The relationship between working capital management and profitability of construction firms in Malaysia

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MASTER OF SCIENCE (FINANCE)
UNIVERSITI UTARA MALAYSIA

JULY 2014

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A Research Project Submitted to
Othman Yeop Abdullah Graduate School of Business
College of Business,
Universiti Utara Malaysia
In Fulfillment of the Requirements for the degree, Master of Science (Finance).

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July 2014

Acknowledgement

First of all, I would like to express my deepest thankfulness to ***Allah***, the Most Gracious the most Merciful, for giving me patience, strength to achieve this dissertation.

I would like to express my deepest sincere gratitude and appreciation to my supervisor, ***Associate Professor Norafifah Ahmad*** Without her unconditional support, continuous guidance, supervision, insightful comments, and encouragement, the accomplishment of this research would not have been possible.

My warm deepest gratitude goes to my husband, ***Hani Qasem Assad*** who stood up with me until I completed my research. I would like to thank him for all the help and encouragement he gave me.

Special thanks go to my ***friends*** whose supporting and encouragement are really appreciated.

Finally, I would like to express my deepest gratitude and appreciation to my ***parents***, my ***brothers*** and ***sisters*** who have always granted me unconditional support and love throughout my whole life.

Abstract

Working capital management has an important role to play in the firms' profitability. This study, the relationship between working capital management and profitability of construction firms in Malaysia, investigates the effect of working capital management on profitability of construction firms in Malaysia for a period of time between 2002 and 2012. In order to do that, this study uses a balanced panel data of thirty construction firms that are on the list of Kuala Lumpur Stock Exchange. The results of the study show that cash conversion cycle, which is used as a proxy of working capital management, along with its components, receivable collection period and payable collection period are significantly negative having an effect on the firms' profitability. However, the results show that the inventory collection period has a negative insignificant effect on the profitability. Additionally, there is a significant impact for the financial leverage, sales growth and firm size on the profitability of firms as well. The study comes to conclusion that the construction firms in Malaysia can develop their profitability by decreasing the inventory conversion period, cash conversion cycle, receivable collection period and payable collection period. The study comes to another conclusion and that is construction firms are required to focus and develop their collection and payment policy. The influential policies have to be formulated for the individual components of working capital. Moreover, the construction firms' profitability can be increased by efficient management and financing of working capital (current assets and current liabilities).

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LIST OF ABBREVIATIONS

variable	Abbreviation
Working capital management	WCM
Return on asset	ROA
Inventory conversion period	IVP
Receivable collection period	RCP
Payable collection period	PCP
Cash conversion cycle	CCC
Firm size	SIZE
Sale growth	SG
Debt ratio	DR

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Working capital management has a crucial and decisive role to play in companies due to its impact on each of the goals of profitability and liquidity as the working capital management takes care of both the current assets, and current liabilities and accounts of great significance in research and financial studies.

One of the main financial duties for any institution, and one of the primary demands to fulfill, is to retain a proper quantity of liquidity to make sure that it fulfills its commitments on time. An institution aims to maintain the proper quantity of current assets and, especially in the receivable accounts and inventory. Additionally, it aims to control over payable accounts and monitor them by making sure that there is a proper variation between them within the limit that ensures the institution is not subjected to the risks of failing in fulfilling its commitments in the short term.

There are two common concepts in working capital. The first one is the gross working capital concept, known as the institution's total investments in current assets, in other words, the assets which are changed into cash during period of a year. These assets are made up of securities, receivable accounts, cash and inventory.

The net working capital is the second concept of working capital. It is referred to the excess gained from current assets minus current liabilities. The significance of this specification comes by quantitatively providing a measurement of the level of trust in the adequacy of current assets to fulfill the short-term commitments. It is fit as a measurement utilized by creditors to get to be familiar with the strong financial position of the institution and the capability of its liquidity to fulfill the obligations. Whenever the amount of current assets compared to current liabilities is greater, it is evident that the company has the ability to meet its obligations easily and vice versa.

This current research seeks to determine how working capital and its components are related to the profitability of a sample of construction companies in Malaysia. The construction sector in Malaysia has great importance as the construction industry constitutes an important element of the Malaysian economy.

It is hoped that investigating the effect of working capital management through its elements on the construction firms' profitability in Malaysia would help in the development of recommendations and solutions through which the components of working capital are controlled to the extent that ensures the achievement of high profitability levels.

1.1. Background

1.1.1. Concept of Working Capital

Capital can be divided into two primary headings: fixed capital and working capital (Subramanian & Paramasivan, 2009).

Fixed capital is meant for that capital utilized for long-term investment of the business concern, for instance, purchasing permanent assets. It is non-recurring by nature.

The other side of the capital is working capital that is needed in order to fulfill the everyday demands of business matters. For instance, creditors' payment, salary paid to workers, purchasing raw materials etc., is of recurring nature. Their conversion into cash can be done easily. Therefore, these can be specified as a short-term capital.

Working capital measures the company's ability to cover its obligations in the short-term and long-term and also demonstrates its strategy in the operation. The company employs its investments and funds of its shareholders through the statement of the variation between current liabilities and current assets to reflect the net working capital.

Generally, whenever the current assets of the company are bigger than its current obligations and whenever its ability to repay its obligations is bigger, the net working capital is positively or negatively affected according to the investment policy pursued by the company. A company's strategic policy is offensive when it requires high risk in

investment by increasing borrowing. It is balanced with balanced risks when it keeps a balance between current liabilities and current assets. It keeps low risks so that it has a large surplus in liquidity and net working capital at high rates. This will have a positive impact on the swap between risk and return and profitability.

1.1.2. Working Capital Management (WCM)

Working capital is known as the variation between current liabilities and assets. The managements that are included in the management of working capital are the management of inventories, receivables, cash and payables. The firm, in cash management, ensures the accessibility of cash for the purpose of meeting its flowing expenditures and decreases the expense out of cash holding (Naser, K., Nuseibeh, R., & Al-hadeya, A. 2013).

Receivables management includes the adoption of appropriate credit policy to the customers of the firm. Appropriate credit policy is predicted to draw customers and increase sales. This policy would positively affect profit and return on capital, even though it would have an effect on the cash flows of the firm.

Corporate management demands to give the correct amount of attention to both increasing sales and keeping necessary cash flows secured. The achievement of the management of inventories is done by sustaining a specific degree of inventory which

permits the production flow and decreases raw materials cost. It is predicted to decrease the costs of ordering to its minimal level; to reduce time for progressive manufacturing and work; to maintain finished merchandise as low as possible and avert over-production and storage costs. Because of all of these, cash flow increases. Additionally, firms manage payables through assigning an appropriate source of financing. Suppliers provide secured credit to ideally finance inventories.

1.1.3. Overview of Construction Industry in Malaysia

There are four subsectors that form the construction sector in Malaysia: Civil engineering residential, non-residential, and special trade works. Special trade works indicate primarily to sustain activities such as painting, carpentry, plumbing, tiling and electrical.

The construction scene in Malaysia is expected to provide a large improvement with the continuous application of the 10^{th} Malaysian Plan. Due to the improvement in distributions and facilitation funds, manufacturing is prepared to get advantage from the plentiful of chances which will be obtained from the plan. These chances, containing high-effect projects, will make various impacts that will reinforce the need and local development for the whole economy, particularly the sector of construction.

1.1.4. Theoretical Basis

The basic concepts, strategies, of working capital management were based on net working capital theory. According to Subramanian & Paramasivan, (2009), there are two important working capital concepts: gross working capital, which refers to the overall current assets, and net working capital, which refers to the excess of current assets over current liability within a specific period. Therefore, if the current assets transcend the current liabilities, working capital is said to be positive but when it goes in the opposite way, the working capital is said to be negative.

Ross, S. A., Westerfield, R. W., & Jaffe, J. (2010) define net working capital as the result of subtracting whole current liabilities from the whole current assets. Applying the concept of net working capital, there were many studies on working capital management conducted by researchers like Nazir, M. S., & Afza, T. (2009), and Filbeck, G., Krueger, T., & Preece, D. (2007) who examine, analyze and report their findings. In line with other researchers .who studied working capital, the present study opts to examine net working capital theory due to the inclusive results on profitability and working capital management that make up the current assets of the firms and current liabilities categories in a company' balance sheet.

1.2. Problem Statement

Working capital management includes decisions on the quantity and the formation of the elements of current assets and current liabilities. This is what makes working capital

management one of the most effective components, to a large extent, in the profitability of the firm. The management of working capital is considered among the most crucial facets of a firm's financial management affecting both its profitability and efficiency (Kaur & Singh, 2013).

Working capital management has a large importance in researches and financial studies relating to the manufacturing companies, in particular, as the current assets hold more than half of the total assets in manufacturing companies (Raheman & Nasr, 2007).

Working capital management produces better performance on manufacturing firms. According to Horne and Wachowitz (2000), the effectiveness of the management of working capital is substantial especially for production companies, where a big portion of assets consist of current assets.

These arguments above for the importance of management of working capital and its impact on profitability results in the first issue, which is analyzed in this study following this question: What is the relationship between working capital and profitability of construction companies in Malaysia?

The connection between every component of working capital management and profitability has an importance in the previous studies too. However, there is a contradiction in the results of the previous studies in terms of the relationship between components working capital management and profitability. For instance, regarding

inventory turnover and receivable collection period, Raheman and Nasr (2007) and Nobanee and Alhajjar (2009) discover that connection between the two components of working capital management and profitability is positive, which is in consistent with the working capital management conservative strategy, even though Deloof (2003) and Alipour (2011) fine that there is a significantly negative connection between both inventory turnover and receivable collection period and profitability, consistent with the WCM aggressive strategy.

Furthermore, there are also conflicting findings regarding the association between payable collection period and profitability. For instance, significant positive connections between payable collection period and profitability in line with the aggressive strategy are mentioned in a report made by Lazaridis and Tryfonidis (2006), Raheman and Nasr (2007), Mathuva (2010), and Alipour (2011). In comparison, Nobanee and Alhajjar (2009), Ramachandran and Janakiraman (2009), Karaduman (2011), and Deloof (2003), show that the relationships are negative, consistent with the working capital management conservative strategy.

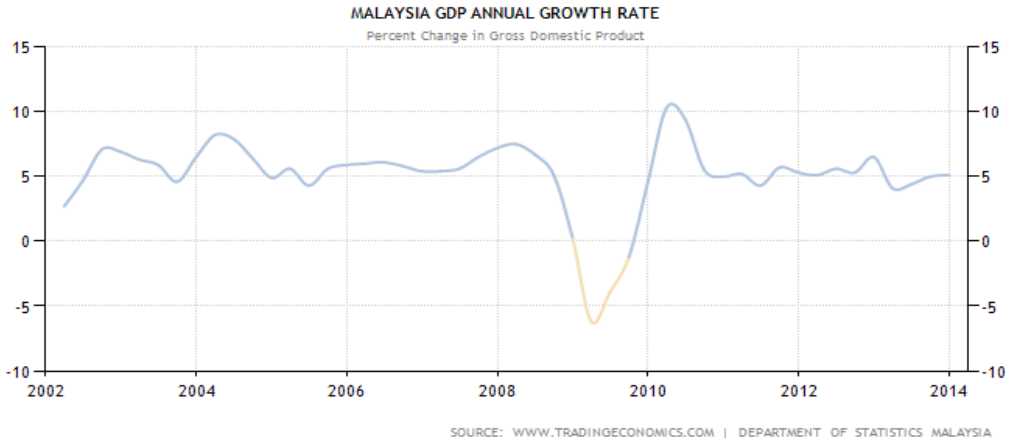
Therefore, these arguments for the impact of every component of the management of working capital on profitability results in bringing up the second issue, which is analyzed in this study in the following question: What is the relationship between components of working capital and profitability of construction firms in Malaysia?

There are many previous studies on the relationship between working capital management and profitability. These studies were conducted in various developing and developed economies. However, this current study is conducted in Malaysia with a focus on the construction sector for a considerable period of time (2002-2012).

The 11-year study period is deemed suitable because it relates to a decade of expansion and contraction in the economy of Malaysia. For example, the first six years (2002-2007) are significant because they constituted a period of economic growth whereas the middle two years (2008- 2009) were the recession years, when the economy was affected by the global financial crisis. The last four years (2010-2012) were years when the economy experienced positive growth again. Figure 1.2 shows GDP annual growth of Malaysia during the period (2002-2014).

Figure 1.1

GDP annual growth of Malaysia (2002-2014)



Source: http://www.tradingeconomics.com/

This study examines the relationship between the management of working capital and its components and the profitability of a sample of 30 construction firms in Malaysia for the period 2002-2012 in an attempt to fill the gap and provide an extension to previous studies in the following respects:

1. It is an extension to previous literature on working capital management by investigating an emerging Asian country, namely Malaysia.

2. It concentrates on one of the largest sectors in Malaysia that is the construction sector. The construction sector makes a vital contribution to the competitiveness and prosperity of the economy. A modern, efficient infrastructure is a key driver of productivity, and the construction industry has a major role in delivering the built infrastructure in an innovative way. In Malaysia construction sector is considered one of the main services sub-sectors that provides high growth and export promotion since the construction sector expects to share 2.5% of gross domestic product in 2020 with average annual growth 5.7% (Economic Planning Unit, Ministry of International Trade and Industry, and Department of Statistics, 2013. Malaysia).

3. It uses a relatively long period of time, from 2002 until 2012. To the knowledge of the author, no studies on working capital management in Malaysia have covered this extent of period. Zariyawati, M. A., Annuar, M. N., Taufiq, H., & Abdul Rahim, A. S. (2009) examine working capital management and corporate performance for a period of six years in earlier years (2000-2006). Moreover, their study period does not include the global crisis.

1.3. Research Questions

1. What is the relationship between cash conversion cycle and Malaysian construction firms' profitability?
2. What is the relationship between inventory conversion cycle and Malaysian construction firms' profitability?
3. What is the relationship between receivable collection period and Malaysian construction firms' profitability?
4. What is the relationship between payable collection period and Malaysian construction firms' profitability?

1.4. Research Objectives

The main objective of this study is to find out the relationship between working capital management and firm profitability, because there is still insufficient studies in Malaysia on this very important aspect of corporate financial management. Because there are contradictory findings from Malaysia and other developed countries, it is worthwhile to examine this aspect again in a different market

structure and legal enforcement such as the ones existing in Malaysia. The specific research objectives are therefore to:

1. Determine the relationship between cash conversion cycle and Malaysian construction firms' profitability.
2. Determine the relationship between inventory conversion cycle and Malaysian construction firms' profitability.
3. Determine the relationship between receivable collection period and Malaysian construction firms' profitability.
4. Determine the relationship between payable collection period and Malaysian construction firms' profitability.

1.5. Significance of the study

This present study is important since to large extent, working capital management affects the profitability of any company. More theoretical and empirical research on relationship between working capital and profitability is necessary, particularly in the context of a developing country. The focus of this study is on the construction sector since it has great importance in Malaysian economy.

This study is important to provide some recommendations, based on the results, on the working capital management to achieve so that construction firms can increase the profitability by having more efficient working capital management. This will lead to positive impact for the Malaysian GDP.

This study is also beneficial to the academics and students in accounting and finance discipline since it gives empirical results on the impact of working capital management and its components on the firm's profitability.

1.6. Scope and Limitations of the Study

This research investigates the relationship between working capital management and its component with the profitability of a sample of 30 construction firms in Malaysia during the period 2002 - 2012.

There are several limitations in this study. First, even though data collected cover quite a substantial period of time, but it is only on construction sector, thus impairing the results from being generalized to other sectors. Second, data was collected from only thirty firms in the construction sector due to an unavailability of data for the rest of the construction firms in all the eleven years under examination. Third, the time available to carry out this present study was limited to only three months making it impossible for the researcher to examine other sectors in the Bursa Malaysia. More conclusive results on the effect of working capital on firm profitability could be gauged if there were sufficient time available to carry out a more extensive and comprehensive investigation.

1.7. Organization of the Thesis

The remainder of this study consists of four chapters. Chapter Two reviews previous studies which examine the relationship between working capital and firms' profitability. Chapter Three explains the research methodology, including the analysis process and

variable measurements. Chapter 4 presents the discussion and results obtained from the analysis. Finally, Chapter 5 provides conclusion, including suggestions and recommendations for future research.

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

This research investigates the relationship between working capital and profitability by using 30 construction firms in Malaysia as a sample. Studies previously conducted on this issue in different countries are discussed. The dependent variable (profitability) and some previous studies related to it and an explanation of the independent variables which represent the management of working capital and the components are also discussed. There is a review of the previous studies which investigate the connection between the management of working capital and firm's profitability. The end of the chapter concludes this chapter.

2.1. Profitability

Profitability is defined as the ability to gain benefit from the whole enterprise activities. It indicates the efficiency of management of an enterprise in generating earnings by using the resources it has at its disposal.

Profitability can be measured by many ratios, among them is return on investment (ROI). This ROI is further divided into two formulas: return on asset (ROA) and return on equity (ROE). (Subramanyam &Wild, 2009, p37).

Return on asset = Net income/total asset

Return on equity = Net income/ \shareholders' equity

Profitability is often the fundamental aim of a firm, and is vital for the survival and continuity of the operations of the firm. Even though wealth maximization is a goal all the shareholders look forward to, they are just as concerned about the company's profitability. Profitability is about the association between the profits made by the firm and the investments that taken by the firms to fulfill these benefits. Therefore, a major effort is needed to direct a firm financing and investing activities towards the ideal use of available resources in order to achieve the best possible return for shareholders, so that the value for yield could be achieved on alternative investments that are exposed to the similar level of risk.

If a firm is profitable, both investing (assets) and financing (equity) degrees grow. In a similar way, if a firm is unprofitable, both investing and financing go down (Subramanyam & Wild, 2009). According to these authors there are other ratios that are used to measure the profitability or firms' operating performance. These are:

Gross profit margin = sales - cost of sales/sales
Operating profit margin = income from operations/sales
Net profit margin = net income/sales

The profitability ratios are used to evaluate the ability of the firm to generate profits from its operating activities in comparison with the expenses and other costs that it bears within a determined period of time. It is also a vital tool for measuring the efficiency of management in the usage of resources in their possession efficiently. Profitability ratios which have a higher value in comparison with the previous periods indicate that the firm achieves a growth in sales and, therefore, a growth in profits.

Profitability is considered an index of business success. The measure of profitability is the main interest of all concerned parties, such as creditors, investors and owners and management, and net sales are taken as a common denominator in the calculation of all rates of return. The gross profit margin, the operating profit margin and net profit margin represent the ability of the company to convert sales into profit.

2.1.1. Profitability Ratios

2.1.1.1. Gross Profit Margin (GPM)

Gross profit margin is one of the most important ratios for the measurement of a firm's profitability. The calculation of gross profit margin is done by the subtraction of sales cost from net sales. This rate reflects the relationship between total sales and cost of sales. The gross profit margin on product sales divided to reach the percentage of the gross profit margin. This ratio indicates the margin available to absorb the costs of sales and administration and other expenses and losses to reach a net profit.

Gross Profit Margin = net income (sales - cost of sales)/sales

2.1.1.2. Operating Profit Margin (OPM)

Operating profit is another helpful indicator to measure profitability. It is the result from all the main activities of a firm. OPM reflects the relationship between operating profit and sales and shows the yield of the main activity before non-operating expenses, income taxes and the ability of the company to make a profit from its core business.

The following equation defines operating profit margin:

OPM = Earnings from operations/sales

2.1.1.3. Net Profit Margin (NPM)

Net profit margin represents the association between sales and net profit. The calculation of this ratio can be amended based on the demand for an analysis such as substituting the revenue net profit before the costs of interest or revenue after taxes and interest. The analyst must look for any income/expenses, profit/loss, unusual or non-recurring in direct connection to the main objective of the company. These items should be excluded when measuring (pure efficiency) for the company.

The net profit margin is calculated using the following equation:

Net profit margin= net income/sales

2.1.1.4. Return on Assets / Investment (ROA or ROI)

The overall efficiency of a firm is measured using this ratio in order to make an interest through assets and investments. The higher this ratio is, the bigger is the profitability. This ratio is an indication of the profitability of the firm's total capital granted by equity and debt capital. Investors prefer to consider this ratio because it provides a clear picture of the profitability of the firm. The following is a formula for the calculation of the return on investment:

Return on asset = net income/total assets

2.1.1.5. Return on Equity (ROE)

Return on equity measures the return fulfilled by the firm to shareholders. This ratio plays a crucial function in investment decisions taking related to the respective owners of shares or rights. The owners look forward to increase this ratio. The return on equity is calculated by the following equation:

Return on equity = net income/total equity

2.1.1.6. The DuPont Analysis

The significance of the rate of return on the equity of shareholders as an indicator of the performance makes the importance of the division of this rate to various components. It provides an understanding of the reasons that cause the change in the rate of return on equity. The process of detailing the rate of return on equity on ratios of its components is referred to as DuPont system. At the beginning, the rate of return on equity can be separated into two proportions: the net profit margin and turnover ratio of shareholders' equity.

Return on equity = (net income/assets)*(assets/total equity)

One can multiply this formula, the bottom and top, with sales:

Return on equity = (sales/sales) * (net income/assets)*(assets/total equity)

By combining these two ratios, it can be seen that the rate of return on equity in the company is comprised of three rates (DuPont system) as follows:

Return on equity = net income/sales * sales/assets * assets/total equity
Return on equity = profit margin * total asset turn over * equity multiplier.

2.1.2. Profitability Measures in Previous Studies

There are some studies that used ROA as a profitability measure (see for example Uremadu & Egbide (2012), Nazir & Afza (2009)**,** Gul, S., Khan, M. B., Rehman, S. U., Khan, M. T., khan, M., & Khan, W. (2013), and Charitou, M. S., Elfani, M., & Lois, P. (2010)). Some other studies applied both ROA & ROE as profitability measures. Uremadu & Egbide (2012)) examine the connection between management of working capital and profitability using a sample of firms in the production sector in Nigeria for the period 2005-2006. They used ROA as a profitability measure. According to the authors, ROA stands for return on investment (ROI); however, it is a more suitable measure of the firm operating effectiveness. Three recommendations are made in this paper. The first is that cash should be promptly collected from credit sales by firms. Secondly, reinvestment for the excess cash should be made in short-term securities (assets) so that profits are generated. The third recommendation is there should be high sales turnover in the Nigerian emerging market.

Nazir & Afza (2009) used the effect of the policy of Aggressive Management of Working Capital on the profitability of firms. In their study, the dependent variable is

ROA. It is a measurement of profitability of non-financial firms in Pakistan, between 1998 and 2005.

Jose, M. L., Lancaster, C., & Stevens, J. L. (1996) used return on assets (ROA) and return on equity (ROE) as profitability proxies and CCC as a working capital management proxy to examine how profitability was related to working capital management. On the basis of the industry type of corporations, the analysis was carried out by the researchers who made a report in which the relationship between CCC and ROA is negative across all industries. In other words, low cash conversion cycle is the result of high profitability even though there is a negative connection between CCC and ROE reported just in the services and retail/ whole sale industries. The authors pointed out that the relationship between CCC and ROE might be determined by other variables like corporate competitive position, production process, capital intensity, marketing channels and product durability.

However, other studies use another measurement for profitability. Gill, A., Biger, N., & Mathur, N. (2010) examine how working capital management is related to profitability. The authors use a sample of American production firms by applying gross operating profit as a profitability measure in an equation GOP = (Sales - Cost of Goods Sold)/ (Total Assets - Financial Assets). Ukaegbu (2014) uses gross operating profit as a dependent variable and a proxy of profitability on panel data of manufacturing firms in some of the developing economies in Africa namely Egypt, Kenya, Nigeria and South Africa. Ukaegbu (2014) finds that positive value can be created for shareholders by

managers if the accounts of the day customers are reduced when they settle these accounts. This can ensure their inventories can be sold off as fast as possible and can delay the payments to their suppliers since their credit rating is not affected.

Raheman & Nasr (2007) also studied the relationship between the management of working capital and profitability for a sample of Pakistani companies using net operating profitability (NOP) as a measure of profitability, known as operating income plus depreciation, and divided this by total assets minus financial assets.

This current study uses ROA as a measurement of profitability following the previous studies such as Uremadu & Egbide (2012), Nazir & Afza (2009)**,** Gul, et al. (2013), and Charitou, et al. (2010).

2.2. Working Capital

Working capital is arrived at by deducting current liabilities from current assets. Working capital is defined here traditionally where it shows the quantity of cash, or liquid assets, which is obtainable to meet the short-term cash demands allocated by current liabilities. A company grows (reduces) its working capital if it grows (reduces) its degree of long-term debt or equity or when it reduces (grows) its degree of fixed assets. Thus, it is important to observe these decisions made with respect to long-term debt and fixed assets and equity are considered as decisions made over the way to prepare the proper degree of working capital.

Moyer, R. C., Mcguigan, J.R., & Kretlow, W.J. (2003) finds that working capital composes of a huge portion of the whole investment in the assets of a company (forty percent in producing and fifty to sixty percent in wholesale and retailing industries). The companies are capable of reducing its financing expenses and get the obtainable funds for expanding higher when they reduce the invested funds in current assets. They figure out that cash assists in keeping the liquid of the company. It makes the company able to pay its obliged money and makes the company protected from going bankrupt.

Current assets are often called the working capital. It represents that part of the investment, which changes from one form to another based on the usual functioning of the affairs in the firm. The idea here revolves around the repeated conversion from cash to inventory to receivables and then back to cash again. This is known as operating cycle of the firm. An alternative to cash is securities which are considered as a substitution in the operating cycle of a company. They are considered as a part of the short-term working capital.

The current liabilities are considered as a source of short-term financing in the firm because they consist all the debts of the company with a maturity of one year or less, and this debt includes accounts payable resulting from the suppliers of the company (accounts payable) and banks (bill payable), the government and employees (receivables).

In general, working capital is known as the difference between current assets of the firm minus its liabilities in circulation. When current assets are in excess of current liabilities, the net working capital of the firm is positive, and in this case, the most common is the net working capital of that part of current liabilities, which is funded by sources of long term capital (long-term debt and equity). As current liabilities represent sources of funding short-term available to the firm, and since the current assets exceed current liabilities, the excess has to be funded by sources of long-term funding.

When the current assets are less than the current liabilities, net working capital of the company is negative. In such rare cases, working capital represents that part of the fixed assets of the firm, which is financed by current liabilities. This conclusion is reached by equalizing the balance sheet: Total assets equals total liabilities plus equity.

The company's balance sheet provides managers with information relating to the financial architecture of the company, which means that the structure of its investments on the one hand and the structure of the sources of funding for these investments on the other hand. This financial structure should make managers continuously aim to increase the value of shareholders' investment in the firm. A crucial part of the financial structure of the company includes the investment level in current assets and to what level these investments are financed from current liabilities.

Additionally, the greater the increase for current assets in comparison to current liabilities, the better the company is able to pay its obligations and vice versa. The cash outflow is relatively expected, so when the obligation occurs (to borrow, for example, from a supplier), the company is aware of when it will pay this obligation. What is difficult to predict is the cash inflow within any process of converting the current assets in the form of liquidity.

2.2.1. Working Capital Components

The management of working capital includes managing the payables, receivables, cash and inventories (Charitou, M., Lois, P., & Santoso, H. B. 2012). Working capital establishes different current assets and current liabilities. According to Subramanian and Paramasivan (2009) the components of working capital includes current assets which contain short-term loans advances, cash at banks, bills receivables, cash in hand, sundry debtors, prepaid expenses, inventories, and accrued income while current liabilities include bills payable, sundry creditors, outstanding charges, short-term loans and advances, dividend payable, bank overdraft and provision for taxation. Figure 1 illustrates these components.

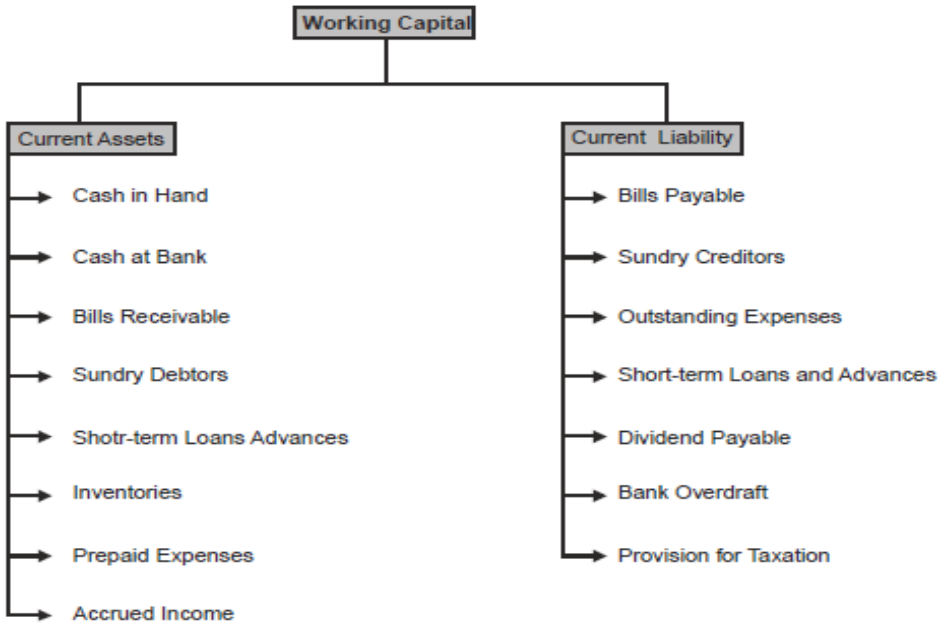
According to Myers, S., Brealey, R., & Marcus, A. (2003), the collection of current, or short-term, assets and liabilities forms what is called working capital.

2.2.1.1. Current Assets

One of the most crucial current assets components is accounts receivable. It appears as a result of the unusual expectation of firms for customers in terms of immediate payment for their purchases. These bills, which are not paid, are a precious asset which firms predict to be capable of turning into cash soon. The big amount of accounts receivables includes bills not paid from sales to other firms, which are called trade credit. The rest comes from the selling of merchandise to the final consumer. They are called consumer credits.

Figure2.1

Components of Working Capital



Source: Subramanian & Paramasivan (2009)

Inventory is another crucial current asset. Inventories probably contain work-in-progress, raw materials, goods ready and waiting for selling and shipment.

The rest of current assets include cash and marketable securities. Cash includes partially of dollar bills; however, the majority of the cash is in the shape of bank deposits. They are probably demand deposits (checking accounts money which is payable immediately by the company) and time deposits (savings accounts money which is payable just outside with a delay). The main marketable security is called commercial paper, and short-term debt, which is unsecured and sold by other companies. The other securities composed of Treasury bills.

For the purpose of cash management, firms encounter as much issue as people do. Advantages always exist in keeping huge amounts of ready cash. On one hand, the risk of having no cash and being obliged to take loans more times on short notice is reduced by having large sum on hand. On the other hand, there is a cost to keeping useless cash balances instead of having the cash to work for gaining interest.

2.2.1.2. Current liabilities

The main current liability of a firm composes of accounts payable, which is outstanding payments due to other firms. The other main current liability contains short term borrowing or notes payable which is an amount that the company owes to a creditor, and

it usually carries an interest expense. Bank indebtedness is the amount owed to the bank in the short term, such as a bank line of credit.

Accounts payable is amount owed to suppliers for products and services that are delivered but not paid for. Moreover, wages payable (salaries), rent, tax and utilities are payable to employees, landlords, government and others.

Accrued liabilities, unearned revenues (customer prepayments) and dividends payable are other important components in the current liabilities.

2.2.2. Net Working Capital

Net working capital makes a comparison between the quantity of current assets, which means the assets which have to be changed into cash during the following twelve months, and the current liabilities; the debt which is due during twelve months (Keown, A. J., Martin, J. D., Petty, J. W., & Scott, D. F. Jr. 2005).

Various projects need an investment growing in working capital. For instance, some of the new sales are probably credit sales, which results in an investment growing in accounts receivable. Additionally, for the purpose of producing and selling the product, the company is probably obliged to get its investment bigger in inventory. However, some of these growing investments of working capital may be funded by growing in

accounts payable. As long as all these implicit modifications are modifications in liabilities and assets, they have no impact on accounting revenue. What can be concluded here is that if this project caused a positive modification in net working capital, it has a meaning that money is invested in growing working capital, and will be a cash outflow. It is going to mean that an account for alterations in net working capital, which probably happens, has to be done. The alteration in net working capital is the extra invested business in working capital minus any extra short term liabilities which were created.

2.2.3. Optimal Level of Investment in Working Capital

For increasing benefits, or reducing of the cost of working capital, or maintaining a balance between profitability and liquidity, an optimization of working capital is needed (Padachi, 2006). Investing very little in working capital, which means aggressive policy of working capital, can result in disrupting production, grows the possibilities of having risks of not affording the fiscal obligations and spoil profitability. Meanwhile, a conservative strategy of financing, which means a huge amount of working capital investment, points out to financing idle that can gain not benefit but involved costs. Therefore, a financial manager must be careful about sustaining proper working capital levels.

Optimal level of investment in working capital is the one in which the wealth of the owners increases. In other words, an increase in the current value of the institution, and as such an outcome is the result of a combination of factors, including sales and cash

flows, and the degree of leverage and operational, so we can say that there is no policy alone to invest in working capital and the same is applied to all the institutions.

2.2.4. Working Capital and Swap between Risk and Return

Any alteration to working capital elements immediately affects profits. As a matter of fact, when profit ratios have decreased or become lower than the competitors', this probably refers to the development chances in working capital (Sagner, J. S. 2011).

The swap between the company's profitability and risks is something that must exist as the profitability in this context means the relationship between sales and cost of sales that have been generated by the use of the company's current and fixed assets within the productive activity. The company's profits could increase by sales or reducing costs while risking, in the framework of working capital management, defined as the probability of the inability of the firm to pay its obligations as they fall due and the company that cannot pay its obligations when due, they fall under the so-called technical financial distress.

It is known, in general, that whenever the net capital the company is greater, the risk it goes through is less. That means the larger net working capital is, the larger liquidity of the company will be, consequently, it is less risky when it falls under the technical financial distress and using these definitions for each of the profitability and the risk, it

can clarify the relationship between them by examining the change in each of the current assets and current liabilities separately.

2.3. Working Capital Management

Working capital is the overall investment of a firm in current assets or assets that it is expected to be changed into cash during a year or fewer than that (Keown et al., 2005). The working capital management was believed to have a trade-off nature where excessive working capital would result in higher liquidity in a corporation to meet its short term obligation but, at the same time, it would also reduce the firm's profitability due to switching of customers. Efficient management of working capital assists to avoid financial crises, thereby, increasing the profitability and enhancing the firm value (Kaur & Singh, 2013).

Working Capital Management is utilized as a vector of cash conversion cycle (CCC), average collection period (ACP), inventory turnover in days (ITID), net trading cycle (NTC), and average payment period (APP) of the firm (Abdulraheman, A., Afza, T., Qayyum, A., & Bodla, M. A. (2010)). According to Lazaridis & Tryfonidis (2006), the best way to describe management of working capital is by the cash conversion cycle. Management of working capital is to look at managing cash, receivables, inventories and payables (Charitou et al., 2012).

Working capital management is a vital part of fiscal manager as well. The primary aim of the management of working capital is managing the current assets and the current liabilities efficiently and sustaining enough amounts of both of them. Simply speaking, it can be called Current Assets and Current Liabilities Administration of the concern of business. Managing the main elements of working capital, like inventories, cash, and receivables presumes greater significance because of the fact that the main part of working capital is obstructed by those assets.

The management of working capital is the action of making plans, arranging, and taking control over the element of working capital like the inventory, cash, payables, overdraft and short-term loaning, and receivables.

2.3.1. Management of Cash

The main aim of management of cash is to maintain the cash investment at the lowest possible level at the same time of maintaining the company operating effectively and efficiently. This aim typically decreases to gather early and make payment late. (Ross, S. A., Westerfield, R. W., & Jaffe, J. 2010).

The concern of business requires cash in order to pay for acquiring services and resources for the usual business conduct. Cash is one of the most crucial and main portion of the current assets. It is the money that the concern of business is able to spend

instantly without any limitation. The work cash compose of currency, coins, balance in its bank accounts and cheques kept by the concern of business. Cash management contains cash outflow and inflow, cash balance kept by the concern and cash flow within the concern.

2.3.1.1. Incentives for Holding Cash

According to (Subramanyam & Paramasivan .2009.p.g. 173) there are four incentives for holding the cash, which are:

1- **The incentive of transaction**: it is the incentive for holding cash or near cash for fulfilling the requirements of routine cash to finance transaction in the usual
2- **Process of business**: Cash is required for purchasing raw materials, pay costs, dividends, taxes etc.
3- **The precautionary incentive**: it the incentive for holding cash or near cash as a mitigating thing, which meet the unpredicted contingencies. Cash is required to meet the unpredicted cases such as strikes, floods etc.
4- **Speculative incentive**: it is an incentive for cash holding to take a quick use of chances usually outside the normal business course. Specific quantity of cash is required to meet a chance to buy raw materials at a low price, and to purchase at desired prices.
5- **The incentive of compensation**: it is an incentive for cash holding in order to make it up for banks for obtaining specific services or borrowings. Banks supplies different services to the concern of business like transfer of funds,

cheque clearance etc.

2.3.2. Management of Inventory

Inventories establish the main important portion of current assets of the concern of business. It is fundamental as well for easy management of the activities of business.

The main aims of the management of inventory are as the following:

- To effective and easy process of production.
- To sustain ideal inventory to increase the profitability.
- To fulfill the seasonal requirements of products.
- To keep away from price growth in future.
- To make sure that the level and inventories site are needed.
- To make plans on the time of purchasing and the place of purchasing.
- To avert both under stock and over stock of inventory.

2.3.2.1. Inventory Management Techniques

The management of inventory contains efficient control and inventories administration. The control of inventory indicates to the system that make sure that required quantity of materials are provided plus the inventories quality at the needed time and, meanwhile, to hinder investment not necessary in inventories. (Ross, et. al. 2010.p.g.861) mentioned that there were three crucial techniques in the inventory management:

- **The ABC Approach**

This approach is a simple one to the management of inventory, where the main idea to have the inventory divided into three or even more groups. The main reason is that a small part of inventory regarding the quantity probably represents a huge part regarding the value of inventory.

- **The Economic Order Quantity Model**

This model indicates the degree of inventory at which the complete inventory cost including the cost of ordering and the cost of carrying. Assigning an ideal level includes two kinds of cost like the cost of ordering and the cost of carrying. The EOQ is the level of inventory that decreases the complete cost of ordering and carrying.

- **Extensions to the EOQ Model**
  - **Safety stock**

It is the implication of additional inventories, which can be taken down if the real lead period and/ or the rates of usage are more than what is predicted. Safety stocks are assigned by the opportunity expense and taking the inventories cost. When the concerns of business keep a low degree of safety stock, this will cause bigger opportunity expense and the bigger amount of safety stock, which includes more carrying expenses.

  - **Reorder points**

This level is stable between both the maximum level and minimum level. Reorder level is that level at the time the concern of business takes new order at this degree. Reorder level is the result of maximum consumption multiplies the period of reorder.

- **Managing derived-Demand Inventories**

Derived-demand, or what is called dependent-demand, items are the elements which are put together to create a part of some parent item or similarly create a part of group of elements. Dependent-demand inventories are usually used among the system of production, not by external demand. Planning of materials requirements and just-in-time management of inventory are both two management methods for derived-demand inventories management.

2.3.3. Management of Receivables account

Receivables are one of the main components of working capital. Account receivable management is known as the procedure of decision making, which results in investing funds of these assets. Consequently, this will result in increasing the overall return on the firm's investment (Subramanyam & Paramasivan, 2009).

The commercial and industrial companies track their products either in cash or on credit. This makes the companies to create a decision to sell on credit because of the need to invest in the accounts of the receivables, and, at the same time, creates the need to manage this investment, especially in companies that expand their sales on credit and receivable accounts constitute an important part of its assets.

The decision to invest in the receivable accounts is considered as any other decisions of investment in terms of being governed by its costs and returns, and there is no

violation for the purpose of the company designed to maximize the returns. Investment in receivable accounts may lead to increased sales, and this positive element in the investment decision in accounts receivable. But, on the other hand, the company may bear the cost of capital which is invested in these accounts in addition to the cost of collection and the cost of debt which is not good; this is a negative element in the decision to invest in the accounts of the receivable.

2.3.4.Working Capital Management Policy

Among the most crucial decisions that should be made for current liabilities and assets is the way the current liabilities will be utilized in order to fund current assets. The quantity of obtainable funds for current liabilities are restricted to the quantity of material bought in the case of payables and quantities which monitors the commitment of the firm with respect to receivables and the quantity of seasonal borrowed money, that can be acceptable by loaners with respect to notes receivable, as the lenders grant seasonal short-term loans for the firm in order to be used to enhance the inventory of this firm and its receivables. It is often that the lenders do not lend short-term funds in order to use them or for long-term investments.

Working capital management makes policies for efficient management. In achieving that purpose, the management depends on three policies on the basis of the connection between sales and working capital. They are:

A. Conservative Working Capital Policy:

This policy refers to risk reduction by sustaining a higher level of working capital. This kind of working capital policy is suitable to meet the seasonal changes in the operation of manufacture.

B. Moderate Working Capital Policy:

The policy of Moderate Working Capital refers to the moderate level of working capital maintenance based on moderate sales level. For example, one percent of alteration in working capital is equal to sales.

C. Aggressive Working Capital Policy:

The policy of Aggressive Working Capital is considered as one of the high hazardous profitability policies. It keeps a low level of Aggressive Working Capital against a high level of sales in the business during a specific period of time**.**

The determination of the level of investment in working capital represents a swap operation between return and risk, and this depends on the relationship of preference between risk and return related to the administration and, generally, when the level of investment in current assets is large. In other words, the current assets to fixed assets ratio are high, meaning that the company follows a policy of working capital for reducing the risk. It also reduces the profitability since the existence of a large investment in current assets means that the company reserves balances are relatively

large cash and securities. To market quickly and have large amounts and variety of materials inventory, the company gives customers payment facilities to encourage sales.

Pursuing a policy of working capital of this type reduces risk because it reduces the likelihood of a lack of cash to pay bills and other financial commitments. And It also reduces the likelihood of entry into force of the material of this inventory and lowers the probability of a declining sales. In return, employing money in investments of this type reduces the profitability of the company because the return on investment in the elements of current assets is usually low. The return is close to zero on cash and little to accounts receivable and inventory, and somewhat higher on the securities. Generally, the return on investment in fixed assets is much higher than the return caused by freezing financings in current assets.

However, if the degree of investment in the current assets is small and the percentage of current assets to fixed assets is small, it refers to the policy of working capital in favor of the risk but increase profitability if reservation facility limits the lowest in investments in cash, inventory and securities.

Companies may also expand the future sales for the customers who are having low financial convenience. This means that the risk is large because of the likelihood of loss of liquidity and lacking of materials in inventory. The failure of customers to pay for

goods is high; in return, the profitability of the company may be large also because the biggest part of the company's investments is invested in fixed assets that achieve a much greater return on investment.

2.3.5. The Significance of Working Capital Management

The policy of working capital is a significant issue in any institution for the reason that it is difficult for the institutions to manage its operations easily if it not for the appropriate working capital management. Its efficient provision may lead a business into success, meanwhile it ineffective management can cause not just to losses but to the final collapse of what could be a major concern as well. The heavy success of business relies on the capability of financial executives to efficient management of inventory, receivables, and payables (Filbeck & Krueger, 2005).

Working capital management includes a number of features that make it a subject of great importance:

1 - Working capital is a crucial proportion of the total assets in the institution despite the differences in the level from an industry to another, as the financial manager devotes most of his decisions to manage these assets.

2 - The direct relationship between the growth of sales of the institution and the need to increase working capital to support this growth in production and sales.

3 - The direct influence of working capital liquidity and profitability, The combination of appropriate working capital components maintains a liquidity of the institution in terms of the possibility of converting these components into cash without loss, and at the same time, it affects the profitability of the institution as the funding increase in working capital carrying the institution the costs funding and the benefits as well.

4 – The components of working capital provide flexibility that characterizes the current assets and current liabilities as the institution can control the volume of investments in current assets, In line with the seasonal changes and business, but it cannot do the same in fixed assets.

2.3.6. Measurement of Working Capital Management

As many last researches cash conversion cycle and net trade cycle were used as a proxy for working capital. Additionally, the components of the management of working capital are: Inventory Conversion Period (ICP), Average Collection Period (ACP) and Average Payable Period (APP). That it will be explained briefly in the following sections.

2.3.6.1. Cash Conversion Cycle (CCC) & Net Trade Cycle (NTC)

Cash conversion cycle is defined as the period of time between the payment of a company for its raw materials and the payment collection from the customer (Myers, S., Brealey, R., & Marcus, A. 2003).

Cash conversion cycle calculated the total of the average days number of outstanding sales on both account receivables and inventories fewer the average days number of sales presented by the account payable of the firm (Keown et al., 2005) while net trade cycle calculated the number of sales of days which a firm had to fund its net working capital investment. Cash conversion cycle is a measurement for the period a company will get cash if it makes its investment bigger in resources for the purpose of expanding sales of customer (Charitou et al., 2012).

$$\text{Cash Conversion Cycle (CCC)} = \text{Inventory Collection Period (ICP)} + \text{Trade Receivables Collection Period (RCP)} - \text{Trade Payable Collection Period (PCP)}$$

Where:

ICP = (Inventory/Cost of sales) x 365

RCP = (Trade Receivables/Net Sales) x 365

PCP = (Trade Payables /Cost of Sales) x 365

There are some of authors Charitou et al. (2012) who distinguish between CCC & NTC and compute NTC by the following formula:

NTC= (Trade Receivables + Inventories – Trade Payable)/ Net Sales) x 365

Abdul Raheman et al., (2010) computed NTC by:

NTC= ACP+ (Inventory / Net Sales*365) - (Accounts Payables /Purchases*365).

In this current study CCC is used as a proxy of working capital management which is in consistency with previous studies such as Jose et al. (1996), Dong & Su, (2010), Charitou et al., (2010), Teruel & Solano (2007), Deloof (2003), Mehta (2014), Kaur & Singh (2013) and Gul et al. (2013).

2.3.6.2. Inventory Conversion Period (ICP)

The inventory collection period (ICP) points out to the time taken for the conversion inventory which is held in the firm into sales.

ICP = Inventory/Cost of sales x 365

In this study ICP is used as a proxy for the inventory policy which is in consistency with previous research such as Deloof (2003), Lazaridis and Tryfonidis (2006), Solano and Teruel (2007), Rahman & Nasr (2007), and Mathuva (2010).

2.3.6.3. Trade Receivable Collection Period (RCP)

The Trade Receivable Collection Period or the average collection period is the time spent for the collection of cash from customers.

(RCP) = Trade Receivables/Net Sales x 365

In this study, RCP is used as a proxy for the policy of collection of the firm as an independent variable, which is in consistency with earlier researches, such as in Deloof

(2003), Lazaridis & Tryfonidis (2006), Solano & Teruel (2007), Rahman & Nasr (2007), and Mathuva (2010).

2.3.6.4. Trade Payable Collection Period (PCP)

The Trade Payable Collection Period (PCP) or average payable period is the time spent to pay to the suppliers of the firm.

(PCP) = Trade Payables /Cost of Sales x 365

In this study, PCP is used as a proxy of the payment policy of the firm as an independent variable which is in consistency with past researchers, such as Deloof (2003), Lazaridis &Tryfonidis (2006), Solano & Teruel (2007), Rahman & Nasr (2007), and Mathuva (2010).

2.3.6.5. Overview of Cash Conversion Cycle (CCC) & Net Trade Cycle (NTC) as Proxies of Working Capital Based on Previous Studies

Many researchers used CCC & NTC as proxies to measure the working capital management. From the recent studies on this issue, and on the relationship between working capital management and profitability, researchers used only cash conversion cycle as a proxy of working capital management (see for example Jose et al. (1996), Dong & Su (2010), Charitou et al. (2010), Teruel & Solano (2007), Deloof (2003), Mehta (2014), Kaur & Singh (2013) and Gul et al. (2013)).

Charitou (2010) examine the influence of the management of working capital on firms financial performance listed on the Cyprus Stock Exchange for the period of time between 1998 and 2007. He uses CCC as a proxy of working capital and ROA as a proxy of profitability, and finds that there is a negative relationship between profitability of firms and days in inventory, CCC, days' sales outstanding and creditor payment period.

However, Shin & Soenen (1998) utilize net trade cycle as a proxy of the management of working capital and find the existence of a robust negative relationship between the company's working capital amounts with the profitability of the company. Caballero et al. (2013) utilized the net trade cycle (NTC) as a working capital management measure and recede corporate performance verse net trade cycle (NTC) and its square (NTC2) and their results companies get an ideal working capital degree that increases their performance and it is less for companies more likely to be fiscally restricted.

There are a few researchers who use both CCC & NTC as proxies of WC such as, Abdul Rahemanet, (2010) who examines the influence of the management of working capital on firm's performance in Pakistani firms between 1998 and 2007 In his analysis, net operating profit (NOP) is used as a profitability proxy and both NTC and CCC isused as a proxy of working capital. As indicated from the results, the performance of the companies is significantly influenced by the net trade cycle, inventory turnover in days and the cash conversion cycle. In general, the manufacturing firms encounter issues with

their policies of collection and payment. Additionally, financial leverage, firm size, and sales growth impact significantly on the firms' profitability as well.

The present study uses CCC as a measurement of working capital as the previous studies by Jose et al. (1996), Dong & Su, (2010), Charitou et al. (2010), Teruel & Solano (2007), Deloof (2003), Mehta (2014), Kaur & Sing,(2013) and Gul et al. (2013).

2.4. Overview of the Relationship between Working Capital Management and Profitability Based on Previous Practical Studies

Different studies were carried out to find how the management of working capital was related to the profitability of a company. This area will be reviewed briefly in this section.

Deloof (2003) examines the relationship of WCM with profitability of 1009 non-financial firms in Belgium from 1992 to 1996; and uses the average of inventory turnover period, debtors collection period and creditors' payment period as a measurement of policy of the trade credit and policy of commodity stocks while the cash conversion cycle as a comprehensive measurement of working capital management. The results indicate that there is a significantly negative relationship between the profitability of firms and the cash conversion cycle. Similarly, there is a negative significant association between the companies' profitability and both debtors collection period and inventory turnover period, which meant that the decrease in the

amount of days in accounts receivable and days in inventory lead to increase in the profitability of firms.

Teruel & Solano (2007) study the impacts of the management of working capital on SME profitability, for a simple of little and medium-sized firms in Spain from1996 to 2002. They found that there is a significant negative relationship between the small companies' profitability and debtors' collection period, inventory turnover period and the cash conversion cycle. Shortening the cash conversion cycle lead to improve on the firm's profitability.

In a study conducted by Tryfonidis and Lazaridis (2006), the connection between the management of working capital with corporate profitability was analyzed. The researchers investigate 131 companies listed on the Athens Stock Exchange (ASE) for the period between 2001 and 2004. Gross operating profit is used by the researchers as a proxy of profitability while CCC is used as a proxy for working capital. They conclude that managers could create value for shareholders by correctly handling the CCC and by maintaining each distinct component to an ideal level.

Mehta (2014) in his study on working capital management and profitability relationship in the emerging markets of UAE examine all real estate and construction companies listed on Abu Dhabi stock exchange from 2007-2010. The results of this study suggest that focusing on reduction of cash conversion cycle and making effective management of inventory and payables could enhance profitability of construction firms. These results are consistent as the results of Kaur & Singh (2013) who investigate the working

capital performance of 164 manufacturing BSE of 200 Indian companies over the period of 2000-2010.

Alipour (2011) looked into the connection between both working capital management and profitability of some firms in Iran. Alipour took gross operating profit as a proxy of profitability and CCC as a proxy of working capital management and he came to conclusion that the profitability of the companies was greatly affected by working capital management and managers could make value for the stockholders by reducing receivable accounts and inventory. The managers have to seek for the methods by all means for correct and effective management on the profitability of companies.

Hayajneh &Yassine (2011) looked into the connection between working capital effectiveness and profitability with fifty three sampling of manufacturing companies, which were on the list of Amman Exchange Market. Their report showed that there was a significant negative connection between profitability and every average receivable collection period, average conversion inventory period and average payment period, and the cash conversion cycle.

Al-Mwalla (2012) looked into the effect of the management policies of working capital on the profitability and value of the firms with a sample of fifty seven manufacturing companies on the list of Amman Stocks Market during the time between 2001and 2009. The investigator reached to the conclusion that a conservative investment policy had a positive effect on the companies' profitability, which were the samples of the research.

Gul et al., (2013) examined the impact of working capital management (WCM) on the performance of little and medium Pakistani enterprises (SME's) for a period of time between 2006-2012. They figured out that profitability of small medium enterprises (SME's) in Pakistan and inventory turnover, CCC, and average collection period were negatively related. However, the number of day's accounted payable was positively associated with profitability.

Charitou et al. (2012) looked into the connection between profitability of firms and the management of working capital.. In this research, CCC and NTC were utilized as a proxy of working capital and ROA was as a proxy of profitability. The researcher used a dataset of all firms in Indonesia in a period of time between 1998 and 2010, in which the outcomes demonstrated that there was an existence of a positive association between the Cash Conversion Cycle and Net Trade Cycle with the profitability of firms. One more thing was shown in the results of this study and that was, as measured by the debt ratio, a negative relationship existed between the firm's riskiness and the firm's Return on Assets.

Hajihassani (2013) used data of 28 Iranian cement companies for six years between 2004 and 2009 to examine the connection between working capital management and profitability. The researcher figured out that there was a very weak and negative correlation between the return on investment with the current ratio (CR) and inventory turnover ratio (ITR), whereas the correlation of (ROI) with the liquid Ratio (LR) and

credit turnover ratio (CTR) was positively so weak. The researcher came to the conclusion that a weak connection between profitability and working capital management existed in the particular situation of Iranian cement manufacturing.

Tauringana& Afrifa, (2013) who carried out a research through which they investigated the relative significance of working capital management, which was measured by the cash conversion cycle (CCC), and its component elements (accounts receivable, inventory, and accounts payable) to the profitability of small to medium-sized enterprises (SME's). Panel data regression analysis and a questionnaire survey of 133 Alternative Investment Market (AIM) as a sample listed on SMEs were used in this study. Between 2005 and 2009, the financial data were utilized in the panel data analysis. The results of the questionnaire survey were on the basis of 19 SMEs respondents. The results of Panel data analysis showed that accounts receivable (AR) and the management of accounts payable (AP) were significant for SMEs profitability. But, AP management was somehow more significant than AR management. Inventory (INV) and CCC management was not significant for SMEs profitability. The results of the questionnaire suggested that the management of the CCC and all its component elements were noticed as significant for SMEs profitability, in which AP, INV and CCC followed respectively.

Mohamad, N., & Saad, N. (2010) looked into working capital management and its influence on the performance of the 172 firms listed and chosen haphazardly from Malaysian Bursa for 5 years (2003-2007). The result indicated that there were important

negative relationships between the variables of working capital with the performance of firms. Therefore, it sheds light on the significance of managing working capital demands to make certain development in the market value and profitability of the company and this aspect must have formed a section of the strategic and operational thinking of the company for the sake of effective and efficient operation.

Zariyawati, M. A., Annuar, M. N., Taufiq, H., & Abdul Rahim, A. S. (2009) investigates the determinants of working capital management of listed firms in Malaysia for the period 2000-2006. Cash conversion cycle is used as a comprehensive measure of working capital management. Results indicate that firm size, debt ratio, growth of the company, economic growth and inflation associates with firm's working capital management.

Hina (2014) examined the influence of the management of working capital on the profitability of firms. In order to look into this association between the two of them, the researcher did a collection of secondary data, which were taken from the Glaxo Smith Kline firm, pharmaceutical firms, which was registered in the Karachi Stock Exchange for five years, from 1996 to 2011. In order to achieve this purpose, the researcher of that study used variables; the variable is return of assets ratio for the measurement of firms' profitability. Other variables were included such as: account receivable turnover, inventory turnover, creditor's turnover, and current ratio as standards for the management of working capital. The outcomes of the study demonstrated that there was an effect of the management of working capital on the firms' profitability and the

relationship was significant. Thus, the managers were probably enhancing the profitability of the companies by reducing the inventory turnover and accounting receivables to the minimum level, and by minimizing the ratios of the creditors turnover; however, there was not a significant impact on reducing or increasing the current ratios on firms' profitability. Therefore, the outcomes of the study showed that the firm was able to get its profitability higher by using an appropriate management of working capital.

Julius (2014) investigated the function of business cycles on the profitability-management of working capital relationship by using Finnish firms sample, which were listed and were beyond eighteen-year time. The researcher found that the influence of the business cycle on the connection between profitability and the management of working capital was obvious in the downturns of economy related to the prosperity of the economy. Additionally, the researcher found out that the importance of effective management of inventory and period of converting accounts receivable grew up within the times of downturns of the economy. So, the outcomes of the study showed that effective management of working capital was important and, therefore, had to be part of the financial planning of firms.

In a research conducted by Nadeem (2014), the data used in the research were secondary for the purpose of analyzing the connection between profitability and working capital. The dependent variable intended to be investigated in that study was net operating profit

and the independent variable was the working capital. There was a significant negative connection between net operating profit and the inventory turnover, the average period of collection, cash conversion cycle and the average period of payment by testing firms in Pakistan as a sample, and were listed on the Karachi Stock Exchange. Based on the former theoretical studies, the connection between corporate profitability and the cash conversion cycle has been predictable. The findings of the regression demonstrated that the account receivable coefficient was negative, which meant that the growth or reduction in the average period of collection had a significant impact on the profitability of the company. On the basis of the correlation matrix of the inter-item, the association between account payables, account receivables and inventory with profitability indicated that there was a negative association with profitability. Inventory demonstrated that the connection was positive with the net operating profitability, which was a proof that the management of working profitability had a positive impact on the firms' profitability.

In a study conducted by Ganesan (2007), an analysis on the effectiveness of the management of working capital was made from the industry of telecommunication equipment. An investigation on the connection between profitability and the efficiency of the management of working capital was conducted. The researcher used regression analysis and correlation for achieving this purpose. The research also used ANOVA to analyze the data and look into the influence of the management of working capital over profitability. The sample used for the research was 443 yearly monitory statements from 349 firms of telecommunication equipment. The study covered a period of time between

2001 and 2007. In this research, there was evidence that there was no significant impact of management of working capital on firms' profitability in the industry of telecommunication equipment, although, there was a negative connection between days working capital and profitability.

The aim of the research conducted by Al-Debi'e (2010) was to examine the connection between the management of working capital and profitability for manufacturing Jordanian companies on the list of Amman Stock Exchange within the period of time between 2001 and 2010. The manufacturing Jordanian firms had significant investment in working capital. Thus, effective management of working capital is predicted to support the profitability of these firms. The outcomes demonstrated that firms with less profit keep waiting for a longer time in order to sell products of their own, to gather credit sales, and to pay their merchandise suppliers. Additionally, the outcome demonstrated that, even though the degree of profitability, Jordanian manufacturing firms paid their providers before gathering credit sales. In the study, three control variables were included: GDP development, leverage and size. The regression models of the research contained these three control variables, which showed significance with predicted signals. Profitability got higher with GDP development and Size, and got less with leverage.

In a research conducted by Solano (2010), the connection between the management of working capital and corporate performance was examined by using a sample of non-

monitory companies in the UK. As long as a better investment in the working capital was able to multiply the sales of the firm, a positive connection between the value of firms and working capital was predicted. But, because of the increase in working capital, the value of the firm is also predictable to fall, as a result of current assets low return and the extra monitory charges the firm suffered. As a result of that, the connection between the value of the company and working capital was negative, which was probably predicted at top degrees of working capital. The results of this study provided robust enhancement for a capsized U-formation connection between working capital investment and the firms' performance, which means that, firms had an ideal level of working capital that increases their performance.

2.5. Conclusion

Various researchers have investigated about the working capital and profitability from various environments and angles, which indicate the importance of the role of the working capital management and its affecting on the firm's profitability.

This study will be an extension of these studies which examined the significance of the relationship between the working capital management and profitability of a firm and will apply in the construction sector in Malaysia during the period 2002 to 2012.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0. Introduction

In this chapter, a development of a theoretical framework is conducted for the purpose of answering the research questions and investigating the objectives presented in chapter one. This chapter is presented in sections which include research framework, hypotheses development, research design, and operational definition, measurement of variables, sampling, data collection procedures and techniques of data analysis.

3.1. Research Framework

This study analysis the effect of working capital management on the profitability of Malaysian construction firms for the period between 2002 and 2012. In order to conduct this analysis, panel data of 30 construction companies listed on Kuala Lumpur Stock Exchange is used.

The framework of this study follows the framework of the studies of (Gul et al., 2013 and Charitou et al., 2010) which concentrate on examining the relationship between the effect of working capital on the profitability of companies, and on how changes in the components of working capital moderate this effect.

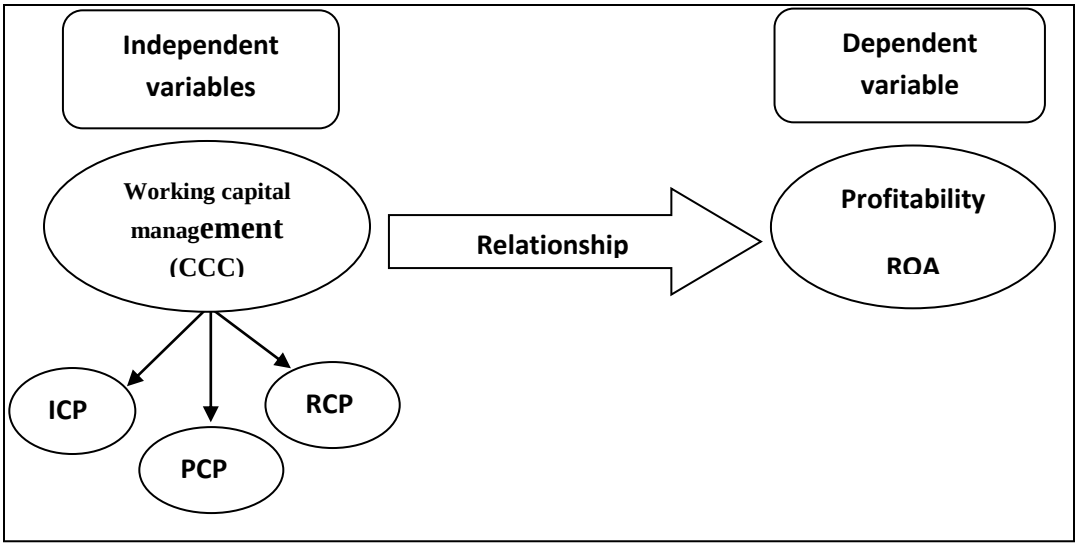
On the basis of the literature review, working capital and profitability are significantly related. A firm is required to keep a balance between liquidity and profitability at the time of carrying out its everyday operations. Liquidity is considered as a precondition to make sure that firms are able to meet their short-term obligations and their continuous flow can be guaranteed for a profitable venture. A well-designed and carried out working capital management is predicted to make a positive contribution to the creation of a firm's value.

In this study, the return on asset of construction companies represents the dependent variable, whereas the cash conversion cycle (proxy of working capital) and the components of working capital, which are inventory conversion period, trade receivable collection period and trade payable collection period, represent the independent variables. The control variables are debt ratio, firm size and sales growth.

The relationships between the dependent variable and the independent variables are tested using regression analysis and Pearson's correlation. Based on the findings, recommendations are presented to Figure 3.1 shows the framework of this study.

Figure 3.1

Research Framework



3.2. Hypotheses/Propositions Development

This section includes statements of hypotheses which are related to the research questions mentioned in chapter 1.

Research question 1: What is the relationship between cash conversion cycle and Malaysian construction firms' profitability?

As stated in chapter 2, the majority of the researches that explain the efficiency degree of working capital management concentrate on profitability as a crucial element. There is an argument that good management of working capital brings about low CCC and this causes fast availability of cash flows and, therefore, better profitability. In this connection, Jose (1996) examines how profitability is related to the management of working capital by utilizing return on assets (ROA) and return of equity (ROE) as proxies for profitability and CCC as a proxy for working capital management. Su and

Dong (2010) examine the connection between management of working capital measured through CCC and the its components and profitability as measured by gross operating profit in a sample of firms listed on Vietnam Stock Exchange. They find that there is a significant and negative relationship between the two variables.

Gill et al. (2010) look at the connection between the management of working capital, measured by CCC, and profitability, which was measured by gross operating profit using a sample of companies in the USA, listed on the New York Exchange. They conclude that there is a possibility of creating profit by dealing with CCC in a correct method and maintaining receivables at an ideal degree.

Corporate features were examined by Rimo and Panbunyuen (2010) that impact the working capital management in a sample of companies listed on NASDAQ OMX Stockholm Exchange. In their report, they mention that corporate profitability is affected by CCC.

Additionally, Rimo and Panbunyuen (2010) mention in their report that there exists a positive relationship between CCC and profitability, in which ROA is used as a measurement by taking a sample of listed firm on NASDAQ OMX Stockholm Exchange. They conclude that the firms surveyed have less effectiveness in the management of working capital. Therefore, it is hypothesized that:

First Hypothesis:

H_o: There is an insignificant relationship between working capital management that cash conversion cycle is its evaluating criterion and profitability.

H_o: $\beta_1=0$

H_1: $\beta_1 \neq 0$

H_1: There is a significant relationship between working capital management that cash conversion cycle is its evaluating criterion and profitability.

The other hypotheses of this study are related to the rest research questions which are:
Research Question 2: What is the relationship between inventory conversion period and Malaysian construction firms' profitability?

Research Question 3: What is the relationship between receivable collection period and Malaysian construction firms' profitability?

Research Question 4: What is the relationship between payable collection period and Malaysian construction firms' profitability?

The connection between every component of working capital management and profitability has an importance in previous studies too. However, there is a contradiction in the results of the previous studies in terms of the relationships between components WCM and profitability.

For instance, regarding inventory turnover and receivable collection period, Raheman & Nasr (2007) and Nobanee& Alhajjar (2009) discover that the connections between the two components of WCM and profitability are positive, which are inconsistent with the WCM conservative strategy. However, Deloof (2003) and Alipour (2011) find that there is a significantly negative connection between both inventory turnover and receivable collection period and profitability, consistent with the WCM aggressive strategy.

Furthermore, there are conflicting findings regarding the association between payable collection period and profitability. For instance, significant positive connections between payable collection period and profitability in line with the aggressive strategy are mentioned in a report made by Tryfonidis & Lazaridis (2006), Raheman & Nasr (2007), Mathuva (2010) and Alipour (2011). In comparison, Nobanee & Alhajjar (2009), Ramachandran & Janakiraman (2009), Karaduman (2010) and Deloof (2003), show that the relationships are negative, consistent with the WCM conservative strategy.

Therefore, it can be concluded, as a result of this review, that it is not clear whether aggressive or conservative strategies are connected positively or negatively with profitability.

Thus, the other three hypotheses are as stated:

Second Hypothesis:

H_o: There is an insignificant relationship between inventory conversion period and profitability.

H_o: $\beta_2=0$

H_1: $\beta_2\neq0$

H_1: There is a significant relationship between inventory conversion period and profitability.

Third Hypothesis:

H_o: There is an insignificant relationship between receivable collection period and profitability.

H_o: $\beta_3=0$

H_1: $\beta_3\neq0$

H_1: There is a significant relationship between receivable collection period and profitability.

Fourth Hypothesis:

H_o: There is an insignificant relation between payable collection period and profitability.

H_o: $\beta_4=0$

H_1: $\beta_4 \neq 0$

H_1: There is a significant relation between payable collection period and profitability.

3.3. Research Design

This study examines how working capital management affects firm's profitability through correlations and regression analysis. The data collected through the systematically assigned symbols are formulated into tables. Therefore, this numerically designed study lays emphasis on the relationships among the independent variables of working capital management and the dependent variable – profitability.

Data was collected from DataStream of UUM's library for construction firms in Malaysia. To investigate the relationship between WCM and firm's profitability, this present study uses regression analysis and develops four models to achieve the objectives.

The dependent variable is firm's profitability measured by return on asset. The independent variable which is working capital management is measured by cash conversion cycle using the formula = cash conversion cycle = inventory conversion period + trade receivable collection period + trade payable collection period.

Finally, this study evaluates the impact of control variables (firm's growth, size, and financial leverage) on the firm's profitability. Three computer software's are used in this study: Excel, SPSS, and E-views.

3.4. Operational Definition

Return on assets (ROA). This is a measure of firm's profitability. It gauges how efficiently a firm uses its assets to produce income.

This is derived by the following formula: ROA = Net sales / Total assets. (Needles et al., 2008).

Working capital (WC). It is the difference between firm's current assets and current liabilities in the same operating period. The working capital formula is:

Working capital = Current assets – Current liabilities. (Gul et al., (2013), and Charitou et al., (2010)).

Working capital management (WCM). This is defined as managerial strategy that guides a firm to maintain efficient levels of both components of working capital, current assets and current liabilities, in respect to each other.

Cash conversion cycle (CCC). This is the period (in days) between the firm's payment for materials and collection on its sales. This is derived by the following formula:

CCC = ICP+RCP+PCP.

Inventory conversion period (ICP). This is the time (in days) taken to convert inventory held in the firm into sales. This is derived by the following formula: ICP= (Inventory / cost of sale) *365. (Gul et al., (2013), and Charitou et al., (2010)).

Trade Receivable Collection Period (RCP). The time spent (in days) for the collection of cash from customers.

This is derived by the following formula: (RCP) = (Trade Receivables/Net Sales) * 365. (Gul et al., (2013), and Charitou et al., (2010)).

Trade Payable Collection Period (PCP). This refers to the time spent (in days) to pay to the suppliers of the firm. This is derived by the following formula: (PCP) = (Trade Payables /Cost of Sales) * 365. (Gul et al., (2013), and Charitou et al., (2010)).

Firm size (SIZE). The data for total assets is in the asset classification of a firm's balance sheet. This is measured by the logarithm of its total assets.

Firm growth (GROWTH). The variation in its annual sales value by reference to previous year's sales [(Sales t – Sales t – 1)/Sales t – 1].

Financial leverage (debt ratio). This is the degree to which a firm is utilizing borrowed money.

3.5. Measurement of Variables /Instrumentation

3.5.1. Dependent Variable

In this study, return on asset (ROA) is the dependent variable. It is the proxy of the firms' profitability and it measured by Return on asset = Net sales/total asset. A company's business goal is achieved by how well its management has performed their operating, financing and investing activities (Needles et al., 2008).

The statement of net income is used to measure a firm's progress in meeting the goal of profitability. A matchup between revenues and expenses in the income statement of a firm creates the firm's profit for a business period. Return on Assets (ROA) measures as net earnings after taxes divide by total assets.

3.5.2. Independent Variables

The most known measure for measuring the working capital management is cash conversion cycle (CCC) (Deloof (2003), and Zariyawati, et al. (2009)). Cash conversion cycle is defined as the period between the firm's payment for materials and collection on its sales, less the day's credit given by the creditors. The firm's cash conversion cycle shows how quickly a firm can turn its inventory into sales to collecting cash while using the day's credit purchases. The cash conversion cycle has three components- Inventory conversion period = (Inventory/cost of sale) *365; Trade Receivable Collection Period = (Trade Receivables/Net Sales) *365; Trade Payable Collection Period = (Trade Payables/Cost of sales) *365. The cash conversion cycle can

be positive or negative. To have shorter cash conversion cycle the firms have to cut on the day's sales are outstanding, reduce the inventory period and have more payables days outstanding.

3.5.3. Control Variables

The control variables are firms' size, growth in sales, and financial leverage. Based on previous studies, firm size (Deloof, 2003; Padachi, 2006; Gul et al. 2013), sales growth (Deloof, 2003; Padachi, 2006; Gul et al. 2013; Nobanee, 2009), and the leverage ratio (Gul et al. 2013; Odit & Chittoo, 2008; Charitou et al., (2010) are considered as control variables.

In this study the size of a firm was measured by the logarithm of its total assets. The growth in sales is measured by: [(Sales t – Sales t – 1) /Sales t – 1], and leverage (Total Debt divided by Total Assets) which is described as the amount of debt incurred to finance the assets of a firm. In the time of the great depression debt was viewed as evil, but today it is a necessity that helps firms to prosperity (Odit & Chittoo, 2008).
The list of all dependent and independent variables has been given in Table 3.1.

Table 3.1

Measurement of Variables and Definitions

Variable	Definition	Measurement
Return On Asset	This is a measure of firm's profitability. It gauges how efficiently a firm uses its assets to produce income.	ROA=Net sales (operating profit) / Total assets. (Needdles et al., 2008).
Inventory conversion period	This is the time (in days) taken to convert inventory held in the firm into sales.	ICP= (Inventory / cost of sale) *365. (Gul et al., (2013), and Charitou et al., (2010))
Trade Receivable Collection Period	The time spent (in days) for the collection of cash from customers.	RCP= (Trade Receivables / Net Sales) *365. (Gul et al., (2013), and Charitou et al., (2010)).
Trade Payable Collection Period	This refers to the time spent (in days) to pay to the suppliers of the firm.	PCP= (Trade Payables /Cost of sales) *365. (Gul et al., (2013), and Charitou et al., (2010)).
Cash Conversion Cycle	This is the period (in days) between the firm's payment for materials and collection on its	CCC=ICP+RCP-PCP

	sales	
Firm Size	The data for total assets is in the asset classification of a firm's balance sheet	Logarithm of its total assets (Deloof, 2003; Padachi, 2006; Gul et al. 2013
Sales Growth	The variation in its annual sales value with reference to previous year's sales.	[(Sales t– Sales t_{-1}) /Sales t_{-1}]. (Deloof, 2003; Padachi, 2006; Gul et al. 2013; Nobanee, 2009).
Debt Ratio	This is the degree to which a firm is utilizing borrowed money.	Total debt/ total asset (Gul et al. 2013; Odit & Chittoo, 2008; Charitou et al., 2010).

Continue of **(**Table 3.1)

3.6. Data Collection

3.6.1. Sampling (Model Specification)

The model specification of this study is adapted from Gul et al., (2013), and Charitou et al., (2010). It uses 4 models as follow:

Model 1:

$$\mathbf{ROA_i = \beta_0 + \beta_1 CCC_i + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Where:

ROA: Return on assets for every firm.

CCC: Cash conversion cycle for every firm.

SIZE: Size of the firm which is represented by the natural logarithm of total assets.

SG: Sales growth for every firm.

DR: Debt ratio for every firm.

β0: The intercept of the equation.

$\beta_{1.....}\beta_4$: The change coefficient for the variables

E: Error term.

This model is used to examine the relationship between profitability and the cash conversion cycle which is proxy of working capital management.

Model 2:

$$\mathbf{ROA_i = \beta_0 + \beta_1 ICP_i + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Where:

ROA: Return on assets for every firm.

ICP: Inventory conversion period for every firm.

SIZE: Size of the firm which is represented by the natural logarithm of total assets.

SG: Sales growth for every firm.

DR: Debt ratio for every firm.

β0: The intercept of the equation.

$\beta_{1.....}\beta_4$: The change coefficient for the variables

e: Error term.

This model is used to examine the relationship between profitability and inventory conversion period.

Model 3:

$$\mathbf{ROA_i = \beta_0 + \beta_1 RCP_i + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Where:

ROA: Return on assets for every firm.

RCP: Receivable collection period for every firm.

SIZE: Size of the firm which is represented by the natural logarithm of total assets.

SG: Sales growth for every firm.

DR: Debt ratio for every firm.

β0: The intercept of the equation.

$\beta_{1.....}\beta_4$: The change coefficient for the variables

e: Error term.

This model is used to examine the relationship between profitability and receivable collection period.

Model 4:

$$\mathbf{ROA_i = \beta_0 + \beta_1 PCPi + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Where:

ROA: Return on assets for every firm.

PCP: Payable collection period for every firm.

SIZE: Size of the firm which is represented by the natural logarithm of total assets.

SG: Sales growth for every firm.

DR: Debt ratio for every firm.

β0: The intercept of the equation.

$\beta_{1.....}\beta_4$: The change coefficient for the variables

e: Error term.

This model is used to examine the relationship between profitability and payable collection period.

3.6.2. Data Collection Procedures

The data of the construction firms in Malaysia were collected for the period from 2002 until 2012 from DataStream. To fulfill the objectives of this study, the data contain all variables measured, including return on assets, cash conversion cycle, inventory conversion period, receivable collection period, payable collection period, firms' growth, debt ratio, and firm size.

The target sample of this study is all construction firms in Malaysia. This study collected the data of all construction firms listed in Data Stream from 2002 to 2012. The total of firms was 96 firms. However, there are some limitations obstructed this study to use all targeted firms in analysis, which were the incomplete data of some firms. Therefore, this study excluded the firms which have not complemented in any variable during the period of study. Additionally, this study excluded firms which had merger and acquisition or firms which established after 2002. Therefore the final sample is 30 firms that have the complete data of all variables during the period from 2002 until 2012.

3.7. Techniques of Data Analysis

This study contains balanced panel data of 30 firms for the period 2002- 2012. GLS method analysis is used in order to avoid any heteroscedasticity that may happen. Thus, GLS method was conducted to run the models by using computer software SPSS, Excel and E-VIEWS.

Descriptive analysis & Pearson correlations for all variables are analyzed, and then VIF test was applied to test for multicollinearity.

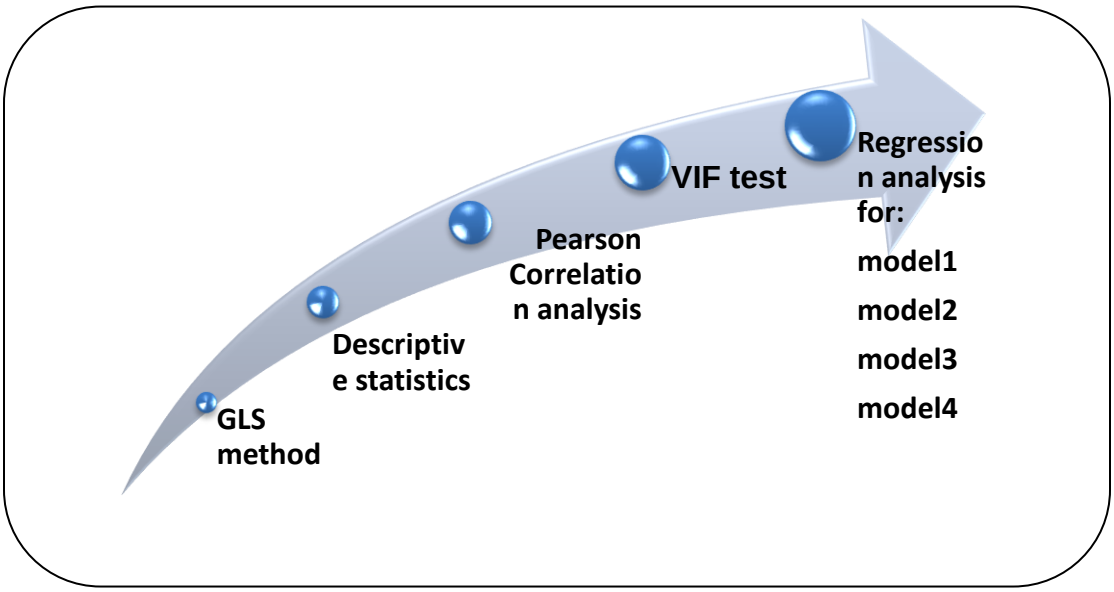
The regression analysis is then explained for every model with the hypotheses tested and then discussed based on the results of the P-value for the variables.

The results are finally compared with the results of previous studies to see if there is any differences or consistency in the findings.

Figure 3.2 shows the techniques of data analysis used in this study.

Figure 3.2

Techniques of data analysis



3.8. Conclusion

This chapter included all details of the methodology that are applied to test the hypothesis and achieve the objectives after which conclusion and recommendations are obtained based on the findings of the tests. Therefore, this chapter includes:

- Research Framework
- Hypotheses/Propositions Development
- Research Design
- Operational Definition
- Measurement of Variables/Instrumentation
- Data Collection:
- Sampling
- Data Collection Procedures
- Techniques of Data Analysis

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0. Introduction

This chapter discusses the results of the relationships between the dependent and independent variables derived from descriptive analysis, correlation analysis and regression analysis.

It involves analyzing the four models. The first model investigates the relationship between the independent variable, which is cash conversion cycle, and dependent variables, which is return on asset as a measure of profitability. Meanwhile, the second model investigates the relationship between the independent variable, which is inventory conversion period, and the dependent variable, which is return on asset. The third model investigates the relationship between the independent variable, which is receivable collection period, and dependent variable, which is return on asset and the fourth model investigates the relationship between the independent variable, which is payable collection period, and dependent variable, which is return on asset.

This chapter contains three sections which are divided into: Descriptive statistics, Correlation Analysis, discussion and results of models and the conclusion.

4.1. Descriptive Statistics

Table 4.1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	330	-43.220	39.340	3.17791	6.487898
CCC	330	-540.000	49391.000	998.72424	2937.88
ICP	330	16.000	47248.000	940.71818	2839.040038
RCP	330	14.000	8736.000	245.82727	526.391533
PCP	330	2.000	6593.000	187.82121	420.131389
SIZE	330	9.410	16.040	12.92739	1.092465
SG	330	-93.990	2254.710	29.41964	183.229249
DR	330	.000	85.130	21.25639	18.206279

Notes: This table shows the descriptive statistics for the working capital management measures and profitability of 30 construction companies in Malaysia during the period 2002 – 2012. ROA represents the return on asset, CCC represents the cash conversion cycle, ICP represents the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of firm, SG represents sale growth and DR represents debt ratio.

Table 4.1 presents the descriptive statics that include minimum, maximum, mean and standard deviation values. The time period of the study consists of eleven years from 2002-2012. The sample consists of 30 firms and 330 observations. Profitability is

measured using return on assets. In the study, it is found that profitability has a mean value of 3.17791 with a standard deviation of 6.487898.

The higher the standard deviation of CCC (2937.88) indicates a wide variation in WCM among the construction firms. As the minimum value of CCC is -540, a negative value, it means that the period of PCP is larger than the period of ICP and RCP, and the maximum is 49391 days. While the average value is 998.7 days, which means that the firm spends 998.7 days to get the cash.

It is also observed that other components of working capital ICP, RCP and PCP have a very large standard deviation that indicates a wide variation in managing these components by firms in the construction industry.

The number of days in which a firm convert inventory into a sale is 940.7 days with a standard deviation of 2839.040038. As the minimum time taken by the firm is 16 days while maximum time is 47248 days.

The average time spent for the collection of cash from customers is 245.8 days with a standard deviation of 526.391533. As the minimum period for the collection is 14 days and the maximum period is 8736 days.

However, the average time spent to pay to the suppliers of the firm is 187.8 days with a standard deviation of 420 days. The minimum period to pay is 2 days while the maximum period was 6593 days.

The descriptive statistics of the control variables indicate that the lowest value of the standard deviation of size of firm, which is 1.09, means low in variance in the size of firms with average about 12.92739, minimum value about 9.410 and maximum value about 16.040.

The average sales growth is 29.41964 while the highest of standard deviation is 183.22, which indicates that there is a wide variation in sales growth in construction firms with minimum value -93.990 and maximum value 2254.710.

The average of debt ratio is 21.25 % with a standard deviation of 18.20. The minimum value is 0 and the maximum is 85.130%.

4.2. Correlation Analysis

The correlations of all variables are presented in the Table 4.2. The results of the Pearson correlation coefficients are presented in Table 4.2 for all variables included to assess the association between the CCC and its components (ICP, RCP and PCP) and ROA.

Table 4.2
Correlation

	ROA	CCC	ICP	RCP	PCP	SIZE	SG	DR
ROA	1	-.044	-.030	-.137*	-.066	.042	.012	-.158**
CCC		1	.995**	.866**	.819**	.016	-.046	-.078
ICP			1	.834**	.841**	.029	-.046	-.059
RCP				1	.833**	-.035	-.060	-.073
PCP					1	.043	-.067	.055
SIZE						1	.007	.440**
SG							1	-.071
DR								1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Notes: This table presents the correlation matrix for the working capital management measures and profitability of 30 construction companies in Malaysia during the period 2002 – 2012. ROA represents the return on asset, CCC represents the cash conversion cycle, ICP represents the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of firm, SG represents sale growth and DR represent debt ratio.

There is a negative correlation between ROA and the four working capital management measures (CCC, ICP, RCP and PCP). This indicates an inverse relationship between the components of working capital management and profitability. When cash conversion cycle, inventory conversion period, receivable conversion period, and payable collection period are shorter (lower), profitability increases.

The CCC, which shows a negative correlation with ROA (-0.448) is consistent with the previous researches that find that decreases in number of day's working capital lead to more profitability. The correlation between ROA and RCP is negative and significant, indicating to the stronger relation between ROA and RCP than the other WCM measures.

The results of the correlations among control variables of sale growth and size of firms have insignificant relation to the profitability, indicating, even though, the size of the firm and sales growth is positively related to profitability, the relationships are rather weak and not significant. Leverage as measured by debt ratio has a negative correlation with profitability, but the relationship is significant. That means that the more leverage a construction firm uses, the lesser its profitability is.

Gujarati, (2003) suggested that multicollinearity becomes a problem only when the correlation coefficient exceeds 0.80 or 0.90. The results in Table 4.2 show that The correlation between CCC and its components ICP, RCP and PCP is strong that more than.80 and significant Therefore, this study also examines the variance inflation factors (VIFs) in the models to further test for multicollinearity. The highest VIFs were well below the threshold value of 10 suggested by Gujarati, (2003) indicating that multicollinearity does not pose a problem to the regressions. Table 4.3 shows the results of VIF test for the four models.

Table 4.3

VIF test's results

MODEL1		MODEL2		MODEL3		MODEL4	
Variables	VIF	Variables	VIF	Variables	VIF	Variables	VIF
CCC	1.012	ICP	1.010	RCP	1.010	PCP	1.008
SIZE	1.247	SIZE	1.248	SIZE	1.243	SIZE	1.243
SG	1.010	SG	1.010	SG	1.011	SG	1.011
DR	1.261	DR	1.258	DR	1.255	DR	1.250

Notes: CCC represents the cash conversion cycle, ICP represents the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of the firm, SG represents sale growth and DR represent debt ratio.

In Table 4.3, the results of the VIF test are reasonably good. In the models, the values of the variance factor in the variables range from 1.008 to 1.261 for PCP to DR indicating the non-existence of multicollinearity among the variables of the model.

4.3. Discussion and Results of Models

4.3.1. Regression analysis of Model 1

The relationship between CCC and ROA is investigated in this study using the first model which is:

$$\mathbf{ROA_i = \beta_0 + \beta_1 CCC_i + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Table 4.4 shows the results of regression analysis of model1.

Table 4.4

Regression results of the relationship between working capital management and profitability.

Variable	Coefficient	Std. Error	T-Statistic	Prob.	
C	-9.788700	2.768839	-3.535309	0.0005	***
CCC	-0.000229	9.56E-05	-2.393285	0.0173	**
SIZE	1.123474	0.219534	5.117549	0.0000	***
SG	0.000349	0.001426	0.244737	0.8068	
DR	-0.075804	0.015508	-4.888143	0.0000	***
R-squared 0.112436	Adjusted R- squared 0.101512		Prob(F-statistic)0.0000		

Notes: CCC represents the cash conversion cycle, ICP represents the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of the firm, SG represents sales growth and DR represents debt ratio.

The results of data analysis of model1 reveal an R-squared of 0.112436. This means that the regression is able to explain 11% of the variables. The significance level of the F statistic is a test of whether the whole regression is worthwhile. Since the present study shows that the significance level of the F statistic is 0.000, the model is good and the independent variables interpret the dependent variable as well.

The constant coefficient value of -9.788700 means that the value of ROA = -9.788700 when all independent variables = 0.

The coefficient values of both CCC and DR are negatively associated with ROA and the probability values (P-value) of both CCC and DR are less than .05 which means that the relationship is significant. However, the coefficient values of both SIZE and SG are positively associated with ROA and the probability value of SIZE (0) is less than 0.05 which means that there is a significant relationship between SIZE and ROA. However, the probability value of SG (0.8068), more than 0.05, that indicates the relationship between ROA and SG is insignificant.

The main result of this model is the negative significant relationship between ROA and CCC. It is indicated by the negative value of the CCC coefficient that there is an inverse relationship between ROA and CCC. In other words, when the cash conversion cycle becomes longer, the profitability is reduced. The significant relation indicates a strong relationship between CCC and ROA. This result is consistent with the results of previous studies by Jose et al. (1996), Dong and Su (2010), Charitou et al. (2010), Teruel & Solano (2007), Deloof (2003), Mehta (2014), Kaur & Singh (2013), Gul et al. (2013) and Mohamad & Saad (2010).

The negative significant relationship between ROA and CCC leads to the rejection of the null hypothesis which states that there is an insignificant relationship between working capital management that cash conversion cycle and profitability. Therefore the alternate hypothesis that is there is a significant relation between working capital management that cash conversion cycle and profitability is accepted.

4.3.2. Regression Analysis of Model 2

The relationship between ICP and ROA is investigated in this study using the second model which is:

$$\mathbf{ROA_i = \beta_0 + \beta_1 ICP_i + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Table 4.5 shows the results of regression analysis of model2.

Table 4.5

Regression results of the relationship between inventory conversion period and profitability.

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-5.927113	4.474922	-1.324518	0.1863	
ICP	-0.000109	0.000125	-0.877637	0.3808	
SIZE	0.844024	0.360007	2.344466	0.0197	**
SG	0.000266	0.001931	-0.137642	0.8906	
DR	-0.079753	0.021689	-3.677113	0.0003	***

R-squared 0.042696 Adjusted R- squared 0.030914 Prob(F-statistic)0.006612

Notes: CCC represents the cash conversion cycle, ICP represent the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of the firm, SG represents sales growth and DR represents debt ratio.

The results of data analysis of model2 reveal: The R-squared = 0.042696. This means that the regression is able to explain 4.2% of the variables and the Prob(F-statistic)=0.006612 indicating that the model is good and the independent variables

interpret the dependent variable. The constant coefficient value = -5.927113**.** This means the value of ROA = -5.927113 when all independent variables = 0.

The coefficient values of both ICP and DR are negatively associated with ROA and the probability value (P-value) of DR (0.0003**)** is less than .05, which means that the relationship is significant. However, the probability value (P-value) of ICP (0.3808) is more than .05 which means that the relationship between ICP and ROA is insignificant.

However, the coefficient values of both SIZE and SG are positively associated with ROA and the probability value of SIZE = (0.0197) is less than 0.05 which means that there is a significant relationship between SIZE and ROA. However, the probability values of SG (0.8906) are more than 0.05 indicating that the relationship between ROA and SG is insignificant.

The main result of this model is the negative insignificant relationship between ROA and ICP. Inventory turnover in days also has an inverse relation with profitability. There will be an improvement to the performance of firms by keeping inventory for just a few days, as the performance of firms gets higher when the number of days of inventory is less. This result is however not statistically significant. This result is consistent with the findings of Teruel & Solano (2007), Charitou et al. (2010), Raheman and Nasr (2007), Lazaridis & Tryfonidis (2006), and Mathur et al. (2010).

Therefore**,** the negative insignificant relationship between ROA and ICP leads to an acceptance of the null hypothesis which states that there is an insignificant relationship between inventory conversion period and profitability.

4.3.3. Regression Analysis of Model 3

The relationship between RCP and ROA is investigated in this study using the third model which is:

$$\mathbf{ROA_i = \beta_0 + \beta_1 RCP_i + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Table 4.6 shows the results of regression analysis of model3.

Table 4.6

Regression results of the relationship between receivable collection period and profitability.

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-8.747238	2.673133	-3.272280	0.0012	***
RCP	-0.002235	0.000495	-4.512351	0.0000	***
SIZE	1.083644	0.211262	5.129382	0.0000	***
SG	3.31E-06	0.001461	0.002267	0.9982	
DR	-0.080603	0.015165	-5.315220	0.0000	***

R-squared 0.168043 Adjusted R- squared 0.157803 Prob(F-statistic)0.000

Notes: CCC represents the cash conversion cycle, ICP represents the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of the firm, SG represents sales growth and DR represents debt ratio.

The results of data analysis of model 3 reveal that the R-squared is 0.168043 which means the model able to explain 16.8 % of the variables. The Prob (F-statistic) = 0 indicating that the model is good and the independent variables interpret the dependent variable.

The constant coefficient value = -8.747238 and this means that the value of ROA = -8.747238 when all independent variables = 0.

The coefficient values of both RCP and DR are negatively associated with ROA and the probability values (P-value) of RCP =(0) that is less than .05 which means the relationship between ROA and RCP is significant . Similarly, the probability value (P-value) of DR = (0) that is less than .05 which means that the relationship between DR and ROA is significant.

However, the coefficient values of both SIZE and SG are positively associated with ROA and the probability values of SIZE = (0) that is less than .05 which means significant relationship between SIZE and ROA. The probability values of SG = (0.9982) more than 0.05 indicates that the relationship between ROA and SG is insignificant.

The main result of this model is that there is a significantly negative relationship between ROA and RCP showing that it is better for the firms to collect its receivables as

soon as possible for greater profitability. Therefore, profitability will grow when firms give less time to their customers for making payment. The same results were also found by Teruel & Solano (2007), Deloof (2003), Raheman et al. (2010), Mathur et al. (2010), Hayajneh & Yassine (2011), Gul et al. (2013), Tanringana & Afrifa (2013), Charitou et al. (2010), Lazaridis (2006) and Raheman and Nasr (2007).

The negative significant relationship between ROA and RCP leads to the rejection of the null hypothesis which states that there is an insignificant relationship between receivable collection period and profitability. The alternative hypothesis which states that there is a significant relationship between receivable collection period and profitability is therefore accepted.

4.3.4. Regression Analysis of Model 4

The relationship between PCP and ROA is investigated in this study using the fourth model which is:

$$\mathbf{ROA_i = \beta_0 + \beta_1 PCPi + \beta_2 SIZE_i + \beta_3 SG_i + \beta_4 DR_i + e_i}$$

Table 4.7 shows the results of regression analysis of model4.

Table 4.7

Regression results of the relationship between payable collection period and profitability

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-9.774219	2.742585	-3.563871	0.0004	***
PCP	-0.001335	0.000603	-2.213438	0.0276	**
SIZE	1.119022	0.217328	5.149010	0.0000	***
SG	0.000344	0.001446	0.237789	0.8122	
DR	-0.071081	0.015511	-4.582677	0.0000	***

R-squared 0.114245 Adjusted R- squared 0.103344 Prob(F-statistic) 0.000

Notes: CCC represents the cash conversion cycle, ICP represents the inventory conversion period, RCP represents receivable collection period, PCP represents payable collection period, SIZE represents total assets of the firm, SG represents sales growth and DR represents debt ratio.

The results of data analysis of model 4 reveal: The R-squared = 0.114245. This means that the model is able to explain 11.4 % of the variables and the Prob(F-statistic) = 0 indicates that the model is good and the independent variables interpret the dependent variable . The constant coefficient value = -9.774219 and that means the value of ROA = -9.774219 when all independent variables = 0.

The coefficient values of both PCP and DR are negatively associated with ROA and the probability values (P-value) of PCP = (0.0276) that is less than .05 which means that the relationship between ROA and RCP is significant. Additionally, the probability values

(P-value) of DR = (0**)**, that is less than .05, which means that the relationship between DR and ROA is significant.

However, the coefficient values of both SIZE and SG are positively associated with ROA and the probability values of SIZE = (0) that is less than .05 which means a significant relationship between SIZE and ROA. The probability values of SG = (0.8122) that is more than 0.05 indicates that the relationship between ROA and SG is insignificant.

The result of this model shows a significant negative relationship between ROA and PCP. This indicates that the firms gain more profits when they pay the accounts payable more quickly. Moreover, a more important difference to the profitability is made by accounts payable management practices presumably because of the minimization of late payment costs like late payment penalties, interest charges, and lost prompt-payment discounts. The same result is consistent with those of Teruel & Solano (2007), Tanringana & Afrifa (2013), Jose et al. (1996), Deloof (2003) and Padachi (2006).

The negative significant relationship between ROA and PCP thus leads to the rejection of the null hypothesis which states that there is an insignificant relationship between payable collection period and profitability. The alternative hypothesis is there is a significant relationship between payable collection period and profitability is thus accepted.

For the control variables for all models, financial debt ratio is used in this study as a proxy for leverage. It shows a significant negative relationship with the dependent variable, meaning that, when the firm's leverage grows, its profitability decreases.

Therefore, construction firms with high leverage may experience lower profit as a result of high interest charges they pay on their borrowings as shown by the significant negative relationship between debt ratio and profitability.

The results which show a positive and significant relationship between firm size and profitability indicate that there is a tendency of larger sized firms to be more profitable. Lastly, the results show a positive, but an insignificant relationship between SG and profitability. This is consistent with the previous studies which used these control variables such as in Gul et al. (2013) and Charitou et al. (2010).

4.4. Conclusion

The results of this study are discussed in this chapter with the main findings shown in Table 4.8

Table 4.8

Summary of results

Variables	**Hypothesis**	**Correlation with ROA**	**Relationship with ROA**	**Decision**
CCC	H_o: $\beta_1=0$ H_1: $\beta_1\neq0$	negative	significant	Reject the null hypothesis and accept the alternative
ICP	H_o: $\beta_2=0$ H_1: $\beta_2\neq0$	negative	insignificant	Not reject the null hypothesis
RCP	H_o: $\beta_3=0$ H_1: $\beta_3\neq0$	negative	significant	Reject the null hypothesis and accept the alternative
PCP	H_o: $\beta_4=0$ H_1: $\beta_4\neq0$	negative	significant	Reject the null hypothesis and accept the alternative

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.0. Introduction

This study is conducted to investigate the relationship between working capital management and firm's profitability. To achieve this purpose, four questions have to be answered. Each question is measured through data which is processed through statistical regression. The results are analyzed so that the objectives of the study are fulfilled. The objectives of this study are:

1. To determine the relationship between cash conversion cycle and Malaysian construction firms' profitability.
2. To determine the relationship between inventory conversion cycle and Malaysian construction firms' profitability.
3. To determine the relationship between receivable collection period and Malaysian construction firms' profitability.
4. To determine the relationship between payable collection period and Malaysian construction firms' profitability.

This chapter provides the overall summary of the results and conclusion. It is divided into four sections. The first section contains a summary of the discussion. The second section includes the conclusion and recommendations of the study. The third section

provides the limitation of the study. The fourth section includes recommendations for future research.

5.1. Summary of the Results

The study investigates the impact of working capital management (WCM) on profitability of construction firms in Malaysia for duration of eleven years, from 2002-2012. Return on assets is used as the dependent variable in order to determine the effect of working capital management on the firm's profitability. Independent variables applied are cash conversion cycle, number of day's inventory, number of days account receivable, and number of days account payable. Control variables are also used. They are firm size, growth in sales, and debt ratio. A balanced panel data of 30 Malaysian construction companies are used to study the impact of WCM on firm's profitability.

Results of correlation analyses show that inventory conversion period, average collection period, number of day's accounts payable and cash conversion cycle all have an inverse relation to firms' profitability. On the other hand, the control variables of size and growth in sales have a positive influence on profitability. In contrast, the debt ratio has a negative impact on profitability.

The results of regression analysis also show a negative significant relationship of receivable collection period, number of day's accounts payable and cash conversion cycle with profitability; however, there is a negative insignificant relationship between inventory conversion period and profitability.

A significant negative relationship is found between debt ratio and profitability, while there is a positive significant association between size of firm and profitability. However, there is a positive and insignificant relationship between sales growth and profitability.

5.2. Conclusion and Recommendations

Working capital management greatly affects the profitability of the construction firms in Malaysia. When the firms have low working capital, they have a higher return on assets. The components of working capital management are also found to heavily affect the Malaysian construction firms' profitability. The firms with a low inventory conversion period, low receivable collection period and low payable collection period have all shown to have a higher profitability. These findings suggest that construction firms in Malaysia can improve their profitability by shortening the inventory conversion period, cash conversion cycle, the receivable collection period and the payable collection period.

Both of receivable collection period and payable collection period have the highest impact on the profitability of the construction firms due to the significant relationships with a profitability that are shown by the results.

The recommendation of this study for the construction firms in particular, and for other firms in general, is that they could improve profitability by decreasing the cash

conversion cycle by means of reducing the inventory conversion period by processing them and quick sale of the products. Additionally, cash conversion cycle can be decreased by decreasing average collection period, which can be done by speeding receivables reception to reduce the number of days required to collect the receivable as much as possible.

Because of the negative significant relationship between profitability and cash conversion cycle, receivable collection period and payable collection period, construction companies should also increase their profitability by giving due concentration on management of the working capital and decreasing the length of the cash conversion cycle by effectively managing the working capital components, especially the payables and receivables. Firms are required to focus and develop their collection and payment policy. Effective policies have to be formulated for the individual components of working capital.

5.3. Recommendation for future research

Due to the limitation in the scope of the study that comprises only 30 listed construction companies in Malaysia, the results of the study may not be applicable to other sectors. The recommendation for future research is:

To extend this study by including all sectors listed on Bursa Malaysia.

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Appendix

Model1

Dependent Variable: ROA
Method: Panel EGLS (Cross-section weights)
Date: 05/17/14 Time: 20:07
Sample: 2002 2012
Periods included: 11
Cross-sections included: 30
Total panel (balanced) observations: 330
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.788700	2.768839	-3.535309	0.0005
CCC	-0.000229	9.56E-05	-2.393285	0.0173
SIZE	1.123474	0.219534	5.117549	0.0000
SG	0.000349	0.001426	0.244737	0.8068
DR	-0.075804	0.015508	-4.888143	0.0000

Weighted Statistics

R-squared	0.112436	Mean dependent var	5.393939
Adjusted R-squared	0.101512	S.D. dependent var	7.493253
S.E. of regression	6.331295	Sum squared resid	13027.72
F-statistic	10.29271	Durbin-Watson stat	0.990340
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.037970	Mean dependent var	3.177909
Sum squared resid	13322.71	Durbin-Watson stat	1.577171

Model2

Dependent Variable: ROA
Method: Panel EGLS (Cross-section weights)
Date: 05/17/14 Time: 20:08
Sample: 2002 2012
Periods included: 11
Cross-sections included: 30
Total panel (balanced) observations: 330
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.864460	2.774678	-3.555173	0.0004
ICP	-0.000201	0.000101	-1.994232	0.0470
SIZE	1.123866	0.220080	5.106620	0.0000
SG	0.000439	0.001437	0.305470	0.7602
DR	-0.074418	0.015526	-4.792989	0.0000

Weighted Statistics

R-squared	0.106952	Mean dependent var	5.381817
Adjusted R-squared	0.095961	S.D. dependent var	7.478765
S.E. of regression	6.336950	Sum squared resid	13051.01
F-statistic	9.730579	Durbin-Watson stat	0.977561
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.035865	Mean dependent var	3.177909
Sum squared resid	13351.86	Durbin-Watson stat	1.568245

Model3

Dependent Variable: ROA
Method: Panel EGLS (Cross-section weights)
Date: 05/17/14 Time: 20:11
Sample: 2002 2012
Periods included: 11
Cross-sections included: 30
Total panel (balanced) observations: 330
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.747238	2.673133	-3.272280	0.0012
RCP	-0.002235	0.000495	-4.512351	0.0000
SIZE	1.083644	0.211262	5.129382	0.0000
SG	3.31E-06	0.001461	0.002267	0.9982
DR	-0.080603	0.015165	-5.315220	0.0000

Weighted Statistics

R-squared	0.168043	Mean dependent var	5.491068
Adjusted R-squared	0.157803	S.D. dependent var	7.727776
S.E. of regression	6.281716	Sum squared resid	12824.49
F-statistic	16.41125	Durbin-Watson stat	1.051335
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.058418	Mean dependent var	3.177909
Sum squared resid	13039.53	Durbin-Watson stat	1.628908

Model 4

Dependent Variable: ROA
Method: Panel EGLS (Cross-section weights)
Date: 05/17/14 Time: 20:12
Sample: 2002 2012
Periods included: 11
Cross-sections included: 30
Total panel (balanced) observations: 330
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.774219	2.742585	-3.563871	0.0004
PCP	-0.001335	0.000603	-2.213438	0.0276
SIZE	1.119022	0.217328	5.149010	0.0000
SG	0.000344	0.001446	0.237789	0.8122
DR	-0.071081	0.015511	-4.582677	0.0000

Weighted Statistics

R-squared	0.114245	Mean dependent var	5.384630
Adjusted R-squared	0.103344	S.D. dependent var	7.528265
S.E. of regression	6.335856	Sum squared resid	13046.50
F-statistic	10.47970	Durbin-Watson stat	0.968939
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.038453	Mean dependent var	3.177909
Sum squared resid	13316.02	Durbin-Watson stat	1.564582

Descriptive

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	330	-43.220	39.340	3.17791	6.487898
CCC	330	-540.000	49391.000	998.72424	2937.882287
ICP	330	16.000	47248.000	940.71818	2839.040038
RCP	330	14.000	8736.000	245.82727	526.391533
PCP	330	2.000	6593.000	187.82121	420.131389
SIZE	330	9.410	16.040	12.92739	1.092465
SG	330	-93.990	2254.710	29.41964	183.229249
DR	330	.000	85.130	21.25639	18.206279
Valid N (listwise)	330				

Correlations

Correlations

		ROA	CCC	ICP	RCP	PCP	SIZE	SG	DR
ROA	Pearson Correlation	1	-.044	-.030	-.137*	-.066	.042	.012	-.158**
	Sig. (2-tailed)		.421	.584	.013	.235	.445	.833	.004
	N	330	330	330	330	330	330	330	330
CCC	Pearson Correlation	-.044	1	.995**	.866**	.819**	.016	-.046	-.078
	Sig. (2-tailed)	.421		.000	.000	.000	.778	.406	.160
	N	330	330	330	330	330	330	330	330
ICP	Pearson Correlation	-.030	.995**	1	.834**	.841**	.029	-.046	-.059
	Sig. (2-tailed)	.584	.000		.000	.000	.600	.402	.287
	N	330	330	330	330	330	330	330	330
RCP	Pearson Correlation	-.137*	.866**	.834**	1	.833**	-.035	-.060	-.073
	Sig. (2-tailed)	.013	.000	.000		.000	.531	.275	.188
	N	330	330	330	330	330	330	330	330
PCP	Pearson Correlation	-.066	.819**	.841**	.833**	1	.043	-.067	.055
	Sig. (2-tailed)	.235	.000	.000	.000		.432	.223	.322
	N	330	330	330	330	330	330	330	330
SIZE	Pearson Correlation	.042	.016	.029	-.035	.043	1	.007	.440**
	Sig. (2-tailed)	.445	.778	.600	.531	.432		.896	.000
	N	330	330	330	330	330	330	330	330
SG	Pearson Correlation	.012	-.046	-.046	-.060	-.067	.007	1	-.071
	Sig. (2-tailed)	.833	.406	.402	.275	.223	.896		.198
	N	330	330	330	330	330	330	330	330
DR	Pearson Correlation	-.158**	-.078	-.059	-.073	.055	.440**	-.071	1
	Sig. (2-tailed)	.004	.160	.287	.188	.322	.000	.198	
	N	330	330	330	330	330	330	330	330

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Samples:

The names of the construction firms that were included in this study are as listed below:

1. A & M REALTY BERHAD
2. ASIAN PAC HOLDINGS
3. BERTAM ALLIANCE
4. COUNTRY VIEW BHD
5. DUTALAND BHD
6. ENCORP BERHAD
7. GLOBAL ORIENTAL BHD
8. FARLIM GROUP
9. HUA YANG BHD
10. I-BERHAD
11. IJM LAND BHD
12. KELADI MAJU BERHAD
13. KEN HOLDINGS BERHAD
14. LBI CAPITAL BHD
15. LBS BINA GROUP BHD
16. MAGNA PRIMA BERHAD
17. MALAYSIA PACIFIC
18. MEDA INCORPORATED
19. MKH BHD
20. MULPHA LAND BHD

21. ORIENTAL INTEREST

22. PJ DEVELOPMENT HLDGS

23. PARAMOUNT CORP BHD

24. PASDEC HOLDINGS

25. PETALING TIN BERHAD

26. SBC CORPORATION BHD

27. SELANGOR DREDGING

28. SP SETIA BHD

29. Y&G CORPORATION

30. YNH PROPERTY BHD