

**WORKING CAPITAL MANAGEMENT AND CORPORATE PROFITABILITY:
EVIDENCE FROM PANEL DATA ANALYSIS OF SELECTED QUOTED
COMPANIES IN SRI LANKA**

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ABSTRACT

The working capital management plays an important role for the success or failure of firm in business because of its effect on firm's profitability as well on liquidity. An optimal working capital management is expected to contribute positively to the creation of firm value. To reach optimal working capital management firm's manager should control the tradeoff between profitability and liquidity accurately. The study aimed to provide empirical evidence about the effects of working capital management on profitability for a panel made up of a sample of eighty Sri Lankan listed firms for the period 2003 to 2009. The study utilized panel data econometrics in a pooled regression, where time series and cross sectional observations were combined and estimated.. The study is based on secondary data collected from 80 listed firms in Sri Lanka stock market. The study found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days and average cash conversion cycle. These results suggest that managers can create value for their shareholders if the firms manage their working capital in more efficient ways by reducing the number of days accounts receivable and inventories to a reasonable minimum.

Key Words: Net operating profitability, The average collection period, Inventory turnover in days and Average cash conversion cycle

INTRODUCTION:

The working capital management plays an important role for success or failure of firm in business because of its effect on firm's profitability as well on liquidity. Efficient management of working capital plays an important role of overall corporate strategy in order to create shareholders value. An optimal working capital management is expected to contribute positively to creation of firm value. To reach optimal working capital management firm's manager should control the tradeoff between profitability and liquidity accurately. The study aimed to provide empirical evidence about the effects of working capital management on profitability performance for a panel made up of a sample of eighty Sri Lankan listed firms .The study utilized panel data econometrics for the period 2003-2009. The study is based on secondary data collected from listed firms in Sri Lanka stock market. The problem statement to be analysed in this study is "Does Working Capital Management Affect Profitability of Sri Lankan Firms?"

Every organization whether, profit oriented or not, irrespective of size and nature of business, requires necessary amount of working capital. Working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of business (Mukhopadhyay, 2004). Working capital management is one of the most important areas while making the liquidity

and profitability comparisons among firms (Eljelly, 2004), involving the decision of the amount and composition of current assets and the financing of these assets. The greater the relative proportion of liquid assets, the lesser the risk of running out of cash, all other things being equal. All individual components of working capital including cash, marketable securities, account receivables and inventory management play a vital role in the performance of any firm. Shin and Soenen, (1998) argued that efficient working capital management is very important to create value for the shareholders while Smith et. al., (1997) emphasized that profitability and liquidity are the salient goals of working capital management.

The purpose of this study is to investigate the relationship between working capital management and firm profitability. Cash conversion cycle is used as measure of 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 & Soenen, 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 Lanka to ensure continuous economic growth.

LITERATURE REVIEW

Afza and Nazir (2007a) found the negative relationship between working capital policies and profitability. In line with the study Afza and Nazir (2007b) further investigated the relationship between the aggressive/conservative working capital policies profitability as well as risk of public limited companies. They found a negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policies. The firms yield negative returns if they follow an aggressive working capital policy.

Lazaridis and Tryfonidis (2006) investigated 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.

In intention to discover the relationship between efficient working capital management and firm's profitability(Shin & Soenen, 1998) used net-trade cycle (NTC) as a measure of working capital management. NTC is basically equal to the CCC whereby all three components are expressed as a percentage of sales. The reason by using NTC because it can be an easy device to estimate for additional financing needs with regard to working capital expressed as a function of the projected sales growth. This relationship is examined using correlation and regression analysis, by industry and working capital intensity. They found, a strong negative relation between the length of the firm's net-trade cycle and its profitability.

In addition, shorter NTC are associated with higher risk-adjusted stock returns. In other word, (Shin & Soenen, 1998) suggest that one possible way the firm to create shareholder value is by reducing firm's NTC.

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.

METHODOLOGY

The purpose of this research is to contribute towards a very important aspect of financial management known as working capital management with reference to Sri Lanka. Here we will see the impact of working capital management on profitability of 80 Sri Lankan firms listed on Colombo stock Exchange for a period of seven years from 2003 – 2009.

DATA SET & SAMPLE

The data used in this study was acquired from Colombo Stock Exchange (CSE), internet and web sites of different firms. Data of firms listed on the CSE for the most recent seven years formed the basis of our calculations. The period covered by the study extends to seven years starting from 2003 to 2009.

VARIABLES

This study undertakes the issue of identifying key variables that influence working capital management of Sri Lankan firms. Choice of the variables is influenced by the previous studies on working capital management. They include dependent, independent and some control variables: Net Profitability (NP), which is a measure of Profitability of the firm, is used as dependant variable. It is defined as Net operating Income divided by Sales.

Average Collection Period (ACP) 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 turnover in days (INT) 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.

Average Payment Period (APP) 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 Average Collection Period with Inventory Turnover in Days and deducting Average Payment Period.

Current asset to total asset Ratio (CA/TA) which is calculated by dividing current assets by Total asset.

In addition , Size (Natural logarithm of Sales (LOS)), Debt Ratio (DR) used as proxy for Leverage and is calculated by dividing Total Debt by Total Equity , are included as control variables.

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

REGRESSION MODEL: POOLED LEAST SQUARES ESTIMATION

The determinants of net operating profitability are investigated for all 560 firm-year observations. The results are shown in Table 1-4. A number of different regression coefficients are estimated for selected independent variables. This regression is estimated using the pooled least squares method with no weights.

The model that we have applied is as follows:

$$NPR_{it} = \beta_0 + \beta_1 (INCP_{it}) + \beta_2 (CATA_{it}) + \beta_3 (LOS_{it}) + \beta_4 (CL/TA_{it}) + \beta_5 (DEEQ_{it}) + \varepsilon \text{ --Model 1}$$

Dependent Variable: NPR

Method: Panel Least Squares

Table : 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.093820	0.012340	7.602913	0.0000
INCP	-0.0004981	0.0001611	-3.09	0.003
CA_TA	0.010708	0.018249	0.586772	0.5576
LOGS	0.087931	0.007032	12.50375	0.0000
CL_TA	-0.082081	0.026066	-3.148978	0.0017
DE_EQ	8.81E-06	2.40E-05	0.366937	0.7138

R-squared	0.229578		
Adjusted R-squared	0.222497		
F-statistic	32.42130	Durbin-Watson stat	2.01853
Prob(F-statistic)	0.000000		

The results of this regression indicate that the coefficient of Inventory turnover in days (INT) is negative and is significant at $\alpha = 5\%$. It implies that the increase or decrease in Inventory turnover in days will significantly affect profitability of the firm. The current liability to total asset ratio has also a significant negative relationship with profitability. Similarly log of sales used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 22.24. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here C is 0.093820; the probability of the coefficient is significant. The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 32.42130.

The second regression is run using the Average Collection Period (ACP) in days as an independent variable as a replacement for inventory collection period. The other variables are the same as they have been in the first regression. The model we have used is shown below:

Model 2:

$$NPR_{it} = \beta_0 + \beta_1 (ACP_{it}) + \beta_2 (CATA_{it}) + \beta_3 (LOS_{it}) + \beta_4 (CL/TA_{it}) + \beta_5 (DEEQ_{it}) + \varepsilon \text{ --Model 2}$$

Dependent Variable: NPR

Method: Panel Least Squares

Table : 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.085990	0.012080	7.118235	0.0000
ACP	-0.0012117	0.000427	-2.84	0.005
CA_TA	5.15E-05	5.61E-05	0.918447	0.3588
LOGS	0.088246	0.007016	12.57808	0.0000
CL_TA	-0.081486	0.025965	-3.138334	0.0018
DE_EQ	8.31E-06	2.39E-05	0.347248	0.7285
R-squared	0.230588			
Adjusted R-squared	0.223555			
F-statistic	32.78648	Durbin-Watson stat		2.023941
Prob(F-statistic)	0.000000			

The results of this regression indicate that the coefficient of accounts receivable is negative and is significant at $\alpha = 5\%$. It implies that the increase or decrease in accounts receivable will significantly affect profitability of the firm. The current asset to total asset ratio has insignificant with profitability. Log of sales used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

The adjusted R^2 is 22.35 and the coefficient of F-statistics is 32.78 and has significant at $\alpha = 1\%$

The third regression is run using the Average Payment Period (APP) in days as an independent variable as a replacement for average collection period. The other variables are the same as they have been in the first and second model. The model we have used is shown below:

Model 3

$$NPR_{it} = \beta_0 + \beta_1 (CCP_{it}) + \beta_2 (CATA_{it}) + \beta_3 (LOGS_{it}) + \beta_4 (CL/TA_{it}) + \beta_5 (DEEQ_{it}) + \epsilon \text{ --Model 3}$$

Dependent Variable: NPR

Method: Panel Least Squares

Table : 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.088070	0.011406	7.721214	0.0000
APP	0.0015635	0.0001375	11.37	0.0000
CA_TA	3.35E-05	4.34E-05	0.770801	0.4412
LOGS	0.088172	0.0070116	12.56740	0.0000
CL_TA	-0.081933	0.025958	-3.156386	0.0017
DE_EQUITY	8.88E-06	2.39E-05	0.371012	0.7108
R-squared	0.230237			
Adjusted R-squared	0.223201			
F-statistic	32.72175	Durbin-Watson stat		2.031887
Prob(F-statistic)	0.000000			

The results of this regression indicate that the coefficient of Average Payment Period (APP) is positive relationship between average payment period and profitability and significant at $\alpha = 1\%$. It implies that the increase or decrease in accounts receivable will significantly affect profitability of the firm. The positive relationship between the average payment period and profitability indicates that the more profitable firms wait longer to pay their bill. The current asset to total asset ratio has an insignificant with profitability. Similarly log of sales used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 23.3201%. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here C is

0.088070; the probability of the coefficient is significant. The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 32.72175

In fourth regression, cash conversion cycle is used as an independent variable instead of average collection period, inventory turnover in days and average payment period. It is the comprehensive measure of checking efficiency of working capital management. The other variables are kept the same as they were in the first three regressions. The model we have used is shown herewith:

Model 4:

$$NPR_{it} = \beta_0 + \beta_1 (CCC_{it}) + \beta_2 (CATA_{it}) + \beta_3 (LOGS_{it}) + \beta_4 (CL/TA_{it}) + \beta_5 (DEEQ_{it}) + \varepsilon \text{ --Model 4}$$

Dependent Variable: NPR

Method: Panel Least Squares

Table : 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.089839	0.011088	8.102588	0.0000
CCC	-0.2778	0.033613	-8.27	0.0000
CA_TA	0.012392	0.029349	0.422219	0.6730
LOGS	0.087938	0.007013	12.53901	0.0000
CL_TA	-0.082232	0.025963	-3.167259	0.0016
DE_EQUITY	8.49E-06	2.39E-05	0.354518	0.7231
R-squared	0.229694			
Adjusted R-squared	0.222653			
F-statistic	32.62143	Durbin-Watson stat		2.009630
Prob(F-statistic)	0.000000			

The results of this regression indicate that the coefficient of Cash Conversion Cycle (CCC) is negative and is significant at $\alpha = 1\%$. It implies that the increase or decrease in cash conversion cycle will significantly affect profitability of the firm. Log of sales used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 22.2653%. The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 32.62

The key findings from the study were

1. There exists a highly significant negative relationship between the period taken to convert inventories into sales (the inventory conversion period) and profitability ($p < 0.05$). (Table 1) This implies that the increase or decrease in inventory conversion in days will significantly affect profitability of the firm.
2. There exists a highly significant negative relationship between the time it takes for firms to collect cash from their debtors (average collection period) and profitability ($p < 0.01$). This means that more profitable firm take the shortest time to collect cash from their customers. (Table 2)

3. There exists a highly significant positive relationship between the time it takes the firm to pay its (Average payment period) and profitability ($p < 0.01$) This implies the longer a firm takes to pay its creditors the more profitable it is.(Table 3)
4. There exists a highly significant negative relationship between the the profitability and cash conversion cycle ($p < 0.01$). This implies that the increase or decrease in cash conversion cycle in days will significantly affect profitability of the firm. (Table 4)
These results suggest that managers can create value for their shareholders if the firms manage their working capital in more efficient ways by reducing the number of days accounts receivable and inventories to a reasonable minimum.

This paper support for existing literatures such as shin and soenen(1998) Deloof(2003), Raheman , Nars(2007) and Dong .H.P et al (2010) and who found a strong negative relationship between the measures of working capital management including the number of days account receivable, number of days inventories and cash conversion cycle with profitability. Moreover, this paper also adds findings of Lazaridis and Tryfonidis(2006) and Dong.H.Pet al (2010)who claimed that there was a positive relationship between number of days accounts payable and profitability.

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