

Working capital management and profitability of SMEs in Thailand

Wanrapee Banchuenvijit

School of Business, University of the Thai Chamber of Commerce

wanrapee_ban@utcc.ac.th

Abstract

The purpose of this study is to examine the effect of working capital management on the profitability of SMEs in Thailand by employing the sample of 15 listed companies on the Market for Alternative Investment (mai) in the industrial industry group. The quarterly financial data from 2011 to 2015 are used. The statistically significant results from the multiple regression with ordinary least squared show that payables deferral period and sales growth positively affect the profitability of SMEs. In addition, current assets to total assets ratio and current liabilities to total assets ratio negatively affect the profitability of SMEs. Therefore, SMEs with longer payables deferral period, higher sales growth, lower current assets to total assets ratio, and lesser current liabilities to total assets ratio can generate more profit.

Keywords: working capital management, profitability, SMEs, Thailand



Introduction

Generally, companies focus on maximizing their values by operating efficiently under acceptable level of risk. To achieve, all business functions, including finance, marketing, accounting, manufacturing, purchasing and human resource, must work collaboratively. Corporate financial management is very important to the company's success because it carries three major tasks combining of uses of funds, sources of funds as well as financial analyzing and planning. Uses of funds can be the investment in current assets and non-current assets. Companies have to ensure the adequate liquidity for the daily operations by implementing the appropriate working capital management policy. The decision makings not only on the suitable cash on hands, account receivables collection periods and inventory periods but also on the sources of funds for this working capital are critical.

Because of Asian Economics Community (AEC), trading and investment; especially in the Small and Medium Enterprises (SMEs) business sector, are very competitive among member nations. SMEs account for approximately 96% of all businesses in AEC. Thus, Thailand, as one of AEC members, aims to enhance its SMEs' source of funds by establishing the Market for Alternative Investment (mai) in 1998. There are 8 industry groups in mai; consisting of agro & food industry, consumer products, financials, industrial, property & construction, resources, services, and technology.

Industrial industry group involves manufacturing and supplying raw materials such as packaging, steel, car parts, petrochemical, chemical, equipment and machinery. There are 34 out of 131 companies listed on mai in the industrial industry group (<https://marketdata.set.or.th/mkt/sectorquotation.do?sector=mai>).

Companies in the industrial industry group

have to deal with a lot of account receivables, inventories and suppliers. Thus, in order to have adequate liquidity, working capital management is very essential to these companies. Therefore, the objective of this study is to examine the effect of working capital management on the profitability of SMEs in Thailand during 2011-2015. The findings will benefit SMEs in managing their working capital more efficiently.

Literature Review

A lot of articles study the association between working capital management and firm performance. For example, Filbeck and Krueger (2005) use the CFO magazine's annual working capital management survey across industries during 1996-2000. They find that working capital measures among industries are significantly different across time. In addition, Singh and Kumar (2014) employ systematic literature review (SLR) method and analyze 126 papers on working capital management. Two main points are examined, including the impact of working capital on profitability of firm and working capital practices. Major finding is that working capital management is important for corporate profitability. Furthermore, Singh et.al. (2017) use meta-analysis technique to analyze the findings of previous articles on the effect of working capital management on firm profitability. They find a negative relation between cash conversion cycle and firm profitability, meaning that an aggressive working capital management policy leads to higher profitability.

The study of working capital management is also of interests of both developed and developing countries around the world. Recently, in Europe, there are the studies in Spain, Finland, UK, Portugal and Norway. Firstly, Garcia-Teruel and Martinez-Solano (2007) examine a panel data of 8,872 small to medium-sized Spanish enterprises during

1996-2002. The results show that firm's profitability can be improved by decreasing days inventories outstanding and days sales outstanding as well as lowering the cash conversion cycle. Secondly, Marttonen et.al. (2013) study the impact of working capital management on profitability of 18 Finnish industrial maintenance firms by using an analytical flexible asset management (FAM) model. They find a significant negative association between the cycle times of operational working capital and the return on investment.

Thirdly, three papers study SMEs in UK. Tauringana and Afrifa (2013) examine 133 Alternative Investment Market (AIM) listed SMEs during 2005-2009 by employing panel data regression analysis and a questionnaire survey. They find that the management of accounts payable and accounts receivable is important for SMEs profitability. Afrifa and Padachi (2016) use panel data regression to analyze 160 Alternative Investment Market (AIM) listed SMEs during 2005-2010. They find a concave relationship between working capital level and firm profitability, showing that there is an optimal working capital level at which firm's profitability is maximized. Afrifa (2016) use unbalanced panel data regression analysis on 6,926 non-financial small and medium enterprises in UK from 2004 to 2013. The results suggest that firms should consider their cash flow when making decision on working capital investment. To improve performance, firms with limited cash flow should reduce their working capital investment. However, firms with available cash flow should raise their working capital investment.

Next, Pais and Gama (2015) study the effects of working capital management on the profitability of 6,063 Portuguese small and medium-sized firms during 2002-2009 by using panel regression (fixed effects) and instrumental variables. They find that a decrease in days inventories outstanding,

days sales outstanding and days payables outstanding leads to higher firms' profitability. The results suggest that the use of more aggressive working capital management policies raises firms' profitability. Lastly, Lyngstadaas and Berg (2016) also find the practice of aggressive working capital policy in Norwegian firms. They employ panel data regressions (fixed effects) as well as a two-stage least squares (to control for endogeneity) to analyze 21,075 Norwegian small and medium-sized enterprises between 2010 and 2013. They find that a reduction in cash conversion cycle increases profitability.

Furthermore, some articles study the impact of working capital management on the profitability of firms in Asia. For instance, Singhania and Mehta (2017) analyze non-financial companies in countries of South East Asia, South Asia and East Asia by using two-step-generalized method of moments and find a non-linear relationship between firm profitability and working capital management in 11 countries comprising of India, Pakistan, Sri Lanka, Bangladesh, Singapore, Malaysia, Indonesia, Hong Kong, Japan, China and South Korea. Moreover, Nobanee et.al. (2011) examine the relation between cash conversion cycle and profitability by employing dynamic panel data analysis on the sample of Japanese firms during 1990-2004. They find a significantly negative relation between the length of the firm's cash conversion cycle and its profitability. Additionally, in Malaysia, Wasiuzzaman (2015) investigates the effect of working capital efficiency on firm value of 192 Malaysian firms during 1999-2008 by utilizing the ordinary least squares regression. The results show that the reduction in working capital investment causes the rising in firm value. Recently, Tran et.al. (2017) study the relationship between working capital management and profitability in Vietnamese small- and medium-sized enterprises and find an increase in firms' profitability from

decreasing the number of days of accounts receivable, accounts inventories and accounts payable to an optimal minimum.

However, Abuzayed (2012) uses panel data analysis (fixed and random effects) and generalized methods of moments to examine the impact of working capital management on firms' performance for the sample of 52 non-financial firms listed on Amman Stock Exchange in Jordan for the period from 2000 to 2008. The positive effect is found, representing that firms with high profit are less motivated to manage their working capital. Also, financial markets in Jordan do not punish managers for managing working capital inefficiently.

Thus, the findings of the study of working capital management and profitability of SMEs in Thailand will fulfill the literature on the efficiency of working capital management of SMEs; particularly, in the emerging markets.

Methodology

Data

Even though there are 34 listed companies on the Market for Alternative Investment (mai) in the industrial industry group, the sample includes only 15 companies that have continuous quarterly financial data of operating profit margin, net profit margin, receivables collection period, payables deferral period, inventory conversion period, current assets to total assets ratio, current liabilities to total assets ratio, and sales during the study period from 2011 to 2015. All the financial data are collected from mai. The sample companies include:

1. 2S Metal Public Company Limited (2S)
2. C.I. Group Public Company Limited (CIG)
3. CPR Gomu Industrial Public Company Limited (CPR)

4. Halcyon Technology Public Company Limited (HTECH)
5. Multibax Public Company Limited (MBAX)
6. Porn Prom Metal Public Company Limited (PPM)
7. Salee Industrial Public Company Limited (SALEE)
8. Sherwood Chemicals Public Company Limited (SWC)
9. Tapaco Public Company Limited (TAPAC)
10. Teera-Mongkol Industrial Public Company Limited (TMI)
11. Thai Mitsuwa Public Company Limited (TMW)
12. Thai Plaspac Public Company Limited (TPAC)
13. Ubis (Asia) Public Company Limited (UBIS)
14. Union Petrochemical Public Company Limited (UKEM)
15. Yuasa Battery (Thailand) Public Company Limited (YUASA)

Models

This study examines the effect of working capital management on the profitability of SMEs in Thailand by employing the multiple regression with ordinary least square. As the measurement of profitability, the dependent variables are operating profit margin (OPM) and net profit margin (NPM). The independent variables of working capital management are receivables collection period (RCP), payables deferral period (PDP) and inventory conversion period (ICP). Additionally, the control variables are current assets to total assets ratio (CATAR), current liabilities to total assets ratio

(CLTAR), sales growth (SG) and log of sales (SIZE). There are 2 models in this study.

Model 1:

$$OPM_{it} = a + b_1RCP_{it} + b_2PDP_{it} + b_3ICP_{it} + b_4CATAR_{it} + b_5CLTAR_{it} + b_6SG_{it} + b_7SIZE_{it} + e_{it}$$

Model 2:

$$NPM_{it} = a + b_1RCP_{it} + b_2PDP_{it} + b_3ICP_{it} + b_4CATAR_{it} + b_5CLTAR_{it} + b_6SG_{it} + b_7SIZE_{it} + e_{it}$$

Where:

OPM = Operating profit ÷ Sales

NPM = Net profit ÷ Sales

RCP = (Account receivables × 365) ÷ Sales

PDP = (Account payables × 365) ÷ Cost of goods sold

ICP = (Inventory × 365) ÷ Cost of goods sold

CATAR = Current assets ÷ Total assets

CLTAR = Current liabilities ÷ Total assets

SG = (Sales_t – Sales_{t-1}) ÷ Sales_{t-1}

SIZE = Log(Sales)

i = Company 1, 2, 3, ..., 15 (1 = 2S; 2 = CIG; ... ; 15 = YUASA)

t = Time period 1, 2, 3, ..., 20 (1 = quarter 1 of 2011; 2 = quarter 2 of 2011; ... ; 20 = quarter 4 of 2015)

The hypotheses of this study are as follows.

H₀: None of the working capital management variables affects the profitability of SMEs in Thailand.

H₁: At least one of the working capital management variables affects the profitability of SMEs in Thailand.

Results

Table 1 Descriptive Statistics

	OPM	NPM	RCP	PDP	ICP	CATAR	CLTAR	SG	SIZE
Mean	0.093300	0.070146	250.4721	198.7627	260.1319	0.551733	0.384100	0.082467	5.562833
Max	0.913200	0.757000	1225.000	783.8300	4327.010	0.940000	0.720000	5.240000	6.630000
Min	-0.105800	-0.118300	22.85000	1.100000	11.31000	0.100000	0.010000	-0.380000	4.720000
S.D.	0.108008	0.088997	154.9888	136.9890	326.0563	0.199845	0.166312	0.378368	0.404215
Obs.	300	300	300	300	300	300	300	300	300

Table 1 shows descriptive statistics of all variables in this study. For profitability variables, operating profit margin has a mean of 9.33% with the maximum of 91.32%, the minimum of -10.58% and the standard deviation of 10.80%. Net profit margin has a mean of 7.01% with the maximum of 75.70%, the minimum of -11.83% and the standard deviation of 8.90%.

For working capital management variables, receivables collection period has a mean of 250.47 days with the maximum of 1,225 days, the minimum of 22.85 days and the standard deviation of 154.99 days. Payables deferral period has a mean of 198.76 days with the maximum of 783.83 days, the minimum of 1.10 days and the standard deviation of 136.99 days. Inventory conversion period has a mean of

260.13 days with the maximum of 4,327.01 days, the minimum of 11.31 days and the standard deviation of 326.06 days.

For control variables, current assets to total assets ratio has a mean of 0.55 times with the maximum of 0.94 times, the minimum of 0.10 times and the standard deviation of 0.20

times. Current liabilities to total assets ratio has a mean of 0.38 times with the

maximum of 0.72 times, the minimum of 0.01 times and the standard deviation of 0.17 times. Sales growth has a mean of 0.08 times with the maximum of 5.24 times, the minimum of -0.38 times and the standard deviation of 0.38 times. Size (as measured by log of sales) has a mean of 5.56 million baht with the maximum of 6.63 million baht, the minimum of 4.72 million baht and the standard deviation of 0.40 million baht.

Table 2 Correlation Matrix

	RCP	PDP	ICP	CATAR	CLTAR	SG	SIZE
RCP	1.000000						
PDP	0.718521	1.000000					
ICP	0.474783	0.312828	1.000000				
CATAR	0.201370	-0.051554	0.200145	1.000000			
CLTAR	0.166387	-0.024409	0.228889	0.585973	1.000000		
SG	-0.116511	0.026465	-0.087772	-0.027833	-0.042574	1.000000	
SIZE	-0.574599	-0.548977	-0.368031	0.391318	0.325067	0.103347	1.000000

In order to check whether independent variables are highly correlated, correlations among independent variables are displayed in Table 2. From Table 2, none of independent variables has the absolute correlation above 0.80; therefore, there is no multicollinearity problem. Every

independent variable can be used in the models.

After solving the problem of heteroscedasticity by applying white heteroscedasticity consistent coefficient covariance, the final equations are as follows.

$$\begin{aligned}
 \text{OPM} = & 0.001448 - 0.0000451\text{RCP} + 0.000178\text{PDP} - 0.00000273\text{ICP} - 0.134447\text{CATAR} \\
 & (0.011963) \quad (0.709087) \quad (3.055382)** \quad (-0.139706) \quad (-3.526394)** \\
 & - 0.227493\text{CLTAR} + 0.227493\text{SG} + 0.036580\text{SIZE} \\
 & (-5.531894)** \quad (3.306692)** \quad (1.637267)
 \end{aligned}$$

$$\text{F-Statistic} = 19.21256$$

$$\text{Prob(F-Statistic)} = 0.000000$$

$$\text{R-Squared} = 0.315338$$

$$\text{t-Statistic} = \text{in parentheses}$$

** = Statistical significance at 0.01 level



From OPM equation, F-Statistic is 19.21256 and Prob(F-Statistic) is 0.000000, meaning that at least one independent variable significantly affects operating profit margin. R-Squared of 31.53% exhibits that all the independent variables in the model help explain the dependent variable 31.53%, the rest 68.47% can be explained by other factors. Referring to t-Statistics, which are numbers in parentheses, PDP, CATAR, CLTAR and SG significantly affect OPM at the 99 percent confidence level.

In addition to the statistically significant variables, the coefficient of PDP is 0.000178, meaning that, when other variables are constant, one-day change in

payables deferral period makes operating profit margin changes 0.0178% in the same direction. The coefficient of CATAR is – 0.134447, meaning that, when other variables are constant, one-unit change in current assets to total assets ratio makes operating profit margin changes 13.44% in the opposite direction. The coefficient of CLTAR is – 0.227493, meaning that, when other variables are constant, one-unit change in current liabilities to total assets ratio makes operating profit margin changes 22.75% in the opposite direction. The coefficient of SG is 0.227493, one-unit change in sales growth makes operating profit margin changes 22.75% in the same direction.

$$\begin{aligned}
 \text{NPM} = & 0.120557 - 0.0000687\text{RCP} + 0.000238\text{PDP} - 0.00000577\text{ICP} - 0.074746\text{CATAR} \\
 & (1.310968) \quad (-1.083771) \quad (2.832775)** \quad (0.216160) \quad (-2.351069)* \\
 & - 0.204462\text{CLTAR} + 0.052665\text{SG} + 0.006008\text{SIZE} \\
 & (-7.136617)** \quad (1.294908) \quad (0.343622)
 \end{aligned}$$

F-Statistic = 30.50680

Prob(F-Statistic) = 0.000000

R-Squared = 0.422408

t-Statistic = in parentheses

** = Statistical significance at 0.01 level

* = Statistical significance at 0.05 level

From NPM equation, F-Statistic is 30.50680 and Prob(F-Statistic) is 0.000000, meaning that at least one independent variable significantly affects net profit margin. R-Squared of 42.24% exhibits that all the independent variables in the model help explain the dependent variable 42.24%, the rest 57.76% can be explained by other factors. Referring to t-Statistics, which are numbers in parentheses, PDP and CLTAR significantly affect NPM at the 99 percent

confidence level. Moreover, CATAR affects NPM at the 95 percent confidence level.

In addition to the statistically significant variables, the coefficient of PDP is 0.000238, meaning that, when other variables are constant, one-day change in payables deferral period makes operating profit margin changes 0.0238% in the same direction. The coefficient of CATAR is – 0.074746, meaning that, when other variables are constant, one-unit change in

current assets to total assets ratio makes operating profit margin changes 7.47% in the opposite direction. The coefficient of CLTAR is -0.204462 , meaning that, when other variables are constant, one-unit change in current liabilities to total assets ratio makes operating profit margin changes 20.45% in the opposite direction.

Conclusions and Discussions

This study examines the effect of working capital management on the profitability of SMEs in Thailand by using the multiple regression with ordinary least square. The quarterly financial data during 2011-2015 of 15 companies listed on the Market for Alternative Investment (mai) in the industrial industry group are used. Table 3 summarizes the results.

Table 3 Summary of Results

	OPM	NPM
Constant	0.001448	0.120557
RCP	-0.0000451	-0.0000687
PDP	0.000178^{**}	0.000238^{**}
ICP	-0.00000273	-0.00000577
CATAR	-0.134447^{**}	-0.074746^*
CLTAR	-0.227493^{**}	-0.227493^{**}
SG	0.227493^{**}	0.052665
SIZE	0.036580	0.006008
F-Statistic	19.21256	30.50680
R-Squared	0.315338	0.422408

** = Statistical significance at 0.01 level

* = Statistical significance at 0.05 level

From Table 3, RCP, ICP, CATAR and CLTAR negatively associate with OPM and NPM. The more the receivables collection period, inventory collection period, current assets to total assets ratio and current liabilities to total assets ratio, the less is the operating profit margin as well as the net profit margin. However, only CATAR and CLTAR show the statistically significant effect. Furthermore, PDP, SG and SIZE positively relate to OPM and NPM. The more the payables deferral period, sales growth and log of sales, the more is the operating profit margin as well as the net profit margin. But, only PDP and SG indicate the statistically significant effect. The statistically significant variables can be discussed as below.

Payables deferral period (PDP) positively and significantly affects the profitability of SMEs in Thailand because SMEs that can negotiate the longer days of credit term from suppliers have fewer days in cash conversion cycle. Therefore, they will have less working capital shortage, and their short term financing cost will be lower, resulting in an increase in their profitability. This result is consistent with Garcia-Teruel and Martinez-Solano (2007), Nobanee et.al. (2011), Marttonen et.al. (2013), Pais and Gama (2015), Wasiuzzaman (2015), Lyngstadaas and Berg (2016), Singh et.al. (2017), Singhania and Mehta (2017), and Tran et.al. (2017).

Current assets to total assets ratio (CATAR) negatively and significantly affects the profitability of SMEs in Thailand because the average CATAR of these SMEs is 0.55, meaning that more than half of total assets are current assets. Also, the companies do not use the relaxed policy of working capital management because they cannot generate more profit while having a lot of current assets. On the other hand, they manage current assets inefficiently as shown in the very high receivables collection period (RCP) (mean = 250.47 days) and inventory conversion period (ICP) (mean = 260.13 days). This negative relation between current assets to total assets ratio and profitability is consistent with Tauringana and Afrifa (2013) as well as Afrifa and Padachi (2016).

The average current liabilities to total assets ratio (CLTAR) of these SMEs is 0.38, and their average total debt with interest obligation to total assets ratio is 0.44, meaning that most of their debt is short-term debt with interest obligation which leads to less profit. This finding is consistent with Garcia-Teruel and Martinez-Solano (2007), Abuzayed (2012), Tauringana and Afrifa (2013), Afrifa and Padachi (2016), Lyngstadaas and Berg (2016), Singhanian and Mehta (2017), and Tran et.al. (2017).

Sales Growth (SG) positively and significantly affects the profitability of SMEs in Thailand because companies with an increase in sales can generate more profit, assuming an increase in sales is greater than an increase in all the

expenses. This positive relation between sales growth and profitability is consistent with Garcia-Teruel and Martinez-Solano (2007), Abuzayed (2012), Pais and Gama (2015), Lyngstadaas and Berg (2016), Singhanian and Mehta (2017), and Tran et.al. (2017).

The results from this study are beneficial to SMEs in managing their working capital more efficiently so that they can earn more profit. First, SMEs should not only negotiate with suppliers to get longer days of credit term, but also maintain lower level of current assets compared to total assets by reducing receivables collection period and inventory conversion period. Consequently, their cash conversion cycle will decrease. In addition, SMEs should lessen current liabilities with interest obligation compared to total assets so that they will pay less interest and create more profit. Finally, SMEs should make continuous growth in sales by implementing attractive marketing strategies so that they can produce more profit. The findings of Thai SMEs also fulfill the literature in the area of working capital management in the emerging markets. Nevertheless, future research should study and compare the efficiency of working capital management of SMEs in other countries (both developed and developing). Hence, SMEs will have guidelines on how to manage their working capital in order to ensure adequate liquidity so that they will be able to survive in the extremely volatile and competitive business environment.



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