

THE IMPACT OF CAPITAL INVESTMENT ON WORKING CAPITAL
MANAGEMENT

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Dedicated to those who stand still with me on completion of this dissertation.

A little thing from you always a great deal for me

Forever.

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ABSTRACT

This study investigates the impact of capital investment (CI) on net liquidity balance (NLB) as well as working capital requirement (WCR) that measures working capital management (WCM) in Malaysia's technology sector. It is contended among the financial researchers that WCM effectiveness could be increased through wise decision and monitoring of the CI. CI offers organization enormous opportunity and benefit to increase the future profitability and capitalize the growth opportunities. However, the previous literatures have not adequately addressed the dependency of NLB and WCR on CI in Malaysia, especially technology sector. Technology sector activity receives strong support and encouragement from government agencies which at the same encounter funding limitations. The objectives of the study were addressed based on panel data collected from annual financial reports of technology sector firms in Malaysia which are listed on the main board of Bursa Malaysia covering from the year 2007 to 2011. First, the study suggests that CI and WCM have negative relationship that contributes to the existing study based on liquidity-profitability theory. Second, the findings demonstrate that NLB is negatively dependent on CI since technology firms has high tendency on operating the WCR. Finally, positive impact of CI on WCR signifies that firms with CI promotes more on WCR to ascertain the firm's liquidity level and simultaneously create value from liquid assets. The finding indicates that WCM is dependent on CI in Malaysia's technology sector as short-term financial management is a result of long-term investment decision. Practical implications suggested that understanding on the impact of CI on WCM in the technology sector in Malaysia will enlighten the financial manager's burden during the decision making process between WCR and NLB. This eventually contributes to the nation's growth by means of CI to capitalize future profitability in the technology sector.

ABSTRAK

Kajian ini menyiasat kesan pelaburan modal (CI) keatas baki tunai bersih (NLB) dan keperluan modal kerja (WCR) yang mengukur pengurusan modal kerja (WCM) dalam sektor teknologi di Malaysia. Para penyelidik beranggapan bahawa keberkesanan WCM boleh ditingkatkan melalui keputusan yang bernas dan pemantauan terhadap CI. CI menawarkan organisasi peluang dan manfaat yang besar bagi meningkatkan keuntungan masa depan dan pada masa yang sama mengambil kesempatan terhadap peluang pertumbuhan yang wujud. Walaubagaimanapun, penyelidikan sebelum ini, tidak mengkaji kebergantungan NLB dan WCR terhadap CI di Malaysia, terutamanya sektor teknologi. Aktiviti sektor teknologi mendapat sokongan dan galakkan daripada agensi kerajaan tetapi pada masa yang sama sektor teknologi berhadapan dengan kesempitan kewangan. Objektif kajian ini dicapai melalui data yang dikumpul daripada laporan kewangan tahunan firma di sektor teknologi di Malaysia yang tersenarai di papan utama Bursa Malaysia daripada tahun 2007 hingga 2011. Pertama, kajian ini mencadangkan bahawa CI dan WCM mempunyai hubungan negatif, dimana ini menambah ilmu kepada kajian yang sedia ada berdasarkan teori kecairan-keuntungan. Kedua, penemuan kajian menyatakan bahawa NLB bergantung kepada CI secara negatif kerana firma teknologi lebih cenderung terhadap operasi WCR. Akhir sekali, kesan positif CI terhadap WCR menandakan bahawa firma lebih menggalakkan WCR untuk memastikan tahap kecairan firma dan pada masa yang sama mewujudkan nilai daripada aset yang cair. Ini menyimpulkan bahawa, CI mempunyai kesan ke atas WCM dalam sektor teknologi di Malaysia dimana, pengurusan kewangan jangka pendek adalah kesan daripada keputusan pelaburan jangka panjang. Implikasi praktikal mencadangkan bahawa pemahaman mengenai kesan CI pada WCM dalam sektor teknologi di Malaysia akan mengurangkan beban pegawai kewangan semasa proses membuat keputusan antara NLB and WCR. Akhirnya, ini akan menyumbang kepada pertumbuhan negara untuk mencapai keuntungan potensi dalam sektor teknologi melalui pelaburan modal.

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LIST OF ABBREVIATIONS

ACP	-	Average collection period
ADMPROD	-	Administrative cost per unit sales
APP	-	Average payment
CACLR	-	Current asset to current liability ratio
CAPM	-	Capital asset pricing model
CATAR	-	Current asset to total asset ratio
CCC	-	Cash conversion cycle
CLTAR	-	Current liability to total asset ratio
CR	-	Current ratio
CPEX	-	Capital expenditure
CONS	-	Constant
DTAR	-	Debt to asset ratio
DV	-	Dependent variable
FIEX	-	Finance expenditure
GFC	-	Global financial crisis
GRW	-	Growth
IT	-	Information Technology
IV	-	Independent variable
LABPROD	-	Sales per employee
LVR	-	Leverage
NLB	-	Net liquidity balance
NWC	-	Net working capital
OIBDP	-	Operating income before depreciation
OCAF	-	Operating cash flow
OPEX	-	Operating expenditure
ROA	-	Return on asset
ROE	-	Return on earning
ROI	-	Return on investment
R&D	-	Research and development
SIZE	-	Firm size
SMEs	-	Small medium enterprises
U.S	-	United States
WC	-	Working capital
WCM	-	Working capital management
WCR	-	Working capital requirement

CHAPTER 1

INTRODUCTION

1.1 Overview of Study

Financial management was established based on inspiration that management teamwork on the shareholders objective which is to maximize the shareholders wealth. A considerable portion of financial manager's working days is depleted in the decision making process between liquidity and profitability. Most of the time, management has to act in shareholders' interest and conflict may arise as shareholders putting the firm in risky condition. Many of the short-term financial management decisions are the result of decisions made on long-term financing policy. This indicating that short-term financial management is crucial as once implemented it essentially determined the firm's future profitability.

1.2 Background of Study

Monetary crisis globally has burst through in September 2007 and affected the real economy by directly reduced the level of credit supply in the corporate world

(Ahmad, 2010). Constraint in getting hold of external funds had directed to the high cost of external funding for the firm (Nambiar, 2010). Thus, investment fund availability can be achieved by liquidation of current asset or generating more operating cash inflow. However, above mentioned ways are influenced by daily operations which are uncontrollable by firm (Fazzari and Petresen, 1993). Hence, liquidity position of the firm is sourced from working capital (WC) which at the same time, the WC can be used for the capital investment if firm faced financial constraint. Apparently, working capital management (WCM) is an important concern in corporations. Hence, understanding the WCM principle will create the efficient environment in managing the WC for the interest of the firm to survive for a longer period of time (Akinlo, 2012).

According to Brealey *et al.* (2011), corporate finance involves two great decisions, which is the financial and investment decision. Those great decisions strongly interrelated with WCM, which has a strong impact on profitability and liquidity of the company (Hill *et al.*, 2010). Thus, WCM is treated as an important component in corporate finance. Appuhami (2008) mentioned that WCM is an important portion as it deals with current asset and current liability, whereby the return of investment (ROI) generated from investments may be adverse if the level of the current assets is excessive. In addition, if an appropriate level of current assets is not maintained within the company, it can lead to disruption of the company's day-to-day operation as corporation faced rapid changes due to globalization.

Corporation's short-term capital needs is derived from WCM, and efficient management of WC is challenging in the uncertain economic condition (Polak, 2013). Growth opportunities are usually seen as the long-term needs of the firms. On the other hand, Appuhami (2008) looked at the current asset as fund tied-up in WC that can be converted to capital investment for growth strategies. Most of the firms are not aware of the factors that lead to efficient WCM in the short-term (Bellouma, 2011) which will also lead to future growth with the right amount of profitable capital investment in the long-term (Eisner, 1978; Ali and Khan, 2011). Explicitly said, WCM efficiency helps the firms' long-term future growth via capital

investment. Sufficient focus on variables that affecting the WCM can enhance knowledge on controlling liquidity level that eventually can embrace firms' growth. However, rigorous focus on liquidity may minimize the profitability and on the other hand, focusing more on profitability may affect the firms' liquidity position (Mathuva, 2010).

Above has acknowledged the importance of capital investment on firm's growth which is a magnitude of small and growing countries like Asian countries (Park and Pincus, 2003). The Asian countries which are striving for growth especially developing countries such as Malaysia has ventured technology sector considerably to decimate poverty at first (Mani and Bartzokas, 2002). This study will bridge the gap in the Malaysia literature on capital investment and WCM. It is crucial as Malaysia's firms has tendency to maintain high liquidity for profit generation and take up longer time period for financial managers to monitor the liquidity position of the firm (Mohamad and Mohd Saad, 2010). On meeting the repayment, inadequate cash flow position leads firms in Malaysia to face financial distress as firm unable to pay their short-term financial obligations (Abdullah *et al.*, 2008).

1.3 Malaysia Development Towards Technology Sector

Malaysia in general regarded as one of the most successful non-western countries to have achieved a moderately smooth transition from conventional to modern economic activity based growth (Onn, 1989). The plantation revolution productions are not capital intensive where the multi-racial economic development before 1970's by colonial politics does not harmonizing the equality of income among the three main ethnics.

New Economy Policy (NEP) established on year 1969 to develop range of export-oriented manufacturing industries such as textiles, electrical and electronic goods and rubber products. The high attention is alerted from agricultural sector to manufacturing sector. Overall, the production prior year 1990's is in the pre-modern economy and was relatively small in volume as well as technologically undeveloped (Lim, 1983). The industrialization required larger supplies of raw materials and capital investment to support the growing opportunity in Malaysia (Onn, 1989).

Subsequently, the transformation of Malaysian economy that was in evidence by the early 1990s took place when the Malaysia's Prime Minister Dato' Seri Dr. Mahathir Mohamad path the Vision 2020. The evolution of Malaysia technology began with various projects such as Multimedia Super Corridor, K-economy, Silicon Valley and ICT Cluster. The increasing trend of growth rate identified since year 2005 in Malaysia technology sector. Currently, Malaysia technology sector became one of the most top performing sectors which are growing in double digit and this sector expected to provide 43,000 employment opportunity by year 2020 (Insider Malaysia, 2012). Thus this indicating that technology sector is an imperative sector that needs superior financial management.

1.4 Problem Statement

WCM requires a troublesome decision making process. Hence, financial manager should monitor closely the day-to-day operation within the firm to match between the source of fund and the required funds in different time period and synchronized it. Capital investment is more widely seen as strategic investment decisions (Ozbebek *et al.*, 2011). Managers spend enormous attention and time to make a capital investment decision as it incurred high expenses and irretrievable (Appuhami, 2008). The decision-making process on different WC components has become frequent and time-consuming. The efficient WCM decision will lead a firm

to react quickly and appropriately to unanticipated changes in market variables such as fluctuation in interest rates and raw material prices furthermore gain competitive advantages over its rivals (Appuhami, 2008). Thus, it is very important for an organization to understand the relationship between capital investment and WCM for better decision making process.

Sagan (1955) and Akinlo (2012) noted that the health of the firm could be affected by inefficient WCM and eventually dragged the firm into bankruptcy. As per Malaysia Department of Insolvency, total 405 of corporate wound-up on year 2011 and the business failure is due to financial constraint (MDI, 2011). Not all the firms that have cash - flow problem are unprofitable firms. The cash-flow problem may be due to cash tied up in other assets such as current assets (Horne and Wachowicz, 2000). On the other hand, inadequate current assets may lead to a shortage of cash. The level of shortage or excessive of near cash items are known as net liquidity balance (NLB) position in a firm which is a main focus in the WCM (Maness and Zietlow, 2005) and NLB should meet its short-term compulsions (Bhunia *et al.*, 2012). Funds tied up in WC can be seen as hidden reserves that can be used to fund capital expansion for growth strategies, which is also known as working capital requirement (WCR). WCR is also known for value creation as well as for sustaining firm's liquidity (Hill and Sartoris, 1992). A profitable capital investment can take place if the firm understands the impact of capital investment on WCR and NLB, which eventually achieve the desired tradeoffs between WCR and NLB (Raheman and Nasr, 2007).

There is a negative relationship between liquidity and profitability (Eljelly, 2004), thus it is vital to understand how the capital investment impacts the NLB and WCR as it is quite necessary for firms' survival within the context of WCM (Aminu, 2012). Based on liquidity-profitability tradeoffs theory in WC, Eljelly (2004) stated the efficient liquidity management is crucial for firm's profitability action. Evidence on the impact of capital investment on WCM has been established focusing on listed companies in the Thailand Stock Exchange (Appuhami, 2008), export of small and medium enterprises (SMEs) in Tunisia (Bellouma, 2011) and on the whole industries listed (large and small firms) on Tehran Stock Exchange (Valipour *et al.*, 2012). The

studies based on this theory are narrow and to date, there has been no study conducted specifically targeting the impact of capital investment on WCM in the technology sector. Study on technology sector is important in Malaysia as the Ministry of Science, Technology and Innovation (MOSTI) has recognized that research and development (R&D) as well as technological innovations are essential tools in the Malaysian government's growth strategy (Inside Malaysia, 2012). This may stimulate to excessive capital investment in technology sector. Thus, the above relationship identification predicted to give a better understanding on avoidance of excessive investment in capital investment that impact the decisions on WCM. The finding with reference to the impact of capital investment on WCM in this study may disclose whether the Malaysia technology sector over emphasis on capital investment that leads to efficient or inefficient WCM.

Since the relationship between corporate investment and cash flow had a tumultuous history (Carpenter and Guariglia, 2008), this study is engaged to answer questions on "what is the impact of capital investment on WCM in technology sector?" This study is essential because liquidity of technology sector is critical since it's strongly relates to extensive capital investment in Malaysia technology sector (Ali, 1992). Technology sector facing financial constraint even though technology sector is the major source of innovation, business development and growth of a nation (Coleman and Robb, 2011). Securing funds at lower cost especially long-term fund is difficult for the technology sector and it is challenging for the technology sector to sustain continuous growth (Colombo and Grilli, 2007). Moreover, low level of tangible asset in technology sector firms tumbling the opportunity of the firms to obtain funding with collateral, since it is difficult to establish the monetary value and forecast on intellectual capital rather than on the physical assets of the firm (Coleman and Robb, 2011). Kasisomayajula (2012) found that the technology sector strive for efficient WCM to lower their operating cost and at the same time release the fund tied up in WC for further investment as external funding for long term is costing. Hence, an understanding on relation of capital investment with WCM, capital investment impact on NLB and WCR enable the firm as well as the industry to carry out capital investment as per the firm's needs between liquidity and profitability.

1.5 Purpose of Study

The purpose of this study has its basis from the issues mentioned in problem of statement. Firms are facing problem in managing their WC to embrace between liquidity and profitability, due to the funds availability constraints in the firm (Fazzari *et al.*, 1987; Carpenter and Guariglia, 2008). Above issue has urged to conduct this study as capital investment can be financed by adjustments in WC (Shulman and Cox, 1985; Appuhami, 2008).

Preceding studies resting on the impact of capital investment on WCM measures have shown a understanding on other countries such as study conducted on computer firms in U.S (Shulman and Cox, 1985), across industries in Thailand (Appuhami, 2008), SMEs in Tunisian (Bellouma, 2011), across industries in Iran (Valipour *et al.*, 2012) and cement, sugar and energy industries in Pakistan (Raheman *et al.*, 2012). This study is conducted similarly on the same ground in Malaysia to further the understanding on technology sector. Enhanced understanding of technology sector's capital investment in Malaysia is essential since technology sector plays important role in influencing economic development (Massa and Testa, 2008). Based on best researcher's knowledge, there is no study has been conducted on this ground with reference to the technology sector in Malaysia.

Therefore, this study aims to enlighten the understanding on the impact of capital investment with WCM and how it relates to liquidity as well as profitability. Besides, this study predicted to enlighten the financial officer's burden due to rapid changes faced by technology sector which has strong growth opportunities. There are firms that struggle to manage WC since there is no sufficient understanding on elements of capital investment that have impacts on NLB and WCR. Sound liquidity management may avoid serious problem such as corporate insolvency (Kasisomayajula, 2012). On top of that, this study is crucial as a high number of corporate insolvencies had been recorded in Malaysia. Ultimately, finding is expected to be useful for benchmarking and performance evaluation on NLB and

WCR of a firm, which gives more information on effective decision-making activity on capital investment and WCM.

1.6 Research Objective

The objectives of this study have its foundation from the purpose mentioned. The study on the impact of capital investment on WCM and its relation will authenticate the liquidity- profitability tradeoffs theory in WC. This study is based on theoretical background on liquidity profitability tradeoffs which enables the firm to notice future uncertainty due to capital investment (Smith, 1980). The result of prior studies have been mixed and contradictory which obtained from different sectors. However, as the existing literature (e.g: Shulman and Cox, 1985; Appuhami, 2008; Beloumma, 2012; Valipour *et al.*, 2012; Raheman, 2012) does not fully address the issues in the technology sector in a developing country. Therefore, the main objectives of this study are:

- 1) To identify the relationship between capital investment and WCM in Malaysia technology sector.
- 2) To study the impact of capital investment on NLB in Malaysia technology sector.
- 3) To study the impact of capital investment on WCR in Malaysia technology sector.

1.7 Research Question

The study focuses on the impact of capital investment on NLB and WCR of technology sector firms in Malaysia that may face fund constraints due to capital

market imperfections. Prior to that, this study identifies the relationship of capital investment with WCM technology based sector in Malaysia. Hence, the focal research questions addressed as per below:

- 1) What is the relationship of capital investment with WCM in Malaysia technology sector?
- 2) How capital investments impact the NLB in Malaysia technology sector?
- 3) How capital investments impact the WCR in Malaysia technology sector?

1.8 Justification on Technology Sector

Demand for both liquidity and fixed asset investments differ across industries (Suto, 2003). Technology sector holds a substantial amount of fixed asset especially intangible assets compared to current asset due to higher growing opportunity in the technology sector (Mani and Bartzokas, 2002) where this has lead to higher operating and finance expenditure. Asymmetric information is one of main capital market imperfections. Capital market does not have sufficient knowledge on new technology and most of the time technology sector limits the amount of information to potential financier due to secrecy of technology (Carpenter and Peterson, 2002). On top of that, technology sector face hurdle to use intangible asset as collateral to raise long-term funding in lower cost due to the uncertainty of the future success of the firm and the difficulty in evaluating the monetary value of intangible assets. Evidenced by Wong (2012), larger firms are less dependent on debt financing in developing countries and strongly evidenced by Carpenter and Peterson (2002) that even developed country does not have well-developed external equity financing for technology financing. As the Asia bond market is still at the beginning stage, the data collected from year 2007 to year 2011 is reflecting that Malaysia technology sector is still dependable on short-term debt prior glance for long-term debt. As Asian countries increasingly begun to compete on the basis of knowledge and

technology since the year 2005 (OECD, 2007), Malaysia had shifted the investment focus more on high-technology and capital intensive industries (The Star, 14 March 2012). The understanding of the impact and relation of capital investment and WCM is crucial for promising business growth without fully depending on capital market.

1.9 Significance to the Field

Based on the description of the above objectives, therefore the importance of this study is described. In short-term, the firms are managing the factors that lead to efficient WCM. However, as company involve in long-term investment decision, the understanding on dependency of WCM on capital investment is important to realize future growth. This will help the current and prospective manager to make better profitable investment decision. The growth of the firm could take place if there is the right amount of profitable capital investment occurred in the firm.

Fund constraint for investment requires the chief financial officer to spend longer time on administration of current asset in the WCM (Horne, 1989; Bhunia and Khan, 2011). On top of that, high level of capital investment involved in technology based sector with intangible assets (Coleman and Robb, 2011). Study regard to technology sector's capital investment and WCM in context of Malaysia is very scarce. The best model identified in this study can be used as benchmark on decision-making process based on capital investment and WCM.

1.10 Scope of Study

In order to limit the scope of study, the capital investment and WCM variables are based on screening criteria as per below:

- Scope one : Firms established in Malaysia.
- Scope two : Firms have been listed on the main board of Bursa Malaysia.
- Scope three : Firms listed under technology sector.
- Scope four : Financial statement available from year 2007 to 2011.

The time frame of study is five years as it is considering any infrequent event that might exist in the firms, whereby short period of time is not appropriate to generalize and conclude the finding. The reason for restricting the time period of five years was due to the availability of data for these years for sample size of 23 firms. On top of that, the 9th and 10th Malaysia Plan has emphasized technology sector for these years as per below:

a) Under 9th Malaysia Plan (2006-2010), the government provided funding allocation of RM5.3 billion for science, technology and innovation initiatives whereby 68% of the funding allocations are for R&D, technology acquisition and commercialization of research. Besides, RM200 million was provided to industrial training institutes and advanced technology training centre (EPU, 2006).

b) As per 10th Malaysia Plan (2011-2015), the government had announced to expedite the implementation of high-speed broadband with a total cost of RM11.3 billion. In line to intensify green technology, RM20 million was allocated for awareness activity and in conjunction announced by the Prime Minister, that measure will be taken to develop intellectuals in science and technology. The RM504 million allocated to build and upgrade equipment at

industrial training institutes and advanced technology training centre (EPU, 2011).

1.11 Research Layout

Chapter 1 had given brief explanations on the financial management and what are the problems faced in firms WCM. Later the focus transmit on the components of the study; it contains the problem of statement, purpose of study, objective of the study, the research question, the justification on technology sector and the significance of this study. The scope study was discussed, based on the time period of study and sector of study chosen.

Chapter 2 starts with exposing the current condition of firm in term of attention on WCM and its components. The review is inclusive the importance of WCM and factors affecting WCM. Besides, studies on WCM and profitability explored. On top of that, the elements of capital investment are presented in this chapter with the evolution of technology sector in Malaysia. This chapter also has listed out the empirical studies on WCM and presented theoretical background. Subsequently, review has been done on studies that examine the impact of capital investment on WCM.

Chapter 3 recognized research framework which is supported by the theoretical background. Subsequently, the hypotheses are built to test the results presented by the literature reviews. On top of that, this chapter provides research design which is an explanatory research as it describes the cause and the effect of independent and dependent variables. This study is to be conducted in Malaysia with secondary data analysis which is obtained from the Bursa Malaysia. Collection and analysis procedures of the above data are described in this chapter.

Chapter 4 documented the result of data analysis conducted on 115 firm-year observations in STATA. Initially, the data were analyzed to display in systematic way as per descriptive analysis. Next the data was analyzed according to the assumption made in regression analysis. Finally, the correlation and regression analysis was conducted on the panel data set and interpreted.

Chapter 5 discusses the result obtained in detail via the objectives mentioned in chapter 1. Later in this chapter, discussed on the reason of similarity and dissimilarity of the findings compared to literature review that presented in chapter 2. Next, the contribution of this study and limitation of this study is explained in detail. Ultimately this chapter presents recommendation of future potential research and conclusion of this study has been made.

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