

## The Relationship of Cash Conversion Cycle and Profitability of Firms: An Empirical Investigation of Pakistani Firms

**Sadia Majeed**

MS Scholar Department of Management Sciences  
The Islamia University of Bahawalpur  
Email: [saadia.majeed@gmail.com](mailto:saadia.majeed@gmail.com)

**Muhammad Abdul Majid Makki**

Assistant Professor Department of Commerce, Baghdad Campus  
The Islamia University of Bahawalpur, Pakistan  
Email: [abdul7896@yahoo.com.au](mailto:abdul7896@yahoo.com.au)

**Saba Saleem**

MS Scholar Department of Management Sciences  
The Islamia University of Bahawalpur  
Email: [saba\\_saleem78@yahoo.com](mailto:saba_saleem78@yahoo.com)

**Tariq Aziz**

MS Scholar Department of Management Sciences  
The Islamia University of Bahawalpur  
Email: [aziztariq@live.com](mailto:aziztariq@live.com)

---

### **Abstract**

**Purpose** – The objective of the study is to examine empirically the impact of Cash conversion cycle on the performance of Pakistani manufacturing firms.

**Design/methodology/approach** – The study used the sample of 32 companies selected randomly from three manufacturing sectors i.e. chemical, automobiles and construction & material for the period of five years ranging from 2006 to 2010. The correlation and regression analyses were used to examine the relationship of CCC with performance of the firms: Return on Assets (ROA), Return on Equity (ROE) and Operating Profit (EBIT).

**Findings** – The study examined the impact of different variables of cash conversion cycle on firm's performance. The study found that the average collection period of accounts receivables, inventory conversion period and Cash conversion cycle (CCC) have negative relationship with firm's performance.

**Originality/value** – Many of the studies on working capital management (WCM) are with reference to developed economies like USA but fewer are with reference to developing economies like Pakistan. This study will contribute to the literature by analyzing the impact of working capital management on the performance of manufacturing firm by validating the results of previous studies stated in the literature.

---

**Keywords:** Cash Conversion Cycle, Firm Performance, working capital management.

## **1. Introduction**

Traditional approach to corporate finance always emphasized the long-term financial decisions like capital budgeting and capital structure, The interest on WCM developed over the past two decades (Lyroudi and Lazaridis 2000). WCM is scrutinized by two methods: static and dynamic. The static method is based on the liquidity ratios. Commonly used current and quick ratios based on the data of balance sheet, measures liquidity at some point in time. The dynamic method is related to the operations of the company. CCC is a dynamic measurement of the time between cash payment for raw materials and then receiving it from accounts receivable (Moss and Stine 1993, Lancaster, Stevens and Jennings 1999). As far as the dynamics of ongoing liquidity management is concerned, CCC combines both balance sheet and income statement data to measure liquidity with dimension of time (Jose et al., 1996).

The WCM theory is based on the traditional models of the CCC that is initiated by Richards and Laughlin (1980). It is a great measure to know that how fine a corporation is organizing its working capital (Nobanee et al. 2011). Gitman (1974) concluded that CCC is the most important aspect in WCM. In fact, it tells about the investment and credit decisions in the customer, inventory and suppliers, which show average number of days started from the date when the firm starts payments to its suppliers and the date when it begins to receive payments from its regulars.

Padachi (2006) analyzed the trends in the WCM and its influence on business performance for small manufacturers of Mauritius. He reported that firm's needs for working capital of change over time depending on the rate of creation of money and high internal investment in inventories and receivables led to reduced profitability.

Nazir and Afza (2008) studied that operating cycle, ROA, leverage and Tobin's q are the features which significantly influence WC requirements in Pakistan, whereas different industries are following different WC requirements. The results are same as concluded by Nazir and Afza (2007).

The main purpose of this study is to look at the relationship between the length of CCC and firm profitability. A sample of 32 firms of 3 different industries was selected covering the period 2006-2010 for Pakistani non-financial firms listed on the Karachi Stock Exchange (KSE). Rest of the paper reviews the existing literature and presents the results.

## **2. Cash Conversion Cycle**

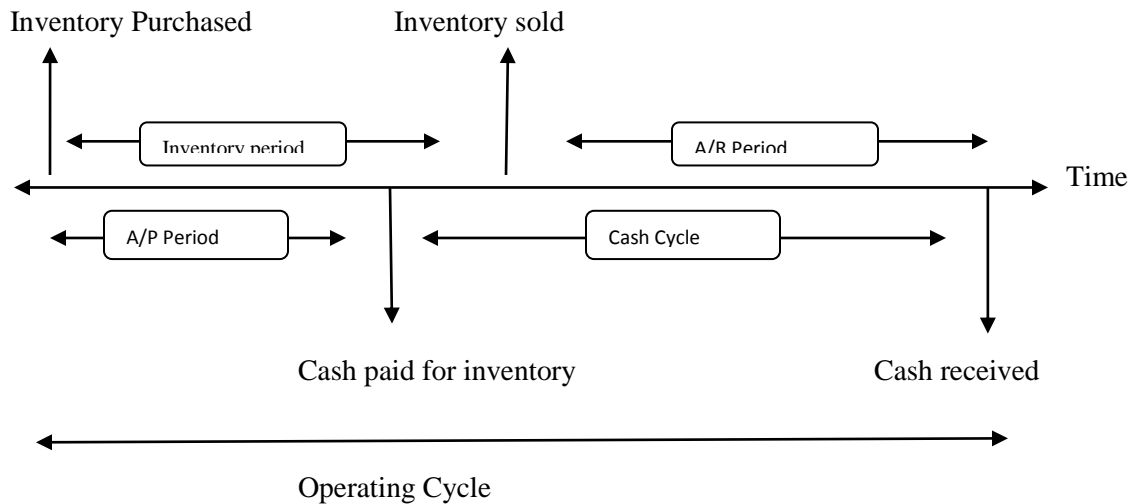
CCC is used as an overall measure of WC, as it shows the gap between expenditure for purchases and collection of sales (Padachi 2006). Jordan (2003) defined cash cycle as "The time between cash disbursement and cash collection".

The equation is:

Cash cycle = Operating cycle - Accounts payable period

Where:

Operating cycle = Inventory period + Accounts receivable period



Cash conversion cycle (Jordan 2003)

### 3. Review of Literature

The researchers reviewed the relationship between the length of the CCC and corporate profitability. Most of the studies examined the empirical relationship between these variables that show a significant and negative relation. Moss and Stine (1993) found that the CCC is associated with small business because small businesses need to better manage their cash availability due to lack of credit. Shortening the CCC enhances profitability because the longer the CCC the greater the need for external borrowing. Deloof (2003) also found a significant negative relationship between gross operating income and number of days of inventory, accounts receivable and accounts payable of Belgian firms. These results suggest to managers to create value for their shareholders by reducing the number of days accounts receivable and inventories to a reasonable minimum. The negative correlation between accounts payable and profitability are contrary with the vision that the less profit-making firms make late payments of their bills.

A study of all non-financial corporations in the United States by Nobanee (2006) suggested that CCC is the measure of the effectiveness of WCM that considers all cash flows associated with inventory, accounts receivable and accounts payable. He investigated that to attain optimal levels of inventory, receivables and payables will reduce the cost of handling and opportunity costs of holding inventories, debtors and creditors, and direct to an most favorable length of the cycle cash conversion.

Another study conducted on Spanish small and medium size firms (SMFs) in Spain by Teruel & Solano (2007) also confirmed the negative association between the profitability and the number of days accounts receivable and inventory days. He added that SMEs should be worried about the WC management, as it can help by minimizing its CCC at a minimum (Teruel and Solano 2007). Vishnani and Shah (2007) measured the impact of policies of WCM on the firm performance in the Indian electronic industry. They find that stock holding period and debtors' collection period has a negative correlation with firm performance while the average payment has positive correlation. At the same time Teruel and Solano (2007) find a strong negative link between the measures of WCM (Liquidity) and financial performance. Thus, managers can generate revenue for their firms by managing the CCC and keeping the accounts of receivables, payables and inventory to an optimal level.

Uyar (2009) examined the impact of CCC with firm size and performance for firms listed at Istanbul Stock. The Results showed that there is a considerable negative association between CCC and the firm performance. Gill et al. (2010) find significant association between the CCC and performance calculated through gross operating profit. They examined a negative correlation between performance and average days of accounts receivable and a positive correlation between CCC and performance.

Raheman et al. (2010) find WCM has a significant negative impact on operating profitability of the firms and plays a vital role to generate value for shareholders. Mohamad and Saad (2010) find significant negative links between WC variables with firm's profitability of Malaysian listed companies. Dong and Su (2010) found negative relationship between CCC and corporate performance in Vietnam and a positive link between number of days accounts payable and performance. So we claim that managers can enhance profits by minimizing the number of days accounts receivable and inventories and more profitable firms wait longer for payment of their bills.

Nobanee et al. (2011) finds a strong negative link between the CCC and ROA for all industries except for consumer goods and services in Japan. Karaduman et al. (2011) in Turkey finds CCC indisputably influences the performance of the firms measured in terms of ROA, listed in the ISE (Istanbul Stock Exchange). The results advocate that it may be possible to enhance performance by improving efficiency of WC. Hayajneh and Ait Yassine (2011) confirmed the link between the WC efficiency and performance of Jordanian manufacturing firms and found strong negative correlation between average receivables collection period, average conversion inventory period, average payment period and the performance measures. Gill (2011) finds the negative link between firm size and WC requirements as bigger firms have lower WC requirements than the smaller firms in Canada and efficient WCM is vital to create the higher profits.

Vijayakumar (2011) observed link between liquidity and performance is one of the areas of performance of corporate enterprise. Empirical outcomes of the studies found a strong but negative correlation between performance and Accounts Receivable Period (ARP), Inventory

Conversion Period(ICP) and Cash Cycle (CCC) for a sample of Indian automobile industry. These results recommend that managers can generate value for their shareholders by minimizing the number of days of accounts receivable and inventories to a reasonable minimum. Additionally, firms are capable of attaining sustainable competitive advantage by means of effective and efficient utilization of the resources of the organization through a careful decline of the CCC to its minimum. In doing so, the performance of the firm is anticipated to enhance. The study also observed that positive link between accounts payable period and profitability. This finding holds that more profitable firms wait longer to pay their bills. These conclusions are in affirmation with Shin and Soenen (1998), Eljelly (2004), Lazaridis and Tryfonidis (2006) and Garcia et al.(2007).

In case of Pakistan Raheman and Nasr (2007) have examined the effect of different variables of WCM on the net operating profitability. They have found a significant negative association between net operating profitability and the average collection period, inventory turnover in days, average payment period and CCC. These results recommended that managers can generate value for their shareholders by minimizing the number of days accounts receivable and inventories to a reasonable minimum. The negative link between accounts payable and performance is consistent with the vision that less profitable firms wait longer to pay their bills. Zubairi (2010) examined that the firm performance and cash cycle can be influenced by firm size in Pakistan. He added that larger firms can be predictable as efficient in collecting receivables due to their power. Since automobile companies are usually capital intensive, we anticipate a direct link of company size with performance. He found that the firm size has a considerable straight effect on performance of automobile firms and liquidity has a positive link with the performance.

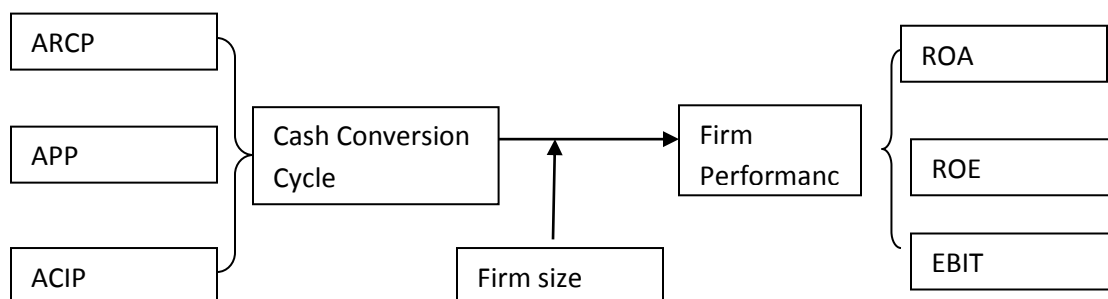
#### 4. Research Objective

The more specific objective is:

- To analyze the effect of CCC on the firm profitability that is ROA, ROE and EBIT separately.

#### 5. Theoretical Framework

The Theoretical Framework is a look at the relationship between CCC and profitability of firms. As it shows that the CCC is measured in terms of ACRP, APP and ACIP and the Firm Performance is measured in terms of ROA, ROE and EBIT.



**6. Research Design/Methodology**

The data used in this study was obtained from financial statements that were downloaded from the official web site of the KSE and companies for the year 2006-2010. The sample of 32 corporations comprises manufacturing companies from three industries (i.e. Construction & Material, Automobiles & parts and chemicals). Service companies do not come within the scope of this study due to non-availability of inventory; therefore, they are not included.

**6.1. Variables**

A variety of variables that can be responsible for the WCM are founded in the literature. The variables included in this study are CCC, ROA, ROE, EBIT and firm size. The ROE is a suitable measure of the profitability since it relates it to the asset base (Padachi 2006). The variables of the study are as follows:

<b>Variables</b>	<b>Abbreviation</b>	<b>Symbol</b>	<b>Measurements</b>
<b>Dependent variable</b>			
Return on Assets	ROA	Y <sub>1</sub>	Net income/Total Assets
Return on Equity	ROE	Y <sub>2</sub>	Net income/Shareholder Equity
Operating Profit	EBIT	Y <sub>3</sub>	Earnings before interest and tax
<b>Independent variables</b>			
Average receivable collection period	ARCP	X <sub>1</sub>	Account receivables *365/Sales
Average conversion inventory period	ACIP	X <sub>2</sub>	Inventory *365/Cost of Sales
Average payment period	APP	X <sub>3</sub>	Accounts Payables *365/Cost of Sales
Cash conversion cycle	CCC	X <sub>4</sub>	CCC=ARCP+ACIP-APP
<b>Control variable</b>			
Size of the company	LOS	X <sub>5</sub>	Natural of logarithm of sales

**6.2. Regression Model Equation**

The regression equation gives an estimation of the linear relationship between a dependent and one or more independent variables.

General syntax for regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_n X_n + \epsilon$$

Left side (Y) of the equation contains the outcome variable while rightside contains the coefficients of independent variables X1, X2.....so on and  $\beta_n$  specifies the coefficient of nth independent variable (Xn).

### 6.2.1. Models and Hypothesis

$$Y_{ROA} = \beta_0 + \beta_1(ARCP) + \beta_2(LOS) + \varepsilon \dots\dots\text{Model 1}$$

In model 2, 3 and 4 ARCP is replaced by ACIP, APP and CCC respectively.

In accordance to the first four models the hypotheses are:

H1 = Companies with low ARCP tend to have high return on assets.

H2 = Companies with low ACIP tend to have high return on assets.

H3 = Companies with high APP tend to have high return on assets.

H4 = Companies with low CCC tend to have high return on assets.

$$Y_{ROE} = \beta_0 + \beta_1(ARCP) + \beta_2(LOS) + \varepsilon \dots\dots\text{Model 5}$$

In model 6, 7 and 8 ARCP is replaced by ACIP, APP and CCC respectively.

In accordance to these models the hypotheses are:

H5 = Companies with less ARCP tend to have higher return on equity.

H6 = Companies with less ACIP tend to have higher return on equity.

H7 = Companies with high APP tend to have higher return on equity.

H8 = Companies with less CCC tend to have higher return on equity.

$$Y_{EBIT} = \beta_0 + \beta_1(ARCP) + \beta_2(LOS) + \varepsilon \dots\dots\text{Model 9}$$

In model 10, 11 and 12 ARCP is replaced by ACIP, APP and CCC respectively.

In accordance to these models the hypotheses are:

H9 = Companies with less ARCP tend to have higher Operating Profit.

H10 = Companies with less ACIP tend to have higher Operating Profit.

H11 = Companies with high APP tend to have higher Operating Profit.

H12 = Companies with less CCC tend to have higher Operating Profit.

## 7. Data Analysis and Results

### 7.1. Descriptive Statistics

The descriptive analysis represents the minimum, maximum, average and standard deviation of the variables used in the study. In descriptive analysis, those years are excluded in which values of the variables are missing. The minimum average collection period is 0.0890 days and maximum average collection period are 231.9760 days. The mean of the average collection period is 25.08891 days with the standard deviation of 36.8438565 days. The minimum average payment period is -576.442 days and maximum average payment period are 331.8080 days. The mean value of average payment period is 22.33650 days with standard deviation of 72.4285394 days. The average inventory conversion period of the firms is 58.36866 days with 60.8752 days of standard deviation. The CCC used to check the efficiency of WC management has minimum

value of -203.63 days and maximum of 333.281 days. The average CCC is 61.12115 days with 76.3397809 days of standard deviation. The mean value of operating profit is 2034.091832 million with standard deviation of 3443.989743 million. The mean value of return on assets is .071086 with standard deviation of 0.0862907. The mean value of return on equity is .154762 with standard deviation of 0.2181693. In the study firm size is calculated as log natural of total assets. The average value of log of total assets is 9.663868 with standard deviation of 0.8577897.

**Table # 1**  
**Descriptive Statistics**

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
EBIT	151	-957575000	17396590000	2034091832	3443989743
ROA	151	-0.2730	0.3470	0.071086	0.0862907
ROE	151	-0.6250	0.7140	0.154762	0.2181693
ACRP	151	0.0890	231.9760	25.08891	36.8438565
APP	151	-576.442	331.8080	22.33650	72.4285394
ACIP	151	-318.709	286.1610	58.36866	60.8752369
CCC	151	-203.63	333.2810	61.12115	76.3397809
LOS	151	6.6300	10.8690	9.663868	0.8577897

## **7.2 Regression Assumptions**

Multiple regression tables show the values of Tolerance and variance Inflationary Factor (VIF). The Collinearity test is applied through SPSS. The values of Tolerance and VIF are calculated for each indicator. The values of Tolerance range from 0 to 1.00 and the values closer to 1.00 in the regression tables show less multicollinearity in variables. Variance Inflationary Factor (VIF) should be less than 5.00. Results of this study prove that VIF score remains below 5 in all years 2006-2010 which point out that none of the CCC indicators is considerably explained by other CCC indicator.

Durbin Watson (DW) test is applied to diagnose first order autocorrelation problem. The DW of all the models here is closer to 2, so regression model is the appropriate method (Neter, et al. 1996). Problems of high correlation among independent variables are captured through correlation matrix, which remain below the limits in all regression models.

## **7.3. Correlation and Regression Results**

The study uses Pearson's correlation analysis to check the association between CCC components and firms performance. The table 2 shows the results of correlation coefficient between the variables.



**Table # 2**  
**Correlation Matrix**

	ROA	ROE	EBIT	ARCP	APP	ACIP	CC	LOS
ROA	1							
ROE	.826*	1						
EBIT	.442**	.665**	1					
ARCP	-.229**	-.258**	-.260**	1				
APP	-.054	-.022	.039	.170*	1			
ACIP	-.157	-.175*	-.245**	.260**	.537**	1		
CCC	-.185*	-.243**	-.357**	.528**	-.438**	.413**	1	
LOS	.192*	.274**	.543**	-.394**	-.129	-.367**	-.361**	1

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

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

The correlation coefficient between ROA & ARCP is -.229 and ROA & APP is -.054 at 5% level of significance. That shows the firms with higher collection period will tend to exhibit low profitability. The correlation coefficient between ROA & ACIP is -.157 that is insignificant but it is significant with ROE and -.185 between ROA and CCC at significance level of 5%. It indicates that the firms whose inventory conversion period is low will enjoy high profitability. The correlation coefficient is insignificant between the average payment period and firms performance measured through ROA and ROE and EBIT. The CCC also shows negative coefficient of -.243 and -.357 with ROE and EBIT respectively at 1% level of significance. That indicates the firms can increase the profitability by reducing the CCC. The correlation coefficient is -.260 between ARCP and EBIT at 1% level of significant. It means as the ARCP increases the firms profitability increases. The correlation coefficient is -.245 between ACIP and EBIT at 1% level of significant. The correlation coefficients are .192, .274 and .543 at 5% level of significant between SIZE and firms performance as measured through ROA, ROE and EBIT respectively. It means larger firms enjoy more profitability as compared to smaller firms. More over the coefficient results also shows that SIZE has negative and significant relationship with ARCP, APP, ACIP and CCC. It means that firms with larger size have low collection period, low ACIP and low CCC. So from above results it can be concluded that a firm can increase its profitability by reducing the time period of accounts receivables, inventory and CCC.

To examine the impact of WCM on firm's performance, the study uses regression analysis. The results of regression models are shown in table 3 and 4 and 5.

**Table# 3**  
**Results of the regression models 1-4**  
**Dependent variable ROA**

	Model 1	Model 2	Model 3	Model 4
Constant	-0.03522	-0.07168	-0.11124	-0.05973
ARCP( $\beta$ )	-0.00042*	-	-	-
ACIP( $\beta$ )	-	-0.00014	-	-
APP( $\beta$ )	-	-	-0.00003	-
CCC( $\beta$ )	-	-	-	-0.00015
LOS( $\beta$ )	0.01210	0.01563	0.01894	0.01449
R	0.25472	0.21353	0.19432	0.22882
R <sup>2</sup>	0.06488	0.04559	0.03776	0.05236
Adjusted R <sup>2</sup>	0.05224	0.03270	0.02475	0.03955
Durbin Watson	1.29171	1.34457	1.36396	1.29274
ANOVA Sig	0.0069	0.03163	0.05792	0.01868
Tolerance	0.8444	0.86537	0.98344	0.86976
VIF	1.18423	1.15556	1.01683	1.14973

The R2 of regression models 1-4 are .06488, .04559, .03776 and .05236 respectively. ROA is reduced by lengthening the ARCP, APP, ACIP and CCC.

$$Y_{ROA} = -0.03522 - 0.00042(ARCP) + 0.01210(LOS) + \varepsilon \dots\dots Model 1$$

In the 1st regression model the co-efficient on the ACRP is negative and significant which is consistent with the results found by Karaduman et al. (2011), Vijayakumar (2011), Luo et al. (2009), Samiloglu and Demirgunes (2008), Garcia-Teruel & Martinez-Solano (2007), Padachi (2006) and Deloof (2003) underlines the importance of WCM for firms so H1 is accepted. Lengthening the deadlines for payments to clients negatively affects profitability. Thus if a more restrictive credit policy is given to customers to give them less time to make their payments improves the performance. Corporate profitability is positively associated with size, so that large size seems in favor for the generation of profitability.

$$Y_{ROA} = -0.07168 - 0.00014(ACIP) + .01563(LOS) + \varepsilon \dots\dots Model 2$$

In the 2nd regression model, the Inventory Conversion Period (ACIP) is used as an independent variable. The co-efficient on the average inventory conversion period is negative and insignificant. This suggests that decrease in the number of day inventory conversion is associated with an increase in profitability. The negative relationship is consistent to Padachi (2006) and Azam & Haider (2011) study that also reveals the negative but significant relationship of ACIP and ROA findings. It means that withholding the payments to suppliers to take advantage of the

cash available for working capital needs. As in this model the p value is insignificant at 95% confidence level so H2 is rejected.

$$Y_{ROA} = -0.11124 - 0.00003(APP) + 0.01894(LOS) + \varepsilon \dots \text{Model 3}$$

In Model 3 it is evident from the table that the co-efficient of average payable period in days is negative in Pakistan industry. Consistent with Vijayakumar (2011), Raheman and Nasr (2007), Padachi (2006) and Lazaridis and Tryfonidis (2006) a negative relationship exist between average payable period and profitability. This result suggests that the increase or decrease in the APP in days affects profitability of the firm. The coefficients on the other control variables are insignificant as in this regression model so H3 is rejected. The firm size is positively related to profitability and this is significant at 5 per cent level.

$$Y_{ROA} = -0.05973 - 0.00015(CCC) + 0.01449(LOS) + \varepsilon \dots \text{Model 4}$$

The results of the fourth regression model are negative but insignificant. So H4 is rejected. It is consistent with Vijayakumar (2011) and Samiloglu and Demirgunes (2008). This result is also in accordance with the findings of Uyar (2009) and Azam & Haider (2011) who found a negative but significant relationship between the length of CCC and Firms' profitability ROA. It is concluded that firms having more profitable operations tend to have shorter CCC to maintain their profit levels. The negative relationship between the firm's CCC and ROA can be explained by the fact that if the investment in current assets is low, it can help in boosting profits.

**Table # 4**  
**Results of the regression models 5-8**  
**Dependent variable ROE**

	<b>Model 5</b>	<b>Model 6</b>	<b>Model 7</b>	<b>Model 8</b>
Constant	-0.32099	-0.42485	-0.52496	-0.34372
ARCP( $\beta$ )	-0.00105*	-	-	-
ACIP( $\beta$ )	-	-0.00030	-	-
APP( $\beta$ )	-	-	0.00004	-
CCC( $\beta$ )	-	-	-	-0.00047*
LOS( $\beta$ )	0.05196*	0.06182*	0.07024*	0.05457*
R	0.31933	0.28566	0.27474	0.31495
R <sup>2</sup>	0.10197	0.08160	0.07548	0.09919
Adjusted R <sup>2</sup>	0.08983	0.06919	0.06299	0.08702
Durbin Watson	1.27796	1.34075	1.34280	1.24993
ANOVA sig	0.00034	0.00183	0.00300	0.00043
Tolerance	0.84442	0.86537	0.98344	0.86976
VIF	1.18423	1.15556	1.01683	1.14973

The R2 of regression models 5-8 are .10197, .08160, .07548 and .09919 which indicates that 10%, 8.1%, 7.5 % and 9.9% variation in dependent variable is explained by independent variables.

$$Y_{ROE} = -0.32099 - 0.00105(ARCP) + .05196(LOS) + \varepsilon \dots\dots Model 5$$

In the 5th regression model the co-efficient on the average collection period is negative and significant so H5 is accepted. This suggests that decreases in the number of days accounts receivable is associated with an increase in profitability.

$$Y_{ROE} = -0.42485 - 0.00030(ACIP) + 0.06182(LOS) + \varepsilon \dots\dots Model 6$$

The results of the 6th regression model are negative and insignificant. These results are consistent with Azam&Haider (2011) study that also reveals the negative but significant relationship of ACIP and ROE. The reason of insignificance of the results of this study is the small sample size. This suggests that decrease in the number of day accounts payable is associated with an increase in profitability. As in this model the p value is insignificant at 95% confidence level so H6 is rejected.

$$Y_{ROE} = -0.52496 + 0.00004(APP) + 0.07024(LOS) + \varepsilon \dots\dots Model 7$$

In 7th Model of regression the co-efficient of APP in days is positive but insignificant in Pakistan industry so H7 is rejected. Azam&Haider(2011) study also revealed the positive but significant relationship of APP and ROE. It is interpreted that if the inventory takes more time to sell, it affects profitability. The firm size is positively related to ROE and this is significant at 5 per cent level of significance.

$$Y_{ROE} = -0.34372 - 0.00047(CCC) + 0.05457(LOS) + \varepsilon \dots\dots Model 8$$

The results of the 8th regression model are negative and insignificant at 95% confidence level between the CCC and ROE so H8 is accepted. This is consistent with the study of Azam&Haider (2011) who also found a significant and negative relationship between the length of CCC and ROE.

**Table# 5**  
**Results of the regression models 9-12**  
**Dependent variable EBIT**

	Model 9	Model 10	Model 11	Model 12
Constant	-18057700190.1192	- 18103578445.439 9	-19693413524.9103	- 15912017128.7424
ARCP( $\beta$ )	-5125076.76793	-	-	-
ACIP( $\beta$ )	-	-2973425.79290	-	-
APP( $\beta$ )	-	-	5247004.69352	-
CCC( $\beta$ )	-	-	-	-8380663.00376*
LOS( $\beta$ )	2092368767.33682*	2101769822.4095 1*	2236196375.21626*	1910037016.39532 *
R	0.54510	0.54496	0.55369	0.56974
R <sup>2</sup>	0.29713	0.29698	0.30657	0.32461
Adjusted R <sup>2</sup>	0.28763	0.28748	0.29720	0.31548
Durbin Watson	1.18747	1.22481	1.23287	1.20503
ANOVA sig	0.00000	0.00000	0.00000	0.00000
Tolerance	0.84442	0.86537	0.98344	0.86976
VIF	1.18423	1.15556	1.01683	1.14973

The R2 of regression models 9-12 are .29713, .29698, .30657 and .32461 which indicates that 29%, 29%, 29% and 32% variation in dependent variable is explained by independent variables.

$$Y_{\text{EBIT}} = -18057700190.1192 - 5125076.76793(\text{ARCP}) + 2092368767.33682(\text{LOS}) + \varepsilon \dots \text{Model 9}$$

The results of the regression model 9 show negative coefficient for ARCP at 95% level of confidence. It shows that average collection period have insignificant negative impact on operating profit so H9 is rejected. It implies that companies can improve their profitability by decreasing their collection period. Based on the regression results H9 is rejected. Our results are aligned with Deloof (2003), Raheman and Nasr (2007), Gill et al. (2010) and Hayajneh and Yassin(2011) who also reported inverse relationship between firms profitability and average collection period.

$$Y_{\text{EBIT}} = -18103578445.4399 - 2973425.7929(\text{ACIP}) + 2101769822.40951(\text{LOS}) + \varepsilon \dots \text{Model 10}$$

The results of the regression model 10 shows negative and insignificant coefficient for ACIP at 95% level of confidence on EBITso H10 is rejected. It implies that companies can improve their profitability by shortening the inventory conversion period. The study results confirms the findings of Garcia-Teruel and Martinez-Solano (2007), Raheman and Nasr (2007) and Hayajneh and Yassin (2011).

$$Y_{EBIT} = -19693413524.9103 + 5247004.69352(APP) + 2236196375.21626(LOS) + \epsilon \dots \text{Model 11}$$

In regression model 11 the ACIP is replaced by APP and other variables remained same. The coefficient of APP is positive but it is insignificant so H11 is rejected. The current study findings are constant with the finding of Siegler et al., (2011) who also reported positive and insignificant relationship with firm's performance.

$$Y_{EBIT} = -15912017128.7424 - 8380663.00376 + 1910037016.39532(LOS) + \epsilon \dots \dots \dots \text{Model 12}$$

In 12th regression model the coefficient of CCC is negative and significant at 95% level of confidence so H12 is accepted. It implies that companies can improve their performance through shortening their CCC. The results of the study confirms the findings of Lancaster and Stevens (1996), Shine and Soenen, 1998, Lazaridis and Tryfonidis (2006), Garcia-Teruel and Martinez-Solano (2007), Nasr (2007) Raheman and Nasr (2007), Mohamad and Saad, (2010), Gill et al, (2010), Hayajneh and Yassin, (2011) and Nobanee et al., (2011).

## **8. Conclusion**

This Study investigates the impact of WCM on firms' performance for non-financial institutes listed in Karachi Stock Exchange (KSE-100 Index). Panel data have been analyzed by applying Pearson correlation for the time period of 2006 to 2010 that represents the mean values of CCC.

Previous research predicts negative relationship between collection period and corporate profitability. The findings indicate that slow collection of receivables is correlated with low profitability. The results are in line with these findings such as Deloof (2003), Lazaridis and Tryfonidis (2006), Raheman and Nasr (2007) who found negative relationship between accounts receivables days and profitability. These results suggest that managers can create value for their shareholders by reducing the number of days for accounts receivables. In addition, the negative relationship suggests that less profitable firms will pursue a decrease of their accounts receivables in an attempt to reduce their cash gap in the CCC. Managers can improve profitability by reducing the credit period granted to their customers.

Examining the relationship between the average number of days, the inventory is held and the profitability, there is a negative but insignificant relationship in this study. Azam & Haider (2011) and Raheman et al. (2010), Zubairi (2010), Raheman and Nasr (2007) and Lazaridis and Tryfonidis (2006) also found the negative relationship. Regarding the average days of accounts

payable, previous studies reported negative correlation of this variable and the profitability of the firm. It is found that there is no statistically significant relationship between these variables.

A negative relationship between CCC and profitability is consistent with the previous theoretical researches such as Azam & Haider (2011), Gill et al, (2010), Raheman et al. (2010), Uyar (2009) and Raheman and Nasir (2007). It gives the message to the firms that the longer CCC is, the less profitable you are. The probable reasons of this relationship are keeping inventory for a long time, being slow in collecting receivables and paying debts quickly.

This paper contributes to the literature in several ways. First, successful management of WC Management is value enhancing to shareholders. Secondly, this evidence suggests that investors do care about firms' daily operations and understand how working capital efficiency is translated into future earnings and profitability. This study is unique in terms of Pakistani context because it explains the relationship of each variable of CCC separately with the firm performance.

The study is limited to the Pakistani manufacturing firms. In addition, the sample size is small and the political and industrial crises of Pakistan are the reasons for the insignificance of some results. Future research should investigate generalization of the findings beyond the Pakistani manufacturing sector. The contribution of this research is important for both academic researchers and business managers. There is still need in the future to identify the sector wise relationship between WCM and firms' performance in Pakistan.

## **References**

- Azam, DM & Haider, SI 2011, 'Impact of Working Capital Management on Firms' Performance: Evidence from Non-Financial Institutions of KSE-30 index', *Interdisciplinary Journal of Contemporary Research In Business*, vol 3, no. 5, pp. 481-492.
- Deloof, M 2003, 'Does Working Capital Management Affect Profitability of Belgian Firms?', *Journal of Business, Finance and Accounting*, vol 30, no. 3, pp. 573-587.
- Dong, HP & Su, JT 2010, 'The Relationship between Working Capital Management and Profitability: A Vietnam Case', *International Research Journal of Finance and Economics*, no. 49, pp. 59-67.
- Garcia-Teruel, PJ & Martinez-Solano, P 2007, 'Effects of working capital management on SME profitability', *International Journal of Managerial Finance*, vol 3, no. 2, pp. 164-177.
- Gill, A 2011, 'Factors That Influence Working Capital Requirements In Canada', *Economics and Finance Review*, vol 1, no. 3, pp. 30-40.
- Gill, A, Biger, N & Mathur, N 2010, 'The Relationship Between Working Capital Management And Profitability: Evidence From The United States', *Business and Economics Journal*(<http://astonjournals.com/bej>), pp. 1-9.
- Gitman, LJ 1974, 'Estimating Corporate Liquidity Requirements: A Simplified Approach', *The Financial Review*, vol 9, pp. 79-88.

- Hayajneh, OS & Ait Yassine, FL 2011, 'The Impact of Working Capital Efficiency on Profitability – An Empirical Analysis on Jordanian Manufacturing Firms', *International Research Journal of Finance and Economics*, no. 66, pp. 67-76.
- Jordan, RW 2003, 'Fundamentals of Corporate Finance', 6th edn, The McGraw–Hill Companies, USA
- Karaduman, HA, Akbas, HE, Caliskan, AO & Durer, S 2011, 'The Relationship between Working Capital Management and Profitability: Evidence from an Emerging Market', *International Research Journal of Finance and Economics*, no. 62, pp. 61-67.
- Karaduman, HA, Akbas, HE, Caliskan, AO & Durer, S 2011, 'The Relationship between Working Capital Management and Profitability: Evidence from an Emerging Market', *International Research Journal of Finance and Economics*, no. 62, pp. 61-67.
- Lancaster, C, Stevens, J & Jennings, J 1999, 'Corporate liquidity and the significance of earnings versus cash flow: an examination of industry effects', *The Journal of Applied Business Research*, vol 15, no. 3, pp. 37-46.
- Luo, MM, Lee, JJ-Y & Hwang, Y 2009, 'Cash Conversion Cycle, Firm Performance and Stock Value', *Current Draft at Workshop*, pp. 1-27.
- Lyrودي, K & Lazaridis, J 2000, 'The cash Conversion Cycle and Liquidity Analysis of The Food Industry in Greece', works paper, SSRN Paper Collection, available at: [http://papers.ssrn.com/paper.taf?abstract\\_id=4236175](http://papers.ssrn.com/paper.taf?abstract_id=4236175).
- Mohamad, NEAB & Mohd Saad, NB 2010, 'Working Capital Management: The Effect of Market Valuation and Profitability in Malaysia', *International Journal of Business and Management*, vol 5, no. 11, pp. 140-147.
- Moss, JD & Stine, B 1993, 'Cash conversion cycle and firm size: A study of retail firms', *Managerial Finance*, vol 19, no. 8, pp. 25-34.
- Moss, J & Stine, B 1993, 'Cash conversion cycle and firm size: a study of retail firms', *Managerial Finance*, vol 19, no. 8, pp. 25-35.
- Nazir, MS & Afza, T 2007 a, "Working Capital Management Policies of Firms: Emperical Evidence From Pakistan", 9th South Asian Management Forum(SAMF), North South University, Dhaka,Bangladesh.
- Nazir, MS & Afza, T 2008, 'On The Factor Determining Working Capital Requirements', *Proceedings of ASBBS*, vol 15, no. 1, pp. 293-301.
- Nobanee, H 2009, 'Working Capital Management and Firm's Profitability: An Optimal Cash Conversion Cycle', (Available at SSRN: <http://ssrn.com/abstract=1471230>).
- Nobanee, H, Abdullatif, M & AlHajjar, M 2011, 'Cash conversion cycle and firm's performance of Japanese firms', *Asian Review of Accounting*, vol 19, no. 2, pp. 147-156.
- Padachi, K 2006, 'Trends in Working Capital Management and its Impact on Firms' Performance: An Analysis of Mauritian Small Manufacturing Firms', *International Review of Business Research Papers*, vol 2, no. 2, pp. 45-58.
- Raheman, A, Afza, T, Qayyum, A & Bodla, MA 2010, 'Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan', *International Research Journal of Finance and Economics*, no. 47, pp. 151-163.
- Raheman, A & Nasr, M 2007, 'Working Capital Management And Profitability – Case Of Pakistani Firms', *International Review of Business Research Papers*, vol 3, no. 1, pp. 279 - 300.



Samiloglu, F & Demirgunes, K 2008, 'The Effect of Working Capital Management on Firm Profitability: Evidence from Turkey', *The International Journal of Applied Economics and Finance*, vol 2, no. 1, pp. 44-50.

Uyar, A 2009, 'The Relationship of Cash Conversion Cycle with Firm Size and Profitability: An Empirical Investigation in Turkey', *International Research Journal of Finance and Economics*, no. 24, pp. 186-193.

Vijayakumar, DA 2011, 'Cash Conversion Cycle and Corporate Profitability- An Empirical Enquiry in Indian Automobile Firms', *International Journal of Research in Commerce, IT and Management*, vol 1, no. 2, pp. 84-91.

Vishnani, S & Shah, B 2007, 'Impact of Working Capital Management Policies on Corporate Performance An Empirical Study', *Global Business Review*, no. 8, pp. 267-281.

Zubairi, HJ 2010, 'Impact of Working Capital Management and Capital Structure on Profitability of Automobile Firms in Pakistan', Electronic copy available at: <http://ssrn.com/abstract=1663354>.