"THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND PROFITABILITY OF LISTED MANUFACTURING COMPANIES IN SRI LANKA"

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ABSTRACT

Working capital management is important part in firm financial management decision. An optimal working capital management is expected to contribute positively to the creation of firm value. To reach optimal working capital management firm manager should control the tradeoff between profitability and liquidity accurately. The objective of this study is to investigate the relationship of corporate profitability and working capital management. We used a sample of 30 Manufacturing companies listed in the Colombo Stock Exchange (CSE) for the period of 2003-2007. The dependent variable, Return on total assets is used as a measure of profitability and the relationship between working capital management and corporate profitability is investigated using panel data analysis. The results of this research showed that there is statistical significance between profitability and the cash conversion cycle. Moreover managers can create profits for their companies by handling correctly the cash conversion cycle and keeping each different component (accounts receivables, accounts payables, inventory) to an optimum level.

Key Variables: Corporate Profitability, Working Capital Management, Cash Conversion Cycle, Return on Total assets.

Introduction

Working capital is an important issue during financial decision making since its being a part of investment in asset that requires appropriate financing investment. However, working capital always being disregard in financial decision making since it involve investment and financing in short term period. Further, also act as a restrain in financial performance, since it does not contribute to return on equity (Sanger, 2001). Though, it should be critical for to a firm to sustain their short term investment since it will ensure the ability of firm in longer period.

The crucial part in managing working capital is required maintaining its liquidity in day-to-day operation to ensure it's smooth running and meets its obligation (Eljelly, 2004). Yet, this is not a simple task since managers must make sure that business operation is running in efficient and profitable manner. There are the possibilities of mismatch of current asset and current liability during this process. If this happens and firm's manager cannot manage it properly then it will affect firm's growth and profitability. The shorter firm cash conversion cycle, the better a firm profitability. This shows that less of time a rupees tied up in current asset and less external financing. While, the longer cash conversion cycle will hurt firm's profitability. The reason is that firm having low liquidity that would affect firm's risk. However, if firm has higher level of account receivable due to the generous trade credit policy it would result to longer cash conversion cycle. In this case, the longer cash conversion cycle will increase profitability. Thus, the traditional view cannot be applied to all circumstances.

Dilemma in working capital management is to achieve desired tradeoff between liquidity and profitability (Smith, 1980; Raheman & Nasr, 2007). Referring to theory of risk and return, investment with more risk will result to more return. Thus, firms with high liquidity of working capital may have low risk then low profitability. Conversely, firm that has low liquidity of working capital, facing high risk results to high profitability. The issue here is in managing working capital, firm must take into consideration all the items in both accounts and try to balance the risk and return.

The purpose of this study is hopefully to contribute towards a crucial element in financial management which working capital management. It is almost untouched in Sri Lanka or very little research has been done in this area. Most previous study focus on develop market (Peel & Wilson, 1996; Shin & Soenon, 1998 and Deloof, 2003). Thus investigating this issue could provide additional insights and perhaps different evidence on the working capital management in emerging capital market. This will surely enrich the finance literature on this issue. Additionally, the results of this study would provide firm managers better insights on how to create efficient working capital management that have ability to maximize firm's value. As a result, it will build up confidence in investor to invest in that firm. Further, the confidence of investors to invest in Sri Lanka will influence the growth of economic. The results of this study would also assist policy-makers to implement new sets of policies regarding the working capital market in Sri

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Lanka to ensure continuous economic growth.

Research Problem

It is a known fact that insolvency and the eventual resultant business liquidation is usually the result of poor financial management technique. In most firms , the major ingredient of financial management is the stock of working capital. The efficient management of a firm's stock of working capital determines the extent to which the fortunes of the firm can be turned around and its eventual going concern status. The question of efficient management brings to mind the apparent ineffectiveness of the current tools employed in the management of working capital presently. Therefore the research problem could be stated as follows.

"To what extent the working capital management affects the profitability of the manufacturing firm"

Literature review

The study of (Shin & Soenen, 1998) consistent with later study on the same objective that done by (Deloof, 2003) by using sample of 1009 large Belgian non-financial firms for the period of 1992-1996. However, (Deloof, 2003) used trade credit policy and inventory policy are measured by number of days accounts receivable, accounts payable and inventories, and the cash conversion cycle as a comprehensive measure of working capital management. He founds a significant negative relation between gross operating income and the number of days accounts receivable, inventories and accounts payable. Thus, he suggests that managers can create value for their shareholders by reducing the number of days accounts receivable and inventories to a reasonable minimum. He also suggests that less profitable firms wait longer to pay their bills.

In other study, (Lyroudi & Lazaridis, 2000) use food industry Greek to examined the cash conversion cycle (CCC) as a liquidity indicator of the firms and tries to determine its relationship with the current and the quick ratios, with its component variables, and investigates the implications of the CCC in terms of profitability and firm size. The results of their study indicate that there is a significant positive relationship between the cash conversion cycle and the traditional liquidity measures of current and quick ratios. The cash conversion cycle also positively related to the return on assets and the net profit margin but had no linear relationship with the leverage ratios. Conversely, the current and quick ratios had negative relationship with the debt to equity ratio, and a positive one with the times interest earned ratio. Finally, there is no difference between the liquidity ratios of large and small firms.

Moss and Stine (1993) revealed that firm size was a factor in the length of the CCC and the study indicated that larger firms have shorter CCC. Further the study revealed that when the CCC was compared to the current and quick ratios, a significant positive relationship was found.

While Jose et al. (1996) examined the relationship between aggressive working capital management and profitability of US firms using Cash Conversion Cycle (CCC) as a measure of working capital management where a shorter CCC represents the aggressiveness of working capital management. The results indicated a significant negative relationship between the cash conversion cycle and profitability indicating that more aggressive working

capital management is associated with higher profitability.

Chiou and Cheng (2006) analyzed the determinants of working capital management and explored that how working capital management of a firm was influenced by the different variables like business indicators, industry effect, operating cash flows, growth opportunity for a firm, firm performance and size of firm. The study has depicted consistent results of leverage and operating cash flow for both net liquid balance and working capital requirements while variables like business indicator, industry effect, growth opportunities, performance of firm, and size of firm were unable to produce consistent conclusions for net liquid balance and working capital requirements of firms.
In the study of Uyar (2009) he examined industry benchmarks for cash conversion cycle (CCC) of merchandising and manufacturing companies and found that merchandising industry has shorter CCC than manufacturing industries. He further examined the relationship between the length of the CCC and the size of the firms and the findings indicated a significant negative correlation between the length of CCC and the firm size, in terms of both net sales and total assets. The study further showed significant negative correlation between the length of CCC and the profitability.

Nazir and Afza (2008) used external and internal factors to explore the determinants of working capital requirements of a firm. Internal factors were operating cycle, operating cash flows, leverage, size, ROA, Tobin's q and growth while industry dummy and level of economic activity as external macroeconomic factors. They found that operating cycle, leverage, ROA and Tobin's q had an influence on the working capital requirements significantly. The study further revealed that working capital management practices are also related to industry and different industries are following different working capital requirements.

While Rehman (2006) studied the impact of the different variables of working capital management including Average Collection Period, Inventory Turnover in Days, Average Payment Period and Cash Conversion Cycle on the Net Operating Profitability of firms and concluded that there was a strong negative relationship between above working capital ratios and profitability of firms. Furthermore the study stated that managers can create a positive value for the shareholders by reducing the cash conversion cycle up to an optimal level. Ramachandran and Janakiraman (2009) found negative relationship between EBIT and the cash conversion cycle (ccc). The study revealed that operational EBIT dictates how to manage the working capital of the firm. Further, it was found that lower gross EBIT was associated with an increase in the accounts payable days. Thus the study concluded that less profitable firms wait longer to pay their bills, taking advantage of credit period granted by their suppliers. While the positive relationship between average receivable days and firms EBIT suggested that less profitable firms will pursue a decrease of their accounts receivable days in an attempt to reduce their cash gap in the CCC.

In the study of Ganesan (2007) he depicted that the working capital management efficiency was negatively associated to the profitability and liquidity. The study revealed that when the working capital

management efficiency was improved by decreasing days of working capital, there was improvement in profitability of the firms in telecommunication firms in terms of profit margin.

Padachi (2006) examined the trend in working capital needs and profitability of firms to identify the causes for any significant differences between the industries. The results showed that high investment in inventories and receivables was associated with lower profitability. The findings also revealed that an increasing trend in the short-term component of trend in the short-term component of working capital financing.

In the study of Raheman and Nasr (2007) they studied the effect of Working Capital Management on liquidity as well on profitability of the firm. The results showed that there was a negative relationship between variables of the working capital management and profitability of the firm. Further the study also found that there was a negative relationship between liquidity and profitability and a positive relationship between size of the firm and its profitability and negative relationship between debt used by the firm and its profitability.

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Figure 1

the relationship of profitability and working capital management. The results of showed that there was a negative relationship between profitability (measured through gross operating profit) and the cash conversion cycle which was used as a measure of working capital management efficacy. Thus managers can create profits for their companies by handling correctly the cash conversion cycle and keeping each component like accounts receivables, accounts payables, inventory to an optimum level. Samiloglu et.al (2008) analyzed the effect of working capital management on the profitability of the firms. The study depicted the accounts receivable period, inventory period and leverage affects the profitability of the firm negatively while growth affects firm's profitability positively.

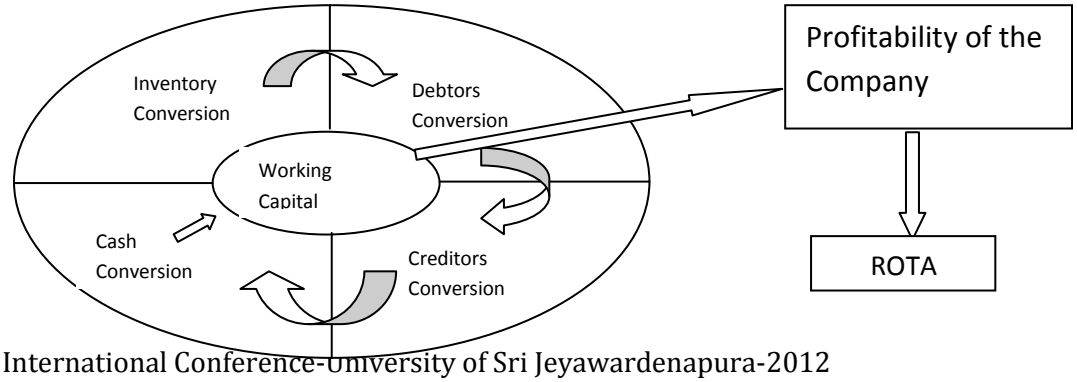
Objectives of the Study

i To findout the relationship between the working capital management and profitability.

ii. To investigate the impact of Working Capital Management on profitability of Listed manufacturing Companies.

Conceptualization Model:

After careful study of the review of literature the following conceptual model was developed.



Hypothesis of the Study

H1: There is a negative relationship between working capital management and profitability.

H2: Working Capital Management significantly impact on profitability of the firm

Methodology

Sampling and Data collection:

The scope of the study is listed manufacturing companies in Sri Lanka. Thirty one companies are listed under manufacturing sectors in Colombo Stock Exchange (CSE) Thirty companies were selected for the study purpose. In order to achieve the objectives , Data were collected from hand book of listed companies published by CSE.

Reliability and Validity

Secondary data for the study were drawn from audited accounts(i.e , income statements and balance sheets) of the particular companies as fairly accurate and reliable. Therefore these data may be considered reliable for the study. Necessary checking and cross checking were done while scanning data from the secondary sources. All these efforts were made in order to generate validity data for the present study.

Variables used in this Study: The following variables were taken into account to measure the working capital management**.**

The inventory conversion period: (IC period) is the time required to convert inventory into cash. IC period is the sum of raw material conversion period, work in process conversion period and finished goods conversion period. We can compute it with the following formula.

$$\text{IC Period} = \frac{\textbf{Averge Inventory}}{\textbf{Cost of Sales}} \times 365$$

Debtors conversion period (DC period) Dc period is the time required to collect the cash from debtors, which is calculated as follows.

$$\text{DC period} = \frac{\textbf{Average Debtors}}{\textbf{Sales}} \times 365$$

Creditors conversion period :(CC period) it is the length of time the firm is able to defer payments on various resource purchase.

$$\text{CC period} = \frac{\textbf{Trade creditors}}{\textbf{Cost of sales}} \times 365$$

Cash conversion Cycle(CCC) It is the length of time between a firm's purchase of inventory and the receipt of cash from accounts receivable. A company's CCC indicates its efficiency in managing working capital, and is of particular use in benchmarking versus competitors or comparable companies. CCC is made up of receivables Collection, Inventory Conversion, and Payables Deferral, and tells us the degree to which suppliers finance a company's inventory.

CCC= IC Period +DC Period-CC period

From the above calculations (ratios) interpretations and companies working capital positions are identified.

Profitability

ROTA was taken into account to measure the profitability. The ratio measures the

percentage of profits earned per rupee of asset and thus is a measure of efficiency of the company in generating profits on its assets.

ROTA = Net Profit x 100

Total Assets

Various studies have utilized the control variables along with the main variables of working capital in order to have an opposite analysis of working capital management on the firm's profitability.(Deloof, 2003). The logarithm of sales used to measure size of firm is a control variable. In addition debt ratio used as proxy for leverage , calculated by dividing total debt by total assets, and ratio of current assets to total assets are also control variable in the regression.

Regression Analysis

To investigate the impact of working capital management on profitability , the model used for the regressions analysis is expressed in the general form as given in equation 1 and the variable inventory conversion period will be replaced in turn by the other independent variables . DC period ,CC period , and CCC.

ROTA = f (loginsales**, cata, Deta, inc days) Equation 1**

$ROTA_{it} = \beta_{0+} \beta_1$ loginsales + β_2 cata+ β_3DeEq+ + β_4 inc days $+E_{it}$ model 1

$ROTA_{it} = \beta_{0+} \beta_1$ loginsales + $\beta_2$cata+ β_3 deEq + $\beta_4$dcp days+E_{it} model 2

$ROTA_{it} = \beta_{0+} \beta_1$ loginsales ++ β_2 cata+ β_3 deEq + $\beta_4$ccp days+E_{it} model 3

$ROTA_{it} = \beta_{0+} \beta_1$ loginsales s++ β_2 cata+ β_3 deEq + $\beta_4$cccdays+E_{it} model 4

Where ROTA- Return on total assets

Loginsales -Natural log value of sales

Cata- Current asset to Total asset Ratio

De/eq- debt to equity ratio

Icp- Inventory conversion period

dcp-Debtors conversion period

ccp- Creditors conversion period

ccc- Cash conversion cycle

Measures where the subscript $_i$ denoting firms(cross section dimension) ranging from 1- 150 and $_t$ denoting years (time series dimension) ranging from 1 to 5. The model specified above is estimated using the regression frame work (Fixed effect and OLS) as employed by Deloof (2003) . (Our model differs, first by using ROTA as a comprehensive measure of profitability**)**

Results and Discussion:

Descriptive statistics: Table1 shows the descriptive statistics of the working capital and profitability measures of the listed manufacturing companies.

Table1: Descriptive Statistics

Variable	Minimum	Maximum	Mean	S.Deviation
Inventory Conversion Period	34.51	902.46	101.41	95.50
Debtors conversion period	5.22	503.58	74.28	62.18
Creditors conversion period	1.00	485.50	65.57	86.96
Cash conversion cycle	-206.88	948.96	109.03	109.25
Net profit ratio	-33.11	27.74	13.12	12.99

(Source: hand book of Listed Companies 2007)

In the case of inventory conversion period the minimum figure for the industry was 34.51days and the maximum is 902.46 days. The mean value for the above was 101.41 days with a standard deviation of 95.50.The minimum and maximum figures for the debtors conversion period was 5.22 days and 503.58 days respectively. The mean value for the debtors conversion period was 74.28 days with a standard deviation of 62.18.For creditors conversion period of the industry the minimum and maximum figures were 1.00 and 485.50days respectively. The mean value for the variable was 65.57 with a standard deviation of 86.96.

The minimum and maximum figures for the cash conversion cycle were -206.88 days and 948.96 days respectively. The mean value for the cash conversion cycle was 109.03 days with a standard deviation of 109.25.The minimum net profitability ratio of the industry was -33.11 and which indicates unfavorable situation. The maximum net profit ratio was 27.72.The mean net profit ratio of the industry was 19.03 with a standard deviation of 9.26.

Relationship between working capital management and profitability

Correlation Analysis:

Pearson Correlation analysis was used to see the relationship between working capital management and profitability. If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable. Table 2 exhibits result of correlation coefficients . The result shows a negative relationship between CCCS and ROTA. This means that result is support the expectation that a lower cash conversion cycle (CCC) is associated with higher profitability.

Table 2 Pearson correlation Analysis

	CA/TA	DE/Eq	ICP	DCP	CCP	CCC	Logsales
ROTA	-0.037	-0.367	-0.210*	-0.064	0.046	-0.232**	-0.037
CA/TA		-0.183	0.556**	0.438**	0.425**	0.163	0.165
CL/TA			0.036	-0.125	-0.036	0.046	-0.20
ICP				0.267**	0.572**	0.373**	0.080
DCP					0.234	0.520	-0.126
CCP						-0.236**	0.159
CCC							-0.177*

** Correlation is significant at the 0.01 level(2- tailed)

* Correlation is significant at the 0.05 level(2- tailed)

Regression Analysis :

Regression analysis was carried out to find out the impact of working capital on profitability of listed manufacturing companies**.** Model 1 regression results are presented in Table 3.

Table3: Regression for Profitability on Inventory Conversion Period

		Model 1				
Dependent		**INC**	CA/TA	D/EQ	**Saleslog**	**Adj. R^2**
ROTA	Fixed effect	-.231	-0.2508	-o.191	0.710	.22
		(0.0207)	(0.016)	(0.847)	(0.016)	
	Pooled OLS	-0.222	-0.161	-0.149	.491	0.19
		(0.025)	(0.023)	(0.881)	(0.045)	

Model 2 regression results are presented in Table 4

Table4: Regression for Profitability on Debtors Conversion Period

		Model 2				
Dependent		**DCP**	CA/TA	D/EQ	**Saleslog**	**Adj. R^2**
ROTA	Fixed effect	-.47	-0.272	-o.90	0.424	.189
		(0.049)	(0.028)	(0.332)	(0.3327)	
	Pooled OLS	-0.34	-0.154	-0.106	.410	0.167
		(0.0374)	(0.032)	(0.253)	(0.097)	

The results offer strong evidence of a negative relationship between the Inventory conversion period and firm profitability. The negative regression coefficient for inventory conversion period was significant (p-value = 0.0207 & 0.025) for both regression implies that a firm with a relatively shorter period of inventory conversion period is more profitable. So H_{1a} has been accepted. Therefore, reducing the firm's INC is potential way for the firm to create additional shareholder value.

Current asset to total assets ratio was negatively related to profitability and also significant. Furthermore, Debt equity ratio was negatively associated with Profitability Both of debt ratio coefficients were not significant . For the sales growth, evidence is positively related to profitability. This is consistent with often argument that growth a part of feature for firm profitability and the creation of shareholder value.

The results offer negative relationship between the debtors conversion period and firm profitability. The negative regression coefficient for debtors conversion period was significant (p-value = 0.049 & 0.0374) for both regression implies that a firm with a relatively shorter period of debtors conversion period is more profitable. H_{1b} has been accepted.Therefore, reducing the firm's DCP was potential way for the firm to create additional shareholder value.

Current asset to total assets ratio was negatively related to profitability. This negative relationship was also significant. Furthermore, Debt equity ratio was negatively associated with Profitability Both of debt ratio coefficients are not significant . For the sales growth, evidence was positively related to profitability but this value was not significant.

Model 3 regression results are presented in Table 5.

Table 5 Regression for Profitability on Creditors conversion period

		Mosel 3				
Dependent		**CCp**	CA/TU	De/Equ	**Sales log**	**Adj. R^2**
ROTA	Fixed Effect	.84	-0.281	-0.144	0.500	.194
		(0.348)	(0.0285)	(0.1218)	(0.92)	
	Pooled ols	0.87	-0. 144	-0.0174	0.339	0.168
		(0.331)	(0.01244)	(0. 142)	(0.168)	

The results offer positive relationship between the creditors conversion period and firm profitability. The positive regression coefficient for creditors conversion period was not significant for both regression. H_{1c} is rejected.

Current asset to total assets ratio was negatively related to profitability. This negative relationship was also significant. Furthermore, Debt equity ratio was negatively associated with Profitability Both of debt ratio coefficients are not significant . For the sales growth, evidence was positively related to profitability but this value is not significant.

The Cash Conversion Cycle (CCC) used as a comprehensive measure of working capital management .The results offer negative relationship between the cash conversion cycle and firm profitability. The negative regression coefficient for cash conversion cycle was significant for both regression (p-value = 0.0228 & 0.009) for both regression implies that a firm with a relatively shorter period of cash conversion cycle more profitable. So H1 is accepted. Therefore, reducing the firm's CCC is potential way for the firm to create additional shareholder value.

Current asset to total assets ratio is negatively related to profitability. This negative relationship was also significant. Furthermore, Debt equity ratio was negatively associated with profitability Both of debt ratio coefficients are not significant . For the sales growth, evidence is positively related to profitability but this value is significant

Model 4 regression results are present in Table 6.

Table 6: Regression for Profitability on Cash Conversion Cycle

		Model 4				
Dependent		**CCC**	CA/TA	DEbt/TA	**Size**	**Adj. R^2**
ROTA	Fixed effect	-0.185	-0.270	-0.817	0..482	.224
		(0.0228)	(0.0262)	(0.335)	(0.046)	
	Pooled ols	-0.221	0.174	-0.17	0.174	.2074
		(0.009)	(0.0143)	(0.056)	(0.014)	

Conclusion

This paper examines the relation between Working Capital Management and corporate profitability. Delof,M. (2003) found a significant negative relation between gross operating income and the number of days accounts receivables, inventories and accounts payables for a large number of a sample of Belgian firms. Shin and Soenen (1998) found a strong negative relation between the cash conversion cycle and corporate profitability for a large sample of listed American firms. In this paper, researcher found a significant negative relation between return on total assets and inventory conversion period, debtors conversion period and cash conversion cycle. The results of the creditors conversion period is somewhat confusing and require further investigation into the matter by the researchers. These results, however, suggest that managers can generate positive returns for their shareholders by reducing the number of days accounts receivable and inventories to a reasonable minimum.

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