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Determining the effect of working capital policies optimization and market power on firm value: A developing country perspective

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ABSTRACT

This study examines how optimal working capital policies impact firm value in 184 Pakistani non-financial firms, with market power as a moderating factor. The study uses panel data from 2011 to 2023 and the Kruskal-Wallis test to look for patterns in working capital policies. It also employs the Generalized Method of Moments (GMM) to address endogeneity. Working capital policies are measured through investment policy (IP), finance policy (FP), and cash conversion cycle (CCC), while market power is assessed using the Herfindahl-Hirschman Index. Firm value is measured via Tobin's q (TQ) and the market-to-book ratio (MB). IP and CCC significantly impact firm value, whereas FP has a negative effect. Conservative IP, extended cash conversion cycles beyond optimal levels, and conservative financing all enhance firm value. Market power weakens the positive impact of IP on firm value but amplifies the benefits of FP and CCC. The findings of the study support trade-off theory. Conservative IP and aggressive FP increase firm value. The study provides financial managers with insights to align working capital strategies with market power and equips policymakers with tools to enhance shareholder value.

Contribution/ Originality: This study identifies optimal working capital policy levels that enhance firm value in a developing economy with financial constraints. Unlike prior research, it examines the moderating role of market power in this relationship. Using Tobin's q and market-to-book ratio provides financial managers with insights on optimizing working capital strategies.

1. INTRODUCTION

Excessive current assets generate returns on short-term investments, while insufficient current assets increase vulnerability to operational difficulties and liquidity risks (Kiymaz, Haque, & Choudhury, 2024; Kouaib & Bu Haya, 2024). Financial managers prioritize the interests of shareholders when making financial choices (Nguyen, Doan, & Nguyen, 2020). Balanced working capital policies (WCP) enhance profitability and create shareholder value. Previous research studies have primarily focused on working capital and firm performance (Deloof, 2003; Jose, Lancaster, & Stevens, 1996; Shin & Soenen, 1998). While a strong link exists between effective WCP and positive outcomes like profitability and firm value (Ahmad, Bashir, & Waqas, 2022; Deloof, 2003; Habib & Kayani, 2022; Kieschnick, Laplante, & Moussawi, 2013; Mandipa & Sibindi, 2022), there is scant research on how firms optimize working capital policies. Studies often investigated optimal working capital levels in developed countries (Anton & Nucu, 2020; Baños-Caballero, García-Teruel, & Martínez-Solano, 2012; Eldomiaty, Anwar, & Ayman, 2018). A few were attempted for

developing countries (Chauhan & Banerjee, 2018; Laghari & Chengang, 2019). This is also true for Pakistan. Habib and Huang (2018) confirmed the non-linear relationship between working capital and textile firms' performance. However, determining optimal levels for working capital policies in relation to firm value is not fully explored.

Pakistan has somewhat less developed financial markets. The nation had the lowest credit-to-private sector ratio among South Asian nations in 2019 at just 17.9%. India's ratio was 50.1%, while Bangladesh's was 45.2%. Notably, Pakistan lags behind other developing countries such as Indonesia, Malaysia, Sri Lanka, and Thailand, and it performs poorly in comparison to other South Asian countries. The World Bank in 2019 highlighted this pattern in financing working capital at the firm level. The net working capital ratio is significantly high in Pakistani firms, indicating that additional funds are tied up in the working capital (Akbar, Jiang, & Akbar, 2022). Given this institutional landscape, efficient working capital management becomes even more critical for Pakistani firms.

Moreover, the ability to manage the working capital effectively could be influenced by the firm's market power, as it increases bargaining power with their suppliers and customers (Dbouk, Moussawi-Haidar, & Jaber, 2020; James, Ngo, & Wang, 2023; Loecker, Eeckhout, & Mongey, 2021; Rahman, Kabir, Ali, & Oliver, 2024). This concept is especially important in developing countries, where firms often face constraints in accessing external capital and rely heavily on internal resources for working capital investments (Luu & Nguyen, 2021). Thus, understanding how MP influences the dynamics between working capital policies and firm value can provide valuable insights for financial managers aiming to optimize their policies.

We used multiple tests in this study. At first, we explored the patterns of investment policy (IP), financing policy (FP), and cash conversion cycle (CCC). For this purpose, we distributed our sample into the high market power (HMP) group and the low market power (LMP) group. The results of the Kruskal-Wallis test show that the HMP group of firms generally adopts a conservative IP. The financial performance patterns of both groups are nearly identical. In the second stage, utilizing the GMM method, we found the optimal levels for working capital policies. After a certain level, IP and CCC decrease while FP increases firm value. Finally, we investigated how market power affected the relationships between working capital policies and firm value in the third stage. The introduction of interaction terms with each policy showed that firms should reduce investment in working capital assets and finance current assets through short-term borrowing.

We contribute to the existing literature in two ways. First, we found evidence for optimal working capital policies with firm value. Second, unlike prior research on the direct effect of market power on working capital (Bhattacharyya, Rahman, & Wright, 2023; Campello & Gao, 2017; Dash, Sethi, & Swain, 2023), our study explores the moderating effect of market power on working capital policies and firm value relation. Third, in contrast to Habib and Huang (2018), our study selected firm value. Firm value is measured using Tobin's q (TQ) and Market-to-book (MB) ratio. These measures are preferable over traditional accounting measures in a way that financial managers do not find easy to manipulate (Chancharat & Kumpamool, 2022). The study highlights the importance of managing working capital policies to increase firm value, filling a significant gap in the existing financial management literature. Initially, our findings build upon previous studies (e.g., Bhattacharyya et al. (2023) and Campello and Gao (2017)) by examining how market power influenced the relation between working capital policies and firm value.

We structure the rest of the study as follows: Section 2 includes a review of the literature and hypothesis development. Section 3 discusses the sampling and methodology utilized in the analysis. Section 4 contains the findings of the study. Finally, Section 5 concludes the work, discusses policy implications, and provides suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Trade-off theory suggests that firms must carefully determine the optimal levels of inventory, cash holdings, receivables, and payables (Smith, 1980; Wasiuzzaman & Arumugam, 2013). Increasing investment in these areas can improve financial performance, especially for firms with low current assets (Aktas, Croci, & Petmezas, 2015). However, understanding the trade-offs is crucial. Investing in current assets can negatively impact firm value due to

financing and opportunity costs, leading to high-interest expenses, bankruptcy risk, and hindrance to value-enhancing investments (Aktas et al., 2015; Sonia Baños-Caballero, García-Teruel, & Martínez-Solano, 2014; Kieschnick et al., 2013; Martínez-Sola, García-Teruel, & Martínez-Solano, 2014). For example, holding larger inventories can prevent production interruptions, reduce supply costs and price fluctuations, and improve customer services by ensuring product availability (Corsten, Peyinghaus, & Gruen, 2004; Fazzari & Petersen, 1993). Similarly, allowing customers more extended payment periods through the production quality verification process and price discrimination can promote long-term relationships (Brennan, Maksimovics, & Zechner, 1988; Long, Malitz, & Ravid, 1993). However, it also raises the issue of bad debts if the customer defaults on payments. Cash holdings act as a buffer, reducing financial distress, financing growth opportunities, and enabling firms to take advantage of prompt payment discounts (Ferreira & Vilela, 2004; Ogundipe, Idowu, & Ogundipe, 2012). Yet, holding cash may result in lower returns for shareholders compared to other investments with similar risk. Working capital policies include investment policies (IP) and financing policies (FP). A conservative IP means high levels of cash, securities, and inventory, which reduces risk but potentially lowers profitability. Aggressive IP implies holding few assets, increasing returns but also raising risks of cash shortages (Brigham & Ehrhardt, 2011; Nazir & Afza, 2009). Conservative FPs rely on long-term financing, reducing liquidity risk but raising capital costs. Aggressive FPs depend on short-term financing, enhancing profitability but increasing liquidity risks (Brigham & Daves, 2014; Kaviani, Reza, Maryam, & Seyed, 2014; Morshed, 2024).

Past empirical studies have relatively focused on developed nations, such as Belgium (Deloof, 2003), Germany (Högerle, Charifzadeh, Ferencz, & Kostin, 2020), Jordan (Abuzayed, 2012), and Spain (García-Teruel & Martínez-Solano, 2007) Norway (Lyngstadaas & Berg, 2016) and UK (Afrifa & Padachi, 2016). In contrast, there has been comparatively less research conducted on developing and emerging economies. Vahid, Elham, Mohsen, and Mohammadreza (2012) evaluated the influence of aggressive and conservative policies on the Tehran Stock Exchange-listed firms' profitability and market value from 2005 to 2009. The findings suggested that a conservative IP, characterized by higher allocation to short-term assets, decreases the firm's profitability and market valuation. Khajehpour, Khodamipour, and Sadeghi (2014) assessed how aggressive working capital management policies influence the profitability of 71 non-financial firms traded on the Tehran Stock Exchange. Their analysis found that a substantial investment in current assets leads to an increase in firm profitability. However, the study found no significant impact of financing policy on firm value, as measured by Tobin's Q. In developing countries, studies investigated the impact of working capital management (considering different proxies) with mixed results (Farhan et al., 2021; Javid & Zita, 2014; Pant, Rathore, Dadsena, & Shandilya, 2024; Rizki, Anggraeni, & Hardiyanto, 2019). Researchers use CCC, in addition to IP and FP, due to its wide usability for measuring working capital. Studies showed mixed results for CCC and firm profitability. A large group showed a negative association (Almeida & Eid Jr, 2014; Bhattacharyya et al., 2023; Chang, Kam, Chang, & Liu, 2019; Deari, Barbuta-Misu, & Virlanuta, 2022; Enqvist, Graham, & Nikkinen, 2014; García-Teruel & Martínez-Solano, 2007; Ibrahim & Dengel, 2021; Karim, Al Mamun, & Kamruzzaman, 2023 ; Kouaib & Bu Haya, 2024; Kumar, Sawarni, & Roy, 2024; Zeidan & Shapir, 2017). A few have found a positive association (Gill, Biger, & Mathur, 2010; Le, 2019). Additionally, some found no significant association (Deloof, 2003; Kroes, Manikas, & Foster, 2024). The economic, industry, and sample differences account for the mixed findings of these studies. The limited examination of working capital management in emerging countries, especially Pakistan, underscores the necessity of understanding how distinct institutional and market factors within the nation affect the correlation between working capital policies and business worth. The unclear results for CCC, IP, and FP highlight the importance of conducting localized research to identify these connections and provide companies operating within Pakistan's economic and regulatory framework with useful information. The inconsistent results necessitate the development of the following hypotheses:

H_1: Working capital IP significantly affects firm value.

H_2: Working capital FP significantly affects firm value.

H_5: CCC significantly affects firm *value.*

2.1. Working Capital Policies Optimization

There is debate in the literature over whether working capital policies and firm profitability are correlated in a concave or inverted way. This model recommends an optimal working capital level that maximizes firm value. Several studies have demonstrated that the existence of an optimal amount of working capital and exceeding it can negatively affect a company's profitability. (|See Afrifa and Padachi (2016); Altaf and Shah (2018); Sonia Baños-Caballero et al. (2014); Boţoc and Anton (2017); Deari et al. (2022); Laghari and Chengang (2019); Mahmood, Han, Mubeen, and Shahzad (2019); and Wetzel and Hofmann (2019)). However, longer CCC might increase the firm value by augmenting inventory levels to avoid operational disruptions (Chang et al., 2019) or by increasing credit sales (Kieschnick et al., 2013), thus boosting the performance metrics. Moreover, the higher CCC through the reduced payables indicates the firm's efforts to maintain stable relationships with the supply chain partners or to avail early payment discounts (Ng, Smith, & Smith, 1999), consequently increasing profitability. Since these studies covered a diverse range of developed countries (such as U.S., UK, and Japan), Central and Eastern Europe, and developing countries (such as China and India), the optimal relationship is not limited to the specific economic context. Moreover, the study fails to provide evidence for how extended CCC may improve firm performance.

Based on the arguments and findings, the following hypotheses are set forth:

H_{1a}: Working capital IP and firm value have an optimal level.

H_{2a}: Working capital FP and firm value have an optimal level.

H_{3a}: CCC and firm value have an optimal level.

2.2. Working Capital Policies, Market Power, and Firm Value

Market power or pricing power represents the sales share of a firm in its respective industry. Studies provided common consensus that firms' market power is widely believed to impact working capital management practices (Sonia Baños-Caballero, García-Teruel, & Martínez-Solano, 2016; Bhattacharya, Morgan, & Rego, 2022; Campello & Gao, 2017; Costello, 2013; Lee, Zhou, & Wang, 2018; Rahaman, Zhang, & Feng, 2022). High market power allows firms to negotiate better terms with suppliers and customers, control prices more effectively, and achieve economies of scale (Dbouk et al., 2020; Jabbouri, Benrqya, Satt, Naili, & Omari, 2023; Loecker et al., 2021; Qualls, 1974). Specifically, firms with greater market power adopt aggressive working capital policies by keeping low receivables and inventories (Dash et al., 2023; Luo, Hanke, & Hanke, 2023; Zimon & Dankiewicz, 2020), and firms with less market power usually face financial constraints problems, which adversely affect their profit margins (Kale & Loon, 2011). Market power of a firm also represents the sales share of that firm in a particular industry and is measured by Herfindahl–Hirschman Index (Amini, Kumar, & Shome, 2024; Aslan & Kumar, 2016). Therefore, studies also used the term "Market Share". As provided by Chortareas, Noikokyris, and Rakeeb (2021) and Rahaman et al. (2022), a firm's market share informs its investment decisions and bears direct implications for its overall profitability. In contrast, a decrease in firm market power can diminish the positive or negative link between working capital policies and firm value. Lower market power typically results in increased competition, which can cause firms to control the credit terms. In such scenarios, even well-managed working capital may not significantly contribute to improving shareholder returns (Enqvist et al., 2014).

These studies leave various gaps. For example, there is limited discussion about how market power significantly affects aggressive and conservative policies on working capital. Moreover, whereas substantial market power is typically associated with advantageous results, an overdependence on price power could hide inefficiencies in other operational domains. Likewise, for enterprises with less market power, the difficulties posed by restricted lending terms and intensified competition necessitate more profound investigation to comprehend how these firms might

innovate or reorganize their working capital strategies to alleviate negative effects. Consequently, we formulate the following hypothesis.

H_{1b}: Market power significantly moderates between IP and firm value.

H_{2b}: Market power significantly moderates between FP and firm value.

H_{3b}: Market power significantly moderates between CCC and firm *value.*

3. DATA AND RESEARCH METHODOLOGY

3.1. The Data

The firm-level data used in this study are collected from Refinitiv Eikon; the sample consists of 184 Pakistani firms for the period 2011 to 2023. The sampled data represent 24 non-financial industries. The selected time period was chosen to provide a comprehensive, long-term perspective on working capital policies and firm value among Pakistani firms. This timeframe encompasses significant phases of economic growth, market volatility, and external shocks, including global economic shifts and domestic policy changes. The analysis aims to offer robust insights into how firms adapt their working capital strategies across varying economic conditions. Firms with financial services and missing data were excluded from the study's original sample. The firms within the sector are selected based on the availability of data. Firms having the maximum data points over the period are given priority.

3.2. Model Specification and Variables

We developed four models to estimate the optimal level between working capital policies and firm value. IP, FP and CCC are regressed against TQ and MB in Model 1 to Model 4 as provided below;

$$TQ_{it} = \alpha_i + \beta_1 TQ_{it-1} + \beta_2 IP_{it} + [\beta_3 IP_{it}]2 + \beta_4 FP_{it} + [\beta_5 FP_{it}]2 + \beta_6 SG_{it} + \beta_7 FS_{it} + \beta_8 DR_{it} + \varepsilon_{it} \quad (1)$$

$$MB_{it} = \alpha_i + \beta_1 MB_{it-1} + \beta_2 IP_{it} + [\beta_3 IP_{it}]2 + \beta_4 FP_{it} + [\beta_5 FP_{it}]2 + \beta_6 SG_{it} + \beta_7 FS_{it} + \beta_8 DR_{it} + \varepsilon_{it} \quad (2)$$

$$TQ_{it} = \alpha_i + \beta_1 TQ_{it-1} + \beta_2 CCC_{it} + [\beta_3 CCC_{it}]2 + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 DR_{it} + \varepsilon_{it} \quad (3)$$

$$MB_{it} = \alpha_i + \beta_1 MB_{it-1} + \beta_2 CCC_{it} + [\beta_3 CCC_{it}]2 + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 DR_{it} + \varepsilon_{it} \quad (4)$$

Where TQ_{it} and MB_{it} are measures of firm value, i.e., the dependent variables. TQ_{it-1} and Mb_{it-1} are the past year (lag value) of TQ and MB, respectively. IP_{it}, FP_{it} are the investment policy and financing policy for firm i at year t. CCC denotes cash conversion cycle for firm i at year t. IP_{it}^2, FP_{it}^2 and CCC_{it}^2 are the squares of investment policy, financing policy, and cash conversion cycle, respectively. In addition, we introduce the interaction of MP with IP, FP, and CCC, as reflected in the information provided below Models 5 to Model 8. In all models, we control for sales growth (SG), firm size (FS), and debt ratio (DR) following previous studies (Akgün & Karataş, 2023; Dash et al., 2023; Deari et al., 2022).

$$TQ_{it} = \alpha_i + \beta_1 TQ_{it-1} + \beta_2 IP_{it} + \beta_3 FP + \beta_4 MP_{it} + \beta_5 IP_{it}\, x\, MP_{it} + \beta_6 FP_{it} x\, MP_{it} + \beta_7 SG_{it} + \beta_8 FS_{it} + \beta_9 DR_{it} + \varepsilon_{it} \quad (5)$$

$$MB_{it} = \alpha_i + \beta_1 MB_{it-1} + \beta_2 IP_{it} + \beta_3 FP + \beta_4 MP_{it} + \beta_5 IP_{it}\, x\, MP_{it} + \beta_6 FP_{it} x\, MP_{it} + \beta_7 SG_{it} + \beta_8 FS_{it} + \beta_9 DR_{it} + \varepsilon_{it} \quad (6)$$

$$TQ_{it} = \alpha_i + \beta_1 TQ_{it-1} + \beta_2 CCC_{it} + \beta_3 MP_{it} + \beta_4 CCC_{it}\, x\, MP_{it} + \beta_5 SG_{it} + \beta_6 FS_{it} + \beta_7 DR_{it} + \varepsilon_{it} \quad (7)$$

$$MB_{it} = \alpha_i + \beta_1 MB_{it-1} + \beta_2 CCC_{it} + \beta_3 MP_{it} + \beta_4 CCC_{it}\, x\, MP_{it} + \beta_5 SG_{it} + \beta_6 FS_{it} + \beta_7 DR_{it} + \varepsilon_{it} \quad (8)$$

Where, MPit is calculated using the Herfindahl-Hirschman Index, which represents the market power of firms Cremers, Nair, and Peyer (2008); Banerjee and Mohanty (2020); and Banerjee, Chatterjee, and Dutta (2024). To capture the moderating effect, MP is multiplied with investment policy, financing policy, and CCC (IP_{it} *x* MP_{it}, FP_{it} *x* MP_{it} and CCC_{it} *x* MP_{it}). The interaction terms reflect how the relationship between working capital policies, CCC and firm performance changes as market power varies. The measurements of the variables in the above equation are given in Table 1.

Table 1. Variables measurement and abbreviations.

Variables (Abbreviations)	Formula
Market-to-book ratio (MBR)	$\frac{Market\ value\ of\ equity}{Book\ value\ of\ equity}$
Tobin's Q (TQ)	$\frac{Market\ value\ of\ equity + Book\ value\ of\ debt}{Book\ value\ of\ total\ assets}$
Investment policy (IP)	$\frac{Current\ assets}{Total\ assets}$
Financing policy (FP)	$\frac{Total\ \ current\ liabilities}{Total\ assets}$
Cash conversion cycle (CCC)	$Inventory\ conversion\ period + average\ payment\ period - average\ collection\ period$ Inventory conversion period = Inventory/Costs of goods sold x 100 average collection period = Account receivables/ Net sales x 100 Average payment period = Accounts payables/Purchases x 100
Market power (MP)	The Herfindahl-Hirschman Index (HHI) is measured as firm sales / industry sales.
Sales growth (SG)	$\frac{Current\ year\ sales - pervious\ year\ sales}{Previous\ year\ sales}$
Firm size (FS)	Natural logarithm of sales
Debt ratio (DR)	$\frac{Total\ \ debt}{Total\ equity}$

This study has employed Generalized Method of Moments (GMM) methodology, which is believed to be robust in handling endogeneity issues that are common in financial research (Altaf & Shah, 2018; Boţoc & Anton, 2017; Kayani, De Silva, & Gan, 2020; Laghari & Chengang, 2019; Mahmood et al., 2019; Yilmaz & Nobanee, 2023). It works well to handle possible endogeneity that comes from simultaneity, omitted variable bias, and measurement errors (Arellano & Bond, 1991).

Moreover, GMM can effectively manage unobserved heterogeneity, ensuring that the estimates are not biased due to unobservable factors varying across firms (Roodman, 2009). GMM is considered a robust method of estimation since it employs internal instruments to mitigate the biases. GMM also adeptly addresses unobserved firm-specific effects, so facilitating the establishment of a causal relationship among predictors and regressors.

In addition, we used Kruskal-Wallis test to deeply analyze how firm-specific factors like market power might moderate the relationship between working capital policies and firm value. This non-parametric test helps to detect significant differences for working capital policy patterns across groups of firms (Kruskal & Wallis, 1952; Siegel, 1988). For this purpose, we diversified our sampled firms in high market power (HMP) group and low market power (LMP) group to understand the patterns of working capital policies to confirm the findings of Jabbouri et al. (2023), Dbouk et al. (2020), and Loecker et al. (2021).

4. FINDINGS AND DISCUSSIONS

4.1. Descriptive Statistics of Variables

Table 2 displays the descriptive statistics for the pertinent variables. There were 2208 observations in all. All of the variables had positive mean values. There was more variation around the means for the dependent variables TQ and MB, whose means were (2.317; 0.064) less than their standard deviations (3.104; 0.152).

Table 2. Descriptive statistics of variables.

Variables	Obs.	Mean	Minimum	Maximum	Std. D.	Skewness	Kurtosis
TQ	2392	2.383	-1.797	20.017	3.637	-3.598	3.354
MB	2392	0.065	-0.297	0.458	0.147	0.636	2.236
IP	2392	0.495	0.010	1.000	0.210	0.110	2.560
FP	2392	0.402	0.006	2.988	0.244	2.327	1.316
CCC	2392	79.685	1	328.471	170.849	-3.391	1.791
MP	2392	2.584	0.034	14.872	3.145	2.152	2.613
SG	2392	0.316	-1.000	332.035	8.071	3.411	1.387
FS	2392	10.772	0.693	15.390	1.696	-0.547	5.197
DR	2392	0.951	-2.187	86.371	8.329	-2.105	0.937

Note: Obs. = Number of observations, Std. D = Standard deviation.

The mean values for IP and FP are 0.495 and 0.402, indicating conservative IP (Farhan et al., 2021; Weinraub & Visscher, 1998). The CCC mean is 79.685, meaning firms take around 80 days to convert purchases to cash. Standard deviations for IP, FP, and CCC are 0.210, 0.244, and 170.849, respectively.

The Kruskal-Wallis test shows that HMP firms have a higher IP (0.521) and a significantly longer CCC (206.214) than LMP firms (21.248), which suggests that they are more cautious with their working capital management (Enqvist et al., 2014). High MP firms hold more liquid assets to seize opportunities or mitigate risks, showing significant differences in IP, FP, and CCC. This confirms the arguments of Enqvist et al. (2014) while contrasting with Jabbouri et al. (2023), Dbouk et al. (2020), and Loecker et al. (2021). The significant differences for the IP, FP, and CCC based on high MP and low MP necessitate the investigation of how MP moderates these working capital policies in relation to firm value. Results are presented in Table 3.

Table 3. Working capital policies in high and low market power firms.

Variables	HMP mean	LMP mean	Kruskal-Wallis H stat.	P value
IP	0.521	0.469	3.531	0.050
FP	0.404	0.401	4.633	0.030
CCC	203.332	21.519	22.714	0.000

4.2. Correlation Analysis

Table 4 demonstrates the correlation among the variables of this study. The correlation analysis determined the relationship among the variables and mitigated the risk of multicollinearity. The results showcased the pairwise correlation among the variables utilized in the study.

Table 4. Pair-wise correlation among variables.

Variables	TQ	MB	IP	FP	CCC	MP	SG	FS	DR
TQ	1								
MB	-0.017	1							
IP	0.065	0.031	1						
FP	0.087	-0.097	0.163	1					
CCC	0.020	0.036	0.044	-0.098	1				
MS	0.060	0.265	0.073	0.027	-0.002	1			
SG	0.002	-0.018	0.022	0.074	-0.011	-0.023	1		
FS	0.014	0.287	0.178	0.019	0.116	0.021	-0.046	1	
DR	0.402	-0.024	0.027	-0.001	0.026	-0.008	-0.001	-0.011	1

The correlation coefficients between TQ (Tobin's Q), IP, FP, CCC, MP, SG, FS, and DR were found to be positive. This sign indicates a direct relationship among these key variables, suggesting that an increase in IP, FP, CCC, MP, SG, FS, and DR is associated with an increase in TQ, highlighting the significance of these variables in

our analysis. On the other side, MB showed a negative relationship with FP, SG, and DR. None of the variables showed a correlation above 0.70, suggesting the absence of multi-collinearity. Furthermore, the impact of the explanatory variables on TQ and MB was discerned through regression analysis.

4.3. Effect of Working Capital Policies and Firm Value

The effect of working capital policies on firm value is estimated through regression analysis. In this study, we conducted regression analyses using the Generalized Method of Moments (GMM). According to Arellano and Bond (1991), the reliability of the GMM estimator hinges on the absence of second-order autocorrelation and the validity of the instruments used.

In our regression analysis, the non-significant p-values for the AR (2) test in all models of Table 5 affirm the absence of second-order serial correlation. These p-values for the AR (2) test are critical as they assess the hypothesis proposed by Arellano and Bond regarding the non-existence of second-order correlation in the error terms. Furthermore, the results from the Sargan (1958) concerning the conditions of moments, as detailed in Models 1–4 of Table 5, show no signs of overidentification, thereby supporting the validity of our instruments. The lag values of TQ and MB are significantly positive in all four models. This means that the past year's firm value is positively associated with future firm value.

Table 5. GMM estimation for optimal working capital policies and firm value.

Variables	(1) TQ	(2) MB	(3) TQ	(4) MB
	Coeff. *p-value*	**Coeff.** *p-value*	**Coeff.** *p-value*	**Coeff.** *p-value*
Lag	0.164*** *0.000*	0.530*** *0.003*	0.192** *0.000*	8.550** *0.000*
IP	149.985*** *0.000*	65.700** *0.000*	-	-
IP^2	-80.028*** *0.000*	-45.420** *0.000*	-	-
FP	-52.070*** *0.000*	-97.800** *0.000*	-	-
FP^2	41.198*** *0.000*	82.400** *0.000*	-	-
CCC	-	-	0.057** *0.000*	0.044** *0.000*
CCC^2	-	-	-0.043** *0.000*	-0.037** *0.000*
SG	0.042*** *0.000*	0.930 *0.282*	5.172*** *0.000*	0.032** *0.000*
FS	-21.910 *** *0.005*	-3.342** *0.000*	-26.879** *0.000*	0.033** *0.000*
DR	0.766*** *0.000*	-8.703** *0.000*	0.445 *0.000***	-0.023** *0.000*
Constant	-12.720*** *0.001*	2.000** *0.000*	-1.783** *0.000*	-0.178** *0.000*
No. of obs.	2392	2392	2392	2392
No. of groups	184	184	184	184
No. of inst.	69	44	147	148
AR (2)	0.376	0.234	0.223	0.242
Hansen test	0.242	0.132	0.327	0.143

Note: Lag is the lag value of a dependent variable. Variable definitions are the same as explained in Table 1. AR(2) is the second-level autocorrelation.. *** and ** represent significance.

Investment policy (IP): In model 1 and model 2, IP significantly and positively impacts TQ (coeff. = 149.985, p = 0.000) and MB (coeff. = 65.700, p = 0.000). This evidence indicates that firm value increases when firms adopt

conservative IP by holding more current assets relative to total assets, supporting *H1*. The need for more investment in current assets stems from non-financial firms needing to boost inventories and trade credits (Brigham & Ehrhardt, 2011; Farhan et al., 2021). The coefficient of IP square (IP2) shows a significant negative relationship with TQ (coeff. = -80.028, p = 0.000) and MB (coeff. = -25.420, p = 0.000), confirming the optimal relationship between working capital investment policy and firm value, supporting *H1a*. The optimal points for IP are 0.94 for TQ and 0.72 for MB, suggesting firms avoid exceeding this level. These results align with Tauringana and Afrifa (2013) but contrast with Nadeem, Waris, Asadullah, and Kamran (2020), who suggested conservative IP increases firm performance.

Financing Policy (FP): The coefficient of FP significantly and negatively affects the TQ (*coeff. = -52.070, p = 0.000*) and MB (*coeff. = -97.800, p = 0.000*), implying that a higher ratio of FP is associated with decreased firm value, supporting *H2*. The coefficient of FP square (FP^2) has a positive and significant effect on TQ (coeff. = 41.198, p = 0.000) and MB (coeff. = 82.400, p = 0.000). The negative and positive coefficients of FP and FP squared (FP^2) confirm that there is an optimal relationship between FP and firm value, supporting *H2a*. This result implies that as firms' financing of current assets through current liabilities increases, firm value increases. Adopting aggressive FP increases firm value. The optimal points for FP are 0.63 for TQ (-52.070/(2 x 41.198)) and 0.59 for MB (-97.800/(2 x 82.400)). These optimal points are higher than the mean value of 0.40, which means adopting a more conservative approach to FP beyond 0.63 is beneficial in generating firm value. When companies choose short-term debt, it may be because they can't get short-term funding from outside sources. Instead, they may rely on internal financing, selling shares, or long-term debt (Fama & French, 2002). This result aligns with the previous work (Afza, 2007; Rizki et al., 2019; Vahid et al., 2012; Weinraub & Visscher, 1998).

The cash conversion cycle (CCC) has a big and positive effect on TQ (coeff. = 0.012, p = 0.000) and MB (coeff. = 0.034, p = 0.000) in models 3 and 4. This suggests that adding a day to the cash conversion cycle raises firm value, which supports H3. Shareholders appear to value firms with longer cash conversion cycles. The *squared coefficient of CCC (CCC2) has a negative effect on both TQ (coeff. = -0.043, p = 0.000) and MB (coeff. = -0.037, p = 0.000), which supports H3a and shows that higher levels of CCC make firms less valuable*. The optimal CCC is 66 days for TQ and 59 days for MB; both are below the mean of 80 days, implying that managing CCC beyond these optimal points reduces firm value. CCC positively contributes to performance when kept below the optimal level, enhancing sales and benefiting from early payment discounts. This aligns with previous studies (Ahangar & Shah, 2017; Altaf & Shah, 2018; Anton & Nucu, 2020; Sonia Baños-Caballero et al., 2014; Deari et al., 2022; Sharma & Kumar, 2011; Yilmaz & Nobanee, 2023). However, when working capital exceeds the optimal threshold, it negatively affects firm earnings due to opportunity costs, financing expenses, and refinancing uncertainties. Control variables show mixed results: SG positively affects all models, FS positively impacts firm value in model 4 only, and DR is positive in models 1 and 3 but negative in models 2 and 4.

4.4. Role of Market Power in Working Capital Policies, CCC, and Firm Value

Table 6 presents the interaction effects of market power (MP) with working capital policies and firm value. MP significantly and positively impacts both TQ (coeff. = 2.332, p = 0.000) and MB (coeff. = 0.110, p = 0.020), suggesting that Pakistani firms with higher MP are more capable of generating firm value. However, the interaction of MP with working capital policies contrasts with their direct effects on firm value. The interaction of IP and MP (IP*MP) shows a significant negative relationship with TQ (coeff. = -8.235, p = 0.000) and MB (coeff. = -0.114, p = 0.001), indicating that MP changes the impact of IP on firm value from positive to negative. This could be due to the inefficiencies caused by excessive working capital or the misallocation of resources, which MP cannot fully offset.

Table 6. GMM estimation for working capital policies, market power and firm value.

Variables	(5) TQ	(6) MB	(7) TQ	(8) MB
	Coeff. p-value	Coeff. p-value	Coeff. p-value	Coeff. p-value
Lag	0.163*** 0.000	0.232 *** 0.000	0.211*** 0.000	0.159*** 0.000
IP	18.416 0.000***	0.442 0.000***		
FP	-3.287** 0.046	-0.132 0.271		
MP	2.232*** 0.000	0.110** 0.020	0.059 0.246	0.012 0.298
IP*MP	-8.235*** 0.000	-0.114*** 0.001		
FP*MP	3.543*** 0.000	0.110 0.773		
CCC	-	-	0.034*** 0.000	0.021*** 0.000
CCC*MP	-	-	0.114*** 0.000	0.351*** 0.000
SG	-1.121*** 0.004	0.014 0.141	0.324*** 0.000	0.321*** 0.000
FS	4.103*** 0.000	-0.146 0.500	1.351*** 0.000	0.012*** 0.000
DR	2.451*** 0.000	-0.024 0.108	-0.315*** 0.000	-0.014*** 0.000
Constant	-60.043*** 0.000	0.104 0.743	-10.050*** 0.000	-0.173*** 0.000
No. of obs.	2392	2392	2392	2392
No. of groups	184	184	184	184
No. of inst.	35	26	43	148
AR (2)	-1.2	-0.7	-1.05	-0.3
Hansen test	23.22	47.15	121.28	83.17

Note: Lag is the lag value of the dependent variable.Variable definitions are the same as explained in Table 1. AR (2) is the second-level autocorrelation. *** and ** represent significance.

For FP, its interaction with MP (FP*MP) has a big and positive effect on TQ (coeff. = 3.543, p = 0.003). This means that companies with high MP can borrow more money without having to pay as much in financial distress costs. This argument supports the trade-off theory, where the benefits of debt, such as tax shields, outweigh the risks for firms with consistent revenue streams (Fama & French, 2002). The way CCC interacts with MP (CCC*MP) has a positive effect on both TQ (coeff. = 0.114, p = 0.000) and MB (coeff. = 0.351, p = 0.000). This suggests that companies that use MP manage CCC well, which increases the value of the company. This supports Deloof (2003) finding that reducing CCC improves profitability. These findings align with the argument that firms adjust working capital policies by leveraging their MP (Dash et al., 2023; Luo, Jiang, Pu, Li, & Yang, 2022; Grzegorz Zimon & Robert Dankiewicz, 2020). H1b, H2b, and H3b are supported. Control variables SG and FS positively affect firm value, while DR has a negative effect, except in Model 5.

These findings enhance existing literature by describing the impact of working capital policies on firm value and considering the moderating role of market power; thereby, presenting theoretical and practical implications. The results support previous research by Deloof (2003) and Enqvist et al. (2014) by showing that conservative investment strategies and prolonged cash conversion cycles can increase firm value to an optimal point, after which the advantages decline. This duality underpins theories such as the trade-off theory (Fama & French, 2002), highlighting the balance between liquidity and opportunity costs. The results differ from previous studies (e.g., Jabbouri et al. (2023) and Nadeem et al. (2020)), demonstrating the distinct dynamics present in developing markets like Pakistan.

As the resource-based view says, firms with more market power can use their size to lower the risks that come with aggressive financing policies and better manage cash conversion cycles. This is what the moderating role of market power means. The findings emphasize the necessity of customizing working capital policies to align with firm-specific conditions, such as market power, to optimize shareholder returns. This study strengthens the discourse on optimal working capital strategies in developing economies by linking results to existing frameworks and empirical findings while also addressing gaps in our understanding of the relationship between market power and liquidity management.

5. CONCLUSION

This study investigates the working capital policy optimization of 184 Pakistani non-financial firms for the period 2011–2023. Additionally, the study finds how market power changes the effect of working capital policies on firm value. Working capital policies are measured through investment policy (IP), financing policy (FP), and cash conversion cycle (CCC), and firm value is measured using Tobin's q (TQ) and market-book ratio (MB). The initial results from the Kruskal-Wallis test indicated that firms with high and low market power adopt different working capital policies. Pakistani firms with high market power adopt a conservative approach to managing IP and CCC. This indicates that firms take significantly longer to convert their inventory into cash, which suggests they could benefit from optimizing their working capital management strategies. These findings motivated us to investigate the moderating role of market power (MP) on working capital policies. For regression analysis, use the Generalized Method of Moments (GMM) to control observable heterogeneity and probable endogeneity problems. The findings showed that IP, FP, and CCC significantly affect firm value at optimal levels. These findings indicate that managers should guard against factors that could harm their company's shareholder returns, such as lost sales, forfeited early payment discounts, or additional financing costs. This study aligns with certain previous studies in similar contexts (e.g., Nadeem et al. (2020) and Farhan et al. (2021) contrasts with others (e.g., Tauringana and Afrifa (2013) and Turaboglu and Topalogu (2017). Upon further analysis, this study reveals that firms with market power tend to adopt aggressive intellectual property (IP) strategies while maintaining a conservative approach to financial management (FM) and corporate social responsibility (CSR). A cautious investment policy in working capital boosts firm value, but taking a more aggressive approach to financing can also be advantageous, to a certain extent. This suggests a trade-off between working capital policies and firm value.

6. SIGNIFICANCE, THEORETICAL AND MANAGERIAL IMPLICATIONS OF THE STUDY

The findings are significant for financial managers in developing countries, demonstrating that strategic working capital management can enhance firm value. Firms with greater market power gain advantages from effective working capital management, resulting in increased returns for shareholders. Rather than overly aggressive or conservative policies, managers should focus on optimizing working capital to enhance financial flexibility and minimize the cost related to supply chain disruptions. The trade-off is important in underdeveloped markets, where efficient management can protect against economic volatilities.

The findings also suggest that policymakers establish and advocate for standardized guidelines on working capital management, particularly for developing countries. They could set industry-specific standards for optimal accounts receivable, accounts payable, and inventory turnover. Governments and financial institutions may provide incentives, including tax reductions or low-interest rate loans, to promote compliance with efficient working capital practices. Regulatory programs should promote financial transparency and offer training programs for financial managers focused on advanced working capital optimization techniques. The study's limitation is its focus on Pakistani non-financial firms. Future research should expand to other developing economies and examine external factors like the 2008 financial crisis and the COVID-19 pandemic.

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