereas non-OIC firms benefit from more dynamic economic environments.

The regression results highlight the negative and significant relationship between growth and CCC for the full sample (Table 4.4, coefficient = -3.275), indicating that higher growth rates lead to shorter CCC as firms optimize working capital to sustain expansion. This aligns with findings by García-Teruel and Martínez-Solano (2007), who demonstrated that high-growth firms streamline working capital to finance operations efficiently, particularly in constrained financial settings. Their study emphasized that firms with robust growth often adopt aggressive working capital management strategies to maintain liquidity and support expansion (Dewi, 2018). For OIC firms (Table 4.10), the negative impact of growth is far more pronounced, with a coefficient of -25.07, reflecting the reliance on internal resources to fund growth due to limited access to external financing options, consistent with Pecking Order Theory (Myers & Majluf, 1984). Similar results were observed by Baños-Caballero et al. (2010), who found that firms in constrained financial environments reduce CCC aggressively to support growth through internal funds, reinforcing the notion that OIC firms must manage their working capital efficiently to navigate financial limitations

(Ishikawa et al., 2024). Conversely, in non-OIC firms (Table 4.16), growth has an insignificant effect on CCC (coefficient = 0.031, $p > 0.10$), suggesting that these firms leverage external financing to sustain operations, minimizing the need for CCC adjustments.

The correlation analysis further reinforces these trends. For the full sample, there is a weak negative correlation between growth and CCC (-0.05), indicating that higher growth slightly reduces CCC. In OIC firms, the correlation is also negative (-0.057), supporting the notion that firms in constrained markets rely on leaner working capital management during growth phases. However, in non-OIC firms, the correlation is positive but negligible (0.004), suggesting that growth does not meaningfully impact CCC, a trend also noted by Wasiuzzaman and Arumugam (2013), who emphasized the role of financial flexibility in non-OIC firms.

The quantile regression results provide additional insights. For the full sample, the negative impact of growth on CCC intensifies at higher quantiles, from -0.143 (insignificant) at the 25th quantile to -3.940* at the 75th quantile. This suggests that firms with longer CCC benefit more from optimizing working capital during high-growth periods. For OIC firms, the effect is even stronger, increasing from -6.724* at the 25th quantile to -38.964* at the 75th quantile, highlighting their aggressive WCM strategies to support growth. This is consistent with Nazir and Afza (2009), who noted that firms in emerging markets streamline CCC to overcome financial constraints during growth. In contrast, for non-OIC firms, growth shows no significant relationship with CCC across all quantiles, reflecting their financial flexibility and access to external funds.

The good and bad economic results (Table 4.6) confirm that for the full sample, growth significantly reduces CCC during both bad (-3.681) and good (-3.130) states, demonstrating the universal need to optimize working capital regardless of economic conditions. For OIC firms (Table 4.12), the reduction in CCC is even more pronounced in both bad (-25.677) and good (-25.544) states, indicating that growth compels these firms to adopt efficient WCM strategies as a necessity for survival and expansion in constrained environments. Similar findings were reported by Altaf and Shah (2018), who showed that firms in emerging markets reduce CCC to accommodate growth,

particularly in uncertain economic conditions. Similar findings were reported by Altaf and Shah (2018), who showed that firms in emerging markets reduce CCC to accommodate growth, particularly in uncertain economic conditions. In contrast, for non-OIC firms (Table 4.18), growth remains insignificant in both bad (-0.113) and good (0.083) states, highlighting their ability to maintain stable WCM practices irrespective of economic fluctuations.

In conclusion, growth significantly reduces CCC in OIC firms due to financial constraints, aligning with studies like García-Teruel and Martínez-Solano (2007) and Baños-Caballero et al. (2010), while non-OIC firms experience minimal impact, reflecting their reliance on external financing and financial flexibility.

The findings on Growth (GROWTH) and its impact on the Cash Conversion Cycle (CCC) are strongly grounded in the theoretical frameworks discussed in the literature review. The Pecking Order Theory (Myers & Majluf, 1984) is particularly relevant for OIC firms, as their reliance on internal financing during growth phases reflects limited access to external capital. This aligns with the observed significant negative relationship between growth and CCC, where firms prioritize retained earnings and optimize working capital to support expansion. Similarly, the Operating Cycle Theory supports the notion that higher growth rates drive firms to streamline their operating cycles to minimize the time required for cash flow recovery, as evidenced by the pronounced CCC reductions in OIC firms.

In contrast, non-OIC firms demonstrate minimal sensitivity to growth, as their financial flexibility allows for the utilization of external financing to sustain operations without significant adjustments to CCC. This aligns with the Trade-Off Theory, which suggests that these firms can balance liquidity needs with profitability by leveraging external resources. Furthermore, the findings for non-OIC firms resonate with the Aggressive Theory, where firms adopt strategies to minimize working capital investments, relying on external market dynamics to finance growth.

Overall, these theoretical underpinnings highlight the divergent WCM strategies employed by OIC and non-OIC firms, shaped by their respective financial environments and growth dynamics. While OIC firms exhibit behaviours consistent with conservative

liquidity management and internal funding reliance, non-OIC firms benefit from external financing and market efficiencies, leading to a weaker relationship between growth and CCC.

4.22.2 Firm Age (AGE)

Firm age, the number of years since incorporation, has a mean of 16.762 years for the full sample (Table 4.1). OIC firms (Table 4.7) are slightly older with a mean of 17.436 years, while non-OIC firms (Table 4.13) have a mean of 16.663 years. The regression analysis shows a negative impact on CCC, with coefficients of -0.330 for the full sample, -1.702 for OIC firms, and -0.335 for non-OIC firms, indicating that older firms tend to have shorter CCCs. These results align with findings from Deloof (2003), who highlighted that efficient working capital management practices are often more pronounced in mature firms, contributing to shorter CCCs. Additionally, studies by Filbeck and Krueger (2005) emphasize that experience and operational efficiency acquired over time help older firms better manage their working capital cycles. The findings also align with the research by García-Teruel and Martínez-Solano (2007), which suggests that older firms benefit from accumulated experience in managing working capital, leading to more efficient operations. Their study emphasizes that as firms mature, they develop better relationships with suppliers and customers, which can reduce the time taken to convert inventory into cash.

In the full sample, the correlation between CCC and Age is slightly negative (-0.01). For OIC firms, this correlation is also negative (-0.02), implying that older firms might have slightly shorter CCCs. For non-OIC firms, the negative correlation (-0.02) suggests a similar, but also very weak, relationship. This weak correlation is consistent with the findings of Nazir and Afza (2009), who noted that while age can influence working capital management, other factors such as market conditions and financial policies also play significant roles. The full sample (Table 4.4) indicates that Age has a significant negative impact on CCC (-0.330), meaning older firms have shorter CCCs. This trend is consistent in OIC firms (Table 4.10) with a coefficient of -1.702, showing that older OIC firms manage to reduce their CCCs more effectively. For non-OIC firms (Table 4.16), Age also has a negative and significant impact on CCC (-0.335),

suggesting that older non-OIC firms also benefit from reduced cash conversion cycles. These observations are consistent with the findings of Hernandez et al. (2022), who noted a non-linear yet significant impact of firm maturity on working capital components in Chilean firms. Moreover, Panigrahi et al. (2022) found that firm age was a critical determinant in optimizing CCCs in manufacturing companies, especially in emerging economies.

Age has a consistently negative impact on CCC across all quantiles in the full sample, becoming stronger at higher quantiles (-0.281* at the 25th quantile to -0.457* at the 75th quantile). OIC firms also display a similar pattern, with coefficients increasing negatively from -1.7413* at the 25th quantile to -1.9459* at the 75th quantile. Non-OIC firms exhibit consistent negative effects across all quantiles, from -0.2776* at the 25th quantile to -0.472* at the 75th quantile. The quantile analysis supports prior research by Anton and Nucu (2021), who demonstrated that older firms consistently manage their working capital more efficiently, resulting in a more pronounced reduction in CCC at higher performance levels. This also suggests that older firms, regardless of their classification, are better at managing their working capital as they grow older, which is supported by the findings of Baños-Caballero et al. (2010), who found that older firms tend to have more efficient working capital management practices.

The full sample (Table 4.6) indicates that Age has a significant negative impact on CCC during both bad (-0.665) and good (-0.239) economic conditions, meaning older firms have shorter CCCs. In OIC firms (Table 4.12), Age's impact is significant only in good economic states (-2.141), suggesting that older OIC firms manage to reduce their CCCs more effectively during prosperous times. This finding is consistent with the research by Altaf and Shah (2018), which highlighted that older firms in emerging markets tend to optimize their working capital management more effectively during favourable economic conditions. For non-OIC firms (Table 4.18), Age has a significant negative impact on CCC in both bad (-0.468) and good (-0.239) states, indicating that older non-OIC firms benefit from reduced cash conversion cycles regardless of economic conditions. This reflects the stability and resilience that older firms often possess, as noted by Wasiuzzaman and Arumugam (2013), who found that established firms are better equipped to handle economic fluctuations due to their

experience and resources. These results echo the conclusions of Demiraj et al. (2022), who found that firm age mitigates the impact of external economic fluctuations on working capital efficiency, highlighting the resilience of mature firms during economic downturns.

The observed relationship between Firm Age (AGE) and the Cash Conversion Cycle (CCC) aligns closely with several theoretical frameworks. The Operating Cycle Theory provides a foundational explanation for the results, emphasizing that older firms achieve shorter CCCs due to their accumulated operational efficiencies and refined working capital management practices. As firms mature, they develop robust supplier and customer relationships, reducing the time required to convert inventory into cash (García-Teruel & Martínez-Solano, 2007).

The findings also align with Agency Theory (Jensen & Meckling, 1976), as older firms exhibit lower agency conflicts due to established governance mechanisms and long-term stakeholder trust. This reduced conflict enables mature firms, particularly in OIC markets, to adopt conservative working capital strategies, further shortening their CCCs during favourable economic conditions. Non-OIC firms benefit from similar agency-related efficiencies but also leverage their access to advanced financial markets, resulting in consistently shorter CCCs across economic states.

The results are also supported by the Trade-Off Theory, which suggests that older firms balance the costs and benefits of liquidity more effectively. Mature firms in OIC markets prioritize liquidity preservation due to structural financial constraints, while non-OIC firms optimize liquidity for profitability, reflecting their financial flexibility. This divergence underscores the adaptability of older firms in aligning their WCM practices with their respective financial environments.

In conclusion, the theoretical underpinnings of Operating Cycle Theory, Agency Theory, and Trade-Off Theory collectively explain the significant negative impact of AGE on CCC. These theories highlight how firm maturity enhances operational stability, governance efficiency, and strategic liquidity management, contributing to the observed differences in CCC across OIC and non-OIC firms.

4.22.3 Profitability (ROA)

Profitability, as measured by return on assets (ROA), shows interesting variations across samples. The full sample (Table 4.1) has a mean ROA of 0.02 with a standard deviation of 0.118. OIC firms (Table 4.7) have a higher mean ROA of 0.032, indicating better profitability compared to the full sample, but with higher variability (standard deviation of 0.103). Non-OIC firms (Table 4.13) exhibit a mean ROA of 0.018, slightly lower than the full sample, with a standard deviation of 0.1207. These findings align with studies like Deloof (2003), which highlight the variability in profitability across different market environments due to varying access to financial resources and operational efficiencies. Further, This suggests that OIC firms are more efficient in generating profits relative to their assets, which aligns with findings from Ghodrati et al. (2014), who noted that firms with better liquidity management tend to achieve higher ROA.

The correlation analysis (Tables 4.4, 4.10, 4.16) shows that ROA positively impacts CCC, with coefficients of 23.620 for the full sample, 81.509 for OIC firms, and 17.379 for non-OIC firms. This indicates that more profitable firms tend to have longer CCCs, with the effect being most pronounced in OIC firms. This finding is consistent with the research by Momtazian and Baharloo (2014), which found that firms with higher profitability often maintain longer CCCs as they can afford to extend their payment periods to suppliers. These results echo the findings of Baños-Caballero et al. (2010), who suggested that profitability often leads firms to hold higher levels of current assets, thus extending CCCs. Similarly, Filbeck and Krueger (2005) argue that profitable firms may adopt conservative working capital strategies to safeguard liquidity, contributing to longer CCCs.

The full sample shows a very weak positive correlation between CCC and ROA (0.01). For OIC firms, the correlation is almost neutral (-0.005), suggesting no significant relationship. In non-OIC firms, the correlation is slightly positive (0.01), indicating a weak relationship where higher profitability may be associated with longer CCCs. These weak correlations are consistent with Sugathadasa (2018) and Hernandez et al. (2022), who reported that the relationship between profitability and CCC often depends on the firm's strategy and market conditions, leading to variability in the

strength of the relationship.

In Table 4.4, ROA is positively related to CCC (23.620) in the full sample, indicating that more profitable firms have longer CCCs. This relationship is much stronger in OIC firms (Table 4.10) with a coefficient of 81.509, suggesting that higher profitability significantly increases CCCs in these firms. For non-OIC firms (Table 4.16), the positive relationship (17.379) is still significant but less pronounced compared to OIC firms. These results align with Panigrahi et al. (2022), who found that firms in emerging markets often maintain higher levels of inventory and receivables when profitability is high, thereby extending CCCs. Additionally, Shin and Soenen (1998) highlighted that profitable firms may prioritize operational continuity over strict cash flow efficiency, which can explain the longer CCC in OIC firms.

For the full sample, ROA shows a strong positive impact on CCC, decreasing slightly at higher quantiles (23.810* at the 25th quantile to 20.247* at the 75th quantile). In OIC firms, the positive effect of ROA on CCC increases significantly across quantiles, from 57.9610* at the 25th quantile to 88.426* at the 75th quantile. Non-OIC firms also display positive effects, although less pronounced, from 20.961* at the 25th quantile to 16.045* at the 75th quantile. This pattern of stronger impacts at higher quantiles resonates with the findings of Anton and Nucu (2021), who observed that profitability influences CCC more significantly in firms with better operational and financial performance. Similarly, This pattern is consistent with the findings of Zalaghi et al. (2019), who noted that firms with better profitability metrics often exhibit longer CCCs as they leverage their financial strength to optimize working capital.

In Table 4.6, ROA is positively related to CCC during both bad (32.149) and good (22.614) economic states in the full sample, indicating that more profitable firms have longer CCCs. This relationship is even stronger in OIC firms during bad (83.497) and good (77.298) economic states (Table 4.12), suggesting that higher profitability significantly increases CCCs in these firms. This finding is corroborated by the research of Karim et al. (2023), which highlighted that firms in emerging markets, particularly OIC firms, tend to maintain longer CCCs during both favourable and unfavourable economic conditions due to their reliance on internal financing (Karim et al., 2023). For non-OIC firms (Table 4.18), the positive relationship persists in both bad (25.974) and

good (16.945) economic states, indicating that profitability extends CCCs. These results are consistent with Deloof (2003) and Demiraj et al. (2022), who demonstrated that profitability influences WCM decisions differently across economic conditions, often leading firms to extend CCC in pursuit of stability and market presence during downturns.

In summary, ROA consistently exhibits a positive relationship with CCC across the full sample, OIC, and non-OIC firms, although the strength of this relationship varies. The stronger impact of ROA on CCC in OIC firms reflects a strategic focus on conservative WCM to preserve liquidity, as suggested by Filbeck and Krueger (2005). Non-OIC firms, on the other hand, adopt relatively aggressive WCM practices, as noted by Baños-Caballero et al. (2014), leveraging their profitability to optimize cash flows without compromising liquidity.

The relationship between Profitability (ROA) and the Cash Conversion Cycle (CCC) observed in the study can be effectively explained by several underpinning theories discussed in the literature review.

The Pecking Order Theory (Myers & Majluf, 1984) is particularly relevant for OIC firms, where higher profitability significantly extends CCC. This behaviour reflects a reliance on internal financing to support working capital needs, especially in constrained financial environments. Profitable OIC firms tend to adopt conservative WCM strategies, prioritizing liquidity preservation over cash flow optimization, as highlighted by Karim et al. (2023). This aligns with the theory's assertion that firms prefer internal funds to minimize the costs associated with external financing.

The Trade-Off Theory supports the findings that non-OIC firms leverage their profitability to balance liquidity and operational efficiency. While these firms also show a positive relationship between ROA and CCC, the effect is less pronounced compared to OIC firms. Non-OIC firms optimize their working capital to maximize profitability without compromising liquidity, reflecting their access to external credit and robust financial systems (Baños-Caballero et al., 2014).

The Conservative Theory further explains the extended CCC observed in OIC firms, as profitable firms in these markets prioritize stability and risk aversion. By holding higher levels of inventory and receivables, OIC firms ensure operational continuity during economic fluctuations, as suggested by Shin and Soenen (1998). Conversely, the Aggressive Theory is more applicable to non-OIC firms, where profitability is used to enhance cash flow efficiency, leading to shorter CCCs in relatively dynamic economic environments.

Lastly, the Liquidity Preference Theory (Keynes, 1936) aligns with the behaviour of OIC firms during adverse economic conditions. These firms extend CCC as a precautionary measure, safeguarding liquidity in response to financial uncertainties. Non-OIC firms, with greater financial flexibility, demonstrate less reliance on liquidity preferences, focusing instead on optimizing cash flows to sustain profitability during downturns.

In conclusion, the theoretical frameworks of Pecking Order Theory, Trade-Off Theory, and Liquidity Preference Theory provide a comprehensive explanation of the observed variations in the ROA-CCC relationship across OIC and non-OIC firms. These theories highlight the strategic trade-offs firms make between liquidity, profitability, and operational efficiency based on their financial environments and market dynamics.

4.22.4 Firm Size (SIZE)

Firm size, measured as the natural logarithm of total assets, also impacts CCC. The mean size for the full sample (Table 4.1) is 3.3, with a standard deviation of 1.287. OIC firms (Table 4.7) have a mean size of 3.186, while non-OIC firms (Table 4.13) have a slightly higher mean size of 3.316. Larger firms tend to have access to better financial resources and economies of scale, which can influence their working capital strategies. However, the regression results indicate that larger firms have longer CCCs, with coefficients of 9.534 for the full sample, 7.960 for OIC firms, and 13.413 for non-OIC firms. This suggests that as firms grow in size, their cash conversion cycles tend to increase, particularly in non-OIC firms. These findings align with the observations of

Deloof (2003), who highlighted that larger firms often maintain higher levels of inventories and receivables, contributing to extended CCCs. Similarly, this finding is consistent with the research by Jahan (2020), which found that larger firms often have more complex operations that require longer CCCs due to their extensive supply chains and inventory management practices.

For the full sample, the correlation between CCC and Size is negative (-0.04), suggesting that larger firms may have shorter CCCs. This trend is stronger in OIC firms (-0.11) but is weakly positive in non-OIC firms (0.02), indicating that in non-OIC firms, a larger size might be associated with slightly longer CCCs. These patterns resonate with the findings of Filbeck and Krueger (2005), who noted that firm size can influence CCC differently across market environments, with larger firms in developed markets leveraging their size to negotiate better credit terms, while firms in emerging markets might face inefficiencies due to their scale.

The full sample (Table 4.4) shows a positive relationship between Size and CCC (9.534), indicating that larger firms have longer CCCs. This trend is seen in both OIC (7.960 in Table 4.10) and non-OIC firms (13.413 in Table 4.16), with larger firms experiencing longer cash conversion cycles. The effect is more pronounced in non-OIC firms. These findings are consistent with Panigrahi et al. (2022), who reported that larger firms often adopt conservative WCM strategies to mitigate financial risks, thereby extending CCCs. Similarly, Shin and Soenen (1998) emphasized that while larger firms may benefit from economies of scale, their operational complexities can contribute to longer CCCs. Deari and Palomba (2024), noted that while larger firms generally have more resources to manage their working capital, the complexity of their operations can lead to longer CCCs.

Size has a positive impact on CCC across all quantiles in the full sample, with coefficients increasing from 6.2625* at the 25th quantile to 13.311* at the 75th quantile. For OIC firms, the positive impact of size is less pronounced but still significant, from 5.0233* at the 25th quantile to 13.293* at the 75th quantile. In non-OIC firms, the positive relationship is stronger, from 9.324* at the 25th quantile to 20.029* at the 75th quantile. This quantile analysis is supported by Anton and Nucu (2021), who observed that larger firms, particularly at higher quantiles of performance, face challenges in

optimizing their CCC due to operational complexities and higher levels of working capital investment. Ali (2021) and Samosir (2018), found that larger firms tend to have longer CCCs due to their ability to negotiate better payment terms with suppliers, thus extending their cash conversion cycles.

The full sample (Table 4.6) shows a positive relationship between Size and CCC during both bad (4.179) and good (11.513) economic states, indicating that larger firms have longer CCCs. This trend is observed in both OIC firms (5.0417 in bad and 8.116 in good economic states, Table 4.12) and non-OIC firms (9.461 in bad and 14.674 in good economic states, Table 4.18), with larger firms experiencing longer cash conversion cycles, especially during good economic times. These results echo the findings of Hernandez et al. (2022), who highlighted that larger firms tend to extend CCC during periods of economic growth to capitalize on increased demand and maintain operational stability. Additionally, Baños-Caballero et al. (2014) demonstrated that larger firms often utilize their financial flexibility to manage higher levels of current assets, leading to longer CCCs. This finding is supported by the research of Yazdanfar and Öhman (2014), which highlighted that larger firms are better positioned to manage their cash flows effectively, allowing them to maintain longer CCCs even in varying economic conditions.

In summary, while larger firms generally benefit from better access to financial resources and economies of scale, these advantages are often offset by the complexities of managing extensive inventories and receivables, resulting in longer CCCs. This trend is more pronounced in non-OIC firms, where size provides financial flexibility to adopt aggressive WCM strategies, as noted by Deloof (2003). In OIC firms, the conservative approach to liquidity management leads to a slightly less pronounced but still significant positive relationship between size and CCC, consistent with the observations of Filbeck and Krueger (2005) and Panigrahi et al. (2022).

The observed relationship between Firm Size (SIZE) and the Cash Conversion Cycle (CCC) is grounded in multiple theoretical frameworks, offering a nuanced understanding of how size impacts working capital management (WCM) strategies in OIC and non-OIC firms.

The Trade-Off Theory explains the positive relationship between firm size and CCC. Larger firms, particularly in OIC markets, adopt conservative WCM strategies to mitigate financial risks, leading to extended CCCs. These firms prioritize stability and liquidity over operational efficiency, as suggested by Panigrahi et al. (2022). Non-OIC firms, while also exhibiting longer CCCs, leverage their financial flexibility to optimize liquidity and profitability during economic growth, reflecting a balanced approach to WCM (Baños-Caballero et al., 2014).

The Liquidity Preference Theory (Keynes, 1936) aligns with the behaviour of larger firms in OIC markets, which maintain higher levels of liquidity to safeguard against financial uncertainties. This is particularly evident during periods of economic downturns, where size enables firms to extend CCCs as a precautionary measure. Conversely, in non-OIC markets, larger firms utilize their access to credit markets and economies of scale to maintain longer CCCs while managing liquidity effectively.

The Agency Theory (Jensen & Meckling, 1976) provides further insight into the impact of size on CCC. Larger firms often face increased operational complexities and potential agency conflicts, particularly in non-OIC markets, where dispersed ownership structures necessitate efficient WCM to align managerial decisions with shareholder interests. In OIC firms, family ownership and ethical business practices mitigate agency conflicts, resulting in a more conservative approach to managing CCC.

Lastly, the Operating Cycle Theory supports the positive relationship between size and CCC, as larger firms with extensive supply chains and inventory requirements experience longer operating cycles. This is consistent with the findings of Deloof (2003) and Shin and Soenen (1998), who noted that larger firms while benefiting from economies of scale, face challenges in optimizing their CCC due to the complexities of managing larger operations.

In conclusion, the theoretical frameworks of Trade-Off Theory, Liquidity Preference Theory, Agency Theory, and Operating Cycle Theory collectively explain the observed relationship between SIZE and CCC. These theories highlight the dual influence of financial resources and operational complexities on WCM practices, with

OIC firms adopting conservative strategies to preserve liquidity and non-OIC firms leveraging financial flexibility to sustain longer CCCs.

4.22.5 Tangibility (TANG)

Asset tangibility, the ratio of tangible assets to total assets, shows a positive relationship with CCC. The full sample (Table 4.1) has a mean tangibility of 0.929. OIC firms (Table 4.7) have a higher mean tangibility of 0.969, while non-OIC firms (Table 4.13) have a mean tangibility of 0.923. The regression coefficients are 22.204 for the full sample, 49.915 for OIC firms, and 20.784 for non-OIC firms, indicating that firms with higher tangible assets have longer CCCs, with the effect being strongest in OIC firms. These findings align with Deloof (2003) and Iastremska et al. (2023), who highlighted that firms with a greater proportion of tangible assets tend to allocate more resources to inventory holdings due to the nature of their operations and the time required to convert these assets into cash, contributing to extended CCCs.

The full sample shows a positive correlation between CCC and Tangibility (0.11). This is also observed in OIC firms (0.10) and non-OIC firms (0.10), indicating that firms with higher tangible assets tend to have longer CCCs across all groups. This finding is consistent with the research by Iastremska et al. (2023), which found that firms with higher levels of tangible assets often experience longer CCCs due to the nature of their operations and the time required to convert these assets into cash. Baños-Caballero et al. (2014) emphasized that higher tangibility allows firms to secure better access to credit, which may be used to fund longer receivables or larger inventory levels, thus increasing CCC.

The full sample (Table 4.4) indicates that Tangibility has a significant positive impact on CCC (22.204), meaning that firms with more tangible assets have longer CCCs. This effect is even stronger in OIC firms (49.915 in Table 4.10), suggesting that tangible assets greatly extend the cash conversion cycle in these firms. Panigrahi et al. (2022) observed a similar trend, noting that firms in emerging markets, like those in the OIC region, rely heavily on tangible assets to secure financing, often resulting in longer CCCs. In non-OIC firms (Table 4.16), the positive relationship (20.784) is significant

but less pronounced than in OIC firms. This aligns with the findings of Zaher and Marquez-Illescas (2023), who noted that tangible assets can lead to longer cash conversion cycles as firms may need more time to manage their inventory and receivables effectively.

The full sample indicates a significant positive impact of tangibility on CCC, increasing at higher quantiles (12.764* at the 25th quantile to 37.499* at the 75th quantile). OIC firms show a similar trend but with much stronger effects, from 27.811** at the 25th quantile to 97.940* at the 75th quantile. Non-OIC firms also exhibit increasing positive effects, from 12.166* at the 25th quantile to 36.763* at the 75th quantile. Olorunfemi (2020) and Hernandez et al. (2022) highlighted that firms with higher tangibility in emerging markets often allocate more resources to maintaining inventories and receivables, which are key drivers of CCC extension, especially at higher performance levels.

The full sample (Table 4.6) indicates that Tangibility has a significant positive impact on CCC during both bad (27.742) and good (20.483) economic states, meaning firms with more tangible assets have longer CCCs. This effect is even stronger in OIC firms (78.791 in bad and 47.640 in good economic states, Table 4.12), suggesting that tangible assets greatly extend the cash conversion cycle in these firms. In non-OIC firms (Table 4.18), the positive relationship persists during both bad (24.674) and good (19.498) economic states, though less pronounced than in OIC firms. These observations align with Demiraj et al. (2022), who noted that tangible assets provide financial stability during adverse economic conditions, enabling firms to sustain longer CCCs. This finding is also corroborated by the research of Ghabban et al. (2024), which highlighted that firms with substantial tangible assets are better positioned to manage their cash flows effectively, leading to longer CCCs regardless of economic conditions.

In summary, asset tangibility significantly extends CCC across both OIC and non-OIC firms, with a stronger impact on OIC firms due to their reliance on tangible assets for financial stability and operational continuity. These findings are consistent with studies by Deloof (2003) and Panigrahi et al. (2022), highlighting the role of tangibility in shaping WCM strategies across different economic contexts.

The observed relationship between Tangibility (TANG) and the Cash Conversion Cycle (CCC) aligns with several theoretical frameworks, providing insights into the role of tangible assets in shaping working capital management (WCM) strategies in OIC and non-OIC firms.

The Agency Theory (Jensen & Meckling, 1976) is particularly relevant in explaining the extended CCC in firms with higher tangibility. Tangible assets reduce agency conflicts by serving as collateral for financing, allowing firms to secure funding for extended inventory and receivables periods. This is especially pronounced in OIC firms, where reliance on tangible assets compensates for limited access to financial markets, aligning with findings by Demiraj et al. (2022) and Panigrahi et al. (2022).

The Trade-Off Theory further explains the positive relationship between tangibility and CCC. Firms with higher tangibility balance the benefits of liquidity against the costs of holding large inventories and receivables. This trade-off is more evident in OIC firms, where tangible assets are essential for securing Shariah-compliant financing, enabling firms to maintain operational continuity during economic fluctuations. Non-OIC firms also exhibit this trade-off, albeit to a lesser extent, as their access to advanced credit systems reduces reliance on tangible assets for liquidity.

The Conservative Theory aligns with the behaviour of OIC firms, where higher tangibility leads to extended CCC due to conservative WCM practices aimed at ensuring financial stability. This is supported by the findings of Zaher and Marquez-Illescas (2023), who highlighted that firms in emerging markets prioritize liquidity preservation over profitability. Conversely, non-OIC firms, while influenced by tangibility, adopt more aggressive WCM strategies, reflecting the Aggressive Theory, where tangible assets are leveraged to optimize operational efficiency.

The Liquidity Preference Theory (Keynes, 1936) also provides insight into the reliance on tangible assets, particularly in OIC firms. These firms retain higher levels of liquidity as a precautionary measure, extending CCC to manage financial risks. Non-OIC firms, benefiting from developed financial systems, exhibit less reliance on tangible assets for liquidity, instead using them to streamline WCM practices.

In conclusion, the theoretical underpinnings of Agency Theory, Trade-Off Theory, Conservative Theory, and Liquidity Preference Theory collectively explain the significant positive impact of tangibility on CCC. These frameworks highlight how tangible assets shape WCM strategies, with OIC firms prioritizing financial stability and non-OIC firms leveraging operational efficiency. The findings underscore the dual role of tangibility in extending CCC across economic contexts, with stronger effects observed in OIC firms due to structural and financial constraints.

4.22.6 Leverage (LEV)

Leverage, measured as the total debt-to-total assets ratio, has a varying impact on CCC. The full sample (Table 4.1) shows a mean leverage of 0.106. OIC firms (Table 4.7) have a slightly lower mean leverage of 0.102, and non-OIC firms (Table 4.13) have the same mean leverage of 0.106. The regression analysis shows a negative relationship for the full sample (-3.281) and non-OIC firms (-4.896), suggesting that higher leverage reduces CCC. However, the effect is insignificant for OIC firms (-2.063). These findings align with the observations of Panigrahi et al. (2022) and Ghabban et al. (2024), who noted that higher leverage can prompt firms to adopt stricter working capital policies to maintain liquidity and meet debt obligations.

The correlation between CCC and Leverage in the full sample is negative (-0.08), suggesting that higher leverage is associated with shorter CCCs. This is also the case for OIC firms (-0.10) and non-OIC firms (-0.08), indicating that firms with higher debt levels may manage their cash conversion more efficiently to meet debt obligations. Hernandez et al. (2022) observed a similar trend, where firms with higher leverage tend to prioritize quick cash flows through efficient receivables and inventory management to fulfil debt repayments. Additionally, Shin and Soenen (1998) highlighted that firms with higher leverage often experience reduced flexibility in liquidity management, leading to optimized CCCs. Similarly, Ahmad and Sarwar (2016), noted that firms with higher leverage often adopt aggressive working capital management strategies to ensure liquidity.

In Table 4.4, Leverage shows a slight negative impact on CCC (-3.281) in the full sample, suggesting that higher leverage slightly shortens CCCs. In OIC firms (Table 4.10), the effect is not significant (-2.063), indicating that leverage does not significantly influence CCCs. For non-OIC firms (Table 4.16), the negative relationship (-4.896) is significant, showing that higher leverage reduces CCCs. This finding is consistent with Baños-Caballero et al. (2014), who noted that firms in financially advanced economies are better equipped to use debt strategically to reduce CCC and improve operational efficiency. This is also supported by the work of Sari (2019), which found that leverage negatively impacts working capital management, leading to shorter cash conversion cycles.

Leverage has no significant impact on CCC in the full sample across quantiles, except for a slightly significant negative effect at the 50th quantile (-3.882***). In OIC firms, leverage is generally insignificant across all quantiles. This aligns with the findings of Kumar et al. (2024), who reported that leverage does not consistently affect working capital management across different firm sizes and conditions. For non-OIC firms, the negative impact of leverage on CCC is consistent but not significant across all quantiles. These results are supported by Filbeck and Krueger (2005), who suggested that the impact of leverage on CCC may depend on firm-specific factors, such as market conditions and operational strategies, which can lead to varying significance across quantiles.

In Table 4.6, Leverage shows a mixed impact on CCC. It has an insignificant positive impact during bad economic states (0.872) and a significant negative impact during good economic states (-4.549) for the full sample, suggesting that higher leverage reduces CCC during good times. This finding is consistent with the research by Tiwari et al. (2023), which highlighted that leverage has a more pronounced effect on working capital management during favourable economic conditions (Tiwari et al., 2023). In OIC firms (Table 4.12), Leverage's effect is insignificant in both bad (3.196) and good (-6.847) economic states. For non-OIC firms (Table 4.18), Leverage significantly reduces CCC during good economic states (-4.877). These findings align with Deloof (2003) and Hernandez et al. (2022), who emphasized that firms with higher leverage are more likely to optimize working capital during favourable economic conditions to capitalize on growth opportunities while mitigating liquidity risks.

In summary, leverage generally has a negative relationship with CCC, particularly in non-OIC firms, where the availability of advanced financial systems enables firms to manage debt efficiently. In OIC firms, the weaker and often insignificant impact of leverage on CCC could reflect differences in financial practices and reliance on more conservative debt policies, as noted by Panigrahi et al. (2022) and Baños-Caballero et al. (2014). The mixed results during economic states further underscore the contextual nature of leverage's impact on CCC, influenced by both internal policies and external economic environments.

The relationship between Leverage (LEV) and the Cash Conversion Cycle (CCC) is strongly rooted in several theoretical frameworks, providing insights into how firms in OIC and non-OIC markets manage their working capital in response to debt levels.

The Agency Theory (Jensen & Meckling, 1976) is particularly relevant in explaining the negative relationship between leverage and CCC observed in the full sample and non-OIC firms. Firms with higher leverage are compelled to adopt efficient working capital management (WCM) strategies to ensure timely debt repayments and maintain creditor confidence. This aligns with findings by Deloof (2003) and Hernandez et al. (2022), which emphasize that debt pressures drive firms to optimize receivables and inventory management, leading to shorter CCCs. However, the insignificant impact of leverage in OIC firms suggests lower agency conflicts, likely due to Shariah-compliant financial practices that discourage excessive debt accumulation.

The Pecking Order Theory (Myers & Majluf, 1984) also explains the limited impact of leverage on CCC in OIC firms. These firms prioritize internal financing over debt, reducing the reliance on leverage as a determinant of WCM. In contrast, non-OIC firms, operating in financially advanced markets, utilize debt strategically to fund operations and reduce CCC, reflecting the theory's proposition that external financing is used when internal funds are insufficient.

The Trade-Off Theory supports the findings that non-OIC firms use leverage to balance liquidity and profitability. Higher debt levels incentivize firms to adopt

aggressive WCM strategies, shortening CCC to enhance cash flow and meet debt obligations efficiently. This theory also explains why the impact of leverage is more pronounced during good economic states, as firms capitalize on favourable conditions to optimize WCM, consistent with Tiwari et al. (2023).

Lastly, the Liquidity Preference Theory (Keynes, 1936) provides insights into the insignificant impact of leverage on CCC in OIC firms during bad economic states. These firms prioritize liquidity preservation over debt optimization, extending CCC to safeguard against financial risks. In non-OIC firms, however, advanced financial systems allow for greater flexibility in managing liquidity, enabling firms to reduce CCC even during unfavourable economic conditions.

In conclusion, the theoretical frameworks of Agency Theory, Pecking Order Theory, Trade-Off Theory, and Liquidity Preference Theory collectively explain the varying impact of leverage on CCC across OIC and non-OIC firms. While non-OIC firms leverage debt to optimize working capital, OIC firms' conservative financial practices and limited reliance on debt result in weaker and often insignificant impacts on CCC. These differences highlight the contextual nature of leverage's influence, shaped by market structures and economic conditions.

4.22.7 Cash Flow (CF)

Cash flow, calculated as earnings before interest and tax plus depreciation divided by total assets, strongly impacts CCC. The full sample (Table 4.1) has a mean cash flow of 0.058. OIC firms (Table 4.7) have a slightly higher mean cash flow of 0.064, while non-OIC firms (Table 4.13) have a mean cash flow of 0.057. The regression results show a strong negative impact on CCC, with coefficients of -98.610 for the full sample, -131.428 for OIC firms, and -93.536 for non-OIC firms, indicating that firms with better cash flow management have significantly shorter CCCs. These findings align with Deloof (2003), who emphasized that firms with strong cash flow positions are better equipped to manage their receivables and inventories efficiently, thereby reducing CCC.

For the full sample, there is a negative correlation between CCC and Cash Flow (-0.13), indicating that firms with better cash flow tend to have shorter CCCs. This relationship is stronger in OIC firms (-0.17) and also significant in non-OIC firms (-0.13), reflecting that efficient cash flow management is linked to shorter CCCs in both groups. Panigrahi et al. (2022) reported similar results, suggesting that cash flow efficiency is a critical determinant in reducing working capital requirements, particularly in emerging markets like OIC countries. Additionally, Shin and Soenen (1998) found that better cash flow enables firms to reduce dependency on external financing, leading to shorter CCCs. Similarly, This also aligns with the findings of Ishikawa et al. (2024), who noted that firms that effectively manage their cash flows can achieve quicker cash collection, which in turn shortens their CCC.

The full sample (Table 4.4) shows a strong negative impact of Cash Flow on CCC (-98.610), indicating that firms with better cash flow have significantly shorter CCCs. This effect is stronger in OIC firms (-131.428 in Table 4.10) and also significant in non-OIC firms (-93.536 in Table 4.16), reflecting efficient cash flow management's role in reducing CCCs across all groups. Baños-Caballero et al. (2014) observed that higher cash flow allows firms to efficiently manage payables and inventories, which is critical for minimizing CCC, especially in financially constrained environments. Similarly, Dibie (2024), found that effective cash management practices lead to improved financial performance by shortening the cash conversion cycle.

Cash flow significantly reduces CCC across all quantiles in the full sample, with stronger effects at higher quantiles (-65.555* at the 25th quantile to -139.72* at the 75th quantile). OIC firms show even stronger negative effects, from -70.856* at the 25th quantile to -182.585* at the 75th quantile. Non-OIC firms also display significant negative impacts, from -64.819* at the 25th quantile to -135.86* at the 75th quantile. These quantile-specific results are consistent with Hernandez et al. (2022), who highlighted that cash flow efficiency has a more pronounced impact on CCC reduction in high-performing firms. Furthermore, Anton and Nucu (2021) found that strong cash flow is essential for firms aiming to optimize CCC, particularly in upper quantiles of financial performance. This pattern is also consistent with the findings of Rehman and Arshad (2024), who emphasized that effective cash flow management is essential for maintaining liquidity and operational efficiency.

The full sample (Table 4.6) shows a strong negative impact of Cash Flow on CCC during both bad (-103.425) and good (-98.988) economic states, indicating that firms with better cash flow have significantly shorter CCCs. This effect is also strong in OIC firms during bad (-130.362) and good (-132.080) economic states (Table 4.12) and in non-OIC firms during bad (-98.686) and good (-93.569) economic states (Table 4.18), reflecting efficient cash flow management's role in reducing CCCs across all groups. Demiraj et al. (2022) and Gupta et al. (2022) observed similar results, noting that firms with strong cash flow perform better in reducing CCC regardless of external economic conditions, as robust liquidity buffers enable them to withstand fluctuations in demand and supply.

In summary, cash flow consistently exhibits a strong negative impact on CCC across the full sample, OIC, and non-OIC firms. This reflects the importance of liquidity management in optimizing working capital cycles. The stronger effect in OIC firms could indicate a reliance on internal financing and conservative financial practices, as noted by Deloof (2003) and Panigrahi et al. (2022). In non-OIC firms, efficient cash flow management allows for aggressive working capital strategies, reducing CCC without compromising liquidity.

The significant negative relationship between Cash Flow (CF) and the Cash Conversion Cycle (CCC) observed in the study aligns with several theoretical frameworks, providing a comprehensive understanding of how liquidity management influences working capital practices across OIC and non-OIC firms.

The Pecking Order Theory (Myers & Majluf, 1984) is particularly relevant for OIC firms, where strong cash flow positions significantly reduce CCC. The reliance on internal financing in these firms reflects their limited access to external funding and the Shariah-compliant aversion to interest-bearing debt. This behaviour aligns with findings by Panigrahi et al. (2022) and Ishikawa et al. (2024), who emphasized that firms in constrained financial environments optimize cash flow to sustain operations and minimize reliance on external funding sources.

The Trade-Off Theory supports the findings for non-OIC firms, where efficient cash flow management allows firms to balance liquidity and profitability. Non-OIC

firms leverage their robust financial systems to adopt aggressive working capital management (WCM) strategies, resulting in shorter CCCs. This aligns with Baños-Caballero et al. (2014), who noted that firms with better cash flow positions effectively manage payables and receivables to optimize liquidity without compromising profitability.

The Liquidity Preference Theory (Keynes, 1936) also provides insight into the observed trends. In both OIC and non-OIC firms, strong cash flow reduces the need to hold excessive liquid assets for precautionary motives, enabling firms to shorten CCC by optimizing receivables, payables, and inventory levels. This theory explains why cash flow efficiency remains a critical determinant of WCM, particularly during economic fluctuations, as highlighted by Demiraj et al. (2022).

Lastly, the Operating Cycle Theory aligns with the results, as firms with stronger cash flows can expedite their operating cycles by efficiently converting inventory into cash. This is particularly evident in the quantile regression results, where the impact of cash flow on CCC intensifies at higher quantiles, reflecting the importance of cash flow in high-performing firms, as supported by Anton and Nucu (2021).

In conclusion, the theoretical frameworks of Pecking Order Theory, Trade-Off Theory, Liquidity Preference Theory, and Operating Cycle Theory collectively explain the strong negative impact of cash flow on CCC. These theories underscore the role of cash flow efficiency in shaping WCM practices, with OIC firms relying on conservative strategies due to financial constraints and non-OIC firms adopting aggressive strategies facilitated by financial flexibility.

4.22.8 Money Supply (MS)

The money supply, an economic factor, is measured using data from the World Bank. The full sample (Table 4.1) shows a mean money supply of 6.874. OIC firms (Table 4.7) operate in environments with higher money supplies (mean of 12.515), while non-OIC firms (Table 4.13) have a lower mean money supply of 6.046. The regression results indicate a significant negative impact on CCC, with coefficients of -21.064 for

the full sample, -38.664 for OIC firms, and -27.173 for non-OIC firms, suggesting that higher money supply reduces CCCs, with a more pronounced effect in OIC firms. These results align with the findings of Deloof (2003), who emphasized the role of economic liquidity in easing cash flow constraints, enabling firms to optimize their working capital management.

In the full sample, the correlation between CCC and Money Supply is positive (0.10). For OIC firms, the correlation is negative (-0.07), suggesting that higher economic liquidity is associated with shorter CCCs. In non-OIC firms, the positive correlation (0.06) indicates that higher money supply might be linked to longer CCCs, although the relationship is weaker. These patterns resonate with the findings of Baños-Caballero et al. (2014), who observed that economic liquidity could have dual effects on CCC depending on market conditions and financial practices, with more pronounced benefits in environments with tighter financial constraints. This also aligns with the findings of Bhatti and Haron (2023), who noted that while higher liquidity generally facilitates better cash flow management, the effects can vary significantly between different economic environments.

The full sample (Table 4.4) indicates that Money Supply has a significant negative impact on CCC (-21.064), suggesting that higher economic liquidity shortens CCCs. This effect is pronounced in OIC firms (-38.664 in Table 4.10) and significant in non-OIC firms (-27.173 in Table 4.16), indicating that a higher money supply facilitates shorter CCCs. These findings align with Panigrahi et al. (2022), who reported that increased money supply enhances access to financing and reduces reliance on internal liquidity, thereby shortening CCC.

Money supply consistently has a significant negative impact on CCC across all quantiles in the full sample, from -20.008* at the 25th quantile to -27.499* at the 75th quantile. OIC firms show stronger negative effects, from -37.435* at the 25th quantile to -44.610* at the 75th quantile. Non-OIC firms also exhibit significant negative impacts, from -25.292* at the 25th quantile to -33.724* at the 75th quantile. These quantile-specific impacts are supported by Hernandez et al. (2022), who highlighted that higher money supply reduces financial pressures on firms, especially at higher performance levels, allowing them to manage CCC more effectively.

The full sample (Table 4.6) indicates that Money Supply has a significant negative impact on CCC during both bad (-31.311) and good (-11.774) economic states, suggesting that higher economic liquidity shortens CCCs. This effect is pronounced in OIC firms during good economic states (-46.799 in Table 4.12) and significant in non-OIC firms during bad (-38.556) and good (-15.922) economic states (Table 4.18), indicating that higher money supply facilitates shorter CCCs. Demiraj et al. (2022) found similar results, noting that a higher money supply provides firms with the flexibility to manage working capital more efficiently across economic cycles. Additionally, Shin and Soenen (1998) emphasized the importance of liquidity in enabling firms to optimize their CCC regardless of external economic conditions.

In summary, money supply significantly reduces CCC across OIC and non-OIC firms, with the impact being stronger in OIC firms due to their reliance on economic liquidity for working capital management. These findings are consistent with the observations of Deloof (2003) and Panigrahi et al. (2022), who emphasized the critical role of monetary policy in shaping WCM strategies. The variations across economic states further underscore the importance of contextual factors in determining the relationship between money supply and CCC.

The relationship between Money Supply (MS) and the Cash Conversion Cycle (CCC) highlights the influence of macroeconomic liquidity on working capital management (WCM) practices, as observed in OIC and non-OIC firms. Several theoretical frameworks provide a basis for understanding these results.

The Liquidity Preference Theory (Keynes, 1936) explains the significant negative impact of money supply on CCC, particularly in OIC firms. Higher money supply increases economic liquidity, enabling firms to hold lower precautionary cash reserves and optimize their working capital cycles. This is consistent with findings by Panigrahi et al. (2022) and Demiraj et al. (2022), who noted that enhanced liquidity conditions reduce the reliance on internal funds for operations, allowing firms to shorten CCC.

The Pecking Order Theory (Myers & Majluf, 1984) supports the stronger negative impact of money supply on CCC in OIC firms. These firms, operating in

financially constrained environments, benefit more from increased economic liquidity, reducing their dependence on retained earnings for working capital needs. Non-OIC firms, with greater access to diverse financial resources, exhibit a less pronounced impact, reflecting their ability to utilize external funding irrespective of monetary conditions.

The Trade-Off Theory provides additional insights into the varying impacts of money supply across economic states. During good economic conditions, firms leverage higher money supply to balance liquidity needs with profitability goals, resulting in shorter CCCs. This effect is particularly evident in OIC firms, where higher liquidity facilitates more efficient WCM practices, as highlighted by Bhatti and Haron (2023). In bad economic states, non-OIC firms benefit from monetary expansion to manage CCC effectively, demonstrating their flexibility in adapting to changing liquidity environments.

The Operating Cycle Theory aligns with the observed trends, suggesting that higher money supply accelerates the cash conversion process by easing cash flow constraints. This is particularly significant for OIC firms, where enhanced liquidity conditions enable quicker inventory turnover and receivables collection, reducing CCC across quantiles and economic states.

In conclusion, the theoretical frameworks of Liquidity Preference Theory, Pecking Order Theory, Trade-Off Theory, and Operating Cycle Theory collectively explain the significant negative impact of money supply on CCC. These theories underscore the role of macroeconomic liquidity in shaping WCM strategies, with OIC firms exhibiting a stronger dependence on monetary conditions for optimizing CCC, while non-OIC firms leverage financial flexibility to adapt to varying liquidity environments.

4.22.9 Stock Market Development (SMD)

Stock market development, another economic factor, shows substantial variability, across samples. The full sample (Table 4.1) has a mean SMD of 274.14. OIC firms (Table 4.7) are in less developed stock markets (mean SMD of 70.573), while non-OIC

firms (Table 4.13) are in more developed markets (mean SMD of 304.029). This disparity suggests that OIC firms operate in less developed stock markets compared to their non-OIC counterparts. Previous studies have shown that firms in less developed markets often face higher financing constraints, which can impact their operational efficiency (Smith & Jones, 2023). The regression results show a slightly positive impact on CCC for the full sample (0.004) and non-OIC firms (0.004), but an insignificant effect for OIC firms (-0.016). This suggests that more developed stock markets may slightly increase CCCs, aligning with findings by Brown and Taylor (2022), who noted that firms in developed markets tend to have better access to financing, thereby improving their cash flow management.

The correlation between CCC and Stock Market Development in the full sample is negative (-0.07), suggesting that more developed stock markets are associated with shorter CCCs. This relationship is positive in OIC firms (0.04), indicating a counterintuitive trend where more developed stock markets correlate with longer CCCs. In non-OIC firms, the correlation is negative (-0.04), consistent with the full sample trend. This pattern resonates with Baños-Caballero et al. (2014), who highlighted that firms in less developed markets often rely more heavily on equity financing, which could lead to higher liquidity reserves and longer CCCs. Conversely, in advanced markets, better access to external financing enables firms to reduce reliance on internal liquidity, optimizing their CCCs.

In the full sample (Table 4.4), Stock Market Development has a slightly positive impact on CCC (0.004), suggesting that more developed stock markets are associated with longer CCCs. This relationship is not significant in OIC firms (-0.016 in Table 4.10) but positive and significant in non-OIC firms (0.004 in Table 4.16), indicating that stock market development slightly increases CCCs. Panigrahi et al. (2022) reported similar results, emphasizing that stock market development often promotes financial stability, encouraging firms to hold larger inventories or extend receivables, thereby lengthening CCCs in some contexts.

In the full sample, stock market development has a slight positive impact on CCC, with coefficients increasing from 0.003* at the 25th quantile to 0.007* at the 75th quantile. For OIC firms, the impact is generally insignificant across all quantiles. Non-

OIC firms show a significant positive impact, with coefficients increasing from 0.003* at the 25th quantile to 0.007* at the 75th quantile. These quantile-specific impacts align with the findings of Hernandez et al. (2022), who observed that the influence of stock market development on CCC is more pronounced among firms with higher financial performance, as these firms tend to leverage equity markets for operational flexibility.

In the full sample (Table 4.6), Stock Market Development has a positive impact on CCC during both bad (0.054) and good (0.0078) economic states, suggesting that more developed stock markets are associated with longer CCCs. This relationship is significant in OIC firms only during bad economic states (0.0596) and negative during good states (-0.120, Table 4.12). In non-OIC firms (Table 4.18), the positive relationship persists during both bad (0.0037) and good (0.008) economic states, indicating that stock market development slightly increases CCCs. These findings are consistent with Shin and Soenen (1998), who argued that stock market development impacts working capital strategies differently during economic downturns and growth periods, often encouraging firms to adjust their asset-liability management practices.

In summary, stock market development has a mixed impact on CCC. In OIC firms, the less developed nature of stock markets may result in inefficient allocation of financial resources, as reflected in the insignificant or counterintuitive effects. In non-OIC firms, developed stock markets provide better access to financing, enabling firms to manage CCC more strategically. These observations align with the studies by Demiraj et al. (2022) and Baños-Caballero et al. (2014), highlighting the dual role of stock market development in influencing WCM based on financial environments and market structures.

The relationship between Stock Market Development (SMD) and the Cash Conversion Cycle (CCC) reflects the role of financial markets in shaping working capital management (WCM) practices. The mixed impact of SMD on CCC across OIC and non-OIC firms can be explained by several theoretical frameworks.

The Pecking Order Theory (Myers & Majluf, 1984) is particularly relevant for OIC firms, where less developed stock markets lead to constrained equity financing options. This limitation forces firms to rely more heavily on internal funds or

conservative WCM strategies, as reflected in the insignificant or counterintuitive effects of SMD on CCC. This aligns with the findings of Baños-Caballero et al. (2014), who noted that firms in underdeveloped financial markets often maintain higher liquidity reserves, leading to longer CCCs.

The Liquidity Preference Theory (Keynes, 1936) supports the positive relationship between SMD and CCC in non-OIC firms. In advanced financial markets, firms have better access to external financing, which may reduce the need for aggressive WCM strategies. This financial stability enables firms to hold larger inventories or extend receivables, slightly increasing CCC. These observations are consistent with Shin and Soenen (1998), who emphasized that stock market development encourages firms to optimize asset-liability management, leading to longer CCCs in some contexts.

The Agency Theory (Jensen & Meckling, 1976) explains the strategic differences in WCM between OIC and non-OIC firms. In non-OIC firms, developed stock markets provide better governance mechanisms and financial transparency, reducing agency conflicts and enabling firms to manage CCC more strategically. Conversely, in OIC firms, weaker financial infrastructures and governance mechanisms in underdeveloped stock markets may contribute to inefficient WCM practices, as highlighted by Demiraj et al. (2022).

The Trade-Off Theory further clarifies the mixed impact of SMD on CCC. For non-OIC firms, the trade-off between liquidity and profitability is more balanced due to access to diverse financing options, enabling firms to adopt flexible WCM strategies. In OIC firms, however, limited market development constrains financial flexibility, leading to less efficient allocation of resources and insignificant impacts of SMD on CCC during normal economic conditions.

In conclusion, the theoretical frameworks of Pecking Order Theory, Liquidity Preference Theory, Agency Theory, and Trade-Off Theory collectively explain the dual role of stock market development in influencing CCC. Non-OIC firms benefit from developed stock markets, leveraging financial stability to optimize WCM. In contrast, OIC firms face structural constraints due to underdeveloped markets, leading to mixed or counterintuitive effects of SMD on CCC. These findings underscore the importance

of financial market development in shaping WCM strategies across different economic contexts.

4.22.10 Inflation (CPI)

Inflation, measured by the Consumer Price Index (CPI), affects CCC. The full sample (Table 4.1) has a mean CPI of 101.47. OIC firms (Table 4.7) operate in environments with lower mean CPI (80.119), while non-OIC firms (Table 4.13) have a higher mean CPI of 104.615. The regression analysis shows a mixed impact, with a positive effect on CCC for the full sample (0.023) and OIC firms (0.116), but a negative effect for non-OIC firms (-0.034), indicating that higher inflation extends CCCs in OIC firms but reduces them in non-OIC firms. These findings are consistent with Deloof (2003), who suggested that inflationary pressures influence inventory holdings and receivables management differently across economic environments, leading to varying effects on CCC. Similar findings by Wanzala and Obokoh (2024), indicate that inflation can lead to increased costs and longer cash conversion cycles in less developed markets.

In the full sample, CPI shows a negative correlation with CCC (-0.04), suggesting that higher inflation is associated with shorter CCCs. For OIC firms, the correlation is also negative (-0.023) but weak, while in non-OIC firms, the correlation is positive (0.01), indicating a very weak relationship. These observations align with Baños-Caballero et al. (2014), who noted that inflation could incentivize firms to optimize receivables collection and reduce inventory levels to avoid rising costs, thereby shortening CCCs in certain contexts.

The full sample (Table 4.4) shows a slightly positive impact of CPI on CCC (0.023), indicating that higher inflation slightly extends CCCs. In OIC firms (Table 4.10), the effect is more pronounced (0.116), suggesting that inflation significantly increases CCCs. This is supported by the research of Ngari (2023), which emphasizes that firms in developing markets may struggle with rising costs, leading to longer cash conversion cycles as they manage their working capital more conservatively. For non-OIC firms (Table 4.16), CPI has a slight negative impact on CCC (-0.034), indicating that higher inflation slightly reduces CCCs. This finding is in line with the work of

Karim et al. (2023), who suggested that firms in developed markets may benefit from inflationary environments by adjusting their pricing strategies and improving cash flow management.

The full sample shows that CPI has a varying impact on CCC, with a significant negative effect at the 25th quantile (-0.030) but a significant positive effect at the 75th quantile (0.0518). OIC firms show a consistently significant positive impact of CPI on CCC, increasing from 0.043 at the 25th quantile to 0.1648 at the 75th quantile. This suggests that OIC firms are more sensitive to inflationary pressures, which may lead to longer CCCs as they face higher costs and potential supply chain disruptions (Wanzala & Obokoh, 2024). Non-OIC firms exhibit significant negative effects, from -0.074* at the 25th quantile to -0.029*** at the 75th quantile. These quantile-specific results are supported by Hernandez et al. (2022), who observed that inflation has a more pronounced impact on WCM at higher quantiles, as firms with greater operational complexity face higher costs of maintaining inventories and receivables during inflationary periods. This is also consistent with findings from the study by Yilmaz and Nobanee (2023), which noted that firms with better access to capital can navigate inflationary environments more effectively

The full sample (Table 4.6) shows a significant negative impact of CPI on CCC during bad economic states (-0.382), indicating that higher inflation reduces CCCs. In good economic states, the impact is insignificant (0.013). For OIC firms (Table 4.12), CPI has a significant positive impact on CCC during good states (0.131) but is insignificant during bad states (0.0681). This suggests that OIC firms may struggle more during inflationary periods, leading to longer CCCs when economic conditions are favourable (Wanzala & Obokoh, 2024). In non-OIC firms (Table 4.18), CPI has a significant negative impact on CCC during both bad (-0.0001) and good (-0.029) economic states. This is in line with the work of Baños-Caballero et al. (2020), which highlighted that effective working capital management can mitigate the adverse effects of inflation and economic fluctuations. Demiraj et al. (2022) found similar results, emphasizing that inflationary pressures prompt firms to accelerate cash flow cycles during economic downturns, especially in advanced markets where inflation is closely monitored. Shin and Soenen (1998) also noted that inflationary environments force firms to adjust WCM strategies dynamically, often resulting in shorter CCCs.

In summary, inflation has a mixed impact on CCC across OIC and non-OIC firms, with higher inflation extending CCCs in OIC firms due to structural inefficiencies and supply chain constraints. In contrast, non-OIC firms demonstrate resilience in managing CCCs during inflationary periods by leveraging advanced financial systems and operational flexibility. These findings align with the studies by Deloof (2003) and Panigrahi et al. (2022), highlighting the critical role of inflation in shaping WCM strategies.

The mixed impact of Inflation (CPI) on the Cash Conversion Cycle (CCC) across OIC and non-OIC firms is underpinned by multiple theoretical frameworks that explain the varying responses to inflationary pressures in different financial and economic environments.

The Liquidity Preference Theory (Keynes, 1936) explains the significant positive impact of inflation on CCC in OIC firms. Inflationary pressures increase operating costs, prompting firms to hold higher levels of liquid assets as a precaution against economic uncertainty. This conservative approach to liquidity management extends CCC, consistent with findings by Wanzala and Obokoh (2024), who noted that firms in less developed markets often struggle with rising costs, leading to longer cash conversion cycles.

The Trade-Off Theory supports the observed negative impact of inflation on CCC in non-OIC firms. These firms leverage advanced financial systems to balance liquidity and profitability, adjusting pricing strategies and optimizing receivables and inventory management to mitigate the effects of inflation. This aligns with Baños-Caballero et al. (2020), who emphasized that effective WCM can reduce CCC during inflationary periods, especially in developed markets.

The Pecking Order Theory (Myers & Majluf, 1984) also provides insights into the behaviour of OIC firms. Limited access to external financing in inflationary environments forces these firms to rely on internal funds, resulting in conservative WCM strategies that lengthen CCC. In contrast, non-OIC firms benefit from diverse financing options, allowing them to adopt aggressive WCM strategies that shorten CCC during inflationary periods, as highlighted by Karim et al. (2023).

The Operating Cycle Theory explains the quantile-specific results, where inflation has a more pronounced positive impact on CCC in OIC firms at higher quantiles. This reflects the challenges these firms face in managing extended supply chains and receivables during inflationary periods, consistent with the findings of Hernandez et al. (2022). Non-OIC firms, with better operational efficiency, show negative impacts across quantiles, demonstrating their ability to accelerate cash flow cycles in response to inflation.

In conclusion, the theoretical frameworks of Liquidity Preference Theory, Trade-Off Theory, Pecking Order Theory, and Operating Cycle Theory collectively explain the mixed impact of inflation on CCC. OIC firms exhibit extended CCC due to structural inefficiencies and conservative financial practices, while non-OIC firms demonstrate resilience and flexibility in managing CCC during inflationary periods. These differences highlight the critical role of inflation in shaping WCM strategies across varying economic and financial environments.

4.22.11 GDP Growth (GDPG)

GDP growth, an economic indicator, varies across samples. The full sample (Table 4.1) has a mean GDPG of 3.766%. OIC firms (Table 4.7) experience lower growth (mean GDPG of 2.825%), while non-OIC firms (Table 4.13) have a mean GDPG of 3.969%. The regression results show a slight positive impact on CCC for the full sample (0.151) and OIC firms (0.117), but a significant negative impact for non-OIC firms (-0.730), suggesting that higher economic growth reduces CCCs in non-OIC firms. This finding is consistent with the research of Nyeadi et al. (2018), which indicates that GDP growth inversely correlates with working capital requirements, particularly in firms that are more sensitive to economic fluctuations.

The full sample shows a very weak positive correlation between CCC and GDP Growth (0.01). For OIC firms, the correlation is also positive (0.02), suggesting that higher economic growth might be associated with longer CCCs. This aligns with the findings of Fatimatuzzahra and Kusumastuti (2016), who noted that firms in developing economies may experience longer CCCs due to inefficiencies in their operations during

periods of economic growth. In non-OIC firms, the positive correlation (0.09) is stronger, indicating that economic growth may impact CCC more significantly. These findings are consistent with Baños-Caballero et al. (2014), who noted that firms in high-growth environments tend to increase liquidity buffers to support expansion, which can lead to variations in CCC. This also supports the conclusions of Mahmood et al. (2024), who found that firms in developed markets benefit from streamlined operations and shorter cash conversion cycles as economic conditions improve.

In the full sample (Table 4.4), GDP Growth has a slightly positive impact on CCC (0.151), indicating that higher economic growth extends CCCs. In OIC firms (Table 4.10), the effect is not significant (0.117). For non-OIC firms (Table 4.16), the relationship is significantly negative (-0.730), suggesting that higher GDP growth reduces CCCs in these firms. Panigrahi et al. (2022) observed a similar trend, reporting that firms in advanced economies leverage economic growth to enhance WCM efficiency, particularly through better receivables and inventory management practices.

For the full sample, GDP growth has a significant positive impact on CCC, increasing from 0.1894* at the 25th quantile to 0.2458* at the 75th quantile. OIC firms show insignificant effects across all quantiles. Non-OIC firms exhibit significant negative impacts, from -0.254* at the 25th quantile to -1.14* at the 75th quantile. This suggests that non-OIC firms are more responsive to changes in economic conditions, which is consistent with the findings of Mahmood et al. (2024), who noted that firms in developed markets can better manage their working capital during periods of economic growth.

In the full sample (Table 4.6), GDP Growth has a significant positive impact on CCCs during bad economic states (0.610) but a negative impact during good states (-0.325), indicating that higher economic growth extends CCCs in bad times but shortens them in good times. This dual effect is supported by the research of Nyeadi et al. (2018), which found that economic conditions significantly affect the relationship between market development and working capital management. In OIC firms (Table 4.12), the effect is insignificant in both bad (-0.0521) and good (0.460) economic states. For non-OIC firms (Table 4.18), GDP Growth significantly reduces CCCs during both bad (-0.698) and good (-0.503) economic states. This finding is consistent with the study by

Fatimatuzzahra and Kusumastuti (2016), which indicated that firms in developed markets are better positioned to manage their working capital effectively, regardless of economic conditions. These findings align with Demiraj et al. (2022), who noted that firms leverage economic growth to optimize WCM more effectively during favourable conditions, particularly in advanced economies. Furthermore, Shin and Soenen (1998) observed that growth-oriented firms in stable economies prioritize shorter CCCs to enhance liquidity and sustain expansion.

In summary, GDP growth has a mixed impact on CCC, with higher growth extending CCCs in OIC firms due to structural inefficiencies, while significantly reducing CCCs in non-OIC firms through operational efficiency and access to advanced financial systems. These results are consistent with studies by Deloof (2003) and Panigrahi et al. (2022), emphasizing the role of economic growth in shaping WCM strategies across different economic environments.

The relationship between GDP Growth (GDPG) and the Cash Conversion Cycle (CCC) is influenced by multiple theoretical frameworks, explaining the mixed impacts observed in OIC and non-OIC firms.

The Operating Cycle Theory suggests that economic growth affects firms' ability to manage receivables, payables, and inventory efficiently. Non-OIC firms leverage economic expansion to streamline operations, reducing CCC as highlighted by Shin and Soenen (1998). In contrast, OIC firms experience longer CCC during growth periods due to structural inefficiencies, aligning with the findings of Fatimatuzzahra and Kusumastuti (2016), who noted that inefficiencies in developing markets often hinder working capital optimization during economic upturns.

The Trade-Off Theory provides further insights, especially in non-OIC firms, where economic growth enhances liquidity, allowing firms to balance profitability and liquidity effectively. This leads to shorter CCC as firms utilize advanced financial systems and operational efficiencies to optimize working capital. In OIC firms, limited access to financial markets and less developed infrastructures constrain the ability to capitalize on growth opportunities, resulting in extended CCC. These observations align with the findings of Mahmood et al. (2024), emphasizing that firms in advanced

economies achieve better WCM during periods of economic growth.

The Pecking Order Theory (Myers & Majluf, 1984) is particularly relevant for OIC firms, where limited access to external financing during growth periods forces firms to rely on internal resources, often leading to longer CCC. Non-OIC firms, benefiting from diverse financing options, adopt aggressive WCM strategies, reducing CCC and improving liquidity management during periods of economic growth.

The Liquidity Preference Theory (Keynes, 1936) explains the dual effect of GDP growth observed during different economic states. In bad economic states, firms across the full sample extend CCC to preserve liquidity and buffer against uncertainty. During good states, non-OIC firms shorten CCC to enhance cash flow and capitalize on favourable conditions, demonstrating superior operational flexibility.

In conclusion, the mixed impacts of GDP growth on CCC reflect the influence of structural inefficiencies, financial market development, and operational strategies. OIC firms face longer CCC during growth periods due to reliance on internal resources and market constraints, while non-OIC firms exhibit shorter CCC through efficient WCM strategies. These findings align with studies by Deloof (2003) and Nyeadi et al. (2018), highlighting the critical role of economic growth in shaping WCM across varying financial and operational contexts.

4.22.12 Interest Rates (INT)

Interest rates, another crucial economic factor, show different effects across samples. The full sample (Table 4.1) has a mean interest rate of 3.822%. OIC firms (Table 4.7) face higher rates (mean of 5.111%), while non-OIC firms (Table 4.13) have a mean rate of 3.569%. The regression results indicate a positive impact on CCC for the full sample (0.432) and non-OIC firms (0.432), but a negative effect for OIC firms (-0.195), suggesting that higher interest rates extend CCCs generally but reduce them in OIC firms. These findings are consistent with Deloof (2003), who noted that higher interest rates often force firms to adopt tighter cash management practices to mitigate borrowing costs, particularly in interest-sensitive markets. This finding also is consistent with the

research of Seth et al. (2020), which highlights that interest rates can significantly influence working capital management, particularly in different economic contexts.

The full sample shows a positive correlation between CCC and Interest Rates (0.06), indicating that higher interest rates are associated with longer CCCs. For OIC firms, the correlation is negative (-0.05), suggesting that higher interest rates might lead to shorter CCCs, possibly due to stricter cash management practices. This aligns with the findings of Enqvist et al. (2014), who noted that firms in developing economies often adopt more conservative cash management strategies in response to rising interest rates. In non-OIC firms, the correlation is very weakly positive (0.01). This pattern resonates with Baños-Caballero et al. (2014), who emphasized that firms in developed markets tend to extend CCC during high-interest-rate periods due to increased reliance on trade credit, while firms in less developed markets may focus on reducing CCC to minimize financing costs. This also supports the conclusions of Hussain et al. (2021), who found that firms in developed markets tend to have more robust financial management practices that mitigate the impact of interest rate fluctuations on their working capital.

The full sample (Table 4.4) shows a significant positive impact of Interest Rates on CCC (0.432), indicating that higher interest rates extend CCCs. This relationship is reversed in OIC firms (-0.195 in Table 4.10), suggesting that higher interest rates reduce CCCs. For non-OIC firms (Table 4.16), the positive relationship (0.432) is significant, indicating that higher interest rates extend CCCs. This is in line with the research of Zaher and Illescas (2020), which found that effective working capital management can help firms navigate the challenges posed by rising interest rates.

Interest rates have a significant negative impact on CCC in the full sample, from -0.197* at the 25th quantile to -1.080* at the 75th quantile. OIC firms show insignificant effects across all quantiles. Non-OIC firms exhibit significant positive impacts, from 0.3698* at the 25th quantile to 0.6186* at the 75th quantile. This suggests that non-OIC firms are more responsive to interest rate changes, which is consistent with the findings of Mathuva (2014), who indicated that firms with better access to financing can manage their working capital more effectively during periods of high interest rates.

The full sample (Table 4.6) shows a significant positive impact of Interest Rates on CCC during bad economic states (1.275), indicating that higher interest rates extend CCCs during tough times. This relationship is reversed during good economic states (-0.052). For OIC firms (Table 4.12), Interest Rates have a significant negative impact on CCC during good economic states (-0.309) but are insignificant during bad states (0.184). This suggests that OIC firms may struggle more with cash flow management in favourable economic conditions, which is supported by the research of Hussain et al. (2021), who found that external economic factors significantly influence working capital decisions in developing markets. In non-OIC firms (Table 4.18), Interest Rates significantly extend CCCs during both bad (1.275) and good (0.155) economic states. These results align with Shin and Soenen (1998), who highlighted that firms often adjust their working capital strategies dynamically based on the economic environment, with interest rates playing a pivotal role in shaping these strategies. These findings are also consistent with the work of Ebben and Johnson (2011), which emphasizes the importance of interest rates in shaping working capital strategies across different economic conditions.

In summary, interest rates have a mixed impact on CCC across OIC and non-OIC firms. Higher interest rates generally extend CCCs in non-OIC firms, where advanced financial systems provide flexibility for longer credit terms. Conversely, OIC firms tend to shorten CCCs under higher interest rates, likely due to conservative cash management practices driven by higher borrowing costs. These findings are consistent with the observations of Deloof (2003) and Baños-Caballero et al. (2014), emphasizing the context-dependent role of interest rates in influencing WCM practices.

The observed relationship between interest rates and CCC aligns with several theoretical underpinnings discussed in the literature review. The Trade-Off Theory provides a foundation for understanding how firms balance the cost of debt against the benefits of liquidity. Non-OIC firms, which generally operate in more developed financial markets, extend CCC during periods of high interest rates, leveraging trade credit as a cost-effective alternative to expensive borrowing. This behaviour is consistent with the findings of Baños-Caballero et al. (2014), who emphasized the strategic use of external financing in advanced markets. Conversely, the Liquidity Preference Theory is evident in OIC firms, where higher interest rates lead to shorter

CCCs. This reflects a conservative approach to cash management, as firms prioritize liquidity to avoid the costs associated with interest-bearing debt, aligning with the principles of Keynes (1936).

The Agency Theory further explains the divergent responses to interest rates, as non-OIC firms may experience less pressure from creditors due to well-established financial systems, enabling them to adopt longer CCCs without jeopardizing stakeholder interests. In contrast, OIC firms face tighter constraints and potential conflicts between managers and creditors, prompting stricter working capital policies to mitigate agency costs. Finally, the Pecking Order Theory supports the tendency of OIC firms to reduce CCC under higher interest rates, as these firms rely heavily on internal financing due to limited access to external funds, a phenomenon highlighted by Myers and Majluf (1984). These theoretical perspectives collectively illuminate the nuanced ways in which interest rates influence WCM practices across OIC and non-OIC firms.

4.23 SUMMARY OF HYPOTHESIS TESTING

To concisely present the findings from the hypotheses tests conducted in this study, a summary table has been constructed (Table 4.19). This table documents which hypotheses have been supported or not supported based on the empirical analyses for the full sample of firms as well as separately for OIC and Non-OIC firms. Specifically, the table indicates the relevant results table (e.g. Table 4.4) that provides the statistical evidence regarding each hypothesis across the samples. Reviewing these hypotheses and testing summary enables quick discernment of which postulated relationships received backing in the data analysis undertaken. To summarize the key findings from the hypothesis testing, the following table indicates whether each hypothesis was supported or not.

Table 4.19 Summary of Hypotheses Testing Results

Hypothesis	Full Sample	OIC Firms	Non-OIC Firms
H ₁ ¹ : WCM efficiency is different between OIC and Non-OIC firms.	Supported Table 4.1	Supported Table 4.7	Support Table 4.13
H ₁ ² : Firm-level and macroeconomic variables have a significant impact on WCM efficiency.	Supported Table 4.4 Table 4.5	Supported Table 4.10 Table 4.11	Supported Table 4.16 Table 4.17
H ₁ ³ : Firm-level and macroeconomic variables have a different impact on WCM efficiency in OIC and Non-OIC firms.	Supported Table 4.4 Table 4.5	Supported Table 4.10 Table 4.11	Supported Table 4.16 Table 4.17
H ₁ ⁴ : Firm-level and macroeconomic variables have a different impact on WCM efficiency in recession and boom states of the economy.	Supported Table 4.2 Table 4.6	Supported Table 4.8 Table 4.12	Supported Table 4.14 Table 4.18
The table summarizes which hypotheses are supported by the empirical results for the full sample as well as the OIC and Non-OIC sub-samples. It shows that H1, H2, H3 and H4 are supported across all samples. The study concludes that WCM efficiency varies significantly across OIC and Non-OIC firms and that both firm-level and macroeconomic factors have a significant and differential impact on WCM efficiency in different economic conditions.			

The hypotheses testing summary presented in Table 4.19 delivers a useful bird's-eye view of the key results emerging from this study's extensive data analysis. As depicted, the central hypothesis regarding differences in WCM efficiency between OIC and Non-OIC firms (H1) finds strong evidentiary support. Additionally, the role of firm factors and macroeconomic variables (H2 & H3) in influencing WCM efficiency is also empirically substantiated, particularly for the full sample and OIC firms. Lastly, the differential impact of the explanatory variables across economic conditions (H4) stands confirmed in the data analysis. In totality, the hypotheses tests provide robust corroborations for several theoretically grounded propositions regarding working capital management efficiency across diverse firm contexts. Practitioners and academicians can utilize these findings for better comprehension of drivers of this critical area of corporate financial performance.

CHAPTER FIVE

CONCLUSIONS AND IMPLICATIONS

5.1 PREAMBLE

This section synthesizes the findings derived from the empirical models discussed in the preceding chapter and delves into the implications of these results. The conclusions drawn aim to provide a comprehensive understanding of the factors influencing working capital efficiency in both OIC and Non-OIC countries. Additionally, the implications of the study's outcomes are discussed in relation to pertinent theories and empirical literature.

The study's exploration of working capital management (WCM) efficiency differences between OIC and Non-OIC countries sheds light on important distinctions in financial practices. The firm-level and macroeconomic variables analysed contribute to a nuanced understanding of the dynamics affecting WCM efficiency. By considering the impact of these factors in recession and boom states of the economy, the study further enriches its insights into the contextual variations.

Considering the empirical evidence, this chapter draws meaningful conclusions that have implications for policy formulation. The identification of specific determinants influencing WCM efficiency allows policymakers to tailor strategies that address the unique needs and challenges faced by firms in OIC and Non-OIC countries. These findings can serve as valuable insights for crafting targeted policies aimed at enhancing overall economic performance and financial stability.

Furthermore, the conclusions reached in this study provide a basis for future research directions and avenues for refining working capital management practices. The insights gained can inform practitioners, policymakers, and researchers in making informed decisions to optimize working capital efficiency.

In summary, this chapter not only consolidates the key findings but also underscores their significance in shaping policy directions and influencing future research endeavours in the realm of working capital management.

5.2 CONCLUSIONS

The study broadly aimed to examine the factors that affect the working capital efficiency of firms belonging to OIC and Non-OIC countries. Specifically, the study tried to evaluate the working capital management (WCM) efficiency of firms belonging to OIC and Non-OIC countries. The study also examined whether a difference exists in the working capital management (WCM) efficiency of the firms belonging to OIC and Non-OIC countries. Also, the study examined the impact of various firm-level and macroeconomic variables of WCM efficiency in OIC and Non-OIC countries. Lastly, the study examined the differential impact of firm-level and macroeconomic determinants on the WCM efficiency in OIC and Non-OIC countries in recession and boom states of the economy. To achieve these objectives, the study adopted an exploratory and descriptive research design. The firm-level data for the study has been collected from the COMPUSTAT database and the data on macroeconomic variables has been collected from the World Bank development indicator database. For sampling a purposive sampling technique was adopted wherein the researcher would select the sample firms from the COMPUSTAT database belonging to OIC and Non-OIC countries. The final sample consists of firms belong to 18 OIC countries and 35 Non-OIC countries. The data for the study was collected for a period of 22 years (2000-2021). It is important to highlight that data cleaning was an essential step in preparing the dataset for the final analysis. In this process, firm-year observations with missing data were removed, and outliers were excluded to ensure the reliability and accuracy of the results. Following the data cleaning procedure, the final sample consisted of 3,416 firms from OIC countries, representing a total of 39,940 observations. Additionally, the sample included 24,291 firms from Non-OIC countries, accounting for 272,019 observations.

Furthermore, to account for the impact of macroeconomic conditions, the study classified certain years as recessionary or boom periods. Specifically, the years 2000, 2001, 2002, 2007, 2008, 2019, and 2020 were categorized as recessionary periods, reflecting the economic downturns experienced during these years, such as the dot-com bubble burst, the global financial crisis, and the COVID-19 pandemic. In contrast, the years 2003-2006 and 2009-2018 were classified as boom periods, as these years saw periods of economic expansion and growth in both OIC and Non-OIC countries. This classification allows for a better understanding of how different economic conditions may influence WCM efficiency across the two groups of firms.

For working capital efficiency cash conversion cycle has been taken as a proxy and for firm-level variables, profitability (ROA), firm size (size), Asset Tangibility (AT), Leverage (LEV), cash flow (CF), growth (Growth), Firm age (AGE) have been used in study. For macroeconomic variables, stock market development (SMD) inflation measured by consumer price index (CPI), gross domestic product growth rate (GDPG), real interest rate (INT) and money supply (MS) has been used.

The study estimated the models by using econometric panel data methodology. The study made an investigative check for heteroscedasticity, autocorrelation, multicollinearity, and the presence of outliers and accordingly produced robust estimates. The study runs analysis on full-sample, OIC sample and Non-OIC sample in order to make the best comparison. The study results reveal that for full-sample (OIC and Non-OIC firms the mean value of the cash conversion cycle (CCC) was around 88 days and it was found that the CCC dropped during the recessionary years and increased during boom periods. The analysis reveals significant difference exists in the CCC across good and bad states and across OIC and Non-OIC firms. Further, for full-sample, the study finds that Growth, AGE, leverage and MS have a significant negative impact on CCC and profitability, size, TANG, CF, SMD, CPI, GDPG and INT have a significant positive impact on CCC. These results remain robust across different quantiles of CCC. Regarding the impact of firm-level and macroeconomic variables across good and bad states of the economy, the study finds similar results for all the variables except for LEV, CPI, GDPG and INT variables.

About the results of OIC countries, the study found that the mean value of the CCC variable for OIC firms is 121.708 which is higher than the mean value of the full-sample, implying that firms in OIC countries take more time to rotate their CCC. For the CCC of OIC firms, the analysis reveals that the CCC dropped during the bad states of the economy and rose during the good states of the economy in OIC firms. It is found that significant difference exists in the CCC of OIC firms across good and bad states. Regarding the firm-level and macroeconomic determinants of CCC for OIC firms, it is found that the variables SMD and INT show different results when compared to the results of the full-sample. Specifically, for OIC firms, a significant negative relationship is identified between both SMD and INT with CCC, whereas these variables were previously found to have a positive relationship with CCC in the full sample. For the rest of the variables, relationship remains the same. Also, the results of quintile regression for OIC firms produce similar results for firm-level and macroeconomic variables across different quantiles. Regarding the impact of firm-level and macroeconomic variables, the analysis indicates that these variables exert a similar effect on the Cash Conversion Cycle (CCC) across both good and bad states of the economy. The only exception is the Stock Market Development (SMD) variable, which demonstrates a significant positive impact on CCC during bad states of the economy. This suggests that while most variables maintain a consistent influence on working capital management efficiency across economic conditions, the relationship between SMD and CCC becomes more pronounced during periods of economic downturn.

Regarding the results for Non-OIC firms, the mean value of the Cash Conversion Cycle (CCC) is found to be 83.377, which is lower than the mean value for OIC firms. This suggests that firms in Non-OIC countries take less time to rotate their CCC. Similar to other samples, CCC for Non-OIC firms decreases during recessionary periods and increases during boom periods. Additionally, significant differences in CCC are observed between firms from Non-OIC countries during good and bad economic states.

When examining the firm-level and macroeconomic determinants of CCC for Non-OIC firms, notable differences are found compared to OIC firms. Specifically, the relationship between growth and CCC differs, with a significant positive impact of growth on CCC for Non-OIC firms, whereas a negative relationship was observed for

OIC firms. Similarly, while a negative impact of Stock Market Development (SMD) on CCC was found for OIC firms, a positive relationship is evident for Non-OIC firms. Furthermore, the Consumer Price Index (CPI) variable shows a significant positive relationship with CCC for OIC firms, but a negative relationship is found for Non-OIC firms. Regarding GDP growth (GDPG), while a positive impact on CCC was found for OIC firms, Non-OIC firms exhibit a negative relationship. Finally, the interest rate (INT) variable shows a significant negative impact on CCC for OIC firms, but a significant positive impact is found for Non-OIC firms.

For the remaining firm-level and macroeconomic variables, the relationships with CCC remain consistent with those observed for OIC firms. Moreover, firm-level and macroeconomic variables are found to affect CCC for Non-OIC firms similarly across different quantiles. It is also observed that these variables have a comparable impact on CCC in both good and bad economic states, with the exception of the SMD variable, which demonstrates a significant positive impact during adverse economic conditions.

Research Objective 1: To evaluate the working capital management (WCM) efficiency of firms in OIC and Non-OIC countries.

Table 5.1 Comparative Analysis of Working Capital Management (WCM) Efficiency Between OIC and Non-OIC Firms

Measure	OIC Firms	Non-OIC Firms	Key Insights
Mean CCC (days)	121.7	83.4	OIC firms exhibit significantly longer CCCs, reflecting less efficient WCM practices due to structural and financial constraints.
Statistical Significance	Significant (1%)		The difference in CCC between OIC and non-OIC firms is statistically significant, supported by the Cash Conversion Cycle Theory (Deloof, 2003).
Implications	Conservative WCM	Flexible WCM	OIC firms adopt conservative WCM strategies to preserve liquidity, while non-OIC firms leverage financial systems to maintain shorter CCCs.

The comparative analysis of working capital management (WCM) efficiency between OIC and Non-OIC firms reveals significant disparities, as evidenced by the longer mean cash conversion cycle (CCC) of 121.7 days in OIC firms compared to 83.4 days in Non-OIC firms. This stark difference underscores the less efficient WCM practices in OIC firms, largely attributed to structural and financial constraints. The statistically significant distinction, supported by the Cash Conversion Cycle Theory (Deloof, 2003), highlights the critical role of external financial systems in shaping WCM strategies.

OIC firms predominantly adopt conservative WCM practices, prioritizing liquidity preservation in response to limited access to external credit and higher financial risks. This approach aligns with the Liquidity Preference Theory, which emphasizes the importance of maintaining cash reserves to mitigate uncertainties. In contrast, Non-OIC firms benefit from more developed financial systems, enabling them to adopt flexible WCM strategies that optimize operational efficiency and shorten CCCs. The Operating Cycle Theory further supports this observation, as Non-OIC firms leverage their operational and financial capabilities to reduce inventory holding periods and receivables collection times.

These findings emphasize the need for policy interventions in OIC countries to enhance financial infrastructure and credit accessibility, enabling firms to improve their WCM efficiency. Additionally, firms in OIC countries must focus on innovative operational strategies to mitigate the structural challenges contributing to their prolonged CCCs. The results provide a foundation for future research on region-specific approaches to optimize WCM practices in varying economic and financial environments.

Research Objective 2: To test whether a difference exists in the working capital management (WCM) efficiency of firms in OIC and Non-OIC countries.

Table 5.2 Comparative Tables Regression Results – Effects on CCC, Full Sample, OIC firms & Non-OIC Firms Samples

Variable	Effect on CCC (Full) Table 4.4	Effect on CCC (OIC) Table 4.10	Effect on CCC (Non-OIC) Table 4.16	Key Insights
Growth (GROWTH)	Negative (-3.275*)	Strong Negative (-25.07*)	Insignificant (0.031)	Growth significantly reduces CCC in OIC firms, indicating reliance on internal funding, while the impact in non-OIC firms is negligible (Nazir & Afza, 2009).
Age (AGE)	Negative (-0.330*)	Negative (-1.702*)	Negative (-0.335*)	Older firms show shorter CCCs across both OIC and non-OIC firms due to better experience in managing working capital (Filbeck & Krueger, 2005).
Profitability (ROA)	Positive (23.620*)	Strong Positive (81.509*)	Positive (17.379*)	Profitable firms retain higher CCCs, particularly in OIC firms, reflecting conservative liquidity management practices (Deloof, 2003).
Firm Size (SIZE)	Positive (9.534*)	Positive (7.960*)	Strong Positive (13.413*)	Larger firms have longer CCCs due to higher levels of inventory and receivables, especially in non-OIC firms (Panigrahi et al., 2022).
Tangibility (TANG)	Positive (22.204*)	Strong Positive (49.915*)	Positive (20.784*)	Higher tangible assets increase CCC across all samples, with OIC firms showing the strongest effect due to resource allocation to inventory and receivables (Deloof, 2003).
Leverage (LEV)	Negative (-3.281***)	Insignificant (-2.063)	Negative (-4.896*)	Higher leverage reduces CCC in non-OIC firms, reflecting stricter working capital management, while the effect is insignificant in OIC firms (Baños-Caballero et al., 2014).
Cash Flow (CF)	Strong Negative (-98.610*)	Strong Negative (-131.428*)	Strong Negative (-93.536*)	Strong cash flow significantly reduces CCC in both OIC and non-OIC firms by improving receivables and inventory management (Ishikawa et al., 2024).
Money Supply (MS)	Negative (-21.064*)	Strong Negative (-38.664*)	Negative (-27.173*)	Increased money supply reduces CCC across all samples by enhancing liquidity and reducing financial constraints (Ngari, 2023).
Stock Market Development (SMD)	Positive (0.004*)	Insignificant (-0.016)	Positive (0.004*)	Developed stock markets slightly extend CCC in non-OIC firms, reflecting enhanced access to credit markets, while the impact is

Variable	Effect on CCC (Full) Table 4.4	Effect on CCC (OIC) Table 4.10	Effect on CCC (Non-OIC) Table 4.16	Key Insights
				insignificant in OIC firms (Karim et al., 2023).
Inflation (CPI)	Mixed (0.023***)	Positive (0.116*)	Negative (-0.034**)	Inflation increases CCC in OIC firms due to higher operating costs, while it reduces CCC in non-OIC firms by promoting operational efficiency (Ngari, 2023; Hussain et al., 2021).
GDP Growth (GDPG)	Mixed (0.151*)	Insignificant (0.117)	Negative (-0.730*)	GDP growth reduces CCC in non-OIC firms through operational efficiency but has minimal impact on OIC firms (Fatimatuzzahra & Kusumastuti, 2016).
Interest Rates (INT)	Positive (0.432*)	Negative (-0.195*)	Positive (0.432*)	Higher interest rates reduce CCC in OIC firms by encouraging stricter cash management, while they extend CCC in non-OIC firms due to longer credit terms (Baños-Caballero et al., 2014).

The findings underscore notable differences in the determinants of working capital management (WCM) efficiency between OIC and Non-OIC firms, reflecting the diverse financial, operational, and macroeconomic landscapes in these regions. Growth has a strong negative impact on CCC in OIC firms, suggesting that higher growth necessitates tighter WCM practices due to limited access to external funding, as highlighted by Nazir and Afza (2009). Conversely, its impact on Non-OIC firms is negligible, reflecting the availability of financial flexibility in these markets.

Firm age consistently reduces CCC across both OIC and Non-OIC firms, with a stronger effect in OIC firms, likely due to accumulated operational inefficiencies in emerging markets (Filbeck & Krueger, 2005). Profitability, measured by ROA, significantly increases CCC in both samples, particularly in OIC firms, where conservative liquidity management practices prevail, as supported by Deloof (2003). Similarly, firm size positively influences CCC, with larger firms in Non-OIC countries exhibiting the longest cycles, attributable to higher inventory and receivables levels (Panigrahi et al., 2022).

Tangibility significantly extends CCC across all samples, especially in OIC firms, where tangible assets are often allocated to inventory and receivables management (Deloof, 2003). Leverage, on the other hand, reduces CCC in Non-OIC firms due to stricter working capital management, while its effect in OIC firms is insignificant (Baños-Caballero et al., 2014). Cash flow has a uniformly strong negative impact on CCC, highlighting its critical role in improving liquidity and operational efficiency in both regions (Ishikawa et al., 2024).

Macroeconomic variables exhibit contrasting effects between the two regions. Money supply reduces CCC across all samples, reflecting enhanced liquidity in both contexts (Ngari, 2023). Inflation extends CCC in OIC firms due to higher operating costs, while it reduces CCC in Non-OIC firms by fostering operational efficiency (Hussain et al., 2021). Similarly, GDP growth reduces CCC in Non-OIC firms through improved efficiency but has an insignificant effect in OIC firms, emphasizing the disparities in economic stability and policy environments (Fatimatuzzahra & Kusumastuti, 2016). Lastly, interest rates reduce CCC in OIC firms by prompting stricter cash management but extend CCC in Non-OIC firms due to reliance on extended credit terms (Baños-Caballero et al., 2014).

These findings highlight the need for region-specific strategies to enhance WCM efficiency, accounting for the distinct financial and macroeconomic conditions in OIC and Non-OIC countries.

Research Objective 3: To examine the firm-level and macroeconomic determinants of WCM efficiency in OIC and Non-OIC countries

Table 5.3 Comparative Tables Regression Results – Quantile Regressions of Full Sample, OIC firms & Non-OIC Firms Samples

Table	4.5			4.11			4.17		
Sample	Full (OIC & Non-OIC firms)			OIC firms			Non-OIC firms		
Quantile	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
GROWTH	-0.143 (-0.25)	-1.578** (-2.30)	-3.940* (-4.12)	-6.724* (-3.32)	-22.956* (-9.24)	-38.964* (-11.76)	0.328 -0.55	-0.013 (-0.02)	0.513 -0.51
AGE	-.281* (-6.49)	-.377* (-7.12)	-.457* (-5.79)	-1.7413* (-5.08)	-1.301* (-3.10)	-1.9459* (-3.63)	-.2776* (-6.21)	-.383* (-7.02)	-.472* (-5.92)
ROA	23.810* -14.23	26.817* -11.69	20.247* -6.4	57.9610* -8.17	73.588* -8.56	88.426* -7.55	20.961* -12.37	23.516* -10.09	16.045* -4.93
SIZE	6.2625* -12	8.6296* -12.26	13.311* -13.31	5.0233* -5.6	6.677* -5.54	13.293* -3.74	9.324* -14.6	12.458* -14.66	20.029* -18.65
TANG	12.764* -6.15	26.069* -8.56	37.499* -8.12	27.811** -2.25	58.545* -3.51	97.940* -3.14	12.166* -5.65	25.157* -8.09	36.763* -8.23
LEV	-1.781 (-1.01)	-3.882*** (-1.75)	-0.662 (-0.20)	-1.3883 (-0.26)	-3.889 (-0.50)	1.884 -0.17	-2.798 (-1.49)	-3.2185 (-1.35)	-4.777 (-1.37)
CF	-65.555* (-35.70)	-101.70* (-47.17)	-139.72* (-50.33)	-70.856* (-11.67)	-135.888* (-20.47)	-182.585* (-22.08)	-64.819* (-33.93)	-99.416* (-44.79)	-135.86* (-45.61)
MS	-20.008* (-14.20)	-20.611* (-13.53)	-27.499* (-14.12)	-37.435* (-4.98)	-35.950* (-3.66)	-44.610* (-3.61)	-25.292* (-17.01)	-27.472* (-16.26)	-33.724* (-15.48)
SMD	.003* -3.82	.0042* -3.79	.007* -4.3	-0.027 (-1.01)	-0.019 (-0.67)	0.0017 -0.06	.003* -4.58	.0046* -4.11	.007* -4.14
CPI	-.030** (-2.57)	-0.001 (-0.15)	.0518* -3.32	0.043 -1.38	.119* -3.14	.1648* -3.17	-.074* (-5.65)	-.048* (-3.44)	-.029*** (-1.63)
GDPG	.1894* -3.35	.1761* -2.69	.2458* -3.14	0.1425 -0.57	0.109 -0.36	-0.0171 (-0.05)	-.254* (-3.37)	-.570* (-6.53)	-1.14* (-9.24)
INT	-.197* (-2.73)	-.5015* (-5.96)	-1.080* (-9.06)	-0.0505 (-0.50)	-0.2357 (-1.69)	-0.252 (-1.27)	.3698* -5.58	.4454* -5.64	.6186* -6.35

The analysis of firm-level and macroeconomic determinants across quantiles provides nuanced insights into the factors influencing working capital management (WCM) efficiency in OIC and Non-OIC firms. The Growth demonstrates a consistently negative impact on WCM efficiency in OIC firms across all quantiles, with the strongest effect observed at the 0.75 quantile. This indicates that higher growth intensifies liquidity constraints in OIC firms, reflecting their reliance on internal funding to sustain expansion (Nazir & Afza, 2009). Conversely, the relationship between growth and

WCM efficiency is largely insignificant in Non-OIC firms, suggesting that developed financial systems mitigate growth-induced liquidity pressures.

Age negatively affects WCM efficiency across all samples, with stronger significance in OIC firms. This highlights the challenges older firms face in maintaining operational agility in less-developed financial environments (Rahman & Rahman, 2020). Return on assets (ROA) positively influences WCM efficiency, particularly in OIC firms, where profitability serves as a critical buffer against liquidity risks (Deloof, 2003). However, the positive impact diminishes at higher quantiles in Non-OIC firms, suggesting a diminishing marginal effect of profitability on WCM efficiency as firm performance improves.

Firm size positively correlates with longer CCCs across all samples, with the strongest impact observed in Non-OIC firms at higher quantiles. This aligns with the resource-based view that larger firms face increased complexity in managing inventories and receivables (Berger & Udell, 1998). Similarly, tangibility has a strong positive impact on WCM efficiency, particularly in OIC firms at higher quantiles, underscoring the reliance on tangible assets for operational stability in emerging markets (Booth et al., 2001).

Macroeconomic variables reveal divergent impacts on WCM efficiency. Inflation (CPI) exhibits a positive relationship in OIC firms, reflecting increased operating costs and inefficiencies, while it negatively impacts Non-OIC firms, where inflation fosters operational adjustments to improve liquidity (Ngari, 2023). GDP growth positively influences WCM efficiency in OIC firms, indicating economic growth's role in enhancing liquidity management, but negatively impacts Non-OIC firms at higher quantiles due to increased operational complexities (Fatimatu Zahra & Kusumastuti, 2016). Interest rates negatively affect OIC firms, promoting stricter cash management practices, while they exhibit a positive relationship in Non-OIC firms, reflecting the ability to leverage financial flexibility during periods of higher borrowing costs (Baños-Caballero et al., 2014).

Overall, the findings highlight the differential impacts of firm-level and macroeconomic factors on WCM efficiency across varying financial environments.

These insights emphasize the need for tailored strategies to address region-specific challenges in optimizing working capital.

Research Objective 4: To investigate the differential impact of firm-level and macroeconomic determinants on the WCM efficiency in OIC and Non-OIC countries in recession and boom states of the economy.

Table 5.4 Comparative Tables Regression Results - State of Economy; Good & Bad Economy of Full Sample, OIC firms & Non-OIC Firms Samples

Table	4.6		4.12		4.18	
Sample	Full-Sample		OIC firms		Non-OIC firms	
State of Economy	Bad State	Good State	Bad State	Good State	Bad State	Good State
GROWTH	-3.681* (-3.94)	-3.130* (-6.87)	-25.677* (-7.57)	-25.544* (-12.70)	-0.113 (-0.13)	0.083 -0.2
AGE	-.665* (-8.87)	-.239* (-4.26)	-0.462 (-0.74)	-2.141* (-4.35)	-.468* (-5.57)	-.239* (-4.42)
ROA	32.149* -8.07	22.614* -10.6	83.497* -4.59	77.298* -8.59	25.974* -6.58	16.945* -7.93
SIZE	4.179* -3.31	11.513* -13.5	5.0417** -2.43	8.116* -5.55	9.461* -6	14.674* -14.62
TANG	27.742* -5.17	20.483* -6.48	78.791** -2.42	47.640** -2.52	24.674* -4.64	19.498* -6.26
LEV	0.872 -0.23	-4.549** (-1.99)	3.196 -0.25	-6.847 (-0.86)	-1.878 (-0.48)	-4.877** (-2.12)
CF	-103.425* (-26.83)	-98.988* (-51.49)	-130.362* (-9.72)	-132.080* (-20.28)	-98.686* (-25.27)	-93.569* (-47.61)
MS	-31.311* (-11.88)	-11.774* (-5.66)	-12.9708 (-0.85)	-46.799* (-4.37)	-38.556* (-13.44)	-15.922* (-7.08)
SMD	.054** -2.59	.0078* -6.26	.0596** -2.06	-.120** (-2.35)	.0037* -3.52	.008* -7.06
CPI	-.382* (-3.20)	0.013 -0.79	0.0681 -1.19	.131* -2.63	-0.0001 (-0.01)	-.029*** (-1.65)
GDPG	.610* -5.14	-.325* (-4.56)	-0.0521 (-0.12)	.460** -2.15	-.698* (-5.39)	-.503* (-7.42)
INT	1.275* -8.3	-0.052 (-1.10)	0.184 -0.97	-.309* (-3.65)	1.275* -8.3	.155* -2.79
Observations	84031	227928	9999	29941	74032	197987
Adj R-squared	0.657	0.6873	0.6581	0.6857	0.6485	0.6806

The analysis of firm-level and macroeconomic determinants across recession and boom states reveals notable variations in their impact on working capital management (WCM) efficiency between OIC and Non-OIC firms. Growth significantly reduces CCC for OIC firms during both economic states, with a slightly stronger effect in recessions. This indicates that economic downturns exacerbate liquidity challenges in OIC firms, compelling them to adopt stringent WCM practices to manage cash flows effectively (Nazir & Afza, 2009). Conversely, growth has an insignificant impact on Non-OIC firms during recessions and a weak positive effect during booms, reflecting the resilience of developed financial systems in mitigating growth-induced liquidity pressures (Brealey et al., 2011).

Age consistently shows a negative impact on CCC in both OIC and Non-OIC firms during recessions and booms, with a stronger effect during downturns. This suggests that older firms face increased operational inefficiencies and liquidity constraints during economic downturns, particularly in emerging markets (Rahman & Rahman, 2020). Return on assets (ROA) positively impacts CCC across all states, with a stronger effect during booms for OIC firms, emphasizing the role of profitability in enhancing liquidity during favourable economic conditions (Deloof, 2003).

Firm size positively correlates with longer CCCs in both OIC and Non-OIC firms, with a more pronounced impact during booms, particularly for Non-OIC firms. This supports the resource-based view that larger firms leverage their scale and access to resources more effectively during economic upturns, albeit at the cost of increased operational complexity (Berger & Udell, 1998). Similarly, tangibility exhibits a significant positive relationship with CCC across all states, with a stronger effect in OIC firms during recessions, reflecting the reliance on tangible assets for financial stability in constrained markets (Booth et al., 2001).

Macroeconomic variables demonstrate divergent impacts between the two groups. Inflation (CPI) positively affects CCC in OIC firms during booms, indicating inefficiencies in managing rising costs, while it negatively impacts Non-OIC firms during recessions, reflecting better adaptability to inflationary pressures (Ngari, 2023). GDP growth positively influences CCC in OIC firms during booms but negatively affects Non-OIC firms during recessions, underscoring the differential fiscal and

monetary responses in developed and emerging markets (Fatimatuzzahra & Kusumastuti, 2016). Interest rates negatively impact CCC in OIC firms during booms, promoting stricter cash management, while they positively affect Non-OIC firms during recessions and booms, reflecting financial flexibility in advanced economies (Baños-Caballero et al., 2014).

Overall, the findings underscore the contextual nature of WCM efficiency, shaped by economic states and regional financial environments. The differential impacts of determinants across OIC and Non-OIC firms highlight the need for tailored WCM strategies that address specific economic and structural challenges.

5.3 IMPLICATIONS AND RECOMMENDATIONS

The study results outlined in the previous section may not be applicable to all businesses and depend on the environment in which they operate. Despite this, the study's conclusions provide some direct recommendations for developing policies with strong theoretical foundations. For instance, the policy framework by regulators should be such that encourages investment in working capital through strong governance structures. Further, the difference in the country's economic structure and the peculiar financial characteristics of the financial system cannot be ignored in the working capital policy setting. For instance, the Non-OIC financial markets are the typical example of market-dominated economies. Hence, in economies where financial markets are the major capital providers, policies that encourage better reporting on internationally accepted accounting principles must be recommended. There is a need for better reporting standards. Further, OIC economies need a robust and stable banking system that would inject confidence into the financial markets of the country and help in removing market imperfections. Additionally, managers must properly identify the factors that are the drivers of working capital and accordingly, frame the working capital policy. For instance, as evidenced by the results, firm-level and macroeconomic determinants differ for OIC and Non-OIC firms therefore managers must study the circumstances and characteristics in which the firm is embedded. It must be noted that country averages and aggregates prove to be *prima facie* figures while framing policies for a particular sector.

The results uncover the specific firm-level and macroeconomic determinants of CCC. The findings, therefore, warrant managers to visualise and evaluate the country-specific attributes and focus on them with a view to enhancing organizational working capital efficiency. For managing working capital efficiently, it offers direct implications for the management of firms' accounts receivables, accounts payables and inventories. These phenomena are specifically reflected by four components of working capital turnover efficiency (CCC) viz, ARP, APP, and ICP. Given these components form CCC, it is imperative that managers can improve the working capital efficiency by asking customers to pay their bills on time. It also implies that managers need to arrange funds to finance the lag between the sales and the receipt of payment thereon. In addition, before formulating a policy on the number of days to be allowed to customers to pay their receivables, it is imperative for the managers to categorize the customers into good paymasters and defaulters. Past payment schedules, bank references etc. would help managers in this aspect. This would also enable the firm to offer credit to only those customers who do not default or do not have cash flow problems. This would reduce the bad debts and the collection costs and thus improve profitability. Further, there must be a well-defined collection and monitoring mechanism in place vis-à-vis each individual customer. Such a mechanism would help in monitoring the efficiency of the firm's credit policy and identify the deviations, if any, in the collection machinery.

Given that APP also forms an important part of CCC, it implies that managers can increase the profitability of firms by deferring payments to their suppliers since deferring payments is a source of working capital financing which is almost free of cost. It must, however, be noted that accounts payable are also risk-prone. This source of finance is much riskier than a bank loan. It is argued that a default on a bank loan takes a long time to impact the firm, while a default on accounts payable has a quick and snowballing effect on the firm. For instance, defaulting on accounts payable erodes the goodwill of the firm, reduces the credit rating in the market, sours the relationship among all the members in the supply chain etc. Caught in such a situation, a firm has to struggle hard to settle back into its position. Under such circumstances, a firm must have a well-inbuilt information-based accounting system that links the cash flows and cash budgets of the firm to its purchase budgets. It would allow a firm to defer payments to the extent where it does not have an adverse effect on the firm profitability. In

addition, stretching the number of days of accounts payable should be based on a cost-benefit analysis. One such technique, as mentioned in the prior literature, can be minimizing the net present value (NPV) of disbursements. Lastly managing ICP is imperative for managers to reduce the number of inventory holding days along with the cost of holding to increase profitability. The reduction in number of days should, however, be done to a reasonable minimum to avoid the risk of running out of stock.

Several modern techniques like material requirement planning, economic order quantity, present value approach etc. should be practically implemented to reduce the inventories to the optimal level. In addition, firms can also reduce the costs of holding inventories by coordinating and smoothening the supply chain which would help to reduce the bullwhip effect. Further, the materials on the shop floor can be coordinated by following a successful Japanese technique 'Kanban system'. This system would help to identify the potential bottlenecks and help fix them so that work goes on as per schedule and at optimal speed. Since CCC is the conduit of ARP, APP and ICP, it implies that these three components should be coordinated in a manner that ultimately reduces CCC. Further, it is implied that managers can reduce the number of days in CCC by enhancing the proportion of short-term debt in working capital. Finance managers must have an appropriate working capital policy in place that reduces costs and enhances profitability.

5.3.1 Policy Implications

The study's findings on differences in working capital management (WCM) efficiency between OIC and Non-OIC countries suggest several important policy implications:

Tailored Economic Policies: Policymakers in OIC countries should develop economic policies that address the unique challenges faced by firms in managing working capital. These policies should consider the longer Cash Conversion Cycles (CCCs) observed in OIC firms (121.708 days compared to 83.377 days for Non-OIC firms)[Table 4.2].

Financial Market Development: The study found that stock market development has different impacts on WCM efficiency in OIC and Non-OIC countries. Policymakers in OIC countries should focus on developing and strengthening their financial markets to improve firms' access to external financing and enhance WCM efficiency.

Macroeconomic Management: The differential impact of macroeconomic factors like GDP growth, inflation, and interest rates on WCM efficiency in OIC and Non-OIC countries suggests that monetary and fiscal policies should be carefully calibrated to support efficient working capital management practices.

Economic Cycle Considerations: Given the greater sensitivity of OIC firms to economic cycles, policymakers should develop strategies to help firms manage working capital more effectively during economic downturns.

Islamic Finance Integration: Policymakers in OIC countries should consider how Islamic financial principles influence WCM practices and develop policies that align with these principles while promoting efficiency.

Education and Training: Governments in OIC countries should invest in education and training programs for financial managers to improve understanding and implementation of efficient WCM practices.

These policy implications highlight the need for a nuanced approach to economic and financial policymaking in OIC countries, considering the unique characteristics of their business environments and financial systems.

5.3.2 Impact of Islamic Financial Principles

Based on the study's findings, Islamic financial principles appear to significantly influence working capital management (WCM) practices in OIC countries, often leading to more conservative approaches compared to Non-OIC countries:

Longer Cash Conversion Cycles (CCC): OIC firms exhibit significantly longer CCCs (121.708 days) compared to Non-OIC firms (83.377 days), suggesting more conservative WCM practices aligned with Islamic financial principles.

Economic Cycle Sensitivity: OIC firms show greater sensitivity to economic cycles in their WCM practices, potentially reflecting the Islamic emphasis on risk-sharing and avoiding excessive speculation.

Profitability Impact: The study found a stronger positive relationship between profitability and CCC in OIC firms, indicating that profitable firms in these countries may maintain higher levels of working capital, possibly due to Islamic principles encouraging more conservative financial management.

Growth and Efficiency: Growth has a stronger negative effect on CCC (-25.07) for OIC firms compared to Non-OIC firms (0.031), suggesting that growing OIC firms focus more on improving WCM efficiency, possibly influenced by Islamic principles of responsible resource management.

Leverage Considerations: The impact of leverage on CCC differs between OIC and Non-OIC firms across economic states, potentially reflecting the Islamic financial system's unique approach to debt and interest. In OIC countries, Islamic financial principles prohibit the charging or paying of interest (riba). This fundamental difference in approach to debt and interest likely influences how firms in these countries manage their leverage and working capital.

Conservative Approach: Islamic financial principles often lead to more conservative financial practices. This may result in OIC firms maintaining lower leverage ratios and higher levels of working capital, especially during economic downturns, to mitigate risk.

Alternative Financing: Islamic finance offers alternative financing methods such as Murabaha, Ijara, and Musharakah. These instruments may impact working capital management differently compared to conventional interest-based loans, potentially leading to different relationships between leverage and CCC in OIC firms.

Risk-sharing: Islamic finance emphasizes risk-sharing rather than risk transfer. This principle may influence how OIC firms use leverage in their working capital management, possibly leading to more stable CCC levels across different economic states.

These findings suggest that Islamic financial principles in OIC countries lead to more conservative and potentially less efficient WCM practices, emphasizing stability and risk mitigation over aggressive working capital optimization. These finding also highlights the need for tailored approaches to working capital management in OIC countries that account for the unique characteristics of Islamic financial systems and their impact on the relationship between leverage and CCC.

5.3.3 Recommendations for Financial Managers

Based on the study's findings, the following are the recommendations for financial managers in OIC countries to improve working capital management (WCM) efficiency:

Optimize Cash Conversion Cycle (CCC): OIC firms have significantly longer CCCs (121.708 days) compared to Non-OIC firms (83.377 days). Financial managers should focus on reducing their CCC by improving inventory management, accelerating receivables collection, and negotiating better payment terms with suppliers. This can be achieved through streamlining supply chain processes, implementing just-in-time inventory systems, offering early payment discounts to customers, and extending payables periods where possible.

Leverage Growth Opportunities and Balance Profitability: The study found a strong negative relationship between growth and CCC (-25.07) for OIC firms, while also showing a positive relationship between profitability (ROA) and CCC. Managers should capitalize on growth opportunities to improve WCM efficiency by reinvesting profits into more efficient operations and streamlining working capital processes during periods of expansion. However, they must also strive to balance profitability with efficient working capital practices, ensuring that higher profits don't lead to overly relaxed WCM.

Adapt to Economic Cycles and Macroeconomic Factors: OIC firms show greater sensitivity to economic cycles and macroeconomic factors such as money supply, stock market development, and interest rates. Managers should develop flexible WCM strategies that can quickly adjust to changing economic conditions, tightening management during downturns and cautiously expanding during upswings. This involves closely monitoring macroeconomic indicators and adjusting WCM strategies accordingly.

Optimize Capital Structure and Enhance Cash Flow Management: The impact of leverage on CCC differs between OIC and Non-OIC firms across economic states. Managers should carefully consider their capital structure decisions in relation to WCM efficiency, taking into account the unique characteristics of Islamic financial systems. Additionally, focus on improving cash flow management, as it shows a significant negative relationship with CCC in OIC firms, indicating that better cash flow practices can lead to improved WCM efficiency.

Consider Firm Characteristics: Recognize that larger and older firms in OIC countries tend to have longer CCCs. Develop strategies to maintain efficiency as the firm grows and matures, such as implementing more sophisticated WCM technologies and practices, and regularly reviewing and optimizing working capital processes.

By implementing these strategies, financial managers in OIC countries can work towards improving their firms' WCM efficiency while adhering to Islamic financial principles. This approach takes into account the unique challenges and opportunities present in OIC markets, allowing for a more tailored and effective WCM strategy.

5.3.3.1 Optimizing the Cash Conversion Cycle (CCC)

Finance managers in OIC countries can optimize the Cash Conversion Cycle (CCC) by increasing Days Payable Outstanding (DPO) by negotiating longer payment terms with suppliers to delay cash outflows; reducing Days Inventory Outstanding (DIO) through improved inventory management, thereby minimizing the time inventory remains unsold; and decreasing Days Sales Outstanding (DSO) by expediting the collection of

receivables, either by offering early payment discounts or enhancing billing processes. By concentrating on these areas, companies can liberate cash previously tied up in inefficient processes, enabling reinvestment into the business. A detailed understanding to optimise each component is essential for optimizing working capital management.

5.3.3.2 Improving Days Payable Outstanding (DPO)

To effectively reduce Days Inventory Outstanding (DIO), financial managers in OIC countries can employ several inventory management techniques. These techniques focus on optimizing inventory levels and improving operational efficiency, which are crucial for enhancing overall working capital management. Here are some of the most effective strategies:

Just-in-Time (JIT) Inventory Management: Implementing JIT systems allows firms to receive goods only as they are needed in the production process, minimizing inventory holding costs and reducing DIO. This approach requires close coordination with suppliers to ensure timely deliveries.

Improved Demand Forecasting: Utilizing advanced analytics and forecasting tools can help predict customer demand more accurately, allowing firms to adjust inventory levels accordingly. Accurate forecasting reduces the likelihood of overstocking or stockouts, directly impacting DIO.

Inventory Optimization Techniques: Employing techniques like ABC analysis (categorizing inventory based on importance) helps prioritize management efforts on high-value items, ensuring that they are stocked appropriately while minimizing excess inventory of lower-value items.

Regular Inventory Audits: Conducting frequent audits and reviews of inventory can identify slow-moving or obsolete stock. By addressing these issues promptly, firms can reduce DIO by ensuring that only relevant and sellable inventory is maintained.

Supplier Collaboration: Building strong relationships with suppliers can lead to more favourable terms, such as shorter lead times and flexible ordering schedules. This collaboration can help reduce the amount of inventory held while ensuring that stock is replenished as needed.

Implementing Technology Solutions: Utilizing inventory management software and automated systems can provide real-time visibility into stock levels, streamline order processing, and improve overall efficiency in managing inventory.

Training and Development: Investing in training for staff involved in inventory management ensures that they are equipped with the necessary skills and knowledge to implement best practices effectively.

By adopting these techniques, OIC firms can significantly reduce their Days Inventory Outstanding (DIO), leading to improved Cash Conversion Cycle (CCC) metrics and enhanced working capital management efficiency.

5.3.3.3 Enhancing Billing Processes to Expedite Receivable Collection

Enhancing billing processes to expedite receivable collection offers several benefits for companies, particularly in improving cash flow and operational efficiency. Here are the key advantages:

Faster Cash Inflows: Streamlined billing processes lead to quicker invoice generation and distribution, which can significantly reduce the time it takes for customers to receive and process invoices. This acceleration helps in converting receivables into cash more rapidly, thereby improving overall cash flow.

Reduced Days Sales Outstanding (DSO): By improving billing accuracy and efficiency, companies can decrease their Days Sales Outstanding (DSO). This reduction means that the average time taken to collect payment from customers is shortened, enhancing liquidity.

Minimized Billing Errors: An efficient billing process reduces the likelihood of errors in invoices, which can lead to disputes and delays in payment. By ensuring accuracy in billing, companies can foster trust with customers and streamline the collection process.

Improved Customer Relationships: Timely and accurate billing enhances customer satisfaction. When customers receive clear and correct invoices promptly, they are more likely to pay on time, leading to stronger relationships and repeat business.

Enhanced Tracking and Reporting: A well-optimized billing process allows for better tracking of accounts receivable. Companies can monitor outstanding invoices more effectively, identify late payments quickly, and take proactive measures to follow up with customers.

Cost Efficiency: Automating billing processes can reduce administrative costs associated with manual invoicing and follow-ups. This efficiency not only saves time but also allows staff to focus on higher-value tasks.

Increased Predictability of Cash Flow: With improved billing processes, companies can better predict cash inflows based on historical data and current receivables. This predictability aids in financial planning and resource allocation.

By implementing these enhancements in their billing processes, companies in OIC countries can significantly improve their receivable collection efforts, leading to better working capital management and overall financial health.

5.3.3.4 Improving Days Sales Outstanding (DSO)

Early payment discounts can significantly impact Days Sales Outstanding (DSO) by incentivizing customers to pay their invoices more quickly. Here are some keyways in which early payment discounts can influence DSO:

Encouragement of Prompt Payments: By offering discounts for early payments, companies motivate customers to settle their invoices sooner. This can lead to a reduction in DSO, as customers are more likely to take advantage of the discount and pay before the due date.

Improved Cash Flow: Accelerating the collection of receivables through early payment discounts enhances cash flow. Improved cash flow allows companies to reinvest in operations or meet other financial obligations more efficiently.

Reduction in Accounts Receivable Aging: Early payment discounts can help decrease the ageing of accounts receivable, resulting in a lower DSO. As customers pay their invoices sooner, the overall time accounts remain outstanding is reduced.

Strengthening Customer Relationships: Offering early payment discounts can foster goodwill and strengthen relationships with customers. Satisfied customers may be more likely to continue doing business with the company, leading to consistent cash inflows and potentially further reductions in DSO.

Cost-Benefit Analysis: While early payment discounts may reduce revenue per sale, the benefits of faster cash collection and reduced DSO often outweigh the costs associated with offering these discounts.

In summary, implementing early payment discounts is a strategic approach that can effectively reduce DSO by encouraging quicker payments from customers, improving cash flow, and enhancing overall working capital management efficiency.

5.3.3.5 Improving Days Payable Outstanding (DPO)

To improve Days Payable Outstanding (DPO) in OIC countries, companies can adopt several effective strategies:

Negotiate Longer Payment Terms: Engage suppliers in discussions to extend payment terms. By establishing longer payment periods, companies can delay cash outflows, improving liquidity.

Build Strong Supplier Relationships: Developing strong relationships with suppliers can lead to more favourable terms. Trust and collaboration may encourage suppliers to offer extended payment options.

Utilize Supply Chain Financing: Explore supply chain financing options that allow companies to extend payment terms while ensuring suppliers receive timely payments. This can help balance cash flow needs.

Implement Technology Solutions: Use electronic invoicing and automated payment systems to streamline the accounts payable process. This can help manage payment schedules more effectively and ensure timely payments without compromising cash flow.

Monitor Supplier Performance: Regularly assess supplier performance and reliability. Companies can negotiate better terms with high-performing suppliers, leveraging their reliability as a bargaining chip.

Consider Bulk Purchasing: If feasible, negotiate bulk purchasing agreements that may allow for extended payment terms in exchange for larger orders, benefiting both parties.

Volume-based negotiations: Leverage purchasing volume to negotiate better payment terms, especially for large or frequent orders.

Standardize payment terms: Establish consistent payment terms across suppliers to simplify processes and potentially negotiate better overall conditions.

Use technology: Implement e-invoicing and automated payment systems to streamline processes, potentially leading to more flexible payment terms.

Consider consignment arrangements: For certain products, explore consignment inventory agreements that can help reduce upfront costs and extend effective payment periods.

Offer early payment incentives: Propose discounts for early payments to suppliers, which can be mutually beneficial by improving cash flow for both parties.

Evaluate Cash Flow Cycles: Align payment schedules with cash flow cycles to ensure that payments are made when cash is available, minimizing the risk of liquidity issues.

By implementing these strategies, companies in OIC countries can effectively improve their DPO, enhancing their working capital management and overall financial health.

Financial managers in OIC countries can leverage macroeconomic factors to improve payment terms with suppliers in the following ways:

Monitor interest rates: The study found that interest rates have a significant positive relationship with the Cash Conversion Cycle (CCC) in OIC countries, particularly during economic downturns. When interest rates are low, financial managers can negotiate longer payment terms with suppliers, as the cost of financing is reduced.

Leverage economic growth: GDP growth demonstrates a significant positive relationship with CCC during economic downturns in OIC countries. During periods of economic growth, financial managers can negotiate more favourable payment terms by emphasizing the potential for increased business volume.

Consider inflation trends: Inflation has a significant negative relationship with CCC in OIC countries. During periods of higher inflation, financial managers can potentially negotiate longer payment terms to offset the decreased purchasing power of money over time.

Utilize stock market development: Stock market development shows a significant positive relationship with CCC in OIC countries. When stock markets are performing well, firms may have better access to capital, which can be used as leverage in negotiations for better payment terms.

Adapt to money supply changes: Money supply has a significant negative relationship with CCC in OIC countries. When the money supply is expanding, financial managers can potentially negotiate more favourable terms due to increased liquidity in the market.

By considering these macroeconomic factors, financial managers in OIC countries can develop more informed strategies for negotiating payment terms with suppliers, ultimately contributing to improved working capital management efficiency.

5.3.3.6 Reinvesting profits into more efficient operations in OIC firms

Based on the study's findings, here are some best practices for OIC firms' managers to reinvest profits into more efficient operations:

Focus on reducing Cash Conversion Cycle (CCC): OIC firms have significantly longer CCCs (121.708 days) compared to Non-OIC firms (83.377 days). Reinvesting profits in technology adaption with due training of human resources to optimize inventory management, accelerate receivables collection, and negotiate better payment terms with suppliers can help reduce the CCC.

Leverage growth opportunities: The study found that growth has a strong negative effect on CCC (-25.07) for OIC firms. This suggests that reinvesting profits into expansion and streamlining operations during growth periods can improve WCM efficiency.

Implement advanced technology: Invest in modern inventory management systems, e-invoicing, and automated payment systems to streamline processes and improve overall operational efficiency.

Enhance cash flow management: Focus on improving cash flow practices, as the study indicates a significant negative relationship between cash flow and CCC in OIC firms.

Consider firm size and age: Recognize that larger and older firms in OIC countries tend to have longer CCCs. Develop strategies to maintain efficiency as the firm grows and matures, such as implementing more sophisticated WCM technologies and practices.

By reinvesting profits into these areas, OIC firms can work towards improving their working capital management efficiency while adhering to Islamic financial principles.

5.3.3.7 Role of Emerging Technologies in Working Capital Management Efficiency

Innovations and technological advancements are key in producing disparities in results across different business domains. Working capital management in the manufacturing sector can be impacted using automation and Internet of Things (IoT) technology, which can increase production efficiency and lower inventory needs. E-commerce and data analytics have the potential to revolutionize how businesses forecast customer demand and handle inventories in the retail industry (Arifani, 2023). By adopting these technologies, businesses can reduce working capital invested in inventories and streamline supply chains, increasing productivity and potential profits. The integration of emerging technologies is revolutionizing working capital management (WCM) efficiency by optimizing its key components: cash, receivables, inventory, and payables management. Generative AI and artificial intelligence (AI) are transforming WCM by providing advanced analytical capabilities and automating decision-making processes. These technologies can analyze historical cash flow data to predict future cash needs, allowing businesses to optimize their cash reserves and avoid liquidity issues (Loo & Lau, 2019). In receivables management, AI can identify patterns in customer payment behaviours, enabling companies to predict which accounts are likely to default, thus reducing days sales outstanding (DSO) and improving cash inflows (Bazimya & Erorita, 2024). For inventory management, generative AI enhances demand forecasting by analysing market trends and historical sales data, helping businesses maintain optimal inventory levels (Paul, 2024).

Big Data analytics and Machine Learning (ML) play a crucial role in enhancing WCM efficiency by enabling organizations to process and analyse large volumes of data. Predictive analytics leverages historical data to forecast demand more accurately, which is essential for effective inventory management (Baker et al., 2019). Machine learning algorithms can automate routine decisions in cash management, such as when to pay suppliers or how much inventory to reorder, thereby improving operational

efficiency (Mazlan & Choong, 2018).

Blockchain technology enhances transparency and security in transactions related to working capital. It can streamline the accounts receivable process by providing a secure and immutable record of transactions, reducing disputes and improving collection times (Deepa et al., 2017). Robotic Process Automation (RPA) automates repetitive tasks in WCM, such as data entry and invoice processing, which reduces errors and frees up human resources for more strategic tasks (Komba, 2017). Large Language Models (LLMs) can enhance communication and information retrieval within organizations, assisting in generating reports, analysing financial documents, and providing insights based on natural language queries (Mehta, 2014).

5.3.3.8 Real-World Examples of Emerging Technologies Improving Working Capital Management Efficiency

Emerging technologies are significantly transforming the landscape of working capital management (WCM), enhancing efficiency and effectiveness in various sectors. Here are some real-world examples of how these technologies are being applied to improve WCM:

AI and machine learning algorithms are being utilized to analyse large datasets, predict cash flow needs, and optimize inventory levels. For instance, companies like Amazon use AI to forecast demand accurately, which helps in managing inventory more effectively. By predicting which products will be in demand, they can reduce excess stock and improve cash flow (Adesoga et al., 2024).

Blockchain provides a secure and transparent way to manage transactions across the supply chain. Wuliangye, a Chinese bottling company, has implemented blockchain to enhance the traceability of its products, which helps in managing accounts receivable and payable more efficiently. This technology allows for real-time tracking of transactions, reducing the time and costs associated with traditional methods (Li & Zeng, 2024).

IoT devices are being used to monitor inventory levels in real time. For example, Walmart employs IoT sensors to track inventory across its supply chain. This real-time data allows for better decision-making regarding stock levels, reducing the cash tied up in inventory and improving overall working capital efficiency (Irfan et al., 2025).

Companies are leveraging big data analytics to gain insights into their working capital needs. Quantum computing has impacted predictive analytics in neuromarketing in a significant way. For instance, Coca-Cola uses data analytics to optimize its supply chain operations, which includes managing its working capital more effectively by analysing sales patterns and adjusting production schedules accordingly (Siddique et al., 2025; Tariq et al., 2025).

Cloud-based solutions enable companies to manage their financial data more efficiently. SAP offers cloud solutions that help businesses streamline their financial processes, including working capital management. These solutions provide real-time access to financial data, allowing for quicker decision-making and improved cash flow management (Shaikh et al., 2025).

Robotic Process Automation (RPA) is being used to automate repetitive tasks in accounts payable and receivable processes. For example, UiPath provides RPA solutions that help companies automate invoice processing, reducing the time spent on manual data entry and improving accuracy. This leads to faster payment cycles and better cash flow management (Abildtrup, A., 2024; Macêdo et al., 2025).

Emerging fintech solutions are providing platforms for supply chain finance, allowing companies to optimize their working capital. For instance, Taulia offers a platform that connects buyers and suppliers, enabling early payment options that improve cash flow for suppliers while providing discounts for buyers (Phraknoi et al., 2024).

AI-driven predictive analytics tools are being used by companies like Coca-Cola, Amazon, Walmart, Unilever, Ford Motor Company etc to optimize inventory levels and forecast demand. By analysing historical sales data and market trends, these tools help businesses make informed decisions about stock levels, reducing excess

inventory and improving cash flow (Saad Aldin., 2024).

Zara, a leading fashion retailer, uses IoT technology to monitor inventory levels in real time across its stores. This allows the company to respond quickly to changes in demand, reducing excess inventory and improving cash flow (Anozie et al., 2024).

Blockchain technology is being used to enhance transparency and efficiency in supply chain finance. For example, Provenance uses blockchain to track the movement of goods and verify the authenticity of products. This transparency helps companies manage their working capital more effectively by reducing fraud and improving trust among supply chain partners (Ahmad et al., 2023; Liu et al., 2023).

Based on these findings, it is recommended that organizations invest in the implementation of emerging technologies to enhance their working capital management (WCM) efficiency. Financial managers should prioritize the adoption of AI and machine learning for predictive analytics in cash flow management and inventory optimization. These technologies can analyze vast datasets to identify patterns and trends, enabling more accurate demand forecasting and inventory level optimization. This can help reduce excess stock, minimize holding costs, and improve overall cash flow management.

The integration of blockchain technology should be considered for improving transparency and security in receivables and payables management. Blockchain can provide a secure and immutable record of transactions, reducing disputes and improving collection times. Smart contracts can automate payment processes, ensuring prompt payments when conditions are met, thus optimizing cash flow.

Companies should also explore the use of Robotic Process Automation (RPA) for automating routine tasks in accounts payable and receivable processes. RPA can streamline invoice processing, data entry, and reconciliation tasks, reducing errors and freeing up human resources for more strategic activities. This automation can lead to faster processing times, improved accuracy, and better overall efficiency in working capital management.

Additionally, the potential of Large Language Models (LLMs) in enhancing financial analysis and decision-making processes should be investigated. LLMs can assist in generating reports, analysing financial documents, and providing insights based on natural language queries. This capability can improve the efficiency of financial analysis and support more informed decision-making related to working capital management.

Furthermore, organizations should consider the broader context of Industry 4.0 and 5.0 when implementing these technologies. The integration of digital technologies into manufacturing and business processes, as emphasized in Industry 4.0, allows for more agile and responsive WCM practices. Industry 5.0 builds on this by focusing on human-centric approaches, where technology complements human decision-making, enhancing overall efficiency.

To fully leverage these technologies, companies should invest in training and development programs for their financial teams. This will ensure that staff are equipped to effectively use and interpret the insights provided by these advanced tools. Additionally, organizations should consider partnering with technology providers or consultants who specialize in implementing these solutions for working capital management.

Finally, it is important for companies to regularly assess and update their technology stack to stay competitive in an increasingly digital landscape. As these technologies continue to evolve, organizations that remain adaptable and open to innovation will be better positioned to optimize their working capital management and enhance their overall financial performance.

5.4 LIMITATIONS OF THE STUDY AND DIRECTIONS FOR FUTURE RESEARCH

5.4.1 Limitations of the Study

This study is not an exception to the rule that studies of this size are rarely flawless and without any limitations. Although this study was well planned and carried out, some

drawbacks remain. First, the study employed a sample of OIC and Non-OIC listed corporations, however only a small number of Non-OIC nations were considered, and a small number of OIC countries were excluded due to a lack of data. The study, which was empirical in nature, solely considered quantitative variables, completely ignoring non-quantitative behavioural finance approaches to managing working capital. The working capital management of a corporation is influenced by a variety of qualitative characteristics, including managerial skill, ability to handle cash flows, and general corporate culture. This study's full disregard for these behavioural and qualitative factors constitutes a shortcoming. However, there are additional corporate governance variables like board size, board composition, CEO tenure, etc. that could affect the Working capital efficiency. The analysis solely considered firm-specific controls and macroeconomic CCC components. The current study has once more neglected these factors. Except for these and a few other restrictions, the study is anticipated to add to the body of knowledge on a topic that is essential to the continued existence and expansion of an organization.

5.4.2 Directions for Future Research

Working capital is not only a vital construct of the capital structure of any business organisation but a phenomenon that is crucial to the organization's liquidity, solvency and profitability three core focus areas of financial management. The area, therefore, warrants perennial and quality research, especially on the dimensions unexplored hitherto. This section would, however, particularly identify for future research those areas of working capital management that ideally should have been the domain of the present study but, because of one or the other reason have remained neglected. The future study can be conducted by investigating firm-level and macroeconomic factors of CCC across different sectors of the economy like services and manufacturing. Future, research can also be conducted by examining the firm-specific financial characteristics like financial constraints that would improve working capital efficiency.

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