Determinants of Working Capital Management and its impact on firm's profitability: Evidence from the Manufacturing Sector of Pakistan.

by
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Dedicated To My
Family
(Who are Source of My Success)

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Abstract

This study explores the relationship between working capital management and profitability for a sample of 323 manufacturing firms listed on Karachi Stock Exchange over a 6 year period that is from 2006 to 2011. The results of this study show that firms should minimize the accounts collection period, inventory conversion period, accounts payable period (components of working capital management) and cash conversion cycle to a reasonable minimum to be profitable. The study finds a positive relationship between the liquidity and profitability which suggests that Pakistani firms hold low level of liquidity and follow aggressive working capital management strategy. Moreover, the results also suggest that financial and macroeconomic conditions of Pakistan measured by GDP growth, inflation and exchange rate have a significant effect on the working capital management investment decisions.

Chapter 1

Introduction

1.1Background

The role of corporate finance for business organizations is highly important. The overall profitability of the business and the interest of a wide variety of stakeholders are significantly affected by the decisions made by the financial managers. Managers on the one hand adopt risk minimization strategies and on the other hand they take serious actions to ensure smooth operations of the firms, to avoid insolvency, and as a result an enhancement in the profitability prospects for the organization.

Working capital management is the major part of financial operations faced by the financial managers, because it has an effect on the liquidity and profitability of the business. Working capital management is the management of short term assets and short term liabilities. The previous studies (Moussawi *et al*, 2006, Mongrut *et al, 2014,* Raheman and Nasr, 2006) reveal that short term assets of both manufacturing and distribution firms contains a big portion of firm's assets. That's why the efficient working capital management is very important for businesses to be profitable.

The efficiency of working capital management is a function of credit policy and cheap supply of raw material and other inputs (Ali, 2011). Managers often face a trade off situation between liquidity and profitability because the decision that tends to maximize profitability tends to the shortage of liquidity.

Working capital management consists of the decision on the quantity and composition of short term assets and short term liabilities. Current assets include all those assets which convert in a

short time period (1 year) into cash. Raheman and Nasr (2007) have stated that working capital management is highly important because it affects the profitability, risk, and also the value of the company. As companies invest a big portion of cash in working capital management so this study expects that an efficient management of working capital will significantly affect the profitability of the firms.

The study also explores various determinants of investment in working capital by taking different macroeconomic and financial variables into consideration. The study is expected to contribute in the literature on the working capital management and manufacturing firms, especially in the case of Pakistan.

1.2 Motivation of the study

Corporate finance is concerned with decision making on three different areas: 1) capital structure, 2) capital budgeting and 3) working capital management (Taleb, Naser, Zoued and Shubiri 2010; Ross, Westerfield and Jaffe 2005). Until now the focus of corporate finance literature is to examine the non current financial decisions such as investment in fixed assets, capital structure, dividend policy and corporate valuation (Teruel and Solano 2010; Teruel and Solano 2007a). However, the most important decisions within firms are made on the working capital management components that are accounts collection, inventory conversion and accounts payable, because they are a significant part of the firm's assets and affect both liquidity and profitability of the business (Taleb, Naser, Zoued and Shubiri 2010; Teruel and Solano 2007a; Deloof 2003; Shin and Soenen 1998). The short term assets of a typical producing firm contain a big portion of its total assets and in the case of a distribution firm this percentage is even higher (Taleb *et al.*, 2010, Deloof, 2006). Due to this reason the study has aim to explore the importance of the efficient working capital

management and also the impact of this efficient management of working capital on the profitability of the manufacturing sector of Pakistan.

A firm can adopt aggressive, moderate or conservative strategy regarding the working capital management decision. An aggressive working capital management strategy is that in which a lower level of short term assets to total assets are maintained by the firm, while a higher level of short term liabilities to total liabilities are used for the financing policy. Excessive level of short term assets (liquidity) may have a inverse effect on the profitability of the firm, while a low level of short term assets leads to higher liquidity risk and the risk of stock outs; This liquidity profitability tradeoff creates difficulties in the maintaining smooth operations of the firm (Horne and Wachowicz, 2004). According to Mongrut *et al.,* (2014) "the goal of working capital management should be to minimize the cash conversion cycle (CCC) without having a negative impact on the quality of its components", both surplus and deficit in working capital management is bad, working capital management depends mainly on the specific circumstances of each firm.

The study also shows which working capital management strategy the Pakistani firms follow that is, aggressive, moderate or conservative working capital investment policy.

According to Lamberson, 1995 "Working capital management has become one of the most important issues in organizations, where many financial managers find it difficult to identify the important drivers of working capital management". Firms can decrease the risk and can be profitable if they can understand the factors affecting working capital management investment decisions (Afza and Nazir, 2009). Taking into consideration the above mentioned importance, the study is going to explore the important determinants of working capital management in the case of Pakistani manufacturing sector.

1.3 Objectives of the Study

Following are the broad objectives we want to achieve in this study

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

    ii.   To find the working capital management investment strategy in Pakistan.

    iii.   To explore the determinants of investment in working capital.

1.4 Significance of the study

The studies on the issue of working capital management mainly focus on specific industries of Pakistan while the focus of this study is to check the impact of working capital management on the profitability of the whole manufacturing sector listed firms on KSE for which data are available for the study period.

The study also tries to find out which strategy the firms adopt regarding their working capital investment, whether they adopt aggressive working capital investment decision, moderate or conservative working capital investment decision, on which no work has been done in the case of Pakistan.

Moreover the study also explores the determinants of investment in working capital management in Pakistan on which no work has been done in Pakistan, so this study is the first of its kind and it is expected that this study will be very productive and will be very helpful for further research in this field of finance. The current study is aimed to contribute to the existing literature by focusing on the impact of working capital management on the profitability of non financial KSE listed firms, and exploring the determinants of working capital management.

1.5 Organization of the study

The remainder of the study is organized as follows. In the next Chapter a literature review on different issues of working capital management is done. In Chapter 3 the theoretical framework for the study is discussed and hypotheses are set. After that in Chapter 4 data sample and time period is discussed and the variables used in both models of the study are defined and after this the models of the study are built. Chapter 5 presents and explains the results from the empirical analysis. Conclusions are made with policy implications and scope for further research in Chapter 6.

Chapter 2

Literature Review

There is extensive research done on the working capital management for the developed markets, but for emerging markets very few studies has been done. In case of Pakistan there is lack of serious work in this area.

Mathuva (2010) has examined the relation between the components of working capital management and corporate profitability for Kenyan listed companies. A sample of thirty companies listed on Nairobi Stock Exchange (NSE) is examined for the period of 1993 to 2008. He used pooled Ordinary Least Square and Fixed Effect Model for analysis. The results of his study show a highly significant inverse relationship between accounts collection period and profitability, which suggest that profitable firms takes less time to collect the receivables, there is a significant positive relationship between the inventory conversion period and profitability, which shows that firms which hold large inventories may decrease any costs incurred due to interruptions in the production process and reduce the risk of shortage of raw material. The highly significant and positive relationship between the payment period and profitability showed that the more the time to pay to the suppliers, the more profitable is the firm.

Deloof (2003) has studied the effect of working capital management on profitability of the non financial Belgian firms for the period of 1992 to 1996, his sample consist of 1,009 firms. He argues that managers can maximize shareholder's wealth by an improvement in the efficiency of working capital management, which can be possible by reducing the collection period of receivables and keeping the inventory level at an optimal. The study shows that profitability (gross operating income) is negatively related to receivables collection period, inventory conversion period,

accounts payable period and the cash conversion cycle. The author further argues that the negative relation between the payable period and the profitability is due to the reason that low profit firms pay their bills late.

Nor and Noriza (2010) investigate the impact of working capital management on the performance of Malaysian listed companies from the market valuation perspective and profitability. The secondary data on 172 listed companies was analyzed for the period of 5 years from 2003 to 2007. The firm performance is measured by Tobin's Q and firm's profitability by returns on asset (ROA) and return on invested capital (ROIC). Both correlation and panel data regression analysis is used. The results shows that the components of working capital management moves in opposite direction with the firm's performance as well as firm's value, which confirms the importance of managing working capital requirements in an effective way to ensure an increase in the market value and profitability of the firms.

Baranchuk, Kieschnic, Plante and Moussawi (2006) investigate whether US firms over invest in working capital or not. They use the data on a panel of US corporations for the period from 1990 through 2004 and find the evidence that US firms over invest in working capital. They further examined the factors that influence the corporate working capital management. They argued on the basis of their study that industry practices, firm size, firm's future sales growth, the proportion of outside directors on a board, executive compensation (current portion), and CEO share ownership significantly affect the efficiency of working capital management of the companies.

Garcia teruel et al., (2011) have investigated the relationship between working capital management and profitability for the Spanish small and medium sized enterprises. They have studied 1008 SME's for the period of 2002 to 2007. They use cash conversion cycle as a comprehensive measure

of working capital management. Unlike others their results suggest a non linear (concave) relationship between the two variables that is, level of working capital management and firm's profitability. Their results suggest that "SME's have working capital management level at an optimal which maximizes their profitability, and this profitability decreases as the companies move away from their optimal level of working capital".

Ganesan (2007) studied the efficiency of working capital management for the telecom equipment industry of India. His sample consists of 349 telecom equipment companies for the period from 2001 to 2007. He has examined the relationship between working capital management efficiency and profitability through correlation analysis, regression analysis and ANOVA analysis. His results suggest that "day's working capital" do not affect the profitability of telecom equipment industry.

Mongrut *et al.* (2014) analyse whether the companies in Latin America over-invest in working capital management or under invest and after that they have analyzed the factors that affects the cash conversion cycle (CCC). They utilize the data available from the Latin American countries that is, Argentine, Brazil, Chile, Mexico and Peru for the period of 1996 to 2008. Their results suggest that Latin American industries overinvest in working capital, size of the firm negatively affects the CCC, industry concentration positively affects the CCC which means that Latin American industries use their market power to minimize their cash conversion cycle, industry's practices are immensely important for the determination of the level of working capital management of companies, companies invest more in working capital when they anticipate a growth in their sales, and also when there is a lower country risk the companies in that country invest more in working capital and vice versa.

Ramachandran and Janakiraman (2009) studied the impact of working capital management efficiency (WCME) on earnings before interest and taxes (EBIT) for the paper industry of India during the period of 1997 98 to 2005 06. They computed three index values to measure working capital management efficiency (WCME) that is, performance index (PI), utilization index (UI) and efficiency index (EI), which are associated with the explanatory variables, that is, cash conversion cycle (CCC), accounts payable period, accounts receivables period, Inventory conversion period. Moreover, many control variables are used in the analysis, and were associated with the earnings before interest and tax (EBIT). Their study suggests that over the study period the Indian paper industry's performance is very well. However as far as less profitable firms are concerned they try to delay the bills, and pursue a decrease in the cash conversion cycle (CCC).

Ray (2012) studied the impact of efficient management of working capital on the profitability of Indian manufacturing companies. She studied 311 manufacturing companies for the period of 14 years (1996-97 to 2009-10). She used average collection period, inventory conversion period, accounts payable period and cash conversion cycle as the components of working capital management and current ratio, debt ratio, size of the firm and financial assets to total assets were used as control variables. The results of her study suggest an inverse relationship between the components of working capital management, financial debt ratio and corporate profitability, while the accounts payable period showed insignificant relationship with the profitability. Her results suggest that managers may efficiently manage the working capital to be profitable.

Vural *et al.* (2012) have examined the impact of working capital management on the firm's performance for the listed manufacturing firms of Turkey. Their study is based on 75 manufacturing companies listed on Istanbul Stock Exchange (ISE) for the period of 2002 2009. They use dynamic panel data analysis and the results they find that gross operating profits which

is the measure for profitability is inversely related with accounts receivable period and cash conversion cycle, also they find an inverse relation between profitability and leverage, which is the control variable. On the basis of their findings they concluded that firms can increase their profitability by reducing the collection period, cash conversion cycle and level of leverage.

Lazaridis and Trifonidis (2006) have investigated the relationship between working capital management and corporate profitability for the Greece firms. They studied 131 companies listed on Athens Stock Exchange for the period of 2001 2004. Their results shows an inverse relationship of accounts collection period, inventory conversion period, cash conversion cycle and financial debt with the gross operating profitability, while fixed financial assets, size of the firm and accounts payable period showed a positive relation with the profitability. These results suggest that managers can create the profits for their firms by handling well the cash conversion cycle and keeping each component of working capital management to an optimal level.

Dash and Hanuman (2009) have proposed a liquidity profitability tradeoff model for working capital management. Goal programming is used to model the working capital management decision to achieve a balance between the liquidity and profitability. The model determines how firms should maintain funds between the short term and long term assets to get a balanced level of liquidity and profitability.

Graham *et al.* (2013) have studied the impact of working capital management on firm profitability in different business cycles for Finland companies. Their sample consists of all companies listed on Nasdaq OMX Helsinki stock exchange for the period of 18 years from 1990 2008. They use return on assets and gross operating income as the measures of profitability, working capital management measured through the three components of working capital management and the cash conversion cycle, while size of the firm, liquidity ratio, leverage ratio, sales growth and operating

income are used as the control variables. The results they draw are that the effect of business cycle on the relationship of working capital management and profitability is more dominant in recession period relative to economic booms period. Moreover they argue that the importance of efficient inventory management and accounts receivable period rises during the period of economic downturns. Keeping in view the following results they have recommended that efficient working capital management is very important and thus should be included in the company's financial planning.

Teruel *et al.* (2009) have explored the impact of market imperfection on working capital management. They analyze 60 manufacturing firms listed on the Spanish Stock Exchange for the period of 1997 to 2004. They have examined whether working capital management is responsive to market imperfections that are, information asymmetries, principal agent problem or financial distress. Their results suggest that firms have set targets regarding the working capital management investment and they make policies to achieve this. Moreover the results confirm the hypothesis that when the firms have financial constraints, than the investment in short term assets compete with the investment in long term assets for funds of the firms. After that they have tried to find the factors affecting working capital management investment decision. They have argued that working capital management depends on the bargaining power, accessibility of internal finance, financing cost and access to capital markets.

Howorth and Westhead (2003) investigate the importance of working capital management in the small UK firms. They collected the primary data from a large sample of small firms for the year of 1996. Principal component analysis and cluster analysis are used. There results suggest that small firms are not homogeneous regarding the working capital management routines, and four different types of companies were detected regarding their working capital management routines.

The first three types of companies are those who focused upon cash management, stock management or debtors routine respectively, while the fourth one are less likely to adopt any working capital management routine. Their results suggests that small companies are not homogenous regarding their working capital management routines and small companies concentrate only on that areas of working capital management where they expect an increase in profit.

Sartoris *et al.* (1983) have presented a generalized cash flow approach to short term financial decisions. They state that the traditional approach treated working capital management problems in a segmented manner and they argue that an integrated approach to working capital management decision will perform well. The study focuses on the cash flow part of working capital management which allowed them to view that the policy decisions affects the timing and amount of cash flows which are amenable to Net Present Value analysis. They have first developed a certainty model for working capital management decisions. The model is robust to various sales patterns and costs assumptions. After that uncertainty is introduced and three methods are used to deal with uncertainty are presented that is, simulation, explicit pricing and neutralization.

Michalski (2008) has presented a value based inventory management model. He has argued that the main financial aim of the firm is value maximization, and an inventory management system contributes to this aim of the firm. He further argues that the current studies on current assets management focus on the book profit maximization as the basic aim. He has presented a modified value based inventory management model including both Economic Order Quantity and Production Order Quantity, which aims the maximization of enterprise value. He argues that "inventory management decisions are complicated". Excessive level of money held in inventory has opportunity cost and it becomes a burden on the enterprise. He has stated that "value based

modifications implied to Economic Order Quantity model and Production Order Quantity model will help managers to better value creating decisions in inventory management."

Gill *et al.* (2010) have studied the relationship between working capital management and profitability for the US non financial firms. They have extended the findings of Lazaridis and Tryfonidis regarding the relationship between working capital management and profitability for a sample of 88 American non financial firms listed on New York Stock Exchange (NYSE) for a period of 3 years that is from 2004 to 2007. They find a significant relationship between the cash conversion cycle (CCC) and the gross operating profitability. They stated on the basis of their results that management can increase the value of the firms by correctly handling the cash conversion cycle and keeping an optimal level of accounts receivables.

James and Horne (2007) have presented a risk return analysis of a firm's working capital management position. In their proposed method they stated that "a firm's management can easily know the risk return trade off for different levels of current assets of the business and for different maturity compositions of its debt, and these factors in turn determine the working capital management position of the firm." They employed certain probability concepts and for alternative strategies information is provided about the liquidity risk, and also the opportunity cost of these alternative policies are found. With the help of their proposed framework more rational working capital management decisions are possible. Moreover with the proposed analysis a firm can achieve a working capital management position which provides the appropriate margin of safety in relation to the costs involved in attaining that position.

Otavio and Medeiros (2005) questioned the fleuriet's model of working capital management on the empirical grounds. Their sample consists of 80 manufacturing Brazilian firms listed on Sao Paulo Stock Exchange for the period of 1995 to 2002. Correlation, cross sectional regression and

panel data regression analysis are used. They empirically showed that the very basic assumption of flueriet's model is wrong on which they concluded that the flueriet's model is wrong. The assumption which is tested is that short term financial assets and short term financial liabilities are uncorrelated with the firm's operations. And they empirically show that current financial assets and current financial liabilities are not erratic and they are related to firms operations. So on the basis of their finding the concluded that fleuriet's model is invalid.

Patrick (2005) applied relative solvency to working capital management. Her sample consists of 25 Nigerian listed companies. She looked at working capital management from the net investment perspective, because current approaches ignore the questions of operational size and relative liquidity when they deal with the issue of working capital management. She used a break even approach for analysis and the validity of the results were checked by students "t" distribution test. She concluded that those firms that hold the relative liquidity do well and they have more chances of growth than those firms which ignore the relative liquidity**.**

Kieschnick *et al.* (2006) studied the impact of working capital management on shareholder's wealth. Their sample consists of all the US manufacturing non financial corporation on which data is available for the period from 1990 to 2006. Firms excess stock returns for the year is used as a proxy for the shareholder's wealth, while net operating working capital management investment, factors that affects the investment in net working capital, and the components of operational working capital management are used as the independent variables. They find the evidence that for an average firm the incremental dollar invested in net operating capital is less worthy than it is held in cash by the firm so that's why efficient working capital management is one of the major concern of the manager. Secondly they stated that "the valuation of incremental dollar invested in working capital management is significantly affected by the firm's future sales expectations, its

debt burden, its financial constraints and its bankruptcy risk." Thirdly they find that "for an average firm the value of the incremental dollar extended in credit to the firm's costumer has a greater effect on shareholder's wealth than the incremental dollar invested in inventories." All of these results demonstrate the importance of working capital management to shareholders.

Boschker (2011) has explored the determinants of working capital management in small and medium enterprises (SME's). His data consist of a big sample of 10,129 SME's for the period of 2006 to 2009 from 11 countries. He incorporates cultural dimensions as the determinants of working capital management with other explanatory variables and explained the results. Hostfede's cultural dimensions are used and panel data estimation technique is used in order to control for unobservable firm heterogeneity. The four cultural variables incorporated are power distance index, individualism, masculinity and uncertainty avoidance index. These cultural variables (excluding individualism which does not significantly affect the cash conversion cycle) significantly affect the four independent variables that is, the components of working capital management that is, cash conversion cycle, inventory conversion period, account collection period and the accounts payable period. He also finds that the smaller the SME the more strongly will be the effect of cultural variables on their working capital management.

Ali (2011) investigate the relationship of working capital management and profitability in the textile industry in Pakistan for the period of 2000 2005, his sample consist of 160 textile firms, following the methodology of Anand and Gupta(2001). He has ranked all the textile firms on the basis of working capital performance ratio (WCPR) and profitability performance ratio (PPR) and find out the best performing firms in the textile industry, after that rank correlation analysis are done which shows insignificant weak positive rank correlation between WCM and profitability, which support his hypothesis of positive rank correlation. Than after that he used regression

analysis to investigate the economic impact. The correlation analysis is carried out between ROA and the explanatory variables which showed that ROA is significantly negatively correlated with days receivables, days payables, while significantly positively correlated with the cash conversion efficiency and insignificantly positively correlated with days in inventory. Both OLS and fixed effect models were used for the regression analysis; FEM was used because OLS exhibit the problem of multicollinearity and spurious relationships. The regression results show that firm size, inventory days and day's receivables are significant while days payables and cash conversion cycle are insignificant. He concluded that "the textile industry established a weak positive rank correlation between profitability performance and working capital management and all the components of WCM have an economic impact on ROA of textile firms in Pakistan."

Rehman and Anjum (2013) investigate the relationship between WCM and profitability for cement industry of Pakistan, there sample consists of 10 listed cement companies for the period of 2003-2008. They argue that when working capital management efficiency increases, liquidity also increases and profitability decreases. These results cannot be generalized because of narrow dataset.

Malik and Iqbal (2012) have examined the impact of WCM on profitability of sugar industry in Pakistan. Their dataset consist of 19 sugar mills listed on KSE for the period of 1999 to 2009. Both Pearson's correlation and multiple regression analysis are used for analysis, the results showed that sales growth, current ratio, number of days in inventory and number of days account payables are significantly affecting the profitability of the firms while sales, gearing ratio and number of days account receivable are insignificant in the research. They use net operating income as a proxy of profitability. The analysis suggests that components of WCM are negatively related to net operating income (NOI). Sales, sales growth and current ratio shows positive and significant

correlation with NOI while gearing ratio has negative relation with NOI. They conclude that number of days account receivables and number of days account payables should be reduced, while number of days in inventory and CCC should be kept at optimum in order to increase profitability of sugar industry.

Raheman and Nasr (2007) analyze the relationship between WCM and profitability of KSE listed companies for the period of 1999 to 2004. Their dataset consist 94 companies. They use Pearson's correlation and regression analysis and find out a strong negative relationship between the components of working capital management and profitability. They argue that managers can create value for their shareholders by reducing the cash conversion cycle to a possible minimum level. Furthermore their study shows a significant inverse relation between liquidity and profitability.

Nazir and Afza (2009) investigate the relationship between WCM and profitability for non financial KSE listed companies from 17 different industrial sectors for the period of 1998 to 2005. They investigate the impact of aggressive working capital management investment and financing policies on profitability which is measured through ROA (accounting measure of profitability) and Tobin's q critique (market measure of profitability). Their results show inverse relation between relative degree of aggressiveness of working capital management investment policies of firms and performance measures, which mean that investors do not believe in the adoption of aggressive approach in working capital, which means managers, can create value if they adopt conservative approach in both working capital management investment and working capital management financing policies, however there is a positive relation between Tobin's q and aggressive working capital management financing policies which suggest that investors are attracted to those firms who adopts aggressive approach for their working capital management financing decisions.

Irfan (2007) analyzed the impact of working capital management on the profitability of listed non financial firms of Pakistan. His sample consists of 263 non financial listed companies over the period of 2006 to 2009. His results were analyzed by LOGIT regression, OLS regression and Pearson's correlation technique. He used return on equity (ROE) and return on assets (ROA) as the proxies for profitability. His results suggest that out of five components of working capital management only current assets to total sales (CATS) showed a significantly negative relationship with profitability while the remaining four components of working capital management that is, current assets over total assets (CATA), inventory turnover, debtor's turnover and current ratio showed significant positive relationship with the profitability. He argues that logistic regression suggested that probability of firm being in profit is highly determined by current assets to total assets (CATA), current assets to total sales (CATS) and current ratio.

Nazir and Afza (2009) have investigated the determining factors of working capital requirements in the case of Pakistani listed manufacturing companies. They studied 132 manufacturing firms for the period of 2004 to 2007. They use working capital requirement as a dependent variable and many economic and financial variables as the determining variables of working capital requirements. Panel data regression is used for the study and the results drawn were that, operating cycle is positively related to working capital requirement which means that the higher the days of operating cycle the more working capital would be required, there is a positive relation between Tobin's Q and WCR which suggest that the efficient working capital management is related with the stock market performance, the positive relationship between ROA and WCR according to them shows that "firms with higher profits are less concerned with the management of working capital, leverage is negatively related with the WCR which suggest that the firms with rising debt tries to lower their investment tied up in working capital.

Chapter 3
Theoretical Framework

This chapter explains the theoretical framework. The theoretical framework relates working capital management decisions to the rational choice theory (RCT), also called the "neoclassicism". The theory makes the assumption that people collectively benefits if they behave rationally. The RCT theory states that economic agents make rational choices among the various alternatives available to him after the benefit cost analysis of each alternative. The choice of the best option is based on the values and utilities which lead to the choice of that option that maximizes the benefits to the economic agent.

There are various constraints under which the rational choices are made by rational individuals:

1) Scarcity of resources. This means that different people posses different resources and also different access to resources.

2) Opportunity costs. This means those forgone benefits which are not attained by forgoing that alternative course of action.

3) Institutional norms also affect the costs and benefits of each available alternative.

4) Information is the last constraint on the rational decision making, it is assumed in the rational choice model that the individuals have the adequate knowledge while making the rational choice maximizing their net benefits.

The preferences of the rational individuals have three basic properties, completeness, transitivity and continuity. Preferences are complete if for example for all options A and B, the individual chooses A to B, or B to A, or is indifferent between A and B. The preferences made by individual are transitive if for example, for all the options available A, B and C, the individual prefers A to B

and B to C, then this person can prefer A to C. If the person is indifferent between A and B, and B and C, than he is indifferent between A and C. Continuity states that if an individual reports A is preferred to B, than the situation close to A must be preferred to B.

Hausman (1992) argued that "economists typically takes the existence of rational preferences as a tantamount to the utility function and rational choice as utility maximization"

3.1 Working capital management according to Rational Choice Theory

Theoretically managers managing working capital management according to the rational choice theory will gather and then utilize all the information available before making the decision regarding the management of working capital. They calculate the net benefits of all the options available, and choose that option between the various options available that maximizes their net benefits (before taking the decision), based on their preferences regarding liquidity risk and profitability. This means that the management tries to keep the average collection period and inventory conversion periods as minimum as possible, and management tries to increase the average payment period as much as possible.

The Economic Order Quantity (EOQ) model is a well known rational inventory management model. With the help of EOQ model a manager can minimize its costs of holding inventories by optimizing the ordered quantity (Q) to get optimal order quantity (Q*). According to the model the inventory policy is influencing by two types of costs, that is, carrying costs and shortage costs. The carrying cost (C) includes direct costs of holding inventory, for example storage cost, handling cost and security cost etc.

The EOQ model assumes that the inventory is sold out at a constant rate, so the average inventory is calculated by dividing the order quantity (Q) by 2. So the carrying costs can be easily calculated as: carrying costs= (Q/2)C.

Figure 1: Selling and restocking process
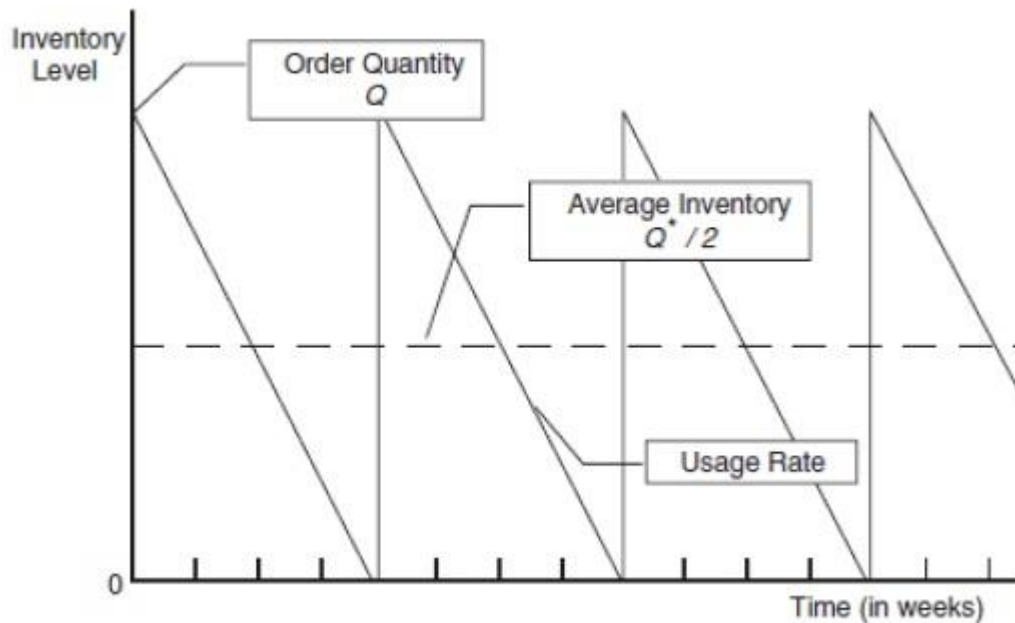
Source: *Boschker. B.A. (2011).* Determinants of Working Capital. Management *in SMEs: National. Culture, a Missing Piece?*

The shortage cost consists of fixed transaction cost per order for restocking (F) and cost incurred due to loss of sales. However the EOQ model assumes that there is no stock out, lost of sales due to insufficient inventory holding is excluded from the EOQ model. So the shortage cost can be calculated as: shortage costs= (D/Q)F

Where D is the annual demand for inventories.

Now to find the optimal quantity (Q*), one way is to use the differentiation of the sum of carrying cost and shortage cost and setting it equal to zero. Next we can also find the optimal quantity by rephrasing this equation and use the formula of Camp, which is: $Q^* = \sqrt{2D*F/C}$.

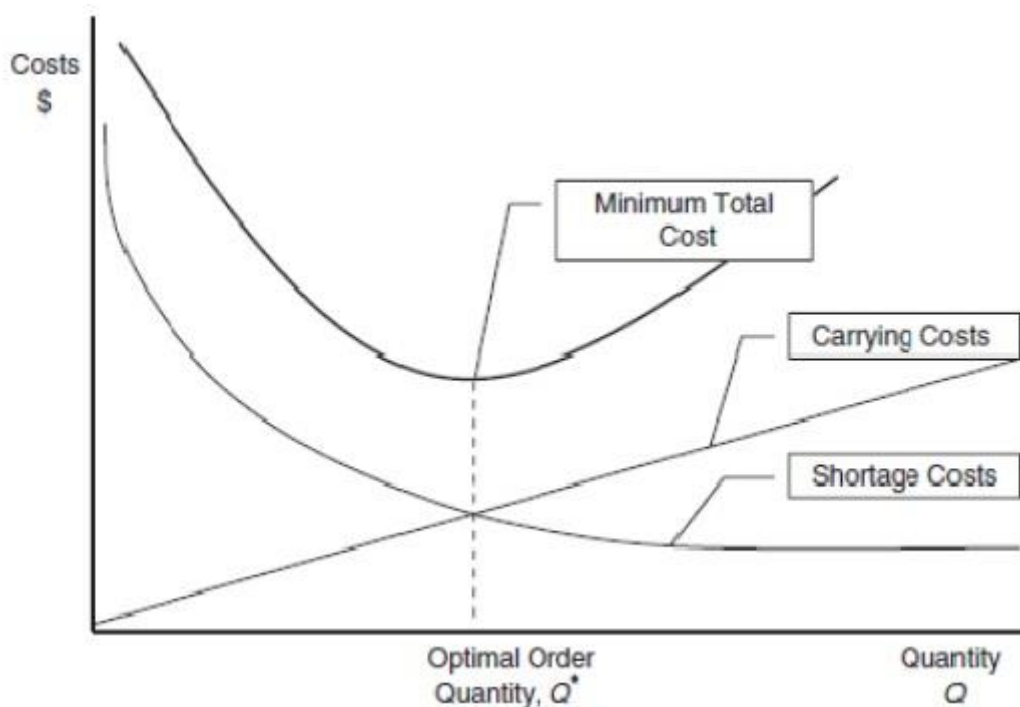**Figure 2**: **Determining the Optimal Order Quantity**

Source: *Boschker. B.A. (2011).* Determinants of Working Capital.Management *in SMEs: National. Culture, a Missing Piece?*

Hence the Rational Choice Theory suggest that the average collection period and inventory conversion period should be minimized; while the average payment period should be increased by the managers get benefits (profit maximization).

3.2 Working capital management and the Agency Theory

The agency theory which is also known as principal agent problem suggests that the managers of firms have set targets and they manage the working capital to achieve these targets ignoring the shareholders interest. As Deloof (2003) stated, "Developing countries have under developed capital markets in the sense that information and agency problems are particularly pronounced". According to the findings of La Porta *et al.* (1997), "developing countries with poorer investor protection have smaller and narrower external capital markets, shows that developing countries have weak legal protection of corporate shareholders and creditors, making bank financing and trade credit more attractive". Fisman and Love (2003) have stated that "trade creditor mitigate weak creditor protection and imperfect information better than formal lenders and find that firms in countries with less developed financial markets use informal credit provided by their suppliers to finance growth".

3.3 The Aggressive, Moderate, Conservative Policies and Working capital management

The decisions made regarding working capital management strategies affects free cash flows and the cost of capital of the company, whether the strategy is to invest in working capital management (focused on assets) or financing the working capital management (focused on liabilities). To separate the financial decision from operating decision needs to take the working capital management decision to first focus on assets because it affects free cash flows to the company, and then to focus on liabilities because it affects the structure and cost of capital used for financing the company.

Net working capital management is that portion of current assets financed with the permanent funds. It is the difference between the current assets and current liabilities. According to Michalski (2008) "it is a consequence of dichotomy between the formal origination of sales revenue and the actual inflow of funds from recovery of receivables and different times when the costs are originated and when the funds covering liabilities are actually paid out."

The company can choose one of the three policies;

3.3.1 Aggressive policy

An aggressive working capital management investment policy is that whereby the level of current assets is minimized and trade credit is restricted. On the one hand minimizing the current assets will result in savings which later results in higher free cash flows. On the other hand, insufficient level of current assets increases the operational risk, because too low inventories may interrupt the production and sales process. Moreover, restrictive credit policy to the customers will result in loss of sales and lower sales revenue; insufficient liquidity may disrupt settlement of accounts payables which negatively affects the company's reputation.

An aggressive working capital management financing policy is that in which a major portion of company's fixed demand and the entirely of its volatile demand for financing current assets is satisfied with short term financing.

Figure 3: Aggressive Policy
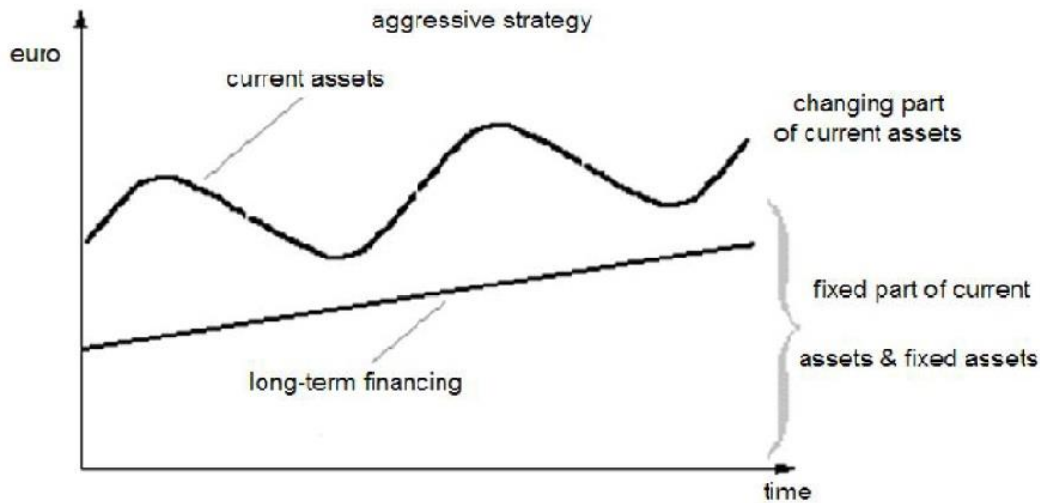
Source: *Michalski, G. (2008). Corporate inventory management with value maximization in view. ZEMEDELSKA EKONOMIKA PRAHA , 54(5), 187.*

3.3.2 Moderate Policy

A moderate working capital management investment policy is that whereby the level of current assets especially inventory and cash is held at an average level.

A moderate working capital management financing policy is that in which the period when financing is needed is adjusted to the period when the company requires given assets.

3.3.3 Conservative Policy

A conservative working capital management investment policy is that in which a high level of current assets (especially inventories and cash) is maintained ensuring a high level of receivables by using a liberal trade creditor's recovery policy.

A conservative working capital management financing policy is that whereby both fixed and volatile levels of current assets are financed with long term financing.

Figure 4: Conservative Policy

The company that that aims maximizing its value should select the aggressive policy. However it is worth considering that the more aggressive the current asset investment policy, the higher will be the risk. Higher risk is accompanied by higher cost of own capital and probably also external capital.

Now this analysis is going to establish the relationship between two of our objectives with the help of existing literature, which are

3.4.1 Working capital management and Profitability

This study uses net operating income as measure of profitability. The reason behind choosing net operating income as a measure of profitability and ignoring return on asset is that for a number of firms financial assets (which are mainly shares in other firms) are a significant part of total assets. When a firm has mainly financial assets on its balance sheet, its operating activities will contribute less to the overall return on assets.

According to Deloof, 2003 "Efficient working capital management refers to the planning and controlling of short term assets and short term liabilities in such a way that eliminates the risk of firm's inability to pay due short term obligations and to avoid excessive investment in current assets." Firms should maintain an optimal level of working capital that maximizes their value. On the one hand keeping large inventory reduces the risk of stock out and the risk of interruption in supply of raw material, and generous trade credit policy may results in an increase in sales. Trade credit may stimulate sales because it allows customers to assess product quality before paying (Deloof and Jegers, 1996). Because trade credit can be an inexpensive source of credit and have a significant cost advantage over financial institutions for providing credit to their customers (Petersen and Rajan, 1997). But the drawback of this holding of large inventory and generous trade credit is that money is locked up in working capital.

Inventory conversion period is a component of working capital management which refers to the time taken to convert inventory held in the firm into sales. The less the time taken by the firm to convert the inventory held into sales, the more profitable will be the firm. We expect an inverse relation of the inventory conversion period and profitability.

Accounts payable, another component of working capital management is the amount of time that firms take to pay the due bills to the creditors who supplies the raw material to the firm. It shows the payment policy of the firm. Delaying payments to the supplier allows the firms to assess the quality of the product they bought, and can be an inexpensive and flexible source of financing for the firms. On the other hand, late payment of invoices can be very costly if the firm is offered a discount for early payments (Deloof, 2003). It is expected that a significant relationship exist between the accounts payable and profitability.

Accounts receivable is another component of working capital management which shows the collection policy of a firm. On the one hand the fast collection of receivables may increase the profitability of the firm while on the other hand, this fast collection of receivables may leads to the loss of sales because customers wants to assess the quality of the product before paying. It is expected a negative and significant relationship between the account receivables period and profitability. The less time taken to collect receivables the more the company will be profitable.

Cash conversion cycle (CCC) is the amount of time that starts with the purchase of raw material by the firms and ends when they get the cash of their sold final goods. The greater the period of cash conversion cycle shows that investment in working capital management is larger. A longer cash conversion cycle might increase profitability because it leads to higher sales. However corporate profitability might also decrease with the larger cash conversion cycle, if the costs of higher investment in working capital management rise faster than the benefits of holding more inventories and/or granting more trade credit to customers (Deloof, 2003).

In addition to these we include current ratio (proxy for liquidity), size of the firms (natural logarithm of sales), sales growth, the financial debt ratio (proxy for leverage), ratio of fixed financial assets to total assets, inflation, the exchange rate and GDP growth as control variables.

To check the relationship between the working capital management and profitability, the following linear form is made which is consistent with the previous studies:

NOP = f(ACPY, ICPY, APPY, CCCY, CR, Size, SG, DR, FFAR, Inf, Exch, GDP growth)

Here NOP is net operating profits , ACPY is the accounts collection period (in an year), ICPY is the inventory conversion period (in an year), APPY is the accounts payables period (in an year), CCCY is the cash conversion cycle (in an year), CR is the current ratio, Size is the firm size, SG is the sales growth, DR is the debt ratio, and FFAR is the fixed financial assets ratio, Inf is the inflation rate, Exch is the exchange rate and GDP growth is the Gross Domestic Product growth rate.

3.4.2 Determinants of investment in working capital management

It is important to determine the factors affecting three main components of working capital management that is the accounts collection period (ACPY), inventory conversion period (ICPY), and accounts payable period (APPY).

It is important to analyze whether the companies in a specific industry follow the industry practices or not. For this purpose we will calculate the industry's average cash conversion cycle which shows the practice adopted in each industry regarding the investment in working capital management and after that it will be regressed against the three components of working capital management.

The study expects a positive relationship between the working capital management level of the industry and of working capital management level of the company.

The size of the company is an important variable when it comes to establishing a working capital management policy. In principle, large size firms invest less in working capital management because they may have better relationship with the suppliers and moreover large size firms have maintained a reputation and their product quality is well known, thus they have little need to extend trade credit, while the small size firms may not yet have an established reputation so they need to provide trade credit to the customers to ensure product quality.

So it is expected that there is a negative relationship between size of the company and investment in working capital management in the case of Pakistan.

The proportion of tangible assets which is the ratio of fixed assets to total affects the working capital management investment decision of the company. For example, the inventory problems of a producer of sugar will differ from those of a telecom company. In addition to this, the accounts receivables problems of these two companies are also different. It is expected that the more capital intensive companies invest less in working capital management in the case of Pakistan.

"A firm's sales expectations have an influence on the investment in working capital management" (Nunn, 1981), and that will also affect the investment in working capital management because if a firm expects the growth in its sales, it will increase the investment in inventories.

Country risk is a variable which is expected to have a significant impact on the investment in working capital. Country risk is being measured with "International Country Risk Guide (ICRG)" that indicates the risk premium that investors and lenders must charge for investing in the

companies belonging to that country. The higher value of country risk index shows the lower risk and vice versa. So we expect a positive relationship between the country risk index and investment in working capital, which means that as the values of country risk increases, the risk will decrease and so the investment in working capital will increase.

Cost of external finance is another variable which is expected to influence the investment in working capital management. If the cost of external sources of finance is low companies will increase their investment in working capital and vice versa.

Kieschnick et al. (2006) argue that "the market power of the company allows it to have better relationships with its suppliers and clients providing it with advantages over its competitors. Hence, the more concentrated the industry, the greater the company's influence will be over its working capital."

Moreover the study include some main macro economic variables to check whether they affect the investment in working capital management or not, these variables are annual exchange rate, inflation and GDP growth rate.

3.5 Development of the Hypotheses

Based on the theoretical framework and empirical literature review, the following hypotheses are formulated to meet the objectives of the study:

i.   There is a possible relationship between the efficient working capital management and profitability of Pakistani manufacturing sector firms.

ii.   There exists an aggressive working capital management investment policy in case of Pakistani manufacturing sector companies.

iii.   There exists a positive relationship between the level of working capital management of the industry and level of working capital management of the firm.

iv.   The size of the firm significantly affects the working capital management investment of the firm.

v.   The proportion of tangible assets significantly affects the working capital.

vi.   The firm's sales expectation significantly affects the investment in working capital management of that firm.

vii.   Country risk is negatively related to working capital management investment.

viii.   Market power of the company significantly affects the working capital management investment.

Chapter 4

Research Methodology and Data

This chapter presents the methodological framework and data used for analysis and data sources

4.1 Data

Sample selected for our analysis consists of all firms of all manufacturing sectors, obtained from the "financial statements analysis of companies listed at Karachi stock exchange" prepared by State Bank of Pakistan (SBP). Data consist of 323 firms and period spans from 2006 2011 (6 years). Data includes various sub sectors of the manufacturing like textile, chemical, food, cement, mineral products, motor vehicles, paper, paper board etc. This study will utilize the data on all those manufacturing firms for which data is available for the study period. The data for country risk is obtained from the International Country Risk Guide (ICRG).

4.2 Variables and Definitions

In this section first we will define the variables used for the first objective of working capital management's impact on profitability and after that we will define the variables used for the second objective which is the determinants of investment in working capital.

4.2.1 Impact of Working Capital Management on the Profitability

The variables used in this relationship are briefly discussed in this part of the study.

4.2.1.1 Net Operating Profits (NOP)

Net Operating Profits is calculated using the given formula consistent with previous studies like Deloof (2003)

$$NOP= (S–CGS+D\&A) / (TA – FA)$$

Here NOP is net operating profit, S shows sales, CGS is used for cost of goods sold, D&A is amount of depreciation and amortization, TA for total assets and FA are financial assets of a firm.

4.2.1.2 Accounts Collection Period (ACPY)

The Accounts Collection Period (ACPY), proxies for collection policy of firms is calculated as:

$$ACPY = AR /S$$

ACPY stands for account collection period in years, AR is account receivables, and S shows sales.

4.2.1.3 Inventory Conversion Period (ICPY)

Inventory Conversion Period (ICPY) proxies for inventory policy which is computed as:

$$ICPY = I / CGS$$

I shows inventory while CGS is cost of goods sold.

4.2.1.4 Accounts Payables Period (APPY)

Accounts payables period (APPY) proxies for payments policy of firms which is obtained as

$$APPY = APP / P$$

APP is average payment period and P is firm's purchases.

4.2.1.5 Cash Conversion Cycle (CCCY)

The Cash Conversion Cycle is the sum of ACPY and ICPY minus the APPY, that is,,

$$CCCY = ACPY + ICPY - APPY$$

Beside these variables there are many control variables which affects the profitability, these control variables are as follows.

4.2.1.6 Current Ratio (CR)

Current ratio (CR) is the commonly used measure of liquidity, it is obtained as

$$CR = CA / CL$$

CA is used for current assets of a firm while CL is used for current liabilities of a firm.

4.2.1.7 Firm Size (Size)

Firm size is a control variable which is the natural log of total turnovers (sales).

4.2.1.8 Debt Ratio

The leverage ratio is obtained as

$$Debt\ Ratio = (STL + LTL) / TA$$

STL is short term loans while LTL are long term loans, and TA is total assets.

4.2.1.9 Fixed Financial Assets Ratio (FFAR)

It is obtained as

$$FFAR = FFA / TA$$

FFA is used for fixed financial assets.

4.2.1.10 Sales Growth

Sales growth is the percentage increase in sales from previous year.

4.2.1.11 Exchange Rate

Exchange rate is the ratio of local currency in terms of foreign currency.

$$\text{Exchange Rate} = \text{LCU/US \$}$$

4.2.1.12 GDP Growth

GDP growth is the percentage increase or decrease of GDP over the period.

4.2.1.13 Inflation

Inflation is the percentage increase in general price level and is measured on annual basis for a fix basket of consumer items.

4.2.2 The Determinants of Investment in Working Capital

The study uses three components of Working capital management as the dependent variables, which are Accounts Collection Period (ACPY), Inventory Conversion Period (ICPY), and Account Payable Period (APPY).

The variables used for our model of the determinants of investment in working capital are as follows.

4.2.2.1 Accounts Collection Period (ACPY)

The Accounts Collection Period (ACPY) is used as a proxy of collection policy obtained as

$$ACPY = AR / S$$

The longer the period of accounts receivables means larger investment in working capital.

4.2.2.2 Inventory Conversion Period (ICPY)

Inventory Conversion Period proxies for inventory policy which is derived as

$$ICPY = I / CGS$$

The longer the inventory conversion period means more investment in working capital.

4.2.2.3 Accounts payables Period (APPY)

Accounts payables period is used as a proxy of payments policy which is obtained as

$$APPY = APP / P$$

If the firms pay their bills late it means they are utilizing this trade credit for further investment in working capital.

4.2.2.4 Average Industry CCC (ACCCY)

ACCC is the average of the CCCY of the firms within same industry.

4.2.2.5 Industry Average Accounts Payable Period (IAAPPY)

IAAPPY is the average of the APPY of the firms within same industry.

4.2.2.6 Size

Firm size is measured by taking natural logarithm of total sales.

4.2.2.7 Proportion of Tangible Assets (PTA)

It is the ratio of tangible assets to total assets, that is,

$$PTA = Tgb\ A\ /\ TA$$

4.2.2.8 Future sales Growth (FSG)

It is the percentage growth of sales expected in next year.

4.2.2.9 Herfindahl Hirschman Index (HHI)

As Herfindahl Hirschman Index (HHI) shows concentration level, here we use it to calculate firm share of sales from total industry sales to capture its market power.

$$HHI = F\ S\ /\ I\ S$$

F S shows firms' sales while I S shows industry total sales.

4.2.2.10 Country Risk

Country risk is a variable is taken from "International Country Risk Guide (ICRG)" which shows premium required by an investor on the eve of investment in a foreign country. Higher country risk will cause higher premium for investors.

4.2.2.11 Cost of external finance

The cost of external finance is calculated as follows:

$$COEF = FC/(TD - AP)$$

FC shows financial cost, TD is used for total debt while AP is account payables.

4.3 Empirical Model Specifications

4.3.1 Model specification for Working capital management and Profitability:

As this study uses the information for 323 firms over the period of 2006 to 2011 to test hypothesis regarding working capital management and profitability and for determinants of investment in working capital, panel data estimation technique is suitable for this purpose. This study uses panel data regression analysis. The general form of our model is

$$NOP_{it} = \beta_0 + \sum_{j}^{n} \beta_j X_{j_{it}} + \varepsilon_{it}$$

NOPit : Net Operating Profitability of firm i at time t

$\beta 0$: The intercept of equation

βi: Coefficients of X jit variables

Xjit: The different independent variables of WCM of firm "i" at time "t"

t :Time = 1, 2,……,6 years.

ε_{it} : The error term

By incorporating the variables in the model becomes:

$$NOP_{it} = \beta_0 + \beta_1 (ACPY_{it}) + \beta_2 (ICPY_{it}) + \beta_3 (APPY_{it}) + \beta_4 (CCCY_{it}) + \beta_5 (CR_{it}) + \beta_6 (Size_{it})$$
$$+ \beta_7 (DR_{it}) + \beta_8 (FFAR_{it}) + \beta_9 (SG_{it}) + \beta_{10} (Inf_t) + \beta_{11} (Exch_t) + \beta_{12} (GDP_t) + \varepsilon_{it}$$

4.3.2 Model specification for the determinants of investment in working capital

The study will use three regression equations for the purpose of determining the factors affecting working capital management investment decision, in which the dependent variables are used which are the components of working capital management (ACPY, ICPY, APPY).

This study also uses panel data regression where the model's general form is

$$ACPY_{it} = \beta_0 + \sum_{j}^{n} \beta_j X_{jit} + \varepsilon_{it}$$

$$ICPY_{it} = \beta_0 + \sum_{j}^{n} \beta_j X_{jit} + \varepsilon_{it}$$

$$APPY_{it} = \beta_0 + \sum_{j}^{n} \beta_j X_{jit} + \varepsilon_{it}$$

Where

ACPYit: Accounts Collection Period of firm "i" at time "t".

ICPYit: Inventory Conversion Period of firm "i" at time "t".

APPYit: Accounts Payable Period of firm "i" at time "t".

β_0: The intercept of equation

β_j: Coefficients of X it variables

Xjit: The different independent variables of firm i at time t

t :Time = 1, 2,……,6 years.

ε_{it} : The error term

Specifically, when we convert this general form of our model into our specified variables it becomes:

$$ACPY_{i,t} = \beta_0 + \beta_1 ACCCY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

$$ICPY_{i,t} = \beta_0 + \beta_1 ACCCY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

$$APPY_{i,t} = \beta_0 + \beta_1 IAAPPY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

4.4 Econometric Modeling

In this study the analysis is done for 323 firms over the period of 2006 to 2011, panel data estimation technique is most appropriate. Panel data estimation is beneficial for three reasons. First it is important when evaluating the management working capital of firms it changes with time, and time series measures of the variables give extra information which cross section estimator failed to provide. Secondly panel data acknowledges large sample size and addition in degree of freedoms. Thirdly panel data estimation better deals with the issue of the independent variable and super visioning of firm particular characteristics.

Empirical researches on working capital possibly go through from two sources of discrepancies which are missing variables and heteroskedasticity biases. When panel data is used, one faces a question whether the individual effect is taken as a fixed or random. The Hausuman test is used to compare fixed effect model with random effect model. The estimation technique is Generalized Least Square to deal with heteroskedasticity.

The Hausman test helped us to choose between the Fixed effect model and Random effect model, because the null hypothesis of the Hausman test is rejected, which clearly indicated the adoption of the Fixed effect model. The Fixed Effect Model is used with cross section weights for our analysis. The reason is that when the number of entities or cross sections is more than the number of time series, there may arise the problem of heteroskedasticity (variations changes over a short period of time). To overcome this issue this study used the GLS with cross section weights.

Chapter 5

Empirical Results

This chapter is going to extract the results for the study from the data on the non manufacturing firms listed on KSE. The chapter is divided into two sections. The first part of this chapter is associated with the first model of our study which is "working capital management and profitability", while the second part is associated with the second model of the study which is "the determinants of investment in working capital management".

5.1 Working capital management and Profitability

In this section this analysis allows to know what type of relationship exists between the components of working capital management and profitability.

We start our analysis with the descriptive statistics: it describes the application of phenomena and provide detailed information about the variables used in our model.

The descriptive statistics presented in table 1 (next page), shows the nature of data. Overall, the mean (median) net operating profit is 20% (16%) with a standard deviation of 19% on both sides. The mean (median) inventory conversion period in years is 0.25 (0.20), which means that firms take on average 92 days (that is 0.251924*365) with the median days of 73 (that is 0.200954*365) to convert the inventories into sales, with a standard deviation of 0.19 meaning 80 days deviation on both sides. The mean (median) accounts collection period in years is 0.098 (0.06), which means that firms take on average 36 days (that is 0.098915*365), with the median days of 22.2 days (0.060950*365) to collect the receivables, with a standard deviation of 0.12, meaning that the deviation from the mean days is 43 days on both sides.

Table 1: Descriptive Statistics

Descriptive Statistics.					
	Mean	Median	Maximum	Minimum	Std. Dev.
NOP	0.203637	0.164876	1.444799	0.27005	0.190627
ICPY	0.251924	0.200954	1.885571	7.99E 05	0.222115
ACPY	0.098915	0.060950	0.932600	0.000000	0.121994
APPY	0.388494	0.243856	2.996187	0.004100	0.428487
CCCY	0.03295	0.043347	1.620764	2.89507	0.444365
CR	1.112304	0.970000	0.990000	0.010000	0.683146
DR	0.681693	0.657287	1.109539	0.038356	0.405275
FFAR	0.135898	0.065875	1.961007	0.000000	0.210139
SG	0.195192	0.145199	3.989197	0.99711	0.466790
SIZE	14.27922	14.37179	18.55706	5.111988	1.651699

Notes: 1 Net Operating Profitability = (Operating Income + Depreciation) / (Total Assets – Financial Assets). 2 Average collection period in years = (account receivable) / Sales. 3 Inventory conversion period in years = (inventories) /Cost of sales.4 Accounts payable period in years = (accounts payable) / purchases. 5 Cash Conversion Cycle =(Average collection period in years + Inventory conversion period in years – Accounts payable period). 6 Current Ratio = current assets/ current liabilities. 7 Debt Ratio = Total Debt / Total Assets. 8 Financial assets to Total Assets =financial assets /Total assets. 9 size =log of sales. 10 sales growth (SG) = (st st 1)/ st 1.

The mean (median) account payables period in years is 0.388 (0.24), which when converted into days from years becomes 141 days (89 days), so it means that the firms on average pay their due bills in 141 days (89 median days). The mean (median) cash conversion cycle in years is 0.032 (0.043) that is 12 days (17 days), with a standard deviation of 0.444, meaning that the days of cash conversion cycle can deviate 162 days from the mean value of days CCC.

The mean (median) current ratio for the sampled firms is 1.11 (0.97) with a standard deviation of 0.68, which means the average current ratio is 111 % (97% median) with a standard deviation of 68% on both sides. The highest current ratio for the companies over the sample and period is 3.99, while the minimum ratio is 0.01. The results show that the mean (median) debt ratio for Pakistani firms is 0.681 (0.857) with a standard deviation of 0.40, which means the average debt ratio is 68% (85%) and it deviate on both sides of mean value on both sides. The mean (median) fixed

financial assets ratio for Pakistani firms is 0.135 (0.065) with a standard deviation of 0.21, which shows that the firms have on average 13.5 % (6.5%) assets in the form of financial assets and it deviates from the mean by 21%. The mean (median) sales growth for Pakistani firms is 0.1951 (0.1451) with a standard deviation of 0.466, which indicates that the average Pakistani firms sales growth over the sample is 19.5% (14.5%) with 46% deviation on both sides of the mean value. Finally the mean (median) size of the firms in the sample (which is measured through the log of sales) is 14.27 (14.37) with a standard deviation of 1.65 on both sides of the mean value. The maximum value for the log of sales in the sample is 18.55, while the minimum value is 5.11.

5.1.1 Regression Analysis

The regression analysis is used for the purpose to identify the important variables that influence the dependent variable. Panel data regression analysis is used on all the balanced panel data set. Panel data is a powerful tool for the study of dynamics of adjustments, compared with time series data and cross sectional data, the panel data identify and measures the effects very well. The Hausman test helped us to choose between the Fixed effect model and Random effect model, because the null hypothesis of the hausman test is rejected, which clearly indicated the adoption of the Fixed effect model. The Fixed Effect Model is used with cross section weights for our analysis. The reason is that when the number of entities or cross sections is more than the number of time series, there may arise the problem of heteroskedasticity (variations changes over a short period of time). To overcome this issue this study used the EGLS with cross section weights.

Table 2: Results of Working capital management and Profitability

Variables	Coefficients	p value

C	0.50979*	0.0000
ICPY	0.03468*	0.0002
ACPY	0.08838*	0.0000
APPY	0.013419*	0.0047
CCCY	0.00047*	0.0000
CR	0.041678*	0.0000
DR	0.02786*	0.0013
FFAR	0.038194*	0.0056
SG	0.020566*	0.0000
SIZE	0.048226*	0.0000
Exchange Rate	0.0504*	0.0000
GDP Growth	0.01612*	0.0071
Inflation	0.01214*	0.0000
HausmanTest (p value)		0.0000
R squared	0.80804	

Notes: The * indicates the significance at 1%. Hausman Test supports fixed effect model.1 Net Operating Profitability = (Operating Income + Depreciation) / (Total Assets – Financial Assets). 2 Average collection period in years = (account receivable) / Sales. 3 Inventory conversion period in years = (inventories) /Cost of sales.4 Accounts payable period in years = (accounts payable) / purchases. 5 Cash Conversion Cycle =(Average collection period in years + Inventory conversion period in years – Accounts payable period). 6 Current Ratio = current assets/ current liabilities. 7 Debt Ratio = Total Debt / Total Assets. 8 Financial assets to Total Assets =financial assets /Total assets. 9 size =log of sales. 10 sales growth (SG) = (st st 1)/ st 1.

In the above regression the components of working capital management, that is the average collection period in years, inventory conversion period in years, the accounts payable period in years, the cash conversion cycle in years and the control variables are regressed against the net operating profitability. The different relationships of the independent variables with the dependent variable are explained under the following headings:

5.1.1.1 Relationship between the Inventory Conversion Period and Profitability

The sign on the intercept of ICPY is negative and the coefficient is significant. The negative coefficient of the inventory conversion period shows that there is a negative relationship between the inventory conversion period and profitability (measured through the net operating profitability). It means that the shorter the period to convert inventories into sales the more profitable the firm will be. This finding is also consistent with the studies on the aggressive working capita policies and clearly shows that the Pakistani firms keep low level of inventory, which is the aggressive approach by which the company holds relatively small portion of its total assets in the form of current assets. Thus the Pakistani firms follow aggressive inventory management policy. The negative relation between the inventory conversion period and the Profitability is consistent with the findings of Lazaridis and Tryfonidis, 2006; Raheman and Nasr, 2007; Deloof,2003; Rehman and Anjum,2013; Vural et al.,2012.

5.1.1.2 Relationship between the Accounts Collection Period and Profitability

The sign of the accounts collection period coefficient is negative and is highly significant. It shows an inverse relationship between the accounts collection period and the Profitability measured by the net operating profit. This negative relationship can be explained as: the shorter the period the firms receive the cash for its sales the more profitable they will be, in other words the frequently the firms receive the cash for its sales the more it will be profitable because of the availability of more cash to the firm for the production operation and hence the production process will be start quickly which will lead to higher sales and thus higher profitability. This result implies that the manager can improve the profitability by reducing the credit period granted to their customers, so the managers should adopt the restrictive credit policy to the customers.

This negative relationship between the accounts collection period and net operating profitability is consistent with the studies of Raheman and Nasr, 2007; Deloof, 2003; Shine and Soenen, 1998; Garcia Teruel and Martinez Solano, 2007 and Mathuva, 2010.

5.1.1.3 Relationship between the Accounts Payable Period and the Profitability

The coefficient in the accounts payable period is positive and highly significant. Which describe a positive relationship between the accounts payable period and the net operating profit. This means that an increase in the accounts payable period is associated with an increase in the net operating profitability. This relationship has two interpretations, first is that, this positive relationship between the account collection period and the net operating profitability holds that the profitable firms wait longer to pay their bills to suppliers so as to take benefit of the cash which will help them in their operations. Secondly this relationship makes economic sense in that by delaying payments firm will be able to maintain a higher level of working capital and which could be used to increase profitability. Consistent with the rule of working capital management that firm should delay the payments to its suppliers as much as possible, keeping in view of not disturbing good will to others.

This positive relationship between the profitability and accounts payable period also shows that the Pakistani manufacturing sector follow aggressive working capital financing policy, whereby they finance the major portion of current assets by the current liabilities.

This relationship is consistent with the studies of Mathuva, 2010; Vural et al., 2012; Lazaridis and Tryfonidis, 2006.

*5.1.1.4 Relationship between the Cash Conversion Cycle and the profitability*

The cash conversion cycle is a comprehensive measure of working capital management, which is the time lag from the inventory conversion period to accounts collection and the payment of due bills. The coefficient on the cash conversion cycle is negative and highly significant, that is significant at 1% level. It shows that there exist a negative relationship between the cash conversion cycle and the net operating profitability, which means that an increase in the cash conversion cycle will cause a decrease in the profitability. Shine and Soenen (1998) have explained this negative relationship by the market power/ market share phenomena, that is, if the firm has market dominance or monopoly power, it will have a great bargaining power with both the suppliers and the customers and hence has a shorter cash conversion cycle, similarly more profits due to market power. This inverse relationship also shows that decreasing the short term assets results in increasing profits, which means that business do not hold liquid cash for too long and used to generate profit for the firm. This finding of negative relationship between the cash conversion cycle and the net operating profits is consistent with the studies of Deloof, 2003; Mathuva, 2010; Raheman and Nasr, 2007; Lazaridis and Tryfonidis, 2006; Ali, 2011.

5.1.1.5 Relationship between the Liquidity and Profitability

Liquidity is measured through the current ratio (CR). The coefficient on the CR is positive and highly significant. This shows a positive relationship between the liquidity and profitability, which is quite surprising because the literature explain a negative relation between the liquidity and profitability. The positive relationship between the liquidity (measured through current ratio) and profitability means that the firms should maintain a high level of current assets and liquidity to be

profitable. But this is not the story; the true picture of the reality can be explained by the study of Michalski, 2008.

Figure 5: Liquidity levels VS Profitability
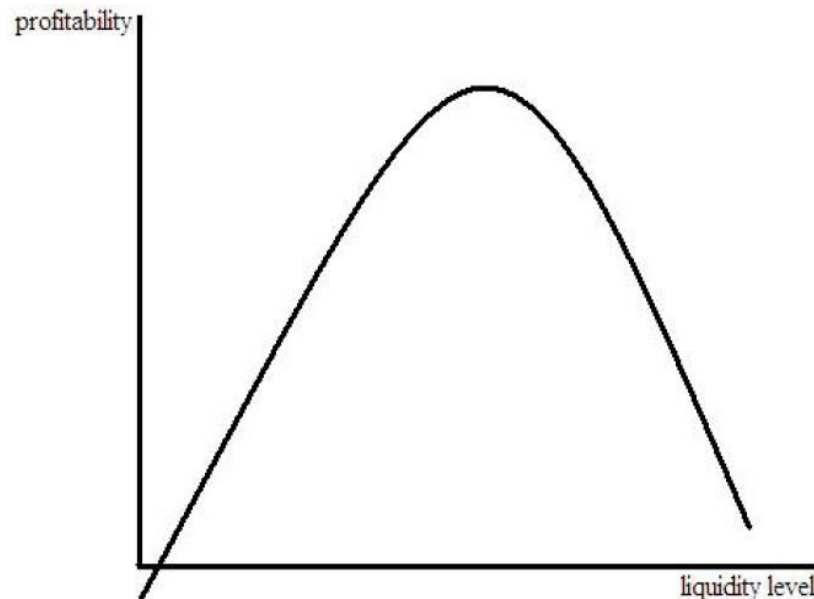
According to him the liquid assets should be maintained at the optimal level, which is the moderate working capital policy, when the firms have the liquidity level to the left of the optimal level, an increase in the liquidity will cause an increase in profitability, because here firms have a lack of liquidity, while to the left of the optimal level an increase in liquidity will cause a decrease in profitability, because here firms maintain more than required level of liquidity which causes a decrease in profitability.

The left side of the optimal level can be termed as the aggressive working capital management policy, because here the firms hold low level of liquidity. The firms who maintain the optimal level of working capital can be said of having moderate working capital management policy, while those firms which maintain a high level of liquidity which is more than the required level (to the right of the optimal level) can be termed as conservative Working capital management policy.

So the positive relationship between the current ratio and the profitability show that Pakistani firms adopt aggressive working capital policy.

5.1.1.6 Relationship of Leverage, Fixed Financial Assets Ratio, Size and Sales growth with profitability

Leverage, size and sales growth are the control variables in the model, which affects the profitability of the firm.

Leverage is measured through the debt ratio. The coefficient on debt ratio is negative and highly significant, which means a negative relationship between the leverage and profitability. If a firm increases its debt financing, it will be resulted in a decrease in profitability in terms of a rise financial expenses. This result is consistent with the results of Deloof, 2003; Raheman and Nasr, 2007; Mathuva, 2010; Garcia Teruel and Martinez Solano, 2013.

The fixed financial assets ratio is used as a control variable which shows the amount of financial assets the firm have. The coefficient on the FFAR is positive and highly significant, that is, significant at 5% level. This means that there exists a positive relationship between the amount of fixed financial assets and the profitability, that is, the more the company has the financial assets the more will be its profitability. This finding is consistent with the studies of Raheman and Nasr, 2007; Mathuva, 2010; Deloof, 2003.

The coefficient on the sales growth is positive and highly significant. This finding shows that the growth in sales is positively related to the profitability, that is, if a firm sales rises compared with the previous year sales, then that firm's profit will also show an increasing trend.

Size of the firm which is measured by the logarithm of sales is highly significant; with the coefficient has a positive sign. This shows a positive relationship between the size of the firm and

profitability, which means that if the firm size increases this, will result in an increasing profitability and vice versa. This relationship is in accordance with the literature regarding the size and profitability relationship. Raheman and Nasr, 2007; Deloof, 2003; Mathuva, 2010; Garcia Teruel and Martinez Solano, 2012, found the same results.

5.1.1.7 Relationship between net operating profitability and inflation

The coefficient on inflation is negative and highly significant which shows that there is an inverse relationship between the inflation and profitability, as the inflation rate increases the profitability of firms decreases and vice versa. This finding is consistent with the finding of Cenap Ilter, 2012; he stated that "inflation sweeps away the profits".

5.1.1.8 Relationship between Profitability and the exchange rate

The relationship between the profitability and the exchange rate is positive and highly significant which shows that as the exchange rate rises the profitability of firms will rise and vice versa. This is because when the local currency appreciates in terms of foreign currency the local firms get more foreign currency from the exports of its goods, while the import of machinery and latest technology from foreign for firms operations become less expensive, so the firms profitability increases.

5.1.1.9 Relationship between firm's profitability and GDP growth

The coefficient of GDP growth is positive and highly significant, which shows that as the GDP of the country grows the profitability increases. The justification behind this positive relation is that as the GDP grows investment and productivity also increases which cause an increase in the firm's profitability.

5.2 Determinants of investment in Working capital management

The dependent variables for our model of determinants of investment in working capital management are the three components of working capital management, which are accounts collection period in year (ACPY), inventory conversion period in year (ICPY), and accounts payables period in year (APPY). The larger the period of ACPY, ICPY and APPY, means the larger investment in working capital. Three regression equations is run for the analysis of determinants of investment in working capital, which are as follows:

$$ACPY_{i,t} = \beta_0 + \beta_1 ACCCY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

$$ICPY_{i,t} = \beta_0 + \beta_1 ACCCY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

$$APPY_{i,t} = \beta_0 + \beta_1 IAAPPY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

Here we want to check what are the important determinants / factors affecting the investment in working capital decision in Pakistan. Our analysis starts by first showing the descriptive statistics and after that we will show the regression analysis.

Table 3: Descriptive Statistics

Descriptive Statistics					
	Mean	Median	Maximum	Minimum	Std. Dev.
ACPY	0.098931	0.060950	0.932600	0.000000	0.122044

ICPY	0.251832	0.200954	1.885571	7.99E 05	0.222142
APPY	0.388546	0.243633	2.996187	0.004100	0.428697
ACCCY	0.016352	0.029747	0.274965	0.0082	0.120258
IAAPPY	0.388479	0.378700	0.879747	0.148233	0.123886
COEF	0.123440	0.111641	4.033865	3.4257	0.249531
CR	37.20969	36.61485	41.04638	34.18043	2.725146
HHI	0.037048	0.009471	0.786903	0.000000	0.083750
PTA	0.496764	0.510840	0.972747	0.000900	0.216293
SG	0.179181	0.145701	3.897313	0.9971	0.400825
SIZE	14.1173	14.3688	18.5570	5.11198	1.87916

Note:1 ACPY = accounts receivables / sales.2 ICPY = Inventory / cost of sales.3 APPY = Average payment period/purchases.4 ACCCY=TCCCYt/no. of firms in the industry.5 IAAPPY=TAPPY/ no. of firms in the industry.6 size=natural logarithm of sales.7 PTA=Tangible Assets / Total Assets.8 SG=percentage growth of sales from one year in the future.9 HHI = Firm's Sales / Industry's total sales.10 CR=country risk.11 Cost of External Finance = Financial Cost/(Total Debt – Accounts Payable).

The above table shows the descriptive statistics of our first regression equation, which shows the important aspects and nature of our data and gives detailed information about each variable of our interest.

The mean (median) accounts collection period is 0.098 (0.06), with a standard deviation of 0.122, which means that an average firm collects its receivables in 0.098*365 (0.06*365) that is 35.77 (22) days. The mean (median) inventory conversion period is 0.25 (0.20) with a standard deviation of 0.22, which means it takes 91 (73) days on average to convert the raw material into sellable products by an average firm. The mean median accounts payable period is 0.388 (0.24) with a standard deviation of 0.42 showing that on average the firms take 141 (87) days to pay their short term obligations. The mean median industry's average cash conversion cycle is 0.016 (0.029) with a standard deviation of 0.12, which shows that the average industry's cash conversion cycle is 5 (11) days (the shorter period of industry's average cash conversion cycle is due to the subtraction of accounts payable period from the sum of accounts collection period and inventory conversion period). The mean (median) value of industry's average accounts payable period (which shows the

industry's practices regarding the accounts payable policy) is 0.388 (0.378) with a standard deviation of 0.12, which shows that an average industry pay its short term bills in 141 (137) days. The mean median value of cost of external finance is 0.12 (0.11) with a standard deviation of 0.24. The mean (median) value of country risk is 37.2 (36.6) with a standard deviation of 2.72, which is the average country risk for Pakistan over the period. The mean (median) value herfindahl hirschman index is 0.037 (0.0094) with a standard deviation of 0.08. The mean (median) value of the proportion of tangible assets is 0.496 (0.51) with a standard deviation of 0.21. The mean (median) value of sales growth is 0.18 (0.14) with a standard deviation of 0.40, which means that the average firms sales grows at a rate of 0.18 (0.14). The mean (median) value of size is 14.11 (14.36) with a standard deviation of 1.87.

5.2.1 Regression Analysis

Here we have run three regression equations; the three equations are interpreted separately under the following headings:

5.2.1.a Equation 1

Now we are going to show the regression results of our first equation. Here we have regressed the determinants of investment in working capital against the first component of working capital management, which is the accounts collection period in year (ACPY). That is:

$$ACPY_{i,t} = \beta_0 + \beta_1 ACCCY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

The important relationships and their interpretations are given under the following headings:

5.2.1.a1 Relationship between Accounts Collection Period (ACPY) and industry practices (ACCCY)

The coefficient on the industry practices regarding working capital management is highly significant with a positive sign, which shows that firms in a specific industry follow the practices prevail in that industry. If the industry practice is to invest a large portion of funds in working capital, the firms in that industry will follow this practice and vice versa, because companies wants to stay closer to the industry policy. This result is consistent with the studies of Kieschnick et al., 2006. Mongrut et al., 2007, Hawawini, Viallet, and Vora (1986).

5.2.1.a2 Relationship between Accounts Collection Period and Cost of External Finance

The coefficient on the cost of external finance is negative and significant at 10% level. It means that there exist a negative relationship between the investment in working capital and the cost of external finance. As the cost of external finance increases firms reduce its investment in working capital and firms will be less generous in providing financing to their customers and vice versa. This finding is in accordance with the studies of Teruel and Solano, 2010, Boschker, 2011.

5.2.1.a3 Relationship between Accounts Collection Period and Country Risk

The coefficient on the country risk index is highly significant with a positive sign. The higher the value of country risk means lower risk in a specific year while the lower value of country risk index indicates a high risk. The positive sign on the intercept of country risk means that as the value of country risk index increases, the country risk decreases and hence the investment in working capital increases, because if the risk is lower the lenders and investors will charge low premium on their investments, so the firms can obtain funds at lower cost and therefore they will be able to invest more in working capital. This result is consistent with the study of Mongrut et al., 2007.

Table 4: Regression Analysis

	Equation.1	Equation.2	Equation.3
	ACPY	ICPY	APPY
ACCCY	0.0535*	0.1385*	
	0.0000	0.0000	
COEF	0.0031**	0.0127**	0.0390*
	0.0376	0.0362	0.0003
CR	0.0004*	0.0028*	0.0013***
	0.0007	0.0000	0.0965
HHI	0.1076*	0.2310*	0.5467*
	0.0000	0.0018	0.0001
PTA	0.0047	0.2692*	0.0486
	0.2949	0.0000	0.1051
SIZE	0.0056*	0.0295*	0.0504*
	0.0000	0.0000	0.0000
SG	0.0058*	0.0422*	0.0836*
	0.0000	0.0000	0.0000
Exch	0.000374*	0.000843*	0.000803*
	0.0000	0.0002	0.0003
Inf	0.000352*	0.000605**	0.000845**
	0.0002	0.0239	0.0448
Growth	0.00159*	0.001234***	0.00494*
	0.0000	0.0790	0.0000
IAAPPY			0.5093*
			0.0000
C	0.1703*	0.8920*	1.4205*
	0.0000	0.0000	0.0000
Prob (F Statistics)	0.0000	0.0000	0.0000
R squared	0.7720	0.6897	0.7384

Note: The * indicates the significance at 1%. Hausman Test supports fixed effect model. 1 ACPY = accounts receivables / sales.2 ICPY = Inventory / cost of sales.3 APPY = Average payment period/purchases.4 ACCCY=TCCCYt/no. of firms in the industry.5 IAAPPY=TAPPY/ no. of firms in the industry.6 size=natural logarithm of sales.7 PTA=Tangible Assets / Total Assets.8 SG=percentage growth of sales.9 HHI = Firm's Sales / Industry's total sales.10 CR=country risk.11 Cost of External Finance = Financial Cost/(Total Debt – Accounts Payable).

5.2.1.a4 Relationship between the Accounts Collection Period and market power

We use the herfendahl hirschman index (HHI) as the proxy for the market power of the companies. The coefficient on the HHI is negative and is highly significant. The negative sign on the HHI indicates that there exist a negative relationship between the market power of the company and the investment in Working capital management. This means that the large size firms use their market

power to decrease the investment in working capital. This findings is against the findings of Kieschnick et al., 2006, for the case of American manufacturing firms, and is consistent with the study of Mongrut, 2007.

5.2.1.a5 Relationship between the Accounts Collection Period and the Size of the company

The coefficient on the size of the company is negative and significant at 1% level, which indicates a strong negative relationship between the size of the company and the investment in working capital management. This means that large size firms invest less in working capital because they may have better relationship with the suppliers and moreover large size firms have maintained a reputation and their product quality is well known, thus they have little need to extend trade credit, while the small size firms may not yet have an established reputation so they need to provide trade credit to the customers to ensure product quality. This result is consistent with the studies of Kieschnick et al., 2006, Mongrut, 2007, and Boschker, 2011.

5.2.1.a6 Relationship between Accounts Collection Period and Sales Growth

 The coefficient on the sales growth is negative and highly significant. Which indicate an inverse relationship between the accounts collection period and the sales growth. This inverse relationship indicates that growing companies try to collect the receivables as soon as possible in order to be able to finance growth. According to Binks and Ennew (1996)" the faster the rate of growth the higher the likelihood of problems in access to (bank) credit". Although growing firms might be very profitable, but they also face the risk of liquidity problems and hence bankruptcy, than the firms growing not so fast, thus in this situation the inventory and receivables are the hidden reserves that can be used to finance growth (Appuhami 2008). This result is consistent with the

studies of Nakamura and Palombini, 2009, García Teruel and Martínez Solano, 2010, Boschker, 2011.

5.2.1.a7 Relationship between the Accounts Collection Period (ACPY) and the Exchange Rate

The coefficient on the exchange rate is positive and highly significant, which can be explained with the perspective of foreign trade. As the exchange rate is a volatile phenomena, if the importer of Pakistani firms goods face an increase in the Pakistani exchange rate while he is to pay, he will try to delay the payments to the Pakistani firm expecting that in the short run the exchange rate of rupee will decrease so he will pay to the Pakistani firm because in the situation (appreciation of rupee) the Pakistani goods will be expensive for him and when the exchange rate of rupee declines, the Pakistani goods will be inexpensive for him.

5.2.1.a8 Relationship between the Accounts Collection Period (ACPY) and inflation

Inflation is positively and significantly affecting the accounts collection period which means that as the inflation increases the receivables to the firms will be delay because the purchasing power of the costumers will be low in the inflationary situation, which will result in the delay payments to the firms and so a longer accounts collection period of the firms.

5.2.1.a9 Relationship between the Accounts Collection Period (ACPY) and GDP growth

The coefficient on growth is negative and highly significant which shows that there exist an inverse relationship between the accounts collection period and the GDP growth, when the GDP of the country grows the firm's receivables will frequently occurs.

5.2.1.b Equation.2

Here the dependent variable is inventory conversion period in years (ICPY), which is a component of investment in working capital. The regression model we have run is:

$$ICPY_{i,t} = \beta_0 + \beta_1 ACCCY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t + \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

Now we are going to interpret the relationships found with the help of the above regression equation.

5.2.1.b1 Relationship between the Inventory Conversion Period (ICPY) and Industry's practices

The coefficient of Industry's average cash conversion cycle (ACCCY) is significant at 1% level with a positive sign, which shows that there exists a positive relationship between the investment in working capital and the industry's practices regarding the working capital management. it means that firms in a specific industry follow the practices that prevails in that industry. If the industry in which the firm operates invest more in working capital, the firm will also invest more in working capital, and vice versa. This result is consistent with the studies of Kieschnick et al., 2006, Mongrut et al., 2007, Hawawini, Viallet, and Vora (1986).

5.2.1.b2 Relationship between the Inventory Conversion Period (ICPY) and Cost of External Finance (COEF)

The coefficient on the cost of external finance (COEF) is significant at 5% level with a negative sign, which shows that there exist an inverse relationship between the investment in working capital and the cost of external finance. The higher the financing cost, the firms will hold less inventories and the lower the financing cost, higher level of inventories will be held by the firms.

If the cost of external finance increases the firms will invest less in working capital, and vice versa. This finding is consistent with the previous studies of Teruel and Solano, 2010 and Boschker, 2011.

5.2.1.b3 Relationship between the Inventory Conversion Period (ICPY) and the Country Risk

The coefficient on the country risk is highly significant, that is at 1% level, with the positive sign, this means that as the value of country risk increases (low country risk), the investment in working capital also increases and vice versa, because in the case of low country risk, the lenders and investors will charge low premium on their investment, so the firms will raise funds at lower cost and hence they will invest more in working capital. This result is consistent with the study of Mongrut et al., 2007.

5.2.1.b4 Relationship between the Inventory Conversion Period (ICPY) and Market Power

The coefficient on the herfindahl hirschman index is significant at 1% level with the negative sign, which shows that there is an inverse relationship between the Inventory Conversion Period (investment in working capital). This means that firms use their market power to reduce the investment in working capital and specifically in inventory conversion period (ICPY). This finding is against the findings of Kieschnick et al., 2006, for the case of American manufacturing firms, and is consistent with the study of Mongrut, 2007.

5.2.1.b5 Relationship between the Inventory Conversion Period (ICPY) and Proportion of Tangible Assets (PTA)

The coefficient on the proportion of tangible assets (PTA) is negative and highly significant, which shows an inverse relationship between the proportion of tangible assets and the inventory conversion period in specific and the investment in working capital in particular. It means that the

companies which are more intensive in tangible assets reduce their inventory conversion period and hence reduces the investment in working capital. This result is consistent with the studies of Kieschnick et al., 2006, and Mongrut, 2007.

5.2.1.b6 Relationship between the Inventory Conversion Period (ICPY) and Sales Growth

The coefficient on sales growth is negative and highly significant, which shows an inverse relationship between the sales growth and the inventory conversion period in specific and investment in Working capital management in particular. According to Binks and Ennew (1996) "the faster the rate of growth the higher the likelihood of problems in access to (bank) credit", Although growing firms might be very profitable, but they also face the risk of liquidity problems and hence bankruptcy, than the firms growing not so fast, thus in this situation the inventory and receivables are the hidden reserves that can be used to finance growth (Appuhami 2008). This result is consistent with the studies of Nakamura and Palombini, 2009, Teruel and Solano, 2010, Boschker, 2011.

5.2.1.b7 Relationship between Inventory Conversion Period (ICPY) and Size

The coefficient on the size is negative and highly significant which shows an inverse relationship between the size and inventory conversion period in specific and investment in Working capital management in particular. This means that the large size firms maintain low level of inventory and invest less in working capital and vice versa. According to Preve and Sarria Allende, 2010 "An economy of scale that affects working capital is the fact that smaller firms need to maintain relatively high levels of inventory in order to profit from quantity discounts and to be prepared for somewhat volatile sales."

This finding is in line with the study of Nakamura and Palombini, 2009, and against the study of Kieschnick et al., 2006, Mongrut et al., 2007.

5.2.1.b8 Relationship between the Inventory Conversion Period (ICPY) and the Exchange Rate

The coefficient on the exchange rate is negative and highly significant which means that as the exchange rate increases the inventory conversion will occur frequently, but this result is correct in the case of exporting firms because the more they produce and exports (while the exchange rate is high) the more profitable they will be by the sale of its products abroad and earning foreign exchange.

5.2.1.b9 Relationship between the Inventory Conversion Period (ICPY) and Inflation

The coefficient on the inflation is positive and significant which means that as the inflation rate increases the inventory conversion period also increases, because the raw material and other inputs required in the production process will be costly for the firms.

5.2.1.b10 Relationship between the Inventory Conversion Period (ICPY) and GDP Growth

The coefficient on GDP growth is positive and significant which shows a positive relationship between the inventory conversion period and the growth. As the GDP of the country increases both long run and short run investments in firms increases and also the production of firms increases which increase the inventory conversion period.

5.2.1.c Equation.3

In equation three we have taken the accounts payable period (APPY) as our dependent variable. The regression equation we have run here is as follows:

$$APPY_{i,t} = \beta_0 + \beta_1 IAAPPY_{i,t} + \beta_2 COEF_{i,t} + \beta_3 CR_i + \beta_4 HHI_{i,t} + \beta_5 PTA_{i,t} + \beta_6 Size_{i,t} + \beta_7 SG_{i,t} + \beta_8 Exch_t$$
$$+ \beta_9 Inf_t + \beta_{10} Growth_t + u_{i,t}$$

Here we have used industry's average accounts payable period (IAAPPY) as a proxy for the industry's practices. The reason behind replacing industry's average cash conversion cycle (ACCCY) by industry's average accounts collection period (IAAPPY) is that we construct the cash conversion cycle by subtracting the accounts payable period from the sum of accounts collection period and inventory conversion period, so it will show a negative relationship between the accounts payable period and the industry's cash conversion cycle.

Now we are going to interpret the important relationship found by our regression equation.

5.2.1.c1 Relationship between the Accounts Payable Period (APPY) and the Industry's Practices

The coefficient on the industry's practices regarding accounts payable policy is positive and highly significant, which means that there is a positive relationship between the industry's practices and the accounts payable period (APPY). If the industry practice is to pay the due bills late, the firms operating in that industry will also follow the same practice and vice versa.

This result is consistent with the studies of Kieschnick et al., 2006. Mongrut et al., 2007, Hawawini, Viallet, and Vora (1986).

5.2.1.c2 Relationship between the Accounts Payable Period (APPY) and the Cost of External Finance (COEF)

The relationship between the accounts payable period (APPY) and cost of external finance is positive and highly significant, this positive relationship shows that as the cost of external sources of finance increases, the firms will use the funds provided by the suppliers by delaying their due

bills. According to Boschker, 2011 "higher financing costs makes it less attractive to provide generous financing to their customers, while they are more willing to pay the cost of forgone discount to their creditors in exchange for a longer credit period."

This result is consistent with the study of Boschker, 2011.

5.2.1.c3 Relationship between the Accounts Payable Period (APPY) and Country Risk

The relationship between the accounts payable period (APPY) and country risk is negative and significant, which shows that as the value of country risk index increases the risk will be lower and as the risk decreases the period of accounts payable also decreases and vice versa, because in the face of lower country risk the lenders will charge low premium on their investment so the firms will raise funds at low cost, so they will not use the funds of their suppliers and pay their bills in short period of time, because according to Molina and Preve, 2007 "Trade credit (cost of foregone discounts) is more expensive than financial credit (interest), so firms with access to financial credit should use it".

5.2.1.c4 Relationship between the Accounts Payable Period and Market power

The coefficient on HHI is negative and highly significant, which shows that as the market power of the firm increases the accounts payable period of those firms decreases. This means that the firms having some degree of monopoly power tries to increase its hold on raw material and for this purpose they establish good relationship with the suppliers by timely payments to the suppliers of raw material.

5.2.1.c5 Relationship between the Accounts Payable Period (APPY) and Sales Growth

The relationship between accounts payable period and sales growth is negative and highly significant, which indicates that the firms with declining sales faces difficulties in paying their bills. According to Boschker, 2011 "firms with declining sales are delaying payments in order not to face bankruptcy".

This result is consistent with the study of Nakamura and Palombini, 2009, and Boschker, 2011.

5.2.1.c6 Relationship between the Accounts Payable Period (APPY) and firm size

The coefficient on the size of the firm is negative and highly significant, which shows an inverse relationship between the accounts payable period and the size of the firm. This shows that larger firms can save more money by replacing expensive trade credit with cheaper financial credit than with delaying payment to their creditors, which they can because of their larger negotiation power (Rafuse, 1996) .Meltzer (1960) study found that large firms have better access to capital markets as compare to smaller firms. According to Howorth and Reber, 2003 "it seems that relatively high fixed costs of time and effort required to arrange financial credit make smaller firms decide to use more trade credit." They also mention that "small firms with low levels of financial management skills may also be unaware of the high cost of trade credit implicit in foregone discounts" (Howorth and Reber 2003).

This result is consistent with the studies of Howorth and Reber, 2003, Boschker, 2011, Mongrut et al., 2009.

5.2.1.c7 Relationship between the Accounts Payable Period (APPY) and Exchange Rate

The coefficient on the exchange rate is positive and highly significant showing that as the exchange rate increases the firms delay their payments to the suppliers. This positive relationship might be the result of foreign demand for the Pakistani products which increase the exchange rate of local currency and to fulfill the foreign demand for local products the firms uses the supplier's fund.

5.2.1.c8 Relationship between the Accounts Payable Period (APPY) and Inflation

The coefficient on inflation is positive and significant showing a positive relationship between the accounts payables period and inflation, which means that as the inflation rate increases the firms delay the payments to their suppliers and utilize the supplier's funds for their operations.

5.2.1.c9 Relationship between the Accounts Payable Period (APPY) and GDP Growth

The coefficient on the GDP growth is negative and highly significant which shows that as the GDP growth rate increases the accounts payable period decreases, that is, firms pay their due bills quickly. As the GDP increases it means that domestic production increases and this increased production requires that the firms pay their bills quickly to the suppliers so that the suppliers can supply the raw material on time when the firms needs the raw material for the production process.

Chapter 6

Conclusions and Implications

6.1 Conclusion

Majority of the Pakistani firms invests more in working capital (Rahman and Nasr, 2007), which become an integral part of business so it affects the level of profitability of firms such that effective working capital management can enhance a business profitability. This study found an inverse significant relationship between the two components of working capital management (that is, inventory conversion period and accounts collection period) and the cash conversion cycle, while the study found a significant positive relationship between the net operating profit and the third component of working capital management (that is, the accounts payable period) for a big sample of Pakistani manufacturing firms listed on Karachi Stock Exchange. These findings suggest that managers can create value for the owners of firms by reducing the length of accounts receivable period, inventory conversion period and the cash conversion cycle to as much as possible, while the positive relationship between the accounts payable period and the net operating profit shows that delaying payments to the suppliers of the firm increases profitability by utilizing those funds. This finding verifies our first hypothesis that efficient management of working capital is positively related to firm's profitability.

These relationships between the net operating profitability and the three components of working capital management suggest that aggressive working capital policy (both investment and financing policies) are preferable in the case of Pakistani manufacturing firms.

Moreover the positive relationship between the current ratio (proxy of liquidity) and net operating profitability shows that Pakistani firms follow aggressive working capital investment policy. The positive relationship between liquidity and profitability is due to the fact that Pakistani firms hold low level of liquidity from the optimal level, so any increase in the liquidity level will positively affects the profitability.

The study also explores some important determinants that affect working capital investment decisions. The study found that Pakistani firms follow the practices prevailed in the industry. When the external financing is costly, firms invest less in working capital management. When the country risk is high (that is uncertainty) the lenders will charge more premiums on their lending, so it will be costly for firms to invest in working capital.

The market power of firms also affects the investment decision of firm. The firms which are more capital intensive tend to invest less in working capital.

6.2 Policy implications

The results suggest that the managers can create value for their owners by reducing the numbers of days accounts receivables, inventory conversion period and hence the cash conversion cycle.

The study also found that aggressive working capital management policy is favorable in the case of Pakistani firms.

6.3 Further research

Further research can be done on determining the strategies regarding working capital management adopted by Pakistani manufacturing firms and also on the in depth study on the factors determining the working capital investment decision.

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