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## UNVEILING THE EFFECTIVENESS OF WORKING CAPITAL MANAGEMENT ON FIRM PERFORMANCE: THE MODERATING ROLE OF FIRM SIZE

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### ABSTRACT

Working capital management is critical to an organization's financial health and long-term performance. The relationship between working capital management and firm performance is uncertain, and research on firm size's moderating effect is scarce. The study investigates the impact of Working capital management (WCM) on firm performance and examines how the firm size moderates this relationship. Firms must efficiently manage working capital to stay financially stable and profitable. WCM procedures affect performance differently depending on the firm size. The research is conducted using the quantitative research design. For this research, we have gathered data from the annual reports of the firms belonging to the KMI-30 index listed at the Pakistan Stock Exchange. The period considered as the research sample is from 2012 to 2022, as it can provide a better analysis of different financial crises and long-term analysis. The quantile regression was used to evaluate the research objective since the data has the issue of heteroscedasticity and autocorrelation. We found that working capital significantly and positively influences the firm performance. However, the moderating role of firm size was found to be insignificant. The findings reveal that firms of all sizes should concentrate on ensuring good working capital management strategies to increase their performance. This requires monitoring and optimizing inventory, accounts receivable, and accounts payable while assuring sufficient liquidity to satisfy operating needs.

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### INTRODUCTION

During the early period of modern finance, businesses were mainly focused on profit maximization by selling more and more goods or services. However, with the passage of time, researchers started realising that the amount of cash a company has on hand is important for its long-term success. It has led to the working capital management (WCM) development which includes managing an organisation's short-term assets and liabilities to ensure that enough cash is available for meeting its short-term obligations (Darun et al., 2015). The working capital concept has become increasingly important in today's global economy since businesses face increasing competition and require being financially resilient during uncertain periods.

As the researchers started exploring the impact that WCM has on the performance of an organisation, they discovered that there were conflicting findings. Some of the research indicated that efficient WCM can positively affect the organisation's profitability (Hashmi and Iqbal, 2022; NG et al., 2017), while others implied that excessive working capital could negatively impact profitability (Ren et al., 2019). However, the topic requires further research, especially with the current changing business dynamic and economic issues being faced around the world. The economic crisis faced around the world recently has also caused issues for firms in efficiently managing the working capital (Ahmad et al., 2022). Hence, the current dynamics that have changed over the years can provide

significant information for managing the organisation's working capital. It has been a subject of considerable interest among researchers and practitioners due to its impact on the profitability of the organisation. The management of the WCM is significant for firms to maintain adequate cash flows and meet short-term obligations, whereas excessive working capital can tie up cash and decline profitability (Hashmi and Iqbal, 2022). However, there is a debate on whether the WCM influence on the performance of the organisation tends to vary with respect to their sizes; small and large firms might behave differently in the association between the WCM and profitability of the organisation taking into account the financial flexibility, tax provisions and ownership structure (Naz et al., 2022). Hence, the study currently aims to contribute towards the current state of knowledge by adding up the firm size as the moderator in the study. The current empirical research does not provide much evidence on how firm size can vary the association between WCM and the profitability of the organisation. However, the research in this prospect is important so that the relationship between WCM and performance is well established. There has been extensive research over the years regarding the WCM impacting the value and profitability of the organisation. The studies have analysed firm size as the control variable, and very few studies have included it as the moderating role (Dalci et al., 2019; Mahmood et al., 2019; Utami and Melvani, 2022). In addition, previous research

does not consider the Islamic Shariah-compliant stock index, which is KMI-100 Index. It can be an excellent choice for research on the impact of WCM on a firm's profit due to reasons. Further, we will measure financial performance from two proxies which are ROA and ROE. In previous studies, only one factor was taken for firm performance.

The study contributes to the present study in two different ways. Firstly, the study considers firm size as the moderator in the model, which has not yet been studied in the previous literature. Secondly, it contributes to the literature by adding the Islamic Shariah-compliant stock index. KMI-30 index includes the top 30 companies listed on the Pakistan Stock Exchange. Previous literature does not have any research that used these measures.

### Hypothesis Development

The study of ur Rahman et al. (2019) evaluated the influence of WCM on the organisation's performance considering the Pakistan stock exchange (PSX) case. The study has used variables such as average collection period (ACP), Account Payable turnover (APT), inventory turnover (IT), and cash conversion cycle (CCC) to evaluate its impact on firm performance. It has been found that ACP negatively impacts the organisation performance. Furthermore, APT, CCC and IT have a positive impact on firm performance. The study by Phuong and Hung (2020) evaluated the WCM and its impact on organisation performance considering Vietnamese organisation. The research has used the variables such as the average receivables (AR), inventory turnover (IT), account payable (AP) and cash conversion cycle CCC. These variables are identified to have a negative impact on the organisation's profitability. NG et al. (2017) identified the impact of WCM factors such as inventory conversion period (ICP), account payable period (APP), receivable collection period (RCP), and cash conversion cycle CCC on firm profitability. ARP negatively influences the performance of the organisation. It further revealed that ICP, APP and CCC have a positive impact on the profitability of the organisation.

H<sub>1</sub>: WCM has a significant impact on organisation's performance. The study by Lee (2009) evaluated the impact of the firm size on the firm profitability. The study has revealed that firm size tends to be the most significant determinant of the performance of the organisation. Almashhadani and Almashhadani (2022) identified the influence of firm size on the performance of the organisation. It has revealed that the firm size has insignificant impact on the profitability of the organisation.

H<sub>2</sub>: Firm size has a significant impact on the organisation's performance.

Mahmood et al. (2019) conducted a study to evaluate the moderating role of firm size on the relationship between WCM and firm performance. The study findings revealed that the firm size significantly moderates the relationship of WCM on firm performance. Dalci et al. (2019) have attempted to identify the moderating impact of firm size on WCM and firm performance. It also revealed that the moderating role of firm size exists between the association of WCM and organisation profitability.

H<sub>3</sub>: Firm Size moderates the relationship between WCM and firm performance.

The working capital of the organisation is regarded to be the difference between organisation's current assets and liabilities. The higher current assets as compared to current liabilities, the firm has the need for financing the positive requirement of the

working capital. Although an appropriate financing strategy can assist organisations in improving performance, working capital financing has an influence on the performance and the firm value (Banos-Caballero et al., 2016).

Firm profitability refers to a company entity's financial performance, which shows how well the firm is utilising its resources to produce profits. It is a measurement of how much a business is making from its business operations after deducting all of the costs involved in producing those profits (Ahmed et al., 2020). Several metrics, including return on investment (ROI), return on equity (ROE), gross profit margin, net profit margin, profits per share (EPS), and others, can be used to determine a company's profitability. These metrics offer information about the business's financial condition and may be used to compare the company's performance to that of its competitors and industry norms (Ahmad et al., 2015). WCM techniques have a major influence on business profitability. One of the primary techniques in which WCM has a significant impact on a company's profitability is by maximising cash flow (Singhania and Mehta, 2017). Considering that, the research by Jana (2018) highlights that a business may lower financing costs, boost profitability, and ensure it has enough cash on hand to satisfy short-term obligations by efficiently managing current assets and current liabilities. Additionally, WCM also influences the profitability of an organisation by lowering the risk of financial difficulty. As effective WCM procedures lessen the likelihood of financial difficulty, which can have a detrimental effect on business profitability (Tran et al., 2017).

The study conducted by Anton and Afloarei Nucu (2020) elucidates that it's also conceivable that the reverse causality is reasonable when businesses are prosperous; they have more money available to invest in working capital. Additionally, a number of factors affect both working capital and corporate profitability. Concerning that, the study by Seth et al. (2021) assesses the effect of a number of exogenous variables on the WCM effectiveness and businesses' performance from the standpoint of a potential endogeneity issue. The following factors, net fixed asset ratio, interest coverage, leverage and asset turnover ratio, are found to have a direct impact on WCM efficiency and, consequently, on the performance of enterprises. Although there is an association between WCM and business profitability, many research indicates that the effect of WCM on company earnings varies with firm size (Singhania and Mehta, 2017; Dalci et al., 2019; Singhania and Mehta, 2017). The influence of economies of scale is one of the main ways that business size modifies the link between WCM and company profitability. Smaller firms might have a higher cost of capital than large firms, which impacts the large firms to effectively manage their working capital (Seth et al. 2021). Moreover, the research study conducted by NG et al. (2017) mentioned that firm size influences the WCM on firm profitability through the availability of resources. As the larger business have the availability of resources, including technology, and humans, which assist them in easily managing the working capital. There have been several studies that have evaluated the role of the WCM on firm performance. The study of Bhatia and Srivastava (2016) examined the link between the WCM on the organisation's performance using the case of emerging economies. The study has analysed the relationship considering the data from 2000-2014. The data analysis approaches used included GMM approach. The study has indicated that WCM tends to have a significant and negative impact on the financial profitability of the organisation. The research of Ren et al. (2019) has further evaluated the influence that WCM has over the performance of organisations in China. The study has applied the analysis of the two-way fixed

effect regression for the sample of the listed companies in China over the period of 2010 to 2017. The cash conversion cycle was considered for evaluating WCM while profitability was measured by profit ratios. The study has indicated the negative influence of the WCM on firm performance.

Furthermore, the research of Habib and Kayani (2022) evaluated the role of the WCM on financial distress. The study has applied the data envelopment analysis (DEA) to evaluate the relative ECM efficiency. It has further used Z-score for predicting the likelihood of financial distress. The study has applied logistic regression for the analysis of the objectives. The findings have shown the significant and negative impact of the WCM efficiency on the financial distress of the organisation. Altaf and Ahmad (2019) further indicated that the financial crisis and financial constraints lead the managers to carefully manage the working capital so that the organisation remains profitable and sustainable in the market. It defines the moderating characteristics of the variable. However, previous literature does not provide evidence on this aspect. Therefore, current research evaluates it from this perspective.

Concerning the research variables, the shorter the accounts receivables days, the less working capital of the business is used by its clients. It helps organisations to be proactive regarding timely payments and increasing the investment prospects towards profitable avenues (Iqbal and Zhuquan, 2015; Nguyen et al. 2020). A high AR day indicates that a business is taking longer to get paid by its clients, which can cause liquidity problems and higher financing expenses. A firm may miss potential investments and face decreased efficiency when its cash flow is significantly impacted, both of which eventually result in poorer profitability. High AR days might be a sign of ineffective credit and collection procedures inside a business. For instance, it can imply that a business is not promptly following up on past-due payments or is not sufficiently credit-screening potential new clients. Rising bad debts and write-offs can result from ineffective collections and credit procedures, which can significantly affect profitability (Munene and Tibbs, 2018). Existing literature concerning the accounts receivables days and firm profitability concluded that accounts receivables days negatively influence the business profitability (Gonçalves et al., 2018; Pakdel and Ashrafi, 2019; Nguyen et al., 2020).

The business having fewer accounts payable days has better solvency, which indicates that it is taking the less working capital of other corporations, which leads to improving the firm reputation. Other than that, some studies show a positive association between accounts payable days and firm profitability (Gorodutse et al. 2017 and Chowdhury et al. 2018). The positive association between the two variables is based on the assumption that businesses can utilize the cash in the investment project despite paying suppliers leading to increased profitability. This argument makes the assumption that the business has investment options that are more lucrative than quickly paying vendors. It is advantageous for a business to pay its suppliers later if the investment projects offer a better rate of interest than the cost of funding its payables. At the same time, some researcher shows a negative association (Kasozi, 2017; Pakdel and Ashrafi, 2019). The negative association indicated that if the premise is taking longer to reimburse, suppliers can result in disrupted relationships with vendors and possibly liquidity concerns. Moreover, Long AP days harm a company's relationships with suppliers, which harms the company's reputation and hinder the ability to negotiate favourable terms in the future. Additionally, failing to pay suppliers on time may also result in suppliers ceasing to provide

goods or services, which could result in a loss of business for the organisation.

Inventory is one of a company's most important assets, and it often makes up a large amount of all of the company's assets. As a result, managing inventory is crucial to WCM. Revenue and capital must be balanced for effective inventory management and optimisation. Moreover, insufficient inventory might cause the business to lose clients due to a shortage of products. High inventories, however, may prevent the company from using its cash in a more profitable venture (Phuong and Hung, (2020). Businesses that can effectively manage their inventory and promptly turn it into sales are often more lucrative and secure financially. In addition to that, holding more inventories supports the companies from the price fluctuations perspective (Anton and Afloarei Nucu, 2020).

### Cash Conversion Cycle Theory

The Cash Conversion Cycle CCC theory measures how long it takes a business to turn its inventory and other resource inputs into cash. It is a crucial measure for assessing how well a company's WCM plan is performing. The CCC hypothesis, which assesses how effectively a business manages its cash flows, is strongly linked to the effect of WCM on firm profitability (Olambo, 2022). Moreover, the research study conducted by Zalaghi et al. (2019) further elucidates that The CCC theory emphasises the need to efficiently manage working capital to increase cash flows and profitability. The idea takes into account how long it takes for consumers to pay their bills, how long it takes for businesses to pay their suppliers, and how long it takes for inventories to be converted into sales. A company's cash flow and profitability can be increased by effectively turning inventory into cash and quickly receiving payments from clients (Mathuva, 2015). This theory emphasises the significance of an organization's assets and obligations being well managed in the short term, which is essential for future development and financial security. Even profitable companies and promising opportunities can go bankrupt without appropriate liquidity management. The Cash Conversion Cycle notion is an important component of research and analysis because it is a useful tool for determining how inventories and cash management practices affect a company's financial success (Muya et al., 2016).

More research was done on the moderating impact of company size on the link between WCM and firm performance in the study by Dalci et al. (2019). It took into account a sample of 285 German non-financial enterprises over an 8-year period. The results of the moderated regression showed that the association between the cash conversion cycle and firm performance is moderated by the firm size. However, the studies in the context of Pakistan are limited.

Based on the literature and gap identified above, the following conceptual framework is developed.

$CCC = \text{Account receivable period} + \text{Inventory conversion period} - \text{Accounts payable period}$

1. Firm size can be a suitable moderating variable with respect to the impact of working capital on a firm's profit as due to several reasons: which are as follows.
2. Resource allocation: The allocation of resources in a company can vary depending on its size. Larger firms may have more resources at their disposal and can allocate them differently compared to smaller firms.
3. Risk management: large firms may have more diversified operations and are better equipped to handle risks compared to smaller firms.

4. Access to capital: larger firms may have better access to capital markets, allowing them to secure funding more easily than smaller firms.
5. Market power: large firms may have more market power than smaller firms, giving them the ability to set prices and influence market dynamics. This could affect the impact of working capital on a firm's profit, as larger firms may be able to pass on their costs to customers more easily.
6. Scale economies: large firms may benefit from economies of scale, enabling them to produce goods or services at a lower cost per unit than smaller firms. This could affect the impact of working capital on a firm's profit, as larger firms may be able to achieve greater efficiencies in their operations.

Overall, the use of firm size as a moderating variable in this research topic can help provide a more comprehensive understanding of the relationship between WCM and profitability and provide insights for managers in making strategic decisions regarding their WCM practices.

## METHODOLOGY

### Research Design

Saunders et al. (2009) have outlined the research design as the general plan that the researcher would conduct to answer the research objectives. The research design specifies the nature and sources for the data to be collected for answering the research objectives, explaining any ethical issues or limitations to be faced while working on the data collection. Our research objective is to firstly evaluate the impact of working capital on the firm performance and secondly evaluate the moderating role of firm size between the relationships. In this regard, we are empirically investigating the cause-and-effect relationship. Hence, the mono-method quantitative technique is the most suitable choice as it can help test the hypothesis developed from the past theory. The numeric data related to the working capital, firm performance and firm size are collected in this regard. The data is collected from secondary sources from the annual reports of the organisations. The research aims to draw the data related to the firm-specific variables that can be more suitably collected from their annual reports. The research is explanatory in nature since it establishes the association between the variables.

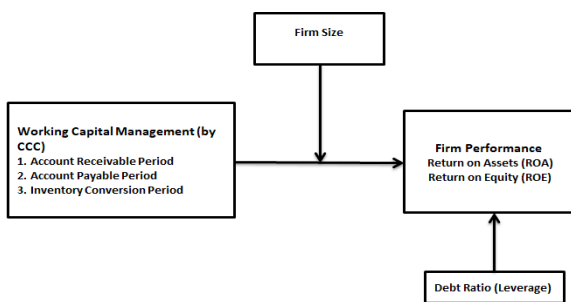


Figure 1. Conceptual framework.

As shown in Figure 1, the independent variables in the study include the account receivable period, account payable period, and inventory conversion period, and the dependent variable is firm performance. Previously, studies have also undertaken these factors of working capital to evaluate their impact on the firm performance. The study by Phuong and Hung (2020) also considered these three variables as the indicators of working capital and evaluated their impact on the firm performance. It has

found a negative impact of these factors on the firm profitability. The study of ur Rahman et al. (2019) has also further used variables such as average collection period, accounts payable, and inventory turnover to evaluate their impact on firm performance. It has been found that average collection periods have a negative impact on firm performance. Furthermore, accounts payable and inventory turnover have a positive impact on firm performance. These factors collectively indicate the cash conversion cycle. Furthermore, the moderating variable firm size is considered in the framework, which is the main contribution to this research since there are not many studies conducted in this regard. The studies of Mahmood et al. (2019) and Dalci et al. (2019) have considered firm size as the moderating variable between WC and firm performance nexus. They revealed the significant moderating effect of firm size on this relationship.

### Measurement

Table 1 shows that the cash conversion cycle is measured by adding the account receivable period with the inventory conversion period while subtracting the account payable (Ur Rehman et al., 2019). The formula for each component is given below. The firm performance is measured using ROA and ROE as used by ur Rahman et al. (2019), Phuong and Hung (2020) and Dalci et al. (2019). These are the most widely used measures of firm performance and are indicated to be more robust than the other measures. Furthermore, firm size is mostly measured using the book value of total assets natural logarithm as used by Dalci et al. (2019). It can provide a more accurate distinction between small, large and medium organisations.

### Sampling Design

The research considered collecting the data from secondary such as annual reports of the organisation. In this research, we will use KMI-30, all index from the Pakistan Stock Exchange (PSX). The time period considered as the research sample is 10 years, as it can provide a better analysis of different financial crises and long-term analysis. The years considered are from 2012 to 2022. The KMI-30 Index is a Shariah-compliant index that helps in tracking the performance of the top 30 organisations that are listed in the PSX. It can be an excellent choice for research to evaluate the influence of WC on the profitability of the organisation due to various reasons. The first and main reason is that KMI-30 stocks are Shariah-compliant; it operates according to Islamic principles. Second, it has a diversification portfolio that includes top companies from various sectors like banking, oil and gas, and cement, which can reduce the impact of industry-specific index. For the third reason, we can see it as a proper market representative as the KMI-30 Index represents a significant portion of the Pakistan Stock Exchange market capitalization. We did not face any issues in data collection as all firms are listed. Therefore, we can say the fourth reason accessibility of data is easy. The fifth reason is major as the first reason the KMI-30 index is relevant to Islamic finance; researching the influence of WC on firm profitability with this particular index is particularly relevant to the field of Islamic finance. The study would add significantly to the current knowledge of Islamic finance and its influence on the operations of an organisation. Furthermore, the previous researchers have not considered the KMI30 index, and hence, this would be the contributing point of this research. The stock return also has fluctuating returns, which further makes it reasonable to study.

Table 1. Variable measurements.

Variables	Measurement	Sources
<i>Independent Variable: WCM</i>		
Cash Collection Cycle	Account receivable period + Inventory conversion period – Accounts payable	ur Rahman et al. (2019), Phuong and Hung (2020)
Account receivable Period	Accounts Receivable * 365 / Sales	ur Rahman (2019), Phuong and Hung (2020)
Inventory conversion Period	Inventory * 365 / Sales	ur Rahman et al. (2019), Phuong and Hung (2020)
Accounts payable period	Accounts Payable * 365 / Sales	ur Rahman et al. (2019), Phuong and Hung (2020)
<i>Dependent Variable: Firm Performance</i>		
ROA	Net Income / Total Assets	ur Rahman et al. (2019), Phuong and Hung (2020); Dalci et al. (2019)
ROE	Net Income / Total Shareholder equity	ur Rahman et al. (2019), Phuong and Hung (2020), Dalci et al. (2019)
<i>Moderating Variables</i>		
Firm Size	Ln (Total Assets)	Dalci et al. (2019)
<i>Control Variables</i>		
Debt Ratio (leverage)	Debt / Equity	Mahmood et al. (2019)

In a summarized way, we can say using the KMI-30 Index is a suitable choice due to the shariah-compliant nature of the companies included in the index, its diversification, market representation, availability of data, and relevance to the field of Islamic finance.

### Statistical Technique and Models

In this study, we will use Quantile regression for the assessment of the data. Quantile regression is a statistical method used to estimate the relationship between independent variables and dependent variables at different points in the distribution of the dependent variables. It is referred to as the extension of linear regression and is used mostly when the assumptions of linear regression, such as linearity, homoscedasticity, independence, or normality, are violated. One of the benefits of using quantile regression is that it allows researchers to examine how the impact of a predictor variable on the response variable varies across different parts of the distribution.

However, a limitation of quantile regression is that it can be more computationally intensive than OLS regression, especially when estimating multiple quantiles. Additionally, the interpretation of the results can be more complex, as the estimated coefficients represent the effect of the predictor variable on the specified quantile rather than the mean of the response variable.

In the context of our topic, using quantile regression can be advantageous. By estimating the conditional quantiles of firm profitability, researchers can identify which aspects of WCM are most important for firms of different sizes and how these aspects may differ across the distribution of profitability. This can provide a more nuanced understanding of the relationship between WCM and firm profitability and help managers to tailor their WCM strategies accordingly.

$$\text{Model 1: ROA} = \beta_0 + \beta_1 \text{CCC} + \beta_2 \text{Lev} + u_{it} \quad (1)$$

$$\text{Model 2: ROE} = \beta_0 + \beta_1 \text{CCC} + \beta_2 \text{Lev} + u_{it} \quad (2)$$

$$\text{Model 3: ROA} = \beta_0 + \beta_1 \text{FS} + \beta_2 \text{Lev} + u_{it} \quad (3)$$

$$\text{Model 4: ROE} = \beta_0 + \beta_1 \text{FS} + \beta_2 \text{Lev} + u_{it} \quad (4)$$

$$\text{Model 5: ROA} = \beta_0 + \beta_1 \text{CCC} + \beta_2 \text{FS} + \beta_3 \text{CCC*FS} + \beta_4 \text{Lev} + u_{it} \quad (5)$$

$$\text{Model 6: ROE} = \beta_0 + \beta_1 \text{CCC} + \beta_2 \text{FS} + \beta_3 \text{CCC*FS} + \beta_4 \text{Lev} + u_{it} \quad (6)$$

In the above equations;

B = Regression coefficient

B<sub>0</sub> = Intercept, Constant

ROA = Return on Asset

ROE = Return on Equity

CCC = CCC = Account receivable period + Inventory conversion period – Accounts payable period

FS = Firm Size

Lev = Leverage

CCC\*FS = Cash Collection Cycle \* Firm Size

u = error term

## RESULTS AND DISCUSSION

### Descriptive Statistics

Table 2 above shows the descriptive statistics of the variables in the study. The cash conversion cycle depicts a mean value of 27.52 days with a standard deviation of 101.02 days. The value shows that the cash conversion cycle for the KMI-30 index companies is average 28 days with the above and below deviation of 101 days. Therefore, the value shows that the cash conversion cycle for the observed companies can have a higher deviation. Furthermore, ROA has a mean value of 9% with a standard deviation of 14%. The value depicts KMI-30 index companies having an average ROA of 9% that can deviate above or below 14% and hence reflect higher deviation. Additionally, ROE has a mean value of 16% with a standard deviation of 43%. The value depicts the average ROE for KMI-30 index companies to be 16%, deviating above or below by 43%, reflecting that it has a higher deviation. Firm size has a mean value of 18.28 with a standard deviation of 1.94, which shows that the firm size is not much deviated and the firms belong to similar sizes. The variable leverage has a mean value of 0.89 with a standard deviation of 3.25 showing the higher leverage of the observed firms.

Table 2. Descriptive statistics.

Variables	Obs	Mean	Std. Dev.	Min	Max
CCC	290	27.52	101.02	-256.43	537.99
ROA	290	0.09	0.14	-1.44	0.53
ROE	290	0.16	0.43	-4.79	2.23
Firm Size	290	18.28	1.94	14.70	24.87
Leverage	290	0.89	3.25	-31.49	11.51

Note: CCC=Cash conversion cycle; ROA= return on assets; ROE = return on equity.

### Correlation Analysis

Table 3 above shows the correlation analysis between the variables of the study. It is seen that ROA and CCC (r= 0.1259) show a weak and positive relationship between the variables. The relationship is indicated to be significant at 5%. Furthermore, ROE and cash conversion cycle (r=0.0807) reflect weak and positive relationships. The relationship between the variables is indicated to be insignificant. Furthermore, firm size and ROA (r=0.1333)

show a weak and positive relationship, which is significant at the 5% level. Firm size and ROE ( $r=0.091$ ) show a weak and positive relationship, which is insignificant at 5% level. Furthermore, debt to equity and ROA ( $r=-0.0186$ ) reflects a weak and negative relationship which is insignificant at the 5% level. Debt to equity and ROE ( $r=0.5585$ ) reflect a moderate and positive relationship between the variables, which is significant at 5% level of significance.

Table 3. Correlation analysis.

Variables	[1]	[2]	[3]	[4]	[5]
[1] CCC	1				
[2] ROA	0.1259*	1			
[3] ROE	0.0807	0.4948*	1		
[4] Firm Size	0.1218*	0.1333*	0.091	1	
[5] Debt to Equity	0.0103	-0.0186	0.5585*	0.0618	1

### Diagnostic Analysis

The diagnostic analysis is involved in evaluating whether the assumptions of regression are not violated within the given data set. The first assumption of the regression analysis is that the data should be normal. For this purpose, the Shapiro-Wilk normality test is applied, which assumes the null hypothesis that the data is normally distributed while the alternative hypothesis indicates that the data is not normally distributed. Shapiro-Wilk Test is used since it is the most widely used test for estimating the normality of the dataset.

Table 4. Shapiro-Wilk Normality Test.

Variables	Obs	W	V	Z	Prob>z
ROA	290	0.671	67.930	9.886	0
CCC	290	0.859	29.185	7.906	0
Leverage	290	0.348	134.871	11.493	0
Firm Size	290	0.953	9.713	5.328	0
ROE	290	0.503	102.753	10.856	0

Table 4 shows the Shapiro-Wilk normality test for the variables. The P-value for all the variables above is indicated to be 0.00, which shows significance at 5%; hence it rejects the null hypothesis that the data is normally distributed. Hence, the dataset violates the first assumption of the regression analysis.

The second assumption of the regression analysis is that there should not be a multicollinearity issue within the model. For this purpose, correlation analysis can be used, which is shown in Table 2 above and indicates that multicollinearity does not exist since the variables are not highly correlated with each other. Hence, the assumption is not violated. The third assumption of the regression analysis is that the residuals must be homoscedastic, and there should not be heteroskedasticity in the residuals. For this purpose, a modified Wald test for GroupWise heteroskedasticity is used. It tests the existence of heteroskedasticity in the panel regression. The null hypothesis of the test is that the data is homoscedastic, whereas the alternative hypothesis indicates the presence of heteroskedasticity. The heteroscedasticity is estimated separately for each model.

Table 5 shows the heteroskedasticity for the residuals in the 6 models that are indicated in the methodology section above. The P-values for all the models are indicated to be 0.00, which is significant at 5% level, and hence null hypothesis of homoscedasticity is rejected. Therefore, it indicates that the residuals for the models are heteroscedastic, and hence it violates the regression assumption.

Table 5. Test for heteroskedasticity.

Models	P-value
Model 1	0.00
Model 2	0.00
Model 3	0.00
Model 4	0.00
Model 5	0.00
Model 6	0.00

The last and important assumption of regression analysis is regarding the presence of serial autocorrelation. There should not be first-order serial autocorrelation. For this purpose, the Wooldridge test for serial autocorrelation is used, which assumes the null hypothesis there is no first-order autocorrelation, while the alternative hypothesis indicates the levels of serial autocorrelation. The autocorrelation is estimated separately for each model indicated above, as the regression was estimated separately for each model. The table below shows the Wooldridge test for autocorrelation for six models elaborated above. It indicated that the P-values are below 0.05, and hence it indicates that the models reject the null hypothesis and hence autocorrelation exists. Therefore, the assumption is violated.

Table 6. Wooldridge test for serial autocorrelation.

Models	P-value
Model 1	0.00
Model 2	0.00
Model 3	0.01
Model 4	0.00
Model 5	0.01
Model 6	0.00

In Table 6, the diagnostic analysis indicated that there had been the presence of serial autocorrelation, heteroskedasticity and non-normal data; the simple panel regression would not provide accurate outcomes. Hence, based on the study of Bořoc and Anton (2017), quantile regression is used in the study for the regression analysis. The regression assumptions are indicated to be violated, and hence the standard error needs to be robust. Therefore, quantile regression is used.

### Regression Analysis

Table 7 shows the quantile regression for the 6 models developed in the above section. The quantile regression was estimated from 0.1 to 0.10 for 1<sup>st</sup> to 10<sup>th</sup> quartile, where 0.2 or the second quartile had the best estimate based on R-Squared, coefficient values and significance values. The significance values indicated to be 10%, 5% and 1%, as the statistical evidences provide the view that these three levels can indicate the margin of error that can be considered. It indicates that the cash conversion cycle ( $B=0.00014$ ) has a positive and significant impact of ROA at 1% level of significance. Furthermore, the cash conversion cycle ( $B=0.0003$ ) shows a positive and significant impact on ROE at a 10% level of significance. Furthermore, it shows that the Firm size ( $B=0.005$ ) has a positive and significant impact on ROA at 1% level of significance. It further indicates that the firm size ( $B=0.007$ ) has a positive and insignificant impact on ROE. Additionally, the moderating role of Firm size on the relationship between the cash conversion cycle and ROA is insignificant ( $B=0.00$ ). It indicates that firm size does not moderate the relationship between cash conversion and ROA. Further, the moderating role of Firm size on the relationship between cash conversion cycle and ROE is also insignificant ( $B=0.00$ ). It indicates that firm size does not

moderate the relationship between cash conversion and ROE. The reason that firm size did not indicate any significant influence is the use of the single index that has almost similar firm sizes. For better analysis, various firms with different sizes need to be incorporated.

The R-Squared for each model above is given to be minimum, indicating that the model might not be a good fit. There can be various probable reasons for this. The model can be improved by incorporating a larger sample or adding other related and control variables in the study.

Table 7. Quantile regression.

Variables	ROA (1)	ROE (2)	ROA (3)	ROE (4)	ROA (5)	ROE (6)
CCC	0.00014***	0.0003*	0.0001***	0.0002*	0.00027	0.002
Firm Size			0.005***	0.007	0.0049**	0.010
Leverage	0.00068	0.045***	0.0002	0.048***	0.0001	0.040***
CCC*Firm Size					0.000	0.000
R-Squared	0.0277	0.0623	0.0394	0.0662	0.0396	0.0572

Note: \*indicate significance at 10%, \*\* indicate significance at 5%, \*\*\* indicate significant at 1%.

## Discussion

### **Objective 1. To determine the Impact of WCM on the financial performance**

The first objective of the current study is to examine the impact of WCM on financial performance. The findings further stated that WCM significantly influences financial performance. Similarly, the research study by Almomani et al. (2021) also found that receivables turnover, inventory turnover, current assets turnover, and working capital turnover impact financial performance, specifically considering manufacturing firms. WCM should be given consideration by professionals and other stakeholders, such as capitalists and financiers, in the manufacturing sector to improve its financial health. The efficacy of WCM also be improved by working capital financing and investment policies, which would aid investors as well as bankers in making investment and borrowing choices.

Moreover, Ajayi et al. (2017) further iterated that proficient working capital managers improve the firm profitability. There is a negative association between financial performance and the cash conversion cycle. However, a positive association has been found between the firm financial performance and average collection period. Therefore, Businesses are required to contemplate easing their credit and collection policies to increase sales and improve financial performance. The company must accomplish this by comparing its average collecting period to the sector's benchmark. While in contraction to the current research finding, Wang et al. (2020) indicated that there is a negative association between WCM and firm performance. Companies using a conservative approach choose to spend a lot of money on WC to boost the number of sales while growing inventories and receivables to boost profitability. Further, Habib and Kayani, (2022) further evaluated the concept of WCM and firm profitability, particularly considering the UAE firms. The findings of this study are partially contradictory to the findings of the current study, as the research found that WCM efficiency has a negative but significant impact on the likelihood of financial distress of a business. WCM's effectiveness on social objectives would encourage decision-makers in businesses to work effectively and adopt the best practices to reduce the likelihood of businesses experiencing financial difficulties. Based on the current research findings and by relating them with the existing literature, it was observed that the impact of WCM on the firm performance varies among the different sectors and time periods.

### **Objective 2. To determine the impact of Firm Size on financial performance**

The second objective examines the impact of firm size on financial performance and firm profitability. From the regression analysis,

it was found that firm size also creates a significant influence on the firm profitability. By relating the findings of the current study with existing literature, the study by Ozcan et al. (2017) found that the size of the business, which was measured through the sale, the firm's assets and the number of individuals working create a positive influence on the firm profitability which was measured through the operating assets return. Considering that, Lin et al. (2019) mentioned that larger businesses generally gain the benefits of economies of scale, which allows them to lower costs as a result of their size. Their fixed expenses can be distributed across a greater volume of output or consumer base, resulting in reduced average costs for each unit and perhaps increased profitability. Moreover, large businesses have better access to finance, allowing them to spend money on R&D, acquisitions, and growth. By fostering development and innovation, this availability of resources can enhance financial success (Gherghina et al., 2020). Similar to the current research findings, Muhindi and Ngaba (2018) also found that firm size significantly impacts commercial banks' financial performance, particularly in Kenya. Larger businesses may hold a better position in the market and have more negotiating power with vendors and consumers. This leads to improved terms and prices, which would increase sales and profitability. In addition to that, Mehmood et al. (2019) claimed that large companies frequently have the capacity to diversify their business activities across many goods, markets, or geographical areas. By reducing risks, such diversification also lessens the effects of recessions on financial performance which leads to improving the firm profitability.

### **Objective 3. To evaluate the firm size as the moderator between the association of WCM and financial performance.**

The third objective aims to examine the firm size as a moderator between the WCM firm profitability. The following research found that the firm size does not moderate the relationship between WCM and the firm financial performance. However, the research study conducted by Dalci et al. (2019) presents contradictory results and states that firm size moderates the relationship between WCM and firm performance. Efficient handling of working capital includes managing the trade-off between liquidity and profitability. Smaller businesses may not have the means to deal with unforeseen circumstances or recessions, and thus it's critical for them to keep enough working capital reservoirs. Larger companies, on the other hand, are more able to manage their working capital with more adaptability due to their higher stability in finances and resources. The ability of a company to handle financial risks and uncertainties is influenced by its size, which can attenuate the link between WCM and profits (Adekola et al., 2017). Furthermore, Seth et al. (2021) further highlighted

that one of the primary ways a company's size alters the relationship between WCM and firm profitability is through the impact of economies of scale. Because larger organisations may have a greater cost of capital than smaller ones, this affects how well those larger enterprises handle their financial resources. Moreover, the research by Lefebvre (2022) elucidated that smaller businesses often demonstrate more adaptability and agility when it comes to shifting marketplace circumstances and their working capital planning practices. They could have less complicated organisational systems and processes for making choices, which enables them to react to opportunities or obstacles more quickly; therefore, profitability rises as a result of this adaptation. Meanwhile, larger companies have issues executing changes effectively, which lessens the direct effect of WCM on their financial performance.

### CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to conduct the analysis to evaluate the impact of the cash conversion cycle on the firm performance. The financial crisis and the liquidity problems that resulted from the financial turmoil refocused the attention of the financial manager on the organization's short-term financial health. Efficiency in WCM refers to modifications, management and policies of the firm's current assets and liabilities to ensure timely payment at maturity and appropriate management of the fixed assets. In this regard, it is important to carefully manage the quantity of each component of working capital in order to maximise it, as an excess of working capital may be ineffective and not generate any return on investment. Hence the study was conducted in this context. We have developed three different hypotheses; the first hypothesis of the study is that WCM has a significant association with firm performance. The regression analysis indicated that the WCM (cash conversion period) has a significant and positive impact on the firm performance. It hence accepts the hypothesis, and it is concluded that the WCM have a significant impact on the firm performance (both ROA and ROE). The second hypothesis of the study was that firm size has a significant impact on firm profitability. The study regression analysis indicated that the firm size has a significant and positive impact on ROA while having an insignificant effect on ROE. Hence, the hypothesis is partially rejected and accepted. The third hypothesis of the study was that firm size moderates the association between WCM and firm profitability. The regression analysis in the study indicated that the firm size does not moderate the relationship between WCM and firm profitability. The following are certain recommendations developed as per the above findings elaborated. Firms must consider focusing on their account receivable and cash conversion cycle since they have a higher proportion for the sample companies. They represent their efficiency and market position and hence must be as early as possible. Furthermore, the organisation must also focus on the optimisation of the debt-to-equity ratio as it is indicated to be higher and riskier for most situations. Hence, the proportion should be optimised so that there are lower risks. The companies need to focus on securing the firm profitability due to the fluctuations in earnings. They must work on the WCM, which can impact the overall value of the organisation and may increase shareholder worth as well.

There are certain limitations facing the study which should be improved for the better analysis of the subject area. Firstly, the study has focused on firms that are almost equivalent in size, and hence there is not much analysis conducted for different firm sizes, which also affected the regression outcomes, and hence the

moderating role is indicated to be insignificant. Hence, future research can be conducted to explore different types of firm sizes like small, medium and large enterprises, which can moderate the variables. Future research can also consider different measures for estimating the firm sizes of the organisation. Secondly, future research also must focus on the various factors in the external environment which can impact their profitability and working capital as a whole. The increase in the sample size can also be one way that future studies can enhance their findings related to working capital and its impact.

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