IMPACT OF WORKING CAPITAL MANAGEMENT ON FIRM PROFITABILITY: THE CASE OF LISTED MANUFACTURING FIRMS ON HO CHI MINH STOCK EXCHANGE

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ABSTRACT

This study is aimed at investigating the relationship between working capital management and profitability. This study is based on a panel data of 98 manufacturing firms listed on Ho Chi Minh City Stock Exchange for a period 6 years (from 2009 to 2014). The results of Pearson's correlation and fixed effects multiple regression analysis found significant negative relationships between cash conversion cycle, net trade cycle, average collection period, average inventory period, average payment period and return on assets. So managers can improve the firm's profitability by reducing cash conversion cycle, net trade cycle and it's components to an optimal level. Further, the control variables including liquidity, leverage, firm size and firm growth also have significant effects on firm profitability. In particular, the findings also imply that managers can use net trade cycle instead of cash conversion cycle confidentially.

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Keywords: Working capital management, Profitability, Cash conversion cycle, Net trade cycle, Manufacturing, Viet Nam stock exchange

Contribution/ Originality

The paper's primary contribution is finding that it is significant negative relationships between working capital management (WCM) and return on assets. In which, WCM variable include: cash conversion cycle, net trade cycle, average collection period, average inventory period, average payment period and return on assets

1. INTRODUCTION

The corporate finance literature has traditionally focused on the study of long-term financial decisions such as investments, capital structure, dividend, etc…whereas short-term financial

decisions, particularly working capital, are really vital to be carefully analyzed as well. Working capital management has been essential to survive because of its effects on a firm's profitability and risk, and consequently its value. It directly affects profitability and liquidity of a firm as it deals with the management of current assets and current liabilities that are essential for the smooth running of a business unit in a profitable manner. However, liquidity and profitability are two sides of the same coin because they work in opposite directions. Increasing liquidity of the firm will reduce profitability of the firm and vice versa. So, the dilemma in working capital management is to achieve desired tradeoff between liquidity and profitability. Hence, working capital management should be given proper consideration and will ultimately influence company profitability.

Besides, working capital performance also provides critical insight into the state of a company's financial position. As an important indicator of financial fitness, the availability of a firm's working capital is one of the first items that lenders or investors will examine on a balance sheet. Moreover, according to Frankfurt Business Media 2012, there are about 1000 companies globally that lose about $2 billion per year due to poor working capital management. And the recent financial and economic crisis has also shown how important it is for firms to maintain a healthy cash position.

Considering the importance of working capital management, there have been numerous articles written about the relationship between working capital management and firm profitability. However, each of the researchers that conducted case studies in different countries had different findings on how working capital management in terms of cash conversion cycle (CCC) and its three components are related to firm profitability. To the best of my knowledge, specific studies exclusively on the impact of working capital management upon profitability of manufacturing firms are scanty, especially for the case of Viet Nam. The efficiency of working capital management is particularly vital for manufacturing firms, where a major part of assets is composed of current assets. Keeping this in view and the wider recognition of the potential contribution of the manufacturing sector to the economy of developing countries, this study will try to provide an understanding of the impact of working capital management on profitability of manufacturing firms listed on the Ho Chi Minh Stock Exchange over a period of 2009-2014. The study's findings are expected to contribute to firms' financial management policies as well as to the corporate finance literature on this theme.

Hence the objectives of this research is to investigate the effect of the various components of working capital management, namely average collection period (ACP), average inventory period (AIP), average payment period (APP) and CCC, on firm profitability. Besides, this study is also aimed to examine whether Net trade cycle (NTC) can efficiently substitute for CCC as a measure of working capital management.

The rest of the paper is structured as follows: The second section gives a theoretical description of the working capital management and embraces the literature review of the findings of authors concerning the relationship between working capital management and firm profitability in different countries while the third section explains the methodology carried out namely the data

collection and the variables investigated in this research. Subsequently, in the fourth section the data analysis is done to investigate the effects of the working capital components on firm profitability. Finally, the main conclusions and recommendations are discussed in the fifth section.

2. LITERATURE REVIEW

2.1. Theoretical Literature

Working capital, called gross working capital, simply refers to current assets and current liabilities used in operations. Working capital and the cycle that it forms is managed by what is called working capital management. Working capital management focuses mainly on the short-term financing and investment decisions of a firm. In other words, working capital management is involving the decisions of the amount and composition of current assets and the financing of these assets. The well - managed working capital promotes a company's well-being on the market in terms of liquidity and profitability and it also acts in favor for the growth of shareholders value. Efficient working capital management is to ensure that a company has adequate ready access to the funds necessary for day-to-day operating expenses, while at the same time making sure that the company's assets are invested in the most productive way. To reach the optimal level of working capital management, there are three dimensions of working capital management should be considered: inventory management, accounts receivable management (debtor management) and accounts payable management (creditor management). Each element has its own characteristics. However, managers should take each component into consideration as a whole since a tradeoff exists in the relationship of each component

2.2. Empirical Literature

The significant part of the literature of working capital focuses on studying the relationship between working capital management and firm profitability. These studies evaluate working capital management by trying to determine the effects of working capital management upon firm performance. All these studies have employed regression analyses using different dependent variables for profitability such as return on assets, gross operating profit, net operating profit, etc. The main used independent variable to measure the efficiency of working capital management is CCC. Besides, there are also many authors that have done researches on accounts receivable, inventory and accounts payable individually. Together with these, to control internal and external factors affecting on the variables that can change the research results, the variables such as liquidity, financial leverage, firm growth, firm size and financial asset ratio were considered as control variables. In general, the results were not quite clear but a majority of studies concluded a negative relationship between working capital management and firm profitability.

A notable difference among the articles is their choice how to measure the dependent variable, firm profitability. A large number of researchers have conducted return on assets ratio (ROA) as a proxy for firm profitability. The common form of ROA is dividing net profit with total assets which was used by Shaskia (2012), Tendai and Enard (2014), Ebrahim and Datin (2012) and

Mathias (2012). Other authors such as Daniel and Ambrose (2013), Jayarathne (2014) and Kesseven (2006) used earnings before interest and taxes divided by total assets. Arunkumar and Radha (2013) and Thair and Imad (2012) used almost the same measurement, the only difference is that the former used profit before depreciation and taxes divided by total assets while the latter used net profit before taxes divided by total assets. The other main measurement is gross operating profit which is calculated as the gross operating profitability (sales minus the cost of goods sold) divided by total operating assets (total assets minus total financial assets). This measurement was used by Joana (2011), Stephen (2012), Mohammad (2011) and Mathias (2012), etc. In addition, there are some other measurements of firm profitability like net operating profit, operating income, the stock returns but they were used by only a few authors.

3. RESEARCH METHODOLOGY

3.1. Data and Sample

The population of this study comprised all the manufacturing firms listed on Ho Chi Minh Stock Exchange. The total number of firms in this sector is 98. The data need for empirical testing of the research hypotheses was gathered from Thomson Reuters database which consists of the secondary data of the annual audited financial statements of listed firms on Ho Chi Minh Stock Exchange for a period of 6 years from 2009 to 2014. To avoid appearing some outliers which may cause skewness in the result, as a rule of thumb, 2 percent of the highest and the lowest values presented by the variable that have the highest standard deviation are removed. As a result, an appropriate panel data set of 561 firm-year observations is obtained, with the observations of 98 firms for the 6 year period from 2009 to 2014.

3.2. Variables

In this section, the dependent, independent and control variables for this study will be indicated. The choice of variables is primarily guided by previous empirical studies, particularly Mathias (2012).

The dependent variable is chosen as a proxy for firm profitability in this research is return on assets which is the ratio of earnings before interests and taxes and total assets. ROA determines the management efficiency in using a firm's assets to generate earnings. It is a better measure since it relates a firm's profitability to its total asset base and is also used by most of researchers.

As mentioned in the literature review, working capital consists of three individual components which together form CCC, namely average receivable period, average inventory period and average payable period. Therefore, in this study, working capital management is measured through these three individual components and CCC. In addition, Net trade cycle, which is used in some other studies, is considered as another comprehensive proxy for working capital management as well.Expressing all components of working capital as a fraction of sales makes NTC easier to calculate and less complex than CCC. Further, this property of NTC also enables it to be a proxy for additional working capital needs as a function of the projected sales growth and working capital

managers can easily estimate the investing and financing needs of working capital expressed as the function of the expected sales growth. However, the empirical evidence on it is relatively much more limited. Further, for the study's purpose of evaluating whether NTC can efficiently substitute for CCC, this study also attempts to investigate the effect of working capital management as measured by NTC on firm performance.

The control variables used in this research consist of liquidity (current ratio), financial leverage (debt ratio), firm growth (sales growth), firm size (the natural logarithm of sales) and financial asset ratio.

3.3. Research Hypotheses

To attain research objectives, the following hypotheses are propounded.

H_{01}: There is no significant relationship between Cash Conversion Cycle and firm profitability.

H_{02}: There is no significant relationship between Average Collection Period and firm profitability.

H_{03}: There is no significant relationship between Average Inventory Period and firm profitability.

H_{04}: There is no significant relationship between Average Payment Period and firm profitability.

H_{05}: There is no significant relationship between Net Trade Cycle and firm profitability.

3.4. Model Specifications

To test the above hypotheses, the following 5 models, mainly based on the 5 models which are used to analyze the relationship between the variables.

Model 1:

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 LIQU_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + \beta_6 FATA_{it} + \varepsilon_{it} \quad (1)$$

Model 2:

$$ROA_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_2 LIQU_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + \beta_6 FATA_{it} + \varepsilon_{it} \quad (2)$$

Model 3:

$$ROA_{it} = \beta_0 + \beta_1 AIP_{it} + \beta_2 LIQU_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + \beta_6 FATA_{it} + \varepsilon_{it} \quad (3)$$

Model 4:

$$ROA_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 LIQU_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + \beta_6 FATA_{it} + \varepsilon_{it} \quad (4)$$

Model 5:

$$ROA_{it} = \beta_0 + \beta_1 NTC_{it} + \beta_2 LIQU_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + \beta_6 FATA_{it} + \varepsilon_{it} \quad (5)$$

Where ROA is Return on assets, CCC is Cash conversion cycle, ACP is Average collection period, AIP is Average inventory period, APP is Average payment period, NTC is Net trade cycle, LIQU is liquidity, LEV is financial leverage, GROWTH is firm's sales growth, SIZE is firm's size, FATA is financial asset ratio. The subscript i refers to firms, ranging from 1 to 98; t represents

years, ranging from 1 to 6; ε is the error term and β is regression model coefficient. The panel data was estimated by using fixed effects model.

3.5. Descriptive Statistics

The descriptive statistics results are illustrated in table 1.where the variables of interest in this study are described in terms of their mean, standard deviation, minimum and maximum value.

Table-1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Observations	
ROA	0.124959	0.093416	-0.25069	0.583363	N =	561
CCC	145.6048	92.4522	17.4	658	N =	561
ACP	66.22805	58.7171	4.9	592.4	N =	561
AIP	113.2552	69.77174	1.6	619.7	N =	561
APP	33.87964	26.03155	0.1	347.2	N =	561
NTC	123.9756	83.64238	-3.849202	729.7519	N =	561
LIQU	1.938509	1.436439	0.29	15.34	N =	561
LEV	0.316184	0.208218	0	0.78338	N =	561
GROWTH	0.169682	0.32198	-0.671077	2.392128	N =	561
SIZE	20.77	1.1233	17.42914	24.82787	N =	561
FATA	0.049247	0.081799	0	0.	N =	561

Source: Stata Output

The descriptive statistics show that the mean value of the profitability of firms included in the study was 12.50% with a standard deviation of 9.34%. The maximum value for ROA is 58.34% for a company in a year while the minimum is -25.07%.

On average, firms took approximately 113 days to convert their inventories into sales. However, the fastest firms roughly took 2 days to clear out stocks while the slowest took 620 days. Firms that have too high average inventories period may face more liquidity risk in that level of inventory. A low average inventories period is considered as a sign of efficient management but too low inventory level can indicate under stocking of inventory which may lead to a loss of sales..

The mean CCC ranged at 146 days, which means that it took an average of 146 days for the capital that is tied up in working capital to convert into cash. The longest CCC was approximately 658 days, which indicated the poor management of CCC.

The results further showed that a typical firm in the study had a size of 20.77 as measured by the natural logarithm of its sales with a standard deviation of 1.12. The maximum value of log of sales for a company within a year is 24.83 and the minimum is 17.43. The debt ratio for firms was fairly modest (mean = 31.62%, SD = 20.82%), with a minimum debt used by a company at 0% and a maximum at 78.34% of total assets.

Generally, the liquidity level of firms in this study were quite good; the average current ratio (mean = 1.94, SD = 1.44) stayed on a level close to the preferred rule of thumb level of 2. The highest current ratio for a company in a particular year was 15.34 times, which revealed that the firms with too high current ratio might not efficiently utilize their current assets whilst the

minimum ratio was 0.29 times which told us that those companies were not capable of paying their current liabilities.

Furthermore, the mean value for financial asset ratio was 4.92% with a standard deviation of 8.18% which implied that companies invested only a small part of their assets. The maximum portion of assets in the form of financial assets for a particular firm came up around 49% while the minimum was only 0%.Together with these, the firms have seen their sales growth by almost 16.97% annually on an average.

3.6. Correlation Results

Pearson's Correlation analysis was used for data to establish if there was a relationship between variables considered in this study. A correlation matrix of all variables is presented in table2

Table-2. Correlation matrix for the study variables

	ROA	CCC	ACP	AIP	APP	NTC	LIQU	LEV	GROWTH	SIZE	FATA
ROA	1.0000										
CCC	-0.2929***	1.0000									
ACP	-0.2605***	0.6972***	1.0000								
AIP	-0.2328***	0.8038***	0.2141***	1.0000							
APP	-0.1715***	0.1754***	0.3532***	0.3083***	1.0000						
NTC	-0.3711***	0.9635***	0.7346***	0.6870***	0.0764*	1.0000					
LIQU	0.3638***	-0.0143	-0.0213	-0.0771*	-0.2037***	-0.0536	1.0000				
LEV	-0.4080***	0.0959**	-0.0345	0.1633***	0.0193	0.1663***	-0.6441***	1.0000			
GROWTH	0.2652***	-0.2161***	-0.1227***	-0.1568***	0.0704*	-0.2433***	-0.0422	-0.0533	1.0000		
SIZE	0.2284***	-0.3235***	-0.3154***	-0.1971***	-0.0909**	-0.3236***	-0.1022**	0.2103***	0.1427***	1.0000	
FATA	0.1383***	0.0431	0.1426***	-0.0661	-0.0087	0.0406	0.1600***	-0.2770***	-0.0177	-0.0141	1.0000

*** p<0.01, ** p<0.05, * p<0.1
Source: Stata Output

The results indicate that ROA is negatively associated with most measures of working capital management, namely CCC, ACP, AIP, APP and NTC. There exists a significant negative relationship between CCC, NTC and ROA with the value of correlation coefficient at -0.2929 and -0.3711 respectively (p<0.01), which implies that reducing the duration of both will be able to enhance firm profitability. Further, the significant negative correlation between ACP, AIP and ROA (r=-0.2605 and r= -0.2328 respectively, p<0.01) is consistent with the view that longer receivables period and inventory conversion period means the more financing sources are invested in working capital, the more opportunity costs of extra financing increase, thus leading to less sales which is related to a decrease in profitability. Average payment period shows a significant negative correlation with ROA (r= -0.1715, p<0.01), which may stem from the fact that lengthening average payment period may damage the corporation's credit reputation and decrease its profitability.

With regard to control variables, the results reveal a significant positive relationship between profitability and four control variables including: liquidity, firm growth, firm size and financial asset ratio. The significant positive correlation between ROA and current ratio (r= 0.3638, p<0.01) implies that profitability and liquidity are directly related. Besides, firm growth is also positively related to ROA (r=0.2652, p<0.01) which demonstrates that an increase in sales growth is

associated with an increase in profitability and vice versa. In addition, firm size and profitability have a significant positive coefficient (r=0.2284, p<0.01) which confirms that larger firms report higher profits than smaller firms. This may be due to larger firms' ability to exploit the economies of scale. Moreover, ROA also shows a positive correlation with financial asset ratio (r=0.1383, p<0.01), which means that as the proportion of a firm's assets in the form of financial assets increases, so do their sales, translating to higher profits. However, it appears that increasing in firm leverage is related to a decrease in profitability (r= -0.4080, p<0.01).

3.7. Regression Results

Table-3. Regression results

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
LIQU	0.0106***	0.00969***	0.00992***	0.00813***	0.0109***
	(0.00300)	(0.00291)	(0.00295)	(0.00280)	(0.00307)
LEV	-0.153***	-0.165***	-0.157***	-0.173***	-0.144***
	(0.0394)	(0.0390)	(0.0390)	(0.0388)	(0.0392)
GROWTH	0.0491***	0.0536***	0.0528***	0.0584***	0.0454***
	(0.0110)	(0.0109)	(0.0105)	(0.0107)	(0.0108)
SIZE	0.00866	0.0107*	0.0104*	0.0128**	0.00693
	(0.00645)	(0.00624)	(0.00616)	(0.00595)	(0.00647)
FATA	0.0573	0.0634	0.0509	0.0555	0.0617
	(0.0499)	(0.0504)	(0.0494)	(0.0487)	(0.0506)
CCC	-0.000167***				
	(4.99e-05)				
ACP		-0.000198**			
		(9.54e-05)			
AIP			-0.000188***		
			(5.39e-05)		
APP				-0.000373**	
				(0.000146)	
NTC					-0.000242***
					(6.95e-05)
Constant	-0.0122	-0.0620	-0.0500	-0.0999	0.0259
	(0.136)	(0.132)	(0.129)	(0.124)	(0.136)
R-sq	0.3249	0.3361	0.3091	0.3232	0.3399
Observations	561	561	561	561	561
Number of firmid	98	98	98	98	98

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Where ROA is Return on assets (dependent variable), CCC is Cash conversion cycle, ACP is Average collection period, AIP is Average inventory period, APP is Average payment period, NTC is Net trade cycle, LIQU is liquidity, LEV is financial leverage, GROWTH is firm's sales growth, SIZE is firm's size, FATA is financial asset ratio.
  Source: Stata Output

The regression estimation in model 1 provides a strong evidence of a negative relationship between CCC and corporate profitability as the coefficient is negative and statistically significant at the level of 1%. That is interpreted that if CCC increases by one day, ROA will drop by 0.0167%. This result is consistent with the view that shortening the CCC will generate more profits for a

firm. Hence, firms can create value for their shareholders by keep the CCC to a reasonable minimum.

The finding from the result of model 2 shows that ACP is a crucial determinant of ROA at 5% confidence interval with a negative effect on ROA, which meaning that a one day increase in the number of days of accounts receivable is associated with a 0.0198% decline in ROA. The result is interpreted that slow collection of accounts receivable is correlated with low profitability. It can be explained that the less the time it takes for customers to pay their bills, the more cash is available to reinvest, which attributes to higher sales that lead to higher corporate profitability.

The results of model 3 reveal that the coefficient of AIP is significant negative at the high level of 1%. It means that there exists a negative relationship between the average days of inventory and profitability, which implies that increasing AIP by one day leads to a 0.0188% decrease in ROA. This finding is in line with the attitude that holding high inventories will incur costs to the firm because the funds which are tied up in inventories cannot make interest earnings. As well, storage and insurance costs have to be paid, furthermore, spoilage, damage and loss of goods may lead to the costs to the firm.

The fourth column of the table 3 presenting the estimation results from the fourth model reveals that APP is also an important determinant of ROA but has a negative effect on ROA. In contrast to theoretical predictions, this finding is consistent with the view that decreasing the time a firm take to settle their creditors will lead it to a higher level of profitability. Here, when the average payment period falls by one day, ROA tends to rise by 0.0373%. One of generally accepted explanations is that paying off creditors who are suppliers earlier will enable suppliers to provide better products or services which will in turn increase the quality of products and services provided to the firm's customers and as a result, profitability will be improved. Hence, APP is good to explain the financial success of listed manufacturing firms in Viet Nam.

Another comprehensive measure of working capital management which is NTC is regressed against ROA in the final model. Here, a negative and highly significant relation is found between the NTC and corporate profitability. It implies that a company with relatively shorter NTC is more profitable. Further, reducing NTC to boost the efficiency of working capital management results for improvement firm performance. The result points out that decreasing the length of NTC by one day is accompanied with a rise in ROA by 0.0242%. Thus, the management board can also create additional value for their shareholders by reducing NTC to a reasonable minimum.

With reference to the control variables, all of these are highly significant with the exception of FATA variable. The results are interpreted that liquidity and profitability move in the same direction, implying that when a firm's liquidity position is better, it will have a positive effect on firm profitability. Besides, growth, which is an indicator of a firm's business opportunities, also has a significant direct effect on ROA. Further, it is found that firm size has a significant positive relationship with firm performance which means that larger firms are more profitable than smaller firms. It is due to the fact that large firms seem to favor the generation of profitability and enjoy economies of scale which adds to their profits. Contrary to theoretical predictions, when the firm

increases its debt financing, it will adversely affect its profitability as can be seen in the negative sign for the variable LEV. In particular, the financial asset ratio is a factor allowing firms to enjoy improved profitability as it has a positive coefficient. However, the relationship is non-significant, it cannot explain much in reality. As well, it implies that investing in financial assets is not a critical factor to consider when taking decision to enhance corporate profitability in case of Viet Nam listed manufacturing firms.

4. CONCLUSIONS AND RECOMMENDATIONS

In this context, the primary objective has been to shed light on the effects of working capital management on profitability by using a six year (2009-2014) dataset on 98 manufacturing firms listed on the Ho Chi Minh City Stock Exchange in Viet Nam.

The results demonstrate that working capital management plays a positive role in increasing the wealth of the shareholders by making a firm more profitable through shortening CCC and NTC. These findings also imply that managers can use NTC instead of CCC confidentially. In addition, ACP, AIP and APP are found to have a significant negative effect on ROA. It means that adopting a more restrictive credit policy, maintaining a lower inventory level and making earlier payments to suppliers may lead to higher profitability. Regarding to control variables, most of them are strongly significant with ROA except for FATA variable. The results confirm that leverage has a negative impact on profitability while other control variables such as liquidity, firm growth and firm size have a positive effect on firm profitability.

In summary, the study concludes that there is a relationship between the various components of working capital and firm profitability which is interpreted that effective working capital management has a significant impact on the Vietnamese listed manufacturing firms' performance.

These findings are critical because they show the relationship between working capital management and firm profitability as well as the way how it affects firm profitability. They assist managers in identifying areas where they might improve their firm's performance. Further, the findings also give investors some insights when evaluating a firm's financial health and making the right investment decisions.

Based on the key findings in this study, managers can enhance firm profitability which ultimately create more value for the shareholders by focusing on reducing CCC or NTC to an optimal level. Also, managers should try to collect receivables as soon as possible because of a fact that by reducing ACP, firms will have available cash to reinvest and can prevent cash from getting eroded by inflation. Besides, managers are encouraged to shorten AIP and APP to a reasonable extent through processing and selling goods more quickly as well as speeding up payments to suppliers.

On the other hand, it is necessary for manufacturing firms in Viet Nam to pay close attention to their liquidity level. This is because the regression results have shown that liquidity is an important factor that contributes significantly to a firm's profitability. In addition, it is important to note that

increasing debt financing will lead to decreasing profitability in terms of financial cost. Hence, managers should take it into consideration when making decisions concerning the use of leverage.

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