



EFFECT OF WORKING CAPITAL MANAGEMENT ON FINANCIAL PERFORMANCE OF FIRMS LISTED IN PAKISTAN STOCK EXCHANGE

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KEYWORDS	ABSTRACT
Working capital; Profitability; Panel data econometrics; Pakistan Stock Exchange; Liquidity preference theory.	This study aims at examining the short-term resource allocation in publicly traded manufacturing firms of Pakistan in terms of an integrated panel data system with a five-pronged independent construct model. A balanced panel system involving 30 firms listed on the Pakistan Stock Exchange (PSX) during 2021 to 2025 is analyzed in terms of 150 firm year observations with complete Fixed Effects (FE) and Random Effects (RE) matrix models. The standard econometric model is justified and the structural analysis is derived from the estimation results. The regression models are statistically significant throughout and it is found that the overall current ratio is the sole dominating determinant of accounting profitability (ROA and ROE). Otherwise, transaction statistics on a daily basis, such as inventory days, days receivable, and days payable, exhibit statistical neutrality in the multi-variate analysis framework. This study demonstrates a purposeful defensive operating policy, which generates a negative average cash conversion cycle of -13.50 days. So, the combination of quick collection periods along with long deferral periods of payments to suppliers creates a free financing mechanism in the supply chain.
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Introduction

The WCM process within the corporate organizations of the developing nations is very complicated and very delicate, affected by the macroeconomic instability and monetary squeeze causing internal credit constraint conditions. In such emerging economies, higher commercial borrowing rates require internal short-term assets as buffer to have liquidity, technical solvency, and operational efficiency. Working Capital Management (WCM) is an indispensable aspect of financial management in corporations since it significantly affects the company's financial liquidity, operation capability, and financial sustainability. Different from the long-term investments which are not always under management, WCM involves the management of short-term resources and obligations such as inventories, receivables, payables, and cash. Good WCM helps the firm operate without problems, finance itself less, and become more profitable, while poor WCM leads to the excessive short-term investment, excessive cost of inventories, or severe liquidity crises (Baños-Caballero et al., 2014; Deloof, 2003).

The link between working capital management and company performance is the main theme discussed in financial management literature. In the process of managing working capital, businesses have to consider liquidity and profitability instead of simply maximizing current assets. Large inventories mean higher expenses associated with storage and financing, and insufficient inventories hinder production. On the other hand, long periods of receivables decrease cash flow, but effective payment collection policies make it better. Payable management is yet another important financial decision, because supplier credit finances corporate operations, but improper payment practices affect supplier relations and business operations. Cash conversion cycle (CCC) that includes inventory, receivables, and payable management allows evaluating company's operational efficiency by assessing how quickly a business converts its assets into cash (Richards & Laughlin, 1980).

There are empirical studies carried out in recent times to study the relationship between effective working capital management and profitability in different countries and industries. The firms that are able to manage their working capital well tend to perform better financially because they are efficient in using resources and do not idle capital. This relationship, however, is not static in nature because the impact of particular working capital components depends on the industry features, market situations, and organization's policies. For example, there is a unique impact on profitability associated with inventory management in manufacturing companies (Jaworski & Czerwonka, 2024; Kiyamaz et al., 2024; Yousaf, 2026).

The importance of working capital management increases in developing countries because of financial constraints, economic uncertainties, and unavailability of low-cost sources of financing. In such an environment, firms cannot depend on the banking system and capital market for funding and are left to manage their liquidity internally. There are numerous macroeconomic problems faced in Pakistan in recent years including inflation, high interest rates, currency depreciation, and increasing cost of production. Such factors make it difficult for firms to borrow money and hence they

need to manage cash flows efficiently (Aldubhani et al., 2022; Iqbal, 2026; MUBASHIR et al., 2025; Mumtaz et al., 2024).

Pakistan cement industry provides a wonderful illustration for working capital management because of its capital intensive operations. Large amounts of money are required in this industry in terms of inputs, energy use, manufacturing process, and safety stock. The increasing costs of energy along with the fluctuation in input prices have added pressure on the finances of the cement manufacturing firms, emphasizing the importance of effective management of inventory, payables, and liquidity. Previous studies conducted in the context of Pakistani cement industry have shown that working capital management greatly impacts performance through efficiency and flexibility. (Sarwat et al., 2017; Ullah et al., 2023).

However, agricultural companies face their own unique issues when it comes to managing their working capital, such as seasonal cycles, uncertainties in the market, and delayed collection of cash flows. Agricultural companies have to ensure proper liquidity levels to support their production operations and purchase their inputs while facing the challenges related to their seasonal variations in sales revenues. Holding excessive inventories and delayed payments from the customers result in less available funds; therefore, proper working capital management is a must for such companies.

Even though there is an abundance of literature that deals with the link between working capital management and financial performance, there are a number of gaps in research. First, there is an inconsistency in the findings of previous studies with regard to the impact of individual elements of working capital management. Although literature proves that good inventory management, shorter receivable period, and lower CCC positively contribute to earnings, other studies claim that the impact depends on industry and macroeconomic environment (Johan et al., 2024; Karim et al., 2024; Sahoo et al., 2026). Second, majority of past studies assess the impact of WCM through one element, which is mainly the CCC. Very few studies look into the impact of inventory turnover ratio, receivable period, payables period, CCC, and current ratio simultaneously on financial performance in terms of ROA and ROE (Boota et al., 2025; Yousaf, 2025). Third, studies conducted in Pakistan are rare with respect to the joint impact of various industries including agriculture and cement. Such industries differ in their nature; agricultural firms operate seasonally and have uncertain cash flows whereas the cement firms need huge investments in inventories.

Purpose of this study is to address the gaps that exist by investigating the impact of working capital management on financial performance of companies listed on Pakistan Stock Exchange (PSX). This particular study specifically looks into the joint analysis of 30 companies belonging to both cement and agriculture sectors for the period from 2021 to 2025. This study aims to investigate the effect of selected variables of working capital such as days payables outstanding, days sales outstanding, inventory management, cash conversion cycle and current ratio on financial performance of company in terms of ROA and ROE (Hussain et al., 2025).

Literature Review And Hypothesis Development

This study contributes to the existing literature by providing recent sector-specific evidence from an emerging economy and by examining working capital practices in two industries with substantially different operational characteristics. The findings provide valuable implications for corporate managers, investors, and financial decision-makers by identifying the working capital factors that are most relevant for improving profitability and maintaining financial stability under uncertain economic conditions.

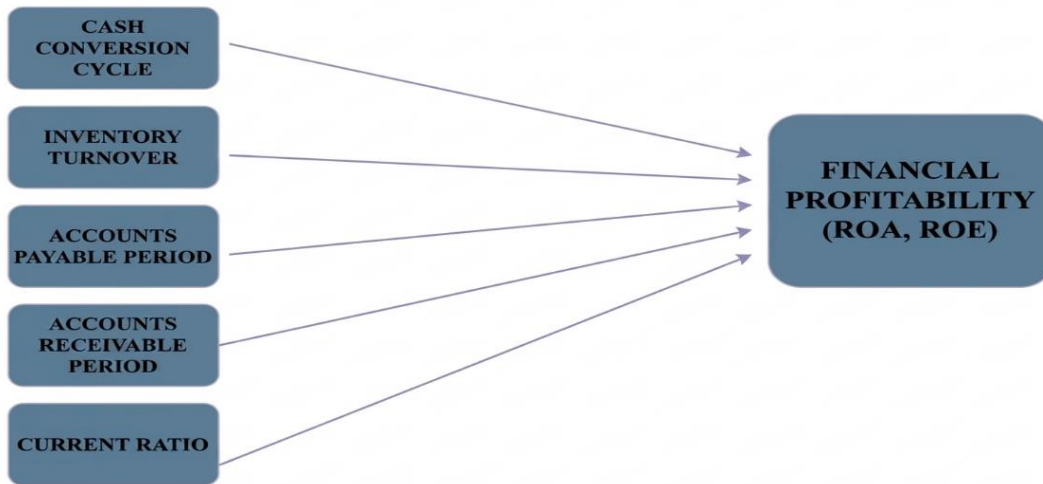


Figure 1, Conceptual Model

The conceptual framework of the current research work pictorially presents the structural linkages and relationships between working capital management dimensions and corporate profitability. As presented in Figure 1 below, the framework is designed with respect to a multi-variable direct model in which short-term assets and liabilities ratios serve as independent variables. In contrast to the use of just one indicator or a single proxy, the framework operationalizes the working capital management by way of a five-pillar concept, i.e., the Cash Conversion Cycle (CCC), Inventory Turnover, Accounts Payable Period, Accounts Receivable Period, and the Current Ratio. The right-hand side of the framework highlights the dependent variable framework, i.e., Financial Profitability, in terms of two indicators of financial performance: ROA and ROE. The straight directional arrows from each of the operational independent variables blocks to the profitability dimension show the empirical regression relationship that needs to be statistically tested. It is therefore clear that the resulting net profitability of the selected listed firms in the Pakistan Stock Exchange (PSE) sectors under consideration is a direct outcome of the structured changes in cash collection cycle, payable periods, inventories cushion and asset to liabilities ratio.

Inventory Turnover and Financial Performance

The inventory turnover shows how effectively the company manages its investment in inventory and generates revenues from it. Good inventory management allows firms to cut down costs associated with holding inventories, avoid unnecessary investments in excess inventories and increase cash flow, and thus, might be positively linked to financial performance. For this reason, the inventory turnover ratio can be used as a measure of working capital management which indicates the profitability of the companies based on accounting ratios like ROA and ROE.

Based on empirical evidence, effective inventory management positively affects the firm's profitability. According to Gołaś, effective inventory management positively influences the profitability of Polish food companies by reducing the losses caused by holding inventory and making better use of resources (Gołaś, 2020). The results obtained can be especially valuable for companies related to agriculture due to additional problems caused by seasonality, storage issues, and inventory spoilage. Furthermore, according to Alnaim and Kouaib, there is a positive correlation between inventory turnover and corporate profitability in manufacturing companies operating in Saudi Arabia (Alnaim & Kouaib, 2023).

Nevertheless, the connection between inventory turnover and business performance could differ according to industry features and economic environment. According to Kiyamaz et al. (2024), working capital components do not impact all organizations equally in developed and developing countries due to financial constraints, inflationary pressure, and market structure, which have an effect on inventory policy choices (Kiyamaz et al., 2024). In developing countries, extended time spent on inventory storage might cause some expenses and add to the financial burden of firms (MUBASHIR et al., 2025).

Inventory management plays a crucial role in Pakistan cement and agriculture sectors. Cement producers need large stocks of raw material and products as they operate continuously, while agriculture firms work seasonally and face uncertainties in realizing sales. Hasan and Alam (2025) proved that inventory turnover is a vital factor affecting profitability of listed cement producers in the Pakistan Stock Exchange (Hasan & Alam, 2025).

According to past empirical research, efficient use of inventory is expected to increase financial performance by avoiding the need for excessive capital investments and improving efficiency (Ahmed & Muzammil, 2026).

H1: There is a positive correlation between inventory turnover and financial performance (ROA and ROE).

Accounts Receivable Period and Financial Performance

The accounts receivable period refers to the average period it takes for a company to receive payments from customers after selling on credit. Effective receivables management allows

companies to recover their money faster, maintain liquidity, and avoid being dependent on external finance (Huynh et al., 2025). On the contrary, lengthy collection periods mean more funds tied up in receivables and have adverse effects on financial performance due to increased finance costs and less cash flow.

Earlier research suggests that longer accounts receivable periods adversely impact financial performance. Specifically, Githiga & Koori observed that lengthy receivable collection periods had an adverse effect on the profitability of agricultural firms traded on the Nairobi Securities Exchange and advised adopting efficient credit management techniques to enhance financial performance (Githiga & Koori, 2023). Likewise, Umar & Al-Faryan (2024) found that longer accounts receivable periods had an adverse impact on the profitability of halal food and beverage firms (Umar & Al-Faryan, 2024).

Nonetheless, empirical research findings are not entirely coherent. For instance, Sadiq and Omolara observed a positive relationship between the accounts receivable period and the profitability of chosen manufacturing firms, implying that flexible credit policy may foster sales revenue and customer relationships (Sadiq & Omolara, 2023). On the contrary, Iqbal et al. found a negative correlation between average receivable period and profitability of engineering and oil and gas firms in Pakistan, showing that poor cash collection practices increase liquidity stress (Iqbal et al., 2020).

Additional empirical evidence about the manufacturing industry in Pakistan underscores the need for efficient receivable management. Specifically, Mumtaz et al. observed a negative correlation between accounts receivable and operational profit margins in PSX listed manufacturing firms (Mumtaz et al., 2024). However, Sarwat et al. observed that receivables do not have a significant effect on profitability of Pakistani cement firms (Sarwat et al., 2017).

Given the significance of managing liquidity in agriculture and using credit mechanism in cement firms, the study anticipates that poor receivable management practice will negatively affect financial performance.

H2: Accounts receivable period has a negative relationship with financial performance (ROA and ROE).

Accounts Payable Period and Financial Performance

An accounts payable period can be defined as an average period within which companies pay their obligations to suppliers and is one of the key elements of working capital management. Trade credit is an opportunity of receiving financing for firms since they can delay cash payments but continue their activities. However, too much time needed to make a payment might have a negative impact on supplier relations, credit reputation, and overall firm stability. Thus, the relationship between accounts payable period and financial performance will depend on the utilization of trade credit by firms.

The connection between accounts payable and profitability is still debatable from the empirical point of view. According to Jaworski and Czerwonka, there was a negative relationship between accounts payable period and financial performance (Jaworski & Czerwonka, 2024). In addition, Kiyamaz et al. claimed that payable periods could have a negative impact on financial performance (Kiyamaz et al., 2024).

Contrarily, other empirical studies emphasize the benefits of supplier credit. Umar and Al-Faryan observed that payables period has positively impacted profitability for firms in the halal food and beverage industry, meaning that supplier finance is capable of supporting operations effectively (Umar & Al-Faryan, 2024). Likewise, Otekunrin et al. observed that there is a positive correlation between management of payables and profitability in agricultural and agro-allied firms (Otekunrin et al., 2021).

Industry-specific literature in Pakistan is also inconsistent. Sarwat et al. observe that payables have insignificantly explained return on assets in the listed cement industry, implying that profitability in capital-intensive industries may be a result of better asset management and production processes (Sarwat et al., 2017). Nonetheless, Mumtaz et al. observe that payables management has positively impacted operational profitability in manufacturing firms listed in PSX (Mumtaz et al., 2024). Based on the contradictory findings, accounts payable management needs to be explored further in the context of Pakistan's agriculture and cement industries.

H3: Payables period has a significant relationship with financial performance (ROA and ROE).

Cash Conversion Cycle and Financial Performance

The cash conversion cycle (CCC) is a useful tool to evaluate the working capital management performance since it measures the impact of inventory management, receivable management, and payable management. The lower CCC means quicker return of invested resources, lesser need for financing, and higher financial efficiency. The level of the optimal cash conversion cycle can vary in different industries.

Some research proves that higher CCC leads to lower financial performance. (Johan et al., 2024) and (Karim et al., 2024) revealed the negative correlation between the cash conversion cycle and profitability of companies. Karim et al. proved that the longer CCC had a negative influence on the profitability ratios in manufacturing companies due to the fact that delayed cash recovery increased the need for financing (Karim et al., 2024).

However, the new evidence shows that CCC and profitability may have a non-linear relationship. For example, Ziętek-Kwaśniewska found an inverted U-shape curve between CCC and profitability in the case of agricultural companies, meaning that there is an optimal level of CCC, which firms need to have (Ziętek-Kwaśniewska, 2025). This result is especially important when talking about agriculture-related companies where biological processes, seasonality, and uncertain demand affect working capital management.

The negative relationship between CCC and profitability was found in Pakistan by (Iqbal et al., 2020), while Raza et al. showed that CCC had a significant impact on financial performance of cement firms traded at Pakistan Stock Exchange due to high capital intensity of cement manufacturing process (Raza et al., 2023). Thus, the following hypothesis is developed.

H4: Cash conversion cycle has a negative relationship with financial performance (ROA and ROE).

Current Ratio and Financial Performance

Current ratio is used to determine whether a business has enough current assets to finance its short-term liabilities and acts as one of the key indicators of effective liquidity management. The presence of enough liquidity will enable the firm to operate effectively while minimizing financial risks. But too much liquidity means ineffective use of the firm's resources since resources are locked up in non-productive current assets.

According to Nduwimana et al, liquidity had a significant influence on financial performance indicators such as ROA, ROE, (Nduwimana et al., 2025) and Tobin's Q implying that companies with sufficient liquidity can better manage their operations.

The relevance of current ratio is more so in agriculture where the production activities are conducted seasonally and the cash flows are delayed. According to Odendo et al. current ratio was highly influential on the financial performance of firms operating in agriculture sector which are traded on the Nairobi Securities Exchange (Odendo et al., 2024).

The results also show mixed effects for Pakistan. Bibi & Amjad found a positive effect of current ratio on profitability for companies listed on the Karachi Stock Exchange (Bibi & Amjad, 2017). Likewise, Zahid et al. (2023) observed a positive impact of current ratio on the return on equity of cement firms in Pakistan (Zahid et al., 2023). Conversely, Raza et al. found that high levels of liquidity were negatively related to market performance of cement firms (Raza et al., 2023). The proposed hypothesis is as follows.

H5: There is a positive effect of current ratio on financial performance (ROA and ROE).

Methodology

Research Design and Model Specification

A quantitative research methodological approach is adopted in this study to empirically analyze the link between working capital management (WCM) and the performance of firms in Pakistan. This is due to the reason that the study involves measurement of financial variables and estimation of the association amongst the variables. The research has explanatory and causal designs where the research attempts to explain the degree of impact of WCM on firm's profitability. Moreover, the

study will use deductive research methodology where the relationship is developed based on financial management theories and then tested using empirical evidence.

Panel data model is used in this study in order to combine cross-sectional and time-series data. Panel data modeling will help in analyzing variations between firms at different time periods as well as in addressing unobservable heterogeneity between firms, which increases the efficiency of empirical estimation. In order to separate the joint effect of working capital components on corporate performance, two baseline panel regression models are specified:

$$ROA_{i,t} = \beta_0 + \beta_1(ITP)_{i,t} + \beta_2(APD)_{i,t} + \beta_3(ARD)_{i,t} + \beta_4(CCC)_{i,t} + \beta_5(CR)_{i,t} + \epsilon_{i,t}$$

$$ROE_{i,t} = \beta_0 + \beta_1(ITP)_{i,t} + \beta_2(APD)_{i,t} + \beta_3(ARD)_{i,t} + \beta_4(CCC)_{i,t} + \beta_5(CR)_{i,t} + \epsilon_{i,t}$$

Where i denotes the individual cross-sectional firms ($i = 1, 2, 3 \dots 30$), t denotes the time period ($t = 2021, 2022, \dots 2025$), β denotes beta, β_0 is the intercept parameter (β_1 to β_5), and $\epsilon_{i,t}$ represents the composite stochastic error term.

Both FE and RE regression models are estimated systematically in this study to ensure high econometric rigour throughout. The decision on which of the two models to use is based on the outcome of the Breusch-Pagan Lagrange Multiplier Test, among others. The analysis will be done using Microsoft Excel for preliminary data manipulation and financial ratios computation, whereas STATA will be used for panel regression analysis and econometric testing.

Population and Sampling

The population for the current study is companies which are listed at Pakistan Stock Exchange (PSX) in the cement and agriculture sectors. Both these sectors have been chosen because of their significant role in the economy and the consistency in their financial reporting.

Final sample will include 30 firms which are listed at PSX and belong to the sectors of agriculture and cement. The sample will be selected using the approach of purposive sampling and on the basis of the availability of complete data for the selected time period. The sample selection approach ensures that only those firms are included in the study whose financial record is available for five years. Time period of the study is from 2021 to 2025.

Data Collection and Sources

Secondary data will be used for this study which will be collected from the annual financial statements of selected firms which are listed at Pakistan Stock Exchange. Financial statements will be used to calculate the required measures of working capital and profitability. Use of secondary financial data will ensure an objective measure of firm performance.

Variables Measurement

The dependent variables to be measured in this study are financial performance variables measured using Return on Assets (ROA) and Return on Equity (ROE). ROA is computed by dividing net income by total assets whereas ROE is computed by dividing net income by shareholders' equity.

Working capital management variables are measured through five independent variables namely: inventory turnover days, accounts receivable days, accounts payable days, current ratio and cash conversion cycle (CCC). Inventory turnover ratio is computed using average inventory divided by cost of goods sold times 365 days. Accounts payable days are computed using average accounts payable divided by sales times 365 days while accounts receivable days are computed using average accounts receivable divided by sales times 365 days.

The current ratio is computed as a measure of liquidity as it represents the ratio of current assets to current liabilities. The CCC is computed by deducting the sum of accounts receivable and inventory turnover from accounts payable.

Results and Findings

Descriptive Statistics

The descriptive statistics in table 1, give an idea about the nature of the research variables and their distribution in terms of 150 firm-year observations. Two dependent variables ROA and ROE have been considered alongside the variables related to Working Capital Management such as Accounts Payable Days (APD), Accounts Receivable Days (ARD), Inventory Turnover Period (ITP) and Cash Conversion Cycle (CCC).

Table 1: Descriptive Statistics

Variables	Obs.	Mean	Median	Std. Deviation	Minimum	Maximum
Return on Assets (ROA)	150	5.60%	4.80%	7.94	-16.49%	42.84%
Return on Equity (ROE)	150	9.81%	8.90%	17.65	-71.39%	73.05%
Accounts Payable Days (APD)	150	86.57	79.73	59.99	11.57	401.02
Accounts Receivable Days (ARD)	150	11.48	10.71	9.11	0.004	52.71
Inventory Turnover Period (ITP)	150	61.60	54.38	40.72	0.28	188.10
Cash Conversion Cycle (CCC)	150	-13.50	-7.45	76.56	-344.95	117.75

Source: Estimated by author using PSX Corporate Reports (2021-2025).

It is evident that there is some variation in financial performance for those sampled companies. ROA and ROE are 5.60% and 9.81% respectively and the values of standard deviations suggest differences in profitability of companies. Working capital ratios also suggest differences in operational management of firms.

Correlation Analysis

In table 2, correlation analysis was conducted to check whether there exists any association between independent variables. and identify possible multicollinearity concerns before regression estimation.

Table 2 : Correlation Matrix

Variables	Account Payable Period (APD)	Account Receivable Period (ARD)	Inventory Turnover Period (ITP)	Current Ratio (CR)	Cash Conversion Cycle (CCC)
(APD)	1.000				
(ARD)	0.080	1.000			
(ITP)	-0.097	0.185	1.000		
(CR)	-0.136	-0.030	-0.208	1.000	
(CCC)	-0.254	0.155	0.297	-0.008	1.000

Source: Estimated by author from PSX company reports (2021-2025).

From the correlation results, it can be seen that no variable has a correlation coefficient higher than the critical value of 0.80, suggesting that the issue of multicollinearity does not exist among the explanatory variables.

Combined Panel Regression Analysis

To provide econometric transparency, Table 3 provides the comparative results for both FE and RE models for both ROA and ROE performance approaches.

Table 3 : Combined Fixed Effects and Random Effects Models Matrix

Independent Variables	ROA: Fixed Effects (FE)	ROA: Random Effects (RE)	ROE: Fixed Effects (FE)	ROE: Random Effects (RE)
APD	-0.0602302 (-0.79)	0.0042396 (0.32)	-0.0555579 (-0.33)	0.0299857 (1.03)
ARD	<i>Omitted</i>	0.0353654 (0.49)	<i>Omitted</i>	0.0838824 (0.53)
ITP	0.0324321 (0.39)	-0.0117554 (-0.60)	0.0208486 (0.11)	-0.0070788 (-0.17)
CR	6.30e-09*** (7.10)	2.79e-09*** (4.77)	1.08e-08*** (5.47)	5.26e-09*** (4.08)

CCC	-0.0597467 (-0.79)	Omitted	-0.0517073 (-0.31)	Omitted
Constant	6.004143*** (3.13)	4.661306** (2.30)	9.217894** (2.16)	5.019663 (1.13)

Source: The author's own estimation using corporate reports of PSX (2021-2025).

Note: * (Parenthetical value indicates the calculated t-statistic for the Fixed Effects and z-score for the Random Effects). ** Asterisk indicates the significance level: *** $p < 0.01$, ** $p < 0.05$.

Model Interpretation and Empirical Synthesis

From the empirical results, which have been produced through the four estimations conducted, it is evident that the Current Ratio (CR) emerges as the only significant factor of corporate performance. Under the ROA model, the Current Ratio factor emerges as positively and significantly associated under both the Fixed Effect ($\beta = 6.30e-09$, $t = 7.10$, $p = 0.000$) and Random Effect ($\beta = 2.79e-09$, $z = 4.77$, $p = 0.000$) estimations. The Current Ratio's strong positive relationship is reflected in the ROE equations, where the current ratio factor is also significantly positively related to ROE under the Fixed Effect ($\beta = 1.08e-08$, $t = 5.47$, $p = 0.000$) and Random Effect ($\beta = 5.26e-09$, $z = 4.08$, $p = 0.000$) estimations. This indicates that higher liquidity cushion improves the asset and equity performance.

On the other hand, individual operational factors such as the Days of AP and ITP do not exhibit any statistically significant relationship with ROA or ROE, as their p-values do not go below the significance threshold values.

Mechanics of Omissions in Econometrics: In the process of STATA matrix computation, perfect singular collinearity automatically omitted some variables in order to avoid computational instability. In the Fixed Effects estimations of ROA and ROE, the omission of the ARD was caused by its deterministic within-firm linear structure that generated statistical redundancy. Likewise, in the case of Random Effects estimations, the omitted variable was the CCC due to perfect multi-collinearity loops with each operational period.

Model Selection Test

In table 4, the Breusch-Pagan Lagrange Multiplier test was used to find out whether there is unobserved cross-sectional variance among the sampled firms.

Table 4: Breusch-Pagan LM Test Diagnostics

Dependent Variable	LM Statistic Index	Prob > Chi ²	Selected Model Specification
Return on Assets (ROA)	34.48	0.0000	Random Effects Framework
Return on Equity (ROE)	45.93	0.0000	Random Effects Framework

Source: Author's own estimates from PSX corporate reports (2021-2025).

From the LM test findings, there were significant firm-specific effects in the two cases being tested ($\chi^2 = 34.48$, $p = 0.0000$) in ROA and ($\chi^2 = 45.93$, $p = 0.0000$) in ROE). The extremely significant probability figures affirm the existence of strong firm-specific effects which justify the use of panel estimates instead of pooled ordinary least squares.

Hypothesis Testing Results Based on Multiple Panel Regression Models

Table 5: Comprehensive Panel Regression Hypothesis Testing Results for ROA and ROE Models

Hypothesis	IV	Expected Sign	ROA Model			ROE Model			Empirical Decision
			Coefficient (β)	t-value	p-value	Coefficient (β)	t-value	p-value	
H1	(ITP)	Positive	0.0324321	0.39	$p > 0.05$	0.0208486	0.11	$p > 0.05$	Not Supported
H2	(ARD)	Negative	Omitted	Omitted	Omitted	Omitted	Omitted	Omitted	Not Supported
H3	(APD)	Positive	-0.0602302	-0.79	$p > 0.05$	-0.0555579	-0.33	$p > 0.05$	Not Supported
H4	(CCC)	Negative	-0.0597467	-0.79	$p > 0.05$	-0.0517073	-0.31	$p > 0.05$	Not Supported
H5	(CR)	Positive	6.30e-09	7.10	0.000***	1.08e-08	5.47	0.000***	Supported

Source: Estimated by author using PSX Corporate Reports (2021-2025).

Note: The fixed effects estimates statistics are derived straight from the corporate performances panel results matrix. Asterisks indicate statistical significance at *** $p < 0.01$. Omitted variables are those which have been dropped by STATA due to perfect collinearity.

The empirical hypotheses (H1-H5) generated for this research were tested using baseline multiple panel linear regression analyses. As illustrated in Table 5, the findings show that only Hypothesis 5 (H5) is statistically supported by the data in both the corporate performance indicators. In the ROA regression analysis, Current Ratio (CR) had a very strong positive impact ($\beta = 6.30e-09$, $t = 7.10$, $p = 0.000$). The relationship also holds true in the ROE regression model ($\beta = 1.08e-08$, $t = 5.47$, $p = 0.000$), and this shows that improvement in total short-term corporate liquidity protection improves asset and equity performances for the sampled companies.

On the other hand, all hypotheses about working capital cycles associated with everyday operations were statistically rejected due to insignificance. Hypothesis 1 (H1) about positive association of inventory turnover time demonstrated statistically insignificant coefficients in both models ($p > 0.05$). Moreover, Hypothesis 3 (H3) about accounts payable cycles showed statistically insignificant coefficients as well ($p > 0.05$). Additionally, because of linear relationship and perfect mathematical collinearity, the accounts receivable days (ARD) and cash conversion cycle (CCC) could not be estimated separately; therefore, Hypothesis 2 (H2) and Hypothesis 4 (H4) lacked empirical evidence. The overall regression results demonstrate that in the conditions of volatility, a short-term assets buffer is much more valuable for accounting gains than any small trading changes.

Discussion and Conclusion

The empirical results that were developed through the panel data analysis of the listed Pakistani manufacturing companies in the cement and agricultural industries have important implications for the short-term management of resources. In situations involving high macroeconomic uncertainty, strong inflation, and severe internal credit crunches, the working capital performance of firms exhibits notable differences from the theoretical baseline. This part will offer a complete explanation of the empirical results based on each research variable and hypothesis tested, as well as in relation to the existing finance literature.

It appears from the multivariate regression analysis that only the overall current ratio (CR) emerges as the single dominating factor influencing accounting profitability as it shows great influence on both ROA and ROE and has strong and significant positive effect. Hence, the research hypothesis on the existence of a significant relationship between current ratio and firm profitability (H5) is strongly validated. This result is consistent with the basic premises of the Liquidity Preference Theory which states that in economically unstable situations, it is essential to maintain high levels of liquid buffer in order to achieve solvency (Zaman et al., 2025). In the light of the recent economic scenario of Pakistan, which is marked by rising cost of business borrowing, high level of inflation, and stringent monetary policy between 2021-25, external funding became extremely costly. Thus, internal short-term liquidities served as the important protective shield for firms, thus turning into an important determinant of corporate profits.

The above findings are consistent with empirical evidence recently uncovered from capital-constrained developing economies. In particular, (Aldubhani et al., 2022) found that in times of high macroeconomic volatility and credit constraints, conventional structural metrics such as the current ratio surpass micro-level transactional cycles as key performance drivers, owing to the dependence of the firm on internal liquidity for smoothing production disruptions (Aldubhani et al., 2022). Furthermore, (Mumtaz et al., 2024) confirmed that in capital-intensive organizations in Pakistan, the presence of a strong current ratio protects the firm from any shocks to the supply side and avoids costly operations defaults, hence improving net operations profits (Mumtaz et al., 2024). Empirically, it is clear that liquid assets are a necessity for the continuity of the business process when there are no avenues for capital in the outside world.

As opposed to the dominating effect of the aggregated Current Ratio (CR), the day-to-day operational measures, i.e., Inventory Turnover (ITP), Accounts Receivable Days (ARD), and Accounts Payable Days (APD), demonstrated no significant correlation in the multivariate panel setting. Therefore, the hypotheses formulated with regard to the individual influence of each daily cycle on ROA and ROE variations (H1, H2, and H3) do not have any support. The classical corporate finance literature, represented, e.g., by Deloof, maintains that the efficient management of the inventory and collection periods results in direct maximization of firm profitability through the release of cash (Deloof, 2003). Nevertheless, the multivariate panel analysis of the case at hand reveals a different picture for Pakistani companies. The insignificant coefficients reported above suggest that the

individual effects of these variables are completely overwhelmed by the overall liquidity strategy and industry-specific operational considerations (Humayun et al., 2026)

The occurrence of insignificant results correlates with the latest findings on diversified manufacturing systems amid substantial changes in environmental conditions. For instance, in the Bulletin of Business and Economics journal article authored by (Humayun et al., 2026), manufacturing companies were examined to conclude that accounts receivable, inventory, and accounts payable periods have insignificant effects on the company's performance under macroeconomic shocks that compel the firm to control overall corporation liquidity instead of focusing on optimizing isolated cycles (Humayun et al., 2026). Moreover, the empirical research on Pakistani firms conducted by Khan et al. (2022) proved that for small-to-medium enterprise configurations, day-to-day measures have an insignificant effect on the profit of the company on their own (Khan et al., 2022). Under high levels of systemic risk, minor variations in daily operations become insignificant compared to overall solvency indicators.

The key structure insight which comes out from this is the existence of a negative average Cash Conversion Cycle (CCC) of -13.50 days. However, in multivariate regression analysis the significance level of Cash Conversion Cycle (CCC) for ROA and ROE is insignificant which means that hypothesis H4 is not valid. It means that although aggregate CCC is very important conceptually, however, its numerical variations do not independently cause significant movements in accounting returns by controlling the main effect of Current Ratio (CR) (Khan, 2026). The negative average cycle is a conscious defense policy and not due to inefficiency of the process. These manufacturing companies make use of fast cash collection period (low Accounts Receivable Period) as well as long delay period of payment to suppliers (high Accounts Payable Period) in order to generate a system of free financing incorporated into the supply chain. Negative Cash Conversion Cycle suggests that these companies manage to get their cash collection from customers and earn revenues even before their liability towards their suppliers comes into effect. This type of business process can provide these firms significant advantages in the environment of high interest rates such as Pakistan.

The structure is largely substantiated by the current literature on supply chain financing within emerging economies. (Jaworski & Czerwonka, 2024) showed that under extreme economic contractions, driving the cash conversion cycle to negative numbers was the best way to defend themselves from higher capital costs as their cash cycles would have maintained a strong relation with survival (Jaworski & Czerwonka, 2024). Furthermore, there is an empirical study conducted by (Wang & Nie, 2025) which indicated that working with optimal working capital structure improved the company's financial flexibility to help companies overcome financial constraints and develop structural supply chain bargaining power for ensuring ultimate technical solvency (Wang & Nie, 2025)

Statistically insignificant parameters of the daily transaction statistics combined with the dominant position of the significant Current Ratio (CR) call for further empirical analysis, which would be specific for the given sectors. The sample considered in the paper includes a combination of the

cement and agriculture sectors from Pakistan Stock Exchange. Functionally, the two sectors represent an antipode of each other as regards their working capital management. Production processes of cement companies imply the necessity to make huge investments in fixed assets, continuous production processes and huge buffer stocks of raw materials and fuel. Therefore, cement companies have to deal with a lower Inventory Turnover (ITP) and a rigid Accounts Payable Period (APD) due to the established institutional relationships with suppliers.

Alternatively, the agricultural/agro-based industry is largely driven by the seasonal cycle of crops, biologically controlled supply, and the high volatility of the demand window. Agricultural companies need fast asset turnover, with tight inventory windows at harvest times and a very dynamic Accounts Receivable Days (ARD), which depends on the credit structure of the agricultural sector. If these structurally diverse sectors are considered as part of an integrated panel dataset, it can be observed that their contrasting effects on profitability balance each other out, resulting in an insignificant result in a multivariate regression matrix. In particular, the positive effect of having strategic inventory in the cement sector to avoid production interruptions is offset by the negative effect of seasonal inventory build-up in the agricultural sector, making the overall coefficients for the panel insignificant.

It should be expressly pointed out that the insignificance of coefficients for the daily variables does not indicate that short-term transaction management is not important; rather, it suggests that under the aggregate panel conditions, the variances between the sectors balance each other out to form an equilibrium where these variables have no separate significant effect. This practical phenomenon explains why the only significant determinant among the aggregate Current Ratio (CR) is the aggregate CR variable. As far as daily cycles vary dramatically and offset each other in different sectors, leading to the insignificance of their individual coefficients, it is still important to maintain a significant current asset cushion in order to avoid technical insolvency.

Conclusion

The paper presents an empirical analysis of working capital management structures in listed Pakistani manufacturing companies from the cement and agriculture industries for the high interest rate period from 2021 to 2025. An analysis of an integrated five-pronged independent construct through static panel econometric models reveals an empirical reality that macro-level liquidity safeguards take precedence over minute transaction measurements in times of tight monetary policy conditions. Aggregate Current Ratio (CR) emerges as the only one predictor that significantly drives corporate accounting profitability whereas ITP, ARD, APD, and CCC are not confirmed by any hypotheses showing an insignificant relationship between these variables and profitability. Moreover, the study shows that a negative cash conversion cycle of -13.50 days provides a very effective defense mechanism that produces a significant free supply chain financing framework. In conclusion, the study finds that in conditions of systemic credit constraints, survival and efficiency of corporate finance depend on significant buffers of aggregate short-term assets and not on optimized micro-level transactions with insignificant returns.

Beyond the direct statistical relationships, these insights change the playing field for the manufacturing firms operating in developing economies plagued by credit constraints. By proving that transaction theory does not hold any water in deep macroeconomic recessions, the current study clearly shows that flexible resource use is an ecological characteristic rather than just a tracking exercise. It is clear from the results that real resilience in times of money crunch comes through the use of institutional supply chain strength where there is the capability of exploiting free supplier credits through extended payment period without cutting down customer cash flows. In developing financial ecosystems where there is the experience of volatility in money tightening periods, the capability of erecting shields within while pushing aggregate cash conversion ratios into negative territory will be the real structural distinction between firm solvency and market exit.

Policy Recommendations, Limitations and Future Research Directions

Policy Recommendations

In light of the practical implications of this study, there are many actionable directions that can be taken by corporate financial officers, supply chain strategists, industry policymakers, and financial institutions in emerging economies. First, corporate finance managers in volatile markets need to shift their tactical attention to ensuring an optimal aggregate current ratio, and not waste time trying to achieve unimportant corporate outcomes by optimizing isolated daily metrics. In the context of ongoing high-interest rates, it is important to focus on having a sufficient short-term liquid asset buffer to mitigate any macroeconomic defaults. Second, supply chain strategists must strategically design defensive credit strategies aimed at achieving a negative cash conversion cycle. By obtaining longer payment terms with the suppliers and ensuring shorter collection periods with the buyers, organizations will be able to obtain a substantial amount of internal credit lines at no cost.

Additionally, the authorities on industry and central banking bodies like the State Bank of Pakistan need to redesign institutional credit scoring models and frameworks for monetary interventions. The risk management experts in the field need to move away from the usual limitations associated with the extension of the payment horizon and need to see if there is enough potential within the firm to be able to create independent supply chain credit flexibilities. Given that the industries of the capital-intensive type like the cement industry and agricultural industries show an extremely asymmetrical reaction to the macro credit constraint, blunt monetary tightening can actually harm their supply chains. The policymakers must design an intricate system of credit availability for different sectors to ensure that no significant industrial complexes are forced into false financial distress due to changes in macro-interest rates.

Limitations and Future Research Directions

In spite of the strict application of the balanced panel econometric approach, the study has certain structural shortcomings that point to particular ways of further scholarly investigation. First of all, the limitation is caused by the nature of the aggregate panel where the analysis is conducted using the dataset of firms operating both in the cement and agricultural industries. The combination of very

different industrial structures into one panel data model will average sectoral coefficients as the peculiarities of the inventory turnover period and the receivable period of each industry will be absorbed, yielding negligible results. Furthermore, the empirical models are based on the data obtained during a very specific post-pandemic tightening period from 2021 to 2025. Such a timeline depicts an era of structural inflation and very high interest rate increases in Pakistan, which might depict some temporary corporate defenses that do not correspond with those in stable economic conditions whereby the micro-transactional variables may experience very significant changes.

Therefore, in future research directions, researchers need to build on such a baseline by utilizing industry specific panel sub-samples in order to highlight the different working capital pressures associated with seasonally varying agricultural industry and heavy cement manufacturing using split sample tests. Researchers need to consider incorporating macro level control mechanisms like domestic interest rate variations, volatility indices in inflation rates, and gross domestic product shocks into the multivariate panel matrix in order to highlight how macro stress leads to the insignificance of the micro cycles. Lastly, the research sample needs to be expanded to include non-listed manufacturing firms and SMEs in order to advance empirical literature and establish whether the transactional variables become insignificant or not in absence of capital markets.

Data Availability Statement

The data used in this study are available from the corresponding author upon reasonable request. Researchers interested in accessing the dataset may contact the corresponding author via email. The data will be provided subject to reasonable conditions regarding confidentiality, ethical considerations, and responsible use of the research data.

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