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BALANCING ACT: HOW INTERNAL AND EXTERNAL RISKS SHAPE WORKING CAPITAL DECISIONS IN MALAYSIA

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ABSTRACT

This paper examines how working capital investment decisions relate to various internal and external risks faced by Malaysian firms. The study employed fixed effects instrumental variable estimation to analyse cross-sectional panel data from 406 firms listed on the Malaysian Securities Exchange (Bursa Malaysia). The results confirmed the hypothesised relationships between the various risks firms face and their working capital investment decisions. These relationships were statistically significant at the 5% or 1% levels for all risks, except for credit risk. Additionally, the connection between economic growth and a firm's market strength in relation to its working capital investment was not confirmed. The industry analysis indicates that firms in the basic materials sector were more sensitive to all measured risks than firms in other sectors. This research fills a gap in the emerging economies literature by examining how working capital investment decisions relate to internal and external risks for Malaysian firms. The findings may assist firms in making more informed decisions regarding their working capital investments. To date, this is the first study to examine the impact of a broad range of risks on working capital investment decisions for firms in an emerging economy.

Keywords: Working capital, financial risk, operational risk, liquidity risk, market risk.

INTRODUCTION

The significance of effective management, investment, and financing of working capital in generating sustainable returns for organisations became particularly evident during the disappointing performance of long-term investments amid the financial crises of 2007 and 2008 (Singh & Kumar, 2014). This experience prompted increased research focusing on working capital (Pitt & Kruger, 2018), primarily

concerning firms in emerging economies. According to Pitt and Kruger (2018), approximately 75% of studies on working capital conducted between 1984 and 2016 concentrated on firms in these countries. However, only about 7% of this research was aimed at understanding the factors influencing a firm's investment in working capital (Pitt & Kruger, 2018). There has been minimal exploration of the impact of a firm's exposure to risk on its decisions in relation to working capital investment.

The present study investigates the determinants of a firm's working capital from a risk perspective, focusing specifically on firms listed on Bursa Malaysia (Malaysian stock exchange). Since the mid-1980s, the Malaysian economy has undergone rapid growth, largely driven by exports as a key growth factor (Adedoyin et al., 2022). This export-driven expansion indicates an open economy that can be affected by uncertainties such as fluctuations in commodity prices, shifts in trade dynamics, and supply chain complexities. These uncertainties can directly influence working capital liquidity and operational efficiency by presenting challenges in inventory and cash flow management, thereby affecting a firm's working capital needs. Navigating and understanding these risks is crucial for maintaining financial performance and operational stability for companies in Malaysia (Azizi et al., 2023). The focus on the company's internal and external risk and the suggested industry clusters differentiates the present study from prior studies on working capital management of companies in Malaysia.

The present study has analysed the impact of a selection of the firm's risks on its decision in relation to working capital investment. These risks were categorised as internal risks, namely the firm's financial risk, credit risk, liquidity risk and operational risk, and external risks, i.e., inflation risk, changes in short-term interest rates and real GDP growth. It attempts to answer the following research questions:

1. What is the relationship between the firm's risk and its decision on working capital investment?
2. What is the relationship between the firm's external risk and its decision on working capital investment?
3. How does the relationship between the firm's risk and its decision on working capital investment differ in different firms given their particular industry affiliation?

The findings of the study confirmed the hypothesised relationship between all the firm's risks and its decision on working capital investment. These relationships were significant at the 5% or 1% level for all risks, except credit risk. The relationship between economic growth and the firm's market strength and its investment in working capital however, failed to confirm the other stated hypothesis of this study. The analysis by industry seemed to suggest that the firm's investment in working capital was more sensitive to all risks measure for firms in the basic materials sector than it was for firms in other sectors.

LITERATURE REVIEW

Rather than being viewed as an insignificant balance sheet item, the strategic role that working capital can play in steering the firm to its long-term goals has become evident. Indeed, optimal decisions on the investment and financing of working capital can afford the firm a competitive advantage (Kwenda & Holden, 2014). The main factors that influence these investment and financing decisions are cited in prior literature as the firm's profitability (Naser et al., 2013), its size (Mongrut et al., 2014), its leverage (Mohamad & Elias, 2013), the firm's level of sales or sales growth (Iftikhar, 2013), its market power (Mongrut et al., 2014; Kwenda & Holden, 2014), the firm's working capital policy (Hassani & Tavosi;

2014), the firm's liquidity (Alavinasab & Davoudi, 2013) and changes in the economic cycle or GDP growth (Mohammad & Elias, 2013; Kwenda & Holden, 2014). Factors not frequently considered in prior literature include credit risk, short-term interest rates, inflation and market volatility.

The account of the literature review that follows is deliberately targeted at gaining insight into these factors and their impact on the firm's decision on working capital investment.

Profitability

Naser et al. (2013) suggested that profitability had a negative association with the firm's level of investment in working capital, implying that more profitable firms invest less in working capital. This relationship was confirmed by later studies such as Baños-Caballero, (2014) and Pais and Gama (2015).

Size and Market Power

Whilst Naser et al. (2013) and Mongrut et al. (2014) suggested a negative relationship between the size of the firm and the level of investment in working capital, others (Kwenda & Holden, 2014) found this relationship to be insignificant. The relationship between the firm's size and its investment in working capital was assumed to be driven by its market power. The firm's market power was assumed to have facilitated better relationships with suppliers and to have given it easier access to lower-cost finance by larger firms (Mongrut et al., 2014). This enhanced negotiating power may lead to more favourable credit terms, debtor arrangements, and lower rates on external finance, which is associated with a reduced need for extensive investment in working capital. As a result, an inverse relationship between a firm's market strength and its working capital investment is expected.

The evidence of the strength of the relationship between a firm's market power and its investment in working capital was not however, overwhelming; Kieschnick et al. (2013) and Kwenda and Holden (2014) found the relationship to be weak and Mongrut et al. (2014) found that in two of the four countries studied, market power did not play an important role in influencing the level of investment in working capital.

Leverage

The most prominent proxies used in prior research on a firm's leverage was its debt ratio (e.g., Kwenda and Holden, 2014; Butt et al., 2013), its equity ratio (e.g., Iftikhar, 2013), the firm's long-term debt to its market value (de Almeida & Eid, 2014), and the firm's total debt as a ratio of the sum of its debt and equity (Onaolapo & Kajola, 2015). Research shows strong evidence of a significant negative relationship between a firm's investment in working capital and its financial leverage (de Almeida & Eid, 2014; Kwenda & Holden, 2014; Onaolapo & Kajola, 2015; Haron & Nomran, 2015). A firm's financial leverage serves as a proxy for its financial risk. This was one of the few references in prior literature on a firm's exposure to risk within the context of its investment in working capital. The relationship between financial leverage and the firm's investment in working capital suggests that firms with higher levels of debt in their capital structure would potentially face a higher cost of debt, making the financing of working capital more expensive, forcing firms to optimise by lowering the level of investment in working capital.

According to Kwenda & Holden (2014), Baños-Caballero et al. (2013), Bhandari & Iyer (2013), and Butt et al. (2013) an alternate source of finance for investment in working capital would be internally generated funds in the form of cash flow from operations. These researchers have also referred to this source of finance as a proxy for the firm's liquidity; the greater the firm's liquidity, the less it will depend on external sources of finance to fund working capital. Alavinasab and Davoudi (2013) suggested that firms with greater liquidity were better positioned to attend to the day-to-day activities of the firm and to ensure that it would meet its short-term financial obligations. The reference to a cash flow-based measure of liquidity makes sense given the prominent role that the components of working capital play in the much-favoured quick and current ratios.

Credit Risk

Literature does not bear much evidence of credit risk being considered within the context of the determinants of a firm's working capital. A negative relationship between general credit risk and a firm's investment in working capital was proposed by Kieschnick et al. (2013). Whilst Kieschnick et al. (2013) chose to reference corporate bond rates as a proxy for a firm's credit risk, the lack of these ratings for firms in emerging economies makes such a reference infeasible. Instead, Baños-Caballero et al. (2013, 2014) chose to use the ratio of a firm's financial cost to its total debt as a proxy for credit risk. The financial constraint brought on by a high credit risk would act as a deterrent to investment in working capital.

Short-term Interest Rates

Access to short-term financing for investment in working capital is critical (Kwenda & Holden, 2014). A barrier to this access is the cost of short-term finance; high costs may act as a disincentive for the investment in working capital (Baños-Caballero et al., 2013). Kieschnick et al. (2013) referred to the annual average 3-month London Interbank Offered Rate (LIBOR) as a proxy for the cost of short-term financing.

Inflation

It may make intuitive sense to factor inflation expectations into a firm's working capital investment decisions. However, there is little reference to inflation risk within the context of the determinants of a firm's working capital. Kieschnick et al. (2013) look at the impact of a firm's spending on working capital on the value of the firm, referring to the average monthly term spread between the 10-year constant maturity rate and the 1-year constant maturity rate on US sovereign bonds as a proxy for inflation expectations.

Sales Growth

Conventional theory suggests that the firm should have an adequate level of investment in working capital to support expected or projected levels of sales (Correia et al., 2023; Mongrut et al., 2014). This would imply a positive correlation between the firms' sales/sales growth and their investment in working capital. Prior literature returned mixed results on this relationship. Whilst Mongrut et al. (2014) found that firms tend increased their investment in working capital in anticipation of future sales growth, others, such as Naser (2013), Iftikhar (2013), Mohammad and Elias (2013) and Iqbal and Zhuquan (2015) found the relationship to be negative and Kwenda and Holden (2014) found both positive and negative correlations with negative and positive sales growth. One of the reasons for these

mixed results may have been provided by Bahhouth et al. (2014) who found that the relative increase working capital over the 20-year period covered by their study was lower than that of sales, implying that technological progress may have had the impact of reducing the need to invest heavily in working capital. A second potential explanation was provided by Orobia et al. (2013 and 2016) and Ramiah et al. (2013), who suggested that small firms generally employ informal working capital management practices in which aligning working capital with the firm's sales may not be a priority.

Working Capital Policy

Most studies that made reference to the firm's working capital policy did so in the manner suggested by Hassani and Tavosi (2014), who referred to the firm's working capital investment policy (WCIP) and its working capital finance policy (WCFP). Amongst others such as Pasandideh and Darabi (2015) followed this approach and almost always reference was made in prior research to the firm's working capital policy within the context of its impact on the firm's profitability. Two studies that considered the firm's working capital policy within the context of the determinants of working capital were Kwenda and Holden (2014) and Iftakhar (2013). Aggressive working capital investment policies are high-risk policies which open the firm up to potential loss due to stock-outs or lost customers if inventory is driven too low and less liberal debtor agreements are favoured. The ratio of a firm's current liabilities to its total assets was used as an indicator of its working capital investment policy, with a higher ratio indicating a more aggressive approach. Aggressive working capital finance policies (WCFP) involve funding long-term assets or fluctuating current assets with short-term liabilities, a high-risk strategy that exposes firms to refinancing risk and potential strain in creditor relationships. Consequently, there are operational risks linked to the chosen working capital policy.

Prior studies have referred to separate policies for working capital investment and working capital finance risk associated with financing and investing in working capital, or as referred to in this study, "working capital operational risk". This study introduces a more intuitive approach by using a combined policy as a proxy for assessing the firm's operational risk. Operational risk was classified based on the firm's working capital policies. The firm's WCIP is defined as the ratio of current assets to sales. The firm's WCFP is defined as the ratio of current liabilities to total liabilities. The firm's overall WCP is defined by the ratio of its WCFP to its WCIP.

Economic Growth

The impact of changes in the economic cycle (or economic growth) on the firm's working capital investment decision was considered by a few studies. Mohammad and Elias (2013), Kwenda and Holden (2014), Baños-Caballero et al. (2013), Kieschnick et al. (2013), and Enqvist et al. (2014) looked at this relationship. Many could not find any significant role played by economic growth as a determinant of the firms' working capital, though Enqvist et al. (2014) did suggest that the role that working capital played in the sustainability of the firms took on a higher level of significance during periods of low economic growth. Whilst a contraction in economic activity may act as a catalyst for decreased investment in working capital, Kwenda and Holden (2014) suggest that difficulty with the turnover of stock and receivables may lead to higher levels of working capital.

The risk-based model of the determinants of the firms' working capital is proposed in this study. With insight gained from prior literature, the proposed hypothesis for the relationship between each of the nine variables used in the risk-based model of the determinants of the firms' working capital is outlined below.

Statement of Hypothesis

This study has proposed the following hypotheses to define the relationship between the firm's sales growth and a broad set of risks and its working capital investment decision, the firm's NOWC being used as a proxy for its investment in working capital.

- **H1:** There is a **positive** relationship between sales growth and the investment in NOWC.
- **H2:** There is a **negative** relationship between financial risk and the investment in NOWC.
- **H3:** There is a **negative** relationship between operational risk (degree of aggressiveness of WCP) and the investment in NOWC.
- **H4:** There is a **negative** relationship between the firm's credit risk and its investment in NOWC.
- **H5:** There is a **positive** relationship between the firm's liquidity risk and the investment in NOWC.
- **H6:** There is a **negative** relationship between the cost of short-term finance and the firm's investment in NOWC.
- **H7:** There is a **negative** relationship between inflation risk, i.e., expectation of higher inflation, and the firm's investment in NOWC.
- **H8:** There is a **positive** relationship between growth in real gross domestic product and the firm's investment in NOWC.
- **H9:** There is a **positive** relationship between the firm's market strength and its investment in NOWC.

DATA AND METHODOLOGY

Description of Data

Financial and accounting data for firms listed on Bursa Malaysia were accessed from Datastream. A random sample comprising 90 % of the firms listed on the representative exchanges was reviewed to meet the following minimum criteria.

- Firms had been trading for the financial period from 2007 to 2016
- Firms had compiled a full set of data for the financial period from 2007 to 2016
- Firms with "abnormal" accounting data, such as negative sales, were excluded
- Holding companies were excluded to avoid duplication
- Some firms appeared twice in the original dataset; these were removed

Out of 823 firms, 406 firms (49%) were included in the final sample of firms. Table 1 shows the number of firms by industry in the final sample.

Table 1

Number of Firms by Industry in the Final Sample

Industry	Number of firms	Percentage
Basic Materials	36	8,90%
Consumer Goods	115	28,30%
Consumer Services	36	8,90%
Financials	0	0,00%
Health Care	11	2,70%
Industrials	167	41,10%
Oil & Gas	9	2,20%
Technology	19	4,70%
Telecommunications	4	1,00%
Utilities	9	2,20%
Total	406	100,00%

METHODOLOGY

The study has proposed the following panel data regression model expressed in Equation (1) below:

$$NOWC_{i,t} = \beta_{i.t.0} + \beta_{i,t,1}SG_{i,t} + \beta_{i,t,2}FR_{i,t} + \beta_{i,t,3}OR_{i,t} + \beta_{i,t,4}LR_{i,t} + \beta_{1,t,5}CR_{i,t} + \beta_{1,t6}STF_{i,t}$$
$$+ \beta_{i,t,7}IR_{i,t} + \beta_{i,t,7}8GDP_{i,t} + \beta_{i,t,9}MS_{i,t} + \epsilon_{i.t}$$

$$(1)$$

Where,
- $NOWC_{i,t}$ = Net Operating Working Capital of firm i in period t
- $SG_{i,t}$ = Sales Growth of firm i in period t
- $FR_{i,t}$ = Financial Risk of firm i in period t
- $OR_{i,t}$ = Operational Risk of firm i in period t
- $LR_{i,t}$ = Liquidity Risk of firm i in period t
- $CR_{i,t}$ = Credit Risk of firm i in period t
- $STF_{i,t}$ = Cost of short-term finance of firm i in period t
- $IR_{i,t}$ = Inflation Risk of firm in period t
- $RGDP_{i,t}$ = Real GDP growth in period t
- $MS_{i,t}$ = Market Strength of firm i in period t

Table 2 describes the proxies used for each dependent and independent variable in the proposed regression model.

Table 2

Proxies used for Dependent and Independent Variables

Variables	Definition of variables
NOWC	NOWC = (current assets - non-operating current assets) – (current liabilities - non-operating current liabilities) /Total Assets
Sales Growth	$SG = (S_t - S_{t-1})/S_{t-1}$
Financial Risk	Debt/Total Assets= (Short term debt + Long term debt)/Total Assets
Operational Risk	Operational risk was classified based on the firm's working capital policies. The firm's WCIP is defined as the ratio of current assets to sales. The firm's WCFP is defined as the ratio of current liabilities to total liabilities. The firm's overall WCP is defined by the ratio of its WCFP to its WCIP.
Liquidity Risk	(Operating Income- Taxes + Depreciation) / Total Assets
Credit Risk	The ratio of Financial Costs to Long-Term interest-bearing debt
Cost of Short-Term Finance	The annual average 3-month interbank rate
Inflation Risk	The annual average monthly term spread between the 10-year constant maturity rate and the 1-year constant maturity rate
Real GDP Growth	The annual percentage change in real GDP
Market Strength	The ratio of the firm's sales to Industry total sales.

The main aim of the study was to analyse the impact of the modelled independent variables on the firm's investment in working capital over time. The methodology used was fixed effects estimation since it could account for biases caused by time-invariant characteristics within the data, and so that estimated coefficients would best explain the variance within the dependent variable.

The analysis was based on panel data that spanned a period of ten years and included many cross-sectional units. As a result, it was important to consider the potential impacts of autocorrelation and heteroskedasticity. The fixed effects model used could address time-invariant omitted variables by focusing on within-unit variation over time, thereby reducing the influence of outliers and heteroskedastic errors. Although the present study had not explicitly tested for these issues, several aspects of the data seemed to suggest that their impact might be limited, as follows:

- The large cross-sectional dimension helped to average out idiosyncratic errors, reducing the likelihood of severe heteroskedasticity.
- Focusing on within-unit variation allowed the fixed effects model to isolate the effects of interest from unit-specific heterogeneity, mitigating the impacts of autocorrelation and heteroskedasticity.
- The 10-year time span had enabled a comprehensive analysis of temporal dynamics, helping to smooth out short-term fluctuations and further reduced the impact of autocorrelation.

To ensure robustness of the study's results, the following tests were carried out: a test for multicollinearity based on Pearson Correlation and Variance Inflation Test (VIF), and a unit root test for stationarity based on the Augmented Dickey-Fuller (ADF) specification.

The null hypothesis of the ADF test was that all panels contained unit root. The study had applied two models of the ADF unit root test, namely the inverse-normal model and the inverse-logit model. These models were used as they are suited for data where panels are both finite and infinite.

RESULTS

Descriptive Statistics

Table 3 illustrates the descriptive statistics for the data used in the study. To address the outliers in the data, the data was winsorized at the 1% and 99% levels for NOWC, WCP, and LR, and at the 5% and 95% levels for CR and SG.

Table 3

Descriptive Statistics

	Obs.	Mean	Std. Dev.	Min	Max
NOWC	4060	0.1959	0.3667	-12.5501	0.9304
SG	4060	0.0666	0.2296	-0.396	0.9051
FR	4060	0.2147	0.2166	0.0000	6.5916
OR	4060	1.244	0.8693	0.0236	5.7178
CR	4060	-0.0262	3.8141	-191.8750	51.1053
LR	4060	0.0916	0.9162	-0.5117	0.5006
STF	4060	0.0322	0.0047	0.0212	0.0371
IR	4060	0.0094	0.0048	0.0029	0.0210
RGDP	4060	0.0478	0.0228	-0.-151	0.0753
MS	4060	0.1354	0.0384	0.0000	0.5384

Univariate Analysis

Table 4 illustrates the Pearson Correlation for the variables used in this study. The initial relationship between the firms NOWC and all independent variables aligned with expectations.

Table 4

Correlation Matrix

	NOWC	SG	FR	OR	CR	LR	STF	IR	RGDP	MS
NOWC	**1.000**									
SG	0.027	**1.000**								
FR	-0.764	0.004	**1.000**							
OR	-0.151	0.084	0.001	**1.000**						
CR	-0.038	-0.009	0.035	-0.002	**1.000**					
LR	0.146	0.234	-0.164	0.245	0.008	**1.000**				
STF	-0.005	0.122	0.006	-0.012	-0.021	-0.016	**1.000**			
IR	-0.002	-0.167	-0.010	-0.007	0.002	-0.026	-0.777	**1.000**		
RGDP	0.001	0.149	-0.005	0.003	-0.000	0.024	0.572	-0.719	**1.000**	
MS	-0.075	0.052	0.105	0.029	0.007	0.133	0.006	-0.008	0.003	**1.000**

The assessment of potential problems with multicollinearity was guided by Hinkle et al. (2003). Regarding the suggested benchmark, the relationship between independent variables can be described as ranging between negligible positive or negative and low positive or negative, ruling out problems associated with multicollinearity. In addition, the VIF values, as can be seen in Table 5, were significantly below the threshold of 10, confirming the lack of constraint due to multicollinearity.

Table5

Variance Inflation Factors

	VIF	1/VIF		VIF	1/VIF
SG	1.09	0,909	STF	2.54	0,833
FR	1.05	0,962	IR	3.54	0,833
OR	1.07	0,943	RGDP	2.08	0,909
CR	1.00	1,000	MS	1.04	0,952
LR	1.18	0,862	Mean VIF	**1.62**	

Multivariate Analysis

Table 6 shows the fixed effects panel data regression results. Model 1 included a firm in the sample. Models 2 to 4 included firms within industry groups. Literature has suggested that firms within an industry tended to exhibit similar behaviours in managing working capital. A segregation of firms by industry did not allow analysis at the industry level due to the limited number of firms in some industries, as is illustrated in Table 1. In an attempt to perform some industry analysis, industries have been grouped based on whether they were "service-oriented" industries or "production-oriented industries". These industry groupings should have firms that shared similar characteristics. Firms included in Industry Group 1 included firms from the Industrial, Oil and Gas and Technology Sectors. Firms included in Industry Group 2 included firms from the Consumer Goods and Services, Health Care, Utilities and Telecommunications Sectors. Firms included in Industry Group 3 were firms from the Basic Materials Sector. All sector classifications aligned with the International Classification

Benchmark (JSE, 2017), which was developed by Dow Jones Indexes and the Financial Times Securities Exchange (FTSE) Group.

Discussion of the Output of the Multivariate Analysis

Sales Growth – The relationship between the firm's sales growth and its investment in working capital aligned with expectations for all models, supporting hypothesis H1. These results align with conventional theory (Correia et al., 2023) and support the finding of Mongrut et al. (2014). The results suggest that firms in Malaysia will increase (decrease) investment in working capital in the form of increased (decreased) inventory or more liberal (less liberal) receivables policies as sales growth increases (decreases).

Table 6

Output of Multivariate Analysis

Variables	Model 1	Model 2	Model 3	Model 4
	Malaysia	Industry Group 1	Industry Group 2	Industry Group 3
SG	0.059***	0.070***	0.013	0.061**
	(0.012)	(0.019)	(0.014)	(0.024)
FR	-1.470***	-1.675***	-0.554***	-0.564***
	(0.017)	(0.021)	(0.033)	(0.072)
OR	-0.126***	-0.205***	-0.119***	-0.116***
	(0.006)	(0.013)	(0.006)	(0.013)
CR	-0.001	-0.001	-0.001	-0.024*
	(0.001)	(0.001)	(0.001)	(0.024)
LR	0.200***	0.011	0.564***	0.665***
	(0.042)	(0.063)	(0.050)	(0.096)
STF	-1.723**	-1.507	0.190	-4.594**
	(0.782)	(1.262)	(0.793)	(1.526)
IR	-1.968**	-1.867	-1.096	-3.830**
	(1.002)	(1.616)	(1.009)	(1.909)
RGDP	-0.317**	-0.296	-0.217	-0.459
	(0.148)	(0.238)	(0.149)	(0.281)
MS	1.687***	2.716**	0.088	0.997***
	(0.313)	(1.058)	(0.302)	(0.305)
Constant	0.724***	0.843***	0.430***	0.570***
	(0.037)	(0.059)	(0.038)	(0.077)

(continued)

Variables	Model 1	Model 2	Model 3	Model 4
	Malaysia	Industry Group 1	Industry Group 2	Industry Group 3
Observations	3,654	1755	1575	324
Number of firms	406	195	175	36
Chi2	7875.97	6623.41	7250.34	339.36
Prob>Chi2	0.000	0.000	0.000	0.000
R2 Within	0.7049	0.8006	0.3554	0.4427
R2 Between	0.5683	0.6613	0.3671	0.1964
R2 Overall	0.6172	0.7200	0.3634	0.2378

Notes. Standard errors in parentheses; ***
$p<0.01$, ** $p<0.05$, * $p<0.1$

Financial Risk - The results showed strong support for the hypothesis H2; it seemed to suggest that firms facing high levels of financial risk tended to have lower investments in working capital. These results are in line with that of Butt et al. (2013), de Almeida and Eid (2014), Naser et al. (2(013), Mohamad and Elias (2013), Kwenda and Holden (2014), Onaolapo and Kajola (2015) and Haron and Nomran, (2015). Financial risk is a significant determinant of a firm's investment in working capital. Reduced capacity to access external finance, such as debt to fund working capital, will necessitate resorting to internally generated funds, such as operational cash flow.

Operational Risk - The result for all models showed that firms that employed a more aggressive WCP (less aggressive WCP) had lower (higher) investment in net operating working capital. These results offered strong support for hypothesis H3. Although the relationship between sales growth and firms' investment in working capital was positive, the ratio of change between firms' WCP and investment in net working capital seemed to suggest that firms could sustain higher sales with relatively low investments in net working capital. Lower net working capital may come in the form of lower inventory levels and more conservative receivables policies, more aggressive payables policies (higher current liabilities), or a combination of these.

Credit Risk – Although the negative relationship between credit risk and the firm's investment in working capital supported Hypothesis H4 for all models, it was only significant for firms in the basic materials sector. This finding aligns with Baños-Caballero et al. (2013), who found a negative and significant relationship between the firm's ratio of financial cost to total debt ratio and its NTC. The implication of this finding for firms is significant, given the impact that perceived financial distress may have on the firm's access to and cost of additional finance.

Liquidity Risk – The liquidity ratio suggests the availability of internally generated funds to support investment in working capital. The results show a positive relationship between the firm's liquidity ratio and its investment in working capital for all models, showing strong support for hypothesis H5 with model 1, model 3 and model 4 at the 1% level of significance. As suggested by Kwenda and Holden (2014), this relationship might suggest that firms tended to adopt a pecking order strategy when financing working capital. The marginally higher coefficients for model 3 and model 4 compared to the coefficients of the financial risk variables seemed to suggest that this might be true for firms within the basic materials and service-oriented sectors. However, the insignificant relationship for model 2 could suggest that the firms in the production-oriented industries tended to rely more on outside sources for finance to support investment in working capital.

Short-term Finance – The insignificant relationship between short-term finance and the firm's investment in working capital for model 3 seemed to suggest that short-term finance was not a major consideration for the firms in the service-oriented sectors when making working capital decisions. Whilst the relationship between short-term finance rates and the firm's investment in working capital for model 1, model 2 and model 4 supported hypothesis H6, this was only significant for firms in the basic materials sector (model 4). When viewed against the significance of financial risk, it would suggest that firms in other sectors prioritised long-term financing options above short-term financing options, whereas firms in the basic materials sector seemed to prefer a more diversified source of funding to support investment in working capital. The preference by firms in sectors other than the basic materials sector is in line with a suggestion by Ramiah et al. (2013) that, after the financial crises of 2007/8, due to cost and availability, many firms have opted to switch from short-term to long-term debt.

Inflation Risk – The results show that the relationship between inflation risk and the firm's investment in working capital was negative for all models, supporting hypothesis H7. However, its impact on the firm's working capital investment decision was only significant for firms in the basic materials sector (model 4). Sensitivity to inflation risk may be an indication of a longer-term view on the planning of working capital spent; the nature of operations within the basic materials sector may incentivise firms to take this longer-term view, whereas consideration of inflation risk may be a secondary concern in other sectors where inventory and receivables turnover may be faster.

GDP Growth – The results of the analysis did not support hypothesis H8. The negative relationship between real GDP growth in period n-1 and the firm's investment in working capital in the current period may indicate a slow adjustment in working capital to changes in economic growth. Kwenda and Holden (2014) suggested that firms might find it difficult to move stock or reduce receivables levels during periods of low economic growth; this may explain sustained higher levels of working capital during periods of slow economic growth. With slower adjustment of working capital to changes in economic growth, firms may forego opportunities when the economy expands.

Market Strength – The firm's market strength was used as a control variable. Market strength is an assumption of the firm's bargaining power. Firms with a high level of market strength are assumed to be favourably positioned in negotiations with suppliers and debtors, enabling them to minimise the investment in working capital. Hence, a negative relationship is assumed between the firm's market strength and its working capital investment. The results of the present study did not support this assumption and therefore did not support hypothesis H9. Firms in Malaysia did not seem to utilise their bargaining power effectively when negotiating with their counterparts. The fact that this did not hold true for Malaysian firms seemed to suggest that additional factors also significantly impacted working capital decisions.

Firms may value maintaining good relationships with suppliers and partners to ensure long-term stability and cooperation rather than risking conflicts or damaging their reputation. Additionally, exercising their bargaining power aggressively could lead to retaliatory actions or disruptions in the supply chain, which could harm their operations. Alternatively, these results may simply be confirming the mixed results cited in the literature.

Test for Stationarity of the Error Term – The Z stats and their respective p-values, and the L stats and their respective p-values represent the results of the ADF unit root test based on the inverse-normal model and the inverse-logit model. The study rejected the null hypothesis of unit root for all variables and both tests, and concluded that the variables used in the analysis were stationary (i.e., void of unit root).

Table 7

Results of the Augmented Dicky Fuller Unit Root Test

Variable	Z	Z p-value	L	L p-value
SG	-37.9141	0.00	-47.2975	0.00
FR	-4.6104	0.00	-8.77720	0.00
OR	-12.1782	0.00	-14.4941	0.00
LR	-163037	0.00	-20.6732	0.00
CR	-28.5675	0.00	-40.2578	0.00
STF	-10.7743	0.00	-9.6049	0.00
IR	-20.2401	0.00	-18.6280	0.00
RGDP	-54.9095	0.00	-63.7482	0.00
MS	-7.8842	0.00	-13.5698	0.00

SUMMARY AND CONCLUSION

In response to a gap in prior research, this study has proposed a regression model based on fixed effects panel data to gain insight into the relationship between selected risks and the firm's decision on working capital investment.

The results confirmed the hypothesised relationship between all the firm's risks and the decision on working capital investment. These relationships were significant at the 5% or 1% level for all risks, except credit risk. However, the relationship between economic growth and the firm's market strength and its investment in working capital failed to confirm the stated hypothesis. The analysis by industry seemed to suggest that the firm's investment in working capital was more sensitive to all risks measure for firms in the basic materials sector than it was for firms in other sectors. Therefore, the overall policy implications for this set of results seem to suggest that a balanced approach to decisions on working capital investment should be taken as this can mitigate financial and inflation risks and in turn, optimise working capital levels. At the same time, the relationship between working capital investment and sales growth may call for measured flexibility in the working capital investment strategy that aligns with sales fluctuations.

The present study, however has its share of limitations. These included the lack of a full set of information for each firm for the ten periods under review. As a result, it had a limited sample size. More specifically, the lack of data for corporate bond rates eliminated a market-based proxy for the firm's credit risk as a preferred option. Moreover, the limited sample size did not allow analysis at an individual industry level. As a whole, due to the limited scope of this study, it does not consider the implications for corporate governance, financial planning, or risk regulation in Malaysia.

With regard to potential future research, there will be opportunities to study the relationship between the components of the firm's working capital and their risks in order to understand the relationship between the firm's risks and working capital at a more granular level. This study could be extended through some qualitative research to test these inferences and to understand the relevance and recognition of these risks for the firms. To further expand on the scope of the present study, future research could also consider the implications for corporate governance, financial planning, or risk regulation in Malaysia.

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