

A COMPARATIVE ANALYSIS OF FIRM RISK INFLUENCE ON WORKING CAPITAL INVESTMENT DECISIONS IN DEVELOPED AND EMERGING ECONOMIES

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ABSTRACT: This study delves into the correlation between a company's decision to invest in working capital and a diverse range of internal (firm-specific) and external risks. Employing dynamic panel data estimation, it analyzed data from 2,996 firms in developed and emerging economies. The findings robustly support the anticipated relationship between a company's risks and its investment in working capital, except market risks. Furthermore, the study uncovers that this correlation is more pronounced for firms in developed economies than those in emerging economies, potentially attributable to more accessible access to working capital funding and more formal planning processes. These results significantly contribute to filling a gap in academic research in corporate finance relating to the influence of firm risk on working capital investment decisions in developed and emerging economies.

Keywords: working capital investment, financial risk, operational risk, liquidity risk, credit risk, inflation risk, short-term finance, market risk

INTRODUCTION

Creating wealth for the shareholder is a well-established objective of the firm (Baños-Caballero et al., 2014; de Almeida and Eid, 2014). Traditionally, long-term investments have been the primary focus for wealth creation. Still, there is a growing recognition of the potential value of the firm's short-term investments, particularly in working capital, following the 2007/8 financial crisis (Singh and Kumar 2014). Recent research saw a notable increase in focus on working capital management, specifically in understanding its role in supporting the firm's profitability and wealth creation and the analysis of factors influencing the firm's working capital (Pitt and Kruger, 2018). However, there has been limited exploration of the impact of the firm's risk on its working capital investment decisions, particularly in the

context of developed and emerging economies. This paper seeks to address this gap in the literature and contribute to a better understanding of the relationship between a firm's risk and its working capital investment decisions in different economic contexts.

The study examines how various types of risk, including financial, credit, liquidity, operational, and inflation risk, as well as changes in short-term interest rates and real GDP growth, influence a company's decision to invest in working capital. The results strongly support the expected connection between a company's risks and its investment in working capital across all risks except market risks. The study also observes that this connection is stronger for companies in developed economies than emerging economies, possibly due to better funding sources and

more structured planning in developed economies.

A review of prior literature on factors affecting working capital follows, followed by an explanation of variable selection and a statement of the research hypothesis before describing and discussing the data and methods used. The paper ends with a discussion and analysis of results and concluding remarks.

LITERATURE REVIEW

The literature cites the factors influencing a firm's working capital investment decision as firm-specific elements such as profitability, sales growth, leverage, age, working capital finance and investment policy, size, operating cash flow, market power, and industry affiliation (Mongrut et al., 2014; Kwenda and Holden, 2014; Baños-Caballero et al., 2013). External factors such as economic growth and country risk also play a significant role (Mongrut et al., 2014). Furthermore, the literature suggests that technological advancements have improved production and control efficiencies, enabling firms to maintain lower inventory levels for a given level of sales. These studies offer a comprehensive understanding of the determinants of a firm's working capital investment decision. An exploration of the findings of a few of these studies follows.

Profitability, firm size, and market power

Naser et al. (2013) found that there is a negative correlation between a firm's profitability and its investment in working capital. This means that more profitable firms allocate less capital to working capital. The study suggests that a firm's ability to maintain lower working capital levels is related to its size and market influence. Additionally, Iftikhar (2013)

suggests that larger firms are more likely to efficiently manage their inventory and accounts receivable and negotiate favorable payment terms with their creditors. Furthermore, larger firms have stronger relationships with suppliers, better access to finance, and the ability to negotiate lower costs than smaller firms (Mongrut et al., 2014).

Market power, defined as the ratio of a firm's sales to that of the sales in its industry of affiliation (Iftikhar, 2013; Mongrut et al., 2014), is identified as a significant factor influencing a firm's investment in working capital in some studies, while in others it is found to be insignificant (Kieschnick et al., 2013; Kwenda and Holden, 2014). The literature suggests that a firm's size and market power are pivotal in maintaining lower working capital levels while sustaining profitability.

Sales growth and technology

Some studies have identified a negative correlation between sales growth and the firm's investment in working capital (Naser, 2013; Iftikhar, 2013; Kwenda and Holden, 2014; Iqbal and Zhuquan, 2015). This negative relationship may be shared among large, well-established firms in a mature life cycle stage, partially explained by technological advancements (Bahhouth et al., 2014). Informal approaches to working capital management have been observed in emerging countries such as Malaysia (Mansoori and Mansoori, 2016) and Iran (Darun et al., 2015), indicating that planning for sales growth may not be a conscious decision for firms in these economies or a priority for smaller firms.

Risk

The existing body of literature has provided limited discussion regarding the

influence of risk on firms' investment in working capital. Predominantly, leverage has been cited as the most frequently discussed risk, serving as a proxy for the firm's financial risk. Following leverage, liquidity risk has been identified as the second most commonly cited form of risk associated with working capital investment (Ramiah, et al., 2013; Butt et al., 2013; Kwenda and Holden, 2014). Notably, the definition of leverage varies, encompassing the firm's debt ratio, equity ratio, long-term debt to market value ratio, and the ratio of the firm's total debt to the sum of its debt and equity. Regardless of the definition, researchers generally anticipate a negative relationship between a firm's investment in working capital and its leverage (financial risk). Higher levels of financial leverage entail heightened risk exposure for firms, consequently exerting upward pressure on finance costs and rendering debt a less optimal funding source for working capital (Baños-Caballero et al., 2013; Kwenda and Holden, 2014).

Firms learned from the 2007/2008 financial crises that liquidity is crucial for survival. Liquidity supports day-to-day operations and facilitates meeting short-term financial obligations (Enqvist et al., 2014; Alavinasab and Davoudi, 2013). Several researchers have denoted a firm's operating cash flow as a means of financing its working capital, effectively serving as a representation of the firm's liquidity (Bhandari and Iyer, 2013; Butt et al., 2013; Kwenda and Holden, 2014). Operating cash flow is an internally generated financing source, potentially representing a more cost-effective alternative when compared to external finance and the accompanying impact of asymmetric information and agency costs (Baños-Caballero et al., 2013; Kwenda and Holden, 2014). Consequently, positive or negative cash flows are correlated with the potential for increased

or decreased investment in working capital.

Working capital policy

Nazir and Afza (2009) defined a firm's working capital policy as the degree of aggressiveness in its working capital investment policy (WCIP) and its working capital finance policy (WCFP). They posited that lower levels of investment in current assets indicate an aggressive working capital investment policy, while higher levels of current liabilities denote an aggressive working capital finance policy. These levels are assessed relative to the firm's total assets. Building on this, Kwenda and Holden (2014) suggested a positive relationship between prior-year working capital investment policies and current-year working capital investment, signifying a gradual adjustment towards a targeted working capital level. Additionally, they proposed a positive correlation between the firm's working capital finance policy and investment in working capital, indicating increased investment in working capital with current liabilities as a source of finance. The literature lacks illustrations of the influence of a firm's (overall) working capital policy on its working capital investment.

Economic growth

The research shows that real gross domestic product changes have been used to measure risks associated with economic cycle fluctuations (Kieschnick et al., 2013; Kwenda and Holden, 2014). While some studies suggest that working capital management becomes more important during periods of low economic growth (Enqvist et al., 2014), others found no significant correlation between economic cycle changes and working capital investment decisions (Mohammad and

Elias, 2013; Kwenda and Holden, 2014). This lack of significance could be due to delays in the firm's response to economic cycle changes.

Industry affiliation

Mongrut et al. (2014) suggested that the average industry cash conversion cycle (CCC) was positively related to the firm's CCC. This assumption was based on the likely impact of capital structures, operations, products, markets, customers, and credit policies among industries on working capital management practices (Naser et al., 2013).

This research adds to the existing literature on the determinants of a firm's working capital by considering the impact of a broad set of risks on its working capital investment decision. In addition to financial risk, liquidity risk, and economic growth, which have already been covered in prior research, this paper also considers the impact of the firm's exposure to operational risk, credit risk, inflation risk, and market risk (market volatility) on its working capital investment decision. It examines a risk-based model of the determinants of the firm's working capital decision.

Variable Selection And Hypothesis Definition

Informed by prior literature, this study adopts the following set of hypotheses for this study.

Sales growth

As with Mongrut et al. (2014), sales growth is assumed to be supported by higher levels of investment in working capital.

***Hypothesis 1:** There is a positive relationship between sales growth and investment in NOWC.*

Financial risks

Conforming to the convention of Butt et al. (2013) and Kwenda and Holden (2014), the firm's debt ratio is used as a proxy for its financial risk (leverage). Higher debt levels may increase the firm's financial risk, potentially reducing access to additional debt and increasing the cost of additional debt. This may disincentivize the use of external debt to finance working capital investment.

***Hypothesis 2:** There is a negative relationship between financial risk and investment in NOWC.*

Operational risk

This research defines the firm's operational risk in terms of its working capital policy. In a departure from prior literature, this research introduces the idea of an overall working capital policy (WCP) for the firm rather than a separate focus on WCIP and WCFP. We define the aggressiveness of WCP by the ratio of WCIP to its WCFP. We also consider the firm's WCIP as the ratio of its current assets to its sales, based on the theoretical notion that investment in current assets is required to support its sales (Moles et al., 2011; Correia et al., 2011). Firms opting for low (high) levels of investment in current assets are assumed to adopt a more aggressive (less aggressive) WCIP. The firm's WCFP is the ratio of its current liabilities to its total liabilities, based on the theoretical notion that investment in current assets can be financed with short-term or long-term finance (Moles et al., 2011; Correia et al., 2011). Firms opting for high (low) levels of investment in current liabilities are assumed to adopt a more aggressive (less aggressive) WCFP, given their willingness to resort to lower (higher) levels of long-term finance to cover the investment in current assets. In this study,

reference is made to the firm's WCP (ratio of WCIP to WCFP) as its operational risk.

Hypothesis 3: *There is a negative relationship between operational risk (degree of aggressiveness of WCP) and investment in NOWC.*

Liquidity risk

In line with Baños-Caballero et al. (2013) and Kwenda and Holden (2014), operating cash flow is a proxy for the firm's liquidity risk. Operating cash flow is a source of internally generated funds that can support the investment in working capital. Positive (negative) cash flows will, therefore, be associated with potential increased (decreased) investment in working capital. The focus that firms, especially firms in developed economies, place on liquidity risk is confirmed by Ramiah et al. (2013), who suggested that firms rank liquidity risk as the most important when considering this risk relative to all other risks.

Hypothesis 4: *There is a positive relationship between the firm's liquidity risk and the investment in NOWC.*

Credit risk

Ideally, the firm's corporate credit rating should be used as a proxy for its credit risk (Kieschnick et al., 2013). However, due to a lack of information on corporate credit ratings for many firms, this study followed the convention of Baños-Caballero et al. (2013 and 2014), which considered the ratio of the firm's financial cost to its total debt as a proxy for the cost of external financing.

Hypothesis 5: *There is a negative relationship between the firm's credit risk and its investment in NOWC.*

Inflation risk

The literature does not report on studies that consider the relationship

between inflation risk and the firm's investment in working capital. Following the approach of Kieschnick et al. (2013), this study referenced the average monthly term spread between the 10-year constant maturity rate and the 1-year constant maturity rate on sovereign bonds for countries where firms are listed, given that these include inflation expectations.

Hypothesis 6: *There is a negative relationship between inflation risk, i.e., the expectation of higher inflation, and the firm's investment in NOWC.*

Market risk

Following the approach of Kieschnick et al. (2013), this study referred to the average monthly standard deviation of the market index for each of the exchanges on which firms in the research sample are listed as a proxy for market risk.

Hypothesis 7: *There is a negative relationship between market risk and the firm's investment in NOWC.*

Short-term finance

To accommodate the potential negative impact that the cost of short-term finance may have on the firm's working capital investment decision (Baños-Caballero et al., 2013), this study follows the approach of Kieschnick et al. (2013) by using the annual average 3-month interbank rate for each of the countries in which firms are listed as a proxy for the cost of short-term financing.

Hypothesis 8: *There is a negative relationship between the cost of short-term finance and the firm's investment in NOWC.*

Economic growth

As with Kwenda and Holden (2014), this study used the country's real gross

domestic product growth as a proxy for economic growth. Although a positive relationship between economic growth and investment in working capital is postulated, it is worth noting that periods of economic contraction could see firms face difficulty reducing their inventories and receivables (Kwenda and Holden, 2014).

Hypothesis 9: *There is a positive relationship between growth in real gross domestic product and the firm's investment in NOWC.*

METODOLOGY

Data

The study utilizes accounting data for companies listed on major stock exchanges for countries listed in Table 1. This selection ensures a diverse representation of firms from developed and emerging economies. Furthermore, the study incorporates the respective countries' macroeconomic and financial market data. The accounting and financial market data came from the Datastream database, while

macroeconomic data were sourced from the World Bank and the IMF. All values were converted to US dollars using average annual exchange rates from Datastream.

Sampling procedure

The sampling procedure was based on selecting a random sample of 90% of listed non-financial firms. The sample was adjusted to account for duplicate firms that did not trade during the period under consideration, had missing data, had "abnormal" accounting data, and were holding companies. From an initial population of 18,727 firms, the final sample used in the study included 2,996 firms (30% of eligible firms after removing duplicate firms); this translated into 29,960 firm-year observations. A high percentage of firms from emerging economies were excluded from the final sample; however, sufficient firms remained, rendering the study viable.

Table 1. provides a detailed description of the sample.

Table 1: Sample of Companies by Country		
Country	Frequency	Per cent
United States	1316	43.0%
United Kingdom	398	13.30%
Germany	277	9.30%
Australia	361	12.10%
Developed Economies	2352	78.50%
South Africa	98	3.30%
India	52	1.70%
Malaysia	406	13.60%
Brazil	88	2.90%
Emerging Economies	644	21.50%

The table shows the number of firms in the final sample and on exchanges in each country. It also displays the percentage distribution of firms in each country and in developed and emerging economies. The classification of countries is

aligned with that of the World Bank and the IMF.

Statistical approach

The analysis used a panel data regression, with the structure of the regression equation model, based on Equation 3, suggesting the use of dynamic panel data

estimation. The proposed model takes the following general form:

$$Y_{i,t} = \beta_0 + \varphi Y_{i,t-1} + \beta_1 X_{i,t} + \varepsilon_{i,t} \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (1)$$

$$\varepsilon_{i,t} = \mu_i + \lambda_t + \nu_{i,t} \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (2)$$

where $X_{i,t}$ is a K-dimensional vector of explanatory variables, β_0 is the intercept and is independent of i and t , $\mu_i \sim \text{IID}(0, \sigma_\mu^2)$, $\nu_{i,t} \sim \text{IID}(0, \sigma_\nu^2)$ and λ_t is the unobservable time effect. This effect is invariant across entities – in the case of this study, across companies. It accounts for time-specific effects that are not included in the regression.

The GMM approach used in the statistical analysis is suitable for situations with a small number of time periods (T) and a large number of individual units or entities (N). It assumes a linear functional relationship with a dynamic left-hand variable, non-strictly exogenous right-hand variables, fixed individual effects, unobserved heterogeneity, heteroskedasticity, and autocorrelation within individual units' errors.

Proposed model and variable definition

Equation 3 was used to analyze the relationship between the net operating working capital investment and the firm's risk.

$$\begin{aligned} NOWC_{i,t} = & \beta_{i,t,0} + \beta_{i,t,1}NOWC_{i,t-1} + \beta_{i,t,2}SG_{i,t} \\ & + \beta_{i,t,3}FR_{i,t} + \beta_{i,t,4}OR_{i,t} \\ & + \beta_{i,t,5}LR_{i,t} \\ & + \beta_{i,t,6}CR_{i,t} + \beta_{i,t,7}STF_{i,t} \\ & + \beta_{i,t,8}MV_{i,t} + \beta_{i,t,9}IR_{i,t} \\ & + \beta_{i,t,10}RGDP_{i,t} + \beta_{i,t,11}MS_{i,t} \\ & + \text{Industry Dummies} + \epsilon_{i,t} \end{aligned} \quad (3)$$

In equation 3, $NOWC_{i,t}$ refers to net operating working capital of firm i in period t , $NOWC_{i,t-1}$ to net operating working capital of firm i in period $t-1$, $SG_{i,t}$ to sales growth of firm i in period t , $FR_{i,t}$ to

financial risk of firm i in period t , $OR_{i,t}$ to operational risk of firm i in period t , $LR_{i,t}$ to liquidity risk of firm i in period t , $CR_{i,t}$ to credit risk of firm i in period t , $STF_{i,t}$ to cost of short-term finance of firm i in period t , $MR_{i,t}$ to market risk of firm i in period t , $IR_{i,t}$ to inflation risk of firm i in period t , $RGDP_{i,t}$ to real GDP growth for each country in period t and $MS_{i,t}$ to market strength of firm i in period t .

The variables used in the regression are as follows:

- **NOWC** is the net operating working capital of the firm standardized by its total assets.
- **Sales growth** is the percentage increase/decrease in sales from year n to year $n+1$.
- **Financial risk** is the firm's debt ratio, i.e., total debt/total assets.
- **Operational risk** is the ratio of the firm's WCIP and its WCFP.
- **Liquidity risk** is the firm's operating income, net of taxes and before depreciation, to total assets.
- **Credit risk** is the ratio of the firm's financial costs to its interest-bearing debt.
- **Inflation risk** is the annual average monthly term spread between the 10-year constant maturity rate and the 1-year constant maturity rate on the sovereign bonds for each country.
- **Market risk** is the standard deviation of the representative stock market volatility index for each exchange.
- **The cost of short-term finance** is the annual average 3-month interbank rate for each country.
- **Real GDP growth** is the annual percentage change in real GDP for each country.
- **Market strength** is the ratio of the firm's sales to the industry's total sales.

Diagnostic Tests

Several diagnostic tests were carried out to ensure the reliability and robustness of the study's results. The first test was an analysis of the variance inflation factor (VIF), which measures the increase in the estimated coefficients given the correlation between the independent variables relative to a case of no correlation between independent variables. The second test was the Levin, Lin, and Chu (LLC) unit root test for the stationarity of the error term, and the third and fourth tests were the Sargan-Hansen J-test to test for over-identifying restrictions in the model and the Arellano-Bond test for autocorrelation.

RESULT AND DISCUSSION

This section presents the statistical analysis results. It includes information on the descriptive statistics of the data used in the analysis and details on the study's univariate and multivariate analyses.

Descriptive statistics

Tables 2 and 3 provide descriptive statistics for companies in developed and emerging economies. To account for outliers in the data, winsorization at the 1% and 99% levels for NOWC, WCP, and LR, and at the 5% and 95% levels for CR and SG, was applied.

Table 2. Descriptive Statistics for Firms in Countries with Developed Economies

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>NOWC</i>	23520	0.1988	0.2391	-3.5199	0.9272
<i>SG</i>	23520	0.0930	0.3927	-0.7415	8.2974
<i>OR</i>	23520	0.0369	26.5029	0.0005	9.7070
<i>FR</i>	23520	0.2341	0.5178	0.0000	59.1840
<i>LR</i>	23520	0.0650	0.2474	-4.5678	0.2390
<i>CR</i>	23520	0.0439	0.1150	-0.5564	0.5905
<i>STF</i>	23520	0.0169	1.9281	-0.0028	0.0670
<i>MV</i>	23520	0.2385	11.6376	0.1083	0.6621
<i>IR</i>	23520	0.0202	0.0093	-0.0060	0.0412
<i>L1_RGDP</i>	23520	0.0163	1.8554	-0.0562	0.0446
<i>MS</i>	23520	0.0125	0.0528	0.0000	0.9630

This table reports the summary statistics for variables used in the regression equation. These statistics represent 2352 firms (23520 observations) listed on exchanges in developed economies.

A comparison of data in Table 2 and Table 3 shows that companies in developed economies have higher working capital investment and sales growth than those in emerging economies. Developed economies also exhibit higher market

volatility and slightly higher market concentration. The spread between long- and short-term bond rates suggests marginally higher inflation risk for developed economy firms. Furthermore, companies in emerging economies tend to have more aggressive working capital strategies and face higher operational risk than those in developed economies. These companies have greater liquidity (10.5% vs. 6.5%) but also face significantly higher costs of debt (8.6% vs. 4.4%) and short-term finance rates (1.7 times higher).

Table 3. Descriptive Statistics for Firms in Countries with Emerging Economies

Variable	Obs	Mean	Std. Dev.	Min	Max
NOWC	6440	0.1691	0.2506	-4.6827	0.7966
SG	6440	0.0883	0.2667	-0.6499	3.9386
OR	6440	0.0231	26.9368	0.0006	12.6625
FR	6440	0.2285	0.2148	0.0000	6.5916
LR	6440	0.1045	0.1210	-2.3435	2.6625
CR	6440	0.0863	0.3250	-1.6316	6.3005
STF	6440	0.0425	2.0485	0.0213	0.1192
MV	6440	0.1631	8.6923	0.0827	0.4773
IR	6440	0.0100	0.0088	-0.0154	0.0326
L1_RGDP	6440	0.0451	2.6891	-0.0355	0.1026
MS	6440	0.0241	0.0649	0.0000	0.6365

This table reports the summary statistics for variables used in the regression equation. These statistics represent 644 firms (6440 observations) listed on exchanges in emerging economies.

Univariate analysis

The information in Tables 4 and 5 shows that the expected relationship between the firms' NOWC and all variables is met, except for inflation risk

and economic growth for firms in developed economies and inflation risk and operational risk for firms in emerging economies.

Based on Hinkle et al. (2003), the relationship between the independent variables ranges from moderate positive or negative to negligible positive or negative, which is considered weak enough to eliminate concerns about multicollinearity.

Table 4. Correlation Matrix for firms in Developed Markets

	NOWC	SG	OR	FR	LR	CR	STF	MV	IR	rGDP	MS
NOWC	1.00										
SG	0.01	1.00									
OR	0.04	-0.01	1.00								
FR	-0.60	-0.02	0.00	1.00							
LR	0.02	0.01	-0.15	-0.11	1.00						
CR	-0.13	-0.03	-0.01	0.13	0.02	1.00					
STF	-0.02	0.21	0.08	-0.03	-0.07	0.02	1.00				
MR	-0.07	-0.03	-0.03	-0.01	-0.02	0.00	0.02	1.00			
IR	0.00	-0.05	0.05	0.01	-0.08	-0.01	-0.47	0.3	1.00		
rGDP	-0.02	0.06	0.04	0.01	-0.05	0.01	0.35	-0.17	-0.41	1.00	
MS	-0.13	-0.02	-0.02	0.01	0.06	0.02	0.04	0.03	-0.03	0.01	1.00

This table reports Pearson correlation coefficients for all variable used in the regression equation. The table illustrates

the correlation coefficients firms listed in developed economies

Table 5. Correlation Matrix for Firms in Emerging Markets

	NOWC	SG	OR	FR	LR	CR	STF	MV	IR	rGDP	MS
NOWC	1.00										
SG	0.01	1.00									
OR	-0.03	-0.06	1.00								
FR	-0.43	0.00	-0.01	1.00							
LR	0.18	0.25	-0.01	-0.15	1.00						
CR	-0.13	0.05	-0.03	0.06	-0.04	1.00					
STF	-0.08	0.16	-0.01	0.04	0.20	-0.01	1.00				
MR	-0.13	0.12	0.04	0.08	0.10	0.15	0.38	1.00			
IR	0.04	-0.11	-0.05	-0.04	0.00	-0.04	-0.30	-0.04	1.00		
rGDP	0.08	0.06	-0.05	0.04	-0.01	-0.03	0.13	0.03	-0.24	1.00	
MS	-0.08	0.04	-0.01	0.06	0.13	0.05	0.09	0.15	0.03	-0.12	1.00

This table reports Pearson correlation coefficients for all variable used in the regression equation. The table illustrates the correlation coefficients firms listed in emerging economies.

The information in tables 4 and 5 is confirmed by the results of the VIF test. The VIF test returned values significantly below 10 (see Table 6), confirming that

multicollinearity is not a significant concern for the analysis (Hair et al., 2010). Lower VIF levels do not imply an absence of multicollinearity; they mean that the levels of multicollinearity may not significantly impact “the ability to demonstrate that the estimated regression coefficients are significantly different to zero” (Hair et al., 2010:199).

Table 6. Variance Inflation Factors

	Companies in Developed Economies	Companies in Emerging Economies
<i>L. NOWC</i>	3.6201	5.0087
<i>L2. NOWC</i>	3.5882	4.8333
<i>Sales Growth</i>	1.0831	1.1196
<i>Operational Risk</i>	1.0633	1.0243
<i>Financial Risk</i>	1.0870	1.2021
<i>Liquidity Risk</i>	1.1557	1.2053
<i>Credit Risk</i>	1.0449	1.0982
<i>Short-term Finance</i>	1.7480	1.5006
<i>Market Risk</i>	4.3624	2.3912
<i>Inflation Risk</i>	2.9906	1.4399
<i>Real GDP Growth (Lagged)</i>	6.7060	2.4772
<i>Market Strength</i>	1.1151	1.3589

This table reports variance inflation factors for all variables used in the regression equation. The table illustrates

these factors for firms listed in developed and emerging economies

Multivariate analysis

In Table 7, Models 1 and 2 display the analysis results for firms in developed and emerging economies. Model 1 includes 2,342 firms with 18,816 observations from developed economies, while Model 2 includes 644 firms with 5,152 observations from emerging economies. The p-values for the Sargan-Hasen J test and AR2 test indicate no over-identification bias or autocorrelation. The F-test confirms a robust model. The analysis controlled for industry and time effects.

The results reveal a strong link between a company's current-year and prior-year investments in working capital, significant at the 1% level for firms in developed and emerging economies. This suggests that managing working capital investments is a long-term endeavor. Additionally, the relationship between working capital management and prior-year levels of NOWC is insignificant beyond year $t-1$.

The regression results show that companies in developed economies exhibit a positive correlation between sales growth and investment in NOWC, thus confirming *hypothesis 1*. This correlation demonstrates statistical significance at the 5% level. Conversely, companies in emerging economies demonstrate a negative correlation between these variables, albeit lacking statistical significance. The outcomes of Model 1 validate the conclusions of Mongrut et al. (2014), indicating that companies augment working capital investment to bolster increased sales. The negative correlation in Model 2 is consistent with the discoveries of Onaolapo and Kajola (2015) for Nigerian-listed firms, Iftikhar (2013) for Pakistani-listed firms, Haron and Nomran (2015) for Malaysian-listed firms, and Mongrut et al. (2013) for firms listed in Brazil, Chile, Mexico, and Peru.

The results suggest that proactively planning for sales growth may necessitate a more structured approach to working capital management, particularly for smaller firms and those in emerging economies, as research suggests that they may not accord priority to this practice (Darun et al., 2015; Orobia et al., 2016).

The findings demonstrate robust support for the inverse correlation between financial risk and investment in NOWC as postulated by *hypothesis 2*. This correlation remains significant at a 1% level across all models. These results align with the research of Kwenda and Holden (2014), Butt et al. (2013), Haron and Nomran (2015), and Onaolalo and Kajola (2015), who obtained analogous results for firms listed in South Africa, Pakistan, Malaysia, and Nigeria, respectively. These results underscore the influence of a firm's capital structure decision on its working capital. During periods of potential growth, organizations seek the flexibility to adjust their working capital. Excessive debt constrains this flexibility by limiting access to funds. A positive (negative) coefficient for the OR variable indicates a negative (positive) relationship between the degree of aggressiveness of the firm's WCP and its investment in working capital. As the firm adopts a more aggressive WCP (i.e., the WCIP/WCFP ratio decreases), investment in NOWC decreases, and as the firm adopts a less aggressive WCP (i.e., the WCIP/WCFP ratio increases), investment in NOWC increases. The results confirm *hypothesis 3* for model 1 with statistical significance at the 5% level. However, the results of model 2 (firms in emerging economies) do not confirm the hypothesized relationship. An analysis of the data shows that the positive relationship between OR and the firm's investment in working capital for firms in emerging economies occurs

mainly in firms with a higher degree of financial distress; these firms may have reduced control of their working capital policy given their degree of financial distress.

In Model 1, the strong endorsement of *hypothesis 4* suggests that companies may prioritize using internally generated funds over external financing when managing working capital, aiming to minimize costs. The findings indicate a robust association between liquidity risk and investment in working capital for firms in developed economies at a 1% significance level. While companies in developed economies also demonstrate a strong inclination towards external financing (as evidenced by the financial risk ratio), the coefficient values hint at a bias towards a pecking order strategy. Conversely, the results for firms in emerging economies do not substantiate the aforementioned hypothesis; the lack of a significant relationship in these

economies aligns with analogous findings by Butt et al. (2013), Kwenda and Holden (2014), and Haron and Nomran (2015). When juxtaposed with the robust support for hypothesis 2, the results suggest that companies in emerging economies, on average, rely more on external sources of finance to fund their working capital due to their comparatively weaker liquidity positions.

The findings robustly support *hypothesis 5* with statistical significance at the 1% and 5% levels for firms in developed and emerging economies, respectively. This discovery holds considerable implications, given the potential influence of perceived financial distress on a firm's ability to obtain additional financing, the associated costs, and its impact on investment in working capital. This is especially pertinent in light of restricted lending by financial institutions after the 2008 financial crisis (Ramiah et al., 2013).

Table 7: Regression Output

	Model 1	S.E.	Model 2	S.E.
<i>L.NOWC</i>	0.615***	(0.088)	0.945***	(0.092)
<i>L2.NOWC</i>	0.0653	(0.062)	-0.0733	(0.071)
<i>Sales Growth</i>	0.0721**	(0.037)	-0.136	(0.084)
<i>Financial Risk</i>	-0.0652***	(0.004)	-0.211***	(0.024)
<i>Operational Risk</i>	0.00103**	(0.001)	-0.00136*	(0.0001)
<i>Liquidity Risk</i>	0.128***	(0.016)	-0.111	(0.149)
<i>Credit Risk</i>	-0.0961***	(0.016)	-0.115**	(0.051)
<i>Inflation Risk</i>	-1.144**	(0.005)	1.109	(0.009)
<i>Market Risk</i>	-0.0952	(0.001)	-0.721***	(0.003)
<i>Short-Term Finance</i>	-0.507	(0.005)	1.226	(0.011)
<i>Real GPD Growth (Lagged)</i>	-0.0631	(0.005)	1.157**	(0.005)
<i>Market Strength</i>	-0.0978	(0.155)	0.375	(0.228)
<i>Constant</i>	0.0323	(0.098)	0.316***	(0.098)
<i>Observations</i>	18816		5152	
<i>Number of Firms</i>	2352		644	
<i>Chi2</i>	2535		4537	
<i>Prob>F</i>	0.000		0.000	
<i>Sargan Stat (J Stat)</i>	34.51		32.91	
<i>Sargan p-value</i>	0.261		0.200	
<i>AR2</i>	-0.169		1.263	
<i>AR2 p-value</i>	0.867		0.206	

This table shows the regression results Models 1 and 2 for firms in developed and emerging economies, respectively. Both models pass tests for overidentification bias and autocorrelation, and the F-test confirms model strength. Standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Hypothesis 6 posits that in an environment characterized by inflation, companies reduce their investment in working capital in response to the perceived uncertainty associated with higher inflation. The findings indicate that firms in developed economies do indeed react to this perceived uncertainty. However, the insignificant correlation between inflation risk and a company's investment in working capital for firms in emerging economies suggests that these companies do not integrate inflation risk into their decision-making regarding working capital investment. For smaller firms within this category, this observation aligns with the informal approach to working capital management as cited by Mansoori and Mansoori (2016), Duran et al. (2015), and Orobia et al. (2016). For these firms, planning for anticipated inflation may not fall within the purview of their management activities. This is consistent with the notion that liquidity risk is not a primary concern for smaller firms, as proposed by Ramiah et al. (2013).

Investment in working capital among firms in emerging economies demonstrates a heightened sensitivity to market volatility, substantiating *hypothesis 7*. An anticipated ramification of volatile markets is the instability in earnings. Working capital management may pose heightened challenges during such periods, particularly for relatively smaller firms in emerging economies. Duran et al. (2015) corroborated this observation in their study of firms in

Malaysia. The study's results reveal an inconsequential correlation between market risk and firms' investment in working capital within developed economies.

The data presented in Tables 2 and 3 indicate comparatively low mean short-term finance rates. The results suggest that these rates do not significantly impact working capital investment for firms in developed and emerging economies, implying that *hypothesis 8* is not confirmed. Following the 2007/8 financial crises, firms may have exercised greater caution in their approach to debt, particularly short-term debt. The analysis indicates a shift from short-term to long-term debt among many firms during this period (Ramiah et al., 2013).

Hypothesis 9 posits that firms tend to bolster their investment in working capital during periods of economic expansion in anticipation of a favorable impact on business growth. Conversely, during economic downturns, firms opt to curtail their investment in working capital in anticipation of an adverse effect on economic growth. The findings for firms in emerging economies affirm this hypothesis, aligning with the conclusions drawn by Baños-Caballero et al. (2013) and Kwenda and Holden (2014) regarding firms in emerging economies. This inclination of firms in emerging economies to respond to projected economic growth rather than transient sales fluctuations may indicate a certain degree of rigidity. Notably, working capital investment in firms in developed economies exhibits greater responsiveness to sales growth than economic growth, implying a capacity for more agile planning.

Market strength denotes the bargaining power of a firm. It is posited that firms with substantial market strength possess superior negotiating leverage when engaging with business

partners and financiers. This, in turn, may lead to more favorable credit terms, debtor arrangements, and rates on external finance (Kwenda and Holden, 2014). Consequently, an inverse correlation between a firm's market strength and its investment in working capital is anticipated. However, this correlation does not appear to be a significant determinant for firms operating in developed or emerging economies

CONCLUSION

This study aimed to explore the connection between a company's decision to invest in working capital and a wide range of risks and to compare this connection between companies in developed and emerging economies. A multivariate regression model based on panel data for firms in four developed and four emerging economies was proposed to achieve this. The model aimed to define the relationship between a company's risk and its investment in working capital. The main findings suggest the following:

- Based on the sensitivity of the firm's working capital investment to financial risk and liquidity risk for firms in developed economies, it would seem that internal and external sources of finance play a key role in the investment in working capital. Based on the stronger sensitivity to liquidity risk, firms in developed economies may show a bias toward a pecking order approach to their financing decision, with internal sources of finance being favored over external sources of finance. The results show that firms in emerging economies, given the strength of the sensitivity of working capital investment to financial risk relative to that of working capital investment to liquidity risk, rely more on external

sources of finance for their working capital investment.

- All firms' investments in working capital are shown to be sensitive to their credit risk, highlighting the impact that perceptions of poor creditworthiness may have on the firm's access to finance.
- The strength of firms' sensitivity to market volatility in emerging economies relative to developed economies suggests that working capital investment in developed economies is more robust to short-term market uncertainty.
- Because the relationship between working capital investment and sales growth and operational risk relates more to short-term planning than the relationship between working capital investment and GDP growth, the results may suggest that firms in developed economies have a more dynamic approach to working capital management than firms in emerging economies.

The study shows that a firm's risk plays a significant role in determining its working capital investment; it also shows that this relationship differs between firms in developed and emerging economies. These findings fill a gap in the current literature regarding the risk-based determinants of the firm's working capital investment. They can advance theory development in this regard, primarily by focusing on the differences in this relationship between firms in developed and emerging economies.

A significant limitation was the ability to conduct the study at a country and industry level to understand what insights such a comparison may uncover. However, given the sample size once the

data were cleaned up, this was not feasible, especially for firms in emerging economies. With data availability, there is scope to expand this study to include analysis at these levels.

Practical Implications

The findings of this study offer several actionable insights for businesses, policymakers, and financial institutions:

Tailored Financing Strategies

Firms in developed economies should prioritize strengthening internal financing mechanisms to align with the pecking order approach suggested by their sensitivity to liquidity risks. This can enhance their ability to fund working capital needs during economic fluctuations. Firms in emerging economies, which rely more on external financing, should focus on improving access to external funds by building creditworthiness and relationships with financial institutions.

Risk Management Approaches

Companies in both developed and emerging economies need to develop strategies to mitigate credit risk, given its critical impact on working capital financing. This includes improving credit ratings, diversifying funding sources, and implementing robust credit monitoring systems. For firms in emerging economies, managing sensitivity to market volatility is vital. This can be achieved through hedging strategies and maintaining liquidity buffers to withstand short-term market shocks.

Dynamic Working Capital Policies

Firms in developed economies are encouraged to adopt more dynamic and responsive working capital management practices. By aligning investment

decisions with real-time operational and sales growth data, they can enhance flexibility and responsiveness to market changes. Firms in emerging economies may benefit from adopting similar dynamic approaches, supported by better data integration and forecasting tools.

Policy and Support Initiatives

Governments and financial institutions in emerging economies should focus on creating a stable financial ecosystem to reduce market volatility and support firms in accessing affordable external financing. Policymakers can encourage capacity building in financial management to help firms in both developed and emerging economies optimize their working capital investments.

Sector and Country-Specific Analyses

While this study was constrained by data availability, future research and policymaking should aim for more granular analyses at industry and country levels. This would provide tailored insights and help firms benchmark their working capital strategies against peers in similar contexts. By understanding the nuanced relationship between risk factors and working capital investment, firms can design strategies that are better aligned with their operational environments, enhancing both financial stability and competitiveness.

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