

# IMPACT OF WORKING CAPITAL MANAGEMENT ON FIRM PROFITABILITY: EVIDENCE FROM SCANDINAVIAN COUNTRIES

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## ABSTRACT

*The intention of this research is to examine the impact of working capital management (WCM) on firm's profitability. We take our sample from major developed Scandinavian states (i.e., Denmark, Norway, and Sweden), during the period 2003-2015. We measure WCM as receivable days (RADs), inventory days (IDs), payable days (PADs), cash conversion cycle (CCC), current ratio (CR) and working capital (WC), and firm's profitability as return on assets (ROA). Additionally, we also use several firm levels (firm size, age, leverage) and country level (GDP growth, financial crisis) control variables to estimate robust outcomes. After controlling aforesaid indicators, we found adverse impact of inventory days (IDs), receivable days (RADs), payable days (PADs), and cash conversion cycle (CCC) on firm's profitability (ROA). These outcomes specify that extensive recovery periods effect on funds availability and supply of material, which subsequently impact on firm operations and profitability. Furthermore, working capital (WC) and current ratio (CR) are positively related to firm's profitability (ROA) that delineates the importance of excessive current assets to foster firm's profitability (ROA).*

**Keywords:** Working Capital Management (WCM), Firm's Profitability, Scandinavian Countries

## INTRODUCTION

Profit maximization and sale growth of any enterprise relay on cost management as well as production process. These determinants indicate enterprise efficiency and market denomination. There are numerous factors which participate in enterprise profitability, but among all working capital management (hereafter WCM) is a unique. It specifies highest portion among enterprise expenses, particularly manufacturing enterprises. According to Uchenna, Mary, and Okelue (2012), working capital

represents 30% to 40% of enterprise overall investment. It is required to maintain WC (working capital) at an optimum point to evade any deficiency and trouble in managing smooth business operations Harris (2005). Managing WC is a crucial element in keeping liquidity and fostering enterprise profitability.

Investment in WC is a part of firm's total assets (Appuhami, 2008), which can be broadly explained as a variance among total current assets and total current liabilities that donates enterprise financial health. Efficient WCM includes controlling and planning of current liabilities and current assets, to maintain stability among profitability and liquidity. As explained by Harris (2005), WCM is a way to finance short term monetary requirements through efficient management of current liabilities and current assets. Firm's basic objective i-e maximizing wealth can only be attained by creating a balance between aforementioned indicators. Thus WCM can be deliberated as a key element to explain firm performance by maintaining liquidity for daily actions (Van Horne & Wachowicz, 2008).

WC is an essential pre-requisite for the success of firms (Ghosh & Maji, 2004). It is also among the seven factors elaborated by Rappaport (1986), which determine shareholder's wealth. The key objective of WCM is to guarantee that enterprise is capable of fulfilling its short run obligations and covers its operating expenses within the time period. However, WC mismanagement may lead to monetary crunch, surges risk and cuts profitability (Ukaegbu, 2014). Due to the substantial amount of WC investment and the importance of WC policy in determining firm's risk, WCM has an impact not only on firm's accounting performance but on market performance as well (Abuzayed, 2012).

The objective of this study is to elucidate the liaison between WCM and firm's performance among Scandinavian countries (Denmark, Norway, and Sweden). There are two reasons for choosing Scandinavian states: firstly these countries have stable economic and political situations. Secondly, their institutional settings are supportive of fostering business activities and building strong business relationship. We measure WCM as receivable days (RADs), inventory days (IDs), payable days (PADs), cash conversion cycle (CCC), working capital (WC) and current ratio (CR), and firm profitability as return on assets (ROA). Study results show the negative impact of inventory days, account receivable days, account payable days, and cash conversion cycle on firm profitability. These results indicate that large recovery period effects on funds availability and

supply of material, which subsequently impact on firm operations and profitability. Moreover, working capital and current ratio have a positive relationship with firm profitability, which shows the importance of excessive current assets to foster ROA. Policy implications of the study recommend that firms which are desired to enhance their profitability should pay special attention to manage WCM.

Section 2 delivers a brief summary of past studies on WCM and hypothesis development. Section 3 defines methodology, variable measurement, and empirical modeling. Section 4 summarizes the experimental analyses and results. Section 5 reports conclusion and policy implications.

### **LITERATURE REVIEW**

Previous studies are focused on examining the role of WCM as optimal inventory level, cash conversion cycle, optimal account receivable and payable, on firm success (Deloof, 2003; Gill, Biger, & Mathur, 2010). Some of them found consistent results and other established mix results. Gill et al. (2010), reviewed the association among WCM and firm success among 88 US firms registered on NYS for the time frame from 2005-07. Firm-level profitability and WCM were measured as gross operating income and cash conversion cycle, respectively. The results signified that firm's manager can earn a profit for business by managing cash conversion cycle efficiently.

Uchenna et al. (2012), scrutinized the impact of WCM on the profitability of industrial firms. Researchers used CCC (cash convert cycle) to quantify WC. Using multiple regression analysis, results showed that WCM as cash conversion cycle, impact on firm profitability. These results were consistent with other previous studies e.g. Pouraghajan and Emamgholipourarchi (2012), and Charitou, Elfani, and Lois (2010), which stated significant relationship among WCM and firm performance.

Aregbeyen (2013), securitized the connection between WCM and firm profitability among 48 industrialized firms registered on Stock Exchange of Nigeria for the time period of 1993 to 2005. WCM was measured through different proxies' i-e. The average period for collection, average period for payment, inventory turnover, and cash conversion cycle. To estimate firm performance author used three measures, which are categorized as gross operating revenue, net operating revenue and returns on assets. The final results specified that ineffective level of working capital reduces firm profitability. These results were in line with past study of Smith (1973), which notified that a huge number of firms failure were

caused by the ineffective level of WC. Thus the efficient and effective level of WC is necessary to attain short term and long term business objectives.

Marttonen, Monto and Karri (2013), inspected the impact of WCM on profitability among industrial maintenance/service sector by using FAM (flexible assets managing) model. Results revealed significantly negative affiliation between WC cyclical time and return on investment (ROI). Baños-Caballero, Gracia-Teruel, and Martinez-Solano (2014), assessed the impact of WCM and firm performance among firms from the non-financial sector of UK.

Economic destructive events such as financial crisis, recession etc. have an impact on working capital practices and policies. Based on recent financial crisis 2007-08, Enqvist, Grahm, and Nikknen (2014), studied the effect of the corporate cycle on the relationship between WCM and firm profitability among Finnish listed firms. Results confirmed that contrary to the boom, economic downturns have a statistically substantial impact on the above stated relationship. The purpose of effective WCM is to reduce cash conversion cycle (CCC) to the acceptable optimal point which suites firm's requirement (Hager, 1976). A shorter working capital refers to a speedy collection of account receivables and delays in account payables. It makes funds available to run business operations and fulfill short-term obligations.

Ukaegbu (2014), projected the affiliation among effectiveness of working capital and corporate performance among different industrial sector across countries (Egypt, Nigeria, South Africa and Kenya). The author used balanced panel quantitative approach to examine aforesaid relationship for the period from 2005 to 2009. The study revealed an adverse relationship between WCM and corporate performance. The high cycle of cash conversion reduces corporate profitability. Same results were reported by Deloof (2003) from Belgium and Filbeck and Krueger (2005) from the United States.

Aktas, Croci, and Petmezas (2015), evaluated the impact of WCM on firms operating in the United States from 1982 to 2011. By using different statistical techniques, results found an optimal level of WCM, and firms which obtain such optimal level will show high operating and stock performance. Literature also suggests numerous theory based arguments to observe the possible association between WCM and firm effectiveness. One argument recommends that, an additional investment in WC foster firm performance by rising sales and reducing supply cost. Another argument proposes that overinvestment in working capital will adversely impact on firm performance by increasing opportunity and financing costs (Kieschnick, Laplante, & Mousawwi, 2013).

Afrifa and Padachi (2016), investigated the connection between the level of WC measured as cash conversion cycle and performance of SMEs for the period of 5 years (2005-10). The empirical findings suggested that a concave relationship between WCM and profitability. Singh, Kumar, and Colombage (2017), quantified the influence of WCM on company's success by using the meta-analytic model created by Hunter, Schmidt, and Jackson (1982). The study used 46 past pieces of literature to evaluate above mentioned relationship. The results indicated that the negative association between cash conversion cycle and firm profitability.

Tran, Abbott, and Jin-Yap (2017), estimated the impact of managing working capital to encourage firm value, especially among Vietnamese SMEs. Authors used diverse measures to calculate WCM i-e raw material, WIP (work in process), finished goods, account receivable, bank and cash balances. The findings of the study presented that efficient WCM representing a reduction in days of inventory turnover, account receivable and account payable will significantly improve firm profitability.

### **RESEARCH HYPOTHESIS**

WCM is an important part of financial management. Efficient managing of WC apparently has an influence on firm's liquidity and profitability (Shin & Soenen, 1998), particularly in SMEs (Baños-Caballero et al., 2012; Padachi, 2006). WCM has both positive and negative impact on firm performance. In a positive relationship, when enterprises own large inventory stock, they can enhance production, which ultimately fosters sales and profitability. In the same way, an increase in a number of days for debtors will foster credit sales and profitability. On the other hand, such increase in recovery period will stuck enterprises into the credit crunch, which will end up in reducing operations, minimizing production, hampering sales and ultimately diminishing profits. Contrary to the prior results, estimates exposed that an inverted-U shape relationship between firm profitability and WCM. Based on above discussion and prior literature, we can hypothesize that;

**H:** WCM has a significant impact on firm performance.

### **RESEARCH METHODOLOGY**

The study population consists of firms operating in three major Scandinavian countries (Denmark, Norway, and Sweden) during the period of 2003 to 2015. These firms are further categorized into 18 industries as per global industrial classification (GIC). Final sample comprises 5194 firm-year observation, to observe the liaison between WCM and profitability of firms. We collect data from financial statements and World

Bank database. Firms only include non-financial sector, and the financial firm is excluded due to the different regulatory environment. Moreover, firms with missing values are also eliminated from the dataset.

### Variables Measurement

We measure firm WCM by using diverse range of proxies i-e inventory days (IDs), account receivable days (ARDs), account payable days (APDs), cash conversion cycle (CCC), working capital (WC), and current ratio (CR) (Afrifa, Taurigana, and Tingbani, 2014; Aregbeyen, 2013). In order to understand the impact of WCM on firm profitability, we use return on assets (ROA) as an indicator to estimate firm's profitability (Aregbeyen, 2013; Uchenna et al., 2012). Along with aforementioned variables, we also incorporate different micro and macro level control variables such as; firm size, firm age, firm leverage, GDP growth, and financial crisis dummies (2008-09). The calculations and formulas to measure each of above proxy are mentioned in Table 1.

Table 1. Variable Definition

Variable	Name	Measurement	Hypothesized Sign
<b>Exploratory Variable</b>			
Firm profitability	Return on Asset	EBIT/Total Asset	
<b>Explanatory Variable</b>			
WCM	Inventory Turnover Days	(Inventory/Cost of Goods Sold)*365	-
	Account Receivable Days	(Receivable/Sales)* days (year)	-
	Account Payable Days	(Payable/ Cost of Goods Sold)* days (year)	-
	Cash Conversion Cycle	Receivable Days+ Inventory Days- Payable Days	-
	Working Capital	Current Assets-Current Liabilities	+
	Current Ratio	Current Assets/Current Liabilities	+
<b>Control Variables</b>			
	Firm Age	Study Year-Incorporation Year	+
	Firm Size	Natural Log of Sales	+
	Firm Leverage	Debt/Total Assets	-
	GDP growth	Annual Growth	+
	Financial Crisis 08	Dummy (1 For The year 2008)	-
	Financial Crisis 09	Dummy (1 For The year 2009)	-

## Econometric Modeling

Based on independent variables shown in Table 1, we have develop six econometric models. The first model developed for inventory days, model (2), (3), (4), (5), and (6) use receivable days, payable days, cash conversion cycle, working capital, and current ratio respectively.

$$\text{Firm Profitability}_{itk} = \beta_0 + \beta_2 \text{Inventory Days}_{itk} + \sum_{j=1}^k \beta_j \text{Control Variables}_{itk} + \varepsilon_{itk} \quad (1)$$

$$\text{Firm Profitability}_{itk} = \beta_0 + \beta_3 \text{Receivable Days}_{itk} + \sum_{j=1}^k \beta_j \text{Control Variables}_{itk} + \varepsilon_{itk} \quad (2)$$

$$\text{Firm Profitability}_{itk} = \beta_0 + \beta_4 \text{Payable Days}_{itk} + \sum_{j=1}^k \beta_j \text{Control Variables}_{itk} + \varepsilon_{itk} \quad (3)$$

$$\text{Firm Profitability}_{itk} = \beta_0 + \beta_5 \text{Cash Conversion Cycle}_{itk} + \sum_{j=1}^k \beta_j \text{Control Variables}_{itk} + \varepsilon_{itk} \quad (4)$$

$$\text{Firm Profitability}_{itk} = \beta_0 + \beta_6 \text{Working Capital}_{itk} + \sum_{j=1}^k \beta_j \text{Control Variables}_{itk} + \varepsilon_{itk} \quad (5)$$

$$\text{Firm Profitability}_{itk} = \beta_0 + \beta_7 \text{Current Ratio}_{itk} + \sum_{j=1}^k \beta_j \text{Control Variables}_{itk} + \varepsilon_{itk} \quad (6)$$

## RESULTS

Table 2 represents the descriptive analysis of dataset utilized to determine the relationship between WMC indicators and firm profitability. It shows that sample firms have averagely 0.0141 return on assets with the minimum value of -3.2592 and the maximum value of 3.3662. As per WCM indicators are concerned, it will take on average, 4.1243 days for inventory, 3.8376 days for account receivable, 4.2654 days for account payable and 4.2305 days for cash conversion cycle. Working capital measures as the difference between the current asset and current liabilities show average log value of 9.8898. Correspondingly, the current ratio calculated as current asset deflated by current liability shows mean value of 0.4400. Control variables indicate that on average, firm age has 3.1110 years of operations, firm size has 7.4281, firm leverage has a ratio of 0.2409 and GDP growth has 1.7691 percent.

Table 2. Descriptive Statistics

Indicators	Observations	Mean	SD
Return on Assets(ROA)	5,194	0.0141	0.4342
Inventory Days(ID)	3,859	4.1243	1.3986
Account Receivable Days(ARD)	4,851	3.8376	0.9671
Account Payable Days(APD)	4,505	4.2654	1.0703
Cash Conversion Cycle(CCC)	3,341	4.2305	1.1237
Working Capital(WC)	4,048	9.8898	2.3597
Current Ratio(CR)	5,194	0.4400	0.7518
Firm Age(AGE)	5,143	3.1110	1.1868
Firm Size(SZ)	5,194	7.4281	1.2583
Firm Leverage(LEV)	4,696	0.2409	0.2362
GDP Growth(GDP)	5,194	1.7691	2.3261
Financial Crisis Dummy 08(FC08)	5,194	0.0705	0.2560
Financial Crisis Dummy 09(FC09)	5,194	0.0728	0.2598

Table 3 elaborates the results of Pearson Correlation Matrix, which addresses the possible chance of collinearity among variables. This statistical issue may lead to biased regression estimations. According to the results, there is no issue of collinearity among variables and most of the univariate results are statistically significant.

Table 3. Pearson Correlation Matrix

	ROA	ID	ARD	APD	CCC	WC	CR	AGE	SZ	LEV	GDP	FC08	FC09
ROA	1.0000												
ID	-0.1315 <sup>a</sup>	1.0000											
ARD	-0.0757 <sup>a</sup>	0.0535 <sup>a</sup>	1.0000										
APD	-0.1112 <sup>a</sup>	0.3521 <sup>a</sup>	0.2168 <sup>a</sup>	1.0000									
CCC	-0.0765 <sup>a</sup>	0.7775 <sup>a</sup>	0.2290 <sup>a</sup>	0.3037 <sup>a</sup>	1.0000								
WC	0.3684 <sup>a</sup>	-0.0314 <sup>c</sup>	-0.0141	-0.1510 <sup>a</sup>	-0.0432 <sup>b</sup>	1.0000							
CR	0.0387 <sup>a</sup>	0.2708 <sup>a</sup>	0.1761 <sup>a</sup>	-0.0962 <sup>a</sup>	0.3315 <sup>a</sup>	0.0205	1.0000						
AGE	0.2086 <sup>a</sup>	0.0013	-0.0405 <sup>a</sup>	-0.1505 <sup>a</sup>	0.0026	0.4136 <sup>a</sup>	-0.0599 <sup>a</sup>	1.0000					
SZ	0.1184 <sup>a</sup>	-0.0037	-0.0288 <sup>b</sup>	-0.0527 <sup>a</sup>	-0.0125	0.0822 <sup>a</sup>	-0.0710 <sup>a</sup>	0.0641 <sup>a</sup>	1.0000				
LEV	-0.0768 <sup>a</sup>	0.0403 <sup>a</sup>	-0.1046 <sup>a</sup>	0.0014	-0.0315 <sup>c</sup>	0.1582 <sup>a</sup>	-0.3588 <sup>a</sup>	0.0625 <sup>a</sup>	-0.0190	1.0000			
GDP	0.0106	0.0206	0.0126	0.0294 <sup>b</sup>	0.0130	-0.0456 <sup>a</sup>	0.0263 <sup>b</sup>	-0.0358 <sup>a</sup>	0.0108	-0.0454 <sup>a</sup>	1.0000		
FC08	0.0025	0.0014	0.0169	-0.0334 <sup>b</sup>	0.0311 <sup>c</sup>	0.0336 <sup>b</sup>	-0.0117	-0.0039	-0.0051	0.0211	-0.2668 <sup>a</sup>	1.0000	
FC09	-0.0102	-0.0227	-0.0019	-0.0385 <sup>a</sup>	-0.0367 <sup>b</sup>	0.0300 <sup>b</sup>	0.0077	0.0083	-0.0211	-0.0005	-0.7166 <sup>a</sup>	-0.0771 <sup>a</sup>	1.0000

Note: <sup>a</sup> significant at 1%, <sup>b</sup> significant at 5%, <sup>c</sup> significant at 10%

To testify the study hypothesis, we have used ordinary least square (OLS) regression analysis along with industry and country control. Moreover, we use robust standard error technique to minimize the chances of heteroskedasticity. Furthermore, we also control for financial crisis periods (2008-09). Accompanied by former controls, we incorporate different firm-level control indicators i-e firm age, size, and leverage. According to results reported in Table 4, after using aforementioned control variables, the results indicate that WCM measure as inventory days, account receivable days, account payable days and cash conversion cycle have significant adverse impact on firm profitability. Which elaborates that increase in a number of days for inventory, account receivable, and cash conversion cycle, will stuck firm in the credit crunch and reduce operations which subsequently hamper profitability.

However, the negative impact of an increase in account payable days on profitability shows that delayed payment to supplier reduces the supply of raw materials which adversely impact on the production process and thus reduce profitability. On the contrary, working capital measure as difference/ratio of current assets and current liabilities explains the positive relationship with firm performance. These results show that high level of current assets as compare to current liabilities, guarantee smooth operations which enhance firm profitability. These results are consistent with past literature (Singh et al., 2017; Tran et al., 2017; Ukaegbu, 2014).



Control variables show that firm age has a positive and statistically significant impact on firm profitability. It verifies that old firms better understand the market dynamics as compare to young firms and have efficient WCM system. Consistent with prior results, firm size identifies that large size firms have significant cash flow to fund operations. However, we found a negative impact of leverage on firm profitability. These estimates show that high leverage firms have to pay a large amount of money in term of interest expenses, which reduce profitability. In line with the theoretical argument that good economic situations enhance firm performance, we found a positive link between GDP growth and firm's profitability. Interestingly, we don't find any statistically significant impact of financial crises (2008-09) on firm profitability. The possible reason for these result may be the feasible conditions for economic activities during the financial crisis period among selected Scandinavian countries. Lastly, all the econometric models pass F Statistics and having significant values of R square.

Table 4. Regression Analysis

ROA	$\beta$	V.I.F.	$\beta$	V.I.F.	$\beta$	V.I.F.	$\beta$	V.I.F.	$\beta$	V.I.F.	$\beta$	V.I.F.
ID	-0.019 <sup>a</sup> (-5.96)	1.34										
ARD			-0.012 <sup>b</sup> (-2.03)	1.37								
APD					-0.032 <sup>a</sup> (-5.15)	1.11						
CCC							-0.012 <sup>a</sup> (-2.86)	1.21				
WC									0.037 <sup>a</sup> (15.5)	1.4		
CR											0.023 <sup>b</sup> (1.97)	1.33
AGE	0.045 <sup>a</sup> (12.12)	1.18	0.042 <sup>a</sup> (12.14)	1.2	0.048 <sup>a</sup> (12.03)	1.21	0.037 <sup>a</sup> (11.57)	1.18	0.023 <sup>a</sup> (5.49)	1.37	0.057 <sup>a</sup> (12.67)	1.18
SZ	0.003 (0.79)	1.03	0.009 (1.55)	1.03	0.002 (0.68)	1.03	0.000 (-0.08)	1.04	0.015 <sup>a</sup> (2.65)	1.04	0.021 <sup>a</sup> (3.51)	1.03
LEV	-0.090 <sup>a</sup> (-5.32)	1.12	-0.134 <sup>a</sup> (-5.03)	1.15	-0.082 <sup>a</sup> (-2.54)	1.12	-0.114 <sup>a</sup> (-5.94)	1.09	-0.033 (-1.25)	1.23	-0.104 <sup>a</sup> (-2.81)	1.34
GDP	0.007 <sup>a</sup> (2.74)	2.97	0.007 <sup>a</sup> (2.82)	2.99	0.007 <sup>a</sup> (2.48)	3.02	0.007 <sup>a</sup> (2.78)	3.2	0.008 <sup>a</sup> (2.71)	2.95	0.008 <sup>a</sup> (2.64)	2.93
FC08	0.018 (1.21)	1.32	0.023 <sup>c</sup> (1.64)	1.33	0.009 (0.55)	1.33	0.018 (1.16)	1.36	0.030 <sup>a</sup> (1.7)	1.31	0.025 (1.41)	1.31
FC09	0.026 (1.34)	2.65	0.022 (1.00)	2.67	0.015 (0.63)	2.7	0.027 (1.38)	2.86	0.031 (1.24)	2.64	0.028 (1.09)	2.63
Cons.	-0.025 (-0.65)		-0.082 <sup>c</sup> (-1.78)		0.018 (0.41)		0.019 (0.51)		-0.534 <sup>a</sup> (-9.78)		-0.288 <sup>a</sup> (-6.17)	
No. of obs.	3,614		4,405		4,126		3,102		3,544		4,657	
F-Stat	14.51		13.37		12.44		12.34		16.8		12.91	
Prob. > F	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
R <sup>2</sup>	0.1242		0.1005		0.1108		0.1215		0.1813		0.109	

Note: <sup>a</sup> significant at 1%, <sup>b</sup> significant at 5%, <sup>c</sup> significant at 10%, (z) value in brackets

## CONCLUSION

To achieve the goals of the current research, we gather data from annual financial statements and World Bank for the period of 2003 to 2015. We run Ordinary least square (OLS) together with robust standard error technique to test our main hypotheses i.e., “WCM has a significant impact on firm performance”. We also test sample data for collinearity through Pearson Correlation Matrix and Variance Inflation Factor. These collinearity tests confirm the absence of collinearity issue among our selected variables.

To find concrete results, we use both firm level (firm age, size, leverage) and country-level control variables (GDP growth, financial crisis). After controlling for several indicators, we find a negative impact of inventory days, account receivable days, account payable days, and cash conversion cycle on firm’s profitability. These results indicate that large recovery period effects on funds availability and supply of material which subsequently impact on firm operations and profitability. Moreover, working capital and current ratio have a positive relationship with firm profitability, which shows the importance of excessive current assets to foster ROA. Policy implications of the study recommend that firms which are desired to enhance their profitability should pay special attention to manage WCM.

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