Research Article

The Impact of Working Capital Management on the Profitability of Listed Food Companies in Thailand

ผลกระทบจากการบริหารเงินทุนหมุนเวียนต่อความสามารถในการทำกำไรของบริษัทจดทะเบียนในประเทศไทยในหมวดอาหารและเครื่องดื่ม

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Abstract

This research studies the impact of working capital management on profitability among the food companies listed on the Stock Exchange of Thailand during 2018-2022. The study examines whether a relationship exists between working capital management and firm's profitability. The measures of working capital management include average collection period, inventory conversion period, average payment period, cash conversion cycle and cash conversion efficiency. Return on equity and return on assets are used as proxies for firm's profitability. The results confirm the

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relationship between working capital management and profitability. In particular, a shorter operating cycle and efficient working capital management increase firm's profitability.

Keywords: *Working Capital Management, Profitability, Average Collection Period, Inventory Conversion Period, Cash Conversion Cycle*

บทคัดย่อ

งานวิจัยนี้ศึกษาผลกระทบจากการบริหารเงินทุนหมุนเวียนต่อความสามารถในการทำกำไรในกลุ่มบริษัทหมวดอาหารและเครื่องดื่มที่จดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทยระหว่างปี ค.ศ. 2018-2022 การศึกษานี้เป็นการทดสอบหาความสัมพันธ์ระหว่างการบริหารเงินทุนหมุนเวียนและความสามารถในการทำกำไรของกิจการ โดยการบริหารเงินทุนหมุนเวียนวัดจากระยะเวลาเก็บหนี้เฉลี่ย ระยะเวลาขายสินค้า ระยะเวลาชำระหนี้เฉลี่ย วงจรเงินสด และประสิทธิภาพของการหมุนเงินสด ส่วนความสามารถในการทำกำไรวัดจากอัตราผลตอบแทนส่วนของผู้ถือหุ้น และอัตราผลตอบแทนจากสินทรัพย์ ผลจากการศึกษายืนยันความสัมพันธ์ระหว่างการบริหารเงินทุนหมุนเวียนและความสามารถในการทำกำไร โดยเฉพาะอย่างยิ่งวงจรการดำเนินงานที่สั้นลงและการบริหารเงินทุนหมุนเวียนอย่างมีประสิทธิภาพจะทำให้ความสามารถในการทำกำไรของกิจการเพิ่มขึ้น

คำสำคัญ: *การบริหารเงินทุนหมุนเวียน ความสามารถในการทำกำไร ระยะเวลาเก็บหนี้เฉลี่ย ระยะเวลาขายสินค้า วงจรเงินสด*

Introduction

Liquidity and profitability are very important aspects for firms to achieve their strategic goals. Working capital management is a simple and straight forward concept of ensuring the ability of the firm to fund the difference between current assets and short- term liabilities and to ensure uninterrupted functioning of the business in day-to-day operations. On the other hand, firms need to make profit and to maximize the shareholders' wealth. In order to achieve the firm's liquidity and profitability, the optimal level of working capital should be determined. Managing the working capital is a challenge task since the firm should maintain minimal working capital in order to attain liquidity. However, the excess working capital may negatively affect the profitability of the firm since it will lose the investment opportunity.

Morshed (2020) explains that the working capital investment and financing policies have the most significant impact on profitability. These policies related to risk and return theory since the conservative policy will reduce both the risk and return and the aggressive one will have the opposite impact. The impact of working capital management on profitability has been studied by many

researchers (e.g. Aldubhani, Wang, Gong, & Maudhah, 2022; Candeias & Dias, 2023; Hong, Farris II, Pohlen, & Idug, 2023; Pham, Nguyen, & Nguyen, 2020). Even though the findings of these research support the relationships between working capital management and profitability, the details of the findings are varied industry by industry. There have been several studies of the impact of working capital management on the profitability in the food industry (e.g. Bieniasz & Golas, 2011; Šeligová & Koštuříková, 2019; Suwannaphak, Tewongsa, Chancharat, & Chancharat, 2018; Thapa, 2013; Ozkaya & Yasar, 2023). They find that shorter working capital cycles affects higher rate of profitability. Among these studies, Thapa (2013) finds the positive relationship between cash conversion cycle and firm's profitability.

Since Thai food industry remains a prime choice for foreign direct investment. The Board of Investment's special incentives enhance the attractiveness of the Thai stock market. The industry's unique strengths, including adept management of perishable goods and strategic partnerships, contribute to its appeal as a dynamic investment opportunity. Thailand's designation as the 'Kitchen of the World' further reinforces its global culinary significance. This study attempts to test the effect of working capital management on profitability of the firms using a sample of listed companies in the Stock Exchange of Thailand (SET), specifically in the food sector.

Research objectives

This study aims to achieve the following objectives.

1. To investigate the extent of working capital efficiency in selected firms.
2. To investigate the extent of profitability in selected firms.
3. To observe the relationship between working capital management and profitability of selected firms.
4. To analyze the significance of the relationship between working capital management and profitability.

Literature review

Literature related to working capital management and profitability of a firm can be summarized as follows.

Working Capital Management is defined as the practical of efficiently handling a company's current assets and liabilities to balance liquidity, profitability, and operational efficiency. Singhania and Mehta (2017) indicate that working capital is a measurement of operating liquidity, and it describes the short-term position of a company. The inefficient handling of working capital causes

the decline in the strength of an entity. For this reason, it is necessary for firm to maintain an optimal level of working capital.

Rafuse (1996) addresses that the majority of the businesses failure are due to the working capital starvation and the success of the firms depends on the timeliness of the cash generation procedure. Owino (2014) studies the effect of working capital management on profitability of manufacturing companies in Kenya. He finds no relation between working capital management and profitability of the companies. Shin and Soenen (1998) study the efficiency of working capital management and corporate profitability. They find a strong negative relation between the length of the firm's net-trade cycle and its profitability.

Majeed, Makki, Saleem, and Aziz (2013) study the relationship between cash conversion cycle and profitability in Pakistani Firms. They find a negative relationship between cash conversion cycle and profitability which means long cash conversion cycle negatively affects profitability.

Basyith, Djazuli, and Fauzi (2021) study whether working capital management affects firm's profitability or not. They observe 135 enterprises listed in the Indonesia Stock Exchange during 2000-2019. They find the choice of working capital investment techniques can enhance return on assets (ROA) but the financing approach may reduce the ROA. Furthermore, they find variation in working capital management policies among different industries, in which the agricultural and infrastructure, utilities, and transportation sectors adopt aggressive approaches, while the consumer products, basic chemicals, and other industries tend to be more conservative.

Ali, Ullah, and Ullah (2016) highlight a significant impact of working capital on a firm's financial well-being. Effective working capital management, involving a delicate balance of cash, inventory, receivables, and payables, plays a pivotal role in ensuring profitability while mitigating liquidity risk. The study emphasizes that estimating working capital is a complex task, with key components such as inventories and accounts receivables significantly affecting a firm's financial performance.

Nguyen, Pham, and Nguyen (2020) delve into the impact of working capital management on firm profitability by obtaining 119 non-financial listed companies in Vietnam Stock Market from 2010 to 2018. They reveal that optimizing working capital management, as measured by the cash conversion cycle and its components, can lead to enhanced profitability. The study also finds that sales growth rate, firm size, leverage, and age have significant impacts on a firm's profitability.

Pham et al. (2020) examine the influence of working capital management factors on the profitability of steel companies listed on the Stock Exchange of Vietnam. They find that WCM has a strong impact on the profitability of businesses. Factors DPO, DIO, DSO, CR, SIZ, GRO have a positive impact on profitability while LEV has a negative impact on profitability

Aldubhani et al. (2022) study the impact of working capital management policies on the profitability of manufacturing companies listed on the Qatar Stock Exchange between 2015 and 2019. They find that companies with shorter receivables collection periods and cash conversion cycles are more profitable. Longer inventory turnover periods and accounts payable payment periods are related to higher profitability of the firms.

Hong et al. (2023) explore the impact of working capital on profitability in the U.S. aviation industry. They find that, among the working capital variables, day-sales-outstanding significantly impact the firm's profitability. A low DSO suggests that an airline effectively manages its cash flows and financial sustainability.

Candeias and Dias (2023). study the relationship between working capital and profitability in the context of the wine industry. The results show that managers could create value for their shareholders if they managed their working capital more efficiently.

The studies of the impact of working capital management on the profitability in the food industry include Bieniasz and Golas (2011), Šeligová and Koštuříková (2019), Suwannaphak et al. (2018), Thapa (2013), and Ozkaya and Yasar (2023). They find that shorter working capital cycles affects higher rate of profitability. Thapa (2013) find the positive relationship between cash conversion cycle and firm's profitability. Even though this finding contradicts others' results, it explains the existence of concave relationship between the working capital management and profitability.

Research hypothesis

Table 1 shows the prospective signs and measurement of all variables. From previous studies, the profitability can be measured by profitability ratios namely return on assets (ROA) or return on equity (ROE). Working capital management can be evaluated by the cash conversion cycle and its components. Superior working capital management should lead to high profitability. Hence, the variables measure working capital management such as cash conversion cycle (CCC), inventory conversion period (ICP), and receivable collection period (RCP) are expected to have negative impact on firm's profitability since higher number of these variables indicates poor working capital management. On the other hand, higher number of credit payment period and cash conversion efficiency reflect superior working capital management and should positively affect the firm's profitability.

Table 1 Prospective signs and measurement of the variables

Variable	Measurement	Prospective Sign
Dependent Variables		
Return on Assets (ROA)	Operating profit as a fraction of total assets $ROA = \frac{Net\ Income_{i,t} + Interest\ Expense\ (1-T)_{i,t}}{Total\ Assets_{i,t}}$	
Return on Equity (ROE)	Profit attributable to the common shareholders as a fraction of total equity. $ROE = \frac{Net\ income\ attributable\ to\ common\ shareholders_{i,t}}{Total\ Equity_{i,t}}$	
Independent Variables		
Inventory Conversion Period (ICP)	Period of time need to acquire and convert raw materials into products and sell it to the end customers. $ICP = \frac{Average\ Inventories}{Cost\ of\ Sales} \times 365\ days$	-
Receivable Collection Period (RCP)	Average number of days those customers on credit basis typically do the payment to the firm. $RCP = \frac{Average\ Accounts\ Receivables}{Revenue} \times 365\ days$	-
Credit Payment Period (CPP)	Average number of days that a firm made the payment to the suppliers on credit basis. $CCP = \frac{Average\ Accounts\ Payables}{Purchases} \times 365\ days$	+
Cash Conversion Cycle (CCC)	CCC represents the period of time to convert the investment of inventory into cash. **CCC = ICP + RCP - CPP**	-
Cash Conversion Efficiency (CCE)	Operating cash flows as a metric of revenue. $CCE = \frac{Operating\ cash\ flows}{Revenue}$	+

Table 1 Prospective signs and measurement of the variables (cont.)

Variable	Measurement	Prospective Sign
Control Variables		
Leverage (LEV)	The fraction of debt capital to the value of its equity capital. $LEV = \frac{Total\ Debt\ Capital}{Total\ Equity}$	+/-
Firm Age (AGE)	Number of years a firm has operated after the incorporation.	+/-
Firm Size (SIZE)	Sum of assets of the firm at the end of the reporting period.	+/-

Conceptual framework

The conceptual framework is drawn from the hypothesis addressed earlier. The proxies for working capital management are cash conversion cycle (CCC), cash conversion efficiency (CCE), inventory conversion period (ICP), receivable collection period (RCP), and credit payment period (CPP). The response variable is profitability which is measured by return on assets (ROA) and return on equity (ROE). Furthermore, size of the firm, firm age and leverage are included in the model as the control variables. The conceptual framework is portrayed in Figure 1.

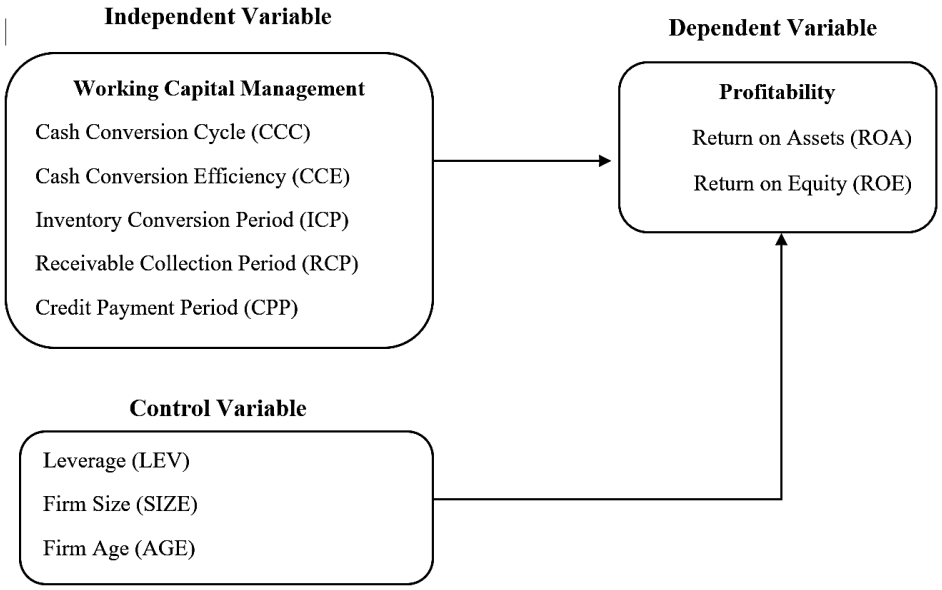

Figure 1 Conceptual framework

Research methodology

Data and sources

The sample was taken from the listed companies in the Stock Exchange of Thailand (SET) under the food sector. The data were gathered from the annual reports published on the website of SET for the period of five years starting from April 1, 2018 to March 31, 2023. A sample of 20 companies is chosen based on their characteristics such as having a fiscal year end in March and being continuously listed during the research period (2018-2023). All variables are gathered using an annual basis.

Multivariate regression analysis

The panel regression analyses are conducted under two regression models to investigate stated hypotheses. Model 1 and Model 2 test the effect of working capital management to the ROA and ROE respectively.

Model 1:

$$ROA = \beta_0 + \beta_1 ICP_{i,t} + \beta_2 RCP_{i,t} + \beta_3 CPP_{i,t} + \beta_4 CCC_{i,t} + \beta_5 CCE_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 AGE_{i,t} + \beta_8 LEV_{i,t}$$

Model 2:

$$ROE = \beta_0 + \beta_1 ICP_{i,t} + \beta_2 RCP_{i,t} + \beta_3 CPP_{i,t} + \beta_4 CCC_{i,t} + \beta_5 CCE_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 AGE_{i,t} + \beta_8 LEV_{i,t}$$

The explanatory variables in the models representing the working capital management are drawn from previous research where.

ICP = Inventory Conversion Period
RCP = Receivable Collection Period
CPP = Credit Payment Period
CCC = Cash Conversion Cycle
CCE = Cash Conversion Efficiency

The control variables are as follows.

SIZE = Firm size measured by total assets
AGE = Firm age
LEV = Leverage

Fixed and random effect models

In executing panel regression, it is imperative to select whether to continue with the random effects or fixed effects model before other investigations. A fixed effects model assumes that the individual groups have specific characteristics that are constant over time but may vary across groups. It controls for these group-specific characteristics, treating them as fixed parameters. On the other hand, a random effects model assumes that the individual groups have characteristics that are random and follow a specific distribution. It considers these characteristics as random variables, allowing for variation both within and between groups.

The choice between fixed and random effects models depends on the nature of the data and the underlying assumptions about the variability in the panel data. A Hausman test for correlation between the individual-specific effects (random effects) with the explanatory variables. Under the null hypothesis of no correlation between the error and the explanatory variable, the random effects model is applicable, whereas if there is correlation between the error and the explanatory variable, fixed effects model may be appropriate. The choice varies on the likelihood of the Chi-Square statistic produced under the Hausman test.

Results

Descriptive statistics

We draw 20 listed firms in the Stock Exchange of Thailand under the category of food. Table 2 shows the descriptive statistics of all variables in the models.

Table 2 Descriptive statistics of 20 firms listed in Stock Exchange of Thailand under the category of food during April 1, 2018 to March 31, 2023

Variable	N	Mean	Variance	S.D.	Min	Max	Range
Dependent variables							
ROA (%)	100	10.85	49.00	7.000	-2.24	25.00	27.24
ROE (%)	100	12.57	83.36	9.130	-4.83	30.31	35.14
Independent Variables							
ICP (days)	100	46.05	249.94	15.809	24.77	76.52	51.74
RCP (days)	100	48.85	1760.09	41.953	14.86	149.57	134.71
CPP (days)	100	46.19	777.28	27.880	16.03	107.73	91.69
CCC (days)	100	47.24	950.14	30.824	6.48	103.19	96.71

Table 2 Descriptive statistics of 20 firms listed in Stock Exchange of Thailand under the category of food during April 1, 2018 to March 31, 2023 (cont.)

Variable	N	Mean	Variance	S.D.	Min	Max	Range
CCE (%)	100	10.41	77.40	8.798	-2.11	27.01	29.12
Leverage	100	0.25	0.0352	0.188	0.0012	0.6275	0.6263
Size (Million THB)	100	35,900	2,756,250,000	52,500	968	197,000	193,062
Age (Years)	100	35.75	194.63	13.951	6	68	62

From table 2, average ROA and ROE of the sample firms during April 1, 2018 to March 31, 2023 are 10.85% and 12.57% respectively.

Regarding the working capital management, the ICP, RCP and CPP are 46 days, 49 days and 46 days respectively. It means that, on average, firms take approximately 46 days (ICP) to produce and sell their products and another 49 days (RCP) to collect money from their customers. The CPP means that firms take around 46 days to pay their payables. The average CCC of 47.24 days shows that firms take approximately 47 days to converts their portion of funds invested in raw material and other scarce resources into cash.

The mean of CCE of the sample firms is 10.41%. This indicates that, on average, approximately 10.41% of the revenue generated from the firms' operations is converted into cash.

Table 3 Hausman test

	Model 1	Model 2
	ROA	ROE
Chi-Sq Statistic (Prob>chi2)	0.6136	0.4815
Appropriate Effect Model	Random	Random

Table 3 shows the result of the Hausman test. According to the Hausman test, the p-values of both models are greater than 0.05. Thus, the null hypothesis can be accepted and the random effect is best fitted for the regression analysis.

The impact of working capital management on profitability

Table 4 shows the outcomes of the regression model. Both models show similar results for variables explaining the working capital management. All variables related to working capital management are statistically significant except for CPP. The ICP, RCP and CCC are statistically

significant at the 5.00% level and have negative relationship with profitability as expected. The ICP is statistically significant at the 1.00% level in Model 1. The result of CPP contradicts with Pais and Gama (2015) who find a statistically significant relationship between CPP and ROA. The signs of the coefficients are as expected.

Table 4 Outcomes of panel data regression

Model	ROA (Model 1)			ROE (Model 2)		
	Coef.	Std. Err.	p	Coef.	Std. Err.	p
ICP	-0.002***	0.000	0.000	-0.002**	0.001	0.003
RCP	-0.002**	0.001	0.042	-0.002**	0.001	0.028
CPP	0.000	0.000	0.418	0.000	0.001	0.977
CCC	-0.004**	0.000	0.025	-0.004**	0.000	0.041
CCE	0.139**	0.065	0.033	0.297**	0.100	0.003
LEV	-0.116**	0.059	0.047	-0.127	0.792	0.110
AGE	0.000	0.001	0.887	0.000	0.001	0.973
SIZE	0.000	0.000	0.600	0.000	0.000	0.202
constant	0.227***	0.530	0.000	0.250***	0.680	0.000
R2		23.92			21.74	
Wald chi2		5.70			3.57	
Prob>chi2		0.000			0.001	
N		100			100	

Note: *** p < 0.001 ** p < 0.05

In Model 1, the CCC has a coefficient of -0.0043 while in Model 2, the coefficient of CCC is -0.0037. This shows that the cash conversion cycle of the sample firms has an inverse relationship with the ROA and ROE as expected. This finding also in line with Abuzayed (2012), Hassan et al. (2021), and Pais and Gama (2015) and which reveal that increment of the days required to convert investment held in the stocks into cash reduce the earning of the organizations operated in the F&B industry. The cash conversion efficiency has a positive impact on ROA and ROE with the coefficient of 0.1385 in Model 1 and 0.2968 in Model 2. This finding also in line with Kaur and Singh (2013).

Besides the working capital management variables, leverage has a negative impact on ROA at 5.00% statistically significant. On the other hand, it does not show any relationship with firm's

profitability measured by ROE. Furthermore, we do not observe any relationship between age and size, and firm's profitability.

Discussion

Both models show similar results for variables explaining the working capital management. All working capital management variables are statistically significant except for CPP. The signs of the coefficients are as expected. The result shows that superior working capital management leads to higher profitability of the firms. ICP and RCP are negatively related to the ROA and ROE. In other words, the operating cycle, which is the summation of ICP and RCP, has an impact on firm's profitability. However, we find no evidence of relationship between CPP and firm's profitability. The credit payment period may not be a significant factor in working capital management in the food industry.

Another measurement of the working capital management efficiency in this study is the cash conversion efficiency. The cash conversion efficiency also has a positive relationship with firm's profitability. The cash conversion efficiency presents the ratio between operating cash flow and revenue. High cash conversion efficiency shows that firm can quickly convert its revenue, especially the credit sale, to cash. Thus, overall results support that working capital management has an impact on firm's profitability.

Conclusions and recommendation

This study examines 20 sample firms listed in the SET in the food and beverage sector. The result shows that the working capital management has effect on firm's profitability. Specifically, there is an inverse relationship of ICP, RCP and CCC with both ROA and ROE. It indicates that the increment of time required for production and recovery of cash will reduce the profitability of the sample firms.

In response to the findings, Stock Exchange Commission (SEC) and Stock Exchange of Thailand (SET) are the key policy implications for regulatory bodies. They should incorporate working capital measures with incentives for effective management. It is essential to collaborate with industry associations. The Ministry of Finance has the potential to encourage sustainability. The SEC conducts regular evaluations to ensure adaptability. Investors in listed companies can benefits from the study's insights by prioritizing enterprises with adequate handling of working capital management for long-term profitability.

For the future research, it is recommended that more data should be collected for study and/or expanding the duration of the study. The study can be done across sectors in order to testify the relationship between the working capital management and firm's profitability. In addition, other performance measurement of profitability such as Tobin' s Q, market value added, and EVA can be applied in the model instead of accounting measures.

The results from this study confirm the theoretical regarding the relationship between working capital management and profitability. In particular, a shorter operating cycle and effective working capital management will increase firm's profitability. Implementing management strategies that prioritize efficient working capital management will benefit firm's profitability in the long-run.

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