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DETERMINANTS OF WORKING CAPITAL MANAGEMENT BEFORE, DURING, AND AFTER THE GLOBAL FINANCIAL CRISIS OF 2008: EVIDENCE FROM MALAYSIA

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ABSTRACT

Financial crisis that hit the economic standing in 2008 has put the blame on the mismanagement of the working capital of firms. Empirical evidences highlight the importance of efficient and sound working capital management thus managers should therefore be alert and sensitive on the factors affecting working capital management to improve firm's performance in order to stay resilient. Nevertheless, limited studies have been done on this matter and is very much pronounced in the East Asian countries, despites the fact that these countries are the worst affected by the crisis. Malaysia is no exception in suffering from the turmoil thus it is paramount to examine the influencing factors of working capital management especially before, during and after a financial crisis in Malaysia. A panel regression is employed on a financial data of 57 Malaysian listed firms from 2002-2012. The study period is divided into three different scenarios, 2002-2006 (before the crisis), 2007-2008 (during the crisis) and 2009-2012 (after crisis). The cash conversion cycle is employed as a measurement of working capital management. The independent variables and their measurements are chosen based on previous studies, which are, profitability (net profit/total asset), debt (total debt/total asset), sales growth ($sales_t$–$sales_{t-1}$)/$sales_{t-1}$), free Cash flow (free cash flow/total asset), firm size (natural logarithm of sales) and liquidity (current asset/current liabilities). Several tests are carried out and the statistical procedure showed that the Random Effect model is the best model to explain the relationship between working capital management and its explanatory variables. A constant negative relationship is spotted between profitability and firm size with working capital management for all the three periods. The negative relationship between profitability and firm size with working capital management provide strong evidence on pecking order theory. Sales growth is negatively related to working capital management before and after the crisis periods. Debt appears to be mixed, with positive sign before the crisis but negative after the crisis. Free cash flow is positively related during the crisis period. No significant relationship however is detected on liquidity. The same variables (profitability, debt, sales growth and firm size) have significant relationships with working capital management before and after the crisis. This study has policy implication where managers can be sensitive on factors affecting working capital management and give particular attention on profitability, debt, sales growth and firm size in the management of their working capital regardless of the economic scenarios.

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INTRODUCTION

Empirical evidences show that working capital management (WCM) directly impacts the performance of a firm (Aktas and Petmezas, 2015). Thus, managers should be sensitive on the factors affecting WCM to ensure a sufficient level of working capital for the firm to stay resilient and competitive. Despite the general realization on its importance in firm's performance, WCM receives much lesser attention from researchers comparative to other elements of financial decisions like capital structure and dividend policies (Banos *et al*., 2014). Research on this area is still scarce particularly in providing empirical evidence on the firms' performance in East Asian countries. Nonetheless, after the East Asian financial turmoil, researchers have started to show interest on WCM. Managers then learnt in a hard way that managing the right amount of working capital at the appropriate time is vital in ensuring efficient operations of a firm. Hence, a firm should be able to allocate sufficient resources to managing working capital, especially during recessions and worst still during economic downturn which could lead to financial crisis (Enqvist *et al*., 2014). Managers realize the fact that the interrelations between the components of working capital and its affecting factors must be studied thoroughly and taken into account when evaluating their influence on firm performance.

The financial turmoil has indeed renewed the focus to WCM and literature has documented the direct impact of WCM on profitability, liquidity as well as firm performance (see, for examples Banos *et al*., 2014; Aktas and Petmezas, 2015). However, despite this new interest on WCM, examinations on its influence on firm performance during financial crisis is still lacking and there is a gap that needs to be filled especially on emerging economies which suffered the most during the crisis. Since Malaysia is no exception in suffering from the turmoil, quite a number of studies have been carried out investigating the influencing factors of WCM in Malaysia during different periods including the financial crisis of 2008 (see, for examples, Wasiuzzaman and Arumugam, 2013; Zariyawati *et al*., 2009; Saarani and Shahadan, 2012). Realizing the effect of the mismanagement of WCM can mean fatal to a firm, it is paramount to examine and understand in depth the influencing factor of WCM especially before, during and after a financial crisis. Such comparison is very important for firms' management as it would enable them to know whether they must alter their management concerning their WCM during the different periods of a crisis. Wasiuzzaman and Arumugam (2013) have asserted that Malaysia is lacking such studies.

Realizing this gap, this study aims to investigate the determinants of WCM of Malaysian firms by taking into account the impact of the financial crisis of 2008. The objective of this study that can alienate it from the existing literature is that the findings may provide empirical evidences to the body of knowledge as well as the practitioners on how firms can manage their working capital efficiently regardless of the economic scenarios, not only during a crisis period, but also before and after a crisis thus fills the gap in the literature. The empirical findings of this study offer practical usage particularly in the event of financial crisis and a distressed state of global economy. In such scenario,

the liquidity of most firms is very unstable with very scarce cash flow due to the tight credit market conditions and decreased demand (Enqvist *et al*., 2014). This condition has even accentuated the need to have an efficient WCM. The evidences documented in this study highlight the importance of working capital to firms, not only in times of distress, but on day to day basis too.

In order to achieve the objectives of the study, panel regression is employed on financial data of 57 Malaysian firms. The study covers three different periods; the first period is before the crisis which is 2002 to 2006, the second period during the crisis which is from 2007 to 2008, while the third period is after the crisis which is from 2009 to 2012. Six independent variables commonly cited are employed to identify variations in cash conversion cycle (CCC) which acts as the proxy for WCM in this study. These variables are profitability, debt level, sales growth, free cash flow, firm size and liquidity.

The paper is divided into five sections. The first section deals with the related literature while the second section discusses the hypotheses development. The third outlines the data and methodology before presenting the empirical result in the fourth section. The last section concludes the whole study.

LITERATURE REVIEW

Effective WCM requires good handling and management of current assets and current liabilities. Firms allocate a handsome amount of funds to invest in working capital and make efforts to understand better the determinants of WCM. Fundamentally, the body of knowledge has identified two main categories of factors affecting WCM. Johnson and Soenen (2003) categorize that factors into external, which is related to the macroeconomic variables and internal which is related to the firm's operations and activities. Most studies cite several common determining factors of WCM like profitability, operating cash flow, liquidity, firm size, firm growth and debt level. Jeng-Ren *et al*. (2006) when examining WCM of selected firms in Taiwan document several determinants affecting WCM significantly like profitability, operating cash flow, leverage and firm growth. They also report that larger firms tend to have more WCM comparative to smaller firms.

Rimo and Panbunyuen (2010) use CCC as proxy of WCM and examine several determinants affecting WCM of Swedish firms such as profitability, sales growth, operating cash flow, firm size, liquidity and debt ratio. They report quite similar results with what is recorded in the existing body of knowledge where profitability, firm size, operating cash flow and sales growth show significant effects on WCM. Profitability is recorded to have a positive impact on the WCM while firm size, sales growth and operating cash flow have a negative effect on the WCM.

Looking at Malaysian scenario, Mohamad and Saad (2010) point out the scarceness of studies on the effects of WCM on Malaysian firms' performance, let alone any analysis done on the three different stages of financial turmoil. Nonetheless among the limited studies, Zariyawati *et al*. (2009) carry out an analysis on certain factors which might affect WCM of Malaysian firms between 2000 and 2006. Their results display similar evidence of some factors affecting the WCM decisions as documented in the literature. During the period understudy, firms in Malaysia seem to take into account firm growth, debt, firm size, economic growth, inflation, and certain elements of corporate

governance like the size of board of directors and the proportion of outsiders on the board of directors in their WCM strategic planning. Saarani and Shahadan (2012) later examine the WCM decisions in Malaysia from 2006 to 2008 and find that the most prominent factors are debt, profitability and non-debt tax shield besides firm growth and firm size. They use WCM as the dependent variable, and other variables like growth of the firm, profitability, leverage, size and industry as the independent variables. Another study revisiting Malaysian WCM scenario from 2000 to 2007 is done by Wasiuzzaman and Arumugam (2013) using the Pooled OLS regression method. The results reconfirm the significant effect of certain factors like economic growth, operating cash flows and firm size on WCM in Malaysia. They also document other affecting factors like volatile revenues and levels of asymmetric information. Nevertheless, size and the independence of the board do not seem to influence the WCM decisions in Malaysia during the period understudy.

In general, studies that examine factors affecting WCM incorporate firms' growth, profitability, size, debt, free cash flow and liquidity as the main independent variables. Hence, following the literature, this study will investigate the relationship between these factors and WCM decisions in Malaysia. As to enrich the body of knowledge, this study will examine the effects of the mentioned determinants on WCM before, during and after the financial crisis of 2008.

HYPOTHESIS DEVELOPMENT

This study developed six hypotheses based on the Pecking Order Theory (POT) and the Agency Theory in three different periods: before, during and after the crisis of 2008.

Profitability

Most studies record a negative relationship between profitability and WCM (see, for examples, Zariyawati *et al*., 2009; Mohamad and Saad, 2010). Most of them argue that this negative relationship arises when there is an increase in working capital in relation to sales, which in turn decreases the risk and profitability on one side and will increase liquidity on the other. Many of them think that effective WCM appears in low cash conversion cycle, which in turn causes quick availability of cash flows and then high revenue. According to the POT, firms prefer internal financing more than external (Myers and Majluf, 1984). It is easy for profitable firms to obtain funding, thus cash would be kept at a minimum (Wasiuzzaman and Arumugam, 2013). Thus, this study hypothesizes that H1: Profitability has a negative impact on WCM of Malaysian firms.

Debt

A negative relationship is expected between debt and WCM. This is according to the POT (Myers and Majluf, 1984) that explains how firms prefer internal financing to external financing. Hence, the hypothesis is H2: Debt has a negative impact on WCM of Malaysian firms.

Sales Growth

The expected relationship between sales and WCM is positive. Jeng-Ren *et al*. (2006) argued that when a firm has an increase in its sales it is logical to require a high level of working capital in order to finance this high level of sales. Thus, the hypothesis is H3: Sales growth has a positive impact on WCM of Malaysian firms.

Free Cash Flow

Based on the agency theory, the agency costs increase if a firm has high free cash flow, because of high expenses with inefficiency of management or loses of some investments (Jensen and Meckling, 1976). This theory can also explain the impact of free cash flow on the WCM. Jensen and Meckling assert that managers who have large free cash flow tend to spend the money at unnecessary costs. Hence, when a firm has a huge level of free cash flow it could enhance managers to engage in negative present value capital projects especially in firms which have low level of controlling on management. Thus, this study hypothesizes that H4: Free cash flow has a positive impact on WCM of Malaysian firms.

Firm Size

The POT takes into account the information asymmetry which means that managers know more about the firm's value than the investors (Myers and Majluf, 1984). Therefore, the information asymmetry affects the choice between internal and external financing (Palombini and Nakamura, 2011). Thus, firms prefer internal financing because of the information asymmetry. Based on this, since larger firms have less information asymmetry, they tend to have higher investments in working capital. Hence, the hypothesis is H5: Firm size has a positive impact on WCM of Malaysian firms.

Liquidity

The POT explains how firms can avoid needing of external financing by deducting an amount of reserve in cash (Myers and Majluf, 1984). In other words, the usage of internal financing to meet the shortage of working capital indicates high liquidity. Thus, the hypothesis is: H6: Liquidity has a negative impact on WCM of Malaysian firms.

DATA AND METHODOLOGY

Data

The objective of the study is to investigate the determinants of WCM of 57 Malaysian listed firms (trading and services and consumer products) for the period from 2002-2012. The period of the study is divided into three different scenarios, 2002-2006 to reflect period before the crisis, 2007-2008 is for period during the crisis, while the period 2009-2012 is post crisis.

Variables and Variables Measurements

The study employs CCC as a measurement of WCM. The independent variables and their measurements are chosen based on previous studies, which are, Profitability (Net Profit/Total Asset), Debt (Total Debt/Total Asset), Sales Growth ($Sales_t$–$Sales_{t-1}$)/$Sales_{t-1}$),Free Cash Flow (Free Cash Flow/Total Asset), Firm Size (natural logarithm of Sales) and Liquidity (Current Asset/Current Liabilities).

Methodology

To investigate the relationships between the explanatory variables and WCM which is measured by CCC, the following equation is estimated.

$$CCC_{i,t} = \beta_0 + \beta_1 PROFIT_{i,t} + \beta_2 DEBT_{i,t} + \beta_3 SALES_{i,t} + \beta_4 FCF_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (1)$$

To determine the best model between Pooled OLS, Fixed Effect and Random Effect, we perform the F-test, Breusch and Pagan LM Test (LM Test) and Hausman Test. The statistical procedure shows Random Effect model is the best model to explain the relationship between WCM and its explanatory variables.

RESULTS AND ANALYSIS

Table 1 presents the regression results on determinants of WCM in three different periods: before, during and after the crisis of 2008. It is found that out of the six explanatory variables, profitability and firm size consistently related negatively with WCM for all the three periods. H1 is therefore supported. The finding of this study however does not support (H5). The negative relationship between profitability and firm size with WCM provide strong evidence on financing hierarchy of POT of firms in the study. Sales growth is negatively related to WCM before and after the crisis periods (H3 is not supported). The finding on the influence of debt is mixed, in which debt is positively related to WCM before the crisis period while negatively related after the crisis period. Free cash flow is positively related during the crisis period (H4 is supported). No significant relationship however is detected on liquidity. It is interesting to note that the same variables (profitability, debt, sales growth and firm size) have significant relationships with WCM before the crisis as well as after the crisis of 2008. Thus, firms should take note that when dealing with WCM during non-crisis periods, they should give particular attention to profitability, debt, sales growth and firm size.

Table 1: DETERMINANTS OF WCM - BEFORE, DURING AND AFTER THE CRISIS OF 2008

Independent Variables	Before Crisis	During Crisis	After Crisis
C	529.834***	960.007***	656.016***
Profit	-26.654**	-67.825***	-35.917*
Debt	121.143*	-118.873	-158.424*
Sales Growth	-130.662***	-64.961	-68.037***
FCF	-58.653	556.734*	78.973
Firm Size	-28.349***	-55.707***	-36.694***
Liquidity	-0.610	-5.014	-0.659
R-squared	0.187	0.352	0.210
Adj R-squared	0.174	0.315	0.189
F-statistic	15.056***	9.693***	9.828***
Durbin-Watson	0.935	1.981	1.395

Note: ***,**, *, significant at 1%, 5% and 10% levels respectively

CONCLUSIONS

This study aims to investigate the determinants of WCM of Malaysian firms in three different scenarios: before, during and after the 2008 crisis. The importance of this study lies in providing an empirical evidence of how firms can manage their working capital efficiently not only during a crisis period, but also before and after a crisis. To achieve the objective, panel regression is employed. Six explanatory variables commonly cited were used to identify the variations in CCC. This study finds that while profitability, debt, sales growth, free cash flow and firm size are significantly affecting WCM during the study period, profitability and firm size are the two factors consistently affecting WCM irrespective the three crisis periods. Therefore, the evidences documented in this study highlight the importance of efficient WCM of a firm regardless of whether it is in time of distress or on daily routine basis and thus fill the gap in the literature. This study can act as a catalyst to more comprehensive and detailed researches and studies on WCM in any economic landscapes. However, this study has limitation. Firstly, the sample is small and focused only on Malaysia. Secondly, other explanatory factors may also be examined to give a better view of the WCM determinants. Hence, it is recommended that future research should also include other factors such as inflation, economic growth and corporate governance in the study of WCM.

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