Impact of Working Capital Management on Profitability: A Study on Listed Manufacturing Companies in Colombo Stock Exchange

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Received: 18 June 2015
Accepted: 12 August 2015

Abstract:

In Sri Lankan context, manufacturing sector has been recognized as an important strategic sector for socio-economic development and provides a significant contribution to the growth of the economy (Press Note Annual Estimates of GDP, 2012, p.5). Hence, it plays a vital role, which determines the driving force of the economy (Press Note Annual Estimates of GDP, 2012, p.5). Consequently, manufacturing companies encounter several issues and challenges in the effort of enhancing their profitability and reduce the threat of insolvency. Specifically, the Sri Lankan manufacturing sector is faced with the dilemma of maintaining an appropriate trade-off between working capital (WC) and profitability. In this study an attempt has been made to identify the impact of WC managementon profitability of listed manufacturing companies. This study is primarily based on secondary data that were extracted from the annual reports of the 20 manufacturing companies listed in Colombo Stock Exchange (CSE). Balanced Panel Data (BPD) of these 20 manufacturing companies were analyzed by using the Pearson's Correlation and Ordinary Least Squire (OLS) regression model to establish the relationship between WCM and the profitability. The study found negative relationship between the profitability and Debtor's Conversion Period (DCP), Inventory Conversion Period (ICP) and Cash Conversion Cycle (CCC), but a positive relationship between profitability and Creditor's Conversion Period (CCP). Moreover the financial leverage, sales growth and firm size also have a significant impact on the profitability. Based on the key findings from this study it has been concluded that the management of a firm can create value for its shareholders by reducing the DCP. The management can also create value for its shareholders by increasing inventories to a reasonable an optimum level. Firms can also take long period to pay their creditors as far as they do not strain their relationship with them. As a recommendation it is suggested for all the manufacturing companies to have a greater focus on the relationship between WCM and profitability, by adopting an appropriate management which will ultimately lead to higher profitability and lower threat of insolvency.

Key Words: *Working Capital Management, Profitability, Manufacturing Sector, Insolvency, Colombo Stock Exchange.*

1. Introduction

Working capital is a financial measure which represents operating liquidity available in a business. Simply working capital is the capital of a business which is used in its day-to-day trading operations. Decisions relating to working capital and short term financing are referred to as working capital Management (WCM). WCM ensures that a company has sufficient cash flows in order to meet its short-term debt obligations and operating expenses. These involve managing the relationship between a firm's short term assets and its short term liabilities. The goal of working capital management is to ensure that the firm is able to continue its operations and that it has sufficient cash flow to satisfy both maturing short term debt and upcoming operational expenses.

The management of working capital involves managing inventories, accounts receivable, accounts payable and cash. Implementing an effective working capital management system is an excellent way for many companies to improve their earnings. Working capital management is vital especially for manufacturing and construction firms, where a major part of assets is composed of current assets (Horne & Wachowitz, 2000). It directly affects the profitability and liquidity of firms (Raheman & Nasr, 2007). The profitability liquidity tradeoff is important because if working capital management is not given due considerations then the firms are likely to fail and face bankruptcy (Kargar& Bluementhal, 1994). The significance of working capital management efficien cy is irrefutable (Filbeck & Krueger, 2005). Working capital is known as life giving force for any economic unit and its management is considered among the most important function of corporate management. Every organization whether, profit oriented or not, irrespective of the size and the nature of the business, requires necessary amount of working capital. Working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of business (Raheman & Nasr, 2007). According to Eljelly (2004), working capital

management is one of the most important areas while making the liquidity and profitability comparison among firms, involving the decision of the amount and composition of current assets and the financing of these assets. The way of managing working capital can have a significant impact on both the liquidity and the profitability of the company (Shin & Soenen, 1998).

The main purpose of any firm is to maximize the profit. But, maintaining liquidity of the firm also is an important objective. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Thus, strategy of the firm must maintain a balance between these two objectives of the firms. Dilemma in working capital management is to achieve desired tradeoff between liquidity and profitability (Raheman & Nasr, 2007). Thus, firms with high liquidity of working capital may have low risk and low profitability. Conversely, a firm that has low liquidity of working capital faces high risk which results to high profitability.

Firms may have an optimal level of working capital that maximizes their value. On the other hand, large inventory and a generous trade credit policy may lead to higher sales. Larger inventory reduces the risk of a stock-out. Trade credit may stimulate sales because it allows customers to assess product quality before paying (Long et al., 1993; and Deloof & Jeger, 2003). Because suppliers may have significant cost advantages over financial institutions in providing credit to their customers, it can also be considered as an inexpensive source of credit for customers (Petersen & Rajan, 1997). The flip side of granting trade credit and keeping inventories is that money is locked up in working capital. Another component of working capital is accounts payable. Delaying payments to suppliers allows a firm to access the quality of the products bought and can be an inexpensive and flexible source of financing for the firm. On the other hand late payment of invoices can be very costly if the firm is offered a discount for early payments.

The popular measure of WCM is the cash conversion cycle i.e. the time lag between the expenditure for the purchases of raw materials and the cash collection of sales of finished goods. Shin & Soenen (1998) investigated the relationship between a measure of the cash conversion cycle and the corporate profitability for a large sample of listed American firms for the 1975 – 1994 periods. They found a strong negative relationship between these two variables. This indicates that the managers can create value for their shareholders by reducing the cash conversion cycle to a reasonable minimum.

Akoto et al., (2013) analyzed the relationship between WCM practices and profitability of listed manufacturing companies in Ghana. The study used secondary data collected from annual reports of all the 13 listed manufacturing companies in Ghana covering the period from 2005 to 2009. Using panel data methodology and regression analysis, the study found a significant negative relationship that exists between profitability and DCP. However, CCC, current ratio, size and current assets turnover ratio significantly and positively influence profitability.

Muhammad & Syed (2011) investigated the impact of WCM on firm's performance for non-financial institutions listed in Karachi Stock Exchange (KSE-30) index. A panel data of 21 companies listed in Karachi KSE-30 index for a period of 2001 to 2010 was analyzed. Results were obtained using canonical correlation analysis to identify the relationship between WCM and firm's performance. The finding shows that WCM has a significant positive impact on firm's performance. They concluded that managers can increase value of shareholders and ROA by reducing their inventory size, CCC and net trading cycle.

Morawakage & Lakshan (2010) examined the relationship between WC cost structure and profitability of 65 Sri Lankan firms listed on CSE. Regression

analysis and correlation test were used to inspect the relationship between variables. The study found that the profitability of the companies increase when managers reduce the ICP and the length of the WC cycle.

Raheman & Nasr (2007) conducted a research to establish the effect of different WC variables such as CCC and its components as well as current ratio on profitability of Pakistan firms. They used a sample of 94 Pakistani firms listed in Karachi Stock Exchange for a period of 6 years from 1999 to 2004 using Pearson correlation and regression analysis based on PLS and General Least Squire (GLS). They found that a strong negative relationship exists between variables of WC and profitability of Pakistani firms. Further, they found a significant negative relationship between liquidity of firms and profitability, and a positive relationship between size of the firm and the profitability. Lazaridis & Tryfonidis (2006) studied the relationship between WCM and corporate profitability of the listed companies in the Athens Stock Exchange. They used a sample of 131 listed companies for the period of 2001- 2004. The results from the regression analysis suggested a statistically significant relationship exists between profitability, measured through gross operating profit and the CCC.

The manufacturing sector provides a significant contribution to the growth of the economy and it is the largest subsector in the industry sector within the economy of Sri Lanka (Press Note Annual Estimates of GDP, 2012, p.5). Hence, this study is significant for the policy makers of Sri Lankan manufacturing companies to identify their drawbacks in managing WC and to modify the functions of WC in order to boost the overall performances in terms of profitability. In Sri Lankan context there are only few researches have been carried out successfully on the impact of WCM on profitability in listed manufacturing companies in Sri Lanka. Therefore,in this study an attempt has been made to identify the impact of WC managementon profitability of listed

manufacturing companies. In addition to this main objective, this study is attempted to provide empirical evidence on the impact of WCM on profitability.

Research Methodology

For this study both primary and secondary data were used to investigate the impact of WCM on firm's profitability. The study is limited to the manufacturing sector of the CSE, which represents one of the leading sectors out of 20 sectors of the CSE. Therefore, secondary data was gathered from twenty (20) manufacturing companies, which were listed in the Colombo Stock Exchange (Guarantee) Ltd (CSE) in 2012. Further, the secondary data were mainly obtained from the Annual reports of the selected companies during the period of 2008 to 2012. In addition to that various sources such as CSE fact books, relevant articles, books and magazines etc were used to collect secondary data. A close ended questionnaire was developed and distributed among the finance mangers within the selected sample to collect primary data. The collected data were analyzed in two stages. Firstly, descriptive way is used to describe the sample to make the study more informative, analytical and useful to readers. Secondly, Pearson Correlation Analysis is used to define whether WCM is associated with company's profitability. Next, the study analyzed the impact of WCM on company's profitability by using Pooled Ordinary Least Square (OLS) for panel data of 20 companies across five years to relax the restrictions of an amply large data set.

To conduct regression analysis using OLS, four models in which each independent variable is alternated respectively while keeping control variables constant.

$$ROA = f(DCP, ICP, CCP, CCC, GROWTH, LEV, SIZE)$$

Model I: $ROA = \beta_0 + \beta_1 GROWTH + \beta_2 DR + \beta_4 SIZE + \beta_5 DCP + €$

Model II: $ROA = \beta 0 + \beta_1 GROWTH + \beta_2 DR + \beta_4 SIZE + \beta_5 ICP + €$

Model III: $ROA = \beta_0 + \beta_1 GROWTH + \beta_2 DR + \beta_4 SIZE + \beta_5 CCP + €$

Model IV: $ROA = \beta_0 + \beta_1 GROWTH + \beta_2 DR + \beta_4 SIZE + \beta_5 CCC + €$

Where:

ROA = Return On Assets

DCP = Debtors Conversion Period

ICP = Inventory Conversion Period

CCP = Cash Conversion Period

CCC = Creditor's Conversion Period

SIZE = Natural Logarithm of Sales (Company Size)

GROWTH = Sales Growth

DR = Total Debt Equity Ratio

β = Regression Coefficients

€ = Error Term

This study is concerned with the impact of working capital management on profitability. It aimed at identifying the impact of four main working capital components such as Debtor's Conversion Period (DCP), Inventory Conversion Period (ICC), Creditor's Conversion Period (CCP) and Cash Conversion Cycle (CCC) on profitability. These four variables have selected as independent variables to analyze the impact of WCM on profitability. To measure the firm profitability, Return on Assets (ROA) is chosen as the dependent variable. The rationale for this choice is according to Lazaridis & Tryfonidis (2006) ROA is the best measure for firm's profitability, because it explains the performance and the progress of the business in utilizing its resources to generate the income. In addition to these variables, Sales Growth (GROWTH), Debt Ratio (DR) and Firm Size (SIZE) were considered as control variables for this study. Further, DR was used as a proxy for leverage and it is calculated by dividing Total Debt by Total Equity.

Results and Discussion

Descriptive analysis shows the mean, median and standard deviation of the different variables of interest in this study. It also presents the minimum and maximum values of the variables which help in getting a clear picture about the variables used in this study. Table 1 presents the empirical results obtained from the models using E-Views and SPSS.

Table 01: Descriptive Statistics of Variables for Manufacturing Firms

Variables	Mean	Median	SD	Minimum	Maximum
ROA	0.157	0.135	0.104	0.052	0.379
DCP	56.535	52.812	32.476	8.747	174.390
ICP	93.851	85.949	47.652	27.135	249.527
CCP	96.503	86.099	49.846	18.969	264.555
CCC	53.883	48.612	54.538	-89.363	201.210
GROWTH	0.161	0.149	0.185	-0.313	0.926
LEV	0.439	0.439	0.165	0.144	0.881
SIZE	15.668	15.668	1.180	12.782	17.815

Source: 2008-2012 Annual Report Data, E-Views & SPSS output

Table 01 summarized variables used in the present study for 100 observations. The mean value of return on assets is 15.7% with a standard deviation (SD) of 10.4%. The mean Debtor's Conversion Period is 56.535 days with SD of 32.476 days. On average, firms take 93.851 days to convert their inventories into sales with a SD of 47.652 days. The table also shows that on an average firms take 96.503 days to pay its creditors with a SD of 49.846 days. The mean cash conversion cycle is 53.883 days. According to this study a firm has an average size of 15.668 as measured by the natural logarithm of its total assets. The mean leverage ratio is 43.9% lagged by total assets. Together with these, firms have seen their sales growth by almost 16.1% annually on an average.

Consistent with Sharma & Kumar (2011), the study next analyzed the Pearson Correlation among the observed variables.

Table 02: Pearson Bi-variate Correlation Coefficient

Variables	ROA	DCP	ICP	CCP	CCC	GROW:	LEV	SIZE
ROA	1							
DCP	-0.161	1						
ICP	0.265**	-0.026	1					
CCP	0.552**	0.026	0.562**	1				
CCC	-0.37**	0.549**	0.344**	-0.407**	1			
GROWTH	0.133	0.127	0.052	-0.127	0.237*	1		
LEV	-0.419**	0.068	0.151	-0.036	0.205*	0.119	1	
SIZE	0.243*	-0.418**	-0.000	0.354**	-0.574**	-0.249*	0.134	1

Source: 2008-2012 Annual Report Data, E-Views & SPSS output

** Correlation is significant at the 0.01 level (two tailed)

* Correlation is significant at the 0.05 level (two tailed)

According to table 02, ROA is negatively related to DCP, CCC, and LEV. The negative relation between ROA and DCP is consistent with the view that the less the time taken by customers to pay their bills, the more cash is available to replenish the inventory hence leading to more sales which result to an increase in profitability. The negative relationship between ROA and CCC is consistent with the view that the time lag between the expenditure for the purchases of raw materials and the collection of sales of finished goods can be too long and that decreasing this time lag increases profitability. The table also shows that the ROA is positively related to ICP, CCP, GROWTH, CR and SIZE. The positive relationship between ROA and ICP can be explained the fact that firms which maintain high inventory levels reduce the cost of possible interruptions in the production process. This helps in preventing loss of business due to the security of products

and reducing the cost of supplying goods and it creates a safeguard against price fluctuations. The positive relation between ROA and CCP can be explained by the fact that lagging payments to suppliers ensures that the firm has some cash to purchase more inventory for sale thus increasing its sales levels hence boosting its profits. Further, firm size is positively related to ROA which means that larger firms have the ability to exploit the economies of scale. The correlation coefficient of inventory conversion period, debtor's conversion period, creditor's conversion period, cash conversion cycle, firm's leverage, sales, growth and company size are significant.

In order to test the hypothesis, Pooled Ordinary Least Squire Regression Analysis has been conducted to determine whether there is a significant relationship between WCM and profitability. The Table 03 and Table 04 provide the results for the models tested in the present study. In order to check the presence of autocorrelation and multi-co-linearity in the data, Durbin Watson (D-W) and Variance Inflation Factor (VIF) statistics was analyzed respectively.

Table 03: Variance Inflation Factor

Dependent variable: Return on Assets (ROA)				
Parameter	**Model I**	**Model II**	**Model III**	**Model IV**
Constant	3.234(0.530)	-4.301(0.400)	-16.584(0.003)	3.883(0.476)
DCP	-0.093(0.000)***	-		
ICP		0.064(0.000)***		
CCP			0.040(0.043)***	
CCC				-0.048(0.000
GROWTH	0.163(0.000)***	0.157(0.001)***	0.170(0.001)***	0.168(0.001
LEV	-0.289(0.00)***	-0.288(0.000)***	-0.271(0.000)***	-0.271(0.000
SIZE	0.36***	0.040(0.000)***	0.020(0.000)***	0.025(0.01
Adjusted R^2	0.312	0.444	0.540	0
F value	9.989(0.000)***	16.780(0.000)***	24.273(0.000)***	10.874(0.000
D-W Statistic	0.847	1.137	1.217	0
Firm years	100	100	100	

Source: 2008-2012 Annual Report Data, E-views & SPSS output

*,** and *** denotes significant level at 10%, 5% & 1% level

The regression results of Model I indicates that the coefficient of DCP is negative (β = -0.093, p< 0.01). This implies that when the number of DCP increased by one day, ROA of the firm tend to decrease by 0.093 percent. The overall model is significant, as it is indicated by the F-value of 9.989 (p < 0.01). The coefficients of the other variables included in the model are also highly significant. Further it shows that ROA increases with the firm size and sales growth and decreases with financial debt. Above results indicates that there is a relationship between DCP and profitability.

Model II tested whether there is a significant relationship between ICP and profitability. The regression result shows a significant negative relation between ROA and ICP (β = -0.064, p-value = 0.000). This implies that when the number of ICP increased by one day, ROA of the firm tend to decrease by 0.064%.

Model III tested whether there is a relationship between CCP and profitability. The coefficient of CCP shows a very significant positive relation on ROA (β = 0.040, p-value = 0.043). It means that CCP is highly significant ($p < 0.05$). This suggests that, an increase in the number of days accounts payable by one day is associated with an increase in profitability by 0.04%. This implies that they withhold their payments to suppliers so as to take advantage of the cash available for their working capital needs. The model's R^2 is 54% with a F-value of 24.273 which is highly significant ($p< 0.05$). Thus, it proves that there is a relationship between CCP and profitability.

Regression coefficient of model IV shows that there is a significant negative relationship between CCC and ROA (β = -0.048, p-value = 0.000). According to the table CCC is significant ($p< 0.1$). This supports the notion that there is a relationship between CCC and profitability. The model's R^2 is 33.3% with a F-value of 10.874 which is highly significant ($p< 0.01$). According to the above regression analysis results table, ROA is negatively related with DCP and CCC. The ICP and CCP are positively related with ROA. This concludes that there is a relationship between WCM and profitability of a firm.

In addition to above analysis, the author conducted an interview with the responsible authorities for WCM. According to the interview, 48% of industry practitioners believe that managing WC is very important for a manufacturing company to enhance their profitability. In addition to that highest percentage i.e. 60% and 90% respectively, stated that profitability of a manufacturing company is negatively related with DCP and CCC. On the other hand 70% and 80% of the industry practitioners stated that the profitability is positively related with ICP and CCP respectively.

Conclusion and Recommendations

This study attempted to assess the impact of WCM on profitability using a five years (2008-2012) data set on 20 manufacturing companies listed in CSE. Considering the statistical results, it can be concluded that the manufacturing sector ICP, DCP, CCP and CCC in days play an important role in determining overall profitability (ROA). The results show that a liberal credit policy tends to decrease the profitability. This finding is consistent with Lazaridis & Tryfonidis (2006). Further, ties up of inventory in the stores leads to the decrease in the profitability. On the other hand, the findings indicate that the firm must try to reduce the CCC to an optimum level. Therefore, this study concludes that there is a relationship between the various components of WC indicating that effective WCM has a great impact on profitability. As a recommendation it is suggested for all the manufacturing companies to have a greater focus on the relationship between WCM and profitability, by a level of an appropriate management which will ultimately lead to higher profitability and lower threat of insolvency. Further, best practice models of WCM related to manufacturing sector have been explored, adopted and recommended for Sri Lankan manufacturing sector which maximizes their benefits and leads to an appropriate balance between growth of the business, optimizing operating cash flow and managing risk simultaneously.

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