

# Working Capital Management and Profitability: Evidence from Manufacturing Sector in Malaysia

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## Abstract

The purpose of this study is to examine the effect of working capital management on firm's profitability. The study is based on a sample of 164 manufacturing firms listed on the Main Board of Bursa Malaysia, covering a span of five years from 2007 to 2011. A discriminatory panel regression and Pearson correlation are used to test the hypotheses. The empirical evidence found that there is existence of significant positive relationship between exogenous variables, the average collection period, inventory conversion period and firm's size and its endogenous variable, which is firm's profitability. The findings also show a significant inverse relationship between debt ratio (leverage) and firm's profitability, but the firm's capability to translate working capital into cash promptly, as proxy in log cash conversion cycle has no impact on firm's profitability.

**Keywords:** Working capital management; Manufacturing sector; Profitability

## Introduction

This study attempts to examine the relationship between the working capital management and firm's profitability. In this research, a panel data have been used for a sample of 164 manufacturing firms listed on Bursa Malaysia over a period of 5 years from 2007 to 2011.

Many findings of past studies were revisited and analyzed to link working capital management with firm's profitability. However, there is still ambiguity regarding the appropriate variables which might serve as proxies for working capital management that would affect firm's profitability. Thus, this research paper is conducted in order to find the appropriate proxy for exogenous variables that will impact the firm's profitability. Similarly it is also found that few studies have been conducted by researcher in Malaysia to determine the impact of working capital management on profitability, particularly in the manufacturing sector, which serves as the second largest sector contributing to Malaysia economy. To become a major contributor to the economic growth of a country, this sector is certainly expected to be well-managed in order to remain efficient and viable. Therefore, this research paper is carried out to investigate how the working capital in the manufacturing sector in Malaysia is managed towards attaining profitability.

In 2008, the global financial crisis and the collapses of colossal organizations such as General Motors and Lehman Brothers have affected the industries business operation worldwide. In the aftermath, the firm's managers are forced to recognize the importance of managing the firm's resources effectively, particularly in the areas of working capital in order to prevent more losses or bankruptcy. Manufacturing sector is not exempted from the impact of the financial crisis. As found earlier, the manufacture sector is important to Malaysia economic growth, through its high export demand and generating employment opportunities. Thus, without doubt, it is imperative for Malaysian analyst to conduct a further study on working capital management, in the field of manufacturing domain.

Based on the Department of Innovation, Industry, Science & Research (DIISR) data from Australia, about half of its total 294 manufacturing firms reported bankruptcy status after the financial crisis in 2008. Similarly, the impact was also widely felt in Malaysia.

According to Bank Negara Malaysia report, the gross domestic product (GDP) contributed from the manufacturing export demand, declined by 8.8% in the fourth quarter of 2008; reported a negative growth of 17.6% in the first quarter of 2009 and, finally, a negative 14.5% in the second quarter of 2009. The recession has left the firms with no choice but to retrench workers and hence increase the unemployment rate. Therefore, it is valuable to know what the Malaysia manufacturing manager would attempt to do, in order to sustain profitability and maintain their working capital to an optimal level, right after the financial crisis in 2007.

Extant research which is conducted in the other part of world, but using different exogenous variables report mixed results in its attempt to determine their impact on organization's profitability. The findings are perplexing managers and major stakeholders during the process of making vital financial decision. Mathuva [1] finds that there is a positive relationship between independent variables, which are measured by average payment period and inventory turnover with firm's profitability. This study runs contrary to findings from Deloof [2], Falope and Ajilore [3], which suggest that there is a significant negative relationship between profitability and the inventory turnover.

This study focuses on evaluating and identifying the significant relationship between the management of working capital and the manufacturing firm's profitability in Malaysia.

Our findings show that there is insignificant negative relationship between the log cash conversion cycle and firm's profitability. However, there is an evidence of positive and significant relationship between the average collection period, inventory conversion period and its profitability. Similarly, this research study also reported that the

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size of firms has a significant positive relationship with profitability of firms. However, other findings show a negative significant relationship between debt ratio (leverage) and firm's profitability.

The results of this study should be great of importance to managers and major stakeholders, such as investors, creditors, and financial analysts especially after the recent global financial crisis which can help them to establish a proper tradeoff policy between firm's liquidity and its performance. The empirical result of this study will benefit the owner and management of the manufacturing firms, to understand the liquidity-performance relationship much better, in order for the management to maintain an appropriate level between liquidity and profitability so as to ensure that the business will function more effectively. They would be expected to know at what extent they should maintain firm's liquidity in order to achieve a satisfactory level of firm's performance. It will also help them to know the optimal level of receivables and inventory level which will be useful for their receivable and inventory control management. Besides, this study is also useful for selected industries' manager, who are anticipated to understand which working capital and corporate finance theory that should actually be adopted by them. Furthermore, this research aim to be a platform for other researchers to conduct more in-depth studies which will contribute more to the field of corporate finance in Malaysia.

### Theoretical framework

In this study, two types of theories have been adopted, which are trade-off theory and pecking order theory. The trade-off theory implies that firms with high level of liquidity may potentially encounter low profitability problem. In other word, there is a plausibility of negative relationship between liquidity and profitability. A study conducted by Filbeck and Krueger [4] has revealed that there is an existence of significant inverse relationship between profitability and liquidity of companies in United Kingdom. Dittmar et al. [5] indicate that when the firms are liquid, the firms generate huge amount of net working capital, follow by diminishing level of profitability. However, in a situation of over trading, the trade-off theory will highlight the firms will, actually be confronted with the problem of holding too little liquid once the firms generate high level of profitability.

Second, the pecking order theory implies that there is an opposite relationship between the levels of debt and profitability. It means that, if the firms has higher debt ratio, the firms would have low or decreasing profitability and vice versa. Myers and Majluf found an inverse relationship between profitability and debt. Profitable firms

with higher level of retained earnings will not be over-dependant on external financing. Thus, a pecking order theory suggests that the firms should rather use the internal fund instead of the required external fund or debt to finance their operation in order to overcome the problem which will potentially affect the firm's value. As reported in a study by Raheman and Nasr, as the firms' leverage increase, it will have a significant and negative impact on its profitability (Figure 1) [6,7].

## Research Objectives

### General objective

The purpose of this analysis is to examine the relationship between management of working capital and firm's profitability for a sample of 164 manufacturing firms listed on Bursa Malaysia over a period of 5 years from 2007 to 2011.

### Specific objective

The specifically objectives of this study are:

- i. To empirically examine whether there is a significant relationship between the working capital management and firm's profitability; and,
- ii. To determine which theory would best fit in explaining the relationship between the working capital management and firm's profitability.

## Literature Review

### Cash conversion cycle and firm's profitability

The relationship between working capital management and firm's profitability in Nigeria Stock Exchange (1996 to 2005) and New York Stock Exchange (2005 to 2007), respectively [3,8]. The results of the study show a significant and positive relationship between firm's profitability and cash conversion cycle. They also opine that higher cash conversion cycle will lead to higher profitability of the firms and vice versa.

There is a negative significant relation between return on asset and cash conversion cycle [2,9-14].

Samilogu and Demirgunes also elucidated the linkage between the management of working capital and firm profitability and they found that the cash conversion cycle has no effect on firm's profitability [15].

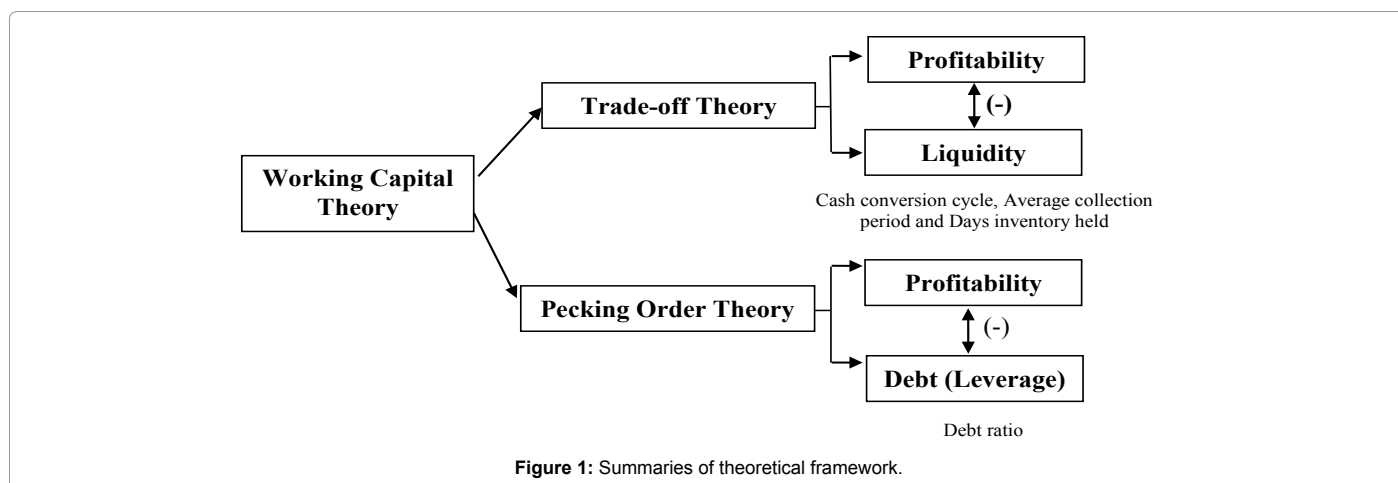


Figure 1: Summaries of theoretical framework.

### Average collection period and firm's profitability

There is a significant and negative relationship between net operating profitability and the average collection period. This seems to suggest that the profitability will decrease if the number of days' collection from debtor increases [2,7,8,14,16-19].

### Inventory conversion period and firm's profitability

There is a significant and negative relationship between net operating profitability and the inventory conversion period in days. It specifies that shortening the number of days of inventories turnover can maximize the firm profitability and hence create shareholder wealth [1,4,7,12,14,16,17,20,21].

### Debt ratio and firm's profitability

The studies done by Dong and Su in Vietnam stock market in 2006 to 2008 show that the debt ratio, as a measure by debt leverage is positively associated with gross operating profit [11]. The result implies that when the debt ratio increases, the firm's profitability will simultaneously rise.

The debt ratio as the proxy for debt leverage is significantly and inversely associated with profitability. In a situation when the firms are less profitable, the firm will be reliant on higher leverage to meet its financial obligation [7,12,16,17,22,23]. They also indicate in this study that when the firms leverage increase, it will have a significant and negative impact on its profitability

Al-Mwalla examined the effect of working capital management policies on the firm's profitability over the period of 2001 to 2009 in Amman Stocks Market [24]. The result, however, shows that the leverage does not have an exact significant impact on firm profitability.

### Firm size and firm's profitability

There is a significant and positive relationship between firm's profitability and size of firms which is measured by natural logarithm

Manufacturing sector	Number of firms selected
Consumer products	83
Industry products	81
<b>Total</b>	<b>164</b>

Table 1: Sample Distribution and Descriptions (2007-2011).

of sales [3,7,11,17,24,25]. The studies indicate that a larger firm can increase the company value by taking advantage of any favorable investment opportunity.

There is no evidence of a statistically significant relationship between firm size and its gross operating profit [8,26].

### Data and Methodology

In this study, the financial data are collected from the DataStream and the annual report of relevant companies listed at the Bursa Malaysia (KLSE) in Malaysia. The sample consists of 164 firms in manufacturing sector over a period of five years spanning from 2007 to 2011. The financial data of those companies include firm's Net Sales, Purchases Inventory, Cost of Goods Sold, Net Income, Total Assets, Total Liabilities and Account Receivable.

The model that is used in this study is Pooled Ordinary Least Squares (OLS), Random and Fixed effect Regression Model.

### Research design (sample selection)

The original sample was consisting of about 400 listed companies on the main board of Bursa Malaysia but was finally narrowed down to 164 firms with an available data. The sample data were obtained from DataStream and Bursa Malaysia website (Table 1 and Figure 2).

### Description of variables

The endogenous or dependent variable in this study is return on asset, as a measure for firm's profitability. Exogenous or independent variable consists of ash conversion cycle, average collection period, average payment period, inventory turnover period, debt ratio and firm size as a proxy for component of working capital management.

### Measurement of variables

The endogenous and exogenous variables stated below are have been used to test the hypotheses in this study (Table 2).

### Hypotheses

The hypotheses are derived based on our objectives. The five hypotheses are stipulated to examine the relationship between working capital management and firm's performance in term of profitability (ROA).

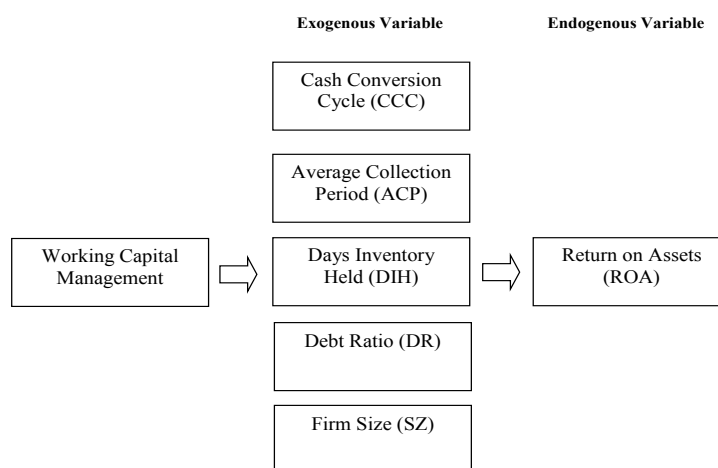


Figure 2: The relationship between working capital management and firm's profitability.

Description	Measurement	Variable
Return on asset (ROA)	(Net income)/(Total assets)	Dependent
Cash Conversion Cycle (CCC)	(Average Collection Period)+(Average Payable Period)+(Inventory Turnover Period)	Independent
Average Collection Period (ACP)	(Account Receivable)/(Net Sales × 365)	Independent
Inventory Conversion Period (ICP)	(Inventory)/(Cost of Goods Sold × 365)	Independent
Debt Ratio (DR)	(Total Liabilities)/(Total Assets)	Independent
Firm Size (SZ)	Natural Logarithm of Sales	Independent

Table 2: Proxy Variables Description with Measurement.

H<sub>1</sub>: There is a relationship between log cash conversion cycle and firm's profitability

H<sub>2</sub>: There is a relationship between log Average collection period and firm's profitability

H<sub>3</sub>: There is a relationship between log Inventory turnover and firm's profitability

H<sub>4</sub>: There is a relationship between debt ratio and firm's profitability

H<sub>5</sub>: There is a relationship between firm size and firm's profitability.

### Data analysis

**Correlation coefficient test:** Correlation coefficient is used to measure the strength of the relationship between two variables such as dependent variable and independent variable. It is conducted to determine the relationship between the five independent variables namely Average Collection Period, Inventory Conversion Period, Cash Conversion Cycle, Debt Ratio and Firm Size with the dependent variable of return on assets ratio. The values of correlation coefficient are ranged from -1.00 to +1.00. A positive correlation coefficient means that the when the values of one variable increase, the value of the other correlated variable will simultaneously rise whereby a negative correlation coefficient indicates that as one variable increases, the other decreases.

**Panel regression analysis:** The model of Pooled Ordinary Least Square (OLS), Random Effect and Fixed Effect Model are used in this study in order to estimate the impact of working capital management on profitability. The regression model as follows:

$$ROA_{it} = C + \beta_1(LCCC_{it}) + \beta_2(LACP_{it}) + \beta_3(LICP_{it}) + \beta_4(DR_{it}) + \beta_5(SZ_{it}) + \epsilon_{it}$$

Where,

C = Constant term

ROA = Return on Assets

LCCC = Natural logarithm of Cash Conversion Cycle

LACP = Natural logarithm of Account Collection Period

LICP = Natural logarithm of Inventory Conversion Cycle

DR = Debt Ratio

SZ = Firm Size (measured by Log of Sales)

$\epsilon$  = Error Term

**Breusch and Pagan Lagrangian multiplier test:** The Breusch and Pagan Lagrangian Multiplier Test are applied to test the hypothesis in order to differentiate which model is appropriate for our research study. The null hypothesis stipulates that the variance of the error term is constant, H<sub>0</sub>:  $\sigma_{\lambda}^2 = 0$ . If the null hypothesis is rejected, the random effect model is thus more appropriate for the research study and vice

versa. The following is the hypothesis of Breusch and Pagan Lagrangian Multiplier Test:

$$H_0: \sigma_{\lambda}^2 = 0$$

$$H_A: \sigma_{\lambda}^2 \neq 0$$

**Hausman test:** Besides the Breusch and Pagan Lagrangian Multiplier Test, we also use the Hausman Test to test the hypothesis that whether fixed-effect or random-effect regression should be the choice for this research study. The null hypothesis states that there exist no co-variance between the firm specific effect and the regressor, H<sub>0</sub>: Cov( $\lambda$ , x<sub>it</sub>) = 0. If the null hypothesis is rejected, the random-effect regression is not appropriate for this study. As a result, we will probably prefer the fixed-effect regression for our study. The following is the hypothesis of Hausman Test:

$$H_0: Cov(\lambda, x_{it}) = 0$$

$$H_A: Cov(\lambda, x_{it}) \neq 0$$

### Descriptive statistics result

The following table presents the descriptive statistics for dependent variable: Return on Assets (ROA) and independent variables: Natural Logarithm of Cash Conversion Cycle (LCCC), Natural Logarithm of Average Collection Period (LACP), Natural Logarithm of Inventory Conversion Period (LICP), Debt Ratio (DR) and Firm Size (SZ).

Table 3 reports descriptive statistics of all the data in this study. The return on assets (ROA) has a mean of 4.83 percent of total asset, and standard deviation is 7.2 percent. The maximum value for the ROA is 41.17 percent and the minimum value is -28.35. Correspondingly, the log of cash conversion cycle (LCCC) is used to test the liquidity of the companies which has shown an average of 4.63 with a standard deviation of 0.64. The maximum value is 5.76 which indicate that the firms take 5 years and above to convert its capital into cash. However, the minimum value is 1.39 or more than 1 year for the company to change it working capital into cash.

In addition, the log of average collection period (LACP) is also used as a proxy to verify the liquidity of the companies which is defined as the ability of the firm to convert it receivables into cash. The mean value of LACP is 4.1 years with the standard deviation of 0.58. Maximum time taken by a firm to collect it receivable is 5.75 years while the minimum level is 1.95 years. Correspondingly, the log of inventory conversion period (LICP) also applies in this research study to check for the level the liquidity of the company. The outcome shows that the means of log of inventory conversion period is 4.40, and the standard deviation is 0.64. The maximum value of log of inventory conversion period (LICP) is 5.81 while the minimum level for this purpose is 2.20.

Besides that, the mean value for debt ratio (DR) is 0.39 with standard deviation of 0.18. The maximum level of debt used by a company is 0.84 while the minimum is 0.02. Result from descriptive statistics also shows

that the average firm size (SZ) which is measured by terms of log of sales is 19.24 while the standard deviation is 1.31. The maximum value of log of sales is 23.33 and the minimum value for this purpose is 15.40.

**Correlation coefficient results**

Table 4 above reports the correlation coefficients among the variables considered in the study. The return on assets is negatively correlated with the log of cash conversion cycle, log of average collection period and debt ratio. The negative correlation between return on assets indicates that when those stated proxy variables increase it may have adverse effect on the firm’s profitability. Information from correlation coefficients also indicates that the log inventory conversion period and firm size is positive associated with the return on asset.

**Panel regression analysis results**

The panel model of regression analysis has been used in this research study, in an attempt to further investigate the relationship between the working capital management and firm’s profitability. To run the data, the E-Views 7 Software were used to analyze the panel data for the total number of 820 company year observations, which represents the sample size of 164 listed firms from manufacturing sector over a 5 year period from 2007 to 2011. The following is the regression estimation result where profitability of firm which is measured by return on assets is regressed against natural logarithm of cash conversion cycle (LCCC),

natural logarithm of average collection period (LACP), natural logarithm of inventory conversion period (LICP), debt ratio (DR) and firm size (SZ).

$$ROA_{it} = C + \beta_1 (LCCC_{it}) + \beta_2 (LACP_{it}) + \beta_3 (LICP_{it}) + \beta_4 (DR_{it}) + \beta_5 (SZ_{it}) + \epsilon_{it}$$

Based on the result presented on Table 5 above, it shows that the coefficient determination, R-square is approximately 0.2804. This indicates that the independent variables explained about 28.04 percent of the variation in return on assets which represent the profitability of the firms. The model also points out that the intercept of the equation is -0.390219 which shows that the ROA is expected to decrease by 0.390219 when the entire variables are remaining constant and unchanged.

From the Table 5 above, the finding shows that there is a negative relationship exists between the log cash conversion cycle (LCCC) and return on assets of the company. It also demonstrates that the log cash conversion cycle is statistically significantly affecting the firm’s profitability. The null hypothesis which shows that there is no relationship between the log cash conversion cycle and firm’s profitability is therefore rejected at 5 percent significant level, indicating a significant alternative hypothesis of a one percent decrease in log cash conversion cycle would increase profitability by 0.0311 percent.

Furthermore, the result illustrated that there is a positive association

	ROA	LCCC	LACP	LICP	DR	SZ
Mean	0.04839	4.631501	4.097567	4.402449	0.393530	19.23812
Median	0.046650	4.672829	4.189655	4.382027	0.402350	19.11237
Maximum	0.411700	5.961005	5.749393	5.808142	0.840900	23.32860
Minimum	-0.283500	1.386294	1.945910	2.197225	0.023600	15.39961
Std. Dev.	0.071960	0.642805	0.580518	0.635178	0.179166	1.314705
Skewness	0.166850	-0.668896	-0.717392	-0.153358	0.052863	0.308278
Kurtosis	5.473043	4.052917	3.709073	2.628077	2.229377	3.121150
Jarque-Bera	212.7660	99.02606	87.51406	7.940380	20.67213	13.48965
Probability	0.000000	0.000000	0.000000	0.018870	0.000032	0.001177
Sum	39.68610	3797.830	3360.005	3610.008	322.6944	15775.26
Sum Sq. Dev.	4.241028	338.4097	276.0041	330.4260	26.29029	1415.600
Observations	820	820	820	820	820	820

Table 3: Descriptive Statistics.

	ROA	LCCC	LACP	LICP	DR	SZ
ROA	1.000000					
LCCC	-0.064009	1.000000				
LACP	-0.191015	0.483427	1.000000			
LICP	0.040960	0.786376	0.179288	1.000000		
DR	-0.310077	-0.175859	0.060099	-0.140587		
SZ	0.326631	-0.312453	-0.396213	-0.263031	0.193900	1.000000

Table 4: Pearson Correlation Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.390219***	0.006665	-4.672173	0.0000
LCCC	-0.031141**	0.004954	2.117926	0.0345
LACP	0.010492***	0.005977	5.704041	0.0000
LICP	0.034091***	0.012653	-12.86727	0.0000
DR	-0.162805***	0.001862	12.66614	0.0000
SZ	0.023591***	0.006665	-4.672173	0.0000
R-squared	0.280431		Adjusted R-squared	0.276011
S.E. of regression	0.061229		F-Statistic	63.44642
Prob. (F-Statistic)	0.000000			

\*\*\*Significant at 1% level; \*\*Significant at 5% level.

Table 5: Model I: The Result of Pooled Ordinary least Square (OLS).

between the firm's profitability and log average collection period (LACP). The finding also stated that the log average collection period has a statistically significant impact on firm's profitability. Therefore, the null hypothesis will be rejected at significant level of 1 percent. This indicates that when the log average collection period increases by one percent, it will lead to an approximately 0.0105 percent growth in profitability.

Additionally, the result above also finds that there is statistically significant and positive relationship between the log inventory conversion period (LICP) and firm's profitability. The null hypothesis is rejected at 1 percent level of significance and highlighting that there is a relationship between the log of inventory conversion period and firms' profitability. It gives an idea that a one percent increase in log inventory conversion period would yield a 0.0341 percent increase in profitability.

The finding also explains that the debt ratio (DR) is significantly affecting the firm's profitability. The result illustrates that there is inverse relationship between the two variables, indicating that for every one percent decreases in debt ratio would result in a 0.1628 percent growth in profitability.

Besides that, the finding also demonstrate evidence of is a positive relationship between firm's profitability and the firm size (SZ) which is calculated by log of sales. The null hypothesis is rejected at 1 percent significant level since the firm size is statistically significant affecting the firm's profitability, suggesting that a one percent increase in firm size increases profitability by 0.0236 percent.

Based on the result using by random effect model in Table 6, it can be observed that the coefficient determination, R-square value is 0.1361. This means that 13.61 percent of the variation in return on assets is explained by the independent variables. Additionally, this model also point out that the intercept of the equation is -0.5174 which shows that the ROA is expected to decrease 0.5174 when the entire variables are remaining constant and unchanged.

The cash conversion cycle was used as the control variable to test

the efficiency of working capital. The regression shows that there is a significant and negative relationship between the firm's profitability and log cash conversion cycle (LCCC). Thus, the null hypothesis is rejected at 1 percent significant level suggesting that a one percent decrease in the cash conversion cycle increases firm's profitability by 0.0201 percent.

Additionally, the finding also shows that the log average collection period (LACP) is positively and significantly affecting the firm profitability. Thus, we fail to accept the null hypothesis at 5 percent significant level. This means that a one percent increase in log average collection period increases profitability by approximately 0.0131 percent.

Furthermore, the log inventory conversion period (LICP) is found to be significant and positively associated to firm's profitability. Therefore, this implies that the null hypothesis of no significant relationship between the log inventory conversion period and firm profitability is rejected at 1 percent significant level. It means to suggest that firm profitability will grow by 0.0298 percent for every one percent increase in log inventory conversion period.

Moreover, this finding also illustrates a negative relationship between the debt ratio (DR) and firm's profitability. It shows that the debt ratio is significantly affecting the firm's profitability. Hence, the null hypothesis is rejected at 1 percent significant level highlighting that a 1 percent decrease in the debt ratio would increase firm's profitability by about 0.1413 percent.

This model also explained that there exists a statistically significant and positive relationship between the firm size (SZ) and firm's profitability. Thus, the null hypothesis is rejected, suggesting that a one percent increase in firm size would yield a 0.0275 percent increase in profitability.

Based on the fixed effect model in Table 7, the R-square is approximately 0.7281. This means that the independent variables explain about 72.82 percent of the variation in return on assets. This model also point out that the intercept of the equation is -1.067701

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.517436***	0.072534	-7.133705	0.0000
LCCC	-0.020112***	0.007455	-2.697622	0.0071
LACP	0.013167**	0.006207	2.121284	0.0342
LICP	0.029791***	0.006937	4.294772	0.0000
DR	-0.141261***	0.017866	-7.906625	0.0000
SZ	0.027522***	0.002996	9.185946	0.0000
R-squared	0.136116		Adjusted R-squared	0.130810
S.E. of regression	0.042491		F-Statistic	25.65125
Prob. (F-Statistic)	0.000000			

\*\*\*Significant at 1% level; \*\*Significant at 5% level.

Table 6: Model II: The Result of Random-Effect Regression.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.067701***	0.167543	-6.372682	0.0000
LCCC	-0.012149	0.008945	-1.358190	0.1749
LACP	0.019530**	0.008204	2.380403	0.0176
LICP	0.032301***	0.008925	3.619087	0.0003
DR	-0.116095***	0.028320	-4.099406	0.0000
SZ	0.051763***	0.007738	6.689734	0.0000
R-squared	0.728172		Adjusted R-squared	0.658023
S.E. of regression	0.042082		F-Statistic	10.38033
Prob. (F-Statistic)	0.000000			

\*\*\*Significant at 1% level; \*\*Significant at 5% level.

Table 7: Model III: The Result of Fixed-Effect Regression.

which shows that the ROA is expected to decrease 1.067701 when the entire variables are remaining constant and unchanged.

From Table 7, the estimation results from the model show that there is insignificant and negative relationship exists between the log cash conversion cycle (LCCC) and firm's profitability. It simply means that, the log cash conversion cycle is not significantly affecting the firm's profitability suggesting, that for every one percent increase in log cash conversion cycle will not lead to any change in firm's profitability.

Furthermore, this finding also illustrates that there is a positive relationship between the average collection period (LACP) and firm's profitability. The log average collection period is significantly influencing the firm's profitability. Therefore, the null hypothesis is rejected at 1 percent significant level, suggesting evidence a one percent level increase in log average collection period will lead to an approximately 0.0195 percent growth in profitability.

Additionally, the result also explains that there is a positive relationship exists between the log inventory conversion periods (LICP) with the firm's profitability. The finding seems to demonstrate that the log inventory conversion period is significantly affecting the firm's profitability. Thus, the null hypothesis is rejected, suggesting that a one percent increase in log inventory conversion period would increase profitability by 0.0323 percent.

The relationship between debt ratio (DR) and firm's profitability is significantly negative in this regression model. Therefore, the null hypothesis is rejected at 1 percent level, indicating that there is a significant relationship between debt ratio and firm's profitability. It means to highlight that the profitability would grow by an approximately 0.1161 percent, while the debt ratio would decrease by one percent.

As mentioned earlier, the firm size (SZ) is measured by log of sale.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.578490	(163,651)	0.0000
Cross-section Chi-square	798.256151	163	0.0000

Table 8: Breusch and Pagan Lagrangian Multiplier Test Results.

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	20.928791	5	0.0008

Table 9: Hausman Test Results.

ROA	Pooled OLS	Random Effect	Fixed Effect
C	-0.390219 (-8.014764)***	-0.517436 (-7.133705)***	-1.067701 (-6.372682)***
LCCC	-0.031141 (-4.672173)***	-0.020112 (-2.697622)***	-0.012149 (-1.358190)
LACP	0.010492 (2.117926)**	0.013167 (2.121284)**	0.019530 (2.380403)**
LICP	0.034091 (5.704041)***	0.029791 (4.294772)***	0.032301 (3.619087)***
DR	-0.162805 (-12.86727)***	-0.141261 (-7.906625)***	-0.116095 (-4.099406)***
SZ	-0.031141 (12.66614)***	0.027522 (9.185946)***	0.051763 (6.689734)***
Observation	820	820	820
LM Test (Pooled vs. RE)	798.256151 (0.0000)*** (random effect is more appropriate)		
Hausman Test (RE vs. FE)	20.928791 (0.0008)*** (random effect is not appropriate)		

\*\*\*Significant at 1% level; \*\*Significant at 5% level.

Table 10: Summaries of the Results of Panel Regression Analysis.

This finding shows that the log of sales is significant and positively associated with the firm's profitability. Thus, the null hypothesis is rejected at 1 percent level. It would mean that for every one percent increase in firm size would increase firm's profitability by 0.0517 percent.

### Breusch and Pagan Lagrangian multiplier test

Based on Table 8, the null hypothesis is rejected at 1 percent significant level. This indicates that the random effect model is more appropriate compared to Pooled ordinary least squares (OLS), because of the presence of error term which is not constant, that will affect the efficiency of the Pooled Model.

### Hausman test

From Table 9, the null hypothesis is rejected because the p-value is statistically significant at 1 percent level. It also means that there is a co-variance between the error term and the regressor, making random effect statistically not efficient. Therefore, the fixed effect model is more appropriate for this study compared to random effect model.

Based on the summaries of the results of panel regression analysis in Table 10, we find evidence that the best model to explain the empirical research for this study is the fixed effect (FE) regression model.

## Results and Discussion

The main purpose of this research is to investigate the relationship between the management of working capital and profitability of 164 manufacturing firms listed in Malaysia over 5 years period from 2007 to 2011. This study also attempts to analyze evidence regarding which theory would be appropriate to explain the relationship between profitability and the working capital management. The hypotheses are finally formulated to examine the relationship between the working capital management and firm profitability which is measured by return on assets. The following discussion of the result is based on the fixed effect model regression (Model III).

### HA<sub>1</sub>: There is a relationship between log cash conversion cycle and firm's profitability

The empirical result suggests that the log cash conversion cycle which is used to measure the liquidity of firms is found to have no

control over the firm's profitability. Thus, this hypothesis is rejected. This finding is different from results found in the previous studies done [2,9-14], which stated that there is indeed an existence of negative relationship between the profitability of the firms and cash conversion cycle. However, this result is still consistent with findings by Samilogu and Demirgunes who indicates that the cash conversion cycle is not significant at all in affecting firms' profitability. Finally it also means that our finding is not consistent with the Trade-off Theory [15].

#### **HA<sub>2</sub>: There is a relationship between log average collection period and firm's profitability**

The log average collection period is used to measure the firm's liquidity and is found to have a significant and positive relationship with the firm's profitability. Therefore, this hypothesis is not rejected suggesting that longer collection period is creating increased profitability, which may seem to highlight those firms may suffer from over trading. As the statistical result portrays, it is totally the opposite with the prior studies [2,7,8,14,16-19]. They found that average collection period have a significant negative relationship on the firm's profitability. Additionally, this finding also seems to suggest that it is not consistent with the Trade-off theory. If the Trade-off theory holds, the profitability should be negatively correlated with the firm's liquidity which is measured by average collection period.

#### **HA<sub>3</sub>: There is a relationship between log inventory conversion period and firm's profitability**

This hypothesis is not rejected because the log inventory conversion period which is used to measure the liquidity of firm is positively correlated to firm's profitability in our study. It would be the firms can create the value and increase the performance by increasing the inventory conversion period. This theory nevertheless is consistent with the management accounting philosophy that inventory that is reported using absorption costing will show increased profit, as the costing of closing inventory will be deferred to next accounting period. This result, however, is not supported by the evidence from the prior studies [1,4,7,12,14,16,17,20,21], which stated that inventory turnover period have a negative relationship on the firm's profitability. In summary, this result is not consistent with the Trade-off theory which implies that the liquidity should be negatively correlated to profitability of the firms.

#### **HA<sub>4</sub>: There is a relationship between debt ratio period and firm's profitability**

This hypothesis is not rejected as the debt ratio is significantly and negatively associated with the profitability. This result is consistent with the Pecking Order Theory which indicates that the debt ratio should be negatively correlated with the profitability. This finding also proving by earlier research study [7,12,16,17,22,23], which finds evidence that there is negative relationship between profitability of a firms and debt ratio.

#### **HA<sub>5</sub>: There is a relationship between firm size and firm's profitability**

Moreover, the result also explained that there is positive relationship between the size of firms and firm's profitability. Thus, this hypothesis is not rejected, suggesting that firm with has grown big has the potential to control markets and supplier chain for its own benefit and reap competitive edge. Several previous studies have shown to support this result, seems to suggest that there is positive relationship between the firm size and profitability of a firm [3,7,11,17].

## **Conclusion**

This study is aimed at investigating the relationship between the working capital management and firm's profitability. For the purpose of analysis, a sample of 164 manufacturing firms over a 5 years period from 2007 to 2011 was selected. The sample data were obtained from DataStream and Bursa Malaysia website. To run and analyze the data, the descriptive statistic, correlation coefficient analysis, and panel regression analysis were used.

Consequently, the empirical results from Model III suggest that the log cash conversion cycle is insignificantly and negatively correlated to profitability. This implies that the log cash conversion cycle have no control over the firm's profitability. Furthermore, the results from the regression analysis also showed that the log average collection period has a significant positive relationship with the profitability of the firm. This means that the longer the credit period granted by the firms to their customer, the higher the firms gain their profitability. In many cases this form of results highlighted the fact that the company is suffering from over-trading.

In addition, the finding also illustrated that the log inventory conversion period is significantly and positively associated with the profitability of the firms. Thus, when the number of day of inventory turnover period increases, the profitability of a firm increases and vice versa, a proposition of the absorption costing approach. This indicates that the manager will be influenced to report longer period of inventory so as to enhance the firm's profitability.

Furthermore, the results from the regression analysis also indicated that the debt ratio has negative relationship with the profitability of firms. In other words, the firm's profitability decreases when the debt ratio increases. This means that the profitable firm is not depending on debt refinancing to pay off their obligations. Additionally, the firm size showed positive relationship with the firm profitability suggesting when the firm size increases it will lead to more profit. This implies that the larger firms would often have strong earning power compared to smaller firms.

## **Implications**

Several implications can be observed from the findings of this study about the relationship between the working capital management and the firm's profitability. First, the empirical results drawn in this study suggest that the log cash conversion cycle is found to have no control over the profitability. Thus, this shows that even though the firms has improved its cash conversion cycle by improving collection of accounts receivable, moving inventory faster and paying it supplier longer, the profitability of the firms would not be affected.

Secondly, the outcomes also show that there is a positive relationship between the log average collection periods with the firm's profitability. This suggests that, when the log average collection periods increase, it will lead to growth in profitability. Therefore, the manager would be encouraged keep its customers credit period longer in order to increase the firm's profitability. In fact, customers are mostly looking for the company which offer them the longer period of payment.

Third, the finding also shows that there is a positive relationship between the log inventory conversion periods toward the firm's profitability. This implies that if the firms have higher inventory conversion period, the profitability will increase. This is opined by Fraser and Ormiston which indicates that the type of industry is important in assessing inventory turnover period [27], as highlighted



on study on jewelry or farm equipment retailed industry which often recorded higher inventory conversion period accompanied by higher profit margin.

Next, the result from the regression analysis also showed that the debt ratio is negatively correlated with the profitability of the firms. This means that when the profitability of a firm increases, the firms are mostly depending less on the debt or leverage. Based on the Pecking Order Theory, it suggests that the firms should use the internal fund rather than external financing to pay off the company debt or obligation. Thus, the profitable firms are often relying on the retained earnings to pay off their obligation.

Lastly, the outcomes also show that there is a positive relationship between the size of firms and the firm's profitability. This implies that, when the firm size is getting bigger, the profitability of a firm will potentially increase. In other words, this means that the firm with bigger size has an effect on enhancing firm profitability compared to smaller firm.

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