WORKING CAPITAL MANAGEMENT AND ITS IMPACT ON FIRMS' PERFORMANCE: AN ANALYSIS OF LISTED MANUFACTURING COMPANIES IN SRI LANKA.

Ananthasayanan,S[1]. & Subramaniam,V.A.[2].

Abstract

A well designed and implemented working capital management is expected to contribute positively to the creation of a firm's value. The purpose of this paper is the relationship between working capital management and its impact on firms' performance. In this study, 25 manufacturing companies out of 31 are selected as sample. The dependent variable, net profit ratio is used as a measure of firm's performance and the relationship between working capital management and performance is investigated using panel data analysis for the period 2003 2007. The regression results show that high investment in inventories and receivables is associated with lower profitability. The key variables used in the analysis are inventory conversion period, debtors conversion period, creditors conversion period and cash conversion cycle. A strong significant relationship between working capital management and profitability has been found in previous empirical work. The findings also reveal working capital management significantly impact on profitability of manufacturing industries.

Key words: Working capital management, Inventory conversion period, Debtors conversion period, Creditors conversion , Net profit ratio and Cash conversion cycle.

1. INTRODUCTION

A firm is required to maintain a balance between liquidity and profitability while conducting its day to day operations. Liquidity is a precondition to ensure that firms are able to meet its short term obligations and its continued flow can be guaranteed from a profitable venture. The importance of cash as an indicator of continuing financial health should not be surprising in view of its crucial role within the business. This requires that business must be run both efficiently and profitably. In the process, an asset-liability mismatch may occur which may increase firm's profitability in the short run but at a risk of its insolvency. On the other hand, too much focus on liquidity will be at the expense of profitability. (Gitman, 1984). Thus, the manager of a business entity is in a dilemma of achieving desired tradeoff between liquidity and profitability in order to maximize the value of a firm.

A firm can be very profitable, but if this is not translated into cash from operations within the same operating cycle, the firm would need to borrow to support its continued working capital needs. Thus, the twin objectives of profitability and liquidity must be synchronized and one should not impinge on the other for long. Investments in

[1]Senior Lecturer, Department of Management Studies, University of Jaffna, Sri Lanka. sayananakshi@yahoo.com
[2]Senior Lecturer, Department of Management Studies, University of Jaffna, Sri Lanka, fmsmani@yahoo.com

current assets are inevitable to ensure delivery of goods or services to the ultimate customers and a proper management of same should give the desired impact on either profitability or liquidity. If resources are blocked at the different stage of the supply chain, this will prolong the cash operating cycle. Although this might increase profitability (due to increase sales), it may also adversely affect the profitability if the costs tied up in working capital exceed the benefits of holding more inventory and/or granting more trade credit to customers. Another component of working capital is accounts payable, but it is different in the sense that it does not consume resources; instead it is often used as a short term source of finance. Thus it helps firms to reduce its cash operating cycle, but it has an implicit cost where discount is offered for early settlement of invoices.(Shin et.al 1998)

This discussion of the importance of working capital management, its different components and its effects on profitability leads us to the problem statement which we will be analyzing.

The problem statement to be analyzed in this study is: "Does Working Capital Management Affect performance of listed manufacturing firms in Sri Lanka. To analyze this problem statement, we have developed objectives of our research, which will hopefully contribute towards a very important aspect of financial management known as working capital management.

The study objectives are to examine the working capital management of the sample firms, and in particular : To examine the impact of debtors conversion period, inventory conversion period , creditors conversion period and cash conversion cycle on net profit ratio.

2 .LITERATURE REVIEW

The working capital meets the short-term financial requirements of a business enterprise. It is a trading capital, not retained in the business in a particular form for longer than a year. The money invested in it changes form and substance during the normal course of business operations. The need for maintaining an adequate working capital can hardly be questioned. Just as circulation of blood is very necessary in the human body to maintain life, the flow of funds is very necessary to maintain business. If it becomes weak, the business can hardly prosper and survive. Working capital starvation is generally credited as a major cause if not the major cause of small business failure in many developed and developing countries (Rafuse, 1996). The success of a firm depends ultimately, on its ability to generate cash receipts in excess of disbursements. The cash flow problems of many businesses are exacerbated by poor financial management and in particular the lack of planning cash requirements (Jarvis et al, 1996).

Imegi, J.C. et.al (2004) analyzed and examined the maneuverings of working capital management in Rivers State-owned (Public) enterprises, with special focus on cash, marketable securities, and accounts receivables optimization. They concluded that variation in size and composition of PE's current assets are not significantly influenced by cash flow predictability and anticipated growth rate, but more by such

factors as nature of business, sales, firm size and profitability. Howarth,C.et.al (2003) discussed the working capital management routines of a large random sample of small companies in the UK. Considerable variability in the take-up of 11 working capital management routines was detected. Principal components analysis and cluster analysis confirm the identification of four distinct types of companies with regard to patterns of WCM. The first three types of companies focused upon cash management, stock or debtor's routines respectively. While the 'fourth type was less likely to take up any WCM routines. Influences on the amount and focus of working capital management were discussed. Multinomial logistic regression analysis suggests that the selected independent variables successfully discriminated between the four 'type' of companies. The results suggest that small companies focus only on areas of working capital management where they expect to improve marginal returns. 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 for the 1975- 94 periods. Satyamoorthi C. R. (2002) conducted a research on management of working capital in co-operatives in Botswana. The paper focused on how the current assets were financed and to discover the relative importance of various current assets components on the basis of four years data of some selected organizations. The study covered the period of 1994-97. The study showed that the co-operatives had low liquidity resulting their weak position to pay short-term debts. Dev Strischek (2001) discusses that when lending, bankers judge a company's working and cash flow management skills, which certainly impact the cost of capital. This is why a lender has a vested interest in three key areas namely; sound collection practices, inventory controls and trade credit disciplines. Ananth Raman and Bowon Kim (October 2001) models the impact of inventory holding cost and reactive capacity on Northco's targeted under stocking and overstocking cost and offers a solution methodology for such problems. Quantifying the impact of varying inventory carrying costs (and hence, high working capital costs) on stock out costs and the value of additional capacity, their results illustrate that apparel manufacturers with high working capital costs, and hence high inventory carrying costs, should target higher stock out costs and achieve lower capacity utilization.(Falope2009).

Ghosh and Maji, (2003) in this paper made an attempt to examine the efficiency of working capital management of the Indian cement companies during 1992 1993 to 2001 2002. For measuring the efficiency of working capital management, performance, utilization, and overall efficiency indices were calculated instead of using some common working capital management ratios. Findings of the study indicated that the Indian Cement Industry as a whole did not perform remarkably well during this period.

Smith and Begemann (1997) emphasized that those who promoted

working capital theory shared that profitability and liquidity comprised the salient goals of working capital management. Results indicated that there were no significant differences amongst the years with respect to the independent variables. The results of their stepwise regression corroborated that total current liabilities divided by funds flow accounted for most of the variability in Return on Investment (ROI). The statistical test results showed that a traditional working capital leverage ratio, current liabilities divided by funds flow, displayed the greatest associations with return on investment.

A research study on working capital management of paper industries in India was conducted by R. Sivarama and Prasad (2001). Their Sample consisted of 21 selected paper mills, including 9 large, 5 medium and 7 small scales for the period from 1983-84 to 1992-93. They reported that the chief executives properly recognized the role of efficient use of working capital in liquidity and profitability, but in practice they could not achieve it. Again they reported a clear reveal of a suboptimum utilization of working capital in paper industry.

Jain, Yadav, Surendra (2007), made a study on Working capital management practices of public sector enterprises in India. The study was based on an analysis of 13 year period data from 1991 to 2003 of 137 public sector enterprises and stated that, a business organization has to be conscious that inadequate working capital can disrupt its operations leading illiquidity. At the same time excessive working capital is also not desirable since it adversely affects profitability. All the above studies provide us a solid base and give us idea regarding working capital management and its components. They also give us the results and conclusions of those researches already conducted on the same area for different countries and environment from different aspects. On basis of these researches done in different countries, we have developed the conceptual model for the research.

3. DATA COLLECTION

The secondary data were used for the study . The data were collected from the hand books of listed companies published by CSE and CD issued by CSE, annual reports of companies, Journals, and books etc.

4 .SAMPLING METHOD

Number of companies in CSE were identified and segregated by sectors. The researcher decided to take only the manufacturing sector. Because working capital management involves the inventory, debtors, creditors which are directly available in manufacturing companies. There are 32 manufacturing companies in CSE. Out of the 31 companies 25 companies were randomly selected for the study. The data representing the periods of 2003 to 2007 were taken into consideration and the average value of each item was considered for the purpose of ratio computation and analysis.

5 .METHODOLOGY

This study undertakes the issue of identifying key variables that influence working capital management . Choice of the variables is influenced by the previous studies on working capital management. All the variables stated below have been used in

this study. They include dependent, independent and some control variables:
Net Profitability ratio (NPR) which is a measure net of profitability of the firm is used as dependant variable. It is defined as Net Income divided by Turn over.

Debtors conversion Period (DCP) used as proxy for the Collection Policy is an independent variable. It is calculated by dividing account receivable by sales and multiplying the result by 365 (number of days in a year).

Inventory conversion period in days (ICP) used as proxy for the Inventory Policy is also an independent variable. It is calculated by dividing inventory by cost of goods sold and multiplying with 365 days.

Creditors conversion Period (CCP) used as proxy for the Payment Policy is also an independent variable. It is calculated by dividing accounts payable by purchases and multiplying the result by 365.

The Cash Conversion Cycle (CCC) used as a comprehensive measure of working capital management is another independent variable, and is measured by adding Inventory conversion Period with Debtors conversion period in Days and deducting Creditors conversion Period.

Control variables :The variables which may influence profits sales a proxy for size :current asset/total asset ratio, current asset /turn over ratio , current liability /total asset ratio are included as a control variables in the regression model. Because firm size does also influence in determining the working capital (Delof,M. 2003).

Fixed effect regression analysis was carried out to find out the impact of working capital on profitability . The model used for the regression analysis which is given below as equation 1 and the variable Inventory conversion period will be replaced in turn by the other explanatory variables.

NPR = f (loginsales, cata, clta, catu,icp days)

Equation 1

$NPR_{it} = \beta_0 + \beta_1$ loginsales$_i$ + β_2 cata+ $\beta_3$clta+ $\beta_4$catu+ β_5 icp days + E_{it} ..... Model 1

$NPR_{it} = \beta_0 + \beta_1$ loginsales + β_2 cata+ $\beta_3$clta+ $\beta_4$catu+ $\beta_5$dcp days+E_{it} ..... Model 2

$NPR_{it} = \beta_0 + \beta_1$ loginsales + β_2 cata+ $\beta_3$clta+ $\beta_4$catu +$\beta_5$ccp days+ E_{it} Model 3

$NPR_{it} = \beta_0 + \beta_1$ loginsales + + β_2 cata+ $\beta_3$clta+ $\beta_4$catu+ $\beta_5$cccdays + E_{it} ..... Model 4

Where
NPR - Net Profit Ratio
Loginsales -Natural log value of sales
Cata- Current asset to Total asset Ratio
clta- Current liability to total asset ratio
catu- Current asset to turnover ratio
icp- Inventory conversion period
dcp-Debtors conversion period
ccp- Creditors conversion period
ccc- Cash conversion cycle

Measures where the subscript , denoting firms(cross section dimension) ranging from 1- 125 and , 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).

5.1 Hypotheses of the research

In this study ,the following hypotheses are formulated by the researcher.

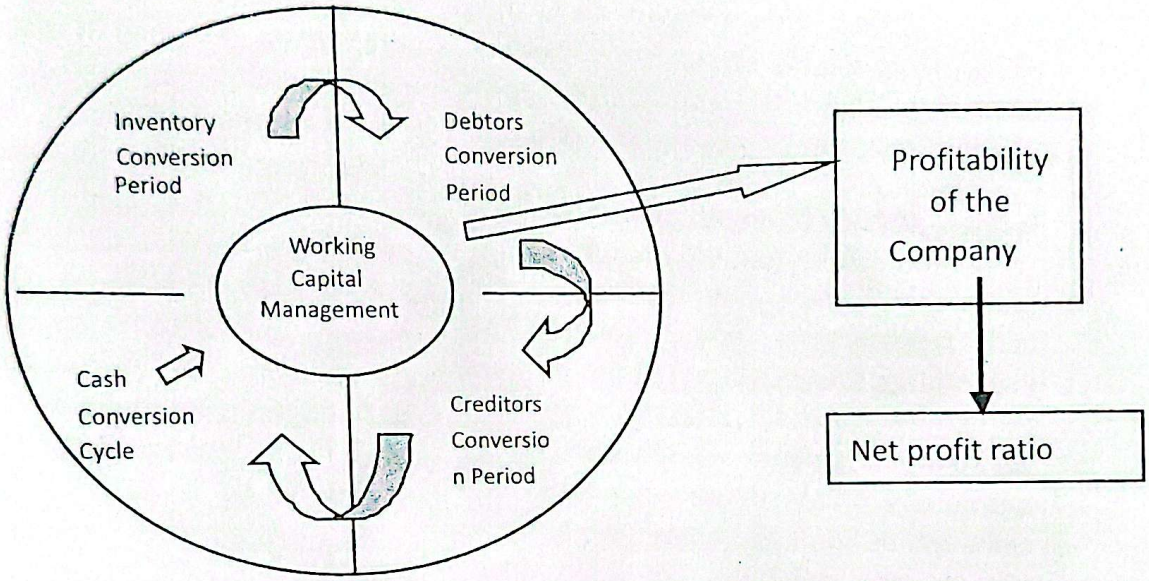
Hypotheses 1(H_1): There is a negative relationship between working capital measures and profitability.

Hypotheses 2(H_2): The working capital management significantly impact on Profitability.

5.2 Conceptualization model

After the careful study of theoretical review of literature the following conceptual model is formulated to depict the relationship between working capital management and profitability.

Figure 1 :Conceptualization Model



Above conceptual model depicts the relationship between working capital management and profitability. This model shows that how to measure the cash conversion cycle (INC+DCP-CCP).

5.3 Descriptive statistics

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

Above Table shows the descriptive statistics of the working capital and profitability measures. In the case of inventory conversion period the minimum figure for the industry is 34.51days and the maximum is 902.46 days. The mean value for the above is 101.41 days with a standard deviation of 95.50.The minimum and maximum figures for the debtors conversion period is 5.22 days and 503.58 days respectively. The mean value for the debtors conversion period is 74.28 days with a standard deviation of 62.18.For creditors conversion period of the industry the minimum and maximum figures are 1.00 and 485.50days respectively. The mean value for the variable is 65.57 with a standard deviation of 86.96.

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

5.4 Relationship between working capital manage-ment and profitability

Profitability is generally depending on working capital management thus working capital indicators such as inventory conversion period, debtors conversion period, creditors conversion period and cash conversion cycle should have a relationship with net profitability. In order to test these relationships the correlation analysis was carried out and the results are summarized in the Table 2.

Table 2 Pearson Correlation Analysis

	CA/TU	CA/TA	CL/TA	ICP	DCP	CCP	CCC	Logsales
NPR	0.466**	0.139**	-0.466**	-0.204**	-0.165**	-0.103*	-0.098**	0.078
CA/TU		0.093	-0.183	0.556**	0.438**	0.425**	0.163	0.165
CA/TA			-0.009	0.067	0.022	0.023	0.051	-0.468
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)

Pearson's Correlation analysis is used for data to see the relationship between variables such as those 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. There is a negative relationship between net profitability on the one hand and the measures of working capital management on the other hand. This is consistent with the view that the time lag between expenditure for purchases of raw material and the collection of sales of finished goods can be too long, and that decreasing this time lag increases profitability. We have started our analysis of correlation results between the inventory conversion period and net profitability. The result of correlation analysis shows a negative coefficient 0.204, with *p*-value of (0.000). It indicates that the result is highly significant at ά. = 1%, and that if the average inventory conversion period increases it will have a negative impact on the profitability and it will decrease. Correlation results between debtors collection period in days and the net Profitability also indicate the same type of result. The correlation coefficient is 0.165 and the *p* value is (0.000). This again shows that the result is highly significant ά. = 1%. Correlation results among the creditors conversion period in days also indicate the negative relationship. Here again, the coefficient is negative and significant at 5% . The coefficient is - 0.103. It means that the less profitable firms wait longer to pay their bills. The cash conversion cycle which is a comprehensive measure of working capital management also has a negative coefficient 0.098 and the *p* value is (0.000). But it is significant at ά. = 1%. It means that if the firm is able to decrease this time period known as cash conversion cycle, it can increase its profitability. By analyzing the results we conclude that if the firm is able to reduce these time periods, then the firm is efficient in managing working capital. This efficiency will lead to increasing its profitability. So H1 is accepted.

5.5 Impact of working capital on profitability

Table 3 gives the results of the fixed effect regression 1-4 and for the OLS regression 5-8. The first half of the Table II represents the results of regression 1 to 4, applying a fixed effect methodology whether the intercept term is allowable.

The Table 3.(column 4) shows the results of fixed effect regression of net profit ratio and the cash conversion cycle. According to the regression summary (Table 3) the coefficient of the cash conversion cycle variable is negative at a value of -0.148 and which is significant at 0.05 level since p value is less than 0.05. Therefore, H_2 is accepted. That is Working capital management significantly impact on profitability. It has the same sign in the OLS regression 8, (coefficient -0.14094)) and significant at 5% level. (p value 0.0495).In regression 4 , the coefficient of the other variables in the models are significant at 1% level except current asset to total asset ratio . Since the working capital is measured with the efficiency ratio such as IC period, DC period, CC period and CCC. This hypothesis (H2) is sub divided and tested as follows

Table 3 : Regressions of profitability on Working Capital variables 25 Manufacturing Companies, 2003- 2007:125 firm year observation dependent variable Net profit ratio

	1	2	3	4	5	6	7	8
Sale(inLog)	0.10187 (0.001)	0.9500 (0.3468)	.94906 (0.0002)	0.9494 (0.0000)	.5448 (0.0125)	.5565 (0.0089)	0.5041 (0.0200)	.5357 (0.013)
CA/TA	-0.16 (0.1213)	-0.138 (0.1768)	-.157 (0.1336)	-.14263 (0.1681)	.1256 (.0442)	0.13096 (0.0332)	0.11664 (0.0624)	0.1341 (0.0324)
CA/TU	0.46004 (0.000)	0.42914 (0.000)	0.40027 (0.000)	0.36899 (0.000)	.46131 (0.000)	0.4638 (0.000)	0.415 (0.000)	0.3978 (0.000)
CL/TA	-0.4318) (0.000)	-0.459 (0.000)	-.4549 (0.000)	-0.44156 (0.000)	-0.375 (0.000)	-0.40049 (0.000)	-0.3945 (0.000)	-0.1409 (0.0495)
INC Period	-0.2015 (0.0170)				-0.15406 (0.0271)			
DC Period		-0.203 (0.0075)				-0.208 (0.0075)		
CC Period			-.13000 (0.0905)				.10031 (.2081)	
CCC Period				-0.148 (0.0333)				-0.14094 (0.0495)
Ad R^2	.437	.445	.4236	.432	.3757	.3964	.3676	.3795

H_{2a}:IC period has impact on net profit of manufacturing industries.

According to the regression summary, Table 3 regression (1) is estimated with fixed effect and includes IC period. The coefficient of the IC period is -0.2015, which is significant at 0.05 levels. Therefore H_{2a} is accepted. This implies that an increase in the number of days IC period by 1 day is associated with a decline in net profit income decreased by. 2015%.

While the coefficient of IC period variable is negative in regression 5, it is -0.15406 which is also significant at 5% level. The R^2 value for the regression 1 is 0.437. Therefore it is possible to say that approximately 44% of the variations in the profitability could be explained by the variation in the IC Period. In regression 5, the adjusted R^2 explain 38 % of the variation in profitability under OLS. It implies that there are no major differences within the research period.

H_{2b} DC period has impact on net profit of manufacturing industries.

According to the regression summary (Table 3) coefficient of the DC period is -0.203, which implies that an increase in the number of debtors conversion period associated with a decrease in net profit ratio by .203%. p value is 0.0075. Therefore H2b is accepted. While the coefficient of DC period variable is negative in regression 2, it has the same sign in the OLS regression 6 (-0.208) and coefficient is also significant .(p value is 0.0075)The R^2 value for the regression 2 is 0.445 therefore it is possible to say that approximately 45% of the variations in the profitability could be explained by the variation in the DC Period. Therefore researcher concluded that DC period significantly affect the profitability of

manufacturing firms in Sri-Lanka. In regression 6, the R2 approximately explains 40 % of the variation in profitability under OLS. It implies that there is no major time effect. In regression 2, the coefficient between the size of the company which was measured by log in sales and the profitability is .95 and p value is .3468.The size of the company does not impact on the profitability of the company .

H_{2c} Creditors Conversion period has an impact on net profit of manufacturing industries

Regression 3 (Table 3) shows the results of fixed effect regression of Net profit ratio and the creditors conversion period. According to the regression summary the coefficient of the creditors conversion period is negative-0.1300 but the coefficient is not significant while the coefficient of Creditors conversion period is positive (in regression 7) and the coefficient is not significantly from zero(p= 0.2081)The coefficient of the other variables included in the model are significant, expect for current asset to total asset ratio .

6. 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, we find a significant negative relation between net profit and inventory conversion period, debtors conversion period, creditors 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. The negative relation between Creditors conversion period and profitability is also in conformity with general view that less profitable firms wait longer to pay their bills.

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