



The Impact of Working Capital Management (WCM) on Firm's Profitability: The Case of Cement Industry of Khyber Pakhtunkhwa (Pakistan)

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Abstract

In this study, researchers looked at how management working capital affected the profitability of manufacturing companies producing cement in Khyber Pakhtunkhwa, Pakistan. Our sample consisted of three manufacturing company's registered on the Karachi Stock Exchange, and we examined their performance over a 12-year period from 2008 to 2020. Our primary independent variables were inventory turnover in days (ITID) and average collection period (ACP), while the dependent variables included return on equity (ROE) and net profit margin (NPM). To examine how management working capital and business performance are related, Studies employed panel data analysis techniques. Our findings suggest a positive influence of management working capital on firm profitability. Importantly, this association was found to be statistically importance at the 5 percent level, indicating that effective management of working capital contributes positively to shareholder value. Our study highlights the significant of sound management working capital practices in enhancing the performance of cement manufacturing companies in Khyber Pakhtunkhwa, Pakistan, ultimately benefiting their shareholders.

Keywords: Management, Working Capital Profitability, Return on Equity, Net Profit Margin, Average Collection Period, Inventory turn in days

1. Introduction

Working capital required for everyday business transactions and processes and represents the amount of current assets. The WCM has a direct relationship with the company's profitability and liquidity, (Kayani, Gan et al. 2023)WCM is administration of short-term assets and liabilities professionally and effectively to minimize payments of liabilities and maximize return to the firm on its assets. (Seth, Chadha et al. 2021)Management of any organization's current assets is its primary function to attain the required balance between risk and profitability. (Sensini 2020).

Effective working capital management, which also implicitly refers to the controlling of current assets and current liabilities, is foundation for company profitability.

Working capital management may become somewhat confusing as a result of the complicated lack of business knowledge expertise and the business environment. This element has the potential to make businesses even more unstable, which reduces firm profitability (Maestre, Le Bagousse-Pinguet et al. 2022).

Effective working capital management to control and plan liabilities and assets to the minimum of risk, Management spends more time on day-to-day problems and makes the decision for working capital management investment, (Raheman and Nasr 2007). The reason is that a manager's focus on supervision working capital is on short term of existing investments and can easily be transferred to cash or any other current asset, (ITICHA 2023). The cash conversion cycle—also known as the management of receivables, inventory, and payables—represents a tactical decision in working capital management. The 3 areas of capital budgeting, capital structure and WCM can be used to categorize the entire subject of corporate finance.(Moon, Mohel et al. 2021).After the 2008 financial crisis, corporate managers began to pay care to idea of WCM. Because it influences corporate stability and profitability, businesses carefully manage their working capital, (Liu, Sehgal et al. 2013).

The lower level of working capital will improve the company's profitability, whereas excessive working capital will indicate that firm has a lot of spare resources and a lack of managerial skills, (Abuzayed 2012). In all corporate finance textbooks, the significance of operating capital management has been thoroughly examined. Research-focused papers have also emphasized the value operating capital management has for business, (van Putten, Akbulut et al. 2011).

The company's inability to recover its debts well on time, which also increases the allowance of bad debts, (Okpala, Osanebi et al. 2019). While inadequate working capital can result in these critical situations, operations and strategic plans also need investment to pursue, which can't be possible with an inadequate level of current assets, (Zimon and Tarighi 2021). Day-to-day operations handling also became very difficult for the firm (Irmiya and Job). WCM is proposing the size and mixture of resources and consumptions of working capital to increase shareholder wealth.WCM significantly contributes to the optimum performance of industrial companies, (Prasetya, Putra et al. 2023).

1.1. Research Objectives

- To offer a thorough explanation of the idea of working capital and its significant in the management finance of businesses.
- To investigate the various working capital features inventory, cash, accounts payable and accounts receivable and their interactions with one another in the management of a firm's liabilities and short-term assets

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- To determine how working capital policies, such as aggressive or conservative methods, affect a company's liquidity, operational effectiveness, and profitability.
- To examine actual case studies and examples from a particular industry that demonstrate the useful effects management of working capital on business performance.
- To Identify best practices and techniques for businesses to use in order to inceßance management of working capital and raise profitability.

1.2. Research Hypothesis

H_{0a}: There is no significant relationship association between Management of Working Capital (MWC) and a company's profitability.

H_{1b}: There is a significant relationship association between Management of Working Capital (WCM) and a company's profitability.

1.2.1. Hypothesis 1: Inventory Turnover in Days (ITID) and Profitability

H₀: There is no important association between Inventory Turnover in Days (ITID) and a company's profitability.

H₁: There is a important association between Inventory Turnover in Days (ITID) and a companies profitability.

1.2.2. Hypothesis 2: Average Collection Period (ACP) and Profitability

H₀: There is no important association between Average Collection Period (ACP) and a company's profitability.

H₁: There is a important association between Average Collection Period (ACP) and a firm's profitability.

1.2.3. Hypothesis 3: RoE and Working Capital Management

H₀: There is no significant association between Return on Equity (RoE) and Working Capital Management (WCM) factors, including ITID and ACP.

H₁: There is a significant relationship between Return on Equity (RoE) and Working Capital Management (WCM) factors, including ITID and ACP.

1.2.4. Hypothesis 4: NPM and Working Capital Management

H₀: There is no important association between Net Profit Margin (NPM) and Working Capital Management (WCM) factors, including ITID and ACP.

H₁: There is a significant association between Net Profit Margin (NPM) and Working Capital Management (WCM) factors, including ITID and ACP.

2. Literature Review

Working capital, according to (Nwude 2012), is the lifeblood of a company. Its efficient provisioning can greatly increase the likelihood of a company's success, while neglect or ineffective management can lead to a company's failure. Working capital can be understood as the deliberate professional practice of keeping current assets in excess of current liabilities in order to maintain a healthy current ratio, which serves as a fundamental indicator of a firm's overall liquidity. Every company wants to maximize profits, so it is crucial for businesses to know "how" to use its liquid assets in the best possible way.

(Raheman and Nasr 2007), "analyzed the influence of working capital management on firms profitability at the Karachi Stock Exchange over a period from 1999 to 2004". Regression model was used for analysis. The variables employed were ACP, ITD, APP, CCC, and ratio analysis. The author discovered a conflict among profitability and working capital. The variables affected the firm's profitability as WCM played a significant role.

In firms, the researchers (Appuhami 2008).(Kamalavalli and Christopher 2009). And (Nzioki, Kimeli et al. 2013), (Nzioki, Kimeli et al. 2013) and (Eljelly 2004)all found a significant relationship. The results of (Naghavi, Falk et al. 2006). all found a significant association. The findings of indicated that working capital management measures were negatively correlated with profitability in KSE over a period from 2001 to 2005. panel regression models and Correlation were used for analysis. The panel variables employed were CC, SG, and ICP. The authors found create a negative relationship among WCM and the profitability of company's. (Shin and Soenen 1998) argued that the link among present assets and the profitability of the companies was negative. examined 19 years of data from 1975 to 1994 to analyze the association between trade cycles and profitability. For the time period studied, the association between profitability and net trade cycle was negative. Khan, Ahmed et al. (2015) investigated the financial ratios impact on the Cement Company's performance in Pakistan. Through an analysis of 10 cement companies, the research study looked into the connection between profitability and working capital management. Five years of data were analyzed for cement companies listed on KSE over the period 2009–2013. Multiple linear regression models were used for the analysis. The panel variables used for analysis were ROE, CCC, CR, ITD, GWCT, QR, and APP. "The author found a positive association between management of working capital and profitability". (Kumar, Panda et al. 2013), in their study, analyzed that growth in organizations has association with working capital management. Most companies failed to achieve their goals due to missed management of short-term liabilities and short-term assets of their companies. Over a period of 1998–2005, a panel regression model was used for analysis. The Variables employed were CCC, APD, TID, ARD,

FFFAR, FDR, and SS. The author found a negative association among working capital management and company's profitability.

3. Methodology

3.1. Sample Size

The basic reasons for selecting cement industry for research in KPK regain. A total of twenty one cement companies are registered on the Karachi Stock Exchange, and three companies were taken as samples. The duration of the data analyzed is from 2008 to 2020 this study.

3.2. Variables of the Study Variables

1. Dependent Variable

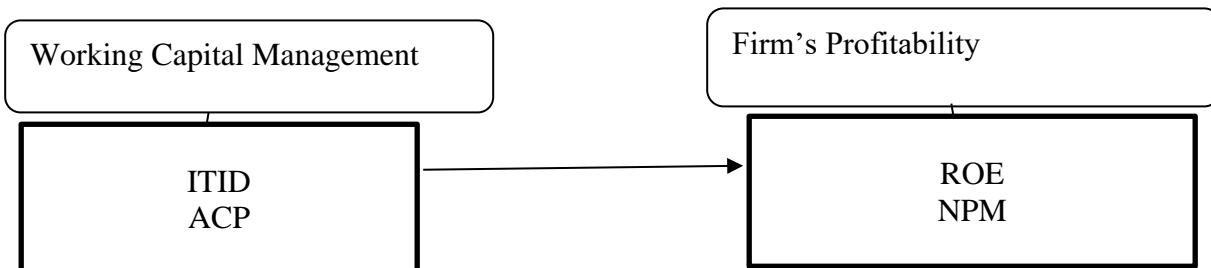
- I. Return on Equity (RoE)
- II. Net Profit Margin (NPM)

2. Independent Variables

- I. Inventory Turn Over in Days (ITID)
- II. Average Collection Period (ACP)

This variable is based on previous studies such as Rahman, M. M. (2011), Ali, S. (2011), Egbide, B. C., & Enyi, P. E. (2008), Raheman and Nasr (2007).

4. Conceptual Framework



Net profit margin (NPM) is the ratio used to measure net income of a firm as a percent of sales. It is derived as net income divided by sales. The net profit margin ratio exposes the general profitability of the concern, which is very beneficial for future investors and shareholders. It is also important for management effectiveness in industrial control and marketing of the products. Gross profit margin ratio, operating profit ratio, return on investment, net profit ratio, return on total assets, and return on capital are the variables employed by (Rahman and McFadden 2011),(Egbide and Enyi 2008). Net Profit Margin = Net Profit/ Total Sale

4.2. Return on Equity

ROE is an examination instrument that displays the returns a company has made from the owners' equity.(Tunstall, Mukhopadhyay et al. 2011) Return on Equity is equal to net income divided by common shareholder equity.

4.3. Inventory Turnover in Days

Inventory Turnover in Days =Inventory / Cost of Goods Sold*90

Inventory management plays the most important role in investment decisions. Investments in inventories have an expected return greater than the cost of the venture investment. Stock up on inventory to increase profits. Most of the previous researchers investigated inventory turnover in days. The private studies used this variable. (Howorth, Westhead et al. 2004), (Rahman and McFadden 2011), (Egbide and Enyi 2008).

4.4. Average Collection Period

The average collection period (ACP) is used to assess success of credit policy. It is calculated as accounts receivable divided by net sales multiplied by 90 days. Private studies used this variable, such as (Raheman, Afza et al. 2010).(Tanveer, Nazir et al. 2016).

4.5. Panel Regression Model

The panel regression model under investigation was used in study to determine combined impact working capital management has on profitability. OLS regression examines been led to determine the significant relationship between variables. Following are the general form of panel regression model:

4.6. General Panel Regression Model

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \dots \quad (I)$$

Y = The coefficient of dependent variable.

β_0 it = the intercept of the model.

β_1 = coefficient of independent variables Xit.

Xit = The explained variables in t time and i firm.

i = number of individuals firms.

t = Time period.

ε = the error term.

4.7. Random Effect Model

On the basis of Hausman Test for Panel Model Specification, our models in the study are as under

$ROE_{it} = \beta_0i + \beta_1(ITID_{it}) + \beta_2(ACP_{it}) + \mu_{it}$ (Random Effect Model)...Model A

$NPM = \beta_0i + \beta_1(ITID_{it}) + \beta_2(ACP_{it}) + \mu_{it}$ (Random Effect Model)...Model B

Where: β_0i = Constant of firm i.

β_1 = coefficient of independent variables Xit.

Xit = The explained variables in t time and i firm.

i = number of individuals., t = Time periods.

ROE_{it} = Return on Equity at t time in i firm

NPM_{it} = Net Profit Margin at t time in i firm

$ITID_{it}$ = Inventory turnover in days at t time in i firm

ACP_{it} = Average Collection Period at t time in i firm.

μ_{it} = error term in t period of i firm.

5. Results and Discussions

This chapter offers descriptive statistics, correlation coefficients, and regression analysis results. In this chapter, to interpret the observed results and report them, we first analyze the company's descriptive statistics, unit root test, correlation, Hausman test, and panel regression.

5.1. Descriptive Statistics

Descriptive statistics demonstrate standard deviation and mean of each variable in this study. It also presents highest and lowest values, skewness, and the type of the variable. Mean and median show the measurement of the center value in the series, and highest and lowest tell the lowest and highest values in the series. Skewness and kurtosis E-Views-8 software has been used for examination of variables in these studies.

The mean and median values of ITID are 26.40 and 25.51, Correspondingly, It describes how firms take 26 days to convert stock into sales. Standard deviation of 15.9 shows distribution of data from actual mean value. The mean and median number of ACP are 7.46 and 3.70, Correspondingly. It describes how firms take 7 days to collect cash from account receivables. The standard deviation of 8.76 shows distribution of data from tmean number. The mean and median number of NPM are 0.15 and 1.19, Correspondingly. It describes how firms generate a net profit of Rs. 15 per Rs. 100 in sales. The standard deviation of 0.12 shows distribution of data from actual mean value. The mean and median values of RoE are 0.08 and 0.08, respectively. It describes firms earning Rs. 8 per Rs. 100 invested by the owner's capital. The standard deviation of 0.09 shows distribution of data from actual mean number. The minimum values for ACP, ITID, NPM, and RoE are 0.05, 0.76, -0.16, and -0.4, respectively. This is the lowest limit of the respective series. The maximum values for ACP, ITID, NPM, and RoE are 56.26, 122.7, 0.33, and 0.26, respectively. This is the highest limit of the respective series. ACP and ITID are positively skewed. It means that most of the observation values are above the mean value. RoE and NPM are negatively skewed. It means that most of the observation values are below the mean value. If the kurtosis value of ITID, ACP, and RoE is greater than 3, it is leptokurtic kurtosis. Most of the observations are close to the mean value, and the chances of extremeness are high. If the kurtosis number is less than 3, it is platykurtic kurtosis. Most of the observations are concentrated a long way from the mean value, so the chances of extremeness are less. Finally, skewness and kurtosis describe that the data is not normally distributed.

Table 1: Descriptive Statistics for ACP, ITID, NPM and ROE over the period 2008 – 2020

	ACP	ITID	NPM	ROE
Mean	7.46	26.40248	0.15	0.08
Median	3.70	25.51532	0.19	0.08
Maximum	56.26	122.70	0.33	0.26
Minimum	0.05	0.76	-0.16	-0.44
Std. Dev.	8.76	15.99	0.12	0.09
Skewness	2.29	2.24	-0.86	-2.59
Kurtosis	11.81	15.16	2.84	16.77

Note: All variables are at normal value.

5.2. Correlation

Correlation refers to the association between independent variables. It similarly expresses a direct or inverse association. But the most important flaw is that it doesn't tell about long-term or short-term relationships between variables. The correlation among variables is presented in the following table: ITID and ACP are negatively correlated with RoE, but this is not a strong correlation. ITID and ACP are positively correlated with NPM, but this is not a strong correlation.

Table 2: Correlations

	ACP	ITID	NPM	ROE
ACP	1.00			
ITID	0.17	1.00		
NPM	0.24	0.31	1.00	
ROE	-0.13	-0.11	-0.12	1.00

Note: All variables are at their 1st differenced level.

5.3. Panel Regression Analysis

Using the panel regression method, the study observed impact of the management of working capital on a company's profitability. It is the most reliable data analysis technique to explain the influence of independent variables on dependent variables. (Nastiti, Atahau et al. 2019), (Rey-Ares, Fernández-López et al. 2021). This studies ran regressions of the influence of working capital management on a firm's performance referring to model dependent variables ROE, NPM, and independent variables ITID and ACP. The estimated results for Cherat, Kohat, and Lucky are as follows:

Table B presents the estimated regression of Model A (ROE), which is used as a dependent variable. The number of R-squared is 0.1395. It shows display that only 13% of variations in dependent variable ROE clarified specified autonomous ACP and ITID, while the remaining 86% explained the other factors considered error terms. Although the R-squared value is low, i.e., 0.1395, the standard error of regression and Durbin-Watson value are quite low, indicating that the model is fit and showing no autocorrelation. The adjusted R-squared value is 0.1168, slightly less than the r-squared value.

Table 3: Summary of the Regression Analysis of Model - A

Independent Variables	Coefficient	Standard Error	t-Statistics	p-value
C	0.0072	0.0059	1.2167	0.0269
ACP	0.0026	0.0013	1.9717	0.0417
ITID	0.0008	0.0059	2.7798	0.0066
Regression Statistics				
R-Squared			0.1395	
Adjusted R-squared			0.1168	
S.E of Regression			0.0558	
F-statistic			7.0803	
Prob.(F-statistic)			0.0014	
Durbin-Watson stat			1.5473	

Note: All variables are at their 1st differenced level.

The probability of the F-statistic is 0.000, indicating that the model (all the estimated coefficients) are significant. F-statistic is 7.0803 and prob (F-statistic) is 0.0014 of the F-statistics displays the rationality of the model; if F-statistic is greater than the probability (F-statistic) value, the model is good. The table further describes that both ACP and ITID have a positive effect on a company's profitability. ACP and ITID have a statistically significant relationship with firm performance. Hence, it proves our alternate hypothesis of the study.

Table B presents the estimated regression of Model-B (NPM), which is used as a dependent variable. The value of R-squared is 0.1039, which shows that only 10% of the variations in the dependent variable ROE explained the specified independent ACP and ITID, and the remaining 90% were explained by the other features considered error terms. Although the R-squared value is low, i.e., 0.1039, the standard error of regression and Durbin-Watson value are quite low, indicating that the model is fit and shows no autocorrelation.

Table 4: Summary of the Regression Analysis of Model - B

Independent Variables	Coefficient	Standard Error	t-Statistics	p-value
C	0.0013	0.0093	0.1428	0.1466
ACP	0.0034	0.0021	-1.4642	0.0373
ITID	0.0006	0.0004	1.2990	0.0432
Regression Statistics				
R-Squared			0.1039	
Adjusted R-squared			0.0901	
S.E of Regression			0.0879	
F-statistic			10.0101	
Prob.(F-statistic)			0.0001	
Durbin-Watson stat			0.5411	

Note: All variables are at their 1st differenced level.

The adjusted R-squared number is 0.0901, slightly less than the r-squared value. The probability of the F-statistic is 0.000, indicating that the model (all the estimated coefficients) are significant. The F-statistic is 10.0101, and the prob. (F-statistic) is 0.0001 of the F-statistics displays the rationality of the model; if F-statistic is greater than the probability (F-statistic) value, then the model is good.

The table further describes that both ACP and ITID have an effect on a companies profitability. ACP and ITID have a statistically important association with companies profitability. ACP has a statistically positive impact on a firm's performance, while ITID also has a important positive effect on the companies profitability. Hence, it proves our alternate hypothesis of the study.

6. Discussion

The result revealed that ACP is important at the 5% level. The association between ACP and ROE is positive, as specified by theory of working capital management, and coefficient 0.0026 means one day's increase in ACP brings 2.06% increases in ROE. In addition, ITID is significant at the 5% level of important. The association among ITID and ROE is positive. A coefficient of 0.0008 means one day's decrease in ITID brings a 0.08 push in ROE. This means that when ACP and ITID increase, it will push their profitability, and when ITID reduces, it will push profitability positively. The ACP and ITID also have a important positive influence on profitability. With growth in turnover of working capital, profitability will also growth. A coefficient of 0.0034 means one-time increases in ACP bring 03.045% increases in NPM. More turnover equals greater efficiency, which demonstrates the working capital's efficiency. At the 5% level of significance, the results are significant. As well, ITID is importance at 5% level of significance. The relationship among ITID and NPM is positive. A coefficient of 0.0006 means one day of decreased ITID brings a 0.06 push in NPM. This means that when ACP and ITID increase, it will push their profitability, and when ITID reduces, it will push profitability positively.

7. Conclusion and Recommendations

7.1. Conclusion

To observe impact of working capital management on companies profitability, current analysis investigated variables of return on equity, inventory turnover in days, net profit margin, and average collection period. All data are collected on a quarterly basis with the end values over a period from 2008 to 2020 registered with the Karachi Stock Exchange. Return on equity and net profit margin are take as dependent and variables, inventory turnover in days and average collection period are used as independent variables. This study has selected three companies: Kohat Cement, Cherat Cement, and Lucky Cement.

The results also revealed that this association is statistically significant at the 5 percent level. This means that management of working capital increases the shareholders' value positively. A current study found that both ACP and ITID have a positive effect on RoA, the proxy for firms. This means that when ACP and ITID increase, it will push their profitability, and when ITID reduces, it will push profitability positively. The current study also concludes that there is a positive relationship between ACP and NPM, the proxy for a companies profitability, and also a positive association between ITID and NPM, the proxy for a firm's performance. This means when ACP increases, it will push their profitability upward, and when ITID reduces, it will push profitability upward.

7.2. Recommendations

The current study recommends that the availability of working capital in the firm would make it more profitable because This study discovered aassocation between working capital and corporate performance. The following are derived on the basis of analysis:

1. By reducing the average collecting period, the company can increase its profitability.
2. The companies can increase its performance by reducing inventory turnover in the day's period as much as possible.

3. The companies can improve their profitability by reducing inventory turnover in the day's period as much as possible, which will minimize the total inventory cost.
4. Based on the findings of the aforementioned study, we can also draw the conclusion that if enterprises are able to increase their working capital in further effective methods, these outcomes can be further supported.

The administration of present assets and present liabilities and financing of these present assets" is what is meant by "working capital management." These businesses will finally boost their profitability if they manage their inventories, cash, and accounts receivable effectively.

7.3. Limitation and Future Research

There is still much to be done regarding working capital in Pakistan. The study suggests that additional research on the subject be conducted using various firms and a variety of sample years. The scope of future research could include managing the several parts of working capital, such as managing cash, receivables, marketable securities, and inventory.

7.4. Limitations of this study include:

7.4.1. Small Sample Size and Generalizability

The study only includes three manufacturing firms from the cement industry in Khyber Pakhtunkhwa, Pakistan. The limited sample size makes it challenging to generalize the findings to a broader population of firms or other industries. The results may not be representative of the entire industry or applicable in different contexts.

7.4.2. Data Quality

The accuracy and reliability of the financial data and other variables used in the study can impact the validity of the results. Potential errors or inconsistencies in financial statements or data collection processes can introduce bias and affect the analysis. Ensuring data quality is crucial to minimize these limitations.

7.4.3. Timeframe

The study covers a 12-year period from 2008 to 2020. Economic conditions, industry dynamics, and business practices can evolve over time. The chosen timeframe may not capture recent developments, emerging trends, or shorter-term fluctuations that could influence the association among "management of working capital and performance".

7.4.4. External Factors

The investigation may not fully account for the influence of external macroeconomic factors. Factors like inflation rates, interest rates, regulatory changes, or market conditions can impact both "management of working capital and profitability". The research emphasis on working capital management and profitability may not incorporate all relevant external factors, limiting the comprehensiveness of the findings.

7.4.5. Causality

While the study establishes a affiliation among management of working capital and pperformance, it may not definitively establish causality. Other unobserved variables or omitted factors could be driving changes in profitability. The study's design may not fully control for all potential confounding variables, making it challenging to found a causal affiliation between management of working capital and performance.

Acknowledging these limitations is essential for interpreting the study's findings accurately and understanding their potential applicability and implications. Further research with larger sample sizes, diverse industries, longer timeframes, and comprehensive control of external factors can help address these limitations and enhance the understanding of the relationship between working capital management and profitability.

7.5. Future research directions

Extended Sample: Increasing the sample size to cover a broader and more varied group of businesses from various sectors and areas. This would increase the findings' generalizability and give more insight into the connection between working capital management and profitability.

Longitudinal Analysis: Conducting a longitudinal analysis over an extended period to observe how the connection between profitable working capital management evolves over time. This would enable researchers to investigation the effect of changing economic circumstances, industry dynamics, and business cycles on the relationship.

Qualitative Insights: Incorporating qualitative research methods, just like surveys or interviews with firm managers, to gain improvement profounder visions into the specific working capital management performs and plans that lead to improved profitability. This would provide a more nuanced understanding of the underlying mechanisms and decision-making processes.

Comparative Analysis: Comparing working capital management's effect on profitability in various industries or areas. This comparative analysis would help identify industry-specific or geographic variations in the relationship and uncover factors that contribute to differential outcomes.

External Factors: Integrating external factors, such as economic indicators, industry-specific variables, or regulatory changes, into the analysis. This would allow researchers to better isolate the impact of working capital management on profitability and understand how external factors interact with internal practices.

Causality Testing: Employing advanced statistical techniques, such as instrumental variables or structural equation modeling, to found causality between working capital management and profitability. By addressing potential endogeneity problems, these techniques can offer stronger proof of the causal relationship.

Impact of Technological Advances: Investigating the influence of emerging technologies, such as automation, artificial intelligence, or data analytics, on working capital management practices and their subsequent effect on companies performance. This research could shed light on the evolving role of technology in optimizing working capital management strategies.

By considering these future research directions, scholars can advance the understanding of how management of working capital impact firm performance and provide valuable insights for practitioners to enhance their financial decision-making processes.

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