

Working Capital Management And Profitability – Case Of Pakistani Firms

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Working Capital Management has its effect on liquidity as well on profitability of the firm. In this research, we have selected a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years from 1999 – 2004, we have studied the effect of different variables of working capital management including the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle and Current ratio on the Net operating profitability of Pakistani firms. Debt ratio, size of the firm (measured in terms of natural logarithm of sales) and financial assets to total assets ratio have been used as control variables. Pearson's correlation, and regression analysis (Pooled least square and general least square with cross section weight models) are used for analysis. The results show that there is a strong negative relationship between variables of the working capital management and profitability of the firm. It means that as the cash conversion cycle increases it will lead to decreasing profitability of the firm, and managers can create a positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level. We find that there is a significant negative relationship between liquidity and profitability. We also find that there is a positive relationship between size of the firm and its profitability. There is also a significant negative relationship between debt used by the firm and its profitability.

Field of Research: Corporate Finance

1. Introduction

Working capital management is a very important component of corporate finance because it directly affects the liquidity and profitability of the company. It deals with current assets and current liabilities. Working capital management is important due to many reasons. For one thing, the current assets of a typical manufacturing firm accounts for over half of its total assets. For a distribution company, they account for even more. Excessive levels of current assets can easily result in a firm's realizing a substandard return on investment. However firms with too few current assets may incur shortages and difficulties in maintaining smooth operations (Horne and Wachowicz, 2000). Efficient working capital management involves planning and controlling current

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assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand (Eljelly, 2004). Many surveys have indicated that managers spend considerable time on day-to-day problems that involve working capital decisions. One reason for this is that current assets are short-lived investments that are continually being converted into other asset types (Rao 1989). With regard to current liabilities, the firm is responsible for paying these obligations on a timely basis. Liquidity for the on going firm is not reliant on the liquidation value of its assets, but rather on the operating cash flows generated by those assets (Soenen, 1993). Taken together, decisions on the level of different working capital components become frequent, repetitive, and time consuming. Working Capital Management is a very sensitive area in the field of financial management (Joshi, 1994). It involves the decision of the amount and composition of current assets and the financing of these assets. Current assets include all those assets that in the normal course of business return to the form of cash within a short period of time, ordinarily within a year and such temporary investment as may be readily converted into cash upon need. The Working Capital Management of a firm in part affects its profitability.

The ultimate objective of any firm is to maximize the profit. But, preserving liquidity of the firm is an important objective too. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Therefore, there must be a trade off between these two objectives of the firms. One objective should not be at cost of the other because both have their importance. If we do not care about profit, we can not survive for a longer period. On the other hand, if we do not care about liquidity, we may face the problem of insolvency or bankruptcy. For these reasons working capital management should be given proper consideration and will ultimately affect the profitability of the firm.

Firms may have an optimal level of working capital that maximizes their value. Large inventory and a generous trade credit policy may lead to high sales. Larger inventory reduces the risk of a stock-out. Trade credit may stimulate sales because it allows customers to assess product quality before paying (Long, Maltiz and Ravid, 1993, and Deloof and Jegers, 1996). Another component of working capital is accounts payable. Delaying payments to suppliers allows a firm to assess the quality of bought products, and can be an inexpensive and flexible source of financing for the firm. On the other hand, late payment of invoices can be very costly if the firm is offered a discount for early payment. A popular measure of Working Capital Management (WCM) is the cash conversion cycle, i.e. the time lag between the expenditure for the purchases of raw materials and the collection of sales of finished goods. The longer this time lag, the larger the investment in working capital (Deloof 2003). A longer cash conversion cycle might increase profitability because it leads to higher sales. However, corporate profitability might also decrease with the cash conversion cycle, if the costs of higher investment in working capital rise faster than the benefits of holding more inventories and/or granting more trade credit to customers. 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 Profitability of Pakistani Firms?”

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. It is almost untouched in Pakistan or very little research has been done in this area.

This research is focusing on working capital management and its effects on profitability for a sample of Pakistani firms. The main objectives are:

- To establish a relationship between Working Capital Management and Profitability over a period of six years for 94 Pakistani companies listed on Karachi Stock Exchange.
- To find out the effects of different components of working capital management on profitability
- To establish a relationship between the two objectives of liquidity and profitability of the Pakistani firm.
- To find out the relationship between profitability and size of the Pakistani firm.
- To find out the relationship between debt used by the Pakistani firm and its profitability
- To draw conclusion about relationship of working capital management and profitability of the Pakistani firms.

To achieve these objectives, this study is organized as follows:

Section two reviews the literature for the relevant theoretical and empirical work on working capital management and its effect on profitability. Section three presents the methodology and framework which includes sample and the variables used in the empirical analysis. Section four portrays and discusses the data analysis, discussion and statistical results. Section five presents the conclusion.

2. Literature Review

Many researchers have studied working capital from different views and in different environments. The following ones were very interesting and useful for our research:

(Eljelly, 2004) elucidated that efficient liquidity management involves planning and controlling current assets and current liabilities in such a manner that eliminates the risk of inability to meet due short-term obligations and avoids excessive investment in these assets. The relation between profitability and liquidity was examined, as measured by current ratio and cash gap (cash conversion cycle) on a sample of joint stock companies in Saudi Arabia using correlation and regression analysis. The study found that the cash conversion cycle was of more importance as a measure of liquidity than the current ratio that affects profitability. The size variable was found to have significant effect on profitability at the industry level. The results were stable and had important implications for liquidity management in various Saudi companies. First, it was clear that there was a negative relationship between profitability and liquidity indicators such as current ratio and cash gap in the Saudi sample examined. Second, the study also

revealed that there was great variation among industries with respect to the significant measure of liquidity.

(Deloof, 2003) discussed that most firms had a large amount of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. Using correlation and regression tests he found a significant negative relationship between gross operating income and the number of days accounts receivable, inventories and accounts payable of Belgian firms. On basis of these results he suggested that managers could create value for their shareholders by reducing the number of days' accounts receivable and inventories to a reasonable minimum. The negative relationship between accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills.

(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. Setting industry norms as target-efficiency levels of the individual firms, this paper also tested the speed of achieving that target level of efficiency by an individual firm during the period of study. Findings of the study indicated that the Indian Cement Industry as a whole did not perform remarkably well during this period.

(Shin and Soenen, 1998) highlighted that efficient Working Capital Management (WCM) was very important for creating value for the shareholders. The way working capital was managed had a significant impact on both profitability and liquidity. The relationship between the length of Net Trading Cycle, corporate profitability and risk adjusted stock return was examined using correlation and regression analysis, by industry and capital intensity. They found a strong negative relationship between lengths of the firm's net-trading Cycle and its profitability. In addition, shorter net trade cycles were associated with higher risk adjusted stock returns.

(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. The problem arose because the maximization of the firm's returns could seriously threaten its liquidity, and the pursuit of liquidity had a tendency to dilute returns. This article evaluated the association between traditional and alternative working capital measures and return on investment (ROI), specifically in industrial firms listed on the Johannesburg Stock Exchange (JSE). The problem under investigation was to establish whether the more recently developed alternative working capital concepts showed improved association with return on investment to that of traditional working capital ratios or not. 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. Well-known liquidity concepts such as the current and quick ratios registered insignificant

associations whilst only one of the newer working capital concepts, the comprehensive liquidity index, indicated significant associations with return on investment.

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 our own methodology for research.

3. 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 Pakistan. Here we will see the relationship between working capital management practices and its affects on profitability of 94 Pakistani firms listed on Karachi stock Exchange for a period of six years from 1999 – 2004. This section of the article discusses the firms and variables included in the study, the distribution patterns of data and applied statistical techniques in investigating the relationship between working capital management and profitability.

3.1 Data Set & Sample

The data used in this study was acquired from Karachi Stock Exchange (KSE), internet and web sites of different firms. Data of firms listed on the KSE for the most recent six years formed the basis of our calculations. The period covered by the study extends to six years starting from 1999 to 2004. The reason for restricting to this period was that the latest data for investigation was available for this period. The sample is based on financial statements of the 94 Pakistani firms, listed on KSE including firms from different sectors of our economy. Because of the specific nature of their activities, firms in financial sector, banking and finance, insurance, leasing, modarabas, business services, renting and other services are excluded from the sample. Finally, the firms with data of the number of day's accounts receivable, number of days inventories, number of days accounts payable and operating income are included in sample.

3.2 Variables

This study undertakes the issue of identifying key variables that influence working capital management of Pakistani firms. Choice of the variables is influenced by the previous studies on working capital management.

All the variables stated below have been used to test the hypotheses of our study. They include dependent, independent and some control variables:

Net Operating Profitability (NOP) which is a measure of Profitability of the firm is used as dependant variable. It is defined as Operating Income plus depreciation, and divided by total assets minus financial assets.

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 (ITID) 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 Ratio (CR) which is a traditional measure of liquidity is calculated by dividing current assets by current liabilities.

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 Assets, and ratio of financial assets to total assets (FATA) are included as control variables. Fixed financial assets are the shares in other firms, intended to contribute to the activities of the firm holding them by establishing a lasting and specific relationship and loans that were granted for the same purpose. For some firms such assets are a significant part of their total assets.

All the above variables have relationships that ultimately affect working capital management. It is expected that there is a negative relationship between Net operating profitability on the one hand and the measures of Working Capital Management (number of days' accounts receivable, inventories and accounts payable and cash conversion cycle) on the other hand. This is consistent with the view that the time lag between expenditure for the purchases of raw materials and the collection of sales of finished goods can be too long, and that decreasing this time lag increases profitability.

3.3 Hypotheses Testing

Since the objective of this study is to examine the relationship between profitability and working capital management, the study makes a set of testable hypothesis {the Null Hypotheses H_0 versus the Alternative ones H_1 }.

Hypothesis 1

The first hypothesis of this study is as follows:

H_{01} : There is no relationship between efficient working capital management and profitability of Pakistani firms.

H_{11} : There is a possible positive relationship between efficient working capital management and profitability of Pakistani firms. Firms more efficient in managing their working capital are expected to pose high level of profitability and vice versa.

Hypothesis 2

The second hypothesis of the study is as follow:

H₀₂: There is no relationship between liquidity and profitability of Pakistani firms.

H₁₂: There may exist a negative relationship between liquidity of Pakistani firms and profitability. Firms with high level of liquidity are expected to post low level of profitability and vice versa.

Hypothesis 3

The Third hypothesis of the study is as follow:

H₀₃: There is no relationship between size of Pakistani firms and profitability.

H₁₃: There may exists a positive relationship between the firm size and its profitability. This may be due to the ability of large firms to reduce liquidity levels and cash gaps.

Hypothesis 4

The Fourth hypothesis of the study is as follow:

H₀₄: There is no relationship between debt used by Pakistani firms and profitability.

H₁₄: There is a possible negative relationship between debt used by Pakistani firms and profitability. Firms with high level of debt usage are expected to post low level of profitability and vice versa.

3.4 Model Specifications:

Our study uses panel data regression analysis of cross-sectional and time series data. We use the pooled regression type of panel data analysis. The pooled regression, also called the constant coefficients model is one where both intercepts and slopes are constant, where the cross section firm data and time series data are pooled together in a single column assuming that there is no significant cross section or temporal effects.

The general form of our model is:

$$NOP_{it} = \beta_0 + \sum_{all}^n \beta_i X_{it} + \varepsilon \quad (\text{Eq. 3.1})$$

NOP_{it} : Net Operating Profitability of firm i at time t ; $i = 1, 2, \dots, 94$ firms.

β_0 : The intercept of equation

β_i : Coefficients of X_{it} variables

X_{it} : The different independent variables for working capital Management of firm i at time t

t : Time = 1, 2,.....,6 years.

ε : The error term

Specifically, when we convert the above general least squares model into our specified variables it becomes:

$$NOP_{it} = \beta_0 + \beta_1(ACP_{it}) + \beta_2(ITID_{it}) + \beta_3(APP_{it}) + \beta_4(CCC_{it}) + \beta_5(CR_{it}) + \beta_6(DR_{it}) + \beta_7(LOS_{it}) + \beta_8(FATA_{it}) + \varepsilon \quad (\text{Eq. 3.2})$$

Where:

NOP : Net Operating Profitability
 ACP : Average Collection Period
 ITID : Inventory Turnover in Days'
 APP : Average Payment Period
 CCC : Cash Conversion Cycle
 CR : Current Ratio
 DR : Debt Ratio
 LOS : Natural logarithm of Sales
 FATA: Financial Assets to Total Assets
 ε : The error term.

3.5 Analysis Used in Study

In this research we have provided two types of data analysis; descriptive and quantitative.

3.6 Descriptive Analysis

Descriptive analysis is the first step in our analysis; it will help us describe relevant aspects of phenomena of cash conversion cycle and provide detailed information about each relevant variable. Research has already been conducted in our area of study and a lot of information is already on hand, and SPSS software has been used for analysis of the different variables in this study.

3.7 Quantitative Analysis

In quantitative analysis we applied two methods: First: we used correlation models, specifically Pearson correlation to measure the degree of association between different variables under consideration. Second: we used Regression analysis to estimate the causal relationships between profitability variable, liquidity and other chosen variables. We have used Pooled Ordinary Least Squares and Generalized Least Squares (cross section weights) methods for analysis. We used panel data in a pooled regression, where time-series and cross-sectional observations were combined and estimated. In other words, several cross-sectional units were observed over a period of time in a panel data setting. For this purpose of analysis the E - views software was used to analyze financial data and especially in case of pooled data.

4. Data Analysis and Discussion

We have performed two types of analysis, descriptive and quantitative. The results of these two types of analysis are discussed in this section.

4.1 Descriptive Analysis

Descriptive analysis shows the average, and standard deviation of the different variables of interest in the study. It also presents the minimum and maximum values of the variables which help in getting a picture about the maximum and minimum values a variable can achieve.

Table 4.1 presents descriptive statistics for 94 Pakistani non financial firms for a period of six years from 1999 to 2004 and for a total 564 firms year observations. The mean value of net operating profitability is 13.3% of total assets, and standard deviation is 11.5%. It means that value of the profitability can deviate from mean to both sides by

11.5%. The maximum value for the net operating profitability is 68.4% for a company in a year while the minimum is -46.6%.

Table 1

Descriptive Statistics					
94 Pakistani Non - financial firms, 1999-2004, 564 firms – year observations					
	N	Minimum	Maximum	Mean	Std. Dev.
ACP	564	0.595	653.853	54.793	69.555
ITID	564	1.238	958.203	78.029	90.017
APP	564	0.254	900.701	59.856	99.106
CCC	564	-855.355	1214.500	72.966	160.165
LOS	564	14.729	25.873	20.834	1.705
CR	564	0.037	19.192	1.531	1.827
DR	564	0.092	3.720	0.732	0.433
FATA	564	0.000		0.043	0.077
NOP	564	-0.466	0.684	0.133	0.115

Source: Calculations Based on Annual reports of firms from 1999-2004

The cash conversion cycle used as a proxy to check the efficiency in managing working capital is on average 73 days and standard deviation is 160 days. Firms receive payment against sales after an average of 55 days and standard deviation is 70 days. Minimum time taken by a company to collect cash from receivables is 1 day while the maximum time for this purpose is 654 days. It takes an average 78 days to sell inventory with standard deviation of 90 days. Here, maximum time taken by a company is 958 days, which is a very large time period to convert inventory into sales. Firms wait an average 60 days to pay their purchases with standard deviation of 99 days. Here, minimum time taken by a company is 0.25 days which is unusual, and maximum time taken for this purpose is 900 days.

To check the size of the firm and its relationship with profitability, natural logarithm of sales is used as a control variable. The mean value of log of sales is 20.83 while the standard deviation is 1.70. The maximum value of log of sales for a company in a year is 25.87 and the minimum is 14.73.

In the same way to check the liquidity of the companies, a traditional measure of liquidity (current ratio) is used. The average current ratio for Pakistani firms is 1.53 with a standard deviation of 1.83. The highest current ratio for a company in a particular year is 19.19 times and in the same way the minimum ratio for a company in a year is 0.04.

To check the debt financing and its relationship with the profitability the debt ratio (obtained by dividing the total debt of the company by the total assets) is used as a control variable. The results of descriptive statistics show that the average debt ratio for the Pakistani companies is 73% with a standard deviation of 43%. The maximum debt financing used by a company is 372% which is unusual but may be possible if the equity of the company is in negative. The minimum level of the debt ratio is 9%.

To check the ratio of fixed financial assets to the total assets of Pakistani firms, the financial assets to total assets ratio is used as a control variable. The mean value for this ratio is 4.3% with a standard deviation of 7.7. The maximum portion of assets in the form of financial assets for a particular company is 55% and the minimum is 0.00.

4.2 Quantitative Analysis

For quantitative analysis we used two methods. At first, correlation is used to measure the degree of association between different variables under consideration. We have been able to identify many important variables associated with working capital management. As multiple variables are influencing our problem, we have identified the crucial factors associated with working capital management. Pearson and Spearman correlations are calculated for all variables used in the study starting with the Pearson's correlation results.

4.3 Pearson's Correlation Coefficient Analysis

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 gross 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.

Appendix 1 presents Pearson correlation coefficients for all variables considered.

We have started our analysis of correlation results between the average collection period and net operating profitability. The result of correlation analysis shows a negative coefficient – 0.165, with p -value of (0.000). It indicates that the result is highly significant at $\alpha = 1\%$, and that if the average collection period increases it will have a negative impact on the profitability and it will decrease. Correlation results between inventory turnover in days and the net operating Profitability also indicate the same type of result. The correlation coefficient is – 0.214 and the p value is (0.000). This again shows that the result is highly significant $\alpha = 1\%$. It also indicates that if the firm takes more time in selling inventory, it will adversely affect its profitability. Correlation results among the payable turnover in days or average payment period also indicate the same trend. Here again, the coefficient is negative and highly significant. The coefficient is - 0.158 and the p value is (0.000). 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 – 0.094 and the p value is (0.026). But it is significant at $\alpha = 5\%$. 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.

Current ratio is a traditional measure of checking liquidity of the firm. In this analysis the current ratio has a significant negative relationship with profitability (measured by net operating profitability). The coefficient is -0.126 and p -value of $(.003)$. The result is significant at $\alpha = 1\%$. It indicates that the two objectives of liquidity and profitability have inverse relationships. So, the Pakistani firms need to maintain a balance or tradeoff between these two measures.

One should not overlook the positive significant association that exists between NOP and LOS (the measures of size). This in turn indicates a positive relationship between size and profitability. The coefficient is positive 0.274 ; with p -value of $(.000)$. The result is highly significant at $\alpha = 1\%$. It shows that as size of the firm increases, it will increase its profitability.

A negative relationship between number of days accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills. In that case, profitability affects the account payables policy and vice versa. An alternative explanation for a negative relationship between the number of days accounts payable and profitability could be that Pakistani firms wait too long to pay their accounts payable. Speeding up payments to suppliers might increase profitability because firms often receive a substantial discount for prompt payment.

Pearson's correlation (Appendix 1) also displays a significant positive relationship between the average collection period and cash conversion cycle; the correlation coefficient is 0.548 and the p -value is $(.000)$. That ratio is highly significant at $\alpha = 1\%$, which means that if a firm takes more time to collect cash against the credit sales it will increase its operating or cash conversion cycle.

There is also a positive relationship between Inventory turnover in days and the cash conversion cycle which means that if the firm takes more time to sell inventory it will lead to increase in the cash conversion cycle as well. The correlation coefficient is positive and is 0.667 , the p -value is again $(.000)$ showing that it is highly significant at $\alpha = 1\%$.

The average payment period and cash conversion cycle have a negative relationship. The coefficient is -0.626 , the p -value is $(.000)$, highly significant at $\alpha = 1\%$. It means that if firms take more time to pay their purchases than the time for collection and selling inventory, the cash conversion cycle will be reduced.

Now, these negative relationships between Cash conversion cycle, Average collection period, Average payment period and Inventory turnover in days with the profitability of companies are consistent with the literature review and have significant effect on the profitability of company.

The results of correlation analysis indicate that as far as Pakistani firms are concerned, the working capital management very significantly and strongly affects their profitability.

4.4 Regression Analysis

For the purpose of identifying the important variables influencing the dependent variable we have used the regression analysis. In panel data (pooled) regression, time -series and cross-sectional observations are combined and estimated. In other words, several cross-sectional units are observed over a period of time in a panel data setting. Panel

data is more useful in studying the dynamics of adjustment, and is better able to identify and measure effects that are simply not detectable in pure cross-sections or pure time-series data. Moreover, many variables can be more accurately measured at the micro level and biases resulting from aggregation over firms or individuals are eliminated.

We used regression analysis to investigate the impact of working capital management on corporate profitability. The determinants of corporate profitability were estimated using pooled least squares and general least squares method with cross section weights.

4.5 Regression Model: Pooled Least Squares Estimation

The determinants of net operating profitability are investigated for all 564 firm-year observations. The results are shown in Appendix 2. 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:

$$NOP_{it} = \beta_0 + \beta_1(ACP_{it}) + \beta_2(LOS_{it}) + \beta_3(CR_{it}) + \beta_4(DR_{it}) + \beta_5(FATA_{it}) + \varepsilon \quad (\text{Eq. 4.1})$$

The results of this regression indicate that the coefficient of accounts receivable is negative and is highly significant at $\alpha = 1\%$. It implies that the increase or decrease in accounts receivable will significantly affect profitability of the firm. The current ratio which is a traditional measure of liquidity has also a significant negative relationship with profitability which confirms our hypotheses that liquidity and profitability has inverse relationship.

We used the Debt ratio as a proxy for leverage; it shows a significant negative relationship with the dependent variable, which means that, when leverage of the firm increases, it will adversely affect its 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. In case of financial assets to total assets ratio, it also has a significant negative relation with profitability. It reflects that if this ratio increases the operating profitability will decrease.

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 32.8%. 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 0.18; 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 55.85.

The second regression is run using the inventory turnover 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 regression. The model we have used is shown below:

$$NOP_{it} = \beta_0 + \beta_1(ITID_{it}) + \beta_2(LOS_{it}) + \beta_3(CR_{it}) + \beta_4(DR_{it}) + \beta_5(FATA_{it}) + \varepsilon \quad (\text{Eq. 4.2})$$

The coefficient of intercept C has a value (-0.238) and is also significant. The coefficient of inventory turnover in days is negative and highly significant at $\alpha = 1\%$, and implies that the increase or decrease in the inventory turnover in days, significantly affects profitability of the firm. It can be interpreted that if the inventory takes more time to sell, it will adversely affect profitability. All the other variables are also significantly affecting profitability as in case of our first regression. Increase in sales has a positive impact on profitability while all other control variables like current ratio, debt ratio, and financial assets to total assets have a significant negative affect on profitability of the firm. The adjusted R^2 is 33%. The F-statistic has a value equal to (57.9) that reflects the highly significance of the model or significance of R-square.

Third regression is run using the average payment period as an independent variable as a substitute of inventory turnover in days. The other variables are same as they have been in first and second regression.

The equation of our model is given below:

$$NOP_{it} = \beta_0 + \beta_1(APP_{it}) + \beta_2(LOS_{it}) + \beta_3(CR_{it}) + \beta_4(DR_{it}) + \beta_5(FATA_{it}) + \varepsilon \quad (\text{Eq. 4.3})$$

Here, the coefficient of C is 0.08 but not significant. The result indicates that the coefficient of average payment period is negative and it is highly significant at $\alpha = 1\%$, and implies that the increase or decrease in the average payment period, significantly affects profitability of the firm. The negative relationship between the average payment period and profitability indicates that the less profitable firms wait longer to pay their bills. All the other variables are also significantly affecting the profitability. The size of the firm has a positive impact on profitability, and the current ratio has a negative impact on profitability; while other control variables like debt ratio, and financial assets to total assets have a significant negative affect on profitability of the firm. The adjusted R^2 is 32%. The F-statistic has a value of 55.10. It also reflects the high significance of the model.

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:

$$NOP_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(LOS_{it}) + \beta_3(CR_{it}) + \beta_4(DR_{it}) + \beta_5(FATA_{it}) + \varepsilon \quad (\text{Eq. 4.4})$$

Taking the cash conversion cycle as an independent variable, the result indicates that the coefficient of cash conversion cycle is negative and is significant at $\alpha = 5\%$ and implies that the increase or decrease, in the cash conversion period, significantly affects profitability of the firm. All the other variables are also significantly affecting profitability. The increase in sales has a positive impact on profitability; current ratio has a negative impact on profitability while other control variables like current ratio, debt ratio, and

financial to total assets have a significant negative affect on profitability of the firm. The adjusted R^2 is 30%. The value of F-statistic is 50.86, and it also reflects the high significance of the model.

Under the pooled least squares method, we have seen the independent variables in the individual regression. The individual regression for each variable showed the significant effect on profitability. In general, the results of pooled least squares are indicating the same interpretation that working capital management affects profitability of the firm. If a firm can effectively manage its working capital, it can lead to increase in profitability. It can also be interpreted that the liquidity and profitability moves in opposite direction. And, there is a need to maintain a trade-off between these two objectives of the firm. It is further interpreted that if the firm increases its debt financing, it will lead to decreasing profitability of the firm in terms of financial cost. The size of the firm has a direct positive relationship with profitability of the firm. If the size (measured in terms of log of sales) increases, it will lead to increasing profitability of the firm.

4.6 Regression Model: General Least Squares – Cross Section Weights

We have also used the general least squares model with cross section weights. When we use the pooled data and cross sections are greater than the time series, there may be a problem of heteroskedasticity (changing variation after short periods of time). To counter this problem we are using the general least squares with cross section weights. In this regression, the common intercept is calculated for all variables and assigned a weight. A weighted least square is obtained by first dividing the weight series by its mean, then multiplying all of the data for each observation by the scaled weight series. The scaling of the weight series is a normalization that has no effect on the parameter results, but makes the weighted residuals more comparable to the un-weighted residuals.

The results of regressions five to eight are presented in Appendix 3

In the first Regression, the average collection period and current ratio are used as independent variables with other control variables.

The coefficient of C is 0.145 and has a significant p -value at $\alpha = 1\%$. The coefficient of accounts receivable is negative and it is highly significant. The coefficient has a significant t -statistics and a p -value of (0.0000), which implies that the collection policy of a firm has a significant effect on profitability. All the other variables are also significantly affecting the profitability. Liquidity of the company also has a negative relationship with the dependent variable. The coefficient of current ratio is -0.015 showing that, when the liquidity position is better, this has a negative affect on profitability of a firm. The variable has a p -value of 0.0000 which is highly significant at $\alpha = 1\%$. The size of the firm (measured in terms of log of sales) has a positive impact on profitability. The coefficient is (0.006) and is highly significant at $\alpha = 1\%$ as the p -value is (0.0000). It is interpreted that when size of the firm increases, it will lead to increasing the profit of the firm. The debt ratio shows a negative relationship with the dependent variable, which means that, when the leverage of the firm's increases, profitability of the firm decreases. This ratio is highly significant at $\alpha = 1\%$ and the coefficient is (-0.0131). The result shows that adjusted R-square (R^2) weighted is (79%) which shows that

there is 79% variation in the dependent variable attributable to the independent variables.

In second regression, inventory turnover in days and current ratio are used as independent variables with other control variables. .

The coefficient of intercept C is significant and equals 0.225. The coefficient of inventory turnover in days (a proxy for inventory policy) is negative, and is highly significant at $\alpha = 1\%$. It implies that the increase or decrease in the inventory turnover in days, significantly affects profitability of the firm. It means that the inventory policy of the firm will affect its profitability. If the inventory is not converted in sales it will lead to decreasing profitability. All the other variables also are significantly affecting profitability at $\alpha = 1\%$ except Size of the firm which is significant at $\alpha = 5\%$. Increase in sales has a positive impact on profitability while all other control variables like current ratio, debt ratio, and financial assets to total assets have a significant negative affect on profitability of the firm. The adjusted (R^2) = 80%, and it shows the variation in the dependant variable's explained by the independent variables. The F-statistic has a value of 451 and also reflects the high significance of the model.

Third regression is run using the average payment period as an independent variable instead of inventory turnover in days. The other variables are the same as they were in the first and second regression.

The coefficient of intercept C is 0.10. The coefficient of average payment period (proxy for payment policy) is negative and highly significant at $\alpha = 1\%$, and implies that the increase or decrease in the average payment period, significantly affects profitability of the firm. The negative relationship between average payment period and profitability indicates that the less profitable firms wait longer to pay their bills. All the other variables are also significantly affecting the profitability. All of them are significant at $\alpha = 1\%$. Size of the firm (measured in terms of log of sales) has a positive impact on its profitability; current ratio has a negative impact on it while other control variables like debt ratio and financial assets to total assets have a significant negative affect on profitability of the firm. The adjusted $R^2 = 81\%$. The F-statistic has a value of 511, and the p -value is 0.0000; all of them reflect high significance of the mode

Fourth regression is run using the cash conversion cycle as an independent variable. It is the comprehensive measure of checking efficiency of working capital management. The other variables are the same as they were in the first three regressions.

Taking the cash conversion cycle as an independent variable, the result indicates that its coefficient is negative and is significant at $\alpha = 1\%$. It implies that an increase or decrease in the cash conversion cycle period, significantly affects the profitability of the firm. All the other variables: size, current ratio, debt ratio and financial assets to total assets are significantly affecting the profitability at 1% significance level. The adjusted $R^2 = 83\%$. The F-statistic also reflects the highly significance of the model as its value is 560 with p -value of 0.0000.

In general, the results of general least squares method with cross section weights are indicating the same interpretation that the working capital management affects profitability of the company. If the firm can effectively manage its working capital, it can

lead to increasing profitability. We can also interpret that liquidity and profitability move in opposite directions. And, there is a need to maintain a trade-off between these two objectives of the firm. It is further interpreted that if the firm increases its debt financing, it will lead to decreasing profitability of the firm in terms of financial cost. Size of the firm has a direct positive relationship with its profitability. If the size (measured in terms of log of sales) increases, it will lead to an increase in profitability of the firm.

5. Conclusion

Most of the Pakistani firms have large amounts of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. We have found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period and cash conversion cycle for a sample of Pakistani firms listed on Karachi Stock Exchange. These results suggest that managers can create value for their shareholders by reducing the number of days accounts receivable and inventories to a reasonable minimum. The negative relationship between accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills.

Regarding our hypotheses, we conclude that our Alternate hypothesis (H_{11}) that working capital management significantly affects profitability of Pakistani firms is the one to be accepted; and therefore we reject null hypothesis (H_{01}). In the same way we accept our research hypotheses (H_{12}) that there is a negative relationship between liquidity and profitability of the firm; therefore we reject null hypotheses (H_{02}). It is found that in Pakistan current ratio is the most important liquidity measure that affects profitability. The Pakistani firms must set a trade-off between these two objectives so that neither the liquidity nor profitability suffers. We also accept our research hypotheses (H_{13}) regarding the size and profitability. As the size (measured in terms of natural logarithm of sales) increases, it will lead to an increase in profitability of the firm; therefore we reject null hypotheses (H_{03}). We do accept our research hypotheses (H_{14}) concerning the debt financing that when the debt financing increases, profitability goes down; therefore we reject null hypotheses (H_{04}) here also. This is interpreted that debt financing will affect the financial cost which will lead to decreasing profitability.

The conclusions are in confirmation with (Deloof 2003), (Eljelly 2004), (Shin and Soenan 1998) who found a strong negative relationship between the measures of working capital management including the average collection period, inventory turnover in days, average payment period and cash conversion cycle with corporate profitability.

On basis of the above analysis we may further conclude that these results can be further strengthened if the firms manage their working capital in more efficient ways. Management of working capital means “management of current assets and current liabilities, and financing these current assets”. If these firms properly manage their cash, accounts receivables and inventories in a proper way, this will ultimately increase profitability of these companies.

There is much to be done about working capital in Pakistan in future. We suggest that further research be conducted on the same topic with different companies and extending the years of the sample. The scope of further research may be extended to

the working capital components management including cash, marketable securities, receivables and inventory management.

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Appendix 1: Pearson's Correlation Coefficients

		Pearson's Correlation Coefficients								
		94 Pakistani Non - financial firms, 1999-2004, 564 firms - year observations								
		ACP	ITID	APP	CCC	LOS	CR	DR	FATA	NOP
ACP	Pearson Correlation	1								
	Sig. (2-tailed)	.								
ITID	Pearson Correlation	.213(**)	1							
	Sig. (2-tailed)	.000	.							
APP	Pearson Correlation	.010	-.020	1						
	Sig. (2-tailed)	.817	.641	.						
CCC	Pearson Correlation	.548(**)	.667(**)	-.626(**)	1					
	Sig. (2-tailed)	.000	.000	.000	.					
LOS	Pearson Correlation	-.238(**)	-.360(**)	.107(*)	-.372(**)	1				
	Sig. (2-tailed)	.000	.000	.011	.000	.				
CR	Pearson Correlation	.109(**)	.128(**)	-.137(**)	.204(**)	-.188(**)	1			
	Sig. (2-tailed)	.010	.002	.001	.000	.000	.			
DR	Pearson Correlation	-.105(*)	-.089(*)	.124(**)	-.172(**)	-.186(**)	-.364(**)	1		
	Sig. (2-tailed)	.012	.034	.003	.000	.000	.000	.		
FATA	Pearson Correlation	.054	.101(*)	-.074	.126(**)	-.024	.193(**)	-.185(**)	1	
	Sig. (2-tailed)	.203	.016	.080	.003	.568	.000	.000	.	
NOP	Pearson Correlation	-.165(**)	-.214(**)	-.158(**)	-.094(*)	.274(**)	-.126(**)	-.434(**)	-.070	1
	Sig. (2-tailed)	.000	.000	.000	.026	.000	.003	.000	.094	.

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

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

Notes: 1- Net Operating Profitability = $(\text{Operating Income} + \text{Depreciation}) / (\text{Total Assets} - \text{Financial Assets})$. 2- Average collection period = $(\text{account receivable} * 365) / \text{Sales}$. 3- Inventory Turnover in days = $(\text{inventories} * 365) / \text{Cost of sales}$. 4- No. of days accounts payable = $(\text{accounts payable} * 365) / \text{purchases}$. 5- The cash conversion cycle = $(\text{Average collection period} + \text{Inventory turnover in days} - \text{Average payment period})$. 6- 6- Current Ratio = $\text{current assets} / \text{current liabilities}$. 7- Debt Ratio = $\text{Total Debt} / \text{Total Assets}$. 8- Financial assets to Total Assets = $\text{financial assets} / \text{Total assets}$.

Appendix 2: Results of Pooled Ordinary Least Squares

Dependant Variable: Net Operating Profitability											
Pooled Ordinary Least Squares											
94 Pakistani Non - financial firms, 1999-2004, 564 firms - year observations											
Regressions	C	CR	DR	LOS	FATA	ACP	ITID	APP	CCC	Adjusted R ²	F-Statistics
1	0.185	-	-0.148	0.005	-0.163	-	-	-	-	0.328	55.851
		0.017				0.0028					
t-statistics	3.169	-	-	1.978	-3.084	-4.736					
		7.069	14.200								
P-Value	0.002	0.000	0.000	0.048	0.002	0.000					0.000
2	0.238	-	-0.149	0.013	-0.148	-	-	-	-	0.336	57.916
		0.017					0.0026				
t-statistics	3.924	-	-	27.365	-2.810		-5.439				
		7.189	14.415								
P-Value	0.000	0.000	0.000	0.000	0.005		0.000				0.000
3	0.084	-	-0.136	0.009	-0.177	-	-	-0.002	-	0.325	55.108
		0.018									
t-statistics	1.514	-	-	3.742	-3.333			-4.456			
		7.308	13.116								
P-Value	0.131	0.000	0.000	0.000	0.001			0.000			0.331
4	0.159	-	-0.146	0.006	-0.159	-	-	-	-	0.307	50.859
		0.017							0.00638		
t-statistics	2.571	-	-	2.077	-2.953				-2.263		
		6.885	13.641								
P-Value	0.010	0.000	0.000	0.038	0.003				0.024		0.000

Notes: 1- Net Operating Profitability = (Operating Income + Depreciation) / (Total Assets – Financial Assets). 2- Average collection period = (account receivable * 365) / Sales. 3- Inventory Turnover in days = (inventories * 365) / Cost of sales. 4- No. of days accounts payable = (accounts payable * 365) / purchases. 5- Cash conversion cycle = (Average collection period + Inventory turnover in days – Average payment period). 6- Current Ratio = current assets

/ current liabilities. 7- Debt Ratio = Total Debt / Total Assets. 8- Financial assets to Total Assets =e financial assets / Total assets.

Appendix 3: Results of General Least Square (Cross Section Weight)

Dependant Variable: Net Operating Profitability											
General Least Square (Cross Section Weight)											
94 Pakistani Non - financial firms, 1999-2004, 564 firms - year observations											
Regressions	C	CR	DR	LOS	FATA	ACP	ITID	APP	CCC	Adjusted R2	F-Statistics
5	0.145	-0.015	-0.131	0.006	-0.114	0.0021	-	-	-	0.789	422.913
t-statistics	5.055	-6.874	-17.275	5.061	-3.333	-6.367					
P-Value	0.000	0.000	0.000	0.000	0.001	0.000					0.000
6	0.225	-0.016	-0.134	0.003	-0.093	-	0.0025	-	-	0.800	451.214
t-statistics	6.974	-7.539	-17.474	1.980	-2.972		-7.712				
P-Value	0.000	0.000	0.000	0.048	0.003		0.000				0.000
7	0.100	-0.016	-0.128	0.008	-0.119	-	-	0.0015	-	0.819	510.781
t-statistics	3.119	-7.674	-16.463	5.813	-3.770			-4.621			
P-Value	0.002	0.000	0.000	0.000	0.000			0.000			0.000
8	0.145	-0.016	-0.134	0.006	-0.103	-	-	-	0.00619	0.832	559.779
t-statistics	4.620	-7.248	-17.685	4.441	-3.192				-3.168		
P-Value	0.000	0.000	0.000	0.000	0.002				0.002		0.000

Notes: 1- Net Operating Profitability = (Operating Income + Depreciation) / (Total Assets – Financial Assets). 2- Average collection period = (account receivable * 365) / Sales. Inventory Turnover in days is (inventories * 365) / Cost of sales. 3- No. of days accounts payable = (accounts payable * 365) / purchases. 4- The cash conversion cycle = (Average collection period + Inventory turnover in days – Average payment period). 5- Current Ratio = current assets / current liabilities. 6- Debt Ratio = Total Debt / Total Assets. 7- Financial assets to Total Assets = financial assets / Total assets.