

Impact of Working Capital Management on Firm's Profitability: Empirical Evidence from Vietnam*

Anh Huu NGUYEN^{**}, Huong Thanh PHAM^{***}, Hang Thu NGUYEN^{****}

Received: January 01, 2020 Revised: February 03, 2020 Accepted: February 06, 2020.

Abstract

This paper investigates the impact of working capital management on the firm's profitability. The research sample includes 119 non-financial listed companies on Vietnam stock market over a period of 9 years from 2010 to 2018. Two statistical approaches include Ordinary least squares (OLS) and fixed effects model (FEM) are employed to address econometric issues and to improve the accuracy of the regression coefficients. The empirical results show the negative and significant impacts of the working capital management, which measured by cash conversion cycle (CCC) and three components of the CCC including accounts receivable turnover in days (ARD), inventory turnover in days (INVD), and accounts payable turnover in days (APD) on the firm's profitability measured by return on assets (ROA) and Tobin's Q. It implies that firms can increase profitability by keeping the optimization of the working capital management measured by the CCC, which includes shortening the time to collect money from clients, accelerating inventory flow and hold the low payment time to creditors. Besides, the profitability of firms was impacted by the sale growth rate, firm size, leverage, and age. Therefore, this paper provides a new insight to managers on how to improve the firm's profitability with working capital management.

Keywords : Working Capital, Firm's Profitability, Stock Market, Cash Conversion Cycle, Listed Companies, Vietnam

JEL Classification Code: G30, M41, F65

1. Introduction

Guthman and Dougall (1948) stated that current assets less current liabilities were known as working capital. The working capital management (WCM) relates to managing current liabilities and current assets to ensure that the firm can remain in a position to pay short-term obligations and meet its operating expenses. Taleb, Zoued, and Shubiri

(2010) emphasized the significant role of the WCM because it affects directly the profitability and liquidation of the firm. Therefore, Ricci and Vito (2000) recognized the key target of the WCM is to control the short-term financing resource to make the compatibility between the profitability and the risk of the companies.

There are many investigations about the relationship between the WCM and the firm's performance or profitability, such as Muhammad, Rehman and Waqas (2016); Bui (2016); Tu and Nguyen (2016); Gul, Khan, Rehman, Khan, Khan, and Khan (2013); Vural, Sokmen, and Cenenak (2012), Sharma and Kumar (2011); Lazaridis and Tryfonidis (2006); Deloof (2003); Shin and Soenen (1998) in different contexts lead to more different results and the conclusion is unidentified. Therefore, it is necessary to examine the effects of the working capital management on the firm's profitability to provide more evidence of the effect of the working capital management on the firm's profitability.

This paper examine the impact of the WCM on the firm's profitability of the listed industrial enterprises on the Vietnamese stock market for the period 2010 to 2018. After that, the investigation gives recommendations to improve

*This research is funded by the National Economics University (NEU), Hanoi, Vietnam. The authors thank anonymous referees for their contributions and the NEU for funding this research.

**First Author and Corresponding Author. Dean, School of Accounting and Auditing, National Economics University, Vietnam [Postal Address: 207 Giai Phong Road, Hanoi, 100000, Vietnam] Tel. (+84) 906163535, Email: anhhn@neu.edu.vn

***Lecturer, School of Accounting and Auditing, National Economics University, Vietnam. Email: pthuong172@gmail.com

****Lecturer, School of Accounting and Auditing, National Economics University, Vietnam.

Email: imi_nguyen2508@gmail.com

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

the effectiveness of WCM to intensify the profitability of the industrial sector listed on the Vietnamese stock market. The investigation contributes to the literature on the relationship between the WCM and the firm's profitability. Furthermore, the paper examine whether the WCM and all components of WCM have an impact on the profitability of listed industrial enterprises in Vietnam.

The remainder of the study is arranged as follows. In section 2, present the literature about WCM and the firm's profitability and then develop the hypotheses. Section 3 describes the research methodology. In section 4, discuss the empirical results and the paper is finalized by the conclusion in section 5.

2. Literature Review and Hypotheses

According to Nguyen, Nguyen, and Nguyen (2019), the internal variables and external variables were two main categories that determined the firm profitability. Internal determinants included variables related to management decisions, financial attributes and firm characteristics such as the WCM, firm size, firm age, capital structure, and sales growth. External determinants included variables related to market, industry and economic environment. This research emphasizes the internal determinants comprising the WCM, sales growth (SG), firm size (FS), leverage (LEV), firm age (AGE), and current ratio (CR).

2.1. Working Capital Management

The WCM is calculated by the difference between current assets and current liabilities. Almost empirical studies showed the negative impact of WCM on the profitability of firms. There are many indicators to measure the WCM such as Net Trade Cycle (NTC) (Shin & Soenen, 1998; Baños-Caballero, García-Teruel, & Martínez-Solano, 2014). On the other hand, Richards and Laughlin (1980) introduced the Cash Conversion Cycle (CCC) as the indicators to measure efficiently the WCM. The CCC is the period from the expenditure of the firm's cash for the purchase of raw materials to produce the finished goods and the collection of cash from the sale of the finished goods. The CCC is calculated by the following three components: The Account Receivables Turnover in Days (ARD) + Inventory Turnover in Days (INVD) - Account Payment Turnover in Days (APD). Almost previous studies used the CCC as the indicator to measure the WCM (e.g., Muhammad, Rehman, & Waqas, 2016; Bui, 2016; Tu & Nguyen, 2014; Gul et al., 2013; Vural, Sokmen and Cenenak, 2012; Sharma & Kumar, 2011; Mohamad & Saad, 2010; Lazaridis & Tryfonidis, 2006; Deloof, 2003). In this research, we choose the CCC and the three components of

the CCC including the ARD, the INVD and the APD as the indicator reveals the WCM.

2.2. Firm Profitability

Profitability reveals the ability to make a profit from all activities of a firm. It shows the efficiency of using all available resources of a firm to make a profit. According to Horward and Upton (1953), "profitability is the ability of a given investment to earn a return from its use". Profitability is divided into two categories including book value (accounting-based measurement) and market value (marketing-base measurement). Book value is the indicator revealed the firm profitability in the past, such as (1) Return on Asset (ROA) (Rahman & Saima, 2018; Muhammad, Rehman & Waqas, 2016; Bui, 2016; Gul et al., 2013; Van Horne, 2008; Sharma & Kumar, 2011; Mohamad & Saad, 2010); (2) Return on invested capital (ROIC) (Enqvist, Graham, & Nikkinen, 2014; Mohamad & Saad, 2010); (3) Gross Operating Profit (GOP) (Tu & Nguyen, 2014; Vural, Sokmen, & Cenenak, 2012; Deloof, 2003); or (4) Net Operating Profit (NOP) (Lazaridis & Tryfonidis, 2006). Market value is the indicator revealed the long-term expectation in the future of shareholder relating to profitability, such as Tobin's Q (Vural, Sokmen, & Cenenak, 2012; Mohamad & Saad, 2010).

This paper selects ROA as the book value and Tobin's Q as the market value of firm profitability and examines how the WCM impacts on the firm's profitability. These two variables reflect not only the past performance (ROA) of firms, but also reflect the long-term performance in the future of the company (Tobin's Q).

The followings present the summary of several previous studies by different authors and in different contexts: Shin and Soenen (1998) studied the relationship between the WCM and profitability of a large sample of US-listed companies over the period 1975 to 1994. The NTC which replaced the CCC was used to measure the WCM. The study concludes the inverse relationship between the firm's profitability and the NTC. Deloof (2003) used a sample of 1,009 non-financial enterprises in Belgium for the period 1992-1996 to investigate the relationship between the WCM and the profitability. The results showed the negative effects between the CCC, the ARD, the INVD, the APD with the GOP. Concurrently, managers need to reduce the ARD and the INVD to a reasonable level may help improve the shareholders' value.

Lazaridis and Tryfonidis (2006) used a sample of 131 companies listed on the Athens stock exchange for the period 2001-2004. The study showed the CCC had the opposite impact on the GOP. The research showed that managers could improve profitability by setting the reasonable level of the CCC and its components. Mohamad

and Saad (2010) applied correlations and multiple regression analysis to investigate the data, including 172 listed firms randomly selected from Bursa Malaysia's main board for 5 years from 2003 to 2007. It concluded that the WCM had the significant negative impacts on the firm's profitability, including market value (Tobin's Q) and book value (ROA, ROIC).

Sharma and Kumar (2011) used the sample including 263 non-financial companies listed on the Bombay Stock Exchange (BSE) for the period 2000-2008 to test the impact of the CCC and its components on the ROA. The conclusion found the statistically significant effects between the ARD and firm size on the ROA. Vural, Sokmen, and Cenenak (2012) used secondary data collected from 75 manufacturing firms listed on the Istanbul Stock Exchange Market for the period 2002 - 2009 with an attempt to investigate the effects of WCR and its components on the firm's profitability including book value (GOP) and market value (Tobin's Q). The results demonstrated that firms could increase the GOP by shortening the ARD and the CCC. However, Tobin's Q was impacted insignificantly except for the CCC.

Gul et al. (2013) investigated the impact of the WCM on the ROA of small and medium enterprises in Pakistan for the period 2006-2012. The results showed that the APD had the positive effect on the ROA. While the ARD, the INVD, and the CCC had the opposite effects on the ROA. On the other hand, the study also found the positive impact of control variables in which firm size on ROA. But the control variable that is current ratio had the opposite effect on ROA. Tu and Nguyen (2014) tested the effects of the WCM on the GOP of 208 non-financial companies listed on the Vietnamese stock market in many economic sectors such as construction, real estate and transportation. The results showed that the effective WCM by shortening the ARD and INVD would increase the profitability of firms. Moreover, other sectors led to the relationship between WCM and profitability was also different.

Bui (2016) used a sample of 35 real estate firms listed on the Vietnam stock market over the period 2010-2014 to test the effects of the working capital policy on the ROA. Research results showed the components of WCM including the ARD, and the INVD had the negative effect on the ROA. Moreover, ROA was impacted by firm size, leverage, and economic growth. Muhammad, Rehman, and Waqas (2016) investigated the influence of the WCM on the firm's profitability measured by the ROA for tobacco industry companies of Pakistan for the period 2005 - 2014. The results showed that the WCM had the strong negative impact on the firm's profitability.

The results from the previous studies showed that the WCM had the strong negative impact on profitability. It means that the enterprises can improve profitability by

minimizing the WCM at a reasonable level. This research focuses on testing the impact of the CCC and its components (including the ARD, the INVD, and the APD) on the profitability (including ROA and Tobin's Q) of enterprises. Sale growth rate (SG), Firm size by total assets (FS), Debt ratio (LEV), Firm age (AGE), and Current ratio (CR) are used as control variables affecting the profitability.

2.3. Hypothesis Development

2.3.1. Accounts Receivable Turnover in Days and Firm Profitability

The shorter the accounts receivable turnover in days (ARD), the less the firm's working capital is used by the customers. It helps firms to be proactive in settling all payments and to widen the investment opportunities in other projects to make a profit. Almost previous empirical studies tested and concluded that the ARD had a negative effect on the profitability as Deloof (2003); Lazaridis and Tryfonidis (2006); Sharma and Kumar (2011); Vural, Sokmen, and Cenenak (2012); Gul et al. (2013); Tu and Nguyen (2014); Bui (2016); and Muhammad, Rehman, and Waqas (2016). Therefore, the hypothesis is given:

H1: The accounts receivable turnover in days (ARD) has the negative impact on the firm's profitability

2.3.2. Inventory Turnover in Days (INVD) and Firm Profitability

The industrial companies have a relatively large amount of inventories. So storing up a large number of inventories will result in the stagnant working capital, large storage costs, affecting the profitability of businesses. The previous empirical studies tested and concluded that the inventory turnover in days (INVD) had a negative impact on the profitability as Deloof (2003); Lazaridis and Tryfonidis (2006); Gul et al. (2013); Tu and Nguyen (2014); Bui (2016); and Muhammad, Rehman, and Waqas (2016). Therefore, the hypothesis is given:

H2: The inventory turnover in days (INVD) has the negative impact on the firm's profitability

2.3.3. Accounts Payable in Days (APD) and Firm Profitability

The lower the APD, the better the solvency of the enterprise is, the less it takes the working capital of other businesses and increases the reputation of the firm. Therefore, it shows the profitability of businesses in the future. Some previous empirical studies tested and concluded that APD had a negative impact on the profitability as Deloof (2003); Lazaridis and Tryfonidis (2006); Tu and Nguyen (2014); Bui (2016), and

Muhammad, Rehman, and Waqas (2016). However, some other empirical studies concluded that APD had a positive effect on the profitability as Sharma and Kumar (2011); Gul et al. (2013) and several studies showed that there was no relationship between the APD and the profitability as Vural, Sokmen, and Cenenak (2012). Therefore, the hypothesis is given:

H3: The accounts payable in days (APD) has the negative impact on the firm’s profitability

2.3.4. Cash Conversion Cycle (CCC) and Firm Profitability

The CCC is calculated by the ARD, the INVD, and the APD. Therefore, the change of any factors will affect the CCC. Almost previous empirical studies examined and concluded that the CCC had a negative impact on the profitability as Deloof (2003); Lazaridis and Tryfonidis (2006); Mohamad and Saad (2010); Sharma and Kumar (2011); Vural, Sokmen and Cenenak (2012); Gul et al. (2013); Tu and Nguyen (2014); Bui (2016), and Muhammad, Rehman, and Waqas (2016). Therefore, the hypothesis is given:

H4: The cash conversion cycle (CCC) has the negative impact on the firm’s profitability

3. Data and Research Methodology

3.1. Data and Variables Measurement

Data used in the study is randomly collected from the financial statements of 226 industrial enterprises listed on the Vietnamese stock market, including the Ha Noi Stock Exchange and Ho Chi Minh City Stock Exchange over the 9 years from 2010 to 2018. The samples are taken as the following: In listed companies on the Vietnamese Stock Market, 226 industrial enterprises were selected. Then, the 83 industrial enterprises are eliminated due to do not have a full financial statement during the research period. All necessary items collected in the financial statements are measured as the calculation in Table 1.

After that, the data of 24 companies which are abnormal; affecting the main variables will be disqualified. From this approach, the authors collect a panel data of 119 enterprises and a total of 1071 observations during the 9 years from 2010 to 2018. Finally, this paper use the panel data, including the independent variables (the CCC, the ARD, the INVD, the APD); the dependent variables (ROA, and Tobin’s Q) and the control variables include firm size (FS), sale grow rate (SG), leverage ratio (LEV), firm age (AGE), and current ratio (CR) for research.

Table 1: Description of variables

Variables	Mean	Maximum	Minimum	Std.Dev.	Observations
ROA _{i,t}	0.035	0.312	-0.121	0.028	1071
TOBIN_Q _{i,t}	1.030	5.243	0.085	0.432	1071
ARD _{i,t}	55.514	773.990	-225.862	70.884	1071
INVD _{i,t}	94.387	799.131	0.054	90.856	1071
APD _{i,t}	33.361	910.515	-687.657	66.290	1071
CCC _{i,t}	116.541	903.167	-387.427	115.143	1071
SG _{i,t}	0.167	43.895	-0.812	1.385	1071
FS _{i,t}	19.963	23.546	16.800	1.355	1071
LEV _{i,t}	0.504	0.964	0.016	0.215	1071
AGE _{i,t}	11.403	26.000	2.000	3.815	1071
CR _{i,t}	2.077	33.151	0.265	2.328	1071

3.2. Model Specification

Model 1a:

$$ROA_{i,t} = \beta_0 + \beta_1*ARD_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4*LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \epsilon_{i,t}$$

Model 1b:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1*ARD_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4*LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \epsilon_{i,t}$$

Model 2a:

$$ROA_{i,t} = \beta_0 + \beta_1*INVD_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4*LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \epsilon_{i,t}$$

Model 2b:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1*INVD_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4*LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \epsilon_{i,t}$$

Model 3a:

$$ROA_{i,t} = \beta_0 + \beta_1*APD_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4* LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \varepsilon_{i,t}$$

Model 3b:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1*APD_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4*LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \varepsilon_{i,t}$$

Model 4a:

$$ROA_{i,t} = \beta_0 + \beta_1*CCC_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4* LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \varepsilon_{i,t}$$

Model 4b:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1*CCC_{i,t} + \beta_2* SG_{i,t} + \beta_3*FS_{i,t} + \beta_4*LEV_{i,t} + \beta_5*AGE_{i,t} + \beta_6*CR_{i,t} + \varepsilon_{i,t}$$

where “i” index firm, “t” is the year and “ε” is the error term.

In general, this investigation uses the ordinary least-squares regression model (OLS) for analysis. In addition to the OLS model, the paper use the Hausman Test to assure findings are robust. In detail, we first run the panel data using the OLS model. Secondly, to determine whether it is necessary to add Cross-section effects in the FEM compared to the OLS estimates, the authors use the Redundant Fixed Effects to verify the need for constraints relating to table units and time points in the FEM. If the Probability of Cross-sections F and Cross-Sections Chi-square is < 0.05, the results of the OLS model can't use (at 5% significance level), we used the results of FEM or REM which based on the Hausman Test. Thirdly, we use the Hausman Test which applied to determine the exogeneity

variables of the unobserved errors and choose between the Fixed Effects Model (FEM) and Random Effects Model (REM). Since the null hypothesis of the Hausman test is rejected (P-value < 0.05), we concluded that the REM is inconsistent and the FEM is preferred and vice versa.

4. Results and Discussion

4.1. Empirical Results

4.1.1. Descriptive Statistics

Table 2 presents the descriptive statistics of all variables. All variables have collected enough data with 1071 observations for the period 2010 to 2018. Dependent variables: Profitability are measured by ROA and the TQ. The average ROA is 3.5%; the highest value and the lowest value of ROA is respectively about 31.2% and 12.1%. The average Tobin's Q is 1.03 times which shows the good signal from investors; the highest value and the lowest value of Tobin's Q is respectively about 5.243 times and 0.085 times. Independent variables. The WCM is measured by The CCC, the ARD, the INVD, and the APD. The average value of the CCC is 116.5 days, which the minimum value and maximum value are respectively 387 days and 903 days. It shows that firms have to take 55.5 days to obtain their money from the clients, 94.4 days to buy raw materials, manufacture and sell the inventories and 33.4 days to pay for the suppliers. Regarding the control variables, the industrial firms have an average SG of 16.7%, an average FS of 19.96, an average LEV of 0.504, an average AGE of 11.4 years and an average CR of 2.077.

Table 2: Descriptive statistics of variables

Variables	Mean	Maximum	Minimum	Std.Dev.	Observations
ROA _{i,t}	0.035	0.312	-0.121	0.028	1071
TOBIN_Q _{i,t}	1.030	5.243	0.085	0.432	1071
ARD _{i,t}	55.514	773.990	-225.862	70.884	1071
INVD _{i,t}	94.387	799.131	0.054	90.856	1071
APD _{i,t}	33.361	910.515	-687.657	66.290	1071
CCC _{i,t}	116.541	903.167	-387.427	115.143	1071
SG _{i,t}	0.167	43.895	-0.812	1.385	1071
FS _{i,t}	19.963	23.546	16.800	1.355	1071
LEV _{i,t}	0.504	0.964	0.016	0.215	1071
AGE _{i,t}	11.403	26.000	2.000	3.815	1071
CR _{i,t}	2.077	33.151	0.265	2.328	1071

4.1.2. Correlation Analysis

Table 3 shows the correlation between all variables in the regression model. According to Gujarati (1995), the regression equation will have a serious multi-collinear

problem when the value of the correlation exceeds 0.8. Table 3 reveals that the correlation coefficient between all variables is <0.8, so there is no multi-collinear problem, these independent variables and control variables can be

used for multivariate regression models. The results of correlation analysis for the ROA indicates the significant negative coefficient with ARD (-0.266); INVD (-0.27); APD (-0.251); CCC (-0.232); FS (-0.068); LEV (-0.272); AGE (-0.055) and the significant positive coefficient with SG (0.307); CR (0.074). The results of correlation analysis for Tobin’s Q indicates the significant negative coefficient with ARD (-0.193); INVD (-0.118); APD (-0.151); CCC (-

0.125); LEV (-0.153); and the significantly positive coefficient with SG (0.067); FS (-0.022); AGE (-0.11); CR (0.05). This implies that to increase the ROA and the Tobin’s Q, firms need to decrease the collection time from clients, inventory storing time and payment time for creditors. The results of correlation analysis are mostly consistent with the results of previous studies and expectation sign of authors.

Table 3: Correlation matrix of variables

Correlation Probability	ROA	TOBIN Q	ARD	INVD	APD	CCC	SG	FS	LEV	AGE	CR
ROA	1										

TOBIN Q	0.481	1									
	0.000	-----									
ARD	-0.266	-0.193	1								
	0.000	0.000	-----								
INVD	-0.270	-0.118	0.197	1							
	0.000	0.000	0.000	-----							
APD	-0.251	-0.151	0.385	0.277	1						
	0.000	0.000	0.000	0.000	-----						
CCC	-0.232	-0.125	0.550	0.751	-0.120	1					
	0.000	0.000	0.000	0.000	0.000	-----					
SG	0.307	0.067	-0.065	-0.050	-0.023	-0.067	1				
	0.000	0.029	0.032	0.099	0.452	0.029	-----				
FS	-0.068	0.022	-0.083	0.080	0.014	0.003	0.049	1			
	0.026	0.466	0.007	0.009	0.637	0.914	0.112	-----			
LEV	-0.272	-0.153	0.064	0.231	0.182	0.117	0.023	0.302	1		
	0.000	0.000	0.035	0.000	0.000	0.000	0.447	0.000	-----		
AGE	-0.055	0.110	-0.019	-0.045	-0.010	-0.041	-0.021	0.085	-0.215	1	
	0.070	0.000	0.534	0.144	0.735	0.180	0.498	0.006	0.000	-----	
CR	0.074	0.050	-0.022	-0.035	-0.156	0.049	-0.026	-0.247	-0.539	0.193	1
	0.015	0.099	0.466	0.258	0.000	0.112	0.389	0.000	0.000	0.000	-----

4.1.3. Regression Analysis

The regression analysis is performed in this paper based on the panel data with two models: OLS, FEM/REM and using the results of the Hausman test. Firstly, the results of the Redundant Fixed Test for all models reveal that the Probability of Cross-sections F and Cross-Sections Chi-square are both $0.000 < 0.05$. It means that the OLS is not appropriate; we use the results of REM/FEM to analyze the regression between the WCM and profitability. Secondly, the results of the Hausman test have P-value $< 5\%$, thus rejecting the null hypothesis and selecting the FEM model to analyze the relationship between the WCM and profitability. The results of regression analysis are shown in Table 4, 5, 6, and 7 as the followings:

Table 4 presents the relationship between the ARD and

the profitability by two models: OLS, REM/FEM. Due to the OLS is not appropriate; we use the results of FEM to reveal the impact of the ARD on the ROA and the Tobin’s Q. The result of FEM shows that the ARD has the statistically significant and negative effects at 1% significance level on the ROA and the Tobin’s Q with a coefficient of -0.00004 and -0.0006 respectively. It means that when the other factors constant if the ARD decreases by 1 unit, the average value of the ROA and the Tobin’s Q will increase respectively by 0.00004 and 0.0006 units. This shows that the shorter the time to collect its money from clients, the higher the profitability of a business.

The control variables SG and FS have respectively the significant and positive impacts on the ROA (0.0065 at 1%

significance level and 0.0104 at 5% significance level) and the Tobin's Q (0.0239 at 1% significance level and 0.071 at 10% significance level). The LEV has also the significant and opposite effects on the ROA and the Tobin's Q, respectively, 0.0411 at 1% significance level, 0.24 at 10% significance level. The AGE has the negative effect at 1% significance level on the ROA with a coefficient of 0.0019

but has the positive effect at 1% significance level on the Tobin's Q with a coefficient of 0.0221. However, there is no relationship between the CR and the firm's profitability. In general, R² at 59.47% and 54.24% reveal that variation of the ROA and the Tobin's Q values can be explained by the ARD and the control variables selected by authors in the model.

Table 4: The impact of the ARD and the firm's profitability (Model 1a and 1b)

Coefficient	Model 1a: ARD & ROA		Model 1b: ARD & Tobin's Q	
	OLS	FEM	OLS	FEM
ARD	-0.0001***	-0.00004***	-0.0011***	-0.0006***
	0.000	0.0016	0.000	0.008
SG	0.0060***	0.0065***	0.0180*	0.0239***
	0.000	0.000	0.051	0.002
FS	-0.0003	0.0104**	0.0114	0.0710*
	0.628	0.000	0.263	0.055
LEV	-0.0430***	-0.0411***	-0.3245***	-0.2400*
	0.000	0.000	0.000	0.061
AGE	-0.0008***	-0.0019***	0.0090**	0.0221***
	0.000	0.000	0.011	0.000
CR	-0.0010**	0.0003	-0.0084	-0.0029
	0.010	0.500	0.201	0.663
R ²	0.2423	0.5947	0.0697	0.5424
P-value (Fixed Test)	0.000		0.000	
P-value (Hausman Test)		0.000		0.0064
Observations	1071	1071	1071	1071

Note: *, **, *** indicated respectively the significance at 10%, 5% and 1% levels.

Table 5 presents the relationship between the INVD and the profitability by two models: OLS, REM/FEM. The same as table 4, the result of FEM shows that the INVD has respectively the statistically significant and negative effects at 1% significance level on the ROA and the Tobin's Q with a coefficient of -0.00005 and -0.00006. It means that when the other factors constant if the INVD decreases by 1 unit, the average value of the ROA and the Tobin's Q will increase respectively by 0.00005 and 0.00006 units. This shows that the shorter the time to storage inventories, the higher the profitability of a business.

The relationship between the profitability and control variables seems to be similar to models 1a and 1b. In models 2a and 2b, the impacts of the SG and the FS on the ROA and the Tobin's Q are positive and significant; the LEV has the negative and significant impacts on the ROA and the Tobin's Q; and the AGE has the negative effect on the ROA but has the positive effect on the Tobin's Q. However, there is no relationship between the CR and firm

profitability.

Table 6 presents the relationship between the APD and the profitability by two models: OLS, REM/FEM. The same as table 4 and table 5, the result of FEM shows that the APD has respectively the statistically significant and negative effects at 1% significance level on the ROA and the Tobin's Q with a coefficient of -0.00005 and -0.00002. It means that when the other factors constant if the APD decreases by 1 unit, the average value of the ROA and the Tobin's Q will increase respectively by 0.00005 and 0.00002 units. This shows that the shorter the time to pay for creditors, the higher the profitability of a business.

The relationship between the profitability and control variables seems to be similar to models 1a and 1b. In models 3a and 3b, the impacts of the SG and the FS on the ROA and the Tobin's Q are also positive and significant; the LEV has the negative and significant impacts on the ROA and the Tobin's Q; and the AGE has the negative effect on the ROA but has the positive effect on the Tobin's Q. Furthermore, the regression results don't show the

significant relationship between the CR and profitability. Lastly, R² at 0.5973 for model 3a shows that 59.73% variation of the ROA values can be explained by the APD and the control variables and R² at 0.5395 for model 3b

reveals that 53.95% variation of the Tobin's Q values can be explained by the APD and the control variables which selected by authors in the model.

Table 5: The impact of the INVD and the firm's profitability (Model 2a and 2b)

Coefficient	Model 2a: INVD & ROA		Model 2b: INVD & Tobin's Q	
	OLS	FEM	OLS	FEM
INVD	-0.0001***	-0.00005***	-0.0004***	-0.0006***
	0.000	0.000	0.009	0.001
SG	0.0061***	0.0064***	0.0200**	0.0228***
	0.000	0.000	0.033	0.003
FS	0.0004	0.0110***	0.0183*	0.0788**
	0.555	0.000	0.073	0.033
LEV	-0.0386***	-0.0398***	-0.3131***	-0.2238*
	0.000	0.000	0.000	0.080
AGE	-0.0008***	-0.0020***	0.0086**	0.0212***
	0.000	0.000	0.015	0.000
CR	-0.0007*	0.0005	-0.0065	0.0003
	0.076	0.207	0.332	0.969
R ²	0.2257	0.5982	0.0457	0.5446
P-value (Fixed Test)	0.000		0.000	
P-value (Hausman test)		0.000		0.026
Oservations	1071	1071	1071	1071

Note: *, **, *** indicated respectively the significance at 10%, 5% and 1% levels.

Table 6: The impact of the APD and the firm's profitability (Model 3a and 3b)

Coefficient	Model 3a: APD & ROA		Model 3b: APD & Tobin's Q	
	OLS	FEM	OLS	FEM
APD	-0.0001***	-0.00005***	-0.0008***	-0.0002***
	0.000	0.0001	0.000	0.340
SG	0.0062***	0.0064***	0.0204**	0.0253***
	0.000	0.000	0.028	0.001
FS	-0.00001	0.0100***	0.0152	0.0712*
	0.991	0.000	0.137	0.055
LEV	-0.0418***	-0.0391***	-0.3194***	-0.2511*
	0.000	0.000	0.000	0.051
AGE	-0.0007***	-0.0018***	0.0094***	0.0217***
	0.000	0.000	0.008	0.000
CR	-0.0012***	0.0001	-0.0107	-0.0035
	0.002	0.757	0.108	0.604
R ²	0.2296	0.5973	0.0554	0.5395
P-value (Fixed Test)	0.000		0	
P-value (Hausman test)		0.000		0.0053
Oservations	1071	1071	1071	1071

Note: *, **, *** indicated respectively the significance at 10%, 5% and 1% levels.

Table 7 presents the relationship between the CCC and the profitability by two models: OLS, REM/FEM. The same as Table 4, 5 and 6, the result of FEM shows that the CCC has respectively the statistically significant and negative effects on the ROA and the Tobin's Q with a coefficient of -0.00002 (at 5% significant level) and -0.00004 (at 1% significant level). It means that when the other factors constant if the CCC decreases by 1 unit, the average value of the ROA and the Tobin's Q will increase respectively by 0.00002 and 0.00004 units. This shows that the shorter the CCC, the higher the profitability of a business.

The relationship between the profitability and control variables seems to be similar to models 1a and 1b. In

models 4a and 4b, the impacts of the SG and the FS on the ROA and the Tobin's Q are also positive and significant; the LEV has the negative and significant impacts on the ROA and the Tobin's Q; and the AGE has the negative effect on the ROA but has the positive effect on the Tobin's Q. Furthermore, the regression results don't show the significant relationship between the CR and profitability. Lastly, R² at 0.5927 for model 4a shows that 59.27% variation of the ROA values can be explained by the CCC and the control variables and R² at 0.5445 for model 4b reveals that 54.45% variation of the Tobin's Q values can be explained by the CCC and the control variables which selected by authors in the model.

Table 7: The impact of the CCC and the firm's profitability (Model 4a and 4b)

Coefficient	Model 4a: CCC & ROA		Model 4b: CCC & Tobin's Q	
	OLS	FEM	OLS	FEM
Probability				
CCC	-0.00004***	-0.00002**	-0.0004***	-0.0004***
	0.000	0.0212	0.001	0.001
SG	0.0061***	0.0066***	0.0194**	0.0248***
	0.000	0.000	0.039	0.001
FS	0.0002	0.0109***	0.0172*	0.0806**
	0.743	0.000	0.092	0.029
LEV	-0.0414***	-0.0425***	-0.3211***	-0.2518**
	0.000	0.000	0.000	0.048
AGE	-0.0008***	-0.0020***	0.0084***	0.0206***
	0.000	0.000	0.017	0.000
CR	-0.0007*	0.0004	-0.0056	0.0007
	0.092	0.304	0.404	0.921
R ²	0.2205	0.5927	0.0488	0.5445
P-value (Fixed Test)	0.000		0	
P-value (Hausman test)		0.000		0.0218
Observations	1071	1071	1071	1071

Note: *, **, *** indicated respectively the significance at 10%, 5% and 1% levels.

4.2. Discussion

The regression results in Table 4, 5, 6, 7 are quite similar to the correlation analysis of all variables in table 3. Overall, the results reveal that the WCM has the significant and negative relationship with firm profitability including the book value (the ROA) and the market value (the Tobin's Q).

Firstly, in the relationship between ARD and the profitability in table 4, the results show that the effect of ARD on firm profitability including book value (the ROA) and market value (The Tobin's Q) are negative and statistically significant. Thus, the above findings are consistent with the hypothesis H1: The ARD has the

negative impact on the firm's profitability. Moreover, the results of this study are completely consistent with previous studies such as Deloof (2003); Lazaridis and Tryfonidis (2006); Sharma and Kumar (2011); Vural, Sokmen, and Cenenak (2012); Gul et al. (2013); Tu and Nguyen (2014); and Bui (2016). This shows that the more the ARD increases, the lower the ability to take back account receivables of enterprises means that businesses are occupied money by customers; have stagnant capitals; incur related costs such as financial costs to raise the new capitals; the possibility of increasing bad debts and lose the opportunity cost to invest in new projects ... The increased costs will contribute to decrease in the firm's profitability of the industrial firms. Thus, it can be concluded that to

increase the firm's profitability, businesses need to reduce the average collection time in some ways such as providing more effective debt collection measures or keeping the optimal credit policies with customers.

Secondly, in the relationship between the INVD and the profitability in table 5, the results show that the effect of the INVD on a firm's profitability is negative and statistically significant. Thus, the above research results are consistent with the hypothesis H2: The INVD has the negative impact on the firm's profitability. Moreover, research results in industrial sector is largely similar to previous studies such as Deloof (2003); Lazaridis and Tryfonidis (2006); Gul et al. (2013); Tu and Nguyen (2014); Bui (2016); and Muhammad, Rehman, and Waqas (2016). The industrial enterprises listed on Vietnam's stock market in 2010 - 2018 have a long time to hold inventory, the INVD has the longest value (94.4 days) in 3 components of the CCC (116.3 days).

However, this result shows that the storage time of inventories is lower, showing that the rotation of goods of enterprises is efficient, quick to generate revenue. Moreover, the quick rotation of inventory helps to increase the quality of goods, make more the opportunity for new contracts, create new revenues and new customers for businesses while reducing the cost of preservation and the storage costs of goods as well as the opportunity cost for stagnant capital of inventories. Thus, it can be concluded that to increase the firm's profitability, businesses need to reduce the INVD by measures such as increasing the quality of goods, creating new customer groups as well as setting policies to optimize the number of inventories while ensuring the efficiency of enterprises.

Thirdly, in the relationship between the APD and the profitability in table 6, the results show that the impact of the APD on the firm's profitability in both book value and market value is negative and statistically significant. Thus, the above results are consistent with hypothesis H3: the APD has the negative impact on the firm's profitability. Moreover, this result is similar to the research results of Deloof (2003); Lazaridis and Tryfonidis (2006); Tu and Nguyen (2014); Bui (2016), and Muhammad, Rehman and Waqas (2016). Account Payable is capital without interest expenses, so businesses need to take advantage of this payment to increase the firm's profitability. Thus, it can be concluded that to increase the firm's profitability, businesses need to reduce the APD in some ways such as taking full advantage of the seller's credit policy and proactively finance to pay for the sellers.

Fourthly, in the relationship between the CCC and the profitability in table 7, the results show that the impact of the CCC on the firm's profitability is also negative and statistically significant. Thus, the above results accept the hypothesis H4: The CCC has the negative impact on the

firm's profitability. This research result is completely consistent with previous studies such as Deloof (2003); Lazaridis and Tryfonidis (2006); Mohamad and Saad (2010); Sharma and Kumar (2011); Vural, Sokmen, and Cenenak (2012); Gul et al. (2013); Tu and Nguyen (2014); Bui (2016), and Muhammad, Rehman, and Waqas (2016). The above research results are quite appropriate because the CCC is an integrated indicator of the ARD, the INVD, and the APD. This shows that businesses need to shorten CCC through creating a reasonable WCM policy that will help businesses to increase their enterprise's life skills, creating added value for investors. Here is the optimization of the CCC including (1) shortening the average time of collecting money will reduce the demand for the WCM and enhance the solvency for businesses; (2) accelerate the process of rotation of cooperatives and (3) slow payment of the bills.

5. Conclusions

Within the framework of this paper, eight models are performed to examine the impacts of the WCM on the firm's profitability of 119 industrial enterprises listed on the Vietnamese stock market for the 9 year period from 2010 to 2018. Research results show the negative and significant impacts of the WCM (measured by the CCC and three components of the CCC including the ARD, the INVD, and the APD) on the firm's profitability including the ROA (represented for Book value) and the Tobin's Q (represented for Market value). Creating a reasonable working capital policy will enable businesses to increase the profitability and create value for investors. It shows that the optimization of the CCC, which includes (1) shortening the time to collect money from clients, (2) accelerating inventory flow and (3) reducing the payment time to creditors will help increase the industrial firm's profitability. In addition, the paper results also find the significantly statistic impacts of the FS, the SG, the LEV and the AGE on the firm's profitability.

References

- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2014). Working capital management, corporate performance and financial constraints. *Journal of Business Research*, 67(3), 332-338.
- Bui, N. T., (2016). The effect of working capital management on the return on assets of Vietnamese real estate companies. *Can Tho University Journal of Science*, 44(1), 18-27.
- Deloof, M., (2003). Does working capital management affects profitability of Belgian firms? *Journal of Business Finance & Accounting*, 30(3-4), 573-587.
- Enqvist, J., Graham, M., & Nikkinen, J. (2014). The impact of

- working capital management on firm profitability in different business cycles: evidence from Finland. *Research in International Business and Finance*, 32(C), 36-49. <https://doi.org/10.1016/j.ribaf.2014.03.005>
- Gul, S., Khan, M. B., Rehman, S. U., Khan, M. T., Khan, M., & Khan, W. (2013). Working capital management and performance of SME sector. *European Journal of Business and Management*, 5(1), 60-68.
- Guthmann, H. G., & Dougall, H. E. (1948). *Corporate Financial Policy* (2nd ed.). New York, NY: Prentice-Hall, Inc.
- Horward, B. B., & Upton, M. (1953). *Introduction to Business Finance* (1st ed.). New York, NY: McGraw Hill.
- Lazaridis, J., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in the Athens Stock Exchange. *Journal of Finance Management Analysis*, 19(1), 26-35.
- Mohamad, N. E. A. B., & Saad, N. B. M., (2010). Working capital management: the effect of market valuation and profitability in Malaysia. *Internal Journal of Business and Management*, 5(11), 140-147. DOI:10.5539/ijbm.v5n11p140
- Muhammad, H., Rehman, A. U., & Waqas, M. (2016). The relationship between working capital management and profitability: a case study of tobacco industry of Pakistan. *Journal of Asian Finance, Economics and Business*, 3(2), 13-20. <https://doi.org/10.13106/jafeb.2016.vol3.no2.13>.
- Nguyen, P. A., Nguyen, A. H., & Nguyen, P. V. (2019). The relationship between productivity and firm's performance: evidence from listed firms in Vietnam stock exchange. *Journal of Asian Finance, Economics and Business*, 6(3), 131-140. <https://doi.org/10.13106/jafeb.2019.vol6.no3.131>
- Rahman, M. M., & Saima, F. N. (2018). Efficiency of board composition on firm performance: empirical evidence from listed manufacturing firms of Bangladesh. *Journal of Asian Finance, Economics and Business*, 5(2), 53-61. <https://doi.org/10.13106/jafeb.2018.vol5.no2.53>
- Ricci, C., & Vito, N. D. (2000). International working capital practices in the UK. *European Financial Management*, 6(1), 69-84. <https://doi.org/10.1111/1468-036X.00112>
- Richards, V. D., & Laughlin, E. J. (1980). A cash conversion cycle approach to liquidity analysis. *Financial Management*, 9(1), 32-38. DOI: 10.2307/3665310
- Sharma, A., & Kumar, S. (2011). Effect of working capital management on firm profitability: empirical evidence from India. *Global Business Review*, 12(1), 159-173.
- Shin, H. H., & Soenen, L. (1998). Efficiency of working capital management and corporate profitability. *Financial Practice and Education*, 8(2), 37-45.
- Taleb, G. A., Zoued, A. N., & Shubiri, F. N. (2010). The determinants of effective working capital management policy: a case study on Jordan. *Interdisciplinary Journal of Contemporary Research in Business*, 2(4), 248-264.
- Tu, T. K. T., & Nguyen, T. U. U. (2014). The relationship between the working capital management and the profitability: experimental evidence in Vietnam. *Journal of Development and Integration*, 14(24), 62-70.
- Van Horne, J. C. (2008). *Fundamentals of Financial Management* (13th ed). Upper Saddle River, NJ: Prentice Hall
- Vural, G., Sokmen, A. G., & Cetenak, E. H. (2012). Affects of working capital management on firm's performance: evidence from Turkey. *International Journal of Economics and Financial Issues*, 2(4), 488-495.