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Article

Does working capital management influence firm competitiveness?

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Abstract: Working Capital Management (hereafter WCM) is the strategic tool that helps a company navigate through challenging economic growth, and influence its competitive performance. Thus, this study examines the impact of WCM on the competitiveness of firms operating in the non-financial sectors in Pakistan. We use the Generalized Method of Moments (GMM) technique to ensure the robustness of our results. The study findings reveal that both a large net trade cycle and surplus working capital have a substantial negative impact on firms' competitiveness within their respective industries. These results suggest that companies should streamline their investments in working capital accounts and concentrate more resources on long-term projects that maximize value to improve their competitiveness compared to other companies. Therefore, firms that are effectively managing their short-term financial affairs are experiencing much better performance in all aspects of firm performance. The research findings highlight the urgent need for governmental initiatives designed to improve WCM practices in these industries. It is imperative for the management of companies with excess net working capital to maximize their working capital efficiency, aligning it with industry standards to enhance competitiveness. Moreover, policymakers should prioritize easing access to financial alternatives that allow enterprises to maintain an efficient working capital structure without relying on excessive measures. Furthermore, policymakers should be cautious when determining minimum cash balance requirements in a cash-strapped economy where external financing is relatively more expensive than in other regional economies.

Keywords: working capital management; systematic generalized method of moments; net trade cycle; non-financial listed companies; firm competitiveness; economic growth; Pakistan

1. Introduction

1.1. Background

The fierce competition among corporations has become more pronounced in the current era of globalization (Kiratli, 2023). The advent of technology, reduction in trade barriers, and lower cost of transportation and communication have accelerated international competition (Moughari and Daim, 2023). Intense competition in the local and global markets demands firms to enhance their competitiveness. Upgrading firm competitiveness benefits the firms themselves and has a favorable impact on the overall competitiveness of the economy (Abdullah et al., 2022; Hermundsdottir and Aspelund, 2021). On the other hand, in the current competitive marketplace, it is a

challenge for all corporations to balance long-run profitability and growth (Mansikkamäki, 2023).

Firm-level success or failure can be understood in the context of financial decisions and strategic controls. Properly applying strategic planning is the outcome of managerial and financial practices. Therefore, it is believed that financial management practices significantly influence the firm competitiveness (Li et al., 2024; Yasmin, 2020). Competitiveness is a crucial concept in a society where market forces influence economic outcomes. It establishes the firm's capability to break into new markets, surpass competitors, draw in capital, and prosper. Policymakers who need to know how competitive their nation is relative to others and how their competitive position changes also need to understand this phenomenon (Falciola et al., 2020; Rajiani and Normuslim, 2023).

The decisions regarding working capital are linked with the management of current assets for an accounting period (Bilgin and Turan, 2023). To maximize profits, proper (effective and efficient) management of assets is required, particularly current assets. Therefore, keen management of organizational resources is vital for companies to become competitive (Akbar, 2014; Akbar et al., 2021). WCM is the forthright notion of ensuring the fulfillment of the gap between short-term assets and liabilities (Akbar and Akbar, 2016; Ponce et al., 2024; Wang et al., 2020).

1.2. Research gap

Most of the previous corporate finance studies primarily focused on examining long-term financing decisions, such as capital structure and dividends. However, WCM is a crucial element of short-term financial management. Financial managers constantly strive to determine the optimal level of WCM. Many researchers have extensively studied the concept of WCM and its influence on corporate performance. However, these studies have primarily focused on evaluating the efficiency, liquidity, and strategic aspects of working capital. Several contemporary literature threads analyze the complexities of WCM practices, encompassing strategies, policies, monitoring, control, technology utilization, and tool and approach adaptation (Hidayat and Dewi, 2023; Purba et al., 2023; Yasmin, 2020). Therefore, it is important to investigate the nexus between WCM and firm competitiveness.

1.3. Purpose and objectives

The aim of conducting this research is to explore how WCM can impact firm competitiveness. Although the body of research on WCM is vast, there is a lack of understanding regarding how working capital affects firms' competitiveness. Examining the competitive impact of working capital is critical given the increasing level of competition in the product market. Moreover, this study develops a model to empirically investigate the influence of cash management and WCM on a firm's market competitiveness across various industrial sectors, particularly in Pakistan. In addition, the ratio of working capital to sales can provide insights into how excessive or insufficient working capital impacts a company's competitive capabilities.

1.4. Novelty of the study

The novelty of this research lies in choosing the topic, sample of study, and econometric technique. Pakistan is an emerging country whose productivity is based on the efficiency of the corporate sector. However, the said sector faces a tremendous fall in competitiveness; therefore, this study is unique from the understanding of how managing working capital is important to foster competitiveness. Moreover, previous studies ignored the concern of endogeneity in the empirical data, leading to biased results. However, we use GMM methods to address the endogeneity issue in this study.

1.5. Significance of the study

This study significantly contributes to the existing literature in the following ways: Initially, we incorporate WCM practices and examine the impact of successful WCM on firm competitiveness, making a significant contribution to the existing literature. Furthermore, our data demonstrates the discrepancies in implementing efficient WCM strategies across different industries. Furthermore, this study proposes that practitioners can assess the competitiveness and sophistication of their firms' WCM strategy by employing the recommended methodologies. Managers can develop strategies for managing working capital and allocate resources and efforts to adopt exceptional business practices. This can lead to improvements in market and industry competitiveness, as demonstrated by the substantial connections identified in the study.

The paper's structure is as follows: Section 2 presents the literature review. Section 3 explains the theoretical background and hypothesis development. Section 4 elaborates on the facts and techniques. Section 5 covers data analysis, while section 6 facilitates the discussion. Section 7 concludes the study.

2. Literature review

Financial managers prioritize WCM and aim to find the optimal working capital level (Tripathi et al., 2023). Many researchers have spent their careers studying WCM, and their findings show that it affects enterprise market rivalry and operational effectiveness. **Table 1** documents the literature review on the topic.

Table 1. Literature review.

Author (Year)	Findings
Zimon et al. (2024)	The study investigated the relationship between adoption quality standards and WCM efficiency. Using various statistical analyses, the results verify the positive nexus among the said indicators.
Jadiyappa and Shette (2024)	The authors investigate the relationship between WCM and corporate social responsibility (CSR) regulations among Indian firms. Using the cash conversion cycle as a proxy for WCM, the outcomes suggested a positive relationship among the studied factors.
Skupieňová et al. (2024)	In a study on Czech firms, researchers explored the nexus between WCM and firm performance. Using empirical data from 2012–2021, results found a positive impact of WCM on the performance of Czech corporations.
Kumar et al. (2024)	The authors of the study examined the impact of WCM and its components on the financial performance of Indian firms. Using the K-means cluster technique, the results proved positive relations among the studied variables.

Table 1. (*Continued*).

Author (Year)	Findings
Habib and Kayani (2023)	In an interesting study, the authors examined the relationship between COVID-19 and the super efficiency of WCM, particularly in the context of the UAE. However, the statistical results found that COVID-19 did not influence the efficiency of WCM.
Habib and Dalwai (2023)	In a study on GCC economies, researchers explored the impact of intellectual capital and WCM on firm performance. Using the data collected from Standard & Poor's database, empirical results suggested a positive impact of intellectual capital and WCM on firm performance.
A. Akbar et al. (2022)	The authors of the study claimed that WC policies boost corporate performance.
Habib and Mourad (2022)	In a study on firms operating in the Gulf, the authors examined the differential impact of the pre-and post-COVID eras on the efficiency of WCM. The findings showed a difference in efficiency before and during the COVID phase.
Habib (2022)	This study evaluated the impact of the efficiency of WCM on firm value in corporations working in the United States. The regression results testified that most of the firms are inadequately managing working capital and WCM has a positive impact on firm value.
Habib and Kayani (2022)	The authors evaluated the impact of WCM efficiency on financial distress before and during the COVID crisis. The results confirmed a negative relationship between WCM efficiency and financial distress.
Purnomo et al. (2021)	In the study on WCM and firm competitiveness, the authors negated this relationship and argued that investment decisions in working capital do not affect firm competitiveness.
Sensini (2020)	A study contended that Italian SMEs can reduce their dependence on external debt and use excessive resources in other investments to become competitive.
Wang et al. (2020)	The study's findings claimed that inefficient WCM enterprises heavily rely on long-term debt to pay short-term responsibilities.

3. Theoretical background and hypothesis development

Two prevalent yet opposing theories guide WCM decisions. Aggressive WCM advocates say companies should use short-term debt more to finance their operations. Aggressive WCM is profitable but risky for financial management (Anwar et al., 2023; Kayani, 2023; Qu and Kim, 2022). Aggressive WCM uses long-term debt to finance fixed assets and current liabilities to finance current assets (Baker et al., 2023; Khan et al., 2016). Therefore, aggressive WCM policies promote more short-term debt and less long-term debt. Indeed, short-term debt is cheaper than long-term. Debt reduction and lower financing costs may increase short-term liquidity risk (Chen et al., 2023; Li and Tongkong, 2024).

Conservative WCM policy advocates said enterprises should employ long-term debt for short-term financing (Jabbouri et al., 2023; Wang et al., 2020). Conservative WCM policies decrease short-term liquidity risk but lower return on investment (ROI) (Jing et al., 2023; Zhu et al., 2023). Additionally, such a program may increase a company's long-term debt. A conservative WCM policy has large cash, marketable securities, inventory, and reserves. The firm can invest excess long-term money in marketable securities to make returns when seasonal current assets are not needed (Baker et al., 2023; Pitigala and Lopez-Calix, 2021).

Contingency theories argue that there is no one-size-fits approach to WCM and that the best effective technique depends on many situational conditions (Franco et al., 2023). These theories emphasize the significance of tailoring WCM procedures to the individual circumstances of the firm, such as its industry, size, and financial status (Harney, 2023). On the other hand, configurational theories imply that the success of WCM depends on how different parts of working capital, such as

accounts receivable, accounts payable, and inventory, are configured and managed with each other (Kindermann et al., 2023). Configurational theories focus on determining the optimal configuration of working capital components to optimize the firm's profitability and liquidity while avoiding risks. Both contingency and configurational theories provide useful insights for managers in making decisions on WCM techniques (Deb et al., 2023).

Researchers observed that efficient WCM increases competitiveness (Yasmin 2020). Firm competitiveness is the foundation of the market economy because enterprises compete in international marketplaces, not states (Falciola et al., 2020). Enterprise competitiveness is multidimensional and varied. They are caused by many causes, including management (Ceptureanu, 2015). Management methods affect competitiveness (Dvorsky et al., 2020). Competitiveness literature defines a corporation as competitive if it has consistently good performance and prospects of good performance supported by resources and competencies (Juscius et al., 2020). Efficient WCM affects business profitability, performance, risk, and value. Initial WCM research concentrated on optimizing cash, inventories, accounts receivable, and accounts payable.

We believe contingency and configurational theories on working capital help improve firms' short-term financial affairs and competitiveness. Thus, an integrated and supply chain-oriented approach to working capital policies can improve WCM efficiency for all stakeholders. Based on the discussion, we postulate that new methodologies should link WCM, channel management, and customer relationship management for firm performance.

H: There is a positive impact of WCM on corporate competitiveness.

4. Methodology

4.1. Sample and variables selection

To test the study's hypothesis, we collected the data for the firms operating in Pakistan. Pakistan is a developing country where firms face limited access to credit and volatile economic conditions. In this situation, managing working capital efficiently is even more crucial. By properly managing working capital, firms operating in Pakistan can save themselves from financial risk and reduce their dependence on external financing. Moreover, WCM can also help Pakistani firms respond swiftly to market changes, thus enhancing their competitiveness.

Furthermore, we exclusively selected non-financial firms for the sample due to various factors. Firstly, non-financial firms process the majority share of the businesses operating in Pakistan; as a result, these firms have a greater impact on the economy. Secondly, non-financial firms face different challenges concerning WCM, such as seasonal changes, disruptions in the supply chain, and limitations on access to finance. The time frame of this study is from 2010 to 2019. The selection of the said time frame is because it provides consistent and reliable data, ensuring the accuracy and validity of our analysis. Furthermore, it allows us to capture dynamic changes in Pakistan's corporate sector over time. Lastly, the said time frame represents the pre-COVID phase. The corporate sector in Pakistan has witnessed losses, stoppages, and closures during and after the COVID situation.

The study's final sample consists of 354 non-financial firms out of 412 firms. The sample firms are further segregated into 12 different industries. Details on the research sample are given in **Table 2**. The said cleansing is made based on the availability of consistent data. The sample firms have consistent data and operate throughout the studied time frame. The statistical data of the sample firms is gathered from annual financial statements published by the respective firms and available on the stock exchange's online portal.

Table 2. Sample.

Sector	Total Firms	Sample Firms
Textile	168	142
Food	47	43
Chemical and Pharmaceuticals	45	40
Other Manufacturing	32	27
Non-Metallic	28	27
Motor Vehicles, Trailers, and Auto parts	20	20
Fuel and Energy	22	16
Information, Communication and Transport	13	12
Cole and Refined Petroleum Products	10	8
Electrical Machinery and Apparatus	7	6
Other Services Activities	11	7
Paper, Paperboard, and Products	9	6
Total	412	354

Source: Author's calculation.

4.2. Empirical testing

In this study, we use firm competitiveness as a dependent variable and WCM as an independent variable. Furthermore, we incorporate multiple control variables into our empirical model. For instance, our research documents that the firm's size, with its available resources and expertise, determines its competitiveness (Mansikkamäki, 2023). We also use the operating expense and cost of goods sold as a ratio of sales. We can assume that both variables foster innovation within firms. Moreover, we use asset turnover ratio and cash flow as control variables. These factors determine the firm's profitability, which eventually enhances the competitiveness of an enterprise (Laborda et al., 2020). Finally, the study incorporates variations in operating income and corporate reserves as control variables. The available literature suggests that both variables influence a firm's ability to engage in competitive activities (Eberhart et al., 2004). **Table 3** provides the details of all the used variables.

To empirically test the study's hypothesis, we develop an empirical model with dependent, independent, and control variables (see model 1 and model 2). The models also contain intercept (a) and error terms (u). We have a panel dataset segregated into firms (i) and years (t). The first model is used to run fixed effect regression because of systematic differences between firms, which can be significant and expose the estimates to bias. Moreover, the second regression model is designed

to evaluate the GMM model. Therefore, we incorporate the lagged variables of dependent variables in the model.

$$\begin{aligned}\mathrm{CSG}_{i,t} = {} & \alpha_{i,t} + \beta_1 \mathrm{ENWC}_{i,t} + \beta_2 \mathrm{NTC}_{i,t} + \beta_3 \mathrm{DAR}_{i,t} + \beta_4 \mathrm{DI}_{i,t} + \beta_5 \mathrm{DAP}_{i,t} + \beta_6 \mathrm{CR}_{i,t} + \beta_7 \mathrm{ATR}_{i,t} + \beta_8 \mathrm{CASR}_{i,t} \\ & + \beta_9 \mathrm{CCAR}_{i,t} + \beta_{10} \mathrm{CSR}_{i,t} + \beta_{11} \mathrm{Size}_{i,t} + \beta_{12} \mathrm{OESR}_{i,t} + \beta_{13} \mathrm{CGSR}_{i,t} + \beta_{14} \mathrm{ATR}_{i,t} + \beta_{15} \mathrm{CF}_{i,t} \\ & + \beta_{16} \mathrm{Reserves}_{i,t} + \beta_{17} \mathrm{VONOI}_{i,t} + \mu_{i,t}\end{aligned} \quad (1)$$

$$\begin{aligned}\mathrm{CSG}_{i,t} = {} & \alpha_{i,t} + \beta_1 \mathrm{ENWC}_{i,t} + \beta_2 \mathrm{NTC}_{i,t} + \beta_3 \mathrm{DAR}_{i,t} + \beta_4 \mathrm{DI}_{i,t} + \beta_5 \mathrm{DAP}_{i,t} + \beta_6 \mathrm{CR}_{i,t} + \beta_7 \mathrm{ATR}_{i,t} + \beta_8 \mathrm{CASR}_{i,t} \\ & + \beta_9 \mathrm{CCAR}_{i,t} + \beta_{10} \mathrm{CSR}_{i,t} + \beta_{11} \mathrm{Size}_{i,t} + \beta_{12} \mathrm{OESR}_{i,t} + \beta_{13} \mathrm{CGSR}_{i,t} + \beta_{14} \mathrm{ATR}_{i,t} + \beta_{15} \mathrm{CF}_{i,t} \\ & + \beta_{16} \mathrm{Reserves}_{i,t} + \beta_{17} \mathrm{VONOI}_{i,t} + \beta_{18} \mathrm{L.CSG} + \beta_{19} \mathrm{L2.CSG}_{i,t} + \mu_{i,t}\end{aligned} \quad (2)$$

Table 3. Variables definition and calculation.

Variables	Descriptions	Calculations
Dependent variable		
CSG	Competitive Sales Growth	Firm sales growth − Industry mean sales growth
Independent variables		
ENWC	Excess Net Working Capital to sales ratio	Firm net working capital to sales ratio − Industry mean networking capital to sales ratio
NTC	Net Trade Cycle	Days account receivable + Days inventory − Days account payables
DAR	Days Account Receivables	(Account receivables/sales) × 365
DI	Days Inventory	(Inventory/Sales) × 365
DAP	Days Account Payables	(Account payables/sales) × 365
CR	Current Ratio	Current assets/Current liabilities
ATR	Acid Test Ratio	(Cash + receivables + Short-term investments)/Current liabilities
CASR	Current Assets to Sales Ratio	Current assets/sales
CCAR	Cash to Current Assets Ratio	Cash/Current Assets
CSR	Cash to Sales Ratio	Cash/sales
Control variables		
Size	Size of the Company	Natural log of total assets
OESR	Operating Expenses to Sales Ratio	Operating expenses/sales
CGSR	Cost of Goods Sold to Sales Ratio	Cost of goods sold/sales
ATR	Assets turnover ratio	Total assets/sales revenue
CF	Cash flows	Cash flows generated by the operations of the firm.
VONOI	Variability of Net Operating Income	The standard deviation of the net operating profit of each firm during the sampled period.
Reserves	Reserves held by the firm	The aggregate balance of all reserves + the balance of profit and loss account

5. Results

Descriptive trends of all the variables are provided in **Table 4**. The mean sales growth of sampled firms is 13.6%, which is quite reasonable. However, the standard deviation of 28.6% depicts that sales growth substantially varies within and across different industries. Moreover, a mean NWC to sales ratio of 24.3% shows that a substantial amount of investment has been made in the working capital accounts, which should be a point of concern for financial managers of these firms. On average, Pakistani firms take 89 days between the purchase of raw materials from suppliers and the final receipt of cash from the customer by the sale of their products.

Similarly, firms take 73 days on average to sell their inventory, which is alarming and reflects that companies are facing problems selling their inventory. In addition, a mean current asset-to-sales ratio of 57% reveals that an ample amount of current assets is deployed to generate sales. The mean cash-to-current assets ratio is 7.5%, whereas the mean cash-to-sales ratio is 3.6%. The average variation in net operating profit is 34%, suggesting that sampled firms have experienced larger variations in profit during the study period. Overall, the above statistics indicate that several inefficiencies exist in different areas of the working capital and the non-financial Pakistani firms have sufficient room to improve their WCM to ensure better competitive performance.

Table 4. Descriptive stats.

Variables	No. of Obs.	Mean	S.D.	Min.	Max.
Sales growth	3479	0.136	0.286	−0.431	0.784
NWC/sales ratio	3479	0.243	0.208	0.003	0.792
NTC	3479	88.873	76.057	0.925	289.133
DI	3479	72.649	60.045	2.708	234.379
DAR	3479	42.935	48.656	0.63	187.555
DAP	3479	28.918	31.815	1.72	119.193
CR	3479	1.292	0.88	0.26	3.8
ATR	3479	0.499	0.544	0.02	2.09
CASR	3479	0.569	0.451	0.155	1.996
CCAR	3478	0.075	0.099	0.002	0.362
CSR	3478	0.036	0.051	0.001	0.197
Size	3479	14.692	1.502	12.108	17.526
OESR	3479	0.09	0.081	0.016	0.314
CGSR	3479	0.873	0.129	0.609	1.164
ATR	3479	1.122	0.681	0.16	2.68
VONOI	3479	0.34	0.31	0.065	1.311
CF	3479	0.097	0.098	−0.084	0.3
Reserves	3479	1,592,948	3,274,290	−996,015	1.27×10^7

Source: Author's calculation.

In **Table 5**, the Pearson correlation explicates the association between investment in working capital and the firm's competitive position. All the variables are standardized by subtracting the respective industry mean value. Both networking capital and industry-adjusted net working capital to sales ratio show a significant negative coefficient with competitive sales growth, indicating that larger funds tied up in short-term assets about sales can lower the firm competitiveness by leaving fewer resources for productive activities. Likewise, negative linkages between the net trade cycle and its components with competitive sales growth reveal that a firm can improve its competitive performance in the market by reducing the length of its net trade cycle.

Table 5. Pearson product-moment coefficients of correlation.

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	−0.20[a]																
2	−0.21[a]	0.09[a]															
3	−0.19[a]	0.78[a]	0.77[a]														
4	−0.20[a]	0.63[a]	0.63[a]	0.28[a]													
5	−0.18[a]	0.17[a]	0.17[a]	0.42[a]	0.40[a]												
6	0.02	0.12[a]	0.12[a]	0.02[a]	0.07[a]	−0.16[a]											
7	0.01	0.09[a]	0.10[a]	−0.09[a]	0.21[a]	−0.14[a]	0.84[a]										
8	−0.27[a]	0.70[a]	0.70[a]	0.64[a]	0.55[a]	0.45[a]	0.18[a]	0.19[a]									
9	0.03[c]	−0.24[a]	−0.24[a]	−0.24[a]	−0.19[a]	−0.15[a]	0.21[a]	0.34[a]	−0.13[a]								
10	−0.07[a]	0.06[a]	0.06[a]	0.04[a]	0.06[a]	0.03[c]	0.28[a]	0.41[a]	0.28[a]	0.78[a]							
11	0.06[a]	−0.05[a]	−0.05[a]	−0.01	−0.14[a]	−0.12[a]	−0.02	0.02	−0.04[a]	0.07[a]	0.08[a]						
12	−0.22[a]	0.32[a]	0.32[a]	0.33[a]	0.32[a]	0.33[a]	0.04[a]	0.03[c]	0.45[a]	−0.04[a]	0.19[a]	−0.21[a]					
13	−0.18[a]	0.03[a]	0.03[c]	0.09[a]	0.12[a]	0.31[a]	−0.32[a]	−0.30[a]	0.14[a]	−0.15[a]	−0.14[a]	−0.23[a]	−0.04[a]				
14	0.08[a]	0.01	0.01	−0.04[a]	−0.09[a]	−0.24[a]	−0.13[a]	−0.12[a]	−0.17[a]	−0.19[a]	−0.19[a]	0.25[a]	−0.19[a]	−0.08[a]			
15	0.22[a]	−0.48[a]	−0.48[a]	−0.46[a]	−0.36[a]	−0.32[a]	0.08[a]	0.02	−0.62[a]	0.15[a]	−0.16[a]	−0.11[a]	−0.27[a]	−0.11[a]			
16	−0.02	0.06[a]	0.06[a]	−0.01	0.09[a]	−0.02	0.06[a]	0.07[a]	0.03[a]	−0.05[a]	−0.03[a]	−0.23[a]	0.17[a]	−0.07[a]	0.12[a]		
17	0.26[a]	−0.22[a]	−0.22[a]	−0.28[a]	−0.24[a]	−0.40[a]	0.29[a]	0.25[a]	−0.38[a]	0.20[a]	0.05[a]	0.23[a]	−0.29[a]	−0.64[a]	0.47[a]	0.04[a]	
18	0.05[a]	−0.08[a]	−0.09[a]	−0.10[a]	−0.12[a]	−0.17[a]	0.25[a]	0.27[a]	−0.02	0.16[a]	0.16[a]	0.59[a]	−0.10[a]	−0.32[a]	−0.01	−0.09[a]	0.29[a]

[c] $p < 0.1$, [b] $p < 0.05$, [a] $p < 0.01$.
1 = ENWC, 2 = NTC, 3 = DI, 4 = DAR, 5 = DAP, 6 = CR, 7 = QR, 8 = CATS, 9 = CTCA, 10 = CTS, 11 = Size, 12 = CSR, 13 = CGSTS, 14 = OESR, 15 = ATR, 16 = VONOI, 17 = CF, 18 = Reserve.

The correlations for current and acid test ratios are not significant; however, the current assets to sales ratio reflects a negative association with competitive sales growth, implying that the larger the liquid resources a firm deploys for generating sales, the lower the competitive sales growth. In addition, there is a positive coefficient between cash to current assets (CTCA) and CSG, indicating that holding more cash relative to current assets helps improve market sales performance for the firm, while a negative cash to sales (CTS) proposes that cash should be efficiently utilized to expedite sales growth. As with the control variables, size, asset turnover, cash flows, and reserves are positively associated with competitive sales growth, whereas OESR and cost of goods sold to sales (CGSTS) put up a negative sign with competitive sales growth. Overall, the correlation matrix demonstrates promising results regarding the association between WCM and the firm's competitive sales growth.

Table 6 presents the outcomes of panel data models regarding the relationship between WCM and firm competitiveness. In this scenario, we favor using fixed effects, as indicated by the substantial Hausman statistics in all the regression models mentioned above. The results of these regressions substantially support the negative relationship between working capital levels and the competitive performance of firms in the industry (Bilgin and Turan, 2023; Hidayat and Dewi, 2023). However, the low coefficients of cash to current assets and cash to sales ratio indicate that the influence of cash holdings on company competition performance is not apparent.

Furthermore, the control variables, such as size, operating expenses to sales ratio, CGS to sales ratio, asset turnover, and cash flows, significantly impact the firm's competitive performance in the Pakistani setting. Although some previous studies oppose our findings (Purnomo et al., 2021), these studies used samples from diverse economies or different time frames. However, most of the extant studies support our results and exhibit empirical findings that align with our research (Jadiyappa and Shette, 2024; Zimon et al., 2024).

Table 6. Panel-based regression models: Industry mean-adjusted sales growth as the dependent variable.

Regression	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
ENWC	−0.194***				
	(−5.04)				
NTC		−0.053***			
		(−5.04)			
DAR			−0.032*		
			(−1.73)		
DI			−0.068***		
			(−4.79)		
DAP			−0.044*		
			(−1.76)		
CR				−0.031**	
				(−2.26)	
ATR				0.047**	
				(2.23)	
CASR				−0.100***	
				(−5.17)	
CCAR					−0.068
					(−0.60)
CSR					−0.072
					(−0.33)
Size	0.071***	0.071***	0.069***	0.064***	0.065***
	(4.35)	(4.35)	(4.19)	(3.97)	(3.95)
OESR	−0.445***	−0.445***	−0.391***	−0.381***	−0.542***
	(−3.79)	(−3.79)	(−3.28)	(−3.17)	(−4.53)
CGSR	−0.326***	−0.326***	−0.311***	−0.292***	−0.330***
	(−4.79)	(−4.79)	(−4.54)	(−4.24)	(−4.84)
ATR	0.158***	0.158***	0.145***	0.146***	0.185***
	(9.29)	(9.29)	(8.24)	(8.17)	(11.13)
CF	0.373***	0.373***	0.369***	0.410***	0.352***
	(3.82)	(3.82)	(3.79)	(4.17)	(3.58)

Table 6. (*Continued*).

Regression	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Reserves	0.001***	0.001***	0.001	0.001	0.001***
	(2.43)	(3.01)	(0.04)	(0.24)	(5.32)
VONOI	0.342***	0.125***	0.022***	0.141***	0.101***
	(13.65)	(10.61)	(7.12)	(19.90)	(16.54)
Constant	−0.001	−0.001	−0.001	−0.001	−0.001
	(−0.09)	(−0.09)	(−0.09)	(−0.07)	(−0.08)
N	3479	3479	3479	3479	3478
Adjusted R^2	0.145	0.145	0.148	0.148	0.139
F	35.082	35.082	31.715	31.657	31.180
Hausman	130.29	130.29	161.52	148.17	114.36
	0.000	0.000	0.000	0.000	0.000

t statistics in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Although panel estimation allows us to account for the heterogeneity (Son, 2024; Trussell and Richards, 1985) that may arise because of the unique characteristics of each firm, simple panel estimation does not cure the possible effects of endogeneity. The issue of endogeneity arises because of the possibility of a two-way relationship between the independent variables and the dependent variable. Specifically, the observed relationship between WCM and firm competitiveness may demonstrate not only the effect of independent variables on firm competitive performance but also the effect of firm competitiveness on these variables. To avoid such a situation, we have estimated our model by applying the two-step generalized method of moments (GMM) proposed by Newey (1985). This technique allows us to control the possible impact of endogeneity using instruments in the regression models. The table below presents the results of two-step GMM regressions.

Table 7. Results of GMM-based estimation: Industry mean-adjusted sales growth as the dependent variable.

Regression	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
L.CSG	−0.292***	−0.292***	−0.303***	−0.301***	−0.283***
	(−91.82)	(−91.82)	(−114.45)	(−117.53)	(−137.97)
L2.CSG	−0.244***	−0.244***	−0.245***	−0.258***	−0.244***
	(−91.58)	(−91.58)	(−118.88)	(−124.78)	(−152.67)
ENWC	−0.406***				
	(−37.46)				
NTC		−0.111***			
		(−37.46)			
DAR			−0.128***		
			(−33.07)		

Table 7. (*Continued*).

Regression	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
DI			−0.139***		
			(−45.72)		
DAP			−0.128***		
			(−35.14)		
CR				−0.074***	
				(−27.16)	
ATR				0.164***	
				(45.74)	
CASR				−0.163***	
				(−36.42)	
CCAR					0.084***
					(4.94)
CSR					−0.168***
					(−7.01)
Size	0.119***	0.119***	0.069***	0.089***	0.113***
	(10.79)	(10.79)	(8.18)	(21.89)	(23.69)
OESR	−0.542***	−0.542***	−0.333***	−0.480***	−0.665***
	(−18.85)	(−18.85)	(−14.92)	(−24.90)	(−48.95)
CGSR	−0.759***	−0.759***	−0.698***	−0.749***	−0.778***
	(−41.74)	(−41.74)	(−44.06)	(−74.00)	(−86.26)
ATR	0.421***	0.421***	0.359***	0.379***	0.466***
	(−2.02)	(−2.02)	(−0.58)	(−0.92)	(−1.53)
CF	0.758***	0.758***	0.752***	0.673***	0.681***
	(25.77)	(25.77)	(34.88)	(43.50)	(40.01)
Reserves	0.000***	0.000***	0.000	0.000	0.000***
	(3.37)	(3.37)	(0.44)	(1.33)	(7.82)
VONOI	0.175***	0.175***	0.120***	0.142***	0.134***
	(17.56)	(17.56)	(14.85)	(27.18)	(22.37)
N	2382	2382	2382	2382	2380
ar2	1.041	1.041	0.729	1.546	1.371
ar2 p	0.298	0.298	0.466	0.122	0.170
Hansen	340.758	340.758	357.567	355.396	355.747
hansen_df	326.000	326.000	396.000	396.000	361.000
Hansen *p*	0.276	0.276	0.918	0.929	0.568

t statistics in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7 presents the findings of the GMM regression analysis on the correlation between the effectiveness of the WCM and the competitiveness of firms in the market. Five distinct sets of regression models were utilized to gain a comprehensive grasp of how various working capital accounts affect Pakistani enterprises' market rivalry. The variables were normalized by subtracting the industry mean. Therefore,

the variable influenced by other factors is the growth of the firm's sales, which is calculated by subtracting the average sales growth of the industry for each year. As mentioned before, only a smaller amount of literature opposes our results (Sensini, 2020). Indeed, most of these studies occurred in diverse environments and varying periods. The findings of our study are in line with most of the literature and thus support our narrative (Akbar et al., 2022; Baker et al., 2023; Kumar et al., 2024; Purba et al., 2023; Skupieňová et al., 2024).

These findings are robust in that we use a series of proxies to quantify WCM, such as excess net working capital to sales ratio, net trade cycle, days account receivables, days inventory, days account payables, current ratio, acid test ratio, current assets to sales ratio, cash to current assets ratio, and cash to sales ratio. Furthermore, we run five different statistical models for all the proxies, as well as both fixed effect regression and GMM regression. These tests could also be considered additional tests because our results are valid even after changing the proxies of WCM. The findings of all the regressions are similar, in line with the previous studies, verify our hypothesis, and support our narrative.

6. Discussion

The findings indicate that excessively tied-up resources in short-lived assets undermine a firm's ability to expand sales by investing in value-enhancing projects (column 1). Moreover, the results confirm that firms with a larger net trade cycle perform poorly in terms of market sales performance than their counterparts (column 2). The third regression model (column 3) presents the regression estimates of individual components of the net trade cycle. Both numbers of days' inventory and receivables are negatively related to the proxy of market competition, conjecturing that a larger pileup of inventories and a looser credit policy adversely affect a firm's ability to expedite its market share relative to its competitors. However, a significant negative coefficient between days' accounts payable and industry-adjusted sales growth recommends that firms that make timely payments to their suppliers are more competitive in terms of sales expansion. One possible reason for this result could be that early payment to the suppliers can help firms establish more long-term and profitable relationships with their supply chain, which can help these firms get a timely and flawless supply of raw materials during periods of extraordinary demand. Furthermore, these firms can take advantage of the discount on early payments in monetary terms.

We include three independent variables in our fourth regression model (column 4): the current ratio, quick ratio, and the current assets to sales ratio, along with the same control variables used in all the regression models. The first two measures evaluate the impact of firm liquidity position. In contrast, the third measure examines the holding of current assets related to sales on the competitive performance of sampled Pakistani firms. The statistics show a negative correlation between competitive sales growth and the current ratio and the current assets to sales ratio, implying that firms that reduce their current asset balance outperform their competitors in the market. Despite a positive correlation between the quick ratio and

competition, the firm can outperform its competitors by maintaining a reasonable amount.

We aim to examine the impact of cash holdings on the competitive ability of Pakistani firms in our last regression model (column 5). Firm competitiveness correlates positively with the CTCA, indicating that firms benefit from holding more cash than current assets as it enables instantaneous fulfillment of needs. Another reason for such results could be that firms with more cash holdings are typically those that are more financially powerful, with substantial market shares and a larger customer base.

On the contrary, the cash-to-sales ratio has a negative relationship with the proxy of firm competitiveness, which is indicative of the fact that more economic and rational use of cash in sales will help firms make more productive utilization of their resources. As with the control variables, size has a significant positive relationship with firm competitive performance, revealing that large-size firms are more competitive in the case of Pakistan. In all regressions, the operating expenses to sales ratio show a significant negative coefficient, revealing that extravagant amounts spent on firms' operating activities can seriously hurt their competitive position in the industry. Similarly, the CGS-to-sales ratio also shows a significant negative relationship with competitive performance, which is obvious. Firms with higher operating expenses or production costs would not be able to lower their prices in comparison to their competitors, resulting in lower sales growth. Furthermore, we found a positive link between asset turnover and competitiveness, as optimal capacity utilization of assets enables firms to meet additional product demand by increasing production. Similarly, both cash flows and reserves have a significant positive relationship with the firm's sales competitiveness, demonstrating that financially sound firms have more funds to produce and promote their products to get ahead of their competitors in a given industry.

Interestingly, VONOI reflects a positive association with competitive performance, indicating that taking on risky projects can yield more rewarding outcomes for such firms. In summary, these results demonstrate a strong correlation between WCM efficiency and a firm's sales performance compared to its competitors, implying that efficient working capital is not only essential for profit maximization but also significantly impacts the firm's ability to compete in the market (Akbar et al., 2021; Desalegn and Solomon, 2021; Jabbouri et al., 2023; Tripathi et al., 2023). Given the nature of GMM estimation, we employed lags of the dependent variables to prevent 2nd-order autocorrelation. In all cases, the *p*-values of the AR2 process are insignificant, ruling out the presence of autocorrelation in our regression models. Likewise, Hansen-*p* is insignificant in all regression models, indicating that there is no endogeneity problem. Our findings are in line with the previous literature, which also supports our narrative (Habib and Kayani, 2023; Jadiyappa and Shette, 2024; Kumar et al., 2024; Zimon et al., 2024). Moreover, our findings support the existing theories, such as contingency and configurational theories, which argue that there is no one-size-fits approach to WCM and that the best effective technique depends on many situational conditions (Franco et al., 2023). Furthermore, the configuration and management of various components of working

capital, including accounts receivable, accounts payable, and inventory, significantly influence the success of WCM (Kindermann et al., 2023).

7. Conclusion

We provide policy insights for the practitioners and financial managers of Pakistan by exploring how WCM can affect the competitive position of the firm in the market. Using panel-based regression techniques and GMM-based regression models, we uncover that excess working capital relative to the industry averages adversely affects the competitiveness of the sampled firms. Likewise, a larger net trade cycle lowers the firm's ability to get ahead of its competitors regarding market share. These results have practical significance for firms and conjecture that efficient WCM is inevitable to survive and thrive in a competitive business environment. These findings were further verified by analyzing individual components of working capital as both inventory days and receivable days posted a negative sign with the competition variable. This result postulates that non-financial firms can improve their sales competition performance by reducing the inventory levels to a sizeable limit.

Likewise, sample firms need to review their credit policy and expedite the collection from their customers to remain competitive. However, a significant negative relationship between days' accounts payable and industry-adjusted sales growth recommends that firms that make timely payments to their suppliers are more competitive in terms of sales expansion. One possible reason for this outcome could be that early payment to the suppliers can help firms establish a long-term and profitable relationship with their supply chain, which can help these firms get a timely and flawless supply of raw materials during periods of extraordinary demand.

Moreover, lower levels of the current ratio exhibit better sales growth in their respective industries. In addition, cash-rich firms post higher sales growth, which reflects their fiscal strength and inner revenue capacity. The results further indicate that firms with a higher cost of goods sold than their sales revenue exhibit lower competitive performance. These findings also confirm that most sample industries have substantial cash cycles and have substantial room for improving their working capital policies. Therefore, firms that are effectively managing their short-term financial affairs are experiencing a much better performance in all aspects of firm performance.

These outcomes imply that firms shall rationalize their investments in working capital accounts and allocate more funds for long-term value-maximizing projects to enhance corporate competitiveness relative to their peers. A higher cash relative to current assets is positively linked with firm competitiveness, implying that cash-rich firms are more competitive and resilient than their industry counterparts. Hence, policymakers should be cautious in determining minimum cash balance requirements in a cash-strap economy where external financing is relatively more costly than other regional economies.

While the present study provides valuable insights into the adverse effects of excess net working capital and extended Net Trade Cycles on firm competitiveness, it is significant to mention this study's limitations and future research directions. One

limitation is the potential heterogeneity of industries, as the impact of WCM may vary across sectors. Future research could delve into industry-specific differences to offer a more nuanced understanding of this association. Secondly, the results of this study can only be generalized to corporations working in developing economies with the same economic status as Pakistan. Future research could explore the relationship between WCM and corporate risk-taking propensity. Moreover, extending the study to examine the interplay of WCM with macroeconomic factors and global market dynamics could yield a more comprehensive understanding of its implications for firm competitiveness in a broader context. Finally, assessing the influence of technological advancements, such as automation and blockchain, on WCM and supply chain practices represents a promising area for future research.

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